

# **Deprivation and the equitable allocation of health care resources to decentralised districts in Tanzania**

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## Executive summary

There is growing concern internationally that limited public sector resources for health care should be allocated equitably. But how can this be done?

Resources can be allocated equitably by using a resource allocation formula that includes measures of the relative need for health services in individual geographic areas (such as districts) in a particular country. One indicator of need that is receiving increased attention is *deprivation*.

This study estimated deprivation levels in each district using data from the 2000 Census.

Deprivation in Tanzania was found to be largely related to three factors:

- the percentage of households without a toilet;
- the percentage of children not enrolled in primary school; and
- the percentage of the population that is illiterate.

There is a marked variation in deprivation between various districts in Tanzania.

Tanzania recently adopted a needs-based formula, which includes a poverty measure, to allocate resources to districts.

This paper presents an analysis of the allocation of health care resources in Tanzania. It is part of a series of studies undertaken in different African countries under the auspices of the theme work on fair financing in the regional network for Equity in Health in east and southern Africa (EQUINET). More extensive details on needs-based resource allocation formulae, deprivation and the methods used in these studies can be found in McIntyre et al. (2000), also available on the EQUINET website [www.equinet africa.org](http://www.equinet africa.org).

This paper analyses equity in current resource allocation in Tanzania, and compares these allocations to equity target allocations, using an index of deprivation. The results revealed that districts currently receiving relatively high allocations according the current poverty-based formula would receive slightly lower budgets if the deprivation index was used in the resource allocation formula. Those with very low allocations would receive slightly more if the deprivation index was used to guide resource allocation. However, the resource allocation differences between the poverty-based and deprivation-based formulae were small. This suggests that Tanzania has already made good progress in addressing equity in resource allocation between districts.

## Introduction

Achieving equity is a key health sector goal in many low-income and middle-income countries. In particular, there is a growing emphasis on allocating limited government resources (and donor funds, where these are combined with tax funding in a common pool) according to the relative need for health services between regions and districts within a country. The underlying intention is to ensure that individuals are not prejudiced in their access to essential health care due to their place of residence, and to promote equity in access to health care based on need. Thus, countries are increasingly using a needs-based formula to guide their allocation of resources. The indicators of need most frequently used in such formulae include:

- the size of the population in each area (e.g. district);
- the demographic composition of the population (as young children, the elderly and women of childbearing age tend to have a greater need for health services);
- levels of ill-health; and
- socio-economic status (given that there is a strong correlation between ill-health and low socio-economic status and that the poor are most reliant on publicly funded services).

One possible indicator of the need for publicly funded health services that is receiving increasing attention is social and material deprivation. What is deprivation? Deprivation may be defined as a state of observable and demonstrable disadvantage relative to the community or wider society to which an individual, family or group belongs (Townsend et al 1988). It is a broader measure than poverty, which is usually defined as lack of income, and takes into account a wide range of factors that would render an individual or household more disadvantaged than others. A number of studies have demonstrated a strong link between deprivation and ill health, suggesting that it may be important to include deprivation as a measure of need for health services.

This paper presents an analysis of the allocation of health care resources in Tanzania. It is part of a series of studies undertaken in different African countries under the auspices of the theme work on fair financing in the regional network for Equity in Health in east and southern Africa (EQUINET). More extensive details on needs-based resource allocation formulae, deprivation and the methods used in these studies can be found in McIntyre et al. (2000), also available on the EQUINET website [www.equinet africa.org](http://www.equinet africa.org).

The paper first provides a brief overview of the current structure of health services and resource allocation mechanisms in Tanzania. It then outlines the methods used in the study, including the approach to deriving an index of deprivation. Finally, the current health care budget allocation between districts in Tanzania is compared with an equity target budget allocation that takes deprivation into account.

## 1. Background to Tanzania and its health system

Tanzania is one of the poorest countries in the world and has significant geographical variation in economic and health indicators (National Bureau of Statistics 2001). The results of a household survey on income poverty in 2000/01 shows that 18% of Tanzanians live below the food poverty line and 35% live below the basic needs poverty line. Poverty is more severe in rural areas than in urban areas. Poor people in urban areas constitute only 13% of the country's poor people, while the rural poor account for 87%. There is also a wide variation between regions and between urban and rural areas in primary school enrolment, ranging from 85% in urban Iringa and Kilimanjaro to 40% in rural Lindi. Households in urban areas generally have higher rates of school enrolment, better access to drinking water, and higher socio-economic status. In contrast, households in remote regions and rural areas have both the worst socio-economic status and the greatest levels of social exclusion.

## 2.1. Health system structure

The health delivery system in Tanzania is organised hierarchically at six levels, each linked with an official administrative level. There is a broad base of primary level care facilities, consisting of dispensaries and village health posts, reaching to a narrow apex of zonal tertiary hospitals (see *Table 1*).

**Table 1: Tanzania's administrative and health system**

Administrative level		Types of facilities	Facilities		
Level	Number		Public	NGO	For-profit
Zone	6	Tertiary hospitals	4	-	-
Region	21	Secondary hospitals (one in each region)	17	-	-
District	121	Primary hospitals (one in each district)	85	81	42
Division	372	Health centres	292	69	41
Ward	2,000	Dispensaries	2,683	598	1,099
Village	11,000	Village health posts	4,000	-	-

Source: Ministry of Health 2002b

The country is divided into 21 regions, each with a population ranging from 450,000 to 2 million people. Most regions (17 out of 21) have regional hospitals. In theory, these are staffed with medical specialists, trained medical and paramedical staff. These hospitals have diagnostic facilities and are expected to serve as training centres for various types of health workers.

Each region consists of four to five districts, with a population in each district ranging from 100,000 to 300,000 in rural areas, and up to a million in urban areas. Most districts have a district hospital owned by government or a mission/voluntary agency, which provides curative and preventive health services and serves as an in-service training centre for district staff. The district hospital is the first referral centre from the primary health care delivery points, which include health centres and dispensaries at divisional and ward levels respectively.

Until the early 1970s, the health system ended at dispensary level. At that point, the government realised that the plan of providing every village with a dispensary was not feasible, and introduced village health workers (VHWs) and village health posts. A key element of health sector reforms in Tanzania in recent years is the decentralisation of district level health service management to local authorities.

## 2.2. Distribution of health services and resources

Health services are not equitably distributed between geographic areas. For example, in the Shinyanga region there are 6,243 people per medical officer, and in urban Dar es Salaam, there are 126,518 people per medical officer. (Ministry of Health Tanzania, 1995). There are also substantial variations in how much physical access patients have to health care facilities, measured in terms of the percentage of people within a six-kilometre radius of a primary health facility and the average distance to a hospital. Urban districts are better served and have better health care access than rural areas. Similarly, there are large differences in the level of health care funding between areas. In 2002, government health care funding to regions ranged from 887 Tanzanian shillings (US\$0.88) per capita in Dar es Salaam to 2,288 Tanzanian shillings (US\$2.3) in Coast region.

Addressing these inequities is particularly difficult, given the low level of overall funding available for health services. The 2002 Tanzanian Public Expenditure Review revealed that, while government health spending has consistently stayed at about 10% of the discretionary budget, absolute health care expenditure on health has increased from about 124 billion Tanzanian Shilling in 1998/99 to about

215 billion Tanzanian shillings (Tsh) in 2002 (Ministry of Health Tanzania, 2002). However, despite the increase in public financial resources allocated to health, two important constraints emerge from the expenditure review:

- The first constraint is the heavy reliance on external funding, with about 53% of health spending being funded by donors.
- The second constraint is that health care expenditure per capita only translates into US\$5.88, significantly less than the minimum level recommended by the World Bank of US\$12 per capita (World Bank, 1993b).

International experience has demonstrated that it is easier to reallocate resources between geographic areas when health services levels are already relatively well resourced and when the level of funding is increasing. This would allow overall budget increases to be allocated to relatively under-resourced areas, rather than funding these allocations by cutting the budgets of relatively over-resourced areas. Nevertheless, it is possibly even more important to ensure an equitable use of resources when they are constrained, to ensure that limited resources benefit those with the greatest need for health care. Tanzania has already introduced strategies to promote equitable allocation of their limited resources, as outlined in the next section.

### **3. Health care resource allocation in Tanzania**

There are two main modes of financing districts within the context of decentralisation to districts: block grants and basket funding.

#### **3.1. Block grants**

Tanzania's health care system is mainly funded by block grants, which are transferred from central to local governments. The size of these grants depends on how much central government was able to collect in tax revenue. Local governments in turn disburse some of these block grant funds to health districts. The central government also disburses funds directly to districts for the procurement of drugs and medical supplies through the Ministry of Health.

Local government (LG) allocates its resources to six main areas: education, water, transport, LG administration, agriculture and health. On average, about 70% of the funds are allocated to the education sector, while only 18% of the LG funds are devoted to health services. LG administration consumes about 6% of LG resources while the other sectors receive the remaining 6% (roads, water and agriculture).

The allocation of block grants to regions and individual local governments clearly influences how equitably health care resources are distributed between districts. Until recently, government funds to local governments were unevenly distributed, with some areas receiving more resources than others. For instance, local government in the Coast Region consistently received the largest per capita transfers compared to all other regions. For example, local government in the Coast Region received an average of 11,234 Tanzanian shillings (Tsh) per person in 2002/3, whereas local government in Shinyanga Region received the lowest transfer of 5,260 Tanzanian shillings (Tsh) per person. There were similar disparities in the allocation of grants to health districts, which are allocated on a historical basis. In other words, each year, they receive the previous year's allocation, with a slight increase to take account of inflation.

Recently, this mechanism for allocating resources was changed. "Beginning from 2004/5, efforts were being made to allocate resources albeit incrementally having regard to the need for equalisation and considering the different levels of poverty incidences in the region" (President's Office, Regional Administration and Local Government, 2003).

### **3.2. Basket funds**

Basket funds refer to donor funds that have been pooled under the Sector Wide Approach (SWAP) initiative. These funds were allocated to local governments on an equal per capita basis (in other words, \$0.5 per person in each local government area). In this way, each council's share is determined by its population size. As indicated previously, a number of variables other than population size may be important in determining the relative need for health services in each area, including age and sex composition, poverty levels and burden of disease.

The Basket Financing Committee (BFC) approved the use of a revised resource allocation formula, as from January 2004. The new formula uses the following variables:

- the population size (with a 70% weighting);
- the under-five mortality rate as a proxy for burden of disease (10% weighting);
- the mileage covered for service supervision and distribution of supplies (10% weighting); and
- the poverty level (10% weighting).

This new formula recognises the individual as the main client-recipient of health services, so 70% of the health funds are distributed in proportion to the population of each district. In addition, councils receive additional resources for three 'special needs categories': the special needs of the poor population (10% of health resources), the special needs of the rural population (10%) and the special needs of districts with a higher-than-average burden of disease. It recognises the higher operational cost of delivering health services in rural and scarcely populated areas, including the higher costs involved in drug distribution and supervision. The formula also aims to redirect resources to areas with a high burden of diseases. The under-five mortality rate (U5MR) was considered an appropriate proxy for this purpose as, according to the Burden of Disease Profile, the U5MR accounts for more than 75% of the total years of life lost in Tanzania.

Although a needs-based formula has recently been adopted for the allocation of basket funds, there remain concerns about how block grant allocations to local governments and the allocation of these funds to health districts impact on the equitable allocation of overall public health care resources. This study seeks to consider this issue and to evaluate the extent to which the basket fund resource allocation formula promotes equitable resource allocation.

## **4. Study methods**

### **4.1. Aim and objectives**

The aim of the study was to determine the extent to which the current allocation of resources to health districts is equitable and to consider alternative resource allocation strategies, particularly in relation to the different levels of deprivation between districts.

The objectives of the study were to:

- quantify the levels of deprivation in individual health districts using routinely available data;
- assess the equity of current resource allocation; and
- identify ways of further promoting equity in the allocation process.

### **4.2. Assessing levels of deprivation**

In order to estimate the levels of deprivation in individual districts, it is necessary to develop a composite index that includes a range of variables that contribute to social and material

deprivation. The study used data from the 2000 National Census to calculate levels of deprivation. *Table 2* presents the variables that were initially considered for inclusion in the deprivation index. These variables were selected because other studies have demonstrated that they are important contributors to household deprivation; they are:

- the percentage of the population in the age group 0–14;
- the percentage of the population 65 years and above;
- the percentage with disability;
- the percentage who are widowed;
- the percentage of children who are orphaned;
- the percentage who are illiterate;
- the percentage of young children who are not enrolled in primary school;
- the percentage of households whose main building material for floor is not cement;
- the percentage whose main source of cooking energy is firewood;
- the percentage who are without pipe/protected well/spring as a source of drinking water;
- the percentage who are without a toilet;
- the average number of people sleeping in a room; and
- the percentage of the population living in rural areas.

The Census data for the above variables was entered using Microsoft DBASE. The analysis was then done using STATA Version 7.0. The variables were then subjected to Spearman correlation to identify which variables were strongly related to each other, as these are the variables that would be included in the deprivation index. The variables that were significantly highly correlated ( $r > 0.8$ ) were:

- the percentage of the population living in rural areas;
- the percentage of the population using firewood as the main source of energy;
- the percentage of the population without a toilet;
- the percentage of the population that is illiterate; and
- the percentage of children who are not enrolled in primary school.

These variables were then included in a Principal Component Analysis (PCA), which is a statistical technique that identifies the variables that altogether contribute to deprivation. It also indicates the relative importance of each variable by assigning it a weight. PCA has been extensively used in deprivation analysis in a number of countries around the world, including in Africa (McIntyre et al, 2000; McIntyre and Gilson, 2000).

Data on all funds disbursed to individual districts for the year 2004 was also retrieved. This included basket funds and district grants (allocations to health from the block grants to local governments) added together.

## 5. Results

### 5.1. Deprivation index

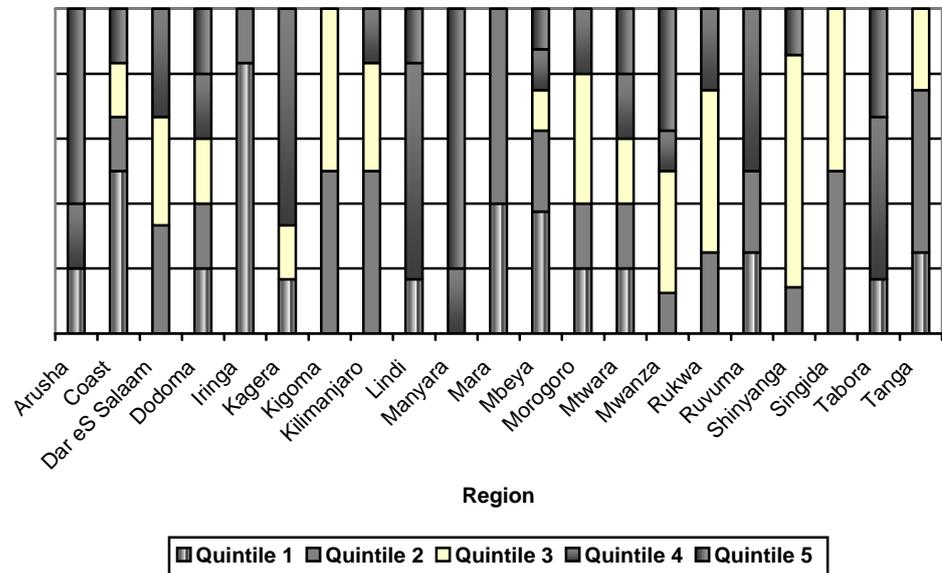
The variables that were ultimately identified by the PCA as significantly contributing to deprivation in Tanzania were:

- the percentage of households without a toilet;
- the percentage of children not enrolled in primary school; and
- the percentage of the population that is illiterate.

The composite deprivation index was calculated for each district and the distribution of deprivation between districts was analysed in terms of quintiles – districts were divided into 20% categories, with the most deprived districts being in quintile 5. *Figure 1* shows that the Manyara region, which is a new region with many rural districts, has many deprived districts. All of the districts in this

region fall into the most two deprived quintiles of districts. According to Figure 1, the study data indicates that deprivation levels vary considerably across the districts within different regions.

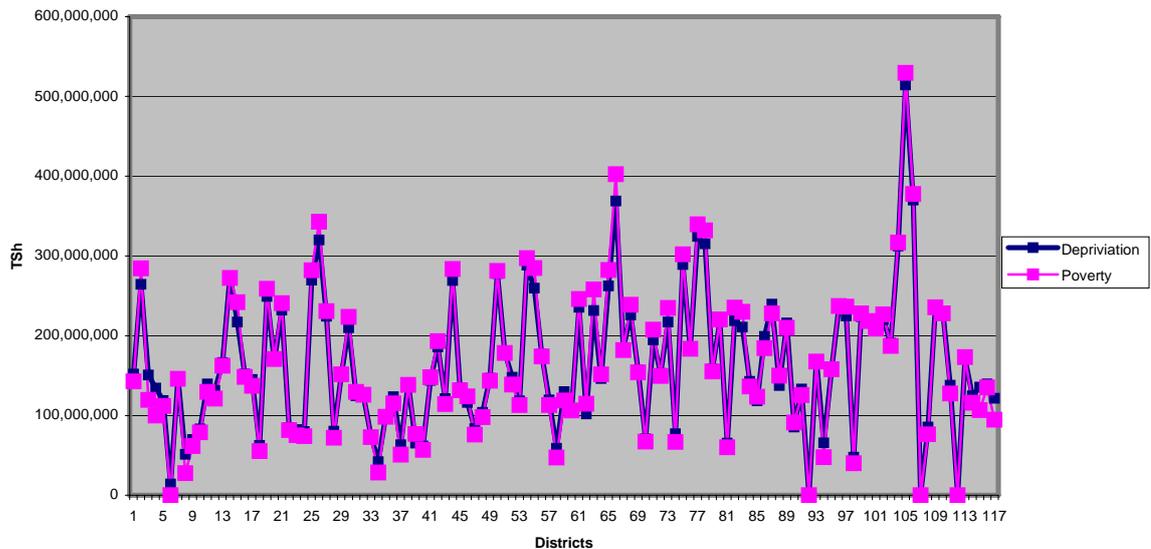
**Figure 1: District deprivation quintile per region**



The deprivation index was then combined with population size in each district to calculate what health budget resources each district should receive in order to promote equity. In other words, relatively more resources were allocated to districts with high levels of deprivation. These ‘equity target’ allocations were compared with the current allocations, which are based on the recently developed needs-based formula that includes poverty levels (see *Figure 2*).

This analysis revealed some differences, but these differences were not significant. This indicates that, in the Tanzanian context, income poverty measures are very similar to broader indicators of social and material deprivation. Thus, the newly adopted Ministry of Health formula that includes a poverty measure allocates resources between districts comparably to using deprivation index obtained in this analysis.

**Figure 2: Comparison in budget allocations using the current poverty-based formula and a formula containing the deprivation index across districts**



## 6. Discussion and conclusions

The analysis revealed that deprivation in Tanzania is largely influenced by illiteracy, non-enrolment of children in schools and lack of toilets in households. There is a marked variation of deprivation between districts and also within regions.

As indicated previously, basket funds were initially allocated on a simple per-capita basis, with each district receiving US\$0.5 per person resident in the district. However, a resource allocation formula incorporating other indicators of need, to supplement district population size, has recently been introduced. The other source of health care funding to districts, namely from the block grants to local governments, is now also being allocated using a similar formula.

The analysis also revealed that the current way in which the Ministry of Health (MoH) allocates resources results in slightly more resources being allocated to better-off districts than would be expected if the deprivation index calculated in this study were used in a resource allocation formula. Thus, those districts with relatively higher budgetary allocations under the current MoH formula would receive a slightly lower budget if the deprivation index was used in the resource allocation formula. Conversely, districts that currently have a relatively lower budget allocation using the poverty-based formula would receive slightly more resources if the deprivation index was used in the formula. However, the difference in resource allocation targets based on the current MoH formula compared with a formula including the deprivation index is very small. This indicates that the Tanzanian MoH is already making good progress in promoting equitable health care resource allocation between districts.

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