Health Economics Unit
Policy & Research Unit,
Ministry of Health and Family Welfare
Government of the People's Republic of Bangladesh

Efficiency Effectiveness
Health
Economics
Unit
Economy Equity

Geographic resource allocation in Bangladesh

Research paper 21

March 2001

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Occasional papers (OPs) are prepared by members of the HEU and PRU principally for internal use. OPs may also be prepared for special purposes such as the HPSP Annual Programme Review. Some OPs are later edited and issued as research notes or papers.

Also available;

Public-private mix for health sector development: proceedings of the fourth annual conference, 25-26th July 1999

Bangladesh National Health Accounts 1996/97, Final report, Data International/ Health Economics Unit.

Contents

Executive summary

The improvement of health status of the most vulnerable groups – particularly the poor, women and children – is one of the core objectives of the Health and Population Sector Programme (HPSP). Significant steps have been taken at the national level to channel resources towards services that can achieve this objective. Yet the current system of geographic resource allocation may be an impediment to attaining this goal.

Resources are currently allocated to districts and upazilas largely according to the size of inpatient facilities and numbers of staff in post. This leads to wide differences in district per capita allocations in both the revenue and (Government) development budget. These differences do not appear to be explained by differences in health need. Indeed analysis suggests that the allocations have no significant positive relationship to health need and may even be inversely related to general deprivation of the area.

A number of countries around the world, with a similar centrally managed public health care system, have attempted to change the system of geographic resource allocation so that it is more closely linked to health need. Examples can be found in low, middle and high income countries. Although there are differences in approaches, most attempt to adjust simple per capita allocations by the age-sex structure of the local population and aggregate measures of health such as infant and standardised mortality rates.

There are three basic principles used in developing a formula:

- Need can only be quantified in an approximate way using proxies. It is, therefore, important to realise that any formula can only partially capture the complex pattern of local circumstances that determine health and health service need in a particular area. A good formula should be seen to allocate resources in proportion to accepted proxies for need.

- The allocation principle and proxy for need should be transparent since the method of calculation is certain to be disputed. As it will lead to some significant changes in resource allocation patterns, it must be as simple and transparent as possible. A formula whose basis is not understandable to policy makers is unlikely to be accepted.

- While targets may be defined by an objective principle, the speed of convergence to the targets is a political choice.

Since Dhaka (city and district) provides much specialist care for the whole population of Bangladesh it is excluded from the simulations. Further work is still required to determine to what extent citizens outside Dhaka really benefit from these services and therefore whether the vastly greater allocation made to the Capital can be justified.

Introducing a system of needs based resource allocation in Bangladesh could be done using existing statistics. Simple preliminary simulations suggest that resources would be moved away to those areas where mortality health status is lowest. These simulations are mainly illustrative and a final formula could only be developed

through a consultative process that determines which statistical proxies are most suitable for measuring the size of the health needs of the vulnerable groups for which HPSP was ultimately designed.

Abbreviations

ADP	Annual Development Programme
BBS	Bangladesh Bureau of Statistics
BCC	Behavioural Change Communication
BIA	Benefits Incidence Analysis
CMMU	Construction Management & Maintenance Unit
CMR	Crude Mortality Rate
CPR	Contraceptive Prevalence Rate
DDO	Drawing and Disbursing Officer
DG	Director General
DGFP	Directorate General of Family Planning
DGHS	Directorate General of Health Services
DoF	Director of Finance
DPA	Direct Project Aid
ESP	Essential Services Package
FD	Finance Division
FY	Financial year
FYP	Five Year Plan
GOB	Government of Bangladesh
HEU	Health Economics Unit
HPSP	Health and Population Sector Programme
IMR	Infant Mortality Rate
LD	Line Director
MACS	Management Accounting System
MAU	Management Accounting Unit
MIS	Management Information Systems
MoF	Ministry of Finance
MOHFW	Ministry of Health and Family Welfare
NHA	National Health Accounts
OP	Operational Plan
PER	Public Expenditure Review
PIP	Project Implementation Plan
PCC	Programme Co-ordination Cell
RPA	Reimbursable Project Aid
SOE	Statement of Expenditure
SWAp	Sector Wide Approach
SMR	Standardised Mortality Rate
UHC	Upazila Health Complexes (formerly Thana Health Complexes)

Introduction

The Health and Population Sector Programme (HPSP) sets as one of its key objectives the improvement of the health status and health care access of the most vulnerable groups in society particularly women, children and the poor (GOB, 1998). In order to achieve this aim resources are being allocated to those facilities and services known to be used and most needed by vulnerable groups, in particular essential services (the ESP) provided through facilities based at upazila level and below.

During the first two years of operation HPSP can claim some success in increasing the proportion of spending going into these priority areas. By the end of the financial year 1999/2000 an estimated 60 – 70 per cent of resources were being spent on the ESP (HEU and MAU, 2000). Yet surveys continue to show that the poor still find it difficult to access high quality essential services (CIETcanada, 2000).

Many factors may inhibit access and mean that large national allocations for essential service levels are not translated into effective access by vulnerable groups. A factor that is likely to be important is the way in which resources are allocated and subsequently used at service delivery levels. Several concerns are important here. One relates to the efficiency of service delivery. Effectiveness of resource use at facility level and incentives to deliver high quality services will be important and this requires further investigation. Consideration of the micro-efficiency of the delivery system is left for future papers.

A second concern, and the main focus of this paper, is the way in which resources are allocated from national to local level. This is important since attempts to increase services to vulnerable groups by changing resource allocation at national level will be hampered if allocations to different areas of the country are not in relation to need and size of vulnerable groups.

This paper begins by describing the current system of resource allocation and the effects of this system in terms of the size of budgets and spending at district and upazila levels. The second half of the paper looks at ways of developing resource allocation methods that are more closely related to health need by presenting a number of example scenarios of the effect of different needs based methods.

Resource allocation in Bangladesh: current methods

The budget setting process

In order to discuss the pattern of resource allocation in context, it is important to be clear on the systems currently used to set budgets at each level of the system. Budgets for most categories of regular expenditure are determined centrally. The system can best be characterised as line budgets based on capacity and historically determined normatives. Line budgets mean that resources are allocated for specific line items (e.g diet, MSR) and virement between lines is not possible. Once budgets have been agreed with the Ministry of Finance it is very difficult even for the DG's office to move funding between lines. MOHFW is permitted to move funding only

within the same broad economic code (e.g. within staff pay and allowance or within supplies). No movement is permitted from the pay code to another code.

Table one: allocation of funding to public facilities

	Allocation basis	District	Upazila	Union	Financial & management authority
Food	Per bed-day	30 Tk per bed- day	30 Tk per bed- day	Not applicable	Civil Surgeon supervises local tender
MSR[1]	• Per bed/Per facility • Top-down decision from DG	22,000	15,000	75,000	Civil Surgeon supervises local tender
Staff	Staff in post up to the maximum allotment per facility	11 doctors 27 nurses 30 other staff	9 doctors 10 nurses 23 other staff	4 other staff	DG
Maintenance, fuel etc (< 1000 Taka)	• Based on historic spending • Vehicle capacity • Utilisation pattern • Political importance	40,000 Taka	25,000 Taka	Not applicable	Civil Surgeon supervises use of budget
Capital (Equipment construction, renovation)	Submissions	Less than contingency fund amount, i.e., about 2000 Taka Submissions	Less than contingency fund amount, i.e., about 2000 Taka Submissions		Civil Surgeon when met from the contingency fund DG/CMMU /PWD

Capacity and historic normatives mean that budget setting is based both on the size of physical capacity as measured by the number of facilities, staff or beds and also funding provided to the same facilities in previous years. Historic patient flows are taken into account in setting the budgets for diet.

The budget setting process begins in the August before the start of the next financial year (see annex four for complete timetable). Civil Surgeons submit a list of requirements to the DG office using a standard format known as budget forms (for the basis of calculation see table one). Budgets are then consolidated by the DG office and sent to the Ministry of Health and the Ministry of Finance for approval. Ultimate ratification is by Parliament in the first week in June, when the consolidated budget for Government is presented.

In practice individual districts have very little flexibility over the use of funds. Budgets for MSR and staff are constructed from the number of facilities and staff. The diet budget is based on the historic patient flow. The Civil Surgeon is responsible for coordinating and awarding tenders for provision of food and MSR. For the latter there is a requirement that 70 per cent of the listed drugs are procured from the Essential Drugs Company a government owned institution. The only real flexibility

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[1] More than 70% drugs. Also surgical instruments, bandages, re-agents, linen and gas (see annex three).

the Civil Surgeon has is in the use of the maintenance budget where he/she may spend up to 5,000 taka for vehicles and 1,500 for building repairs using local contractors. Works costing more than this are managed by the TEMO, for vehicles, and Public Works Department (PWD), for buildings, from a budget allocation managed by CMMU.

Total budget allocations for districts and upazilas

Table two: composition of a typical district hospital and UHC budget

District Hospital (50 beds)					
Item	**Unit**	**Unit cost**	**Units**	**Total**	**%**
Staff				-	
Doctors	Annual salary	104,000	11	1,144,000	16.4%
Nurses	Annual salary	74,000	27	1,998,000	28.6%
Other	Annual salary	42,000	30	1,260,000	18.0%
			Sub-total	*4,402,000*	*63.0%*
Other					
Food	Per bed, per day	30	18,250	547,500	7.8%
MSR	Per bed	22,000	50	1,100,000	15.7%
Maintenance	Per year	40,000	1	40,000	0.6%
Other	Per year	900,000	1	900,000	12.9%
			Sub-total	*2,587,500*	*37.0%*
			TOTAL	**6,989,500**	100%
Upazila Health Complex (31 beds)					
Staff					
Doctors	Annual salary	104,000	9	936,000	25.9%
Nurses	Annual salary	73,000	10	730,000	20.2%
Other	Annual salary	40,000	23	920,000	25.4%
			Sub-total	*2,586,000*	*71.5%*
Other					
Food	Per bed, per day	30	11,315	339,450	9.4%
MSR	Per bed	15,000	31	465,000	12.9%
Maintenance	Per year	25,000	1	25,000	0.7%
Other	Per year	200,000	1	200,000	5.5%
			Sub-total	*1,029,450*	*28.5%*
			TOTAL	**3,615,450**	100.0%

Notes
1. Assumes 50 bed district hospital, 31 bed UHC
2. Salary figures taken from averages from small hospital study (Quayyum and Howlader, 2000)
3. Figures assume hospital operating at 100% capacity with all allocated posts full.

The numbers of beds varies little from one area to another, a product of the normative of 31 bed Upazila Health Complexes and 50,100 or 200 bed district hospitals. The near-equal distribution of facilities across administrative areas means that there is a

highly unequal distribution of population per bed since an upazila with a population of 100,000 is allocated a similar size facility to one with 400,000 people. There are plans to extend some UHCs to 50 bed facilities in areas with greater 'needs'.

The distribution of beds and facilities is extremely important in determining the level of funding for each area. Revenue funding for inpatient facilities is largely determined by the number of beds and staff (see table one). In 1999/2000 a 50 bed district hospital might have received an allocation of around 7 million taka and a upazila facility between 3.5 and 5 million taka (table two). More than two thirds of this allocation is for staffing. At union level a Union Health and Family Welfare Centre (UHFWC) receives around 240,000 taka for staffing and supplies. This comprises mostly salaries – each union sub-centre has 4 paramedic and support staff. On average there is one UHFWC for every 3 unions. A further 6-7 health staff work at the field level in each union[2]. The figure excludes staff financed under the development budget, mostly DG-FP staff. Finally, the Civil Surgeon's Office, which provides administrative support for the entire district as well as delivering a public health function, cost on average around 7.5 million taka (see table four). For a district with 6 upazilas and 24 unions this implies a total district revenue allocation of around 5.2 Crore Taka.

Table three: public health revenue spending in 'average district'

Facility	Unit cost	Units	Total	%
District hospital	6,989,500	1	6,989,500	13.4%
Civil Surgeon's office [1]	7,500,000	1	7,500,000	14.4%
UHC	3,615,450	6	21,692,700	41.7%
UHFWC [2]	88,200	18	1,587,600	3.1%
Field Staff [3]	39600	360	14,256,000	27.4%
			52,025,800	100.0%

Notes:
1. Average budget allocation for district with 5-7 upazilas, Bangladesh Health Bulletin, 1997.
2. MSR allocation of 75,000 plus 4 staff.
3. Assumes district comprising 6 upazilas and 24 unions.

It should be noted that although upazila and district facilities provide both inpatient and ambulatory care the allocation is determined solely by reference to the numbers of beds, bed days and staff and takes no account of patient load in the outpatient department.

The result is that budgets and expenditures bear little relation in principle to either the size of the population or the number of patients treated (as measured by the number of admissions and outpatient consultations). In theory, if the occupancy levels fell to only 50 per cent, the budgetary allocations would only fall by around three percent, mostly reflecting lower diet requirements. In practice the DG does have more flexibility through the selective filling of vacancies. Many facilities do not have the maximum number of allotted posts actually filled. A recent study in some district

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[2] . Most of the staff under the DG-FP are excluded since they continue to be funded under the development budget during 1999/2000. This will change during 2000/2001 as staff are transferred to the revenue budget.

hospitals in Dhaka district found that only 65 per cent of doctor positions were filled (Quayyum and Howlader, 2000). In upazila facilities the proportion is lower still. The flexibility over posts may, however, be less than this suggests since many areas, particularly in upazila facilities, are unattractive to doctors and nurses who generally prefer to work in larger urban facilities.

District resource allocation and spending

Given the normative basis of allocation and district spending it is not surprising that allocations on a population basis vary enormously. Dhaka records the highest per capita, spending more than 426 Taka per capita. But account must be taken of the fact that Dhaka also provides much specialist care to the rest of Bangladesh.

Outside Dhaka, districts continue to exhibit considerable variation (see figure one). Spending during 1999/2000 ranged from 54 Taka (Gazipur) to 256 Taka (Bandarban) per head.

Figure one: variations in per capita spending (revenue & development), 1999/2000
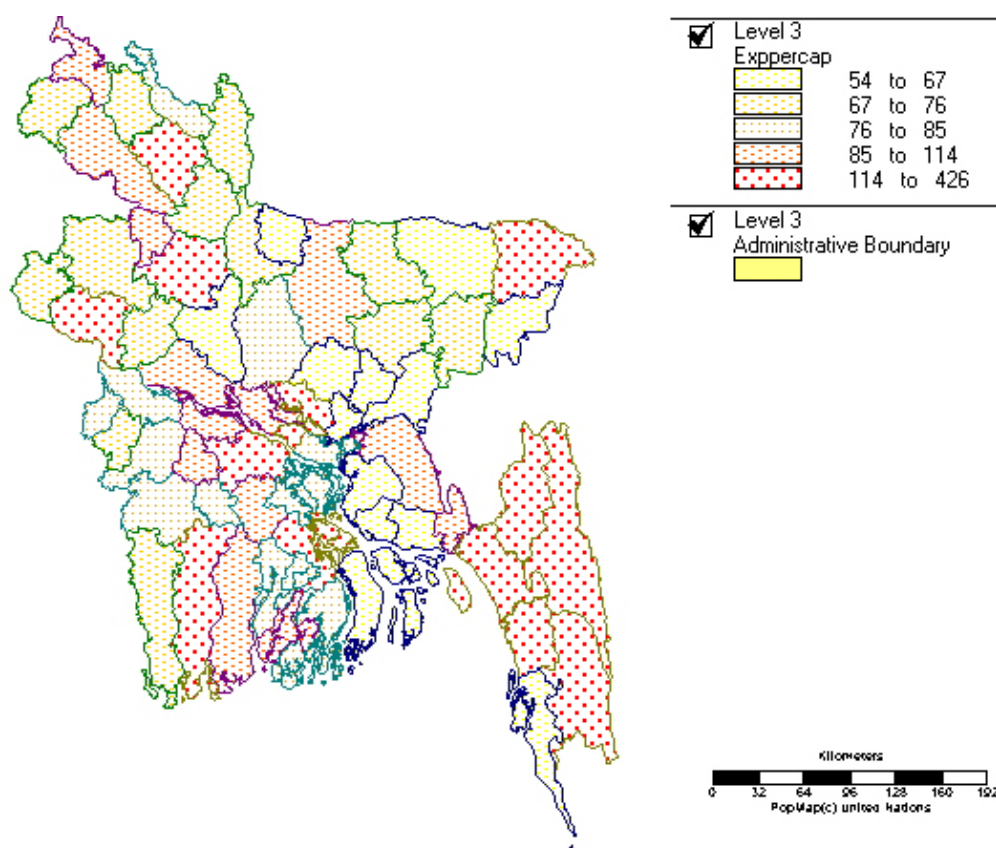
Variation in spending is apparent both within divisions and between divisions (table four). Within each division spending tends to be higher in districts with medical colleges. These higher allocations reflect both the training function of these institutions and also the fact that they serve patients from surrounding districts. Yet even outside the MCH districts, substantive variations persist with the maximum allocation to district exceeding the minimum by between 50 and 100 percent in most divisions.

It might be expected , given that the normatives described in table one mostly relate to allocation of the revenue budget, that the development budget would bear more relationship to population size of health needs. In fact this turns out not to be the case. In most districts government development allocations[3] closely match the magnitude allocations made under the revenue budget. A correlation coefficient of +0.89 (p<0.01) exists between allocations made to districts under the development and revenue budget. There appears, therefore, to be little difference in the final pattern of allocations between budgets.

Table four: average, minimum and maximum taka spending per head by division (1999/2000 Government Development and Revenue budget)

		Average	Minimum	Maximum
Rajshahi	All	89.34	66.52	176.12
	Non-MCH	78.79	66.52	113.99
Khulna	All	85.76	67.03	138.70
	Non-MCH	79.87	67.03	97.74
Barisal	All	90.73	61.25	153.18
	Non-MCH	78.24	61.25	87.63
Dhaka (excluding Dhaka district)	All	83.14	54.50	170.36
	Non-MCH	75.05	54.50	92.95
Chittagong	All	121.69	59.17	255.73
	Non-MCH	122.21	59.17	255.73
Sylhet	All	86.67	62.12	147.24
	Non-MCH	66.48	62.12	71.10
Bangladesh		90.13	54.50	255.73

From an equity perspective an important question is whether the differences in allocations and final spending reflect the needs of the area. This is a complex question since the measurement of need is multi-dimensional. One way of analyzing the question is by comparing current spending patterns to summary measures of health outcomes. A simple correlation between infant mortality and expenditures in a district yielded no significant positive association (r^2 equal to 0.03). A similar correlation with the age-gender standardized mortality rate was similarly not significant (r^2 less than 0.01).

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[3] Including donor funding through government but not direct programme aid. Information on the latter is are not available by district.

Figure two: relationship between Human Development Index and public spending per capita
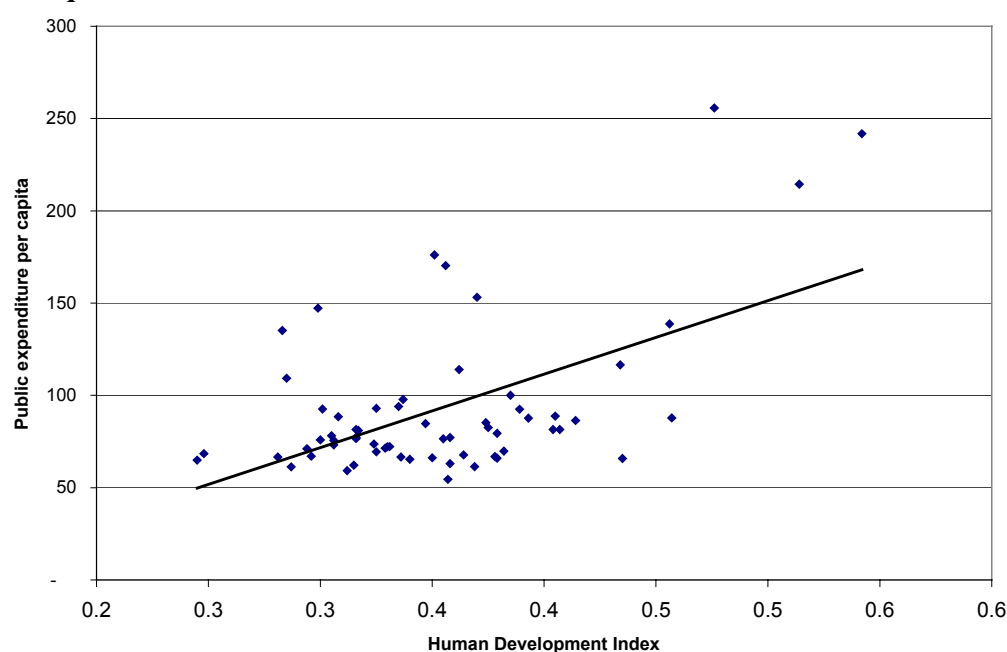
A more sophisticated measure of general development is provided by the Human Development Index which incorporates infant mortality, literacy and GDP per capita into a single index (1 is the highest level possible, 0 the lowest). UNDP computed HDIs for each district of the country (UNDP, 1996). The relationship between the HDI and public spending per capita is illustrated in figure two. The general trend suggests that districts with weaker development, as measured by the HDI, receive lower funding. The picture is slightly more complex. Those districts with the highest HDI (above 0.43) receive the highest allocation (118 taka per capita). Districts with the lowest HDI (less than 0.3) receive around 93 taka and the middle districts receive, on average, 83 taka per capita.

The overall conclusion is that using broad measures of health outcome and general human development patterns of spending at district level do not appear to reflect need.

Financial allocations to upazilas

Below district level resources are allocated both to upazila level inpatient facilities, outpatient care and community services. An analysis of all upazilas outside large urban areas with exactly 31 beds was carried out – 369 upazilas in total. This indicated that in 1999/2000 total spending averaged 1.37 Crore taka.

Figure three: distribution of total spending by upazila

Std. Dev = .51
Mean = 1.37
N = 369.00

EXP_CROR
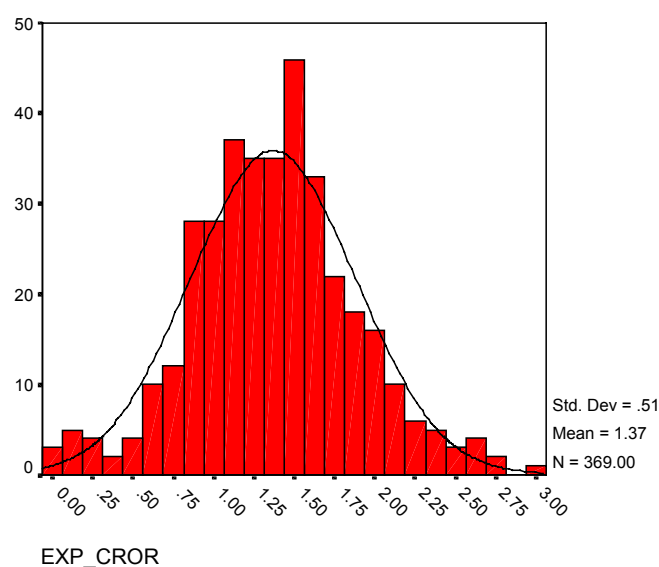
Further analysis (detailed in annex 2, section two) suggested that although the size of the upazila allocation is dependent primarily on the numbers of staff, much of the intra-upazila variation in allocation is accounted for by differences in the size of the population of the area. The analysis also suggests that upazilas in Syhlet division generally receive lower allocations than upazilas in other divisions (holding population and other factors constant).

The relationship with population is interesting given that the resources are not directly distributed according to population and that, at the district level, spending per capita varies considerably. The likely reason for the relationship to population is an indirect one – that spending, particularly under the development budget, reflects a calculation of local health need which in turn is related to the size of the resident population. This finding is a positive one since it suggests that any move towards an explicit adjusted population based formula would not be too out of line with current implicit practice at sub-district level.

A needs-based allocation formula

Introduction

In this section we consider the use of a formula for allocating resources according to measures of differential geographic need. The scenarios presented are illustrative and in practice any formula would require substantial consultation and development. There are a number of important issues that could hinder the introduction of the formula. These cannot be resolved by the Ministry of Health and Family Welfare alone.

One is that it would be necessary for the Ministry of Finance to de-link budgetary allocations from the system of line based norms established for budget allocations. A key concern here is that, in doing this, financial control and accountability might be lost. It is important to state, however, that needs based allocation does not obviate the need for sound budgetary planning and financial reporting. Although districts might be allocated an overall budget on the basis of population need, each district would

have to submit their plans for spending by line items prior to the agreement of the budget and so before the beginning of the fiscal year. Deviations from spending by line items during the year might be allowed but large changes would have to be explained.

The preparation of district budgets in this way is closely related to the development of Local Level Planning now being piloted in a number of districts. Skills in local planning can be considered an essential pre-requisite for the successful development of a needs based allocation system.

A second issue is the current division in budgetary allocation between revenue and development. While there are logical reasons for treating recurrent and capital spending differently when undertaking resource allocation, the mix of capital and recurrent spending in both revenue and development budgets makes the development of separate formulae for each budget a more complex task. One option would be to develop three allocation methods: one for revenue, another for the recurrent portion of the development budget and a third for capital.

Background to the use of allocation formulae

The geographic allocation of resources for public health care according to historic convention and capacity based normative is not peculiar to Bangladesh. It is a situation common to many centrally managed public health services. There is a small but growing international literature on ways of re-orientating resource allocation so that systems are more responsive to local health needs. Countries as diverse as Canada, South Africa, Zambia, the United Kingdom and Australia now use formulae for allocating resources based on need as defined by the size and characteristics of the population ((Lake, 2000), (Bourne, Pick et al., 1990; Gilbert, Gibbeerd et al., 1992; Birch and Chambers, 1993; Mays, 1995)). All of these countries have had to adapt a system of allocation that is driven mainly by size and use of facilities to a system that is guided by the needs of the resident population.

Although the details of each formula are different, a number of common guiding principles emerge from the literature.

- Need can only be quantified in an approximate way using proxies.

It is first important to realise that any formula can only partially capture the complex pattern of local circumstances that determine health and health service need in a particular area. Formulae must include proxies that approximate the health needs of an area. In fact this is likely to be true of any method for allocating resources. In the case of a formula the basis of allocation is explicit and as a result more open to question and debate.

A good formula should be seen to allocate resources in proportion to accepted proxies for need. Need should be measured using accepted general criteria based on statistics that are regularly collected for each district. In this paper we offer some examples of how resources might be allocated in Bangladesh using common methods of measuring health need. It is important to state, however, that the final variables

adopted should be subject to open debate on their suitability in explaining the essential determinants of need.

- The allocation principle and proxy for need should be transparent.

A second principle is that since the method of calculation is certain to be disputed because it will lead to some significant changes in resource allocation patterns, it must be as simple and transparent as possible.

A strategy that several countries, including both Zambia and the United Kingdom, have adopted is to initially introduce a relatively simple formula and then later increase sophistication as data and experience develops. More sophistication can help take account of more complex socio-economic and health related determinants of demand for services. But care must be taken since sophistication is also likely to mean fewer will understand and be able to critique the methodology.

Problems can occur when apparent sophistication covers up for choices based on less objective criteria. In the UK an initially clear and transparent formula, introduced during the 1970s, was made more complicated during the 1980s when an apparently sophisticated statistical method was introduced to adjust for relative differences in morbidity between areas (Carr-Hill, 1990). The new formula had the effect of shifting resources to those areas supportive of the government of the time and led to charges that the changes were politically inspired. The methods used were later shown to be scientifically flawed. A simple but transparent formula may have much greater chance of winning general acceptance and reduces the chances that flawed methods are covered up by statistical sophistication.

- While targets may be defined by an objective principle, the speed of convergence to the targets is a political choice.

The method of final allocation can be determined by a formula that is as objective as possible. The introduction of such a formula and the speed of its implementation is mostly a political choice. The transition can be made quickly within a few years or extended over a longer period of time. An immediate transition is probably not advisable since local services will take time to adapt to smaller or larger allocations.

Towards a resource allocation formula based on need

This section begins to develop a formula for allocating resources on a geographic basis. It utilised readily available data both from sample surveys, the 1991 census and regular Management Information Systems (MIS).

Need for health and health care is a difficult concept to define but it implies underlying disease and disability which medical interventions might reduce. Given that the spending for health is limited allocations must also be constrained by the overall level of resources.

A number of important factors will affect the need for health services in a particular area. This can be divided into two main components. First, that which is explained by

the size and structure of the population. Second, the components of need that are dependent on other health and socio-economic factors.

Size and structure of the population

Perhaps the most important factor in determining needs in an area will be the size of the population. In addition, the age and gender structure also affects the level of services required. In most countries, including Bangladesh, requirement for services tends to be highest for the very young (under 1), women of child bearing age and the elderly. This trend is partly displayed in the spending by age group (illustrated figure four) although this may under-estimate relative need at certain ages if it is not expressed in health care utilisation. In practice these factors vary little between districts and even upazilas. The proportion of women in the population, for example, varies between 45 and 50 percent across all districts.

Figure four: public spending by age group in Bangladesh (taka per capita)
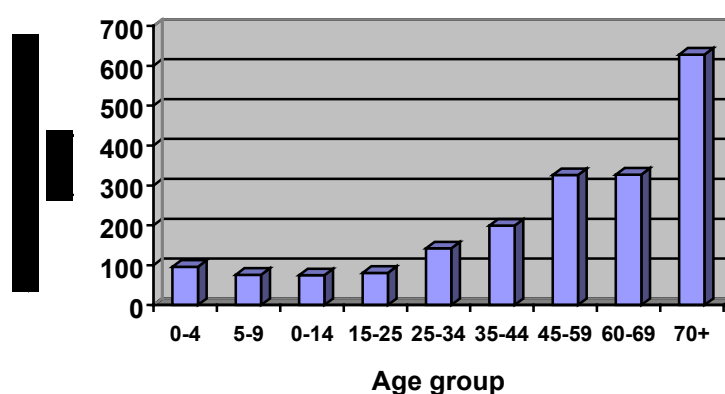
Source: (Heath_Economics_Unit and Data_International, 1998)

Other socio-economic factors

Differential health needs also exist within individual age-gender groups. Some groups are more exposed or at-risk to disease. There is frequently a strong link between poverty and inequality and mortality and morbidity. Locational factors, such as proximity to rivers, may also predispose certain groups to higher levels of disease (e.g. malaria).

Identifying a suitable indicator of disease that can be used to weight resource allocations is not an easy task. One way would be to compare differential patterns of morbidity within given age/gender groups. The problem with this method is that statistics can only record those episodes of illness that are reported to the health system. Most reporting systems are biased in this respect. Hospital statistics, for example, indicate only those patients utilising facilities, which in turn is determined by access to facilities. Household surveys can help to gather information on actual disease prevalence but the sample is often not sufficiently large or wide to provide a guide to relative differences between districts and sub-districts.

An alternative is to make use of a good proxy for morbidity that is less likely to be biased. One candidate, used in both the UK as well as South Africa, is the standardized mortality rate (SMR)[4]. A benefit of using mortality rates is that the recording of mortality should be relatively free of bias in that a statistical system is required to record all deaths. It has been found that for populations of more than 100,000 the SMR is often a good predictor of actual morbidity in an area (Carr-Hill, 1990).

In Bangladesh the reliability of mortality statistics have been questioned and un-reporting of deaths suggested (Streatfield, 2000). From the point of view of an allocation formula this may not be a problem if there is systematic under-reporting across the country. If, however, the under-reporting is greater in some areas compared to others then this could distort the results. The IMR may be a more reliable mortality indicator and calculations based on this indicator are also provided. This indicator emphasizes infant deaths rather than the general disease burden. Since, however, a great many of the burden of mortality are infant and maternal deaths, and that current health policy is to concentrate on improving health care for these groups, such a bias may be acceptable.

The costs of care

The cost of providing services to a defined population may vary from area to area. The factors determining these costs are complex and include regional differences in staffing costs, differential transport costs and variations in local prices of basic food commodities[5]. Ideally all of these factors should be included in a medical price index that can be used to adjust allocations. Few countries, Bangladesh included, have such an index.

One factor affecting cost is location. Per capita costs of care, through increased transport costs and treatment times, tend to rise where an area is sparsely populated. Part of this cost may be borne by patients through longer journeys to health facilities andpart by the health system through the provision of smaller facilities scattered across the area.

As a proxy for this effect, and in the absence of other local measures of cost, the density of population has been used to construct an index for cost. While the density captures part of the cost differential, it fails to account for other cost-drivers such as higher salary levels or cost of supplies in one area compared to another. One justification for its use is that national pay scales and central procurement of many supplies mean that costs of inputs are broadly similar across the country. Some further work is required here to indicate whether this is indeed the case.

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[4] Mortality rates can be standardised by comparing the mortality rate that would be expected in a given area based on the local age structure and national age/gender specific mortality rates to those actually observed. Use of crude mortality rates is inaccurate since a district may record a higher mortality rate as a result, for example, of a larger elderly population which itself indicates a relatively successful health care system rather than relative deprivation.

[5] In Bangladesh, as in other centrally planned systems, it could be argued that, since items such as staff wages are nationally determined, local variation does not occur. This is true in terms of the impact on expenditures. However there is a hidden cost in remoter areas where staff are reluctant to work and positions are often not filled. In the end the cost is borne by patients, in terms of lower quality care , rather than the health system.

Resource allocations

In order to obtain allocations for each area the above need and cost factors are used to adjust the population of each district up or down. This adjusted population is then used as a basis for proportional allocations. A district whose need and/or cost factors are above average will have these reflected in an increased population and, therefore, larger proportional allocations. The converse occurs for districts with lower than average needs and costs. For any district, *i*, the total target allocation is given as the product of both need and costs factors as follows:

$$Allocation_i \quad = \quad PerCap \times POP_i \times (1+a_i) \times (1+n_i) \times (1+c\ )$$

where PerCap is the national budget (excluding Dhaka City) divided by the total national population, POP_i is the population of district *i*, *a* is the district age/gender adjustment, *n* is the needs adjustment and *c* is the cost adjustor[6]. For the country as a whole each of these factors are zero (by definition). Positive values represent above national average indicators while negative values represent below average.

Adjusted populations and corresponding allocations were calculated using the above formula and available data. For the district of Madaripur, for example, the adjusted allocation becomes:

$$Allocation_{Madaripur} \quad = \quad PerCap \times Pop_i \times 1.09 \times 0.69 \times 0.96$$

This indicates that the district has an above average proportion of very young and very old but a below average SMR and index of cost (higher population density).

For the purposes of the simulations below Dhaka district is excluded. The per capita allocation to Dhaka is several times larger than to the next largest district. In addition many travel to Dhaka from other districts to receive treatment for diseases requiring non-tertiary inpatient care notably from DMCH (see section on cross-boundary flows below).

The detailed results are given in annex one. The summary impact on each division using both the SMR and IMR as indicator of intra-age/gender group need is shown in figure five. The levels in the first 'column' indicate current total allocations (in crore taka). The subsequent line traces out the impact on total allocations of allocating first according to population and then population adjusted for (1) age/sex, (2) SMR (3) SMR and cost of care and (4) IMR and cost of care.

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[6] This format is replicated from Peacock, S. and Smith, P. (1995) The resource allocation consequences of the new NHS needs formula, York, Centre for Health Economics, University of York, Discussion Paper 134.

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Figure five: effect of weighting on division allocations (based on total expenditure 1999/2000)

	Current	Captitation	Age/sex	SMR	SMR+cost	IMR+cost
— ♦ — RajshahiDiv.	280.2	275.1	270.0	230.0	232.1	231.2
— ■ — KhulnaDiv.	130.3	133.1	133.2	133.7	138.8	114.4
— ▲ — BarisalDiv.	84.2	77.1	79.6	80.0	79.4	80.2
— ✕ — DhakaDiv.	258.3	278.2	285.6	265.2	257.0	269.8
··· ✳ ··· ChittagongDiv.	229.9	220.6	214.6	255.9	251.3	253.1
— ● — Sylhet Div.	72.2	71.0	72.1	90.3	96.4	106.4
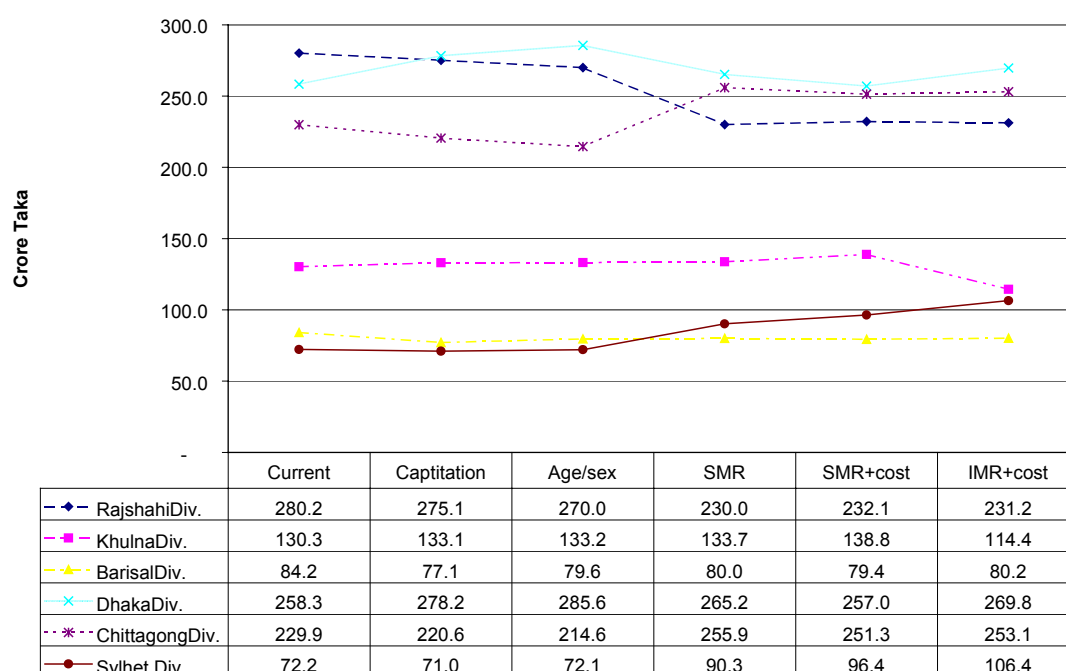
It can be seen that the simulations lead to significant increases in allocations to Chittagong (10% increase) and Sylhet (47% increase) divisions. In contrast the target allocation for Rajshahi declines by around 18 per cent. No significant change is recorded for Dhaka (not including Dhaka district) and Khulna divisions. Within all divisions, however, there are some significant gainers and losers.

Cross-boundary use of services

An important issue, and indeed objection to the needs based formula, is the way in which district level facilities providing care to residents of other districts are reflected in the resource allocation. This is known as the cross-boundary flow question. This is primarily an issue for those districts with medical college hospitals or tertiary level facilities.

In order to investigate the magnitude of cross boundary flows a small survey of inpatients and outpatients was undertaken in five medical facilities – three district and two medical college hospitals. Approximately 1,100 patients were sampled across a range of specialties.

The results (table five) suggest that district hospitals are predominantly used by those residing in that district. More than 90 percent of both inpatients and outpatients came from the same district for the three hospitals surveyed. Indeed between 60 and 80 percent of outpatients and between 20 and 50 percent of inpatients came from the upazila in which the hospital is built.

Table five: use of district and MCH facilities by upazila/district or residence

	Chittagong district	Dhaka MCH [1]	Kishorjanj district	Manikganj district	Mymensingh MCH	Total
Inpatients						
Sadar (%)	20.0%	15.3%	38.5%	52.0%	50.0%	32.7%
Own district (%)	94.4%	41.8%	96.2%	98.0%	75.0%	72.6%
Adjacent districts (%)	3.3%	22.0%	3.8%	0.0%	22.0%	14.5%
Other (%)	2.2%	36.2%	0.0%	2.0%	3.0%	12.9%
Total inpatients	90	177	78	50	164	559
Outpatients						
Sadar (%)	59.0%	41.9%	77.1%	68.3%	79.3%	62.1%
Own district	95.1%	81.9%	99.0%	98.4%	98.9%	92.6%
Adjacent districts (%)	0.0%	9.7%	1.0%	1.6%	1.1%	3.9%
Other (%)	4.9%	8.4%	0.0%	0.0%	0.0%	3.5%
Total outpatients	61	155	96	63	87	462

The use of Mymensingh medical college is similar to that of the district hospitals with more than 75 percent of inpatients and almost 100% of outpatients coming from Mymensingh district. More than 50 percent of inpatients for the Medical College came from the Sadar upazila.

Based on the results of the survey Dhaka Medical College (DMCH) is used more widely by patients outside Dhaka district. Almost 60 percent of inpatients come from outside the district although this falls to only 20 percent of outpatients. Some of this use is from districts adjacent to Dhaka although a significant minority of inpatients, 36 percent, come from further a-field. Based on the departments covered in the survey, patients come to DMCH particularly for urology services.

The survey is indicative rather than representative and further work would be required to investigate whether these patterns repeat at national level. If they are representative then it suggests that for district facilities the low level of cross-boundary flow suggests little need for significant financial compensation for treating other-district patients. This would need to be modified for districts with medical college hospitals (see annex five). The result for Mymensingh is, however, notable. It may be that the survey was conducted at an un-typical time and further data collection may be required.

This issue of cross-boundary could be tackled in several ways. One way would be to make a greater national allocation to those districts offering such services. Another way, given that facilities tend to be used by patients from the same division, is to allocate resources to each division on the basis of weighted capitation and then permit divisions themselves to make an adjustment for boundary flows by re-allocating some of the resources from each district to the division level facilities (mostly medical college hospitals).

In both cases some basic information is required on boundary flows preferably on an on-going basis. One way to do this is to add a question on district of residence to the

Hospital Managament Information System. This would ensure that representative and regular data were collected to measure cross-boundary flows than could be used to adjust allocations to divisions districts.

Another important aspect of cross-boundary flow is the influence of major roads on the case mix and volume of activity in certain hospitals. Casual observation indicates that some district and upazila facilities situated close to main roads are frequently crowded, predominantly with trauma cases resulting from road traffic accidents. Many of the victims of these accidents are from outside the area. Some allowance for this will be required when refining the formula. This could be based on hospital admission statistics (MIS) although these may not give sufficient detail on the cause of the admission (beyond being a trauma case).

Formula versus special needs allocations

One potential disadvantage of a formulaic approach is that it does not take into account the special and possibly ephemeral needs of particular divisions and districts that are not reflected in the regular statistical reporting eg areas suffering periodic excessive flooding or those with particular epidemic or endemic diseases. While special allocations for particular vertical programmes is probably not to be encouraged, particularly in the context of a sector wide approach, there may be an argument for reserving part of the annual allocation so that it could be disbursed in a different way from the main formula. Taken further, a separate formula could be devised for allocating specific elements of the budget. This is indeed what is done in the UK where separate formula are used to allocate funding for acute care, care for the mentally ill and community health services (Peacock and Smith, 1995).

In summary, in order to maintain the objective of transparency it is suggested that one formula be developed for the majority of the allocation. If specific allocation is desired then a small part of the budget should be retained to be allocated outside the formula.

Introducing weighted resource allocations

A weighted needs based allocation formula, along the lines of the one described above, could not be introduced over-night. In the UK, for example, it took 10-15 years to move actual allocations to within a few percent of the weighted targets. A time lag is necessary in order to allow services to adapt to increased or reduced allocations. The actual length of the time lag is a political decision.

Phasing in a resource allocation formula can be done in a number of ways. One possibility is for the adjustment to be carried out through the allocation of real nominal budget growth. In this case the based allocation to any division or district is based on the historic allocation with additional funding from growth funding for those districts which lag behind their need-based per capita targets.

Figure six: transition to needs based targets (3 per cent real growth in budget)
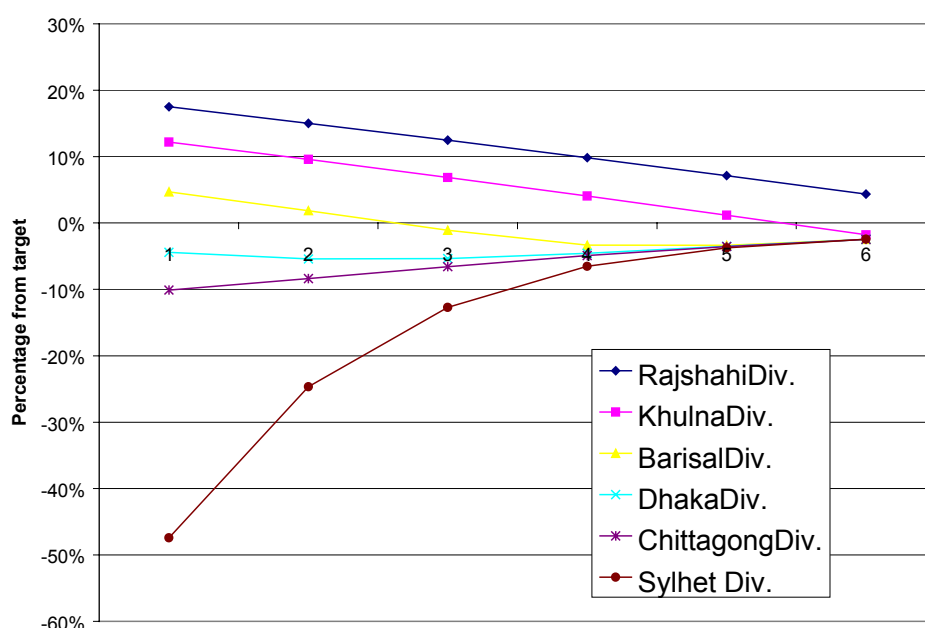
The speed of the change is dependent on the rate of economic growth. If, for example, the real health budget (adjusting for inflation) grows at 3 per cent per annum all divisions could be within five percent of the target weighted allocations within five years (see figure six). Within divisions, adjustment would take longer unless real reductions were made into some district allocations to permit intra-division reallocation of funding. It should be observed that the diagram essentially indicates changing relative shares of the total budget. The gradual implementation, and also assumption of real terms growth in the budget, permits allocations to continue to rise in all divisions but with varying rates of increase.

Practical implementation of a needs based budget can take a number of forms depending on the level of local decentralisation. Both options below require the transition to needs based budgets, with forecasted allocations to be planned in advance preferably over a three to five year time horizon. This could be modelled within the framework of the medium term financial strategy for the health sector.

1. Normative planning within district needs-based resource envelopes

One option is for the Ministry of Health, in collaboration with the Ministry of Finance, to set needs based district allocations based on a needs analysis similar to the one proposed above. District and upazila budgets would then be composed using normative methods but within this overall resource envelope. The resource envelope might even be applied in the initial stages, to divisions with a longer transition to needs based district allocations. Limitations over virement between line items could continue as a way of ensuring administrative control.

This may be the most feasible short/medium term option given the lack of delegated financial powers or decentralised management decision making.

It should be noted that in order to budget within a needs based resource envelope it may be necessary to relax some of the normatives. For example a district receiving a lower allocation may not have the resources to fill the entire complement of posts suggested by the facility normative.

2. Local level planned budgets

A more sophisticated option is for the district to be notified of its needs based budget in advance but for district and upazila managers to decide on what activities and services should be financed. The planning process would not be strictly constrained by normatives but follow a justification based on the needs of the community. Financial control during the year would still be strictly imposed and local level planners would have to spend within the budgeted line items. This process could be integrated with the Local Level Planning process already started in a number of districts.

In fact it would be possible to work both systems simultaneously. Some districts could plan their own budget structure while in others it could be determined at national level. But both would be constrained by the overall district based resource envelope.

Allocation of capital

An important objection to a standard formula based on current population health care needs is that it does not adequately account for past over or under-investment in the health sector in a particular area. Greater allocations to an area now might be justified on the basis that they make up for levels of resources allocated historically.

The resource allocation formula described above is principally aimed at the allocation of the recurrent element of the budget – both revenue and development. The allocation of funding for capital developments is a more complex issue since explicit account must be taken of past levels of investment.

In fact, a system based on need is less, rather than more, likely to perpetuate inequalities based on historic investments. Historic normative methods tend to base recurrent allocation on the size of facilities. This automatic link is broken in moving towards a needs based system.

In order to take into account past investments the state of the network of facilities would have to be assessed and valued. Future allocations would take into account the state of the valuation of the capital stock and investments made to priority areas. The area of capital allocation is a complex one and further work would be needed should the current system be regarded as unsatisfactory.

Summary

The level of public finance for health care provided to each geographic area in Bangladesh is largely determined by the size of facilities and employment of staff rather than health or socio-economic need. Such a situation is common to many centrally managed and publicly funded health care systems.

The system has two fundamental weaknesses. First, it tends to thwart the objective of allocating resources towards the most vulnerable and means that national equity objectives may not be carried down to local level. Second, since allocations are not related to the level of activity of facilities but rather to the size of capacity, it does nothing to reward a greater level of system (technical efficiency). The system can, therefore, be both inequitable and inefficient.

The advent of the Sector Wide Approach in fact provides an ideal opportunity to begin changing the system of allocation. Under a project approach, it would have been difficult to change the system of allocation for what amounted to dozens of separate budget allocations with specific purposes. The gradual unification of allocations under the revenue and development budgets enables resources to be allocated through a small number of channels in a more equitable way.

The Local Level Planning (LLP) initiative provides a further opportunity to develop needs based allocations. LLP requires districts and later upazilas to decide priorities based on local needs. It is likely that this process will increase the need to decentralise budget decision making since this will increase the impact of the local level planning and prioritisation process. The process is also likely to highlight the apparent discrepancies in allocations and call attention to the basis for current decisions over local allocations.

Reforming the system of geographic resource allocation could have a profound impact on the effectiveness of resource use by channelling more resources to needy areas and reducing the incentive to preserve capacity rather than addressing local needs.

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Annex one: Allocation of district budget based on needs based capitation weighting

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		Current spending		Capitation			Age/sex adjustment								SMR+age/sex			
Zila		Total (crore taka)	Per capita (taka)	Total (crore taka)	Per capita (taka)	% change	Age/gender weights	Adjusted population	Total (crore taka)	Per capita (taka)	% marginal change	% total change	SMR	Adjusted population	Total (crore taka)	Per capita (taka)	% marginal change	% total change
Bangladesh		1,055	90.72	1,055	90.72	100.0%	1.00	116,300	1,055	90.72	100%	100.0%	1.00	116,936	1,055	90.72	100%	100.0%
RajshahiDiv.		280.22	92.40	275	90.72	98.2%	0.98	29,762	270	89.03	98%	96.4%	0.94	25,494	230	75.85	85%	82.1%
Bogra		35.67	113.99	28	90.72	79.6%	0.98	3,077	28	89.21	98%	78.3%	0.70	2,159	19	62.25	70%	54.6%
Dinajpur		24.63	93.90	24	90.72	96.6%	0.98	2,566	23	88.75	98%	94.5%	0.89	2,276	21	78.29	88%	83.4%
Gaibandha		14.80	71.40	21	90.72	138.7%	0.99	2,230	20	89.41	99%	136.7%	0.78	1,746	16	69.62	78%	106.5%
Joypurhat		8.24	92.44	8	90.72	98.1%	0.99	879	8	89.54	99%	96.9%	1.10	967	9	97.98	109%	106.0%
Kurigram		13.53	73.11	17	90.72	124.1%	0.99	1,829	17	89.64	99%	122.6%	0.68	1,235	11	60.19	67%	82.3%
Lalmonirhat		7.99	76.54	9	90.72	118.5%	1.03	1,080	10	93.89	103%	122.7%	0.85	922	8	79.71	85%	104.1%
Naogaon		17.80	71.40	23	90.72	127.1%	0.98	2,447	22	89.03	98%	124.7%	0.65	1,583	14	57.29	64%	80.2%
Natore		10.34	67.76	14	90.72	133.9%	1.02	1,557	14	92.55	102%	136.6%	0.75	1,166	11	68.95	74%	101.8%
Nawabganj		9.51	69.41	12	90.72	130.7%	0.94	1,293	12	85.61	94%	123.3%	1.01	1,310	12	86.27	101%	124.3%
Nilphamari		10.63	68.39	14	90.72	132.7%	0.99	1,533	14	89.47	99%	130.8%	0.77	1,186	11	68.85	77%	100.7%
Pabna		19.55	88.43	20	90.72	102.6%	0.99	2,178	20	89.37	99%	101.1%	0.70	1,522	14	62.13	70%	70.3%
Panchagarh		7.21	92.56	7	90.72	98.0%	1.03	801	7	93.31	103%	100.8%	0.84	674	6	78.07	84%	84.3%
Rajshahi		40.46	176.12	21	90.72	51.5%	0.92	2,103	19	83.06	92%	47.2%	0.84	1,776	16	69.75	84%	39.6%
Rangpur		34.11	135.21	23	90.72	67.1%	0.97	2,453	22	88.22	97%	65.2%	0.93	2,277	21	81.44	92%	60.2%
Sirajganj		17.39	66.52	24	90.72	136.4%	0.99	2,600	24	90.25	99%	135.7%	1.43	3,716	34	128.27	142%	192.8%
Thakurgaon		8.38	72.28	11	90.72	125.5%	0.98	1,136	10	88.89	98%	123.0%	0.86	978	9	76.11	86%	105.3%
KhulnaDiv.		130.28	88.79	133	90.72	102.2%	1.00	14,683	133	90.78	100%	102.2%	1.08	14,815	134	91.10	100%	102.6%
Bagerhat		14.35	87.74	15	90.72	103.4%	1.05	1,722	16	95.53	105%	108.9%	0.84	1,442	13	79.59	83%	90.7%
Chudanga		6.29	67.03	9	90.72	135.3%	0.97	909	8	87.86	97%	131.1%	1.35	1,225	11	117.71	134%	175.6%
Jessore		18.72	77.14	22	90.72	117.6%	0.99	2,407	22	90.00	99%	116.7%	1.06	2,552	23	94.93	105%	123.1%
Jhenaidah		12.16	77.21	14	90.72	117.5%	0.99	1,554	14	89.50	99%	115.9%	0.82	1,282	12	73.43	82%	95.1%
Khulna		34.04	138.70	22	90.72	65.4%	0.96	2,355	21	87.06	96%	62.8%	0.77	1,807	16	66.45	76%	47.9%
Kushtia		13.48	78.16	16	90.72	116.1%	1.00	1,718	16	90.37	100%	115.6%	1.45	2,497	23	130.61	145%	167.1%
Magura		8.12	97.74	8	90.72	92.8%	1.01	842	8	91.93	101%	94.1%	1.14	959	9	104.13	113%	106.5%
Meherpur		4.58	81.44	5	90.72	111.4%	1.00	559	5	90.31	100%	110.9%	0.94	528	5	84.70	94%	104.0%
Narail		5.90	82.56	6	90.72	109.9%	1.05	753	7	95.54	105%	115.7%	0.79	598	5	75.50	79%	91.5%
Satkhira		12.65	69.84	16	90.72	129.9%	1.03	1,863	17	93.33	103%	133.6%	1.03	1,924	17	95.88	103%	137.3%
BarisalDiv.		84.16	99.08	77	90.72	91.6%	1.03	8,778	80	93.75	103%	94.6%	0.92	8,865	80	94.17	100%	95.0%
Barguna		7.73	87.63	8	90.72	103.5%	1.04	920	8	94.63	104%	108.0%	1.07	988	9	101.12	107%	115.4%
Barisal		38.75	153.18	23	90.72	59.2%	1.03	2,616	24	93.81	103%	61.2%	0.99	2,598	23	92.66	99%	60.5%
Bhola		10.39	61.25	15	90.72	148.1%	0.98	1,662	15	88.86	98%	145.1%	0.97	1,606	14	85.40	96%	139.4%
Jhalokati		6.17	81.45	7	90.72	111.4%	1.07	808	7	96.71	107%	118.7%	0.62	502	5	59.70	62%	73.3%
Patuakhali		11.35	79.44	13	90.72	114.2%	1.04	1,485	13	94.31	104%	118.7%	1.01	1,506	14	95.08	101%	119.7%
Pirojpur		9.76	81.45	11	90.72	111.4%	1.07	1,286	12	97.38	107%	119.6%	1.29	1,665	15	125.38	129%	153.9%
DhakaDiv.		258.33	84.23	278	90.72	107.7%	1.03	31,478	286	93.11	103%	110.5%	0.94	29,393	265	86.47	93%	102.7%
Dhaka		-	0.00	-	-								-					
Faridpur		29.06	170.36	15	90.72	53.3%	1.04	1,771	16	94.17	104%	55.3%	0.81	1,430	13	75.62	80%	44.4%
Gazipur		10.50	54.50	17	90.72	166.5%	0.98	1,881	17	88.56	98%	162.5%	1.05	1,967	18	92.08	104%	169.0%
Gopalganj		10.24	86.35	11	90.72	105.1%	1.06	1,262	11	96.56	106%	111.8%	0.74	929	8	70.66	73%	81.8%
Jamalpur		15.83	73.66	19	90.72	123.2%	1.01	2,161	20	91.23	101%	123.9%	0.69	1,496	14	62.83	69%	85.3%
Kishoreganj		18.89	72.12	24	90.72	125.8%	1.03	2,696	24	93.39	103%	129.5%	1.30	3,506	32	120.78	129%	167.5%
Madaripur		9.23	76.46	11	90.72	118.6%	1.05	1,263	11	94.97	105%	124.2%	0.69	877	8	65.53	69%	85.7%
Manikganj		12.25	92.95	12	90.72	97.6%	1.09	1,440	13	99.11	109%	106.6%	0.70	1,005	9	68.79	69%	74.0%
Munshiganj		11.24	84.76	12	90.72	107.0%	1.05	1,394	13	95.37	105%	112.5%	1.18	1,641	15	111.69	117%	131.8%
Mymensingh		49.67	109.23	41	90.72	83.1%	1.01	4,604	42	91.86	101%	84.1%	1.12	5,172	47	102.63	112%	94.0%
Narayanganj		13.43	65.94	18	90.72	137.6%	0.98	1,994	18	88.81	98%	134.7%	1.00	1,993	18	88.28	99%	133.9%
Narsingdi		11.67	61.33	17	90.72	147.9%	1.02	1,947	18	92.81	102%	151.3%	1.01	1,965	18	93.18	100%	151.9%
Netrokona		14.93	75.63	18	90.72	120.0%	1.04	2,061	19	94.72	104%	125.2%	0.74	1,531	14	69.98	74%	92.5%
Rajbari		8.20	85.16	9	90.72	106.5%	1.02	981	9	92.42	102%	108.5%	0.88	865	8	81.06	88%	95.2%
Shariatpur		8.68	80.97	10	90.72	112.0%	1.06	1,137	10	96.26	106%	118.9%	0.75	850	8	71.54	74%	88.3%
Sherpur		8.47	64.92	12	90.72	139.7%	1.01	1,317	12	91.64	101%	141.2%	1.22	1,602	14	110.83	121%	170.7%
Tangail		26.04	75.88	31	90.72	119.6%	1.04	3,567	32	94.29	104%	124.3%	0.72	2,565	23	67.43	72%	88.9%
ChittagongDiv.		230	94.56	221	90.72	95.9%	0.97	23,653	215	88.26	97%	93.3%	1.01	28,366	256	105.27	119%	111.3%
Bandarban		6.88	255.73	2	90.72	35.5%	0.99	267	2	90.00	99%	35.2%	0.75	201	2	67.53	75%	26.4%
Brahmanbaria		14.77	59.17	23	90.72	153.3%	1.01	2,516	23	91.45	101%	154.6%	0.98	2,466	22	89.14	97%	150.7%
Chandpur		15.48	65.78	21	90.72	137.9%	1.02	2,404	22	92.68	102%	140.9%	0.67	1,609	15	61.70	67%	93.8%
Chittagong		74.66	116.56	58	90.72	77.8%	0.94	6,007	55	85.09	94%	73.0%	1.54	9,248	83	130.28	153%	111.8%
Comilla		48.31	100.02	44	90.72	90.7%	0.98	4,729	43	88.82	98%	88.8%	0.94	4,442	40	82.98	93%	83.0%
Cox's Bazar		11.17	66.59	15	90.72	136.2%	0.91	1,525	14	82.50	91%	123.9%	2.48	3,786	34	203.68	247%	305.9%
Feni		11.36	88.71	12	90.72	102.3%	1.00	1,281	12	90.69	100%	102.2%	1.03	1,325	12	93.31	103%	105.2%
Khagrachhari		8.81	214.44	4	90.72	42.3%	0.97	397	4	87.69	97%	40.9%	0.60	237	2	52.03	59%	24.3%
Lakshmipur		9.62	62.98	14	90.72	144.0%	0.99	1,518	14	90.13	99%	143.1%	0.88	1,334	12	78.74	87%	125.0%
Rangamati		11.53	241.77	4	90.72	37.5%	0.96	457	4	86.83	96%	35.9%	1.29	590	5	111.51	128%	46.1%
Noakhali		17.29	66.89	23	90.72	135.6%	0.99	2,553	23	89.60	99%	134.0%	1.23	3,130	28	109.26	122%	163.4%
Sylhet Div.		72	92.29	71	90.72	98.3%	1.02	7,947	72	92.14	102%	99.8%	-	10,003	90	115.35	125%	125.0%
Moulvibazar		10.49	66.20	14	90.72	137.0%	1.03	1,638	15	93.83	103%	141.7%	0.90	1,469	13	83.65	89%	126.4%
Habiganj		12.49	71.10	16	90.72	127.6%	1.03	1,816	16	93.79	103%	131.9%	1.30	2,291	21	117.63	125%	165.4%
Sunamganj		12.24	62.12	18	90.72	146.0%	1.02	2,008	18	92.42	102%	148.8%	1.53	3,016	27	138.08	149%	222.3%
Sylhet		36.99	147.24	23	90.72	61.6%	0.99	2,484	23	89.70	99%	60.9%	1.28	3,227	29	115.92	129%	78.7%

1	19	20	21	22	23	24	25	26	27	28	29
		SMR+age/sex+cost						IMR+age/sex +cost			
Zila	Log density index	Adjusted population	Total (crore taka)	Per Capita (taka)	% marginal change	% total change	IMR index	Adjusted population	Total (crore taka)	Per capita (taka)	% total change
Bangladesh		115,614	1,055	90.72	100%	100.0%	1.00	114,570	1,055	90.72	100.0%
RajshahiDiv.		25,438	232	76.55	101%	82.8%		25,106	231	76.24	82.5%
Bogra	0.97	2,098	19	61.19	98%	53.7%	0.67	2,016	19	59.32	52.0%
Dinajpur	1.02	2,319	21	80.67	103%	85.9%	0.83	2,173	20	76.29	81.2%
Gaibandha	0.98	1,704	16	68.71	99%	105.1%	0.82	1,784	16	72.62	111.1%
Joypurhat	1.00	968	9	99.19	101%	107.3%	0.67	593	5	61.32	66.3%
Kurigram	1.00	1,235	11	60.88	101%	83.3%	0.89	1,623	15	80.75	110.5%
Lalmonirhat	1.02	937	9	81.95	103%	107.1%	0.89	974	9	85.96	112.3%
Naogaon	1.04	1,640	15	60.03	105%	84.1%	0.92	2,335	21	86.24	120.8%
Natore	1.00	1,169	11	69.94	101%	103.2%	0.71	1,105	10	66.67	98.4%
Nawabganj	1.01	1,327	12	88.39	102%	127.3%	0.90	1,177	11	79.11	114.0%
Nilphamari	1.00	1,182	11	69.39	101%	101.5%	1.18	1,801	17	106.75	156.1%
Pabna	0.97	1,483	14	61.22	99%	69.2%	0.62	1,311	12	54.60	61.7%
Panchagarh	1.07	719	7	84.22	108%	91.0%	0.82	701	6	82.85	89.5%
Rajshahi	0.99	1,766	16	70.14	101%	39.8%	0.71	1,480	14	59.32	33.7%
Rangpur	0.97	2,209	20	79.90	98%	59.1%	0.75	1,791	16	65.37	48.3%
Sirajganj	0.98	3,648	33	127.37	99%	191.5%	1.29	3,298	30	116.18	174.7%
Thakurgaon	1.06	1,034	9	81.44	107%	112.7%	0.79	945	9	75.08	103.9%
KhulnaDiv.		15,213	139	94.62	104%	106.6%		12,421	114	77.96	87.8%
Bagerhat	1.11	1,606	15	89.65	113%	102.2%	0.81	1,551	14	87.35	99.6%
Chudanga	1.00	1,226	11	119.13	101%	177.7%	1.20	1,094	10	107.27	160.0%
Jessore	0.98	2,508	23	94.33	99%	122.3%	0.62	1,461	13	55.45	71.9%
Jhenaidah	1.01	1,294	12	74.98	102%	97.1%	0.67	1,057	10	61.82	80.1%
Khulna	1.07	1,938	18	72.06	108%	52.0%	0.98	2,468	23	92.60	66.8%
Kushtia	0.97	2,418	22	127.93	98%	163.7%	0.73	1,215	11	64.87	83.0%
Magura	1.00	962	9	105.69	101%	108.1%	1.01	854	8	94.67	96.9%
Meherpur	1.02	540	5	87.77	104%	107.8%	0.70	399	4	65.42	80.3%
Narail	1.02	609	6	77.77	103%	94.2%	0.84	646	6	83.21	100.8%
Satkhira	1.10	2,111	19	106.39	111%	152.3%	0.82	1,676	15	85.23	122.0%
BarisalDiv.	–	8,696	79	93.43	99%	94.3%		8,709	80	94.42	95.3%
Barguna	1.02	1,013	9	104.80	104%	119.6%	1.02	964	9	100.62	114.8%
Barisal	0.93	2,413	22	87.04	94%	56.8%	1.00	2,429	22	88.42	57.7%
Bhola	0.98	1,577	14	84.81	99%	138.5%	0.98	1,595	15	86.55	141.3%
Jhalokati	0.96	480	4	57.78	97%	70.9%	1.30	1,008	9	122.42	150.3%
Patuakhali	1.06	1,600	15	102.19	107%	128.6%	0.92	1,454	13	93.70	117.9%
Pirojpur	0.97	1,613	15	122.89	98%	150.9%	1.01	1,260	12	96.84	118.9%
DhakaDiv.	–	28,161	257	83.79	97%	99.5%		29,293	270	87.96	104.4%
Dhaka	0.80						0.62				
Faridpur	0.99	1,417	13	75.82	100%	44.5%	0.80	1,400	13	75.57	44.4%
Gazipur	0.97	1,917	17	90.78	99%	166.6%	0.95	1,751	16	83.67	153.5%
Gopalganj	1.01	937	9	72.10	102%	83.5%	0.74	944	9	73.31	84.9%
Jamalpur	0.97	1,454	13	61.74	98%	83.8%	0.97	2,028	19	86.92	118.0%
Kishoreganj	0.97	3,400	31	118.48	98%	164.3%	1.27	3,319	31	116.70	161.8%
Madaripur	0.96	838	8	63.34	97%	82.8%	0.76	922	8	70.38	92.0%
Manikganj	0.97	973	9	67.36	98%	72.5%	0.57	799	7	55.80	60.0%
Munshiganj	0.90	1,476	13	101.61	91%	119.9%	0.71	887	8	61.63	72.7%
Mymensingh	0.96	4,969	45	99.72	97%	91.3%	1.33	5,863	54	118.75	108.7%
Narayanganj	0.84	1,674	15	75.00	85%	113.7%	0.74	1,242	11	56.14	85.1%
Narsingdi	0.91	1,786	16	85.65	92%	139.6%	1.10	1,948	18	94.25	153.7%
Netrokona	1.03	1,583	14	73.17	105%	96.8%	0.90	1,915	18	89.32	118.1%
Rajbari	0.99	855	8	81.03	100%	95.2%	0.95	926	9	88.54	104.0%
Shariatpur	0.92	778	7	66.27	93%	81.8%	1.00	1,041	10	89.47	110.5%
Sherpur	0.98	1,574	14	110.18	99%	169.7%	1.40	1,818	17	128.39	197.8%
Tangail	0.99	2,530	23	67.27	100%	88.6%	0.71	2,490	23	66.80	88.0%
ChittagongDiv.	–	27,540	251	103.38	98%	109.3%		27,483	253	104.10	110.1%
Bandarban	1.64	331	3	112.30	166%	43.9%	0.70	306	3	104.61	40.9%
Brahmanbaria	0.95	2,339	21	85.53	96%	144.6%	1.04	2,494	23	92.00	155.5%
Chandpur	0.93	1,490	14	57.81	94%	87.9%	0.72	1,601	15	62.65	95.2%
Chittagong	0.95	8,789	80	125.23	96%	107.4%	1.43	8,145	75	117.11	100.5%
Comilla	0.91	4,024	37	76.03	92%	76.0%	1.00	4,283	39	81.66	81.6%
Cox's Bazar	1.03	3,892	36	211.81	104%	318.1%	2.47	3,875	36	212.80	319.6%
Feni	0.92	1,216	11	86.63	93%	97.7%	1.07	1,254	12	90.18	101.7%
Khagrachhari	1.39	329	3	73.14	141%	34.1%	0.81	447	4	100.05	46.7%
Lakshmipur	0.96	1,280	12	76.47	97%	121.4%	1.17	1,703	16	102.63	162.9%
Rangamati	1.53	900	8	172.25	154%	71.2%	0.78	540	5	104.33	43.2%
Noakhali	0.94	2,948	27	104.07	95%	155.6%	1.18	2,836	26	101.02	151.0%
Sylhet Div.		10,566	96	123.25	107%	133.5%		11,558	106	136.05	147.4%
Moulvibazar	1.03	1,508	14	86.87	104%	131.2%	1.40	2,362	22	137.31	207.4%
Habiganj	1.04	2,467	23	128.15	109%	180.2%	1.35	2,551	23	133.71	188.1%
Sunamganj	1.09	3,352	31	155.22	112%	249.9%	1.57	3,445	32	160.97	259.1%
Sylhet	1.02	3,239	30	117.68	102%	79.9%	1.27	3,200	29	117.32	79.7%

Column notes

1. District name.
2. Total spending by district (Revenue budget, government development and Reimbursable Programme Aid through government, 1999/2000, Crore Taka).
3. Per capita spending (Column 2 divided by district population).
4. Spending based on equal per capita allocations (national allocation divided by national population multiplied by district population).
5. Spending per capita (Column 3 divided by district population).
6. Percentage change compared to current allocations (Column 5 compared to Column 2).
7. Weights based on age and sex – value greater (less) than one indicates greater (lower) proportion of groups with more need e.g. elderly, women.
8. Adjusted population based on age/sex weights.
9. Total allocations based on equal per capita allocations adjusted weighted by age/sex.
10. Per capita spending (Column 9 divided by district population).
11. Percentage change of age/sex adjusted allocations compared to equal per capita allocations (Column 9 compared to Column 5).
12. Percentage change of age/sex adjusted allocations compared to current allocations (Column 9 compared to Column 2).
13. Age/sex adjusted Standardised Mortality Rates (SMR).
14. Adjusted population based on age/sex weights and SMR.
15. Total spending adjusted for age/sex and SMR weights.
16. Per capita spending (Column 14 divided by district population).
17. Percentage change of SMR adjusted allocations compared to age/sex adjusted allocations (Column 15 compared to Column 9).
18. Percentage change of SMR adjusted allocations compared to current allocations (Column 15 compared to Column 2).
19. Cost index based on density of population (District population density divided by average population density).
20. Adjusted population based on age/sex weights, SMR and cost index.
21. Total spending adjusted for age/sex, SMR weights and cost index.
22. Per capita spending (Column 21 divided by district population).
23. Percentage change of Cost adjusted allocations compared to SMR adjusted allocations (Column 21 compared to Column 15).
24. Percentage change of Cost adjusted allocations compared to current allocations (Column 21 compared to Column 2).
25. Infant Mortality Rate (IMR) index (District IMR compared to national average IMR).
26. Adjusted population based on age/sex weights, IMR and cost index.
27. Total spending adjusted for age/sex, IMR weights and cost index.
28. Per capita spending (Column 27 divided by district population).
29. Percentage change of Cost adjusted allocations compared to current allocations (Column 27 compared to Column 2).

Annex two: Results of multivariate analysis

Section one: A statistical model of hospital throughput

Published statistics indicate there is considerable variation between the volume efficiency of facilities across districts. In order to investigate these variations in more detail a simple statistical model was estimated. This considered both demand and supply factors as determinants of final throughput activity.

Demand factors are both economic and need based. Economic factors include the costs of getting to the facility, including both transport and location of the facility in relation to the population. Need based factors include levels of morbidity, age and gender balance. Supply side factors are also important - better quality facilities and services encourage people to utilise public services rather than using private providers or self-treatment.

Data available by upazila are extremely limited. On demand side a proxy for distance costs is given by the density of population. Alternatively, assuming that the facility is centred roughly in the middle of the upazila and that the population is distributed evenly, average distances can be estimated from the land area of the upazila. Both variables are used alternatively. Data on morbidity or mortality rates are not available at national level by upazila. Hospital death rates are available but these are likely to be partly determined within the model since intensity of bed use is likely to be determined in part by death rates.

On the supply side numbers of beds and expenditure (budget) per bed/per capita are available as general proxies for level of supply. Expenditure per bed is the most attractive since it should be a reasonable proxy for quality and volume of service provided to each patient.

Table 2.1: statistical analysis of district level facility throughput

Ln_TP	Coef.	Std. Err. [1]	t-statistic	P>t	[95% Conf.	Interval]
Density	.0005109	.0001208	4.230	0.000	.0002734	.0007484
Den_sq	-1.51e-07	3.55e-08	-4.266	0.000	-2.21e-07	-8.16e-08
Exp_bed	4.27e-07	1.13e-07	3.784	0.000	2.05e-07	6.49e-07
Per_fem	4.009431	1.911817	2.097	0.037	.2498046	7.769058
Per_Fad	.312321	.3390185	0.921	0.358	-.3543659	.979008
Barisal	-.2531653	.1026241	-2.467	0.014	-.4549777	-.0513529
Chittag	-.0758094	.0763174	-0.993	0.321	-.2258891	.0742703
Sylhet	-.439702	.1036245	-4.243	0.000	-.6434817	-.2359224
Dhaka	-.2859348	.0728201	-3.927	0.000	-.429137	-.1427326
Khulna	.102418	.0829955	1.234	0.218	-.0607943	.2656304
_cons	1.799968	.9395499	1.916	0.056	-.0476765	3.647612

[1] Heteroskedastic adjusted standard errors

On the demand side the model suggests that distance to the facility, as proxied by density, is an important factor determining demand. The use of the density squared term and significant negative coefficient accounts for the urban effect – that is the very densely populated upazilas tend to be in or close to large urban areas where the population is more likely to travel to district, medical college and specialist hospitals rather than using a upazila facility. The proportion of women is also seen to be an important factor.

Section 2: statistical analysis of upazila allocations

A regression was performed to examine whether location (division), population density, size of population, percentage of women in population, number of women and proportion of women admissions are significantly related to the total level of spending in upazilas. Only upazilas with 31 beds were included in the analysis.

Table 2.2: statistical analysis of upazila spending

	Coefficient	Std. Error	t	Sig.
(Constant)	0.4232	0.2498	1.6938	0.0912
DENSITY	0.000003	0.0000	0.0747	0.9405
ALL_AD	- 0.00004	0.0001	- 0.5328	0.5945
POP 99	0.0032	0.0002	15.5185	0.0000
F_ADM	0.00008	0.0001	0.5450	0.5861
P_FE_AD	0.5099	0.4669	1.0920	0.2756
SYLHET	- 0.2907	0.0801	- 3.6312	0.0003
KHULNA	- 0.0815	0.0623	- 1.3085	0.1916
DHAKA	0.0256	0.0552	0.4645	0.6426
CHITTAG	- 0.0697	0.0575	- 1.2121	0.2263
BARISAL	0.0041	0.0773	0.0527	0.9580
R-squared		0.5343		
Adjusted R-squared		0.5212		
F-Statistic		40.3700		

The results of the regression are shown in table 2.2. Population size is the main significant variable indicating that, although there is clearly considerable variation in per capita spending, size of population is an important factor in the current system of allocations. The only other significant variable was the Sylhet (dummy variable) which was negative. This indicates that there appears to be some bias against Sylhet in the allocation of public funding at upazila level. Further investigation into the reasons for this bias is required. Negative coefficients were also recorded for Khulna and Chittagong but they were not significant (5% confidence level).

Annex three: line budget setting process for districts and upazilas

The process for setting the budget for different line items is as follows:

Diet budget:

Diet allocation for any level of Government health facilities (that is, District Hospitals and Upazila Health Complexes) is a top-down decision from the DG Office - Taka 30 per bed per day. Current per bed diet allocation has been raised from the previous allotment of Taka 25 per bed-day based on some arbitrary methods. Provision for diet/food is made from the Non-Development Budget. Each of the health facilities, however, submits an inflated diet budget (about 20% higher than the facilities' capacity) for any financial year to the respective district's Civil Surgeon. 20% escalation in the original diet requirement is partly based on the previous year's IPD patient flow. The Accountant (from CS Office) prepares the total diet budget with help from the respective departments' In-Charge. The UHC's Accountant submits the diet budget to the Upazila Health and Family Planning Officer (UH&FPO) for approval.

The approved diet budget from the UHC, and the budget from the CS Office, are submitted tothe respective district's CS for approval. On approval from the CS, the district's total diet budget is then sent to the DG Office. Diet budgets from all the districts are then consolidated in the DG Office and then sent to the MOHFW and the Ministry of Finance for Parliamentary approval. Upon approval byParliament the diet budget is sent to the Ministry of Finance and MOHFW. MOHFW then allocates the budget to each of the districts and sends it to each CS. The CS Office nominates a Contractor (lowest bidder - for one financial year) through a Tender Committee following a tender. The same Contractor does not necessarily supply food to the District Hospital as well as the Upazila Health Complex. MOHFW decides who will be members of the Tender Committee. In general, the Tender Committee is comprised of the CS; the District Marketing Officer; the UH&FPO; a representative of the District Commissioner; and the In-Charges of all the departments in the health facility. In-Charges from the respective departments provide a 'diet scale' (specifying the daily requirement for rice, dal, eggs, vegetables and other food items). The Contractor supplies food according to the 'diet slip'. Everyday the food supplies are received by the Nursing Supervisor ,who is designated by the CS and the UH&FPO for the respective Upazila. The Cook cooks the food and the Ward Boys distribute the diet among the patients according to the diet slip.

In case of an exceess of in-patients and, consequently, exhaustion of the diet fund , a 'demand' for an additional diet budget is prepared by the accountant with assistance from the respective departments and submitted to the CS for approval by the DG Office. While the 'proposal' for 'unexpected expenditure' is being approved, funding is met from the 'contingency fund' category. To meet such 'unexpected expenditures' each facility escalates their diet budget by roughly 20%. However, "no expenditure is

incurred in anticipation of authorisation of an annual budget, without the prior concurrence of the Ministry of Finance."[7]

Medical Surgical Requisites (MSR) budget:

The MSR budget allocation is prepared centrally on the basis of number of beds and patient flow (both out patients and in-patients - in other words, for the facility as a whole) of the previous year, taking into consideration the changing prices of MSR. The Storekeepers and Accountants of the CS office and Upazila Health Complexes prepare an MSR budget for their respective facilities. The UHC's Storekeepers and Accountants are also responsible for compiling MSR budgets for each of the unions under the respective Upazila. The CS approves the MSR budget for the District Hospital. SACMO, with help from MA, prepares the MSR budget for Union health sub-centres. The MSR budget for UHC and other Union facilities under the respective Upazila is approved by the UH&FPO and then sent to the CS.

The process of getting Parliamentary approval and distribution of the budget accordingly is similar for all line items. The CS Office nominates a Contractor (lowest bidder - for one financial year) through an MSR Tender Committee following a tender.The Tender Committee is comprised of the CS; the District Marketing Officer; the UH&FPO; a representative of the District Commissioner; and the In-Charges of all the departments in the health facility. The Contractor supplies the MSR to the CS Office and the CS releases the MSR to each of the health facilities under the respective district, according to the 'indent' (or the request) submitted by UHC (for UHC and Union sub-centres, together). The MSRs are kept in a District Reserve Store (DRS) – a store-room (inside the CS Office) for storing all the MSRs. The CS is the In-Charge of DRS, and the Storekeeper receives and maintains the MSR records. The CS office is mandated to buy 70% of the 'centrally provided listed drugs' from EDCL (Essential Drugs Company Limited) – a capital city based Government owned institution. The rest of the 30% of listed drugs, along with other components of MSR (for example: gauze/bandage; linen; gas/oxygen etc.), are procured locally through a similar tender process involving the MSR Tender Committee.

The Central Medical Store Department (CMSD) is responsible for all overseas procurement of MSR items and equipment (exclusively) for the Health department. Any equipment, when procured through international bidding, is sent to the local health facilities by the CMSD.

All public health facilities are required to buy IV fluid, Vaccine, Sera etc. that are produced by the Institute of Public Health (IPH) against payment of the price. If EDCL or IPH fails to supply any drug or MSR item, then those items may be procured by direct purchase[8].

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[7] "Delegation of financial powers for and sub-delegation of financial powers" by Ministry of Finance, Finance Division, Expenditure Control Wing, March 7, 2000.

[8] "A handbook on financial management for the health and population sector programme" prepared by The Management Accounting Unit, MOHFW.

Salary and Allowances budget:

Accountants from UHCs and the CS office prepare their respective facilities' salary budget following a format sent by the DG Office. The format includes categories such as salary (officers and staff of health and family planning wings)_ and, separately, other allowances (such as housing, medical, contingencies, etc). The budget for officers and staff are based on the existing filled posts. There is also a separate budget for staff overtime based on the previous year and met from the Non-Development Budget. In addition to these, information on the number of staff in/out to deputation, or in-training, are provided in the same format as for the salary budget.

The process of getting Parliamentary approval and distribution of the budget accordingly is similar for salary and allowances budgets. The CS and the UH&FPO authorises the Accountants of their respective facilities to release the monthly salary payments.

Maintenance (fuel, vehicles, equipment, machinery, other) budget:

On the basis of last year's expenditures on maintenance, the Accountants of the District Hospital and UHC prepare a maintenance budget for submission to, and approval from, the CS (the Upazila and Union maintenance budget is first approved by the UH&FPO and then sent to the CS). In some cases, an ambulance driver informs the CS and UH&FPO (in case of UHC) and the Accountant prepares a budget.

The provision for maintenance is mainly met from the Non-Development Budget and decided centrally. The decision factors are various - capacity of the vehicle; pattern of facility utilisation; political importance of the region; frequent visits by influential people, etc. The annual provision for (all) vehicle maintenance for the CS Office is about Taka 40,000 and for UHC Taka 25,000. Any vehicle maintenance expenditure (including fuel for the vehicle) exceeding Taka 3,000 for UHC and Taka 5,000 for a District Hospital per annum per vehicle would require prior approval from the Ministry of Finance. The MOHFW can exercise financial power for no more than Taka 20,000 in a year for one vehicle[9]. In the process of seeking approval, the Accountant, with help from the Transport Officer / Driver prepares a 'demand note' (approved by UH&FPO in the case of UHC) – this is submitted to the CS, whothen sends it to the DG Office for consideration. In such cases where maintenance expenditure exceeds the ceiling, the transport / vehicles are sent to Transport and Equipment Maintenance Organisation (TEMO) for repair works. TEMO is a capital

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[9] "Delegation of financial powers for and sub-delegation of financial powers" by Ministry of Finance, Finance Division, Expenditure Control Wing, March 7, 2000 – defines financial powers regarding 'maintenance of Government owned vehicles' (under Non-Development Budget) as follows: "the CS (for District Hospitals) and UH&FPO (for UHC and Union health sub-centres) and MOHFW can spend not above Taka 5,000; Taka 3,000, and Taka 20,000 respectively subject to budget provision, provided that (i) existing rules and regulations and Government orders in this regard are observed, and (ii) total cost of repair is not split up to avoid expenditure sanction of the higher authority".
  Projects under the ADP budget define financial powers regarding the repair of vehicles belonging to development projects as follows – MOHFW is given full power; the DG Office is given power upto Taka 60,000 and each of the LDs under HPSP can exercise power up to Taka 40,000 per vehicle in a year subject to (i) specific budget provision exits and (ii) existing rules and regulations are observed.

city based Government owned organisation where all kinds of transport / vehicles (exclusively) from the Health Department are repaired. TEMO has its own Mechanics to do its jobs. TEMO also has its own separate budget for all kinds of maintenance. The TEMO budget is prepared based on previous years' expenditure patterns and 'pending works' from last year. The proposed budget is then sent to the DG Office for approval from MOHFW and finally from Parliament via the Ministry of Finance.

On approval from the DG Office for repair byTEMO, the local health facilities (in the districts and Upazila) send their vehicles to TEMO. But when the vehicle's condition is such that it cannot be sent to TEMO, the local health facilities, upon being certified by TEMO, repair the vehicle locally.

In addition to these, under the Non-Development Budget the CS and the MOHFW are given full responsibility (by the Ministry of Finance) for the maintenance of machinery, instrument, office equipment and furniture, subject to budget provision. The UH&FPO, on the other hand, would require permission from the Ministry of Finance if more than Taka 1,500 is spent for maintenance (of machinery, instruments, office equipment and furniture) purposes. The LDs and the MOHFW, under the ADP Budget, are given full power subject to the existing rules and regulations, and budget provision[10].

Budget for Capital goods, Construction / Renovation:

Small-scale (up to Taka 1000 to Taka 2000) renovations are arranged locally from a 'contingency fund'. In such cases, the respective departments' In-Charge is informed, and who assists the Accountant in preparing the budget, which is finally sent to the CS for approval. Upon submission of the bill, the CS authorises the Accountant to release the funds. In the case of UHC and other Union health sub-centres, the budget is approved by the UH&FPO.

The CMMU has an approved budgeted allocation for any kind of renovation or construction in any public health facility Any renovation or construction work requiring more than Taka 2,000 (and which cannot be met from the 'contingency fund') is managed by the Public Works Department or Local Government Engineering Division, or even by CMMU itself, depending upon the existence of a local branch. Any health facilities requiring such large-scale renovation submit a 'demand note' to the CS, prepared by the Accountant.

Similarly, any purchase of machinery, instruments, office equipment and furniture has to be in accordance with the Government Order – under the Non-Development Budgetary framework, the CS (for District Hospital); UH&FPO (for UHC and Union health sub-centres), and the MOHFW must seek prior approval from the Ministry of Finance if more than Taka 10,000; Taka 5,000, and Taka 50,000, respectively is required for the above mentioned purpose, provided that (i) necessary budget provision exists, (ii) existing Government rules and regulations are observed, and (iii) expenditure is not split up to avoid sanctions from the higher authority. The LDs and

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[10] "Delegation of financial powers for and sub-delegation of financial powers" by Ministry of Finance, Finance Division, Expenditure Control Wing, March 7, 2000.

the MOHFW, under the ADP Budget, are given full power subject to the existing rules and regulations, and budget provision[10].

Budget for Other Items:

The local health facilities (in the districts and Upazilas) are allocated funds for various other categories, including budgets for utilities (gas, water, electricity, water, etc); taxes; training; supplies (stationery, seals, stamps, etc), etc. The budgeting process and the basis of budget requests is similar for every category.

For example, local health facilities prepare their utility budget on the basis of previous years' expenditure. The UH&FPO approves the utility budget for UHC and Union sub-centres prepared by the Accountant. The UH&FPO approved utility budget for UHC and Union health facilities, and the utility budget for the District Hospital (prepared by the Accountant) is submitted to the CS Office for approval – this is then sent to the DG Office; the MOHFW and, finally, to the Ministry of Finance for Parliamentary approval. Each local level health facility pays their utility bill according to the T&T Board charge.

The LDs and the MOHFW, under the ADP Budget framework, are designated to exercise full power regarding the payment for utility services subject to budget provision.

Contingency fund:

The contingency fund is allocated on the basis of previous years' expenditure pattern and the number of beds in the facility. The local health facilities (in the districts and Upazilas) meet their various types of 'non-line-item' expenditures (including the 'unexpected' ones) through the contingency fund. One such expenditure is spending on 'laundry'. There is a Tender Committee in the CS Office who selects the lowest bidder through a local tender process. The Contractor does the laundry on demand from the local health facility. On submission of the laundry bill, the Contractor is fully reimbursed.

Other types of spending met from the 'contingency fund' include small repair or maintenance works, etc.

In general:
The process for Non-Development Budgeting, for Upazila and district level public health facilities is such that a 'Call Notice' is given to the Drawing and Disbursement Officers (DDO) of every Upazila and District by the Ministry of Finance (MOF). The CS is the DDO for his district. A 'Call Notice' includes columns on 'next FY budget for the respective Upazila'; 'expenditure for the 1st quarter of the previous FY'; 'non financial budget (e.g. supplies and services)'. After compiling the information, each DDO sends the 'Call Notice' to the DG by November. The DG Office then compiles all the 'Call Notices' and sends the aggregated budget information to the Joint Secretary, Administration, MOHFW. From MOHFW the budget is then sent to the MOF for approval by Parliament. The MOF has 'modelling software' with which it calculates its own budget estimation for each Ministry. The approved budget is then sent back to the DG Office. The DG Office then distributes the budget amongst all

Upazilas and districts accordingly. The Joint Secretary, Finance and Management, MOHFW issues an authorisation letter to each Upazila and district DDO for the collection of funds. The approved budget could vary from the initial budget estimation made by each Upazila DDO for all categories except the 'salary' item.

For the Development Budget the initial process of budgeting is similar except that the compiled 'Call Notices' are sent to the Line Director (LD), MOHFW, who then sends the consolidated 'Call Notice' to PCC, which negotiates with the Planning Commission and MOF regarding the budget. After approval by Parliament the budget is sent back to the LD, MOHFW and runs its simulations following 'budget modelling' software provided by MAU. The rest of the process is similar to the Non-Development Budgeting process. The LD makes his/her own 'needs assessment' with help from the CMSD unit under MOHFW. The LD, MOHFW with PCC and Planning Cell of MOHFW negotiates the Government's share in the budget on the basis of each of the units' own assessments. With respect to Project Aid, the LD negotiates with each of the donors. But for the Pool Fund (that is, RPA Other and RPA through GOB), the LD negotiates with the World Bank. In this case, fundsare theoretically released by the Joint Secretary, Finance and Management, MOHFW but in practice they are collected from the World Bank. On the other hand, for DPA - the Joint Secretary, Finance and Management, MOHFW theoretically release the fund to the LD, MOHFW and through the LD the Program Manager can collect the DPA allocation.

The budget setting process under Non-Development Budget and ADP Budget frameworks is roughly the same. One important distinction between the two types of budget is that officials from local health facilities start spending money on different line items (especially, salary budget) even before the facilities are actually sanctioned in the Non-Development Budget. But this is not the case with the ADP Budget. Another important difference is regarding the exercise of financial powers by different tiers of health facility. Under the Non-Development Budget financial power for spending money is clearly given to the CS, the UH&FPO, the DG Office and MOHFW. But financial power in the ADP Budget is delegated to LDs, the DG Office and MOHFW – who can sub-delegate financial authority to specific programs (in local health facilities) under the ADP Budget.

The budget setting process:

Line item and financial capacity	Allocation basis	District	Upazila	Union	Financial authority
Food	• Per bed-day • Top-down decision from DG office	30 Taka per-bed-day	30 Taka per-bed-day	Not applicable (since no bed facility)	Civil Surgeon
MSR*	• Per bed / Per facility • Top-down decision from DG office	22,000 Taka per bed per year	15,000 Taka per bed per year	75,000 Taka per year	Civil Surgeon
Staff	Staff in post up (including in/out to deputation, training)	11 doctors 27 nurses 30 other staff	9 doctors 10 nurses 23 other staff	4 other staff	DG
• Maintenance (fuel, vehicle, etc.) (<5000 taka for DH and < 3000 taka per vehicle for UHC) • Maintenance (machinery, equipment, etc.) (<1500 taka)	• Previous year expense • Vehicle capacity • Utilisation pattern • Political importance etc.	40,000 Taka per annum for all vehicle	25,000 Taka per annum for all vehicle	Not applicable	Civil Surgeon
• Capital (construction, renovation) (<2000 taka) • Purchase of machinery, equipment, etc. (<10,000 taka for DH and <5000 taka per procurement for UHC and below)	• Previous year expenditure pattern • Current year requirement • Submissions	• Less than contingency fund amount, i.e., about 2000 Taka for maintenance • Submissions	• Less than contingency fund amount, i.e., about 2000 Taka for maintenance • Submissions		Civil Surgeon DG / CMMU

*MSR is divided into 8 sub-groups. MSR allocation for different levels of health facilities is:

	Medical college	District Hospital	Upazila Health Complex
Group A: drugs	51-60%	51-70%	51-75%
Group B: equipment	15-20%	12-20%	10-20%
Group C: gauze/bandage	6-8%	5-8%	5-8%
Group D: linen	6-8%	4-8%	4-8%
Group E: gas/oxygen	5%	3-5%	1-5%
Group F: reagents	5%	3-5%	2-5%
Group G: furniture	2%	2%	2%
Group H: supplies	1%	1%	1%

Annex four: Budget Calendar

| Non-Development Budget[11]		Development Budget (for HPSP)	
Date	**Activity**	*Date*	**Activity**
31st August	Distribution of Budget Forms for next FY from FD-MoF to Ministries		
31st August	Call notices from DG DoF to DDOs (Estimating Officers)		
31st august	Submission of estimates by DDOs to DG DoF		
25th November	Receipt of consolidated estimates by FD MoF from MOHFW along with 1st three months actuals from current FY		
20th January	Completion of examination of Budget Estimates by FD MoF		
15th February	Receipt of six months actuals by FD MoF	15th February	Call notices from LD to DDOs (Estimating Officers)
15th February	Commencement of budget meetings between MOHFW and FD MoF	15th February	Completion of 1st Draft OP with estimates
28th February	Completion of review of the estimates on basis of 1st six months actuals	21st March	Draft OP to DG Director of Planning and DG
10th March	Distribution of first edition of the Budget to MOHFW from FD MoF	15th April	Consolidation of OP Estimates by Planning Cell, MOHFW
h28th March	Completion of discussions between MOHFW and FD regarding estimates	21st April	National Steering Committee request for HPSP Estimates for ADP
1st week of April	Presentation of budget estimates to the Cabinet	31st May	ADP allocation for HPSP determined
31st May	Preparation and printing of Budget Estimate, details of Receipts and Expenditure, Supplementary Estimate and Finance Minster's speech	31st May	Approval and printing of ADP and ADB
1st week of June	Presentation of Budget estimate to Parliament	1st week of June	Presentation of Budget estimate to Parliament
		1st week of July	Revision of OP budgets based on approved HPSP budget
		3rd week of July	National Steering Committee request for revised OP
		31st July	Approval of OP by National Steering Committee

Source: (MAU, 2000)

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[11] The Family Planning and Health Services Directorates each have their own Finance Director with a Finance and Audit section. The Finance section in each is responsible for the preparation of the non-development budget for that Directorate. The given budget calendar is followed by both the Directorates.

Annex five: Inpatient service use of medical college hospitals

Mymensingh Medical College Hospital[12]
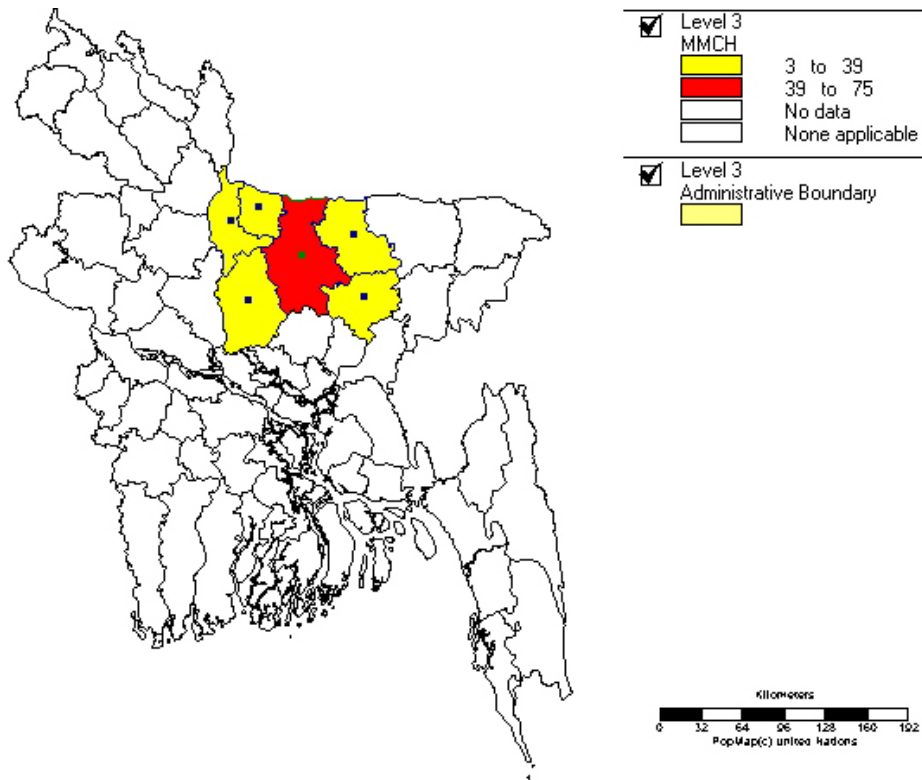
Dhaka Medical College Hospital

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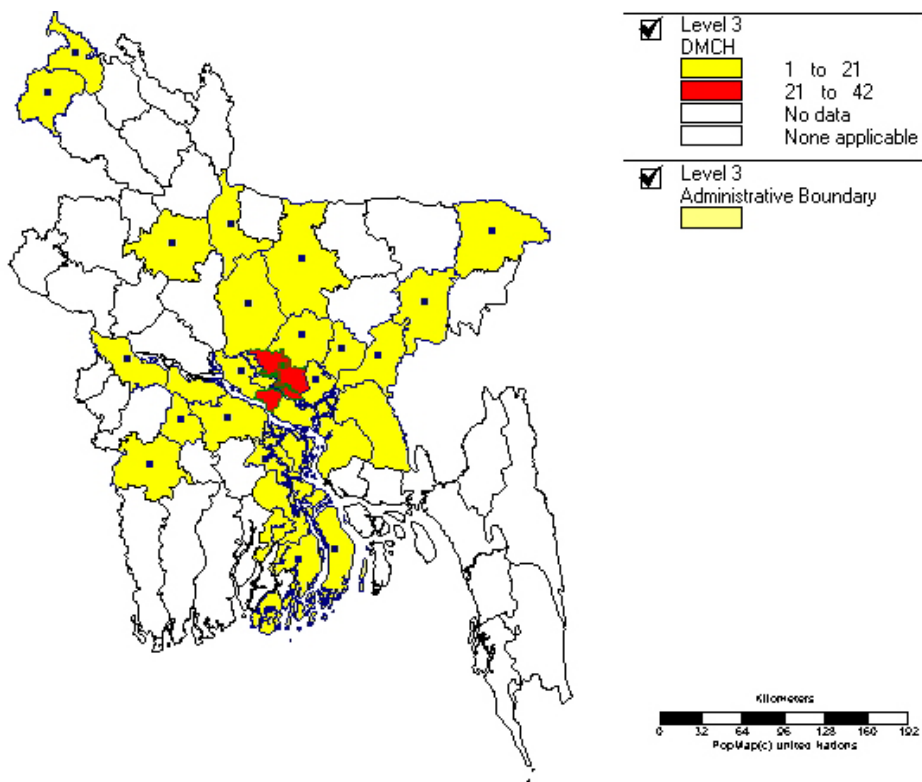
[12] Numbers are percentage ranges showing proportion of total users coming from different areas.