Out-of-pocket healthcare payment for primary healthcare in the era of national health insurance: a five-year study of seven districts in northern Ghana

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Abstract

Background: Ghana introduced a national health insurance program in 2005 with the goal of removing the impoverishing effects of out-of-pocket healthcare payments and ensure access to equitable health care. However, over a decade of implementation, the impact of this program on out-of-pocket payments (OOP) is inconsistent. This paper examines the trend in out-of-pocket payment for primary health care and the determinants of out-of-pocket payments.

Methods: Using a five-year panel data of revenues accruing to public primary health facilities, we employed descriptive statistics and mean comparison test (t-test) to examine the trend in revenues accruing from out-of-pocket payment vis-à-vis health insurance claims for health services, medication, and obstetric care. Furthermore, a multiple linear regression model is fitted to assess the relationship between four explanatory variables and out-of-pocket health payment.

Results: Out-of-pocket payment for health services and medications were found to reduce by 63% and 62% respectively between 2010 and 2014. Total insurance claims however increased by 16% within the same period. The t-test was statistically significant for the mean reduction in out-of-pocket payment but not that of insurance claims. Factors significantly associated with out-of-pocket payment in a given district are population, number of community health facilities and year of observation.

Conclusion: There was a general significant reduction in revenues accruing from out-of-pocket healthcare payment over the five-year study period. Thus, Ghana's national health insurance program is significantly contributing to reducing out-of-pocket payment because the revenue base of primary health outlets is progressively shifting from out-of-pocket payment to insurance claims.

Key Words: *Out-of-pocket payment, National Health Insurance Scheme, primary health care, GEHIP, Ghana*

Introduction

The United Nations Sustainable Development Goals (SDGs) has reiterated the need for countries to ensure the financial risk protection of their citizens against the cost of unforeseen ill health and to work towards attaining Universal Health Coverage (UHC) [1]. Globally, it is estimated that over 150 million people face financial catastrophe while about 100 million are pushed into poverty each year due to direct out-of-pocket healthcare payments [2]. In addition, direct out-of-pocket healthcare payments have detrimental effects on the allocation of household disposable income for basic needs such as food, shelter, clothing, education and utilities among others [3, 4]. This creates the need for health systems to ensure financial protection of individuals and households against the economic burden of ill health.

Recognizing this, the World Health Assembly resolution (WHA)58.33 called on member countries to commit to transition towards Universal Health Coverage (UHC) [5]. The concept of universal health coverage aims to ensure all people have access to healthcare services when in need without financial impediments. It encompasses three dimensions: the proportion of people covered, the range of services covered and the proportion of health cost covered [2, 6].

Health insurance has been recognized as an effective approach for the equitable financing of health care. By pooling risk and resources together, health insurance has the potential to improve access

to healthcare while providing risk protection against the cost of healthcare expenditure [7, 8]. However, usually evaluating the impact of health financing interventions is dicey and the available evidence does not often support a unanimous conclusion [9]. This implies that health financing interventions such as national health insurance schemes require continuous monitoring and evaluation in order to inform policy and practice. This study thus seeks to assess the impact of Ghana's national health insurance program on out-of-pocket health payments and contribute to the evidence-base of the financial risk protection provided by its implementation.

Overview of Ghana's National Health Insurance Scheme

Ghana introduced a Nationwide Health Insurance Scheme (NHIS) in 2004 with the goal of removing financial barriers to accessing healthcare and protecting all citizens from catastrophic healthcare payments that arise from direct out-of-pocket fees at the point of service delivery [10–13]. It is based on a contributory model where service benefits are restricted to contributors except people under the age of 18 years, pensioners, those above 65years and indigents [10, 14, 15]. Enrolment unto the NHIS is mandatory by law, however, the fact that it is a social policy coupled with the large informal sector workers in Ghana, enforcement of its mandatory requirement is fraught with difficulties. Thus the scheme relies on the voluntary registration of members from the informal sector [11].

The (NHIS) is financed by premium payments by subscribers, a 2.5% national health insurance levy on Value-added Tax (VAT) collected on selected goods and services, another 2.5% deduction of workers contribution to the Social Security and National Insurance Trust (SSNIT) fund. Other sources of funding to the NHIS are Government of Ghana budget allocations, grants, donations and proceeds of investments made by the national health insurance council [10, 16, 17].

The NHIS benefit package covers about 95% of all diseases conditions in Ghana, services covered by the scheme include outpatient, services, essential drugs, inpatient accommodation, maternity care including cesarean delivery, dental care, and eye care among others [18].

Previous studies have shed light on various aspects of Ghana's health insurance scheme, including helping to understand the determinants of enrolment onto the scheme [15, 19], the perception and experience of stakeholders with the NHIS [10], it's contribution to health facility utilization [20], its alignment with primary care goals [13], how the informal sector could be more actively involved [11], and its financial protective effects [9, 12, 21, 22] among others.

While there is population-level evidence that Ghana's national health insurance is contributing to a reduction in catastrophic healthcare payments and indeed has financial protective capabilities [9, 21, 22], some studies also reveal that out-of-pocket health payment is still prevalent and pervasive in Ghana [9, 23]. For instance, the most recent demographic and health surveillance report reveal that one-third of people covered by the NHIS still pay out-of-pocket for medicines and services [23].

In the face of the mix evidence on the impact of Ghana's national health insurance program on direct out-of-pocket payments, there is the need for more empirical studies to examine the extent to which Ghana's national health insurance policy is achieving its goal of impacting on out-of-pocket payments and financial risk protection against the cost of unforeseen ill health. This paper adopts a provider perspective by using health facility-based revenue data to contribute to the knowledge based on the extent to which Ghana's national insurance program is impacting on out-of-pocket payment.

Methods and Materials

Source of data and study setting

This paper used a five-year panel data collected from public primary healthcare facilities in seven districts of the Upper East Region (UER) of northern Ghana. The data was collected as part of the costing arm of a five-year health system strengthening and research program called the Ghana Essential Health Intervention Project (GEHIP) that was implemented from 2010 to 2015. This data was collected to help assess the cost-effectiveness of the GEHIP project. (Details of GEHIP are described elsewhere [24, 25]).

The UER is one of the ten administrative regions of Ghana. It ranks among the three poorest and remote regions in the country with a population of over 1 million people, it is located in the northeastern corner of Ghana within the Savannah ecological belt. Subsistence agriculture is the predominant occupation of the indigenes, with only one short rainy season and deteriorating soil fertility, poverty is pervasive, formal educational status is low and migration to the southern part of Ghana during the dry season is a common practice [25–27]. The seven districts from which data for this study were collected are Bolgatanga Municipal, Builsa District, Bongo District, Talensi-Nabdam District, Bawku Municipal, Bawku West District and Garu-Tempani District. These seven districts make up a total population of about 906,459 at the time of the study. As at 2014 when this data collection was taking place, five of the districts had district hospitals, also 33 health centers and a total of 106 community-based healthcare compounds were present within the study area.

Data collection and analysis

Revenue data was systematically collected on all public primary healthcare facilities in the seven selected districts that were involved in the GEHIP project on a quarterly basis. Data were collected by trained research assistants from the respective District Health Management Teams (DHMT) for each district and entered into an excel template.

Internally generated funds were extracted separately for analysis, funds from national health insurance claims were separated from that of direct out-of-pocket payment from patients. Data was collected in the local Ghanaian cedi but converted to US dollar equivalent during analysis using mid-year exchange rates reported by the Bank of Ghana. From the data, three major healthcare revenue items were determined namely: medications, services, and obstetric care. Descriptive statistics is first used to present out-of-pocket health payment and health insurance claims by medications, services and obstetric care for 2010-2014 while percentage change over the period. The year 2010 was used as the base year for the purpose of comparisons. While 2010 represent about six years into the implementation of Ghana's national health insurance policy, the reason for its selection as the base year in this study is arbitrary and only represent the first point at which our data were collected.

Next, using STATA version 14 software, we perform a mean comparison test to determine and compare the statistically difference by pairing out-of-pocket payments and insurance claims of 2010 (the based year) each of the subsequent years (i.e. 2011, 2012, 2013 and 2014). We report standard errors and p-values of all paired cases. Lastly, we sort to explore the relationship between revenues accruing from out-of-pocket payment and five explanatory variables using multiple linear regression. The variable used in this analysis are: year of observation, population, number of community-based health facilities, number of health centers and the presence of a district hospital.

The basic assumption in this study is that if there are progressively higher and significant out-of-pocket payments relative to insurance claims, then the impact of Ghana's health insurance program is assumed to be ineffectively contributing to reducing out-of-pocket payments. On the other hand, if there exist relatively high insurance claims as against out-of-pocket payments, then the program is deemed to be progressively reducing out-of-pocket payments and thus contributing to removing financial barriers to healthcare and Ghana's health sector goal of moving towards universal health coverage.

Results

Table 1 shows the revenues from out-of-pocket payments and health insurance claims in the seven study districts over the 2010-2014 period. It is observed that out-of-pocket payment for healthcare at the point of care reduced significantly over the period. For instance, out-of-pocket payment for medications reduced by 62% while that of services reduced by 63% in 2014 using the year 2010 as the base year.

Table 1: Revenues from Out-of-pocket payments and Insurance Claims (2010-2014)

Out-of-Pocket payment								
Year	**Medicines**		**Services**		**OBGY**		**Total**	
	Amount	**% Change**	**Amount**	**% Change**	**Amount**	**% Change**	**Amount**	**% Change**
2010	64,753.74	-	51,289.16	-	-	-	116,042.89	-
2011	57,712.67	-10.87	36,907.84	-28.04	-	-	94,620.51	-18.46
2012	45,590.81	-29.59	32,839.93	-35.97	-	-	78,430.75	-32.41
2013	42,121.98	-34.95	29,249.20	-42.97	-	-	71,371.18	-38.5
2014	24,936.51	-61.49	19,246.92	-62.47	-	-	44,183.43	-61.92
Total	**235,115.71**		**169,533.05**		**-**		**404,648.76**	
Health Insurance Claims								
Year	**Medicines**		**Services**		**OBGY**		**Total**	
	Amount	**% Change**	**Amount**	**% Change**	**Amount**	**% Change**	**Amount**	**% Change**

2010	1,050,963.54	-	600,384.49	-	157,721.86	-	1,809,069.88	-
2011	1,075,459.58	2.33	657,471.90	9.51	262,691.54	66.55	1,995,623.02	10.31
2012	1,162,036.26	10.57	742,906.70	23.74	229,201.18	45.32	2,134,144.14	17.97
2013	1,403,336.84	33.53	822,940.72	37.07	302,967.71	92.09	2,529,245.27	39.81
2014	1,145,589.36	9.00	677,536.16	12.85	276,593.39	75.37	2,099,718.90	16.07
Total	**5,837,385.58**		**3,501,239.97**		**1,229,175.67**		**10,567,801.22**	

2010 is used as the reference point for % change

Also, in all cases, there was an increase in insurance claims. For instance, claims for medications increased to as high as 34% in 2013 and then 9% in 2014. That of services increase by 37% in 2013 and then settled at 13% in 2014. Health insurance claims was observed to have taken the overall cost of obstetric care. With about $157,721.86 insurance claims in the year 2010, this figure increased by 92% in 2013 and then settled at 75% increment in 2014.

Figure 1 depicts the five-year trend in out-of-pocket payments for medications and services for the five-year period. It also portrays the steady decrease in out-of-pocket payment for health service and medication from 2010 to 2014

[Insert Figure 1 about hear)]

Figure 2 is a comparison of the percentage distribution of out-of-pocket healthcare payment and health insurance claims over the study period. In 2010, while insurance claims were 94% of all revenues accruing to primary healthcare facilities in the seven study districts, out-of-pocket payments was only 6.03%. This percentage further dropped to 4.53%, 3.54%, 2,74% and 2.07% respectively for the years 2011, 2012, 2013 and 2014 respectively. Percentage of insurance claims, however, increased steadily to 97.93% of total revenue by the year 2014.

[Insert Figure 2 about here)]

The mean comparison test (t-test) is shown in Table 2. It can be observed that the mean reduction in out-of-pocket payment for medications comparing the year 2010 and 2014 was significant at 5% level of significance. Also, the mean total out-of-pocket payment was significant at 10% level of significance. Mean comparison for health insurance claims was however not statistically significant.

Table 2: Mean Comparison Test (t-test) Using 2010 as Comparison Year.

Out-of-Pocket Payment					Insurance Claims			
	Mean	Std. Err.	Pr (|T| > |t|)		Mean	Std. Err.	Pr(|T| > |t|)
Medicines				**Medicines**			
2010	9250.53	2200.90		2010	150137.60	37623.74	
2011	8244.67	2011.58	0.742	2011	153637.10	23692.66	0.939
2012	6512.97	1740.95	0.349	2012	166005.20	26286.83	0.736
2013	6017.43	2651.08	0.367	2013	200476.70	32464.77	0.331
2014	3562.36	1289.14	0.046	2014	163655.60	20672.11	0.758
Service				**Service**			
2010	7327.024	3489.46		2010	85769.21	13492.69	
2011	5272.548	1039.658	0.5830	2011	93924.56	6729.046	0.599
2012	4691.419	798.2169	0.4757	2012	106129.50	7614.583	0.213
2013	4178.459	1015.631	0.4033	2013	117563.00	12143.12	0.105
2014	2749.561	643.0391	0.2213	2014	96790.88	8069.039	0.497
Total Out-of-Pocket				**Total Insurance Claims**			
2010	16581.7	4785.157		2010	258438.60	53813.43	
2011	13517.22	2626.376	0.585	2011	285089.00	35154.24	0.686
2012	11204.39	2327.428	0.332	2012	304877.70	38781.77	0.497
2013	10195.88	3566.824	0.306	2013	361320.80	46091.88	0.172
2014	6334.033	1890.123	0.070	2014	299959.80	31874.62	0.519

Linear regression results are presented in Table 3, the results reveal that with each progressive year between 2010-2014, out-of-pocket payment reduced by $ 3596.57 (p-value 0.033). Also, with a unit increase in a district's population, out-of-pocket payment increases by about $ 0.07 (p-value = 0.011). If the number of community-based health service (CHPS) increase by 1, the level of out-of-pocket payment increase by $ 1027 (p-value 0.069) but the number of health centers in a district

and the availability of a Hospital is not significantly associated with the level out-of-pocket payment for primary healthcare.

Table 3: Multiple Linear Regression Analysis of Out-of-pocket payment

Out-of-Pocket Payment	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
Year Observed	-3596.57	1609.168	-2.24	0.033	-6882.93	-310.206
Population(District)	0.071188	0.026253	2.71	0.011	0.017573	0.124803
No. CHPS Compounds	1027.037	545.0015	1.88	0.069	-86.0048	2140.078
No. Health Centers	175.4221	719.6536	0.24	0.809	-1294.31	1645.151
Availability of District Hospital	53.8807	3709.947	0.01	0.989	-7522.84	7630.604

$R^2 = 0.6614$, *Adj* $R^2 = 0.60$

Discussion

This paper has analysis health facility revenues data by segregating them by out-of-pocket health care payments and health insurance claims for primary healthcare over a five-year period. The goal to contribute to the evidence on the state of out-of-pocket health payment in Ghana as a national health insurance programs is in operation. Prior to the introduction of the national health insurance scheme in Ghana, the incidence of financial catastrophe and impoverishments due to out-of-pocket healthcare payments in Ghana was relatively high [4, 28]. Although there is still a significant level of out-of-pocket payments in Ghana [21–23], this study shows that at least at the primary healthcare level in public facilities, out-of-pocket payments are significantly declining due to the uptake of health insurance.

Results of this study are consistent with those of previous studies that have shown that although out-of-pocket healthcare payments still exist in Ghana, the national health insurance program is having a positive impact on out-of-pocket healthcare payment and indeed has a protective effect on the financial burden of accessing healthcare [9, 21, 22].

Based on the mean comparison test, this study reveals that medications/drugs had the most significant reduction component of out-of-pocket payment for primary healthcare in the study area. Previous related study did not decipher this fact owing to the fact that they all relied on population-based data which is good for examining OOP but might not be able to disaggregate OOP in the system-based components as this study has done.

linear regression analyses have shown that year of observation, population, number of community-based health facilities are significantly associated with OOP. It indicates that with each successive year, within the five-year study period, there has been a significant steady reduction in OOP. previous studies have alluded to the financial protective abilities of Ghana's national health insurance program[9, 29]. We also found that district population and number of community-based primary health facilities had a significant positive association with OOP and that a unit increase in them results in an increase in OOP payment, the reason for this is might simply be that the more the people, the more they will access health care and then make health payments. Also, higher number of CHPS compounds improves access to primary healthcare at the community level which would contribute to increase in revenue generation either in the form of OOP or insurance claims.

The implication of the outcome of this study in the light of the existing literature on the impact of Ghana's insurance program on out-of-pocket payment is that it complements the population-based studies that have found insurance to have a financial protective effect on healthcare payments. Although these studies have also argued that substantial out-of-pocket payments still exist [9, 21], Findings of this study show that these payments are not pronounced at the primary healthcare level.

Study limitations: this study used data from public primary healthcare facilities, it is possible that out-of-pocket payment in private health facilities and higher levels of care could be different, the

impact of insurance on out-of-pocket payment might, therefore, be overrated in this study. These notwithstanding, this study provides reliable evidence on the impact of Ghana's health insurance on out-of-pocket health payment at the primary healthcare level.

Conclusion

This study has used health facility-based data to contribute to understanding the extent to which Ghana's health insurance program is contributing to removing financial barriers to healthcare delivery in Ghana.

The evidence confirms that Ghana's health insurance program is meaningfully reducing out-of-pocket healthcare payments for primary healthcare in Ghana. There is, therefore, the need for policy makers and implementers to ensure its sustainability. Also, efforts should be made to make it easier for the informal sector workers to fully participate in the insurance program so that Ghana's move towards universal health coverage can be accelerated.

Declarations:

Ethical approval

The GEHIP project obtained ethical approval from the Ghana Health Service Institutional Review Committee as well as the Navrongo Health Research Center Ethics Review Board prior to the conduct of the study.

Consent for publication

Not applicable

Availability of data and materials

Dataset used in this study is available from the corresponding Author upon reasonable request.

Competing interests

All Authors declare no competing interest.

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Author contribution

EWK and JA conceived the idea; EWK did the analysis and drafted the paper, JA, AAB, AP, AC JKAW and JP provided supervisory support and critically reviewed the paper. All Authors read and approved of the final draft for submission.

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Figure Legends

1. Figure 1: Trend in out-of-pocket payment for healthcare services and medications (2010-2014)
2. Figure 2: Comparison of out-of-pocket payment and health insurance claims (2010-2014)

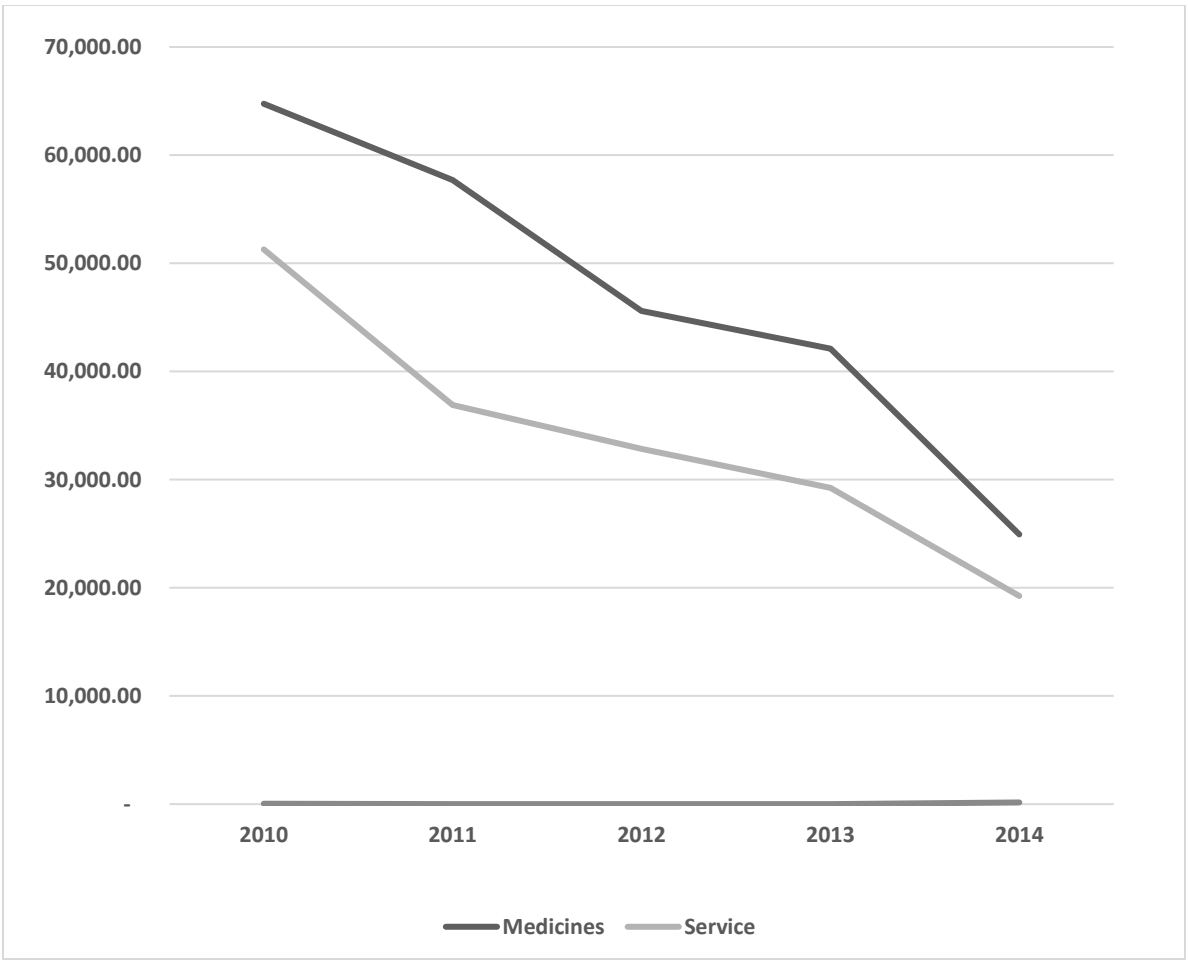

Figure 1: Trend in out-of-pocket payment for healthcare services and medications (2010 to 2014)

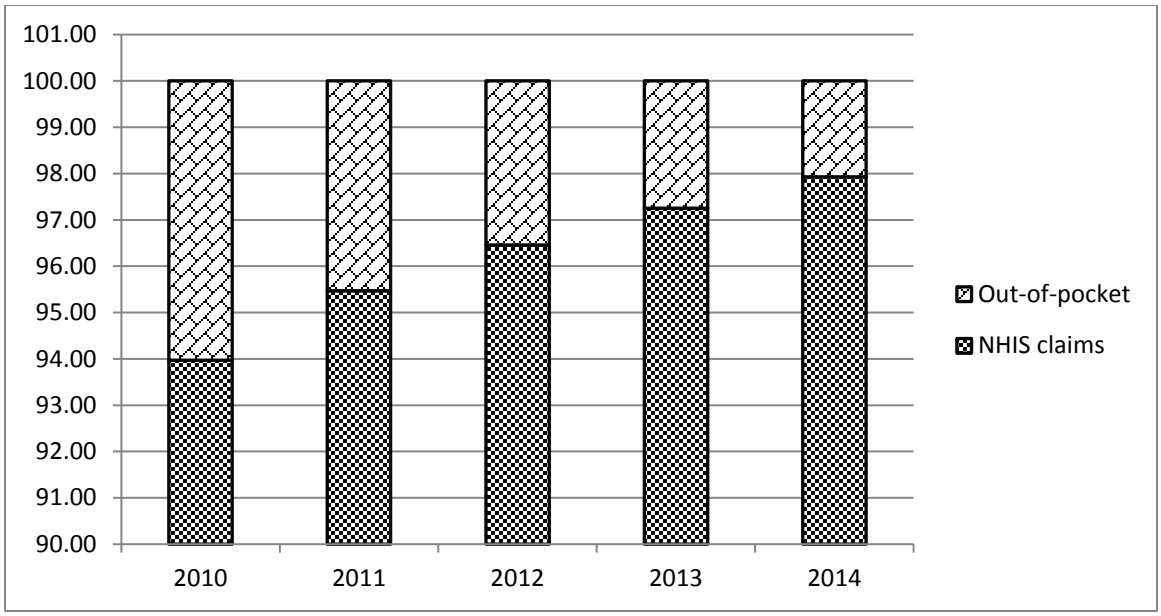

Figure 2: Out-of-pocket payment and health insurance claims (2010-2014)

Supplementary Tables

Table 1: Description of Revenue Categories

Revenue Category	***Description of Expenditure inputs***
Medicines/Drugs	This included all revenue accruing from drugs, vaccines, medical consumables and non-medical consumables such as laboratory test kits, plasters, strings etc.
Service	Included revenue accruing from healthcare services such as consultation, worn dressings, administrative services including surgical operations etc.
Obstetric Care	Include all revenue accruing from antenatal and post-natal care services

Table 2: Background characteristics of study districts

District	Population	Hospital	Health Centers/Clinics	CHPS Compounds
Garu-Tempani	136,087	0	4	18
Builsa	97,343	1	5	21
Bongo	88,502	1	6	18
Bawku Municipal	227,983	1	2	13
Bawku West	98,435	1	4	13
Talensi-Nabdam	120,403	0	3	12
Bolgatanga M.	137,706	1	9	11
Total	**906,459**	**5**	**33**	**106**