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# BENEFIT INCIDENCE OF PUBLIC HEALTH SPENDING FOR PUBLIC AND FAITH-INSPIRED PROVIDERS IN GHANA

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*This paper uses the fifth round of the Ghana Living Standards Survey collected in 2005-2006 to conduct a benefit incidence analysis of public spending for health. District-level financial data on public transfers are combined with household survey data on the use of various types of facilities by the population to assess whether public health spending reaches equally various segments of the population. The estimates of benefit incidence are presented separately for public and faith-inspired facilities, given that the later also benefit from public funding. The analysis suggests substantial variation in transfers and unit costs by districts, with higher costs in areas with the lowest and highest poverty measures, and lower costs in-between. Public health funding is also found to be regressive, in large part because hospitals and clinics still benefited the better off more than the poor, whether they are operated by the government or faith-inspired providers.*

## INTRODUCTION

Historically, as is the case for many other sub-Saharan Africa countries, Ghana's public health spending was concentrated in urban areas and tertiary-level health facilities. In recent decades however, significant reforms have been undertaken in order to improve access to health services among the poor, as well as make the services provided more affordable (e.g. Salisu and Prinz 2009). Organizational and fiscal decentralization reforms were implemented among others through the creation of Budget Management Centers designed to facilitate transfers of resources from the Ministry of Health to districts-level authorities. Higher emphasis was placed on provision of primary care through the development of Community Health and Planning Services facilities. And a fundamental reform of funding for health care was initiated with the creation of the National Health Insurance Scheme and its exemption policies designed to reduce barriers to access for the poor.

Today health remains a major priority for the Government of Ghana, which has positioned Human Development as one of the core pillars of its Second Poverty Reduction Strategy Paper. With significant resources allocated to the health sector, it is critical to measure whether or not the funding provided is reaching the target group that needs it the most, namely the poor. Using benefit-incidence analysis, the objective of this paper is to measure to what extent public health spending is pro-poor. Previous studies on

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the benefit incidence of health spending in Ghana based on the third and fourth rounds of the GLSS surveys for 1991-1992 and 1998-1999 as well as other data have suggested that better off households tended to benefit the most from health spending (e.g. Demery et al 1995, Nyonator and Kutzin 1999, and Canagarajah and Xiao 2001: see also the analysis of Demographic and Health Surveys in Makinen et al 2011, and the qualitative fieldwork by Shojou et al 2012 as well as Wodon 2013).

In this paper, we update the analysis using the fifth round of the GLSS, collected in 2005-2006, and we test whether the benefit incidence analysis of public spending for health depends on the assumptions used to estimate unit costs. More precisely, using district-level financial data to compute district-level unit costs, this paper takes a closer look at the distribution of spending across both geography and income groups to understand if efforts to decentralize spending and invest in pro-poor services in health have succeeded in leading to a pro-poor benefit incidence.

Another feature of this paper is that we compare benefit incidence results for both public health facilities and the facilities operated by the Christian Health Association of Ghana (CHAG) which also benefits from public funding, especially for staff salaries. Overall, the analysis suggests that public health spending remains regressive for both the public and faith-inspired sectors in large part because hospitals and clinics still benefit the better off more than the poor, independently of who operates the facilities.

## **DATA AND METHODOLOGY**

Three sources of data are used in the paper. The first two sources are nationally representative household surveys. The first survey is the Ghana Living Standards Survey (GLSS5) implemented in 2005-2006. The GLSS is a multi-purpose household survey covering demography, health, education, employment, migration, housing, agriculture activities, non-farm self-employment, household expenditures, durable goods and, remittances and other incomes. The 2005/06 round of the survey was administrated to around 36,500 individuals grouped into 8700 households. This nationwide sample is deemed representative at the level of the ten regions. The second survey is the large sample (50,000 households) 2003 Core Welfare Indicator Questionnaire (CWIQ) survey, deemed representative at the district level. Both surveys distinguish between faith-inspired and other types of providers when asking about care sought by individuals, although this is done in slightly different ways in each of the two surveys.

In the CWIQ survey, one question is asked as to whether each individual in the household has consulted a doctor, nurse, pharmacist, health professional, dentist or traditional healer for any reason during the last 4 weeks. For those who did consult, a subsequent question is asked as to the kind of health provider/facility the household member did see or visit. The modalities for the response are a private hospital/clinic, a public hospital/clinic, a community health center, a private doctor/dentist, a traditional healer, a missionary/hospital, a pharmacist/drugstore, and finally the option "Other". Of those providers, three will be considered as benefiting from public health spending: public hospitals/clinics, community health centers, and missionary/hospital facilities. Those data

will then be combined with administrative data on public funding for health at the district level. For reasons explained below, in order to compute unit costs, public hospitals/clinics and missionary/hospital facilities are combined as one type of provider, while community health centers will be considered as a separate type of provider.

In the GLSS5, the questions are asked differently, and more precisely. For those who consulted a health provider in the last two weeks, a question is asked as to where the consultation took place.<sup>2</sup> The modalities for the response are a hospital, a clinic, a MCH clinic, a maternity home, a pharmacy, a chemical store, a consultant's home, the patient's home, and "other". The next question is whether this was a public or private facility, with three modalities for the question: public, private religious, and private non-religious. The combination of the two questions permits the identification of the faith-inspired as opposed to the public facilities, as well as the type of facility used. Here again, to compute unit costs, hospitals and clinics will be aggregated together, and treated separately from community health centers (MCH clinics).

In addition to these two surveys, we use administrative data on public health spending. Budget data are available for all 138 districts, and the total budget included in the analysis is GHC 321,115,072. Five different budget lines are provided: salaries which account for 69.0 percent of the total budget (GHC 221,675,525), administration for the Ministry of health, accounting for 5.1 percent of the budget (GHC 17,244,558), administration for the NHIA accounting for 3.1 percent of the budget (GHC 9,824,628), services for the Ministry of health, with a budget share of 0.6 percent (GHC 1,861,186), and finally services for the NHIA with a budget share of 22.0 percent (GHC 70,509,167). We cannot differentiate in the budget data between funding allocated to faith-inspired as opposed to public facilities, and at the time of the budget data, it is likely that public facilities were better funded than faith-inspired facilities. But since then further steps have been taken to fund faith-inspired facilities more equally, and we simply assume here that all hospitals and clinics within a district receive the same funding proportionally to the number of visits to the facilities observed in the survey and the district allocation available in the data. We also assume that a visit to a community health center costs only half as much as a visit to a hospital or a clinic. We could change these assumptions, but it should not make much difference in the final results given that visits to community health centers account for only a small share of all visits to the three types of facilities combined (hospitals, clinics, community health centers).

Given the above data, the methodology to conduct the benefit incidence analysis is standard. As noted among others by Castro-Leal et al (1999) and Demery (2003), the starting point in conducting a benefit incidence analysis lies in assessing the use of government services by households, which is done here by using the two nationally representative household surveys mentioned above. This information is then combined with data on the cost for the government to provide the services, so that one can estimate

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<sup>2</sup> A separate and useful question is also asked about whom was consulted for the most recent visit. The modalities for the responses are a doctor, a dentist, a nurse, a medical assistant, a midwife, a pharmacist, a drug/chemical seller, a traditional healer, a trained TBA, an untrained TBA, a spiritualist, and finally the option "other". This question is however not used for the analysis presented in this paper.

the share of public spending that is allocated to different groups of households. In most analyses of benefit incidence analysis the data on unit cost is often provided only at a fairly aggregate level. Using the same notation as in Demery (2003), denote by  $S_i$  the net government spending on health facilities of type  $i$ , with  $i = 1, \dots, 3$  representing different types of facilities (hospitals, clinics, and health centers). The value  $S_i$  should represent net costs for the government after having deducted fees and receipts from other cost recovery mechanisms, or net funding transfers as is the case of Ghana. Denote by  $E_{ij}$  the number of patients using facilities from household group  $j$  (which may for example represent quintiles) in facility type  $i$ , and by  $E_i$  the total number of patients using this type of facility. Only students attending government-subsidized (i.e., typically public, but also in the case of Ghana faith-inspired) facilities should be taken into account in the estimation. Then,  $S_i/E_i$  can be considered as the average unit cost for the government of providing health services in facilities of type  $i$ . The total implicit transfer in kind received from public health spending for households of type  $j$ , denoted by  $X_j$ , is then:

$$X_j \equiv \sum_{i=1}^3 E_{ij} \frac{S_i}{E_i} \quad (1)$$

Equation (1) makes it clear that the value of the benefits accruing to group  $j$  depends on both the unit cost of providing health services in different types of facilities, and the number of patients using the facilities in each household group. If  $S$  denotes the total public spending for health, the share of the total health subsidy accruing to group  $j$ , denoted by  $x_j$ , is then given by:

$$x_j \equiv \frac{\sum_{k=1}^n \sum_{i=1}^3 E_{ij} \frac{S_i}{E_i}}{\sum_{k=1}^n \sum_{i=1}^3 e_{ij} S_i} = \sum_{k=1}^n \sum_{i=1}^3 e_{ij} S_i \quad (2)$$

As pointed out by Demery (2003), a group's benefit share of total public spending is equal to the weighted sum of the group's share of total health visits for each type of facilities ( $e_{ij}$ ), with the weight defined by the shares of the total budget allocated to the various types of facilities. In order to make comparisons between groups, or to assess whether the share of total benefits received by any given group can be considered as equitable, it is standard to compare the share of the benefits received by a group to the group's population share in the total population.

Consider now the case when public subsidies for health services vary across geographic areas, denoted by the subscript  $k$  (these represent districts in the case of Ghana). If  $S_{ik}$  denotes the total cost of providing health services for facilities of type  $i$  in area  $k$  ( $k=1, \dots, n$ ), and  $E_{ik}$  is the number of patients using facilities of type  $i$  in area  $k$ , then,  $S_{ik}/E_{ik}$  is the average unit cost of public health services at level  $i$  in area  $k$ . These area-specific unit costs are important to factor in the analysis, because they may differ substantially between areas, and because in terms of outcomes, there is an implicit assumption (although not always verified empirically) that higher unit costs may be associated with higher quality in health services. In the case of health services in developing countries like Ghana, given that a large share of the costs are accounted for by the salary of health personnel (as well as drugs, but those are more often subject to cost recovery), the unit costs may differ between areas due to both different ratios of health personnel to patients (as well as occupancy rates for hospital beds for example), and differences in the

qualification and thereby pay levels of health personnel (doctors, nurses, midwives, etc.), which may also differ between areas, with poorer and more remote areas often staffed by less qualified personnel, but also possibly with lower occupancy rates or use of facilities by personnel. Denoting by  $E_{ijk}$  the number of patients of group  $j$  using facilities of type  $i$  and area  $k$ , we have:

$$X_j^K \equiv \sum_{k=1}^n \sum_{i=1}^3 E_{ijk} \frac{S_{ik}}{E_{ik}} \quad (4)$$

As before, if  $S$  denotes the total public spending for health, the share of the total health subsidy accruing to group  $j$ , denoted by  $x_j$ , is then given by:

$$x_j^K \equiv \sum_{k=1}^n \sum_{i=1}^3 \frac{E_{ijk}}{E_{ik}} \frac{S_{ik}}{S} = \sum_{k=1}^n \sum_{i=1}^3 e_{ijk} s_{ik} \quad (5)$$

A group's benefit share of total public spending is still equal to the weighted sum of the group's share of total visits to health facilities, but the sum is now taken for all types of facilities in each district or region, with the weight defined by the shares of the total budget allocated to the various types of facilities and districts or regions. As we shall see in the next section, the use of aggregate national-level unit costs as opposed to unit costs disaggregated by district or region can make a difference in the estimation of the shares accruing to each household group.

## UNIT COSTS

The first step in the analysis consists in the estimation of unit costs by district. Differences in unit costs between districts are derived from the budgets allocated to each districts and the number of visits to the districts as computed in the surveys (using the appropriate expansion factors). Using the CWIQ data, we compute unit costs at both the district and the regional levels. With the GLSS5, we compute the unit costs only at the regional level, given the smaller sample size of the survey. In both cases, as shown in table 1, the unit costs vary widely across districts and regions, with higher unit costs observed in both the wealthiest (Greater Accra) and the poorest regions (Upper West).

It could be that in Accra and a number of other comparatively better off regions, higher unit costs reflect the fact that health personnel attending to patients tend to be more qualified (most of the doctors tend to be concentrated in the wealthier parts of the country). By contrast, in poorer areas and due to affordability issues, the demand for care is lower (which translates for example in lower occupation rates for hospitals), which may also result in higher unit costs because of lower levels of utilization for the services made available. This then would also imply lower unit costs for districts and regions that tend to be in the middle of the welfare distribution. This "U" shape relationship between the incidence of poverty and average unit costs for visits to health facilities in a given district or region is clearly visible in Figure 1 (the size of the dots in the scatter plots are proportional to the size of the population in the various districts or regions in each Figure, but not comparable for district as opposed to regional scatter plots; both linear and quadratic best fit lines using regressions weighted by population are provided).

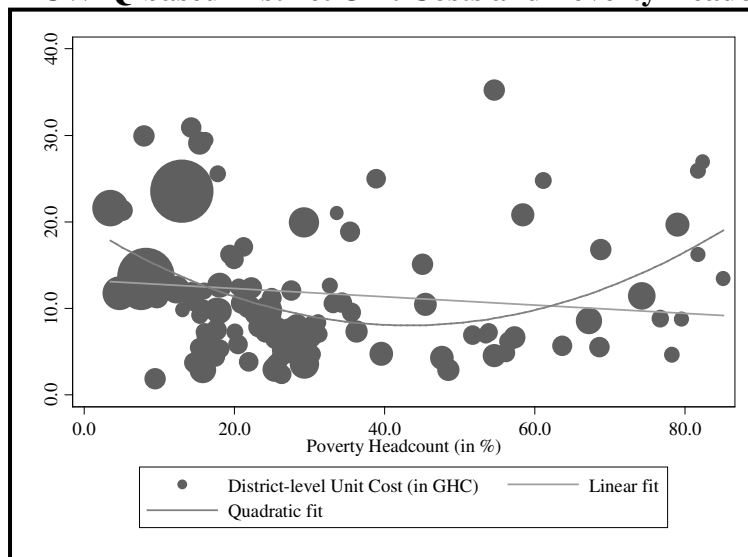
**Table 1: Unit cost estimates per visit to a health facility**

	Total cost by region, in GHC	Unit cost GLSS 5 2005-2006	Unit Cost, CWIQ 2003		
			District Average	District Minimum	District Maximum
Western	22,994,468	5.6	6.9	2.9	25.5
Central	22,597,436	7.8	7.6	1.9	29.9
Grater Accra	60,990,935	14.9	19.9	9.2	23.5
Volta	27,849,206	11.5	9.3	4.8	21
Eastern	40,634,717	6.6	10.5	5.3	21.3
Ashanti	53,912,428	8.3	8.9	2.4	15.7
Brong Ahafo	40,507,241	11.6	13.8	4.3	30.9
Northern	24,579,028	5.8	9.6	2.9	35.2
Upper East	14,914,581	11.7	9.4	4.7	16.8
Upper West	12,135,021	12.5	19.8	13.5	27
National	321,115,061	8.9	10.7	1.9	35.2

Source: Authors' estimation using CWIQ 2003, GLSS5 2005-2006, and administrative data.

**Figure 1: Relationship between unit costs and poverty levels at the regional level**

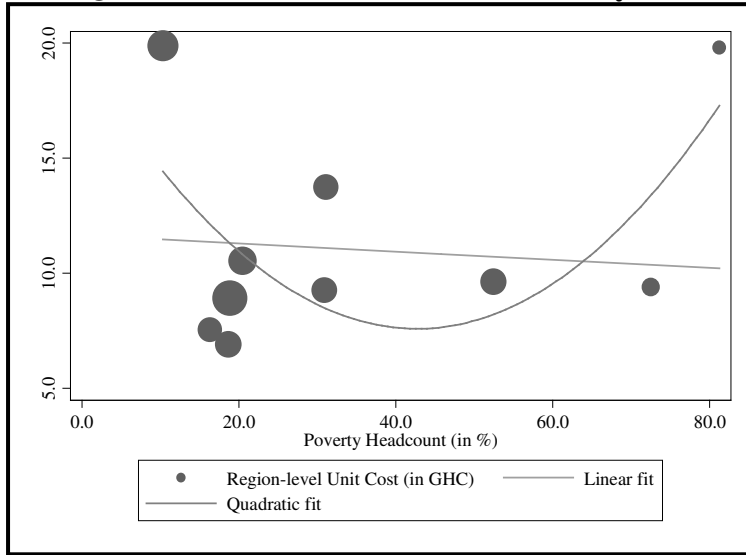
**(a) CWIQ-based District Unit Costs and Poverty Headcounts**



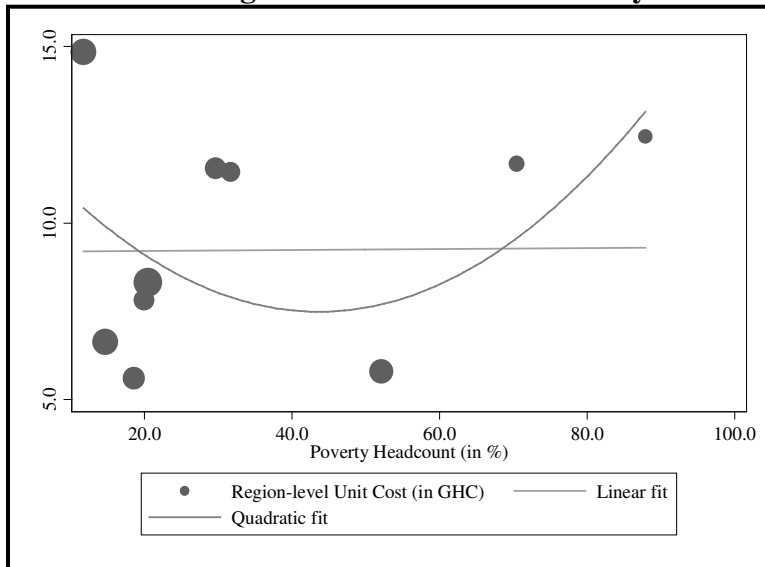
Source: Authors' estimation using CWIQ 2003, GLSS5 2005-2006, and administrative data.

**Figure 1 (Continued): Relationship between unit costs and poverty levels at the regional level**

**(b) CWIQ-based District Unit Costs and Poverty Headcounts**



**(c) GLSS5-based Regional Unit Costs and Poverty Headcounts**



Source: Authors' estimation using CWIQ 2003, GLSS5 2005-2006, and administrative data.



## BENEFIT INCIDENCE

The results of the benefit incidence analysis are provided in tables 2 through 4. Table 2 provides simply the share of visits to health facilities accounted by various population groups – namely the urban and rural populations, as well as the population ranked according to level of consumption per equivalent adult into five quintiles of well-being, from the poorest (Q1) to the richest (Q5) quintile. Table 3 then combines that information with the unit costs estimated in the previous section, using both the district-level and regional unit costs in the case of the CWIQ 2003 survey, and the regional level costs in the GLSS5. Finally table 4 repeats the exercise by considering national unit costs (thus no differences in estimation of the unit costs between areas).

Consider first table 2 which is solely based on the survey data. A few findings stand out. As expected, visits to private facilities tend to be concentrated among the top quintiles of the distribution, and this is observed with both the CWIQ and the GLSS5 surveys. In the CWIQ survey, religious facilities tend to serve the poor significantly more than public facilities, but the reverse is observed in the GLSS5 survey. Thus, while in terms of the estimation of the unit costs the two surveys tended to generate similar results, in terms of the visits to health facilities, the results differ, so that it is difficult to reach a clear conclusion. The questionnaire of the GLSS5 is better to identify where individuals seek care than that of the CWIQ, but this is not a sufficient reason to discount the results obtained with the CWIQ. Said differently, a fair assessment of the results would be to say that on average, between the two surveys, the incidence of visits profile is not too different between the public and the faith-inspired providers. There is also a clear pattern observed in both surveys whereby visits to hospitals are more frequent in the top quintiles, while visits to community health centers are more frequent in the lower quintiles. Visits to clinics are more prevalent among the better off, but less so than visits to hospital. Given the cost of the services provided by various facilities and location effects (hospitals tend more often to be located in urban and therefore often wealthier areas), these results are as expected.

**Table 2: Share of Patients Attending Facilities by Location and Quintile (%)**

	Residence Area		Welfare Quintile					Total
	Urban	Rural	Q1	Q2	Q3	Q4	Q5	
CWIQ 2003								
All visits	47.1	52.9	13.2	16.5	19.0	22.1	29.2	100.0
Public facilities	44.0	56.0	14.6	17.7	19.4	21.2	27.1	100.0
Private facilities	61.1	38.9	6.7	12.5	17.7	25.3	37.7	100.0
Religious facilities	30.7	69.3	20.2	17.3	19.3	20.6	22.6	100.0
All hospitals/clinics	47.8	52.2	12.7	16.5	19.1	22.2	29.6	100.0
Public hospitals/clinics	44.9	55.1	14.0	17.7	19.5	21.4	27.5	100.0
Private hospitals/clinics	61.1	38.9	6.7	12.5	17.7	25.3	37.7	100.0
Religious hospitals/clinics	30.7	69.3	20.2	17.3	19.3	20.6	22.6	100.0
Community health centers	22.1	77.9	29.7	18.4	15.7	17.2	18.9	100.0
GLSS 2005-2006								
All visits	43.2	56.8	11.0	15.8	19.1	22.5	31.6	100.0
Public facilities	42.0	58.0	12.3	16.9	19.5	22.7	28.6	100.0
Private facilities	47.9	52.1	7.9	13.3	16.0	22.4	40.4	100.0
Religious facilities	41.9	58.1	8.3	12.4	23.5	21.4	34.4	100.0
All hospitals	52.3	47.7	8.3	13.9	18.6	23.6	35.7	100.0
Public hospitals	50.1	49.9	8.9	14.9	18.9	24.0	33.3	100.0
Private hospitals	69.6	30.4	6.1	9.7	11.7	24.8	47.7	100.0
Religious hospitals	49.4	50.6	5.1	9.4	24.8	18.1	42.6	100.0
All clinics	33.1	66.9	13.8	18.9	19.7	20.9	26.7	100.0
Public clinics	29.8	70.2	16.9	21.1	21.0	20.5	20.6	100.0
Private clinics	39.4	60.6	8.2	15.5	17.0	20.4	39.0	100.0
Religious clinics	31.9	68.1	13.2	15.8	21.2	25.9	23.9	100.0
All community health centers	23.0	77.0	20.9	9.4	18.8	26.7	24.3	100.0
Public community health centers	17.9	82.1	27.9	7.8	10.8	23.9	29.6	100.0
Private community health centers	28.8	71.2	13.3	9.0	28.6	31.6	17.5	100.0
Religious community health centers	34.8	65.2	-	29.8	32.2	21.7	16.3	100.0

Source: Authors' estimation.

Note: no data on visits to religious community health centers in the bottom quintile.

Table 3 provides the data not only in terms of visits, but in terms of benefit incidence, whereby the cost associated with the different facilities (which takes into account their location in various districts or regions) is also factored in. Note that this analysis includes only public and faith-inspired facilities, given that private facilities tend not to be funded by the state. By and large, taking into account the unit costs does not fundamentally change the results. This is in part because despite the “U” pattern mentioned earlier in the geographic distribution of unit costs, on average there are no linear patterns that differentiate unit costs between districts according to levels of poverty; this, together with the fact that there are poor populations in many different types of districts tends to average out the potential influence that differences in unit costs might yield (for example, more benefits due to higher unit costs would accrue to some of the households in the poorest parts of the country, but this is then compensated by the use of facilities by the poor in some of the areas that have medium levels of poverty, etc.) When the analysis is conducted using national level unit costs, the results (not shown here) are again similar.

**Table 3: Benefit Incidence by Location and Quintile (%)**

	Residence Area		Welfare Quintile					Total
	Urban	Rural	Q1	Q2	Q3	Q4	Q5	
CWIQ 2003, District Level Costs								
All visits	54.5	45.5	12.8	15.9	19.2	21.7	30.3	100.0
Public facilities	55.8	44.2	12.2	15.8	19.2	21.9	31.0	100.0
Religious facilities	36.6	63.4	21.7	18.0	18.7	19.5	22.1	100.0
All hospitals/clinics	54.9	45.1	12.4	15.9	19.3	21.8	30.5	100.0
Public hospitals/clinics	56.3	43.7	11.7	15.8	19.4	22.0	31.2	100.0
Religious hospitals/clinics	36.6	63.4	21.7	18.0	18.7	19.5	22.1	100.0
CHC	31.4	68.6	34.3	16.2	12.8	15.8	20.8	100.0
CWIQ 2003, Regional Level Costs								
All visits	54.5	45.5	12.8	15.9	19.2	21.7	30.3	100.0
Public facilities	55.8	44.2	12.2	15.8	19.2	21.9	31.0	100.0
Religious facilities	36.6	63.4	21.7	18.0	18.7	19.5	22.1	100.0
All hospitals/clinics	54.9	45.1	12.4	15.9	19.3	21.8	30.5	100.0
Public hospitals/clinics	56.3	43.7	11.7	15.8	19.4	22.0	31.2	100.0
Religious hospitals/clinics	36.6	63.4	21.7	18.0	18.7	19.5	22.1	100.0
CHC	31.4	68.6	34.3	16.2	12.8	15.8	20.8	100.0
GLSS 2005-2006, Regional Level Costs								
All visits	46.1	53.9	11.8	16.6	19.6	22.0	29.9	100.0
Public facilities	45.9	54.1	12.2	17.1	19.4	22.2	29.1	100.0
Religious facilities	48.3	51.7	8.8	11.5	21.3	20.6	37.8	100.0
All hospitals	53.7	46.3	8.8	14.6	19.1	22.3	35.1	100.0
Public hospitals	53.5	46.5	9.3	15.2	18.8	22.7	34.0	100.0
Religious hospitals	56.0	44.0	4.5	8.1	22.7	18.2	46.5	100.0
All clinics	34.9	65.1	16.1	20.1	20.6	21.6	21.7	100.0
Public clinics	34.6	65.4	16.2	20.5	20.8	21.3	21.2	100.0
Religious clinics	37.7	62.3	15.0	15.9	19.2	23.8	26.1	100.0
All health centers	20.6	79.4	28.2	9.5	12.2	23.3	26.8	100.0
Public health centers	19.3	80.7	30.3	8.1	10.8	23.3	27.5	100.0
Religious centers	38.0	62.0	-	28.0	30.6	23.7	17.8	100.0

Source: Authors' estimation.

## CONCLUSION

The objective of this paper was to use two different but nationally representative household surveys to conduct a benefit incidence analysis of public spending for health. While many benefit incidence studies assume that unit costs are uniform with a country, we were able to use detailed district- and region-level unit costs to assess whether the average public cost of a consultation to a facility costs more in some districts or regions than in others. The analysis suggests substantial variation in transfers and unit costs between districts and regions, with higher unit costs in geographic areas with the lowest and highest poverty measures, and lower costs in-between – that is, unit costs reveal an inverted “U” relationship versus the incidence of poverty by district or region.

The district- or regional level unit costs as well as the data on the use of facilities were then combined with the data on the socio-economic characteristics of households to assess whether public health spending reaches equally various segments of the population. Public health funding was found to be regressive overall, in large part because hospitals and clinics still benefited more in both surveys the better off than the

poor. Finally, the analysis also distinguished government or faith-inspired providers, and although there were differences in results for faith-inspired providers between the two surveys, overall the results suggest that public spending for faith-inspired providers does not necessarily reach the poor significantly better than public spending for public providers (in one survey, faith-inspired providers reached the poor more than public providers but it was the reverse in the other survey).

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