Distributional analysis of rural-urban household healthcare expenditure differentials in developing countries: evidence from Ghana

Samuel Ampaw

School of Economics, University of Nottingham Ningbo China, Ningbo, China, and

Edward Nketiah-Amponsah, Frank Agyire-Tettey and Bernardin Senadza

Department of Economics, University of Ghana, Accra, Ghana

Abstract

Purpose – Equity in access to and use of healthcare resources is a global development agenda. Policymakers' knowledge of the sources of differences in household healthcare spending is crucial for effective policy. This paper aims to investigate the differences in the determinants of household healthcare expenditure across space and along selected quantiles of healthcare expenditure in Ghana. The determinants of rural-urban healthcare expenditure gap are also explored.

Design/methodology/approach – Data was obtained from the sixth round of the Ghana Living Standards Survey (GLSS 6) conducted in 2013. An unconditional quantile regression (UQR) and a decomposition technique based on UQR, adjusted for sample selection bias, were applied.

Findings – The results indicate that differences in the determinants of household healthcare expenditure across space and along quantiles are driven by individual-level variables. Besides, the rural-urban health expenditure gap is greatest among households in the lower quantiles and this gap is largely driven by differences in household income per capita and percentage of household members enrolled on health insurance policies.

Originality/value – The findings show that there are differences in the determinants of household health expenditure along with the income distribution, as well as between rural and urban localities, which would call for targeted policies to address these inequalities.

Keywords Household healthcare expenditure, Rural-urban inequality,
Unconditional quantile regression, Healthcare financing policy, Developing countries, Ghana

Paper type Research paper

1. Introduction

Public health spending is important to improving health outcomes and human capital development. Improved health outcomes have positive consequences for economic growth and individual welfare. For instance, Murthya and Okunadeb (2009) argue that increased healthcare expenditure has a positive effect on labour efficiency, quality of life and welfare. They further credit improved health outcomes to increases in healthcare spending. Anyanwu and Erhijakpor (2009) also find that health expenditures have a negative impact on health outcomes such as infant and under-five mortality in Africa. Similar findings were made by Ashiabi *et al.* (2016) and Arthur and Oaikhenan (2017). Novignon *et al.* (2015) observe that population health status relates positively with labour force participation and

contributes to national output. Yet, public health spending continues to be low in developing countries compared with developed countries. The OECD countries alone contribute about 85% of the world's total healthcare spending, while Africa's share is only 3% (Novignon *et al.*, 2012). The burden of financing health needs in many developing countries, Ghana inclusive, therefore, falls on the households largely (Ottersen *et al.*, 2017).

Malik and Syed (2012) disclose that in 2005, out-of-pocket (OOP) healthcare payment was 67% of the total healthcare expenditure in Pakistan, while the corresponding figure was 45% in Ghana (Akazili *et al.*, 2014). Molla *et al.* (2017) also report that OOP healthcare payments by households contribute up to 63% of total health expenditure in Bangladesh. In Nigeria, despite the introduction of the National Health Insurance Scheme (NHIS), household healthcare financing accounts for more than 60% of Nigeria's total healthcare spending (Olasehinde and Olaniyan, 2017), the existence of an NHIS notwithstanding. Against this backdrop, studies on the factors that motivate household healthcare spending in developing countries are justified. Molla *et al.* (2017) opine that such studies are useful for effective policy on the healthcare financing system.

Typifying the situation in several developing countries, a majority of deprived persons in Ghana reside in the country's rural areas. Although Ghana's national average poverty incidence is 24% as at 2013, rural households account for 78% of the poor with a higher than national average poverty incidence of 38% (Ghana Statistical Service, 2014). In addition, rural households in Ghana are reported to have less access to healthcare compared to their urban counterparts (ibid). Owing to the complex relationship between poverty and health, Peters *et al.* (2008) and O'Donnell (2007) posit that the poor, most of whom reside in rural areas of developing countries, suffer most from ill-health.

The extant literature affirms the rural-urban inequality in the access to and utilisation of healthcare resources (*inter alia,* Hartley, 2004; Ziller *et al.*, 2006; Donfouet *et al.*, 2011; Ghana Statistical Service, 2014; Lee *et al.*, 2014; Olasehinde and Olaniyan, 2017; Molla *et al.*, 2017). However, not much is reported about the sources of these differences. Meanwhile, inequity in the use of healthcare resources has been identified as a hindrance to the achievement of universal health coverage, even though it remains central to the achievement of the sustainable development agenda (WHO, 2010; Ottersen *et al.*, 2017). Using the most recent and nationally representative household-level data for Ghana, this paper seeks to contribute to the present literature in two ways. Firstly, it seeks to examine the differences in the determinants of healthcare expenditure among rural and urban households. Owing to the possibility of the drivers of healthcare spending varying along with the distribution of household healthcare expenditure, we used the unconditional quantile regression (UQR) technique. Secondly, the paper explores the determinants of the rural-urban household healthcare expenditure gap along the 10th, 25th, 50th, 75th and 90th quantiles of healthcare expenditure using the UQR-based decomposition technique. To obtain consistent parameter estimates from the UQR, we followed the Heckman two-step procedure to correct for sample selection bias (Heckman, 1979). To the best of the authors' knowledge, this is a novel contribution to literature. The rest of the paper is organised as follows. Section 2 presents a brief exposition on healthcare financing in Ghana. Section 3 is on related to the empirical literature. Section 4 presents the data and methods. Results are discussed in Section 5 and finally, Section 6 concludes with policy recommendations.

2. Synopsis of healthcare financing in Ghana
Ghana's health financing system has seen several phases. According to Akazili *et al.* (2014), the system has over the years been modelled after the political ideology of the ruling government. Prior to independence, the system of OOP payments for healthcare was

practiced. However, the governments in the post-independence era provided free healthcare for the citizenry. In the early 1980s, stemming from the Structural Adjustment Programme, the user fee OOP payment/cash-and-carry) system was reinstated. This was because the tax-financed system encountered quality and sustainability challenges. Bagnoli (2017) reports that the user fee system resulted in a drop in utilisation of healthcare by about 25% among rural residents, elderly, women and the poor. To address the challenges associated with the user fee system, community-based insurance schemes were introduced in the 1990s. These pooled risks and improved access to healthcare resources. The community-based insurance schemes motivated the NHIS, which was introduced in the year 2003. This scheme is among the first in sub-Saharan Africa (Aryeetey et al., 2016a).

Nketiah–Amponsah and Arthur (2013) submit that in 2005, implementation of the scheme gave rise to increased outpatient utilisation from 0.6 million to 16.9 million. Furthermore, Aryeetey et al. (2016b) posit that enrollment on the NHIS reduces OOP payments on health, protects against catastrophic expenditures and alleviates poverty. Even though the NHIS was designed to be pro-poor, enrolment on it is currently impeded by poverty (Jehu–Appiah et al., 2011; Dixon et al., 2011; Akazili et al., 2014; Ghana Statistical Service, 2014; Alhassan et al., 2016). Bagnoli (2017) postulates that the scheme being pro-rich and pro-urban raises equity concerns. Though the NHIS is still in operation, Owusu–Sekyere and Bagah (2014) disclose that OOP payments on healthcare in Ghana have re-emerged in recent times partly due to delayed reimbursement to NHIS-accredited health facilities. This assertion is supported by the Ghana Statistical Service (2014), which reports that more than half of OOP payments, including cost of consultation, medicines and hospital admissions, are financed by households.

3. Related literature
3.1 Determinants of healthcare expenditure
Few cross-sectional studies have examined the determinants of household healthcare expenditure in developing countries (inter alia, Onwujekwe et al., 2010; You and Kobayashi, 2011; Yildirim et al., 2011; Malik and Syed, 2012; Molla et al., 2017; Olasehinde and Olaniyan, 2017; Mahumud et al., 2017). These studies focus more on the mean pattern of health expenditure. For instance, while You and Kobayashi (2011) adopted the Heckman selection model to correct for selection bias in their study, which used data from the 2004 China Health and Nutrition Survey, Onwujekwe et al. (2010) applied logistic regression to model data collected from six rural and urban areas (three each) in south-east Nigeria. Even though averages are good, distribution is also important.

Despite the identified shortcomings, the existing literature emphasises the importance of household-level and individual-level variables in influencing household healthcare expenditures. In a recent study of household healthcare expenditure in Nigeria, Olasehinde and Olaniyan (2017) find age, religion, education, income, household size and household headship to be significant determinants. Further findings are that though household characteristics are more significant among rural households, individual characteristics of the household head, including marital status and employment, have varying effects in both rural and urban areas. Olasehinde and Olaniyan (2017) used the Engel curve technique, which is based on the ordinary least squares method, to model data from the 2010 Harmonised Nigeria Living Standards Survey. Like most of the extant studies, the study by Olasehinde and Olaniyan (2017) fails to correct for potential selection bias besides the fact that the identified determinants are likely to vary along with the distribution of healthcare. Even though Molla et al. (2017) examined the determinants of high household healthcare expenditure in Bangladesh using multiple linear regression techniques, in the present paper,

we contribute further to the literature by applying the UQR approach to explore the determinants of household health expenditure along the 10th, 25th, 50th, 75th and 90th quantiles of healthcare expenditure in both rural and urban areas of Ghana using relatively more recent data.

3.2 Rural-urban inequities in healthcare

Huge and widening gaps in terms of welfare, measured by consumption, are reported between urban and rural areas of most developing economies. According to Go *et al.* (2007), this unequal distribution of economic and social outcomes, including access to health contributes substantially to the overall inequality in sub-Saharan Africa. The rural-urban inequities in the distribution of household consumption have been fairly studied (*inter alia,* Nguyen *et al.*, 2007; Agyire–Tettey *et al.*, 2017; Azam, 2017).

Using the UQR-based decomposition technique, Agyire–Tettey *et al.* (2017) examined the rural-urban consumption gap in Ghana. They attribute the gap in consumption between rural and urban households to disparities in the returns to socioeconomic factors. Azam (2017) used the same technique to explore the rural-urban welfare gap in India. They submit that India's consumption gap results from urban advantages in socioeconomic characteristics; adding that the disparity in education contributes most to the established rural-urban consumption gap in India. Nguyen *et al.* (2007) made similar findings for Vietnam using the same empirical approach. They add that the factors accounting for the rural-urban inequality in consumption -such as education, ethnicity and age- vary across the distribution of consumption expenditures. Though healthcare is a component of consumption and the rural-urban inequalities in the access to and utilisation of healthcare resources continue to broaden, the literature on the rural-urban gap in the consumption of healthcare in developing countries is non-existent to the best of the authors' knowledge.

From the above discussions, it is evident that existing studies are biased towards exploring the differences in the determinants of household healthcare expenditures in rural and urban areas without explaining the determinants of the healthcare consumption gaps. In addressing this lacuna in the literature, the present study investigates the sources of the rural-urban healthcare expenditure gaps along with the distribution of household healthcare expenditure.

4. Methods

4.1 Data

We use data from the sixth round of the Ghana Living Standards Survey (GLSS 6). The survey was conducted by the Ghana Statistical Service from 18 October 2012 to 17 October 2013. Technical support was provided by the World Bank as the Ghana Living Standard Survey (GLSS) epitomises the World Bank's Living Standards Measurement Survey. The GLSS follows a two-stage sampling method. In the first stage, enumeration areas were randomly selected. The selection is done by means of probabilities. These probabilities are proportional to the proportions of the population. Subsequently, households are systematically selected based on the principal sampling units. Despite the selection of a nationally representative sample of 18,000 households in 1,200 enumeration areas, 16,772 households were successfully interviewed in the GLSS6 (Ghana Statistical Service, 2014). This resulted in a response rate of 93.2%. The GLSS6 provides information on individual and household characteristics.

4.2 Outcome variables

The GLSS6 collected data on the total household spending on healthcare (tothlthexp) in local currency units (Ghanaian cedi, *GHS*). This total covered spending on medical products, appliances and equipment, outpatient services and hospital services (hospitalisation). Then,

there is potential selectivity bias, as sick respondents tend to spend more on health. However, this is partly addressed by the inclusion of health status as a control variable. Per capita, household healthcare expenditure (pchlthexp) was computed from the total (tothlthexp). Given that the variable (*pchlthexp*) is right-skewed, we applied the inverse hyperbolic sine transformation (IHST) technique to normalise it. Seven households out of the original 16,772 households were dropped due to missing information about their total healthcare expenditure. Of the remaining 16,765 households, 7,373 reported incurring no cost on healthcare over the survey period while the remaining 9,392 indicated otherwise. The healthcare spending status, a binary variable, was used to model the decision by households in Ghana to spend on healthcare. The goal was to enable the computation of the inverse mills variable[1] used in correcting for potential sample selection biases. All the sampled households were used[2]. On the other hand, in exploring the determinants of healthcare expenditures among households in rural and urban households, as well as investigating the sources of the rural-urban healthcare expenditure gaps along the 10th, 25th, 50th, 75th and 90th quantiles, only the sampled households with observed healthcare expenditures were used. The description and measurement of the outcome variables are presented in Table 1.

4.3 Explanatory variables
With recourse to the literature, the individual and household characteristics selected to explore the rural-urban household healthcare expenditure differentials in Ghana include age, sex, employment type, educational attainment, income, ethnicity, religion, health status, health insurance. Due to the high level of nonresponse with regards to some selected variables in the data, the total number of interviewed households further dropped from 16,765 to 16,514. Of the 16,514 households used for the study, 9,254 reported spending on healthcare albeit 7,260 indicated otherwise. The description and measurement of the selected explanatory variables are presented in Table 2.

4.4 Estimation technique
A UQR, adjusted for sample selection bias was used to achieve the first objective of the study. Following Heckman's two-step procedure (Heckman, 1979), we first obtained an inverse mills ratio (IMR) (sample selection correction term) based on a logistic regression model. This variable was then used as an independent variable in the UQR. The choice of the UQR over the conditional quantile regression is merely because of the interpretational advantage of the former over the latter. The healthcare expenditure linear regression model used is specified as follows:

$$Y_{ji} = pchlthexp_{ji} = \beta_{j0} + \sum_{q=1}^{Q} \beta_{jq} X_{jiq} + \varepsilon_{ji} \qquad (1)$$

where; $pchlthexp_{ji}$ (y_{ji}) is the IHST of healthcare expenditure per capita of household i, located in area j (rural or urban); X_{jiq} denotes the vector of explanatory variables of household i in

Outcome variables	Description and measurement
Healthcare expenditure (pchlthexp)	IHST of household healthcare expenditure per capita: in GHS
Spends on health (hlth_spends)	Healthcare spending status: 1 = household spends on healthcare, otherwise 0

Explanatory variables	Description and measurement
	Head characteristics
Age/100	Age of household head: number of years/100
Age^2	Age square: square of the age of household head
Female	Sex of household head: 1 = female; male = 0
Employment	Employment type: 1 = other employment (domestic employment/family employment/apprentiship/others)[+]; 2 = salaried/wage employment; 3 = self-employment
Educational	Educational attainment: 1 = no formal education[+]; 2 = basic; 3 = at least secondary
Christian	Religious affiliation: 1 = Christianity; 0 = no religion, Islam, traditional, etc.
Akan	Ethnic affiliation: 1 = Akan; 0 = otherwise
	Household characteristics
Income	Log of real household income per capita (GHS)
% ill	Percentage of ill/injured household members in the past 24 h
% insured	Percentage of medically insured household members
% < 18 years	Percentage of household members below 18 years.
% > 64 years	Percentage of household members over 64 years.
Urban	Place of residence: 1 = urban; 0 = rural
	Variables for satisfying the exclusion principle in the Heckman approach
North	Region of residence: 1 = three northern regions (northern, upper east and upper west regions), otherwise 0
Ecological zone	Ecological zone of residence: 1 = coastal zone, 2 = forest zone, 3 = Savannah zone, 4 = Greater Accra Metropolitan Assembly (GAMA)

Table 2.
Description and measurements of the selected explanatory variables

area j. βjq represent the vector of parameters. Subsequently, we applied the UQR-based decomposition technique proposed by Fortin *et al.* (2011) to explain the household healthcare expenditure gap in rural vs urban Ghana. This approach decomposed the gap into the selected explanatory variables. According to Fortin *et al.* (2011), the UQR technique is an extension of the Oaxaca–Blinder (OB) mean-based decomposition technique. From equation (1), the OB decomposition model is specified as follows.:

$$\underbrace{\overline{Y}_{1i} - \overline{Y}_{0i}}_{\hat{\Delta}^{O}_{hlthesp}(Overall\,gap)} = \underbrace{\{(\hat{\beta}_{u0} - \hat{\beta}_{r0}) + \sum_{q=1}^{Q} \overline{X}_{uq}(\hat{\beta}_{uq} - \hat{\beta}_{rq})}_{\hat{\Delta}^{U}_{hlthexp}(Unexplained)} + \underbrace{\sum_{q=1}^{Q} (\overline{X}_{uq} - \overline{X}_{rq})\hat{\beta}_{rq}}_{\hat{\Delta}^{E}_{hlthexp}(Explained)}$$

(2)

where; $\hat{\beta}_{j0}$ and $\hat{\beta}_{jq}$ denote the estimated intercept and parameters for the respective regression models in j (urban, rural). Equation (2) provides estimates for the overall rural-urban household healthcare expenditure gap, which is decomposed into explained and unexplained effects at the mean. It also provides estimates to depict the contribution of each covariate to the observed gap.

5. Results and discussion
5.1 Summary statistics
Figure 1 shows the kernel density of household healthcare expenditure per capita for rural and urban households in Ghana based on data from the GLSS6. The figure depicts that in the year under review, the urban density lies rightward of the rural density. This suggests that on

average urban households spend more on the health of their members than rural households. This is confirmed by Table 3, which reports summary statistics of the selected variables by place of residence (rural vs urban) for 3,846 urban households and 5,410 rural households that spent on healthcare and suggest that on average urban households spent more on health than rural households. This difference is statistically significant. Urban households are shown to have relatively younger members, a greater proportion of female heads, heads in salaried/wage and domestic/family employments head with higher education and heads who are Christians and Akans.[3] Additionally, urban households have higher income per capita and more medically insured members than their counterparts in rural areas. Conversely, more rural households than the urban households in our sample have greater percentages of ill members and older dependants (persons over 64 years). Aside from basic education and the percentage of household members who are younger than 18 years, all other variables differ statistically.

5.2 Determinants of healthcare expenditure
Table 4 presents the coefficient estimates from the UQR of the determinants of household healthcare expenditure in rural vs urban Ghana at the 10th, 25th, 50th, 75th and 90th quantiles. The IMR is significant at all the quantiles, suggesting the presence of selection bias in household healthcare expenditure decisions. The household-level variables – including household income and the percentage of ill and medically insured household members – proved to be the most significant determinants across space and along the selected quantiles. These variables are found to have similar effects on healthcare expenditure. The other two household-level variables, the percentage of household members
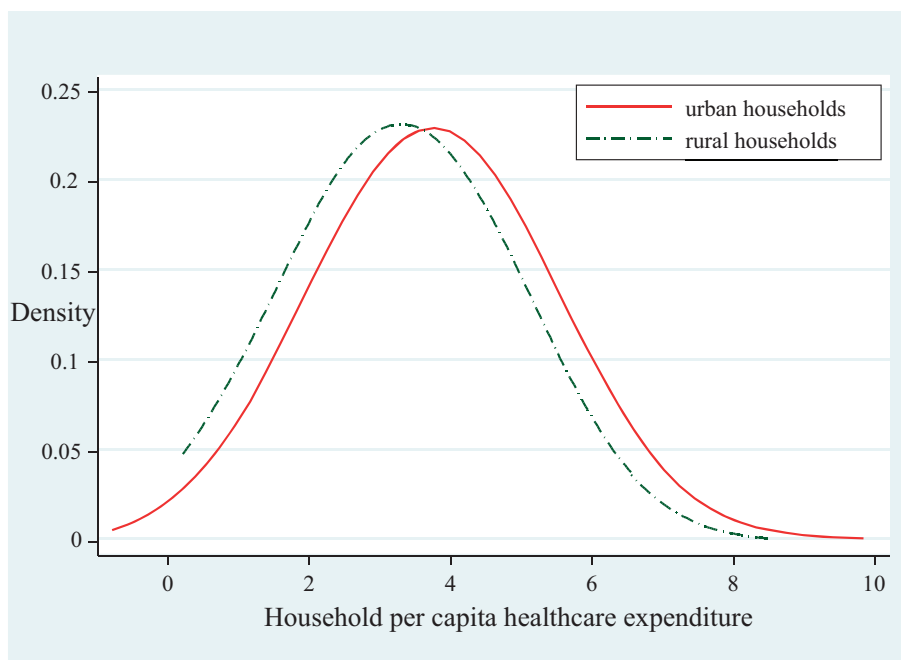

Figure 1.
Rural-urban inequality in healthcare expenditure in Ghana, 2012/2013

Source: Computed by authors from GLSS 6, 2012/2013

Variables	Rural		Urban		Mean	p-value
	Mean	SE	Mean	SE	Difference	
Healthcare expenditure	3.45	0.04	3.84	0.04	−0.39***	0.00
Age	47.55	0.32	44.45	0.34	3.10***	0.00
Female	0.26	0.01	0.35	0.01	−0.09***	0.00
Christian	0.67	0.02	0.77	0.02	−0.10***	0.00
Akan	0.47	0.02	0.53	0.2	−0.06*	0.06
Other employments	0.04	0.00	0.07	0.01	−0.03***	0.00
Salaried/wage employment	0.12	0.01	0.35	0.01	−0.23***	0.00
Self-employment	0.84	0.01	0.58	0.02	0.26***	0.00
No education	0.47	0.02	0.25	0.02	0.22***	0.00
Basic education	0.44	0.01	0.47	0.01	−0.02	0.19
At least secondary education	0.08	0.01	0.28	0.02	−0.20***	0.00
Income	6.92	0.04	7.07	0.05	0.15***	0.01
% ill	15.07	0.55	13.62	0.56	1.45*	0.07
% insured	6.91	0.60	12.53	1.03	−5.62**	0.00
% < 18 years	16.35	0.21	16.05	0.28	0.29	0.40
% > 64 years	8.34	0.41	6.17	0.40	2.17***	0.00

Notes: All but health expenditure, age, income, ill members, health insured, young dependents and old dependents, are in proportions. SD = standard deviation. SE = linearised standard errors. Sample weights and clusters used in the estimation of the mean values and SEs
Source: Computed by authors from GLSS 6, 2012/2013

Table 3.
Summary statistics of the selected variables by place of residence

below 18 years and those above 64 years, are, however, significant in the lower (10th and 25th) and mid (50th) quantiles only. The significant individual-level variables ($p < 0.05$) – comprising employment type, higher education and ethnicity- are found to have differential effects on household healthcare expenditure across space and along the selected quantiles. The results indicate that the differences in the determinants of household healthcare expenditure across space and the selected quantiles exist mainly in the individual-level variables.

Income and ill-health are reported to have positive effects on household healthcare expenditure. You and Kobayashi (2011), Olasehinde and Olaniyan (2017) made similar observations in their study of China and Nigeria, respectively. On average, we find that a percentage change in income results in a 0.158 percentage change in healthcare expenditure in Ghana. The income elasticity of demand for healthcare being positive but less than one presupposes that healthcare is considered a necessity good by both rural and urban households in Ghana. The low-income elasticity reported is plausibly due to the presence of the NHIS in Ghana, which renders the ability to pay a less important determinant of healthcare expenditure. Rous and Hotchkiss (2003), however, report a higher income elasticity of 1.02 for Nepal, using data from 1995/1996. Along the selected quantiles, we find the income elasticity to be greater in the rural sample relative to the urban sample. Olasehinde and Olaniyan (2017) reported the same for rural and urban Nigeria at the mean expenditure. Income as a determinant of household healthcare expenditure is more important in rural areas compared to the urban areas.

Our study further finds that the percentage of medically insured household members is positively associated with household healthcare expenditure. This suggests a complementary relationship between the two variables. A plausible reason for this finding is the fact that health insurance policies in Ghana, the NHIS inclusive, mostly do not cover the entire costs incurred while seeking and obtaining healthcare, and thus, households

Explanatory Variables	10th quantile		25th quantile		50th quantile		75th quantile		90th quantile	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Head characteristics										
Age/100	-0.170(1.692)	1.24(1.03)	1.714(1.667)	0.07(1.12)	1.887(1.529)	-0.30(0.97)	3.135*(1.665)	0.13(1.24)	3.050(2.083)	2.71*(1.64)
Age²	0.340(1.764)	-1.24(1.01)	-1.109(1.703)	-0.14(1.06)	-1.209(1.509)	0.28(0.92)	-2.425(1.651)	-0.03(1.19)	-2.336(2.125)	-2.01(1.54)
Female	0.114(0.127)	-0.09(0.10)	-0.134(0.096)	-0.01(0.09)	-0.021(0.099)	0.05(0.08)	0.144(0.097)	0.09(0.08)	0.192(0.120)	0.04(0.12)
Salaried/wage	-0.040(0.133)	-0.40**(0.17)	0.076(0.189)	-0.29(0.18)	0.138(0.153)	-0.30**(0.15)	-0.172(0.169)	-0.19(0.20)	-0.502*(0.259)	0.13(0.25)
Self-employed	0.175(0.143)	0.22(0.14)	0.576***(0.209)	0.32**(0.15)	0.528***(0.162)	0.22*(0.13)	0.127(0.165)	0.33**(0.17)	-0.110(0.258)	0.54**(0.22)
Basic	0.135(0.141)	-0.01(0.09)	0.234*(0.121)	0.08(0.09)	0.200*(0.104)	-0.05(0.07)	0.148*(0.089)	-0.09(0.07)	0.165(0.116)	-0.10(0.10)
At least secondary	0.121(0.166)	0.16(0.12)	0.271*(0.143)	-0.04(0.14)	0.157(0.124)	-0.10(0.11)	0.187*(0.110)	0.01(0.13)	0.382***(0.147)	0.08(0.19)
Christian	0.053(0.140)	0.04(0.09)	-0.010(0.105)	0.09(0.07)	0.099(0.094)	-0.01(0.06)	-0.032(0.079)	0.01(0.07)	-0.019(0.106)	-0.00(0.09)
Akan	0.163(0.111)	0.33***(0.08)	0.175*(0.096)	0.34***(0.08)	0.282***(0.087)	0.45***(0.07)	0.212**(0.081)	0.42***(0.07)	0.152(0.106)	0.41***(0.09)
Household characteristics										
Income	0.154***(0.033)	0.17***(0.03)	0.123***(0.024)	0.16***(0.02)	0.115***(0.022)	0.16***(0.03)	0.127***(0.023)	0.21***(0.03)	0.127***(0.031)	0.23***(0.04)
% ill	0.012***(0.002)	0.02***(0.00)	0.017***(0.002)	0.02***(0.00)	0.020***(0.002)	0.01***(0.00)	0.018***(0.002)	0.02***(0.00)	0.017***(0.003)	0.02***(0.00)
% insured	0.005***(0.001)	0.01***(0.00)	0.008***(0.002)	0.00***(0.00)	0.010***(0.002)	0.00***(0.00)	0.007***(0.002)	0.01***(0.00)	0.006***(0.003)	0.01***(0.00)
% < 18 years	0.003(0.003)	0.01**(0.00)	0.010*(0.003)	-0.00(0.00)	0.008***(0.003)	0.00(0.00)	-0.000(0.003)	-0.00(0.00)	-0.005(0.004)	-0.00(0.00)
% > 64 years	0.001(0.003)	0.00*(0.00)	0.002(0.003)	0.00*(0.00)	0.002(0.003)	0.00(0.00)	0.002(0.003)	0.00(0.00)	0.006(0.005)	-0.00(0.00)
Mills	1.861***(0.281)	2.40***(0.25)	2.299***(0.278)	2.25***(0.22)	2.581***(0.260)	2.11***(0.25)	2.217***(0.251)	2.54***(0.24)	1.835***(0.310)	2.83***(0.34)
Constant	-0.866(0.622)	-1.78*(0.49)	-1.084*(0.599)	-0.55(0.44)	-0.498(0.574)	0.64(0.42)	0.937(0.592)	0.78(0.49)	2.248(0.743)	0.37(0.68)
Observations	3,846	5,410	3,846	5,410	3,846	5,410	3,846	5,410	3,846	5,410
R^2	0.044	0.05	0.065	0.08	0.105	0.10	0.113	0.14	0.077	0.08

Notes: Results from the UQR (corrected for sample selection bias). Bootstrap standard errors in parentheses. *** $p < 0.01$; ** $p < 0.05$; and * $p < 0.1$
Source: Computed by authors from GLSS6, 2012/2013

Table 4.
Determinants of
rural-urban
household healthcare
expenditure in
Ghana, 2012/2013

unavoidably are required to incur additional costs. In the NHIS for instance, dialysis and chemotherapy for the treatment of kidney and cancer conditions are not covered by the scheme. Furthermore, as expected, the percentage of dependants (both young and old) is found to have a positive and significant effect on household healthcare expenditure. This is particularly so in the lower and mid quantiles; though varies across space.

Relative to households headed by persons in domestic or family employments or apprenticeships, households headed by persons in paid jobs in rural areas are found to spend less on healthcare. This is particularly so among households in the lowest (10th) and mid (50th) quantiles only. The rationale for this may be that households headed by persons in paid jobs together with their dependents, benefit from paid healthcare by their employers and, hence, tend to spend less on healthcare. Besides, as enrolment in the NHIS is mandatory for public sector employees, households headed by government workers are more likely to be insured and, thus, spend less OOP on healthcare. van der Wielen *et al.* (2018) highlight the positive correlation between public sector employment and enrolment in the NHIS. Moreover, but for the households in the 10th quantile, both rural and urban households headed by persons in self-employments are found to spend more on healthcare. In the higher quantiles (75th and 90th), self-employment is significant ($p < 0.05$) only among rural households.

Finally, though Rous and Hotchkiss (2003) report a negative relationship between higher education and household healthcare spending in Nepal, higher education is found to have a positive effect on higher household healthcare expenditure allocation in urban Ghana. Particularly, the attainment of at least a secondary education variable is reported to be significant ($p < 0.01$) in the 90th quantile in the urban sample only. Suggestively, higher education is associated with higher healthcare spending in urban Ghana. This evidence discourages the use of the same healthcare financing policies based on education to address healthcare needs in both rural and urban Ghana.

5.3 Rural-urban inequality in healthcare expenditure

Table 5 shows the results from the UQR-based decomposition for the rural-urban healthcare expenditure gap and the determinants of the gap. Similar to the earlier discussion, the significance ($p < 0.01$) of the IMR proposes the presence of selection bias, which when not corrected would result in the inconsistent estimation of the covariates. The total gap is decomposed into explained (endowments/covariate) and unexplained (returns to covariates). The contribution of the covariates to the gap is found to be greater than that of the returns. Moreover, beyond the 25th quantile, the overall gap is found to mimic the trend of the unexplained gap more than the trend in the explained gap (Figure 2). The results in Table 5 indicate that the overall gap in the rural-urban healthcare expenditure is significantly influenced by gaps in both the explained and unexplained factors. Along with the entire distribution of healthcare expenditure, urban households are found to expend more on healthcare than rural households. The observed gap is found to be greatest among the households in the least quantile (10th and 25th) and least among the average spenders (in the 50th quantile) on healthcare.

Differences in per capita income, percentage of household members enrolled on health insurance policies and ethnic affiliation between rural and urban households proved to contribute most to the rural-urban household healthcare expenditure gap. This is because these variables are found to have significant ($p < 0.05$) and positive effects on the household healthcare expenditure gap between rural and urban households in all the quantiles. Agyire–Tettey *et al.* (2017) report that though Ghana has experienced impressive economic growth since the 1990s, between-group inequalities remain ubiquitous. This suggests that the country's

Explanatory variables	10th quantile		25th quantile		50th quantile
	(1) Explained	(2) Unexplained	(3) Explained	(4) Unexplained	(5) Explained
Difference	0.518***(0.057)		0.492***(0.046)		0.415***(0.037)
Total Decomposition	0.269*** (0.037)	0.249*** (0.071)	0.265*** (0.033)	0.228*** (0.056)	0.332*** (0.028)
Detailed decomposition					
Head characteristics					
Age/100	−0.017(0.045)	−0.539(0.965)	−0.039(0.037)	0.525(0.815)	−0.046(0.037)
Age^2	0.008(0.050)	0.464(0.530)	0.029(0.040)	−0.103(0.431)	0.031(0.039)
Female	0.000(0.009)	0.015(0.028)	−0.018**(0.008)	−0.022(0.027)	−0.005(0.007)
Salaried/wage	−0.006(0.033)	0.037(0.025)	0.005(0.029)	0.035(0.023)	0.030(0.027)
Self-employed	−0.109*(0.037)	0.193(0.182)	−0.149***(0.036)	0.307*(0.166)	−0.135***(0.032)
Basic	−0.002(0.008)	−0.034(0.054)	0.003(0.007)	−0.033(0.043)	0.006(0.006)
At least secondary	0.012 (0.024)	−0.013 (0.014)	0.032 (0.021)	0.012 (0.013)	0.030 (0.020)
Christian	0.018(0.014)	0.098*(0.087)	0.013(0.012)	0.014(0.066)	0.020*(0.010)
Akan	0.036***(0.013)	−0.074*(0.038)	0.029**(0.011)	−0.069**(0.034)	0.037**(0.012)
Household characteristics					
Income	0.021***(0.006)	−0.582**(0.247)	0.017***(0.005)	−0.602***(0.190)	0.015***(0.005)
% ill	−0.003(0.007)	−0.035(0.030)	−0.004(0.009)	−0.023(0.028)	−0.004(0.010)
% insured	0.027***(0.007)	−0.004(0.011)	0.033***(0.007)	0.007(0.012)	0.041***(0.008)
% < 18 years	−0.000(0.001)	−0.137**(0.061)	−0.001(0.002)	0.080(0.059)	−0.001(0.002)
% > 64 years	−0.004(0.004)	−0.033(0.022)	−0.006(0.004)	−0.009(0.021)	−0.007*(0.004)
Mills	0.288***(0.031)	−0.143(0.168)	0.319***(0.030)	0.134(0.153)	0.320***(0.027)
Constant		1.037(0.682)		−0.026(0.634)	
Observations	9,256	9,256	9,256	9,256	9,256

Notes: Results from UQR-based decomposition method. Bootstrap standard errors in parentheses ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$
Source: Computed by authors from GLSS6, 2012/2013

(continued)

Table 5.

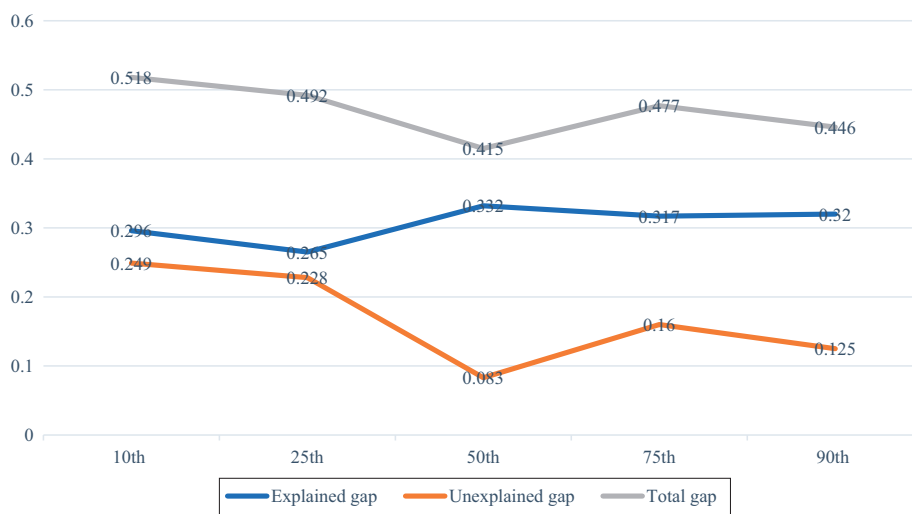| Explanatory variables	50th quantile	75th quantile		90th quantile	
	(6) Unexplained	(7) Explained	(8) Unexplained	(9) Explained	(10) Unexplained
Difference	0.415***(0.037)	0.477***(0.037)		0.446***(0.047)	
Total	0.083*(0.044)	0.317***(0.027)	0.160***(0.037)	0.320***(0.036)	0.125***(0.046)
Decomposition					
Detailed decomposition					
Head characteristics					
Age/100	0.978(0.739)	−0.071*(0.035)	1.005*(0.701)	−0.061(0.046)	−0.153(0.953)
Age²	−0.333(0.390)	0.055(0.037)	−0.400(0.375)	0.040(0.049)	0.117(0.495)
Female	−0.016(0.021)	0.005(0.007)	0.001(0.023)	0.009(0.010)	0.010(0.029)
Salaried/wage	0.040**(0.020)	−0.043(0.029)	−0.006(0.021)	−0.057(0.039)	−0.028(0.028)
Self-employed	0.281*(0.144)	−0.018(0.034)	−0.186(0.150)	−0.009(0.047)	−0.303(0.198)
Basic	0.022(0.038)	0.009*(0.005)	0.053*(0.032)	0.014**(0.006)	0.098**(0.042)
At least	0.019*	0.038***	0.019*	0.077***	0.018
secondary	(0.011)	(0.017)	(0.011)	(0.022)	(0.014)
Christian	0.072(0.060)	−0.003(0.009)	−0.032(0.054)	−0.004(0.011)	−0.018(0.066)
Akan	−0.070*(0.031)	0.039*(0.010)	−0.059**(0.028)	0.033*(0.012)	−0.084**(0.039)
Household characteristics					
Income	−0.612***(0.181)	0.017***(0.005)	−0.733***(0.182)	0.017***(0.005)	−0.844***(0.228)
% ill	0.056**(0.027)	−0.004(0.008)	−0.014(0.028)	−0.004(0.009)	0.003(0.043)
% insured	0.018(0.012)	0.029***(0.008)	−0.005(0.014)	0.029**(0.012)	−0.020(0.023)
% < 18 years	0.030(0.055)	0.000(0.001)	0.009(0.054)	0.001(0.002)	−0.102(0.074)
% > 64 years	0.012(0.021)	−0.009*(0.004)	0.031(0.024)	−0.011*(0.006)	0.077**(0.034)
Mills	0.313*(0.131)	0.273*(0.025)	−0.032(0.129)	0.247***(0.032)	−0.156(0.169)
Constant	−0.726(0.543)		0.507(0.540)		1.512**(0.713)
Observations	9,256	9,256	9,256	9,256	9,256

Figure 2.
Distribution of the
rural-urban
household healthcare
expenditure gap,
2012/2013

Source: Computed by authors from GLSS 6, 2012/2013

growth has not been equitably distributed. The rural sector increasingly accounts for the biggest share of the extremely poor population (Ghana Statistical Service, 2018). More so, the institution of the NHIS to protect the poor, most of whom reside in the rural areas, from financial catastrophes associated with healthcare consumption has been pro-urban (Akazili *et al.*, 2014). The informal fees charged at NHIS accredited facilities further discourage participation in the NHIS especially by the poor. We show that efforts to narrow the rural-urban household healthcare expenditure gap should be directed towards minimising the rural-urban gaps in household income per capita and enrolment on health insurance policies.

Other significant variables including self-employment and formal education are reported to differ on how they affect the rural-urban healthcare expenditure gap along the selected quantiles. In particular, albeit self-employment is found to have a significant ($p < 0.01$) and negative effect on the gap in the 10th, 25th and 50th quantiles, formal education is reported to have a significant ($p < 0.05$) and positive effect on the gap in the higher quantiles (75th and 90th) only. In regard to policy, policymakers in attempts to alleviate and ultimately eradicate, the rural-urban household healthcare expenditure gap among Ghanaian households, which spend most on healthcare ought to consider reducing the rural-urban gaps in the attainment of formal education.

6. Conclusion

This paper attempts to provide a distributional analysis of the rural-urban healthcare expenditure differentials in Ghana. In particular, it investigates the differences in the determinants of household healthcare expenditure across space and along selected quantiles of healthcare expenditure. The rural-urban expenditure gap and its determinants along selected quantiles are also explored. Because equity in the access and use of healthcare resources is a global development agenda, policymakers ought to know these differences for effective policy.

Results from UQR indicate that individual-level variables including employment type, higher education and ethnicity are more important in explaining household healthcare expenditure differentials across space (rural vs urban) and along the selected quantiles compared to household-level characteristics. Besides, based on the UQR-based decomposition method, the study finds a

positive health expenditure gap in favour of urban households. This gap is reported to be greatest among households in the lower quantiles. Further findings are that this gap is principally driven by rural-urban differences in household income per capita, percentage of household members enrolled on health insurance policies and ethnic affiliation.

We suggest that, as different factors affect household healthcare spending, targeted policies should be prioritised. Furthermore, to reduce rural-urban healthcare expenditure inequality, efforts must be geared towards narrowing the rural-urban differences in income per capita and enrolment on health insurance policies.

Notes

1. Following Heckman (1979) two-step approach.

2. Included both those who spent on healthcare and those who did not spend on healthcare.

3. The dominant ethnic group, accounting for more than 50% of the population.

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Corresponding author

Bernardin Senadza can be contacted at: bsenadza@ug.edu.gh

Appendix A

Explanatory variables	Coefficient	Linearised Standard error
Head characteristics		
Age/100	1.038	0.828
Age^2	−1.001	0.822
Female	−0.065	0.054
Salaried/wage	−0.002	0.109
Self-employed	0.349***	0.113
Basic	−0.129**	0.060
At least secondary	−0.179**	0.083
Ethnicity	0.107	0.075
Religion	−0.044	0.070
Household characteristics		
Income	0.063***	0.018
% ill	0.010***	0.001
% insured	0.004**	0.002
% < 18 years	0.004**	0.002
% > 64 years	0.002	0.001
Exclusion principle variables		
North	−0.300*	0.174
Forest	−0.186	0.159
Coastal	−0.329*	0.195
GAMA	−0.343	0.210
Household size	0.214***	0.023
Household size square	−0.009***	0.002
Constant	−1.158***	0.272
Observations	16,514	
F-statistic	13.45 (0.000)	
F-adjusted mean residual test	0.521 (0.860)	

Notes: ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$
Source: Computed by authors from GLSS6, 2012/2013

Table A1.
Logistic regression:
determinants of
household healthcare
expenditure, 2012/
2013