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Resource Allocation Options for Financing in the Health Sector: International Experience and Lessons for Guatemala

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Table of Contents

List of Abbreviations and Acronyms

DHS	Demographic and Health Survey
FONASA	*Fondo Nacional de Salud*
GP	General Practitioner
IGSS	Instituto Guatemalteco de Seguridad Social
MCF	Municipal Common Fund
MOH	Ministry of Health
MPF	Ministry of Public Finance
PAHO	Pan-American Health Organization
PPS	Prospective Payment System
RAWP	Resource Allocation Working Party
SILAIS	*Locales de Atención Integral en Salud*
SMR	Standardized Mortality Ratio

I. Introduction

Financing of the health sector in Guatemala has long been a political process whose technical basis has resulted in an allocation of resources among departments and districts that does not match health needs or objectives of health equity. Differences between health areas are huge, and most of the money goes to hospital services, urban areas, non- indigenous populations and departments with lower poverty incidence. Though the situation is unfair from a health systems perspective and has garnered much criticism, historical patterns of resource allocation cannot be significantly altered under the current rules and procedures of budget assignments.

The objectives of revising current health sector criteria are to distribute financing resources in a transparent and predictable manner that can help Guatemala achieve a more fair distribution that responds equitably to health needs of the population and encourages more efficient use of scarce resources. While better meeting the health needs of the population will likely entail increasing the financing resource envelope of the Guatemalan health sector, an equally important task is to ensure that resources that available are directed towards reducing inequalities in responsiveness to health needs.

In an effort to provide the government with alternative allocation options, this report presents a review of the prevalent options available in the international literature and discusses the options as applied in different countries. No model has been demonstrated to be the best in all cases and some are likely to depend on local conditions such as information systems and political will. Reviewing the current models in Guatemala, we then present an integrated alternative that suggests one way to improve the equity of response to different health needs in the health areas. We present this alternative to initiate a dialogue and not as the only model to be considered.

II. Current International Methods of Resource Allocation

Allocation of health sector financing involves the distribution of scarce resources to health facilities and providers to improve access to health services and, ultimately, population health. To varying degrees of success, resource allocation reflects attempts to match available resources to organizational and patient needs at sub-national levels of the system through use of one or more distributional formula(e) or methodologies. As described in Table 1, prevalent approaches to health sector resource allocation are usually based on one of two criteria: existing supply of andb demand for services, and health needs. There are two primary mechanisms that use supply and demand as the basis for resource allocation — organizational budget request (historical budgeting) and patterns of utilization — while a health needs approach almost always employs development of a weighted capitation formula. Countries often simultaneously use different formulae, such as utilization for the hospital sector and weighted capitation for primary care. These three methods of resource allocation are discussed, in turn.

Table 1. Common Methods of Resource Allocation

Mechanism	Basis	Description	Advantages	Drawbacks	Examples
Budget request	▪ Inputs	▪ Often operationalized as historical budgeting in which area-wide budget requests are incremental additions from the previous year's budget	▪ Easy-to-calculate based on health facility features (e.g., # health workers; # beds; # facilities)	▪ Perpetuation of historic inequities of distribution of resources ▪ Little link to health needs / cost containment	▪ Bangladesh
Utilization	▪ Supply and demand	▪ Funding is allocated according to the volume of health care services used in a region. The mode of payment can vary (e.g., fee-for-service vs. case-based payment) as can the use of budgetary caps (e.g., caps on expenditure/volume).	▪ Easy-to-calculate based on provision of services ▪ Considers health demand	▪ Perpetuation of existing inequities in utilization/historic inequities of distribution of resources ▪ Funding tied to health *demand* rather than *needs* (and no incentives to contain costs)	▪ Chile (prior to capitation)
Weighted capitation	▪ Health needs ▪ Equity	▪ Funding is allocated on a per capita basis, adjusted by non-health specific factors (e.g., area rurality, poverty) and/or health-specific factors (indicators of health status, behaviors, and/or outcomes)	▪ Most countries have data to inform simpler forms of weighted capitation ▪ Ties funding to health needs (to varying degrees) rather than demand ▪ Eliminates incentives of utilization-based method for inappropriate / unnecessary utilization	▪ Simpler forms omit many socio-economic /-demographic factors affecting health need ▪ More complicated forms are data-intensive ▪ Weighting is arbitrary/made on contestable assumptions about relationships to health needs ▪ Demand may need to be adjusted to objectively identified health needs	▪ Spain ▪ Chile ▪ Colombia ▪ Tanzania ▪ United Kingdom

Budget request

Allocation by budget request is the most supply-side driven way to allocate resources. It is usually based mostly (if not entirely) on costs associated with existing inputs and infrastructure characteristics of a particular locality, such as the number of beds (by level of facility), the number of health workers (by type of provider), and expected needs for equipment, supplies and/or pharmaceuticals. In practice, this method often involves historical budgeting in which requests are based on incremental additions to the previous year's expenditures. In Bangladesh, for example, budgets are set centrally based on infrastructure capacity (number of facilities, beds, staff) and historical norms (e.g., patient flows for determining food-related allocations), and once the total resource envelope is set for a particular line item, there is almost no ability to re-allocate between line items. Often the decisions about infrastructure and the patterns of utilization are strongly influenced by the unequal economic and political resources of different areas rather than their actual health needs. The result has been wide differences in per capita allocations at lower levels of the system that are not related to objective indicators of health need and even may be negatively associated with deprivation (e.g., rural areas often receive less per capita than urban areas). The system is also inefficient because allocation is based on the size of infrastructure capacity rather than level of activities of facilities (Ensor, Hossain et al. 2001).

Perhaps because the ease of calculating budget requests based on inputs, it remains a commonly used methods of resource allocation in low- and middle-income countries. Indeed, it has the advantage of being simple to operationalize in settings where data which inform the other formulae, such as local burden of disease or health utilization patterns, are scarce. Its disadvantages are many, including: perpetuation of supply-side distributional inequities across regions by favoring areas with the most/largest facilities and human resource posts; accentuating inefficiencies in supply of services, particularly since facilities and providers can generate their own demand; and failure to connect financing to health demand or needs (Rice and Smith 2001; Diderichsen 2004). Many less developed (including most Latin American countries) and even middle income countries (e.g. former Soviet systems in Central and Eastern Europe), have used this approach.

Historical budgeting may continue to drive resource allocation even when alternative methods are in use. In decentralized South Africa, for example, provinces are allocated block grants based on need as determined by a needs based "deprivation index". These block grants include funding for the health sector as well as other sectors. However, incremental/historical budgeting is still the norm in the health sector, , mostly due to a lack of knowledge at the provincial level to calculate a budget based on need and poor quality data. Due to these technical and data constraints, large inequalities across provinces in health financing still remain despite the use of needs-based formula more generally (Okorafor 2005).

Utilization

Utilization-based formulae add demand-side factors to allocation by budget request. Utilization-based allocation refers to any system which distributes funds retrospectively for services rendered. Because availability of services depends on their supply, the supply-side elements of budget request factor implicitly into utilization-based formulae. This is a common method of resource allocation to secondary and tertiary care facilities (even when alternative resource allocation mechanisms are used for other levels of service) where, given the range of services provided, it may be difficult to distribute resources sector wide on a fully prospective basis. Point-of-service financing such as fee-for-service is a commonly used utilization-based method. The primary advantage of utilization-based financing is that it accurately reflects existing health supply and demand. The primary disadvantages are that health supply and demand may not reflect health needs, and that, there may be few incentives for aggregate-level cost containment.

Though utilization-based financing methods are generally susceptible to cost escalation, there are tools available to improve equity and efficiency in health financing. One tool involves the method of payment itself for services rendered. Ministries have typically reimbursed hospitals (or other facilities) retrospectively based on costs incurred for each admissions (i.e., fee-for-service). Evidence shows that this system is the most prone to cost escalation among point-of-service methods. Conversely, prospective payment fixes prices and/or reimbursement amounts for a given class of admissions, with hospital reimbursement based on these schedules. The Medicare Prospective Payment System (PPS) in the United States is one of the most well-known of these systems, and evidence suggests that PPS and prospective payment systems more generally are much better able to contain costs than fee-for service (Culyer and Newhouse 2000). While prospective payment contains many advantages, it also requires a high degree of technical capacity to implement, including: criteria for determining admission categories (e.g., Diagnosis-Related Groups) for which similar levels of reimbursement are provided; and determining appropriate levels of reimbursement which contain costs yet do not provide incentives for providers/facilities to shirk on quality. These more complex tools are usually only implemented in middle and upper income countries with sufficient resources, regulatory capacity, and reliable information infrastructure.

Global budgeting is a second tool that can be used in conjunction with utilization-based financing to contain costs.[1] Global budgeting involves prospectively determining an amount over a fixed period (e.g., annually) within which operating expenses of must be contained. It serves as a cap on total spending and clearly defines the limit of available resources of the purchaser. While budgets are often set at the facility level (i.e., individual hospitals), there are also systems that apply separate global budgets to health sub-sectors, such as in Taiwan where hospitals, dental facilities, and outpatient clinics. each have sector wide global budgets which form the pool of available resources on an annual basis. Global budgets can be applied to all services provided within a facility or targeted towards specific services. Global budgeting generally work best when there is only one purchaser of services (Dredge 2004).

[1] While weighted capitation may also be considered a form of global budgeting, it is treated separately in the following section.

Many systems combine aspects of these tools related to utilization-based resource allocation to improve efficiency and equity of financing. Under global budgeting, for example, the payer(s) may decide to release only 75% of the requested budget to hospitals at the start of the year, with the rest contingent on its performance on a set of pre-decided indicators. Performance of a hospital maybe measured in relation to its peers, and this may also form a comparative basis for ascertaining whether the rest of the budget should be released or not. This provides for tighter regulation of performance and reach of the hospital. Some payers also decide to favorably weigh finances for clients of a certain group (ethnic, socioeconomic etc) to favor provision of care to neglected groups. Whether this was achieved or not can also be evaluated under this scheme of payment. This system is finding favor progressively in European countries, such as in Germany where it has been successfully implemented since 1995.

Weighted capitation

Weighted capitation refers to a wide range of formulae that are intended to allocate resources based on health needs and not necessarily existing supply and/or demand. While there are examples of non-weighted capitation (e.g., Spain (Diderichsen 2004)), almost all countries which use a capitation system distribute resources on a per capita basis with adjustments made to socio-demographic or -economic factors which are felt to influence health needs. Weighted capitation methodologies range widely in degree of sophistication and complexity. Simpler formulas use weights for characteristics that are not health-specific but may affect health needs and factors which might affect differences in expenditures, such as degree of rurality or poverty in a particular area which might increase both health problems and the costs of treating them. More complicated models include any number of factors with a more direct connection to health needs, such as local mortality rates, age structures, or socio-economic characteristics of individuals in a particular area. Factors used for weighting these different factors can be both area-wide and at the individual level, but the latter requires a greater degree of sophistication and availability of data.

The primary advantage of weighted capitation resides in its attempt to link resource allocation to health needs and costs in a transparent way. Cost containment incentives are also built into capitation because the providers receive a limited budget and must work within it. Disadvantages include the many challenges in operationalizing aspects related to weighting, including: extensive data collection/analysis; making strong assumptions about and quantifying relationships between socio-demographic/-economic characteristics and adjusting current utilization to quantified indicators of need..

There are several examples of countries using weighted capitation to allocate health sector resources. In the Latin America and Caribbean region, Colombia and Chile are among the countries that use weighted capitation to distribute resources to certain levels of their health systems. In Chile, financing for primary care services is allocated on a per capita basis to municipalities through the national health fund *FONASA* which is funded by a combination of general tax revenues and social insurance contributions. To determine the amount disbursed per person, the government calculates the cost of

providing services under its basic package of services, including the costs of labor, administration, and a percentage of pharmaceuticals. The base rate is adjusted with higher levels of payment made for rural and or poor municipalities (by around 20% in each case). Specifically, rural municipalities are those in which over 30% of residents are rural and capacity to generate own-source revenues. In addition, there is a Municipal Common Fund (MCF), an equalization mechanism, which uses levels of municipal rurality and poverty to redistribute locally generated tax revenue from better off municipalities to subsidize delivery of care compared to worse off municipalities. Providers are paid on a per capita basis according to the number of registered beneficiaries in municipal clinics (regardless of whether registered beneficiaries use services or not) under negotiated sums each month (Gideon 2001; Vargas and Wasem 2006).

Under a somewhat more complex method in Colombia, municipalities receive a portion of funding through the Social Investment Transfer or "municipal participation" funds (the percentage started at 15% in 1994 and increased gradually to a minimum of 22% by 2002. "Municipal participation" funds are distributed based on a formula that takes into consideration the following municipal characteristics: Unsatisfied Basic Needs Index, poverty level, municipal population, fiscal effort, administrative efficiency, and quality of life indicators. These transfers are exclusively for use in "social investment," with 25% explicitly earmarked to the health sector and an additional 20% to discretionary investment (Bossert, Chawla et al. 2000).

Weighted capitation can be used to improve equity in health spending and reorienting funding toward health activities. Based on data from 1996 in Chile, before the MCF transfer, the richest municipality had an almost 19 times higher level of own source revenue than the poorest municipality. After the transfer, the richest municipality only had double the amount of own-source revenues compared to the poorest. In terms of health spending, the ratio total public health expenditures per capita between the richest and poorest municipalities fell from 2.2 in 1991 to 1.6 in 1996 (Bossert, Larranaga et al. 2003).

III. Weighted Capitation: formula development and issues

There are two primary issues to be addressed in developing weighted capitation formulae: choice of weighting variables and determination of weights.[2]

Choice of weighting variables

No weighted capitation model can include every factor with connection to health needs, concerns for equity, or other factors that drive development of the model. As seen in Colombia and Chile, for example, the per capita allocation is adjusted for municipal income only (Chile) or poverty level, fiscal effort, administrative efficiency, and quality

[2] Determining an appropriate level of capitation is also important in addressing health needs. However, the level of capitation depends on the total resource envelope, with the latter usually based on political negotiations with financiers (e.g., the Ministry of Finance; donors). Determination of an appropriate level of capitation is therefore beyond the scope of this report.

of life indicators (Colombia). These adjustors only begin to look at the various kinds of diversity that might exist among different areas of the country. Other factors, such as type of ethnic population in that area, type of diseases seen, and demographic break up of target population can play an important role in the kind of budgets these lower levels of government might need to provide services adequately. Some of the most common models are discussed in turn, below.

Demographic models: these allocation models are based predominantly on age, sex and ethnicity. Expenditures are known to be higher for women and children, making age and sex important factors for consideration. Ethnicity may be considered by some governments, as some ethnic groups are less likely to seek care, and higher resource allocation for them would make caring for such groups lucrative for healthcare centers.

Socioeconomic models: socioeconomic status is considered a good predictor of health needs by some countries, though evidence for this is unclear. It is well known though, that lower socioeconomic groups have greater health problems, and higher morbidity and mortality. How this information could translate into policies and allocation formulae is yet to be seen. Besides income, factors like education, occupation and rural/urban status are considered important in making such decisions.

Epidemiological and health models: these models rely on morbidity and mortality data for resource allocation. Crude and standardized mortality has been used with varying success in the UK. It is considered a fair predictor for the morbidity of a population, and is also indicative of the high costs before death, that a health center might curtail. It has only limited utility though, in predicting healthcare access and utilization.

Certain diagnoses (morbidity) are considered fair predictors of the health status of the community, as well as of the costs entailed for the health center. Though this data might have great utility, ascertaining disease prevalence in each area (as such diseases might vary by geography, socioeconomic standards and access to preventive care), and weighting these diseases appropriately might be practically very difficult to achieve.

Table 2 lists commonly used variables in weighted capitation formulae.

Table 2. Commonly used weighted capitation variables

Demographic	Socioeconomic	Epidemiologic/health
Area-level variables		
▪ Proportion of dependents	▪ Area income/level of poverty ▪ Proportion of economically active persons employed	▪ Standardized Mortality Ratio ▪ Infant/under-5 Mortality Ratio
Individual-level variables		
▪ Age ▪ Sex ▪ Ethnicity ▪ Marital status	▪ Income/occupation ▪ Housing conditions	

Determination of weights

Once weighting variables are selected, there are many different ways to determine levels of each weight. The particular methodology will depend on the underlying motivation(s) for weighted capitation (e.g., purely focused on health needs vs. health needs and poverty reduction) as well as technical capacities. In many developing countries where data availability and quality are poor, non-statistical methods dominate, such as basing weights on negotiations with donors and/or health sector stakeholders. In higher-income settings, statistical estimation models (e.g., small-area regression analysis, principal components analysis) are often used to inform weights. Because motivations for weighted capitation formulae vary for each health system, there are many different existing models and permutations. Three such models are examined in greater detail, below: those of Tanzania, the United Kingdom and a model proposed for Nicaragua. The two former examples represent different ends of the spectrum in terms of health systems contexts, levels of development, health status and health needs. They therefore provide a sense of the range of possible weighted capitation formulae used in the health sector. The Nicaraguan example provides an instance of needs-based formula allocation in a context more similar to that of Guatemala.

The Tanzanian weighted capitation formula seeks to improve equity in health sector resource allocation and contribute to poverty alleviation and development. A portion of health sector financing for local-level Councils comes from a "Basket Fund" which, until recently, used population size as the sole criteria for distribution of resources. Health sector stakeholders, however, have identified several factors considered to be important to achieving this goal, including: population structure, burden of disease, poverty level, local costs in delivery of services, number of health facilities, patient workload, geographical features, and infrastructure. Because of daunting data requirements, the pilot formula currently in place uses only four variables to consider some of these factors: population size (70%), poverty index (10%), vehicle route mileage (10%), and under-five mortality rate (10%).

Mathematically, the formula can be expressed as:

$$0.7\left(\frac{\text{Council Population}}{\text{Tanzania Population}}\right)+0.1(\text{Council poverty rate}*\text{Council Population})$$

$$+0.1\left(\frac{\text{Council Mileage}}{\text{Tanzania Mileage}}\right)+0.1\left(\frac{\text{Council U5MR}}{\text{Tanzania U5MR}}\right)$$

While the population index and mileage covered for delivery of health services are relatively easily obtained (from censuses and maps, respectively), the poverty index and under-five mortality rate are more difficult to calculate. The Council poverty rate is actually a regional poverty rate since council-level poverty rates are not available and it is estimated by using the regional poverty rate. Under-five mortality is calculated from the latest Demographic and Health Survey as that data is similarly unavailable at the Council level (Mujinja, Kataika et al. 2006).

Weighted capitation in the United Kingdom began in the mid-1970s under recommendations made by the Resource Allocation Working Party (RAWP). Turning

away from a largely historical budgeting system (leading to strong biases towards large urban centers), RAWP introduced weighted capitation based on population size, with adjustments made for demographic and epidemiologic/health characteristics as well as variation in input prices of local services.

Mathematically, the RAWP formula can be expressed as:

$$\sum_j SMR_{ij}\left(\sum_k Beds_{jk} Pop_{jk}\right)$$

Where the total allocation to area *i* is equal to the standardized mortality ratio (*SMR*) for condition *j* in area *i*, multiplied by the number of bed days (*Beds*) required by age/sex group *k* for condition *j* and by the population (*Pop*) in area *i* by age/sex group *k* for condition *j*.

However, due to methodological controversies surrounding RAWP, it has now been superceded by even more complex (and data-intensive) empirical formulae based on involved econometric analysis of small-area data (Smith 2008). As an example, indexes developed for 2001 incorporated three factors — age, "additional need", and variations in input costs — with indexes developed separately for different conditions (e.g., acute somatic care, psychiatric care, community care, general practice, and prescription drugs). The age factor, based on individual data, calculates average costs separately for eight age strata. The additional need factor is based on small-area analysis in which weights are set to regression coefficients of costs on "need factors", such as age-standardized SMR and the proportion of pension-age individuals living alone. An index is created as the product of each need factor raised to the power of the regression coefficient. Finally, variation in input costs is based on both staff costs (90%) and land/building prices (10%) (Diderichsen 2004).

In Nicaragua, HSPH researchers conducting a study on decentralization found a 5-fold difference in current per capita allocations among the 17 districts (SILAIS) (Bossert 2001). HSPH recommended that Nicaragua implement a "needs-based" capitation formula based on a household survey characterized by random selection. As noted above a needs-based formula often is not possible in countries where health burden data are not available or are often not reliable. Nicaragua was a special case because a Demographic and Health Survey (DHS-ENDESA) had recently been carried out in 2001 and had data on health care needs for the population. Another study (Bitran) conducted in 1999 provided information on the costs of these health care needs. The DHS provided data on the following health care needs of the population: diarrhea, IRA, vaccinations, papanicolau exams, antenatal visits, and general health care visits. The Bitran study identified costs for each of these health care needs for three regions within Nicaragua (Central, Atlantic, Pacific). With the DHS data and the costing data HSPH was able to estimate the total budget needed by Nicaragua to attend to the most necessary health care needs of its population. The size of this health care budget for each SILAIS then became the weighting factor used to allocate the actual amount of funding available in Nicaragua. Even though Nicaragua has an excellent system of reporting routine data, it was decided

not to use these figures to avoid incentives to increase reporting of certain illnesses in order to receive a larger budget allocation.

The needs-based formula uses the percent of illnesses treated in public facilities, not treated at all, or treated by "others" estimated through the DHS 2001 to calculate an estimated cost for the illness countrywide. The estimated cost for each illness is calculated according to the following formula:

Cost for Illness = (% treated for illness[3]) x (population size) x (cost to treat illness)

Costs for each illness were then combined to produce the total costs per SILAIS. In order to adjust the total estimated costs to the budget available the weight for each SILAIS was calculated by dividing the combined costs for each SILAIS by the total estimated health care budget. This weighting score was then multiplied by the actual available health care budget to arrive at the amount available to allocate to that SILAIS.

Issues and Controversies

Methodological Considerations

Development of weighted capitation models can require extensive technical capacities, and any new method considered for such allocation should consider its appropriateness in terms of statistical performance, administrative feasibility, simplicity and robustness to manipulation. Capitation models arbitrarily parameterize "needs" for adjustments to per capita funding, as in the cases of the Tanzanian and English models described, above. These *ad hoc* methods may or may not accurately characterize relationships between needs and resource allocation. If a locality has a 10% higher standardized mortality ratio than the national average, for example, should that region be provided more than, less than or exactly 10% greater resources (implying a greater than proportional relationship (e.g., quadratic; exponential), less than proportional relationship (e.g., fractional exponential) or exactly proportional relationship, respectively)? Indeed, research suggests that varying assumptions about functional form of needs and health can have significant impacts on levels of adjustment made to capitation models (Bedard and Dorland 2000).

Further, as the main purpose behind employing these models is to ensure the basic caveats of healthcare provision, i.e. equity and efficiency, the primary goal to ascertain the best variables for a potential allocation formula should be a robust needs assessment. In the UK, a method of paying general practitioners (GPs) more for 'deprived' areas exists. By this rule, those GPs who service areas where the need is greater than the supply, get a higher adjusted budget allotment than others. Though this method starts to address the issue of equity, such needs assessments lack justification and evidence (as of 2000) and have shown little success in terms of increased equity for these areas.

[3] Percent treated in public facilities, not treated at all, or treated by "other" method from DHS 2001

Finally, administrative data can be employed in assessing need, and supply of medical services, and help project future demands. Bed allocation rates, total patient turnover rates etc are usually used in countries that have a nationalized system for healthcare (UK, South Africa). These are factored into the formula along with other mortality rates to arrive at the budget to be allocated.

Phasing-in of formulas and Gaining Political Support

Changes in allocation formulae produce "winners" and "losers" and are therefore inherently difficult both for technical and political reasons. South Africa, for instance, attempted to significantly redistribute resources within a five-year period (doubling the share of some provinces while reducing by 20% to 25% the share of other provinces). This proved untenable, with "losers" receiving extra short-term support and "winners" unable to absorb the additional financing (Pearson 2002). In many countries the process has involved both the inclusion of major stakeholders and the incremental phasing in of proposed changes. Usually some technical work needs to be done to develop an understanding of the problems and the options and to gain consensus on the methodology and criteria that might be used to change current allocations. It is advisable to gain this consensus before the criteria are applied to avoid identifying who will win and who will lose at the outset. Once there is agreement on the methods and criteria, then a technical team should produce an analysis of the changes that would be applied to each district or municipality. This analysis should show a "target" toward which the allocations should work over a period of 5-15 years so that the "losers" will adjust their expenditures by a limited percent reduction each year and the "winners" can program increases accordingly and not waste additional resources. If this is too politically sensitive, the phasing in of the formula could be done only with any allocation budgetary increases assigned only (or mainly) to the "winners" in the formula analysis. It should be noted that it took UK 15 years to phase in its formula by allocating *growth* in health budgets to underserved areas rather than reducing absolute levels of budgets to any particular areas (Pearson 2002; Smith 2008). Political changes prevented the implementation of the HSPH formula in Nicaragua (Bossert).

IV. Current Methods for Health Resource Allocation in Guatemala

The Ministry of Health (MOH) currently uses a mix of methods to allocate resources to health areas. The current mix is heavily oriented toward an input-based budget request model that is based to a large degree on historical levels of financing for each department. As illustrated in Table 3, health areas request their budgets based mostly on expected needs of personnel, supplies, equipment and other inputs to deliver a bundle of outputs (i.e., primary and secondary services of health care). Budget requests are, for the most part, based on incremental additions to the previous year's budget or historical supply-side needs, although precise calculations for different budget headings are calculated using various methods. An exception concerns the Coverage Extension Program. This component of the MOH budget is allocated on a per capita basis that is, in principle, derived from calculations of health needs in a typical 10,000 inhabitants' jurisdiction (estimates take into account the demographic profile of rural communities and the most

prevalent health problems for different age groups, notably women in reproductive age and children below 5 years of age). However, the resource envelope for this program is such a small part of the total budget that, for the case of contracted services, estimates are likely based on historical levels of financing. Once the various line items of the MOH budget are consolidated, the total amount calculated is usually above the ceiling granted to MOH by the Ministry of Public Finance (MPF). Health area ceilings, based on the previous year's levels (i.e., historical budget), are subsequently set.

Table 3. Methods of determining health area allocation of resources

Line Item	Primary determinant(s) of resource allocation	Notes
Salaries and Wages	▪ Approved staffing levels	▪ Little fluctuation from year-to-year ▪ Consumes between 40% (2004) and 60% (2008) of health area budgets
Contracted services	▪ Historical patterns of consumption ▪ Per capita (Coverage Extension Program, since 2008)	▪ Includes wide variety of services (e.g., maintenance, training, medical services) ▪ Consumes between 5% (2004-2007) and 20% (2008) of health area budgets ▪ Since 2008, includes financing for Coverage Extension Program
Materials and supplies	▪ Input costing exercise for providing interventions for 18 priority programs	▪ Consumes around 20% (2008) of health area budgets
Physical plant	▪ Historical patterns of consumption ▪ Investment plans	▪ Consumes between 1% to 6% of health area budgets
Current transfers	▪ Historical patterns of consumption ▪ Availability of co-financing from donors	▪ Finances several operations of MOH (e.g., contributions to international/regional institutions; funding for specialized health workers)

Source: Authors' summaries based on SIAF reports of budget allocation.

This regional-level allocation methodology suggests that health needs do not serve as a primary basis for resource allocation. Indeed, budgeting by line item as described in Table 3 makes it more likely for health areas and the MOH as a whole to turn programmatic budgeting exercises — which, in theory, take health needs into account — into budget requests that take as the starting point the previous year's supply-side allocation. Thus whether by intention or not, resources allocated to departments appear to be related primarily to population size and not based on any quantified indicators of health needs, such as incidence of poverty or burden of disease. It is likely that at an earlier period allocations were made based on population size and over time these budgets have become historical and not changed according to other indicators of need. While Table 4 indicates a relatively consistent association between regional population size and share of the MOH budget[4], there are some favored regions (Metropolitan) and unfavored regions (Southwestern) in terms of budget/population ratios and there does not appear to be a connection with readily available indicators of health need, such as poverty levels or share of population who lack coverage of services provided by the Guatemalan Institute of Social Security (IGSS).

[4] Statistical analysis indicates a significantly positive correlation of 0.86 ($p < 0.01$).

Table 4. Guatemala (2006) regions' share of health budget compared to share of total population, poverty and population not entitled to IGSS services.

Region	Share of MOH budget	Share of population	Share of people living in poverty	Share of people not covered by IGSS
Metropolitan	34%	23%	7%	15%
Southwestern	18%	24%	28%	27%
Northwestern	11%	14%	20%	16%
Central	9%	11%	10%	10%
Northeast	8%	8%	9%	9%
Southeast	8%	8%	9%	9%
North	7%	9%	13%	10%
Peten	4%	3%	4%	4%

Source: Authors' calculations based on UNDP National Development Report 2008.

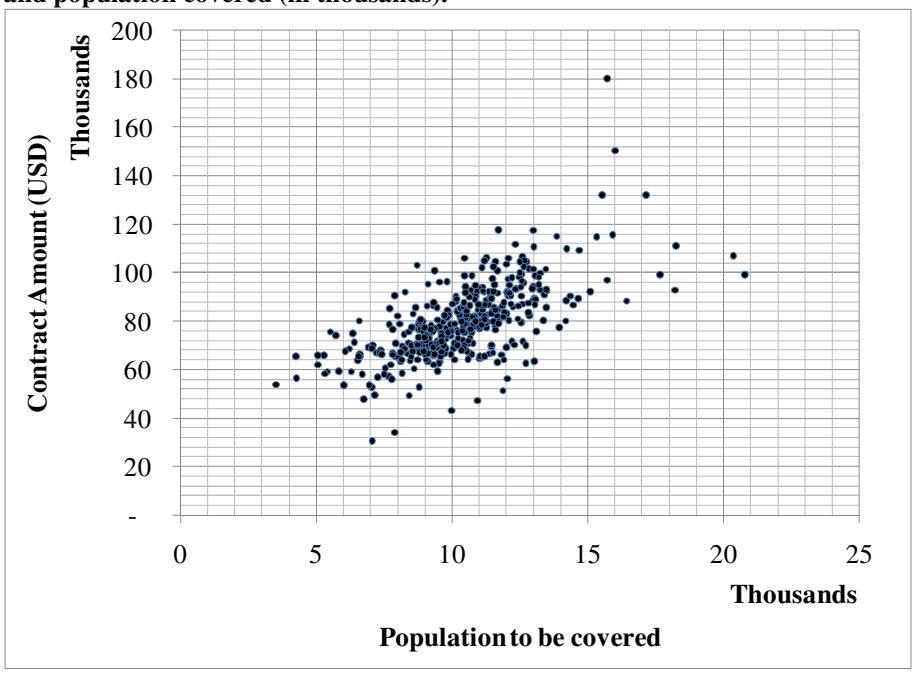
This population-based distribution also does not take into account an indicator of health need that is particularly relevant to the context of Guatemala: the health status of the indigenous population. According to the Pan-American Health Organization (PAHO), indigenous people, who make up 41% of the population of Guatemala, experience worse health status than the non-indigenous populations, including higher rates of infant, child and maternal mortality rates (as a result of more precarious economic circumstances), higher fertility rates (i.e., two or three children more than non-indigenous mothers) and relatively limited access to health care.[5] In addition, the Living Conditions Survey (ENCOVI 2006) has shown persistent gaps in access to health care for rural, indigenous and poor people: 52% of respondents in urban areas visited a physician due to an episode of illness episode compared to 25% in rural areas; 44% of non-indigenous did so compared to 24% of indigenous people; and 58% in the highest income quintile did so compared to only 13% in the lowest income quintile.[6]

Guatemala has also experimented with several different allocation methods, such as the Coverage Extension Program and the Constitutional Transfers to Municipalities, indicating that there is experience in using alternatives to the historical budgeting model used by the Ministry of Health for allocation to the health areas. In 1997, the Coverage Extension Program was introduced as a mechanism to transfer public funds to the local level by calculating the per capita cost of a package of primary health services, and contracting NGOs as providers. The amount of resources provided to each department depended on the number of jurisdictions to be covered, where jurisdictions were defined as a cluster of communities with at least 10,000 inhabitants. In 2008, The Coverage Extension Program granted 487 contracts to 93 NGOs to cover underserved communities, for a total of 4.6 million inhabitants in 4,163 rural care centers. The total value of these contracts granted cam e to QTZ 229.2 million, or about 6% of the MOH's budget.

[5] PAHO, Health in the Americas 2007, Vol II Countries: Guatemala, pp 384

[6] Flores, W (2008) Asi…Funcionamos?? El Sistema de Salud en Guatemala, No. 4. Cuadro 25, pp93. Programa de Naciones Unidas para el Desarrollo, 2008.

Figure 1. Guatemala, 2007. Coverage Extension Program: contracts by total amount (thousand USD) and population covered (in thousands).



Source: Authors' calculations based on MSPAS / CEP Records for 2007.

The model used of resource allocation is a simplified capitation model that estimates the per capita costs a limited primary health care package of interventions that should be available to every person in the catchment area of the NGO. This can be seen in Figure 1 in which there is a relatively tight relationship between local-level population size and contract amount[7]. Notably, however, this model does not attempt to assess variations in health need that might come from income, ethnicity or demographic differences from one area to another.

A second alternative model to the MOH historical budgeting is embodied in the Constitutional Transfers to Municipalities which distributes public funds to municipalities, allowing local governments to select their allocations to different sectors according to their own priorities. This approach is to some extent inspired by what has been called "empowered participatory governance" or even "accountable autonomy".[8] In terms of specifics, the allocation formula is targeted to the 333 autonomous municipalities which by constitutional mandate receive 10% out of the General Revenue's State Budget. At least 90% of these transfers must be used in programs and projects of education, health, infrastructure and other activities aiming to improve the citizens' living conditions. These intergovernmental transfers, by law must be distributed according to the following formula: a) 25% in equal amount for each municipality; b)

[7] It should be noted that there is some health area variation in per capita allocations. This results primarily from adjustments made since 2006 to the capita-based formula in which municipalities are grouped into four priority categories (with priority based on such factors as localization, accessibility, and unsatisfied basic human needs indexes); these groups are assigned different multipliers to the based per capita level.
[8] FUNG, Archon: Creating Deliberative Publics: Governance After Devolution and Democratic Centralism. In: The Good Society, Vol 11, No. 1, 2002, pp 66-71

25% proportional to the municipality's total population; c) 25% proportional to the municipality's per capita current revenues; d) 15% in direct proportion to the number of villages and hamlets; and e) 10% in inverse proportion to the municipality's per capita current revenues. These distribution weights result in 50% favoring bigger municipalities (in terms of population and current revenues) and 50% favoring smaller, rural municipalities with fiscal limitations.

The applicability of this model to the health sector is limited in two ways. First, while the model has been applied for almost two decades by the central government to make transfers to municipalities, it has not been applied specifically to Guatemala's health sector. Second, this model is designed primarily as a means of re-allocating central resources to compensate for the lack of local capacity to generate resources from local sources, and attempts to favor those municipalities that have less capacity to collect revenues. It is therefore not designed to address any specific needs based on differences in quantifiable indicators related to social sectors, such as health or education. However, if there are significant differences in the municipal allocations to health, it might be useful in the future to take these allocations into account in the formula process in a way that does not create incentives to reduce municipal allocations.

V. Developing a needs-based formula for Guatemala

The following section explores one possible option for revising current resource allocation and moving towards a more consistent formula-based method. There are many other options or variations that the Ministry of Health may consider, but the option described below provides insights into how to operationalize determination of a new resource allocation method based on application of the principles of needs-based international models described in the first part of this paper. We suggest a model which uses a framework similar to that of the constitutional transfers to municipalities with weighting criteria that allocates financing based on departmental population size, demographics, socio-economic profile and geographic size. Specifically, we propose distributing 60% of the MOH budget to departments on a per capita basis, with the remaining 40% incorporating adjustments related to health needs (Table 5). It should be noted that the weight of each adjustment variable chosen here is arbitrary and the weighting scheme is intended as an example for stimulating further discussion. Since a needs-based weighting scheme is ultimately a policy decision, there is no "right" formula. Experience from other countries nonetheless suggests that a real-world application of an allocation formula requires transparency, detailed justification for the choice of variable weighting (and variables themselves), and a consensus-building process to gain acceptability.

Table 5. Adjusting variables for a resource allocation scenario based in objective criteria

Adjustment Variable	Construction	Weight
Equal per capita for all people not covered by IGSS*	▪ Population not covered by IGSS for the department as percentage total population not covered by IGSS in the country.	60%
Share of population in 0-6 and 65+ segments*	▪ Population in the age segments for the department as percentage of population in the segments for the country	16%

Adjustment Variable	Construction	Weight
Share of poor population*	▪ Population living in poverty at the department as percentage of total population living in poverty at the country	10%
Share of households headed by indigenous people*	▪ Households headed by indigenous people at the department as percentage of households headed by indigenous people in the country	10%
Share of territory occupied by the department**	▪ Area occupied by the department in squared kilometers as percentage of the country's total area.	4%

* Statistical Annex National Human Development Report (based on ENCOVI 2006)
** National Geographic Institute (IGN) Geographic Dictionary
Source: authors

Variable 1: Equal per capita level

For the portion of the model that allocates financing on a per capita basis, the first decision is to define the population that should be included in the resource allocation formula. Since the Ministry of Health should allocate its funding to the population it is intended to serve, the population that is currently covered by another public insurance entity, the IGSS, should be excluded from calculations. Using this smaller estimated population for each department, the first step in the allocation formula would be to allocate the same per capita level to all departments. Specifically, the total budget ceiling of MOH for 2009 is USD 480 million, with 53% assigned to health areas and hospitals (USD 255 million). The population not covered by IGSS currently totals 10.7 million persons, resulting in an average per capita allocation of USD 23.85. A weight of 60% is chosen for the equal per capita portion of the model.

Variable 2: Demographic structure adjustment

A demographic structure adjustment is motivated by the differing health needs faced by people at different stages of life. While there are many demographic adjustments that could be made to address health needs of specific segments of the population, it is well-documented and almost universally accepted that needs for health care are higher in childhood and among the elderly.[9] This first adjustment therefore adds resources for departments in which comparatively more children and elderly people reside and which can be expected to have comparatively greater health needs and/or higher demand for health care services. Operationally, available data make it possible to make this adjustment based on the population of children under 7 (i.e., pre-school years) and of adults over 65 years of age (i.e., retirement age). The relative weight of this adjustment is chosen to be only 16%, allowing departments significant scope in using equal per capita funds to target other age groups that may be particularly important segments of their respective populations (e.g., adolescents and young adults who may require particularly expensive health services, such as treating injuries due to violence or addressing reproductive health needs).

[9] BAEZA, C y Packard TC (2006) Beyond Survival: Protecting Households from Health Shocks in Latin America. The World Bank; Stanford University Press. Pag. 20 – 22.

Variables 3 and 4: Socio-economic profile adjustment

Those in worse socio-economic circumstances can be expected to have greater health needs than the better-off, even if current demand among the worse-off is not reflected in current utilization rates due to such factors as accessibility barriers. Making an adjustment to favor departments with relatively disadvantaged socio-economic profiles is intended to reduce existing barriers to utilization (e.g., fees and travel costs, both of which may discourage use by those socio-economically disadvantaged) and increase the availability and quality of public health services. Further, favoring departments with disadvantaged socio-economic profiles is consistent with targeting public subsidies at Guatemala's most vulnerable populations. Operationally, this adjustment is based on two indicators: the proportion of the population under the poverty line and the share of households headed by indigenous people. The relative weight of this adjustment is 20% (10% adjustment for poverty and 10% adjustment for the indigenous population).

Variable 5: Geographic size adjustment

Departments whose populations are more dispersed are likely to face greater difficulties in making services accessible to their catchment populations compared to departments with higher population density. On the demand side, for example, patients likely face higher transportation costs when seeking services. On the supply side, departments may have to invest comparatively more in infrastructure, such as creating information networks to assist emergencies at community level. Further, given that more rural departments (i.e., those with a higher degree of population dispersion) also tend to contain a high proportion of indigenous population, rural departments also face a set of provision-related issues not faced by more urban departments, such as contracting bilingual providers. This adjustment is therefore intended to enable departments to provide services to rural populations that are comparable to more urban departments. The relative weight of this adjustment is 4%.

Simulated effects of implementing the proposed resource allocation formula

The following resource allocation scenario is based on an average allocation of USD 23.85 per capita. The average USD 23.85 per capita is based on the Guatemalan population not covered by IGSS, while individual departmental allocations deviate from this per capita average according to the four adjustment variables described above. Table 6 presents the departmental-level weights that would guide the proposed health needs-based allocation formula.

Table 6. Actual values of the Adjusting Variables for Resource Allocation

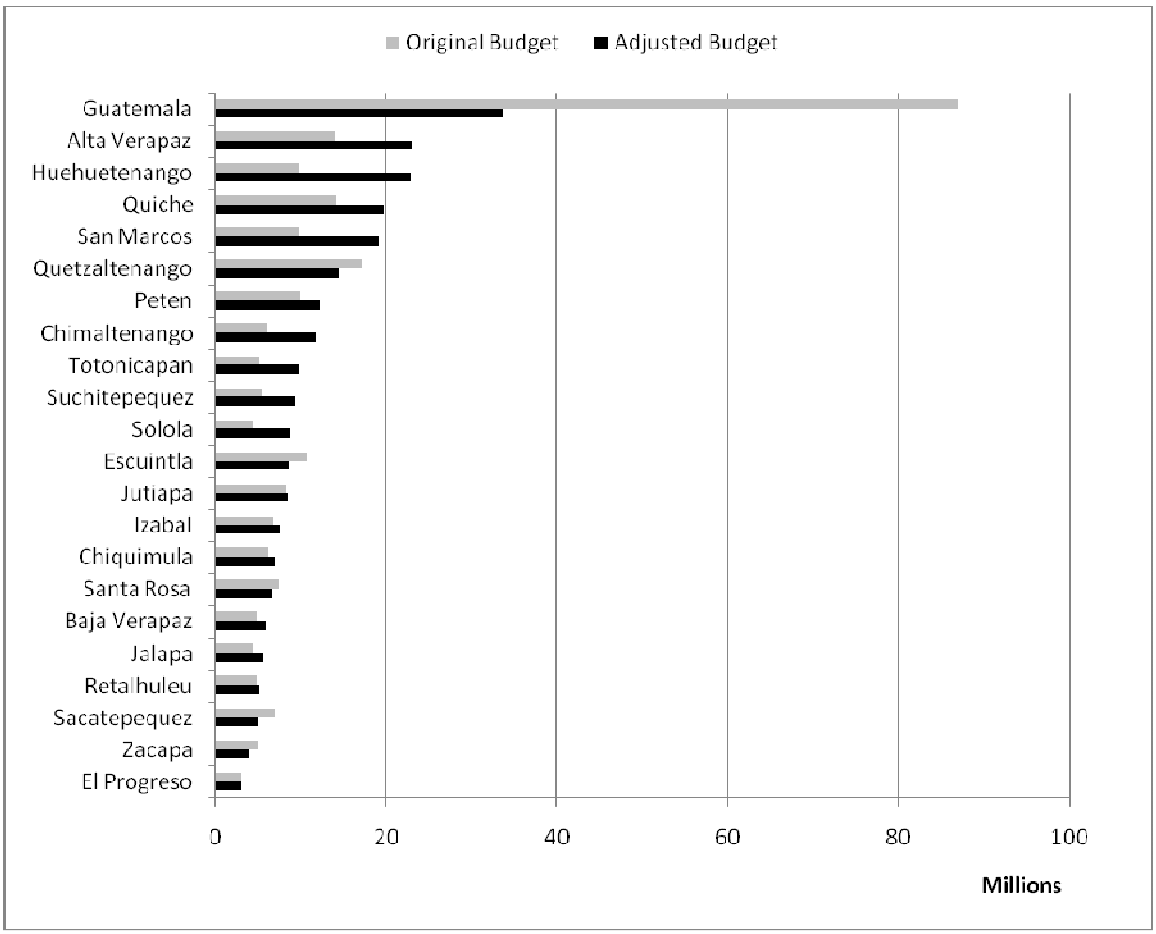
Department	Population Share	Share of pop. 0-6 and 65+	Share of poor pop.	Share of indigenous -headed households	Share of IGSS covered	Share of area (km2)
Guatemala	22.9%	19.5%	7.3%	7.1%	61.4%	2.0%
El Progreso	1.2%	1.2%	1.0%	0.0%	0.3%	1.8%
Sacatepequez	2.1%	2.0%	1.5%	1.7%	2.3%	0.4%

Department	Population Share	Share of pop. 0-6 and 65+	Share of poor pop.	Share of indigenous -headed households	Share of IGSS covered	Share of area (km2)
Chimaltenango	4.0%	4.1%	4.7%	7.6%	1.5%	1.8%
Escuintla	4.7%	4.6%	3.8%	0.8%	10.3%	4.0%
Santa Rosa	2.6%	2.6%	2.9%	0.1%	0.6%	2.7%
Solola	2.8%	2.8%	4.1%	6.8%	0.7%	1.0%
Totonicapan	3.0%	3.1%	4.3%	7.7%	0.4%	1.0%
Quetzaltenango	5.7%	5.6%	4.9%	6.7%	3.7%	1.8%
Suchitepequez	3.6%	3.6%	3.8%	4.0%	2.7%	2.3%
Retalhuleu	2.1%	2.1%	2.1%	1.4%	1.9%	1.7%
San Marcos	7.0%	7.2%	8.9%	6.5%	2.6%	3.5%
Huehuetenango	7.6%	8.0%	10.6%	11.4%	1.5%	6.8%
Quiche	5.9%	6.5%	9.4%	13.8%	0.9%	7.7%
Baja Verapaz	1.9%	2.0%	2.6%	3.1%	0.6%	2.9%
Alta Verapaz	7.0%	8.1%	10.9%	15.5%	1.7%	8.0%
Peten	3.4%	3.7%	3.8%	2.0%	0.6%	32.9%
Izabal	2.8%	3.0%	2.8%	1.7%	2.5%	8.3%
Zacapa	1.7%	1.7%	1.8%	0.0%	1.5%	2.5%
Chiquimula	2.6%	2.9%	3.1%	0.9%	0.9%	2.2%
Jalapa	2.2%	2.5%	2.6%	0.1%	0.5%	1.9%
Jutiapa	3.3%	3.2%	3.0%	1.1%	0.8%	3.0%

Source: Authors' elaboration based on Statistical Annex of the National Human Development Report 2008 and Geographic Dictionary of the National Geographic Institute.

Based on the relative percentages of each weighting variable in Table 6, the results of the new allocation are presented graphically in Figure 2 and in tabular format in Table 8 of the Annex. Guatemala still has the largest share of resources, as 23% of the population resides there, but its share is diminished relative to other departments due to the formula's exclusion of those already covered by the IGSS. Further, several departments that currently receive the lowest per capita shares of resources, such as Alta Verapaz, Huehuetenango, Quiché and San Marcos, move up to the top of the list. Given the socio-economic conditions of those provinces (e.g., large populations, deficit of social infrastructure, and extreme poverty), this proposed revision to the current resource allocation does much to address health needs-focused objectives.

Figure 2. Resource allocation by capitation, weighted on demographic, socioeconomic, ethno-linguistic and spatial criteria



Source: Authors' calculations.

Absorptive capacity considerations

The capacity of net beneficiary and losing departments to effectively put to adapt to higher and lower levels of financing, respectively, is necessary for a revised allocation of resources to meet intended health goals. Appropriate phasing-in of a needs-based formula will address both sets of issues, particularly in terms of the capacity of winning departments to absorb higher funding levels. Removing some portion of hospital financing from the needs-based formula could address capacity issues of the biggest losing department (Guatemala City) to shed costs. Each of these issues is addressed, in turn.

Phasing-in of a needs-based allocation formula for Guatemala

As suggested in Section III (Issues and Controversies), any new resource allocation formula would require departments to adjust to and accept new funding levels. One set of issues that might affect their ability to do so revolves around absorptive capacity of both winners and losers under re-allocation. Experience from other countries (e.g., South Africa) suggests that absorptive capacity constraints will require an incremental approach to re-allocating levels of financing across departments. Previously under-resourced departments may not have the necessary infrastructure or personnel, for example, to

rapidly scale up services resulting from increased financing. And over-resourced departments will likely have personnel costs that are relatively fixed in the short-term. A second set of issues revolves around political resistance from departments that are "losers" under a new allocation formula. Given that these departments tend to be the most urbanized and enjoy political sway (e.g., Guatemala), there is likely to be opposition to allocating resources away from them.

To what extent might absorptive capacity limit re-allocation among health areas from the current distribution of resources to that proposed by the formula? Recent budgetary trends provide insight into current absorptive capacity of funding fluctuations. According to MOH data from 2004 to 2008, the overall MOH budget has increased in real terms by 9% per year, on average.[10] This suggests that the minimum absorptive capacity for the Ministry as a whole is 9%. Further, increases of funding for individual departments is greater than the overall average of 9%: during this time period, annual budgets of 15 departments grew by an average of 10% or more (in real terms), and 6 had annual increases averaging over 15% (in real terms). From a budget allocation standpoint, departments have been able to absorb year-to-year changes of even larger magnitudes. For example, two particularly departments that are particularly big "winners" under the needs-based formula (Huehuetenango and Alta Verapaz) absorbed one-year real increases of 34% and 27%, respectively. Other departments have absorbed upwards of 70% increases (e.g., Totonicapan). Recent budgetary data also suggests that health areas have been able to actually spend year-to-year increases in budget allocations. From 2004 to 2008, health areas spent, on average, significantly more than originally approved budgets.[11] These data reinforce the conclusion that health areas have been able to manage substantial increases in funds.

While it does not appear that absorptive capacity is a primary constraint to transitioning to the proposed formula, a phased-in approach is still recommended. There are two main ways to operationalize a phased-in approach. A first option would be to maintain (i.e., not reduce) the current budget levels in over-resourced departments, while distributing future increases in the overall MOH budget to under-resourced departments; this is the approach that the United Kingdom took in phasing in its RAWP formula. A second option would be to actively decrease the level of budgets of over-resourced departments and distribute those funds (as well as any additional financing due to yearly increases in MOH funding) to under-resourced departments; this characterizes South Africa's approach. The advantages of the first approach are two-fold. First, by not actively reducing funding levels of over-resourced departments, it might temper political resistance to re-allocating resources. Second, it extends the timeline of phasing in the new resource allocation, giving departments time to absorb the implications of either increased or maintained budgets over time. The advantages of the second approach are that it does not rely exclusively on future MOH budget increases to implement the

[10] Over this period, the budget increased nominally from 476,534,527 to 835256182 Quetzales (or 115% per year, on average). At an annual inflation of 6% (WDI), the real average annual increase is 9%.

[11] Modifications to approved budgets during those years were necessary for several reasons, including disasters, climatic events, epidemics, vaccination campaigns, and difficulties with the pharmaceutical open contract purchasing mechanism requiring health areas to purchase drugs at higher prices than anticipated.

transition, and it shortens the timeframe of transition (which may be desirable of departments have relatively high absorptive capacity). In short, the advantages of each respective option are essentially the disadvantages of the other. The choice of policy option therefore revolves around which constraint(s) (political, absorptive, future MOH funding) are most pressing.

To understand how long it might take to transition from the current allocation of resources to that proposed by the formula under different approaches, Table 7 compares the relative time necessary to reach the formula's targets under varying scenarios.[12] A more detailed presentation of one of the scenarios is provided in Table 9 and Table 10 of the Annex). If the first approach were followed — relying solely on allocation of MOH budgetary growth to under-resourced departments while maintaining current financing levels of over-resourced departments — it would require 11 years to reach the formula's targets if the MOH budget grew (in real terms) by 10% per year. On average, the greatest annual increase that any individual under-resourced department would have to absorb over the life of the transition would be 19%. If the second approach were followed — relying on both allocation of MOH budgetary growth to under-resourced departments and actively reducing financing levels of over-resourced departments — and assuming the MOH budget grew by 10% per year, the amount of time would be reduced by one-half if over-resourced departmental budgets were reduced by 10% per year, and by 3 years if annual reductions to over-resourced departmental budgets were capped at 5% per year. Compared to the first approach, absorptive capacity requirements for under-resourced departments would be larger: on average over the life of the transition, the maximum annual increase for any given department would range from 24% (if over-resourced departments experienced 5% reductions) to 29% (if over-resourced departments experienced 10% reductions). The second approach also makes it possible to transition to the formula's proposed allocation even if the MOH budget experiences no future changes, from 10 to 20 years if over-resourced departmental budgets reduced by 10% and 5%, respectively (maximum absorptive capacity requirements under these scenarios would be +/- 10% and 5%, respectively).

Table 7. Years required to transition from current to needs-based allocation

Scenario		**Annual real % change in budgets for over-resourced departments**		
		0%	**-5%**	**-10%**
Annual real % change in MOH budget	**0%**	Not possible	19 years	10 years
	+10%	11 years	8 years	5 years

Source: Author's calculations.

Hospital level of care and a needs-based formula

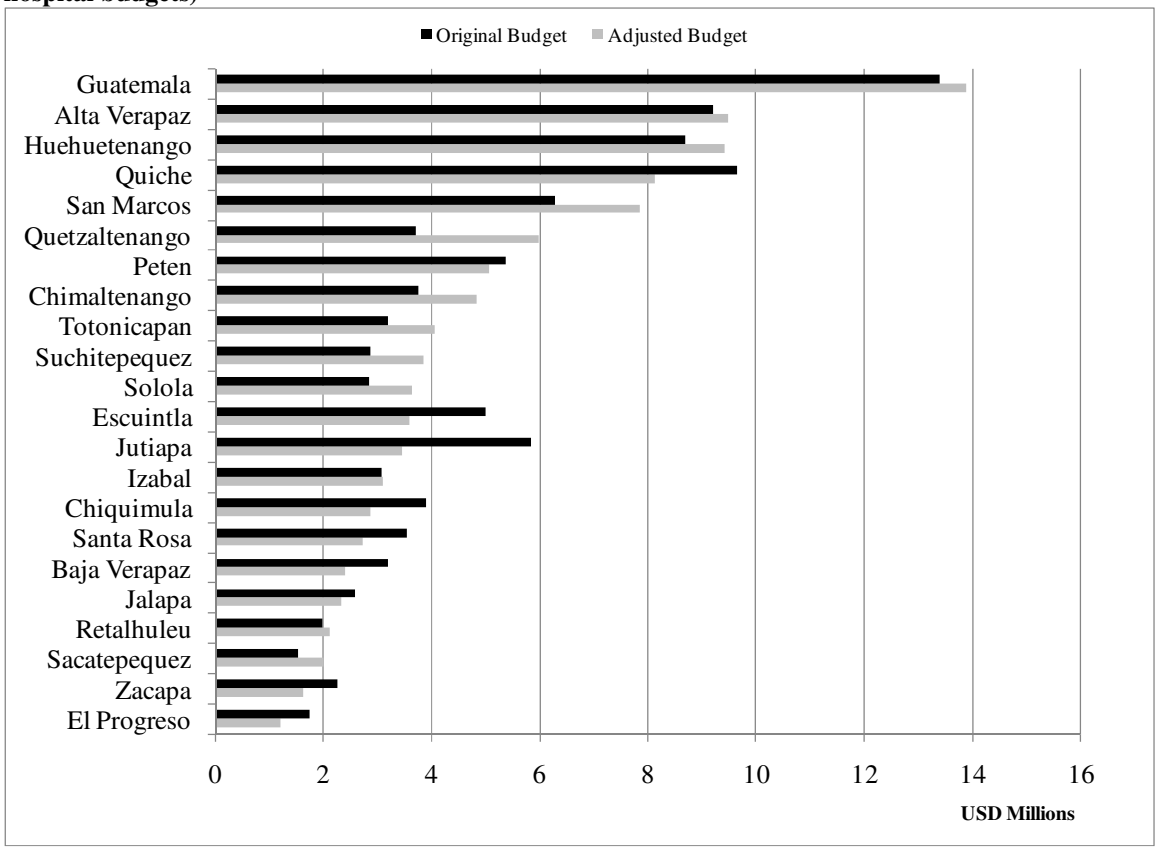
Whatever the pace of phasing-in a needs-based formula, the potential reduction in financing for Guatemala's largest department – Guatemala City – poses significant challenges to reforming the current allocation of resources. Home to more and larger hospitals than in any other area of the country, it's disproportionate share of resources is

[12] All scenarios assume that the relative needs-based shares of departmental allocations will remain static over the time period needed to make this transition and predictability in the total MOH resource envelope (i.e., either steady increases or no change).

in some ways understandable: not only are hospital costs significantly larger on a per capita basis than primary or even secondary care costs, but it draws patients from all regions of the country. Including all such costs in a per capita adjusted formula therefore poses a real risk to under-financing such hospitals. Additionally, the concentration of specialized hospitals and services likely would garner significant political resistance to resource allocation reform which reduces Guatemala's City's share of the budget.

As an alternative to the formula as proposed above, the MOH could consider limiting the capita-based formula to health area financing that excludes all or some costs associated with the hospital level of care. At the extreme, as illustrated in **Error! Reference source not found.**, if the formula were to exclude all hospitals, the number of "loser" departments would increase greatly, some former losers become winners, and, perhaps most importantly, pre-existing imbalances remain largely in place. While this option does the most to address concerns about absorptive capacity for both winners and losers, policymakers would have to decide if the (marginal) improvements in allocation among departments merit the costs (financial, technical and political) in doing so.

Figure 3. Guatemala, 2007. Original and Adjusted Budget of the Health Areas (excluding all current hospital budgets)

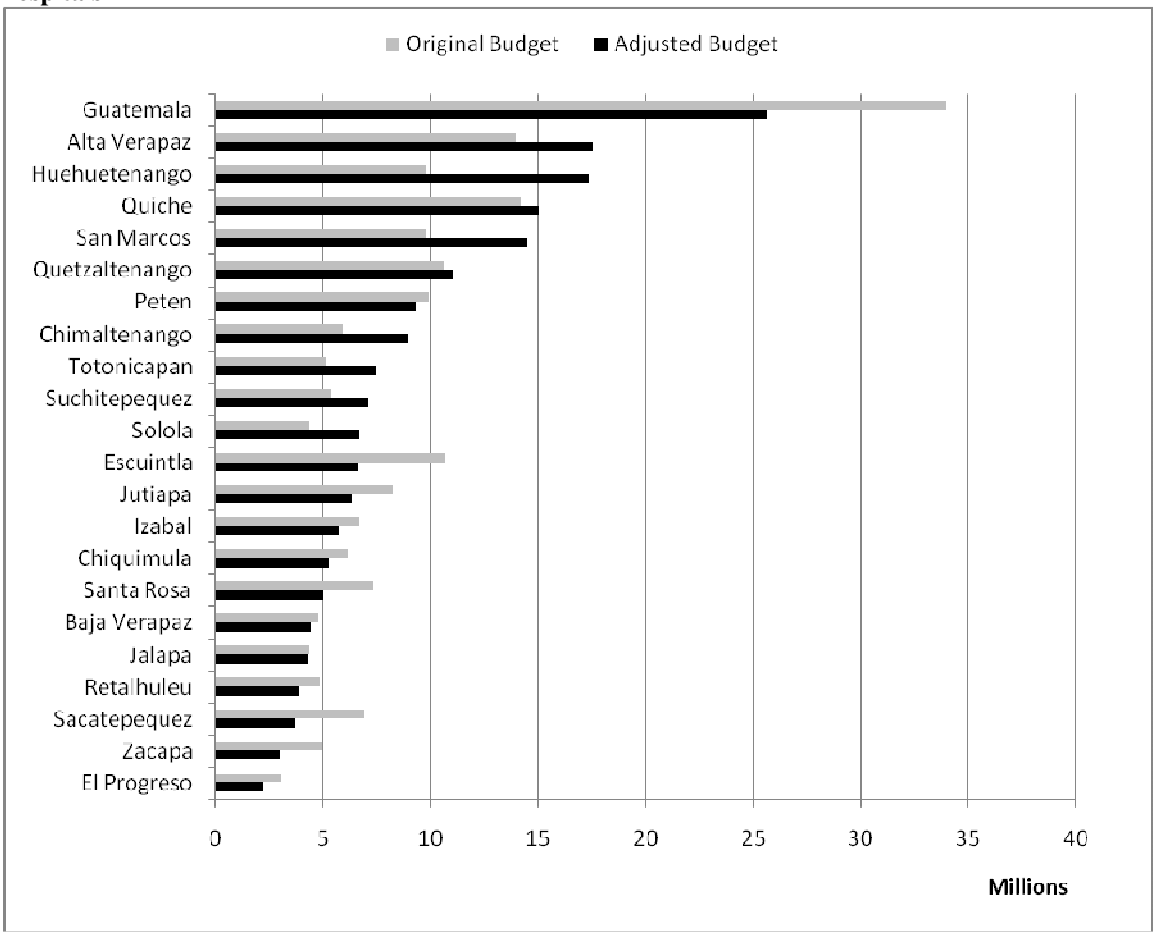


Source: Authors' calculations.

The optimal degree to which hospitals are included in the per capita allocation formula is likely in between the two extremes of including and excluding all hospitals, respectively. It is quite likely that including only a portion of hospital services in the formula will

address limitations found in totally including or excluding hospitals from calculations. One option would be to exclude tertiary-level hospitals from the formula and/or a portion of financing for those hospitals that relates most directly to tertiary-level care. A second option would be to remove from the formula the share of hospital services provided to patients outside of the health area in which the hospital is located. While such refinements would require detailed analysis of hospital services, it is instructive that including 25% of budgets for the country's largest hospitals (e.g., tertiary, referral, specialized, multiregional) in the formula results in significant re-allocations and reductions in pre-existing imbalances (Figure 4). This suggests that there may be a relatively wide menu of policy options related to inclusion/exclusion of hospital services in the allocation formula that both redress existing regional imbalances and address concerns about absorptive capacity of metropolitan areas to adapt to financing reductions.

Figure 4. Guatemala, 2007. Original and Adjusted Budget of the Health Areas, current budgets of secondary hospitals and 25% of current budgets for tertiary/referral/specialized/multiregional hospitals



Source: Authors' calculations.

VI. Concluding Remarks

Available evidence suggests that the current structure of resource allocation in Guatemala is not consistent with several health sector objectives, including meeting health demands and needs and reducing inequities in health. While revisions to the current structure of

resource allocation will face challenges on many fronts, this sections suggests that it is technically possible to develop a needs-based formula approach that more equitably distributes scarce resources and raise levels of financing to a threshold consistent with international guidelines for providing a minimum package of interventions. For most of Guatemala's departments, the formula-based allocation described here would result in spending that is two to three times higher than current levels of resource allocation.

Because this exercise in creating a new formula-based resource allocation for Guatemala is heuristic in nature, it does not claim to address many challenges that would arise in operationalizing revisions in practice. From a technical point of view, the scenario illustrated here indicates that using objective budget allocation criteria may better respond to health needs than the current mix of methods, all while using the same level of resources devoted to health in the 2009 budget. Successfully redesigning resource allocation methods, however, is not just a technical process. The absorptive capacity of re-allocation "winners", for instance, may be limited. As pointed out earlier, additional investments — such as the definition of portfolios of explicitly guaranteed services at primary, secondary and tertiary levels; analysis and forecasting of demand and utilization of services, adjusted by problems of accessibility and acceptability of services; extension of the mechanism of capitation to other levels of care; contracting out providers from public and private sector, including IGSS and NGO's to deliver those packages; determining financing modalities for cross-departmental referrals; and creating partnerships with municipalities for administering primary services and providing surveillance of services delivery at all levels — might be necessary so that reallocated funds are used optimally. As importantly, political considerations need to be taken into account, such as resistance from Guatemala and other "losers" in the proposed re-allocation. The social and political issues of gaining support for such a set of measures goes beyond the modest intentions of the present exercise. The exercise nonetheless does indicate that the MOH has the opportunity to begin a process in which health financing is more based on health need than it is today.

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VIII. Annex

Table 8. Amount of resources allocated by criterion and weight applied (USD Thousands).

COD	Department	Standard Per capita (60%)	Age adjustment (16%)	Poverty Adjustment (10%)	Ethnicity Adjustment (10%)	Area Adjustment (4%)	Adjusted Budget	Original Budget
1	Guatemala	22,381.4	7,946.2	1,871.6	1,811.4	199.1	34,209.7	86,951.7
2	El Progreso	2,043.5	474.2	242.5	6.5	180.0	2,946.7	3,043.6
3	Sacatepequez	3,231.7	808.6	390.8	436.4	43.6	4,911.0	6,907.9
4	Chimaltenango	6,929.6	1,654.6	1,209.7	1,936.8	185.3	11,916.1	5,915.1
5	Escuintla	5,353.9	1,888.0	972.7	194.9	410.6	8,820.1	10,707.7
6	Santa Rosa	4,560.7	1,076.7	741.6	26.5	276.8	6,682.3	7,355.2
7	Solola	4,929.2	1,130.9	1,037.2	1,739.3	99.4	8,936.0	4,365.1
8	Totonicapan	5,524.9	1,284.5	1,093.0	1,961.4	99.4	9,963.3	5,130.4
9	Quetzaltenango	9,300.0	2,273.0	1,244.4	1,717.6	182.7	14,717.7	17,040.1
10	Suchitepequez	5,742.7	1,484.3	977.4	1,027.8	235.1	9,467.4	5,366.6
11	Retalhuleu	3,280.4	844.9	530.1	350.7	173.8	5,179.9	4,773.7
12	San Marcos	12,109.0	2,953.0	2,279.6	1,648.2	355.1	19,344.8	9,762.2
13	Huehuetenango	13,628.6	3,269.5	2,706.2	2,914.3	693.1	23,211.7	13,116.2
14	Quiche	10,717.6	2,641.9	2,398.3	3,514.2	784.7	20,056.6	14,168.5
15	Baja Verapaz	3,319.8	821.4	666.0	784.9	292.6	5,884.7	4,719.2
16	Alta Verapaz	12,519.5	3,320.2	2,773.8	3,963.2	813.5	23,390.1	13,965.9
17	Peten	6,136.0	1,505.4	969.6	506.3	3,358.0	12,475.3	11,316.3
18	Izabal	4,405.8	1,228.9	726.1	427.3	846.5	7,634.6	6,691.0
19	Zacapa	2,580.0	693.3	446.3	5.3	251.9	3,976.8	4,984.6
20	Chiquimula	4,598.8	1,194.7	784.5	218.4	222.5	7,019.0	6,111.9
21	Jalapa	3,830.5	1,002.8	658.0	29.9	193.2	5,714.4	4,361.0
22	Jutiapa	5,850.2	1,296.1	776.1	274.3	301.5	8,498.2	8,202.4
	TOTAL	152,973.9	40,793.0	25,495.6	25,495.6	10,198.3	254,956.5	254,956.5

Table 9. Transition from the current to needs-based resource allocation (as percentage of budget) – Approach 1 (no reduction in over-resourced department budgets; 10% yearly growth in overall MOH budget)

Department	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Overall change (%)
Guatemala	0.341	0.310	0.282	0.256	0.233	0.212	0.193	0.175	0.159	0.145	0.134	-0.207
Quetzaltenango	0.067	0.061	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	-0.009
Sacatepequez	0.027	0.025	0.022	0.020	0.019	0.019	0.019	0.019	0.019	0.019	0.019	-0.008
Escuintla	0.042	0.038	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	-0.007
Zacapa	0.020	0.018	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	-0.004
Santa Rosa	0.029	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	-0.003
El Progreso	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.000
Jutiapa	0.032	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.001
Retalhuleu	0.019	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.002
Chiquimula	0.024	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.004
Izabal	0.026	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.004
Peten	0.044	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.005
Baja Verapaz	0.019	0.022	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.005
Jalapa	0.017	0.019	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.005
Suchitepequez	0.021	0.023	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.016
Solola	0.017	0.019	0.023	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.018
Totonicapan	0.020	0.022	0.023	0.030	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.019
Quiche	0.056	0.061	0.065	0.067	0.076	0.079	0.079	0.079	0.079	0.079	0.079	0.023
Chimaltenango	0.023	0.026	0.027	0.028	0.029	0.042	0.047	0.047	0.047	0.047	0.047	0.024
Alta Verapaz	0.055	0.060	0.064	0.066	0.068	0.070	0.082	0.092	0.092	0.092	0.092	0.037
San Marcos	0.038	0.042	0.045	0.046	0.048	0.049	0.050	0.057	0.072	0.076	0.076	0.038
Huehuetenango	0.051	0.057	0.060	0.062	0.064	0.066	0.068	0.069	0.070	0.081	0.091	0.040
Total	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	

Table 10. Transition from the current to needs-based resource allocation (in levels) – Approach 1 (no reduction in over-resourced department budgets; 10% yearly growth in overall MOH budget)*

Department	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Average annual change
Guatemala	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.348	0.00
Quetzaltenango	0.067	0.067	0.070	0.077	0.085	0.093	0.102	0.112	0.124	0.136	0.150	0.08
Sacatepequez	0.027	0.027	0.027	0.027	0.028	0.031	0.034	0.038	0.041	0.045	0.050	0.06
Escuintla	0.042	0.042	0.042	0.046	0.051	0.056	0.061	0.067	0.074	0.082	0.090	0.08
Zacapa	0.020	0.020	0.020	0.021	0.023	0.025	0.028	0.030	0.033	0.037	0.040	0.08
Santa Rosa	0.029	0.029	0.032	0.035	0.038	0.042	0.046	0.051	0.056	0.062	0.068	0.09
El Progreso	0.012	0.013	0.014	0.015	0.017	0.019	0.020	0.023	0.025	0.027	0.030	0.10
Jutiapa	0.032	0.037	0.040	0.044	0.049	0.054	0.059	0.065	0.071	0.079	0.086	0.10
Retalhuleu	0.019	0.022	0.025	0.027	0.030	0.033	0.036	0.040	0.044	0.048	0.053	0.11
Chiquimula	0.024	0.030	0.033	0.037	0.040	0.044	0.049	0.054	0.059	0.065	0.071	0.12
Izabal	0.026	0.033	0.036	0.040	0.044	0.048	0.053	0.058	0.064	0.071	0.078	0.12
Peten	0.044	0.054	0.059	0.065	0.072	0.079	0.087	0.095	0.105	0.115	0.127	0.11
Baja Verapaz	0.019	0.024	0.028	0.031	0.034	0.037	0.041	0.045	0.049	0.054	0.060	0.13
Jalapa	0.017	0.021	0.027	0.030	0.033	0.036	0.040	0.044	0.048	0.053	0.058	0.13
Suchitepequez	0.021	0.025	0.045	0.049	0.054	0.060	0.066	0.072	0.080	0.088	0.096	0.18
Solola	0.017	0.021	0.028	0.047	0.051	0.056	0.062	0.068	0.075	0.083	0.091	0.19
Totonicapan	0.020	0.024	0.028	0.039	0.057	0.063	0.069	0.076	0.084	0.092	0.101	0.18
Quiche	0.056	0.067	0.078	0.090	0.111	0.127	0.139	0.153	0.169	0.185	0.204	0.14
Chimaltenango	0.023	0.028	0.033	0.037	0.042	0.068	0.083	0.091	0.100	0.110	0.121	0.19
Alta Verapaz	0.055	0.066	0.077	0.088	0.100	0.113	0.146	0.179	0.197	0.216	0.238	0.16
San Marcos	0.038	0.046	0.054	0.062	0.070	0.079	0.089	0.111	0.153	0.179	0.197	0.18
Huehuetenango	0.051	0.062	0.073	0.083	0.094	0.106	0.120	0.135	0.151	0.190	0.236	0.17
Total	1.0	1.1	1.21	1.33	1.46	1.61	1.77	1.95	2.14	2.36	2.59	

* Levels are normalized where the total Year 1 level budget is set to 1