

**EFFECT OF CAPITATION PAYMENT ON MEMBERSHIP, OUTPATIENT  
(OPD) UTILIZATION AND COST UNDER THE NATIONAL HEALTH  
INSURANCE SCHEME IN GHANA**

by

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## **ABSTRACT**

In 2012, the National Health Insurance Authority (NHIA) in Ghana introduced a capitation policy within the districts of the Ashanti region, reducing the generosity of their previous insurance program. The key objective of this policy was to lessen escalating healthcare utilization and cost. Employing a natural experiment design, this study uses district-level longitudinal data from 2010-2015 categorized under two main groups, the intervention districts, and the control districts, to examine the impact capitation had on health insurance membership, along with outpatient department (OPD) utilization and cost. This difference-in-differences approach identifies the effect of capitation on each of these factors using ordinary least squares. Findings from this study suggest that a less generous insurance policy reduced program membership by 39 percent, putting resulting downward pressure on OPD utilization (falling 48 percent) and cost (falling 38 percent). Hence, initial results imply the policy met the expectation of the NHIA in that capitation would reduce or slow down OPD utilization and claims cost. However, capitation tended to impact economically vulnerable populations to a greater degree with large decreases in membership occurring especially among those in poverty (upwards of a 70 percent reduction in membership). Additionally, there appears to have been a cost-offset in that capitation also produced rising inpatient department costs by almost 29 percent among impacted districts, suggesting a negative fiscal externality. Thus, policy makers may wish to be cognizant of the inequitable impacts of capitation along with the potential for cost-offsets which reduce the intended objectives of capitation.

## **DEDICATION**

This work is dedicated to Comfort Atiniak (my mom) and Jonas Awuroh Bayong (my late dad). My mom has worked tirelessly after the passing of my dad to bring me this far.

Also to my siblings: Andrews Bayong, Abdel-Rahim Bayong, Mohammed Bayong and Fildauz Bayong for their prayers and support.

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## 1 INTRODUCTION

The government of Ghana, like most governments in African countries, wanted to provide public health care for its citizens at the time of independence through a tax funded health system.<sup>1</sup> However, economic challenges faced by the country in the 1960s and 1970s made it difficult for the nation to continue financing health care with general tax revenues. In light of such challenges, policies regarding out-of-pocket user fees were introduced, which began as a partial cost recovery system, whereby patients were required to pay a percentage of their health care costs (Agyei-Baffour, Oppong, & Boateng, 2013; Adjei, Osei & Diko, 2012). The objective of this paper is to evaluate the impact of one such health insurance policy, capitation, on health insurance membership, outpatient department (OPD) health care utilization, and the corresponding costs.

In particular, a capitation model was introduced in select Ghana districts from 2012-2014. Examining the districts that received this treatment, along with those who did not, allows for a natural experiment opportunity when data is observed over a 2010-2014 period. Exploiting this policy change thereby allows me to examine the effect capitation had on outpatient health care delivery using a difference-in-differences estimator.

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<sup>1</sup> Ghana became an independent state on March 6, 1957, when Britain relinquished its control over the Gold Coast and Ashanti, the Northern Territories Protectorate, and British Togoland.

This paper adds to already existing literature by examining the effect capitation had on health insurance membership, particularly among various, potentially vulnerable subgroups, including the poor and elderly. Another contribution of this paper is that it analyzes the effect capitation had on inpatient department (IPD) utilization and cost – an aspect of health care that was not subject to the capitation policy but may be avenue for cost or utilization ‘offsetting’, representing a fiscal externality. Thus, I hypothesize that while a less generous health insurance model will reduce the quantity of memberships demanded and put downward pressure on OPD utilization and cost, those least able to afford a less generous policy will exit the market, and providers will seek methods to offset reductions in their revenue stream by shifting utilization and cost to IPD channels. Hence, demand-side effects will be, at least, partially offset by supply-side reaction.

As conjectured, my findings suggest that a less generous health care insurance policy led to fewer members, reduced OPD utilization (measured in annual visits), and ultimately lower annual OPD costs (measured in annual US dollars). However, the impact of the policy was not evenly distributed among the population. In fact, it was the poor who were most affected by this policy, followed by children, and those working in the informal sector of the economy. Notably, among the poor, there was almost a 70 percent decline in membership within treatment districts after the policy was implemented, with the next largest impact being among children at about a 41 percent decrease.

Additionally, the reduction of outpatient cost as the result of capitation seems to have resulted in a shifting from outpatient cost to inpatient cost where the National Health Insurance Scheme still used methods not subject to capitation – i.e., Fee for Service concerning drugs along with a Diagnosis Related Groupings payment method. It would appear that while there was not a utilization offset, a cost offset was observed. That is, districts that were the recipients of capitation witnessed no statistically significant change in IPD utilization, however, costs rose by 29 percent which offset a large amount of the 38 percent decrease in OPD costs. Thus, these results suggest there was a degree of cost shifting present, causing a negative fiscal externality which reduces the efficiency of this insurance policy.

The key results of this analysis suggest that policymakers should be aware that economically vulnerable individuals are disproportionately impacted by capitation. Additionally, the cost savings observed within the OPD sector, as a result of a less generous insurance model, are not conclusive evidence of an effective policy. More specifically, policy makers need to examine the impact of such a policy in a more fulsome manner which accounts for the possibility of cost shifting.

In Section 2, a brief background of Ghana's health insurance model is discussed. This section also presents the different payment systems that have been adopted since its inception, showing why and how the capitation system was introduced on a pilot basis. Section 3 provides the methods, which includes definitions of the dependent and explanatory variables, along with the econometric specification that incorporates a

difference-in-differences design. The results are presented in Section 4, and my findings are subsequently discussed in Section 5.

## **2 BACKGROUND**

### **2.1 Health Care in Ghana**

In Ghana, most health care is provided by the government and is largely administered by the Ministry of Health and Ghana Health Services. The health care system has five levels of providers: health posts, health centers and clinics, district hospitals, regional hospitals and tertiary hospitals. Health posts are the first level of primary care for rural areas. These providers listed above are funded by the government of Ghana, financial credits, along with the Internally Generated Fund (IGF) and the Donors-pooled Health Fund. As noted on the MOH website,<sup>2</sup> there are 200 hospitals in Ghana and while some for-profit clinics exist, they provide less than 2 percent of health care services.

Two governmental bodies oversee health care infrastructure and delivery in Ghana – the Ministry of Health (MOH) and Ghana Health Services (GHS). Until 1996, the MOH oversaw the direct provision of health service delivery in Ghana. Today, however, health service delivery is provided by the GHS.

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<sup>2</sup> See: [www.moh-ghana.org](http://www.moh-ghana.org)

The goal of the MOH is, “to improve the health status of all people living in Ghana through effective and efficient policy formulation, resource mobilization, monitoring and regulation of delivery of health care by different health agencies” ([www.moh-ghana.org](http://www.moh-ghana.org)). The MOH works on policy formation, the monitoring and evaluation of health service delivery throughout the country, resource allocation for health services, and the regulation of health services delivery. Additionally, the MOH also develops the framework for the regulations of food, drugs, and health service delivery.

In addition to the above, prior to 1996, the MOH also oversaw the delivery of health services, suggesting concerns of appropriate levels of separation regarding policy and implementation. Thus, in order to fully carry out the Ministry’s duty of policy formation and regulation oversight, there was a need to rethink the role of the MOH in Ghana’s health care delivery system ([www.moh-ghana.org](http://www.moh-ghana.org)). This led to Act 525 in 1996, whereby the responsibilities of health service delivery were shifted to the GHS.

Hence, the second governmental body that works with health care in Ghana is the GHS, which as noted by the Ghana Health Service Council, is: “an autonomous Executive Agency responsible for implementation of national policies under the control of the Minister for Health through its governing Council”. This organization is the service provision arm of the health care system in the country, and works to implement national health care policies, provide health care services, and manage resources for health care delivery. The functions of the GHS include:

- Developing strategies and technical guidelines to achieve national policy goals and objectives.
- Undertaking management and administration of health resources within GHS
- Promoting healthy living and habits among residents
- Establishing effective disease surveillance, prevention, and control
- Determining charges for health services (contingent on approval from MOH)

## **2.2 Health Insurance in Ghana**

The National Health Insurance Scheme (NHIS) is a social intervention program introduced by the Ghana government to provide financial access to quality health care for its residents. NHIS membership in Ghana is voluntary and is largely funded by: The National Health Insurance Levy (NHIL), which is a 2.5 percent levy on goods and services collected under the Value Added Tax (VAT), 2.5 percentage points of Social Security and National Insurance Trust (SSNIT) contributions, monthly returns on National Health Insurance Fund (NHIF) investments, and premiums paid by informal sector subscribers.<sup>3</sup> Other sources of funding to the NHIF include money allocated by the parliament of Ghana, grants, donations, gifts/voluntary contributions, and interests accrued from investments. NHIS subscribers fall into two broad categories: (i) the informal group, who are required to pay an insurance premium, and (ii) premium exempt groups.

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<sup>3</sup> The informal sector are largely self-employed persons such as farmers, traders, local food processors, artisans, and craft-workers.

Those in the premium exempt group include:

- Formal sector employees<sup>4</sup> and the self-employed who contribute to the Social Security and National Insurance Trust (SSNIT contributors)
- Children (persons under 18 years of age)
- Persons in need of pre-natal, delivery and post-natal health care services (pregnant women)
- Persons classified by the Minister for Gender, Children and Social Protection as poor
- Categories of differently abled persons determined by the minister responsible for social welfare.
- Persons with mental health concerns
- Pensioners of the Social Security and National Insurance Trust (SSNIT pensioners)
- Persons above 70 years of age (the elderly)

In addition to the premium, subscribers are also required to pay a processing fee or renewal fee for their membership. Table 1 depicts the different categories of subscribers, payments they must make, and whether they must serve a waiting period. The latter is how long one has to wait before they can use the insurance to access health care after registering or

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<sup>4</sup> Formal sector represents all permanent jobs with specific working hours and regular salaries.

renewing. The length of the waiting period is one month, and its reason is to prevent adverse selection.<sup>5</sup>

**Table 1 Fees Paid by Each Category**

<b>CATEGORIES</b>	<b>Processing Fee</b>	<b>Renewal Fee</b>	<b>Waiting Period</b>	<b>Premium</b>
SSNIT Contributors	YES	YES	YES	NO
SSNIT Pensioners	YES	YES	YES	NO
Adults (age 70 & above)	YES	YES	YES	NO
Children (under 18)	YES	YES	YES	NO
Under 5 years	YES	YES	NO	NO
Pregnant women	NO	NO	NO	NO
Poor	NO	NO	NO	NO
Having Poor Mental Health	NO	NO	NO	NO

**Source:** <http://nhis.gov.gh/membership.aspx>

Important issues to address in designing an efficient health insurance system includes how money is collected from residents and pooled to pay for services, what services are covered by the insurance, and how these services are paid for on behalf of the insured (also known as the provider payment method). Defined, the provider payment method is “the mechanism used to transfer funds from the purchaser of health care services to the

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<sup>5</sup> Adverse selection in insurance refers to a scenario in which higher-risk or sick individuals who have greater coverage needs, purchase insurance, while healthy people delay or decide to abstain until they get sick. The concept of adverse selection is well-described in Akerloff’s 1970 paper “The Market for Lemons”.



providers” (Kazungu et al, 2018. pp.1). There are several different methods that can be used to pay providers under a health insurance scheme. These includes Fee for Service (this is often itemized)<sup>6</sup>, Diagnosis Related Groupings, and Capitation. In Ghana, Itemized Fee for Service (FFS) methods exist for non-insured clients regarding both health care services and drugs. In turn, Diagnosis Related Groupings (DRG) are provided for insured clients when it comes to care and an FFS design covers their drugs.

Notably, insurance is provided at the national level by the National Health Insurance Authority (NHIA). Established under the National Health Insurance Act 2003, Act 650, The NHIA is a corporate body, with perpetual succession, that may sue and be sued in its own name. As a corporate body, the Authority in the performance of its functions may acquire and hold movable and immovable property and may enter a contract or any other transaction. Their mission “is to provide financial risk protection against the cost of quality health care for all residents in Ghana and to delight their members and other stakeholders with an enthusiastic, motivated, and empathetic professional staff who share the values of honesty and accountability in partnership with all stakeholders”. Additionally, the NHIA aspire “to be a model of a sustainable, progressive, and equitable national health insurance scheme in Africa and beyond”.

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<sup>6</sup> To explain what the term itemized means, an illustration from day-to-day life is used: it is rather like choosing a basket of goods from a supermarket and then proceeding to the checkout to have the cost of this basket tallied such that the buyer may pay their total grocery bill.

Regarding the NHIA, and in the case of the FFS method, the provider typically lists the different services that they have provided for the client, along with the cost of each service. In turn, the provider requests payment from the NHIA. The advantage of an FFS method is that the provider has no incentive to leave anything off the ‘shopping list’. The disadvantage is that precisely for this reason, since the provider is also often the ‘owner’ of the ‘shop’ and the one choosing the items to be purchased for the client (given their specialized knowledge), it is possible that the provider includes services that are not deemed necessary. Amporfu (2011) found that over-inducement of care is practiced in NHIS accredited hospitals on insurance members. More specifically, these patients who visited private hospitals were likely to be asked by physicians to make additional visits, which were unlikely unnecessary. To put this in context, perhaps a doctor recommends a Caesarean Section, when it is not necessary, in order to receive more reimbursement from the NHIA. Interestingly, in an interview with the Upper West Regional Director of the NHIA, which was published by Ghana Business News - a reputable national news agency - over-inducement was recognized.<sup>7</sup> However, this is not to suggest that such supplier induced demand will certainly occur; it is merely a potential weakness of the system.

In the DRG payment method under the NHIA, related diagnoses are grouped together and the average cost of treatment in that group is determined. Providers are therefore paid according to the diagnosis they give their client based on the average cost method. Under

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<sup>7</sup>See: <https://www.ghanabusinessnews.com/2018/12/23/nhis-funding-challenges-due-to-escalating-claims-cost-director/>.

the DRG system, providers must fill claim forms for reimbursement from NHIA after providing the services. The claims made by the providers are then vetted for accuracy and genuineness before payment. The process may be administratively complicated, increasing the transaction cost among providers and the NHIA. The DRG for services also still holds some incentives for cost escalation, though they are less than under itemized fee for service. Since medicines at all levels remain under itemized fee for service, the potential of cost escalation in this area is strong.

As stated in the introduction, the objective of this paper is to evaluate the impact of the introduction of capitation on health insurance membership, OPD health care utilization and associated cost. Capitation is a provider payment mechanism in which providers are paid, typically in advance, a pre-determined fixed rate to provide a defined set of services for the insured over a period of time. The amount paid to the provider is irrespective of whether the insured seeks care during the designated period. This fixed amount is typically expressed on a per-member per-month basis. Additionally, members refer to a list of accredited providers provided by NHIS. Under this payment system, the member selects a preferred primary provider (PPP) to provide all the services under the capitation basket in exchange for the capitation rate. The total capitation amount is transferred to the provider at the beginning of the service period. The amount is calculated based on the total number of members who have selected a given provider.

In 2012, the NHIA began a pilot of capitation payment for primary care services in the Ashanti region to test its sustainability as an alternative provider payment method. Some

reasons for this decision include increasing claims cost, perceived fraud, an ineffective gate-keeper system, and ‘provider-shopping’<sup>8</sup> among subscribers. While the pilot program transitioned into actual implementation in the Ashanti region, it was short lived as the policy was suspended by the government in August 2017, following complaints from both providers and subscribers.

According to Andoh-Adjei et al. (2016a), between 2007 and 2009, the average cost of outpatient claims increased by about 50 percent from GHC6.93 (2.80 USD) to GHC10.11 (4.21 USD), and in 2010, outpatient claims accounted for 70 percent of total claims received by the NHIA. This represented about 30 percent of the total cost of claims paid out by NHIA. The growth in utilization translates into growth in claims cost, therefore one may acknowledge that the growth in service utilization may be due to the yearly growth in membership and the low financial barrier to accessing health care service. However, it is also not certain whether this phenomenon is the reason for cost escalation, or this result is partly due to a moral hazard<sup>9</sup> which is associated with social health insurance schemes world-wide.

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<sup>8</sup> Patients seek multiple medications from visiting different doctors and having prescriptions filled. To add to this, patients do not tell their doctors of previous doctor visits, or what medications they have been using for the past month.

<sup>9</sup> In the insurance world, moral hazard occurs when the insured take more risk knowing their insurers will protect them. For the seminal insight on this topic in the health care sector, see Arrow (1963).

Andoh-Adjei et al. (2018b) found overbilling of medicines, inappropriate application of tariffs, duplication of claims, lack of diagnostic evidence to back claims, the absence of a linkage between treatment and diagnosis, and treatment outside the defined benefits package were some of the concerns that had been identified regarding claims submitted by service providers for settlement by the NHIA. Further to that, they stated that clinical audit activities also revealed irrational prescription of medicines, rising amounts of medicine supplied to subscribers, provision of services above accreditation level, and overbilling of medicines. Finally, between 2010 and 2012 the authors noted that an amount of GHC20,103,976 (9,307,396 USD) was found to have been paid as un-earned claims to providers, partly as a result of the previously mentioned provider-side moral hazards.

The Ministry of Health Joint Assessment Team that conducted a holistic assessment of the Ghana Health Sector Program of Work in 2012, also noted that since its introduction, the National Health Insurance Scheme (NHIS) has led to increased utilization of OPD services across all the regions. The team, however, raised concern that “with the backdrop of doubling OPD per capita rate, 80 percent of total outpatients being NHIS-insured members, and 34 percent of the population being active NHIS members, the high proportion of OPD attendance could either be a reflection of frivolous use of services by NHIS members or a reflection of high NHIS membership among those in need of services and concluded that ‘a positive answer to these questions poses a financial risk to NHIS, and that these issues should be further investigated and addressed’”.

To address these challenges, the NHIA decided to introduce a capitation model for primary outpatient services as part of its provider payment reforms, beginning with a pilot in the Ashanti region that bore the highest cost burden of claims (28 percent in 2010). Since the pilot began in 2012, several studies, as described below, have documented various experiences with the capitation payment policy. Many of these studies focused on user<sup>10</sup> and implementer experiences and perceptions of key stakeholders about the policy. User knowledge, understanding, and perceptions may certainly impact capitation payment policy. In a survey of NHIS clients and providers in Kumasi, Agyei-Baffuor and colleagues (2013) found that 98 percent of respondents had heard about capitation. This did not however translate into an understanding of the capitation system as only 40 percent of respondents completely understood the meaning of capitation. This finding was corroborated by Aboagye (2013), who alludes to low levels of education and awareness about the policy among subscribers.

A series of papers suggest that providers perceive capitation as exposing their facilities to financial risk.<sup>11</sup> In particular, Takyi and Danquah (2015) conclude that providers who held such perceptions were more likely to reduce their quality of treatment, thereby negatively impacting health outcomes. The NHIA also attributed that the type of enrollee played a key role in the nature of the financial burden they incurred. For instance, the number of registered pregnant women more than doubled from 421,234 in 2008 to 1,277,819 in 2010

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<sup>10</sup> Subscribers and providers.

<sup>11</sup> See: Adjei (2016), Takyi and Danquah (2015), and Opoku et al. (2014).

(Koduah et al. 2016). Aboagye (2013) also reported that there was a general lack of clarity among service providers on the differences between capitation and DRG financing.

Dodoo (2013) in his analysis of the capitation pilot, explained that stakeholder understanding of the capitation policy was generally low and this negatively affected their interest and position on the policy, leading to the perception that the policy was detrimental to their capacity to provide quality healthcare. This assertion was corroborated by Koduah et al. (2016) who stated that the perceived and real bureaucratic power which characterized the pre-implementation and implementation stages of the pilot forced the providers to also assert their own powers. They “contested and resisted various aspects of the policy and its implementation arrangements” without recourse to the technical arguments that may be in favor of the capitation payment policy. Thus, the policy was perceived as political (Agyei-Baffuor et al. 2013; Koduah et al. 2016), based on whether one was pro or anti capitation (Asuoye et al. 2016).

On provider views of the per capita rate and payment schedules, Opoku et al. (2014) and Adjei (2016) report complaints about the inconsistency or lateness of the per capita payments among providers. In addition, Adjei (2016) mentioned that the delayed payment encouraged unauthorized co-payment. Dodoo (2013) reports the per capita rate was one of the major issues of contention between providers and implementers – i.e., providers felt that the per capita rate was low (Koduah et al, 2016), non-risk adjusted (Takyi and Danquah 2016, Koduah et al. 2016), and lacked clarity on how the per capita rates were calculated (Koduah et al. 2016, Asuoye et al. 2016).

Focusing on PPP enrolment, Andoh-Adjei et al. (2016a) posit that the two most important criteria for the selection of PPPs were accessibility and perceived quality of care while Tumaku et al. (2017) identifies four key factors defining choice of PPP: (i) service delivery, (ii) customer care and prestige, (iii) distance, and (iv) family/peer influences. On subscribers' experiences of the PPP selection process, Agyei- Baffuor et al. (2016) report that they found the selection was restrictive, especially among those who were administratively assigned a PPP. Dodo (2013) also reported that although clients were required to choose three different PPPs in order of preference, at the point of enrolment, it was later changed to two PPPs without prior communication to subscribers. Consequently, this resulted in confusion among subscribers as to which service providers they had been assigned to (Aboagye, 2013). For providers, their challenge with the enrolment process was their inability to access the list of enrollees to their facilities (Adjei, 2016).

With regard to the influence of capitation on service quality, Agyei- Baffuor et al. (2013) concluded that majority of respondents had a positive perception about the following parameters of service quality under capitation: staff availability and reception, service availability, the benefits package, prompt access to care, and quality of service. Similarly, Adjei et al. (2016) found that capitation promoted standardized health care practices, improvement in health outcomes, cost reduction, and access to opportune care. They further reported that capitation encouraged strict adherence to treatment policies and guidelines. In support, Andoh-Adjei et al. (2016b) also reported that, despite the negative attitude towards capitation payment, health insurance subscribers in Ghana had high trust



in their primary care provider giving them quality care under capitation payment. However, Adjei (2016) reported that patients under capitation were more likely to change their PPP or be referred to other facilities compared to patients under the DRG system. The reason for this trend could be that providers under capitation saw it as a way to dump their patients on other providers to avoid using their capitated funds. Conversely, it could also be due to inadequate medical resources, equipment, and qualified personnel in such health facilities.

On implementation challenges, Andoh- Adjei et al. (2016b), Adjei (2016) and Koduah et al. (2016) report resistance to the capitation policy by medical professionals, civil society organizations, and politicians - especially during the pre-implementation and early stages - for what they perceived as its potential negative effect on primary health care. Adjei (2016) stated that the managers of the policy also complained that the number of blanks<sup>12</sup> spread across provider lists were not used for the intended purpose. These blanks were spread across all providers to cater for NHIS subscribers who, for one reason or another, had no PPP as at the time they visited a health facility. However, the NHIS explained that providers turned away such persons, or submitted claims under the DRG for such patients, regardless of the number of blanks allocated to them.

According to Koduah et al. (2016), contestation and resistance by health care service providers created unanticipated effects. In particular, there was intense media attention,

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<sup>12</sup> Under capitation, the NHIA pays the capitation rate to a PPP, based on the total number of enrollees, plus an additional amount to cater for those who are not enrolled with such PPPs so that they may receive care in case of an emergency.

along with capitation discussions across the country - not only in the Ashanti region where the pilot was taking place. The Ashanti Development Union, a mobilized advocacy group, immediately opposed the capitation policy. Stakeholders called for the policy to be suspended, and private self-financing providers accredited by the NHIS suspended services to NHIS subscribers as part of their protest against the policy. According to Koduah et al. (2016), the main contested issues included: the per capita rate being too low, the enrolment rate, and rationale for using the Ashanti region as a pilot site. Some providers claimed the region was chosen because NHIA labelled the Ashanti region as a “fraud region”.

*“NHIA brought capitation to the region because they believe there is fraud and abuse here. So the focus is to fight fraud”* [Private self-financing provider, 8/11/2012].

Others claimed the region was being punished for its voting patterns. The region is politically described as a ‘stronghold’ of the New Patriotic Party (NPP) – the party in opposition at the time of introduction regarding the pilot.

*“Some people believe this is political, this is to punish the region for voting against the government in power. The timing was also wrong, implementing such a policy in an election year in an opposition dominated region, it’s difficult to understand their (NHIA) motive”* [GHS staff, 28/8/2012].

### **3 METHODS**

#### **3.1 Study Setting**

Districts in three regions, namely Ashanti, Volta and Central, were selected for this study. Data from all the 52 districts within these three regions were used for analysis in order to establish a set of control and policy observations. Capitation was introduced to the Ashanti

region in 2012 as a provider payment option, therefore it is the ‘intervention’ group for the study, while Volta and Central are the ‘control’ regions.

The following total population values are based on the Ghana Statistical Service 2010 census<sup>13</sup> while insurance member data comes from NHIA dataset used for this study. As of 2014, the estimated population of Ghana was about 27,224,480. Having a total population of 3,784,438 and accounting for about 14 percent of the population of Ghana, the Ashanti region had 1,736,429 insurance members as of 2014, representing about 46 percent of the region’s population. Moreover, the Volta Region had a population of 2,378,921, representing 8.7 percent of the population, with 1,026,990 being insurance members in 2014. Finally, the Central region had a population of 2,222,254, that is about 8.2 percent of the entire population, with 712,552 insurance members in 2014. For reference purposes, Figure A.1 depicts a map of Ghana based on regions.

The data used for this analysis is longitudinal and consists of membership, utilization, and claims expenditure information, obtained from the National Health Insurance Authority over a 5-year period (2010-2014). Given concerns over heteroscedasticity and serial correlation with panel data, i.e.,  $cov(u_{i,t}, u_{i,s}) \neq 0$  for  $s \neq t$ , standard errors are clustered at the regional level in order to remove possible bias. Thus, all parameter estimates are accompanied with robust standard errors, which correct for potential inference errors.

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<sup>13</sup> These reflect the most recent estimates as Ghana updates its census every 10 years.

The primary limitation of this study is that individual-level data was not available and therefore the use of district-level data led to a smaller sample size and larger standard errors in the regression model. Also, relative to developed countries, the Ghana government does not provide public-use statistical resources to researchers, which reduces the availability of explanatory variables for this study. Moreover, the population census in Ghana is done every ten years – thus district populations and poverty prevalence data are time constant in this study. Nevertheless, even with limited explanatory variable options, a reasonable amount of variation in my models is explained (in some cases R-squared values exceed 40 percent), particularly by the natural experiment design and the difference-in-differences estimator as illustrated below.

### **3.2 Dependent Variables**

In this study, there are three dependent variables of interest, which are: total outpatient department health care utilization (in annual visits), total annual outpatient department costs (in annual USD), and National Health Insurance membership. The OPD is the main reception of the hospital and also serves as an emergency center. Additionally, the OPD is the gateway to the other wards, thus serving as the referral point to other health institutions. As stated in Section 2.2, one of the main reasons why capitation was introduced was to reduce OPD cost. For this study, OPD costs for the insured were converted from the Ghanaian currency (cedis) to US dollars when the data was received. Total OPD utilization represents the total number of visits among insurance members to a hospital in a given

year. Finally, membership captures the number of individuals who have registered in a given year with the National Health Insurance Scheme.

### 3.3. Explanatory Variables

To partition the study into its control and treatment groups, observations occurring in Ashanti equal unity; zero if observed in the Central or Volta regions. Moreover, to differentiate between the pre- and post-policy periods, observations occurring in 2010 and 2011 are coded as zero; unity for those in 2012-2014. Given the natural experiment design of this dataset, the key explanatory variable for this study is the difference-in-differences estimator which is an interaction of the previously mentioned dummy variables. Finally, to proxy for a district's size and level of economic well-being, I also include controls for population and poverty prevalence, both observed in 2010 terms.<sup>14</sup>

### 3.4 Econometric Specification

The regression model for this analysis is as follows:

$$y_{j,t}^m = \beta_0 + \beta_1 Intervention_{j,t} + \beta_2 Post_t + \beta_3 DiD_{j,t} + X_{j,t}\beta + e_{j,t} \quad (1)$$

Where  $y$  is outcome  $m$  for region  $j$  in time  $t$ . *Intervention* is a dummy variable which captures whether or not the region was part of the capitation policy. *Post* is a dummy

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<sup>14</sup> As noted previously, Ghana only updates this data on ten years intervals – thus, these values are constant across years for each district.

variable differentiating between whether the observation occurred pre- or post-intervention, and  $DiD$  is the difference-in-differences interaction term of *Intervention* and *Post*. More specifically, the  $DiD$  variable equals unity for treated regions in the post-intervention period and zero for all other observations. The equation also captures regional variations concerning population size and economic well-being which are contained in  $X$ . The  $\beta$  parameters are estimated using ordinary least squares, with  $\beta_3$  being of key interest to this study. Finally,  $e$  is the error term. Estimating the above equation using OLS examines the hypothesis: Did the introduction of capitation – i.e., a less generous health care insurance model - reduce NHIS membership, OPD utilization, and cost?

In order for the above econometric specification to produce an appropriate identification strategy, whereby the difference-in-differences estimator *causes* changes in the dependent variables of interest, the following three assumptions are made:

1. Differences between the intervention and control groups are captured by  $\beta_1$ .
2. Outcome variables for the intervention and control groups follow the same trend (i.e., parallel trends). The parallel trend assumption requires that in the absence of capitation, the difference between the intervention and control districts is constant over time. Note that while levels may differ, this assumption entails that in absence of capitation, changes over time must be equal.
3. The introduction of the intervention (capitation) should cause a deviation from trend. More specifically, as soon as capitation is introduced, this assumption requires that outcome variables in the intervention districts experience a deviation from the trend.

## 4 RESULTS

### 4.1 Descriptive Statistics

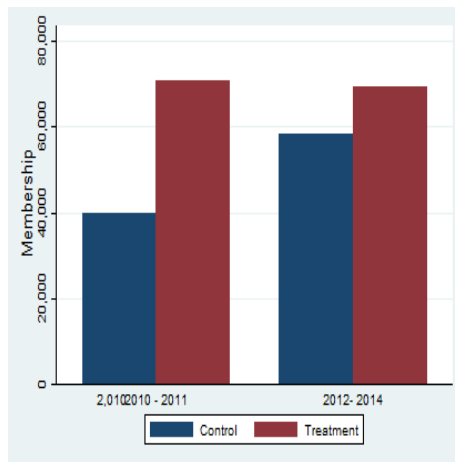
Table 2 presents summary statistics of pooled outcome variables, along with population counts and poverty rates, by district. With an overall sample size of 260 observations (52 districts pooled over 5 years), mean insurance membership within a district was almost 60,000 people, with a standard deviation of almost 37,000. For OPD utilization, the district mean was approximately 173,004 total visits per year, with a standard deviation of about 129,580. In terms of dollars, the mean OPD cost was just over 1.8 million USD, with a rather large standard deviation of almost 1.6 million USD. The mean district population was just over 160,000 but ranged in size from about 47,000-520,000 people. Poverty rates had the largest amount of variation, with some districts having virtually no poverty (2 percent) and others have a prevalence that exceeded three-quarters of its population (78 percent).

**Table 2 Descriptive Statistics of Key Variables**

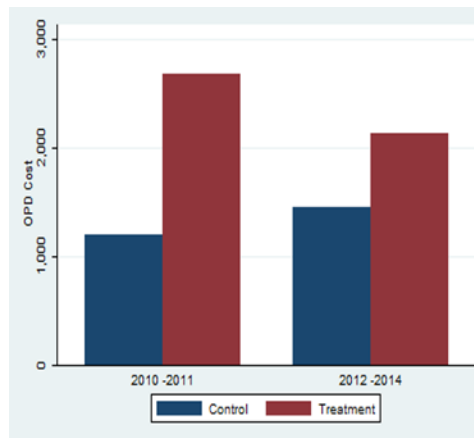
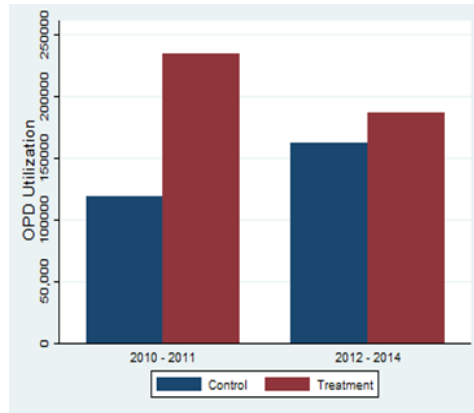
<b>Variables</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Minimum</b>	<b>Maximum</b>
Total Membership	260	59,628	36,847	13,167	190,900
OPD Utilization (visits per year)	260	173,004	129,580	15,910	907,471
OPD Cost (Annual USD)	260	1,816,143	1,572,384	80,901	9,619,092
Population	260	161,262	87,917	46,661	521,338
Poverty Incidence (%)	260	23.92	16.26	1.90	77.70

Figure 1 presents three cross-tabulations of pooled means regarding the outcome variables for my sample of 24 treatment districts and 28 control districts observed over 5 years (2010-2014). The means of OPD annual cost (in US dollars), OPD utilization (in annual number of visits to health facilities) and insurance membership for treatment districts were relatively higher in the pre-intervention period (2010-2011). However, these mean values decreased during the policy years (2012-2014), while the control group means increased. Hence, these descriptive statistics indeed provide evidence that the policy, especially initially, had its intended effect. More specifically, it would appear that capitation led to a fall in total membership and decreases OPD utilization and cost.

**Figure 1 Cross Tabulations**







## 4.2 OLS Regression Results

Table 3 presents a series of regression results for key dependent variables, using ordinary least squares. For interpretation purposes, the dependent variables are specified in natural log terms – thus, parameter estimates, when multiplied by 100, may be interpreted as having a percentage impact on outcomes. Consisting of 260 observations from 52 districts

(24 control and 28 treatment), pooled over 5 years, regression results explain 30 to almost 50 percent of dependent variable variation.

**Table 3 Regression Results (OPD Cost, Utilization and Membership)**

<b>VARIABLES</b>	<b>ln(OPD Cost)</b>	<b>ln(OPD Utilization)</b>	<b>ln(Membership)</b>
Post	0.1378 (0.091)	0.3603*** (0.084)	0.3910*** (0.037)
Intervention	0.5638*** (0.185)	0.4650** (0.184)	0.3119** (0.128)
DD Estimator	-0.3812*** (0.107)	-0.4806*** (0.094)	-0.3874*** (0.054)
ln(Poverty)	-0.2995*** (0.098)	-0.2372** (0.105)	-0.2472*** (0.090)
ln(Population)	0.5080*** (0.181)	0.4161** (0.174)	0.3518*** (0.129)
Constant	8.7035*** (2.306)	7.2627*** (2.284)	7.1147*** (1.734)
Observations	260	260	260
R-squared	0.385	0.297	0.473

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Results suggests that while the control group OPD cost seemed to be trending upward, a relatively large standard error prevents it from being statistically different from zero. Moreover, prior to the policy change, treatment regions were associated with a level of OPD cost that was about 56 percent higher than the control districts. However, the capitation policy appears to have reduced OPD cost in the treatment regions by

approximately 38 percent. Unsurprisingly, districts with higher rates of poverty (specified in natural log terms) are associated with reduced OPD costs, while districts with larger populations (also specified in natural log terms) are associated with increased OPD costs.

Results also suggest that OPD utilization was 47 percent higher in treatment districts, prior to the capitation policy. However, the policy appears to have reduced utilization in affected districts by 48 percent. That said, the general trend among control districts was quite the opposite, whereby utilization rose over this period by about 36 percent. Like in the case of OPD cost, utilization tends to be lower in poorer districts, while being higher in those which were more populous.

Treatment districts had 31 percent more memberships before the introduction of the policy. Again, it would appear that the policy had its intended impact such that total membership is predicted to have fallen by 38 percent after capitation was introduced. And, once again, there appears to have been an upward trend among control districts in that memberships rose by 39 percent during this period. As before, poverty and population have respective negative and positive associations with membership totals.

#### **4.3 Impact of Capitation on Sub-Group Membership**

The previous results clearly demonstrate a negative impact of capitation on membership. Table 4 presents a series of regressions concerning the magnitude of effect this policy had

on a set of sub-groups – many of which represent vulnerable segments of the population. In particular, I examine membership totals among informal sector workers, SSNIT contributors, children (under 18 years of age), elderly (over the age of 70), and the poor using the econometric model presented previously for 260 district-level observations. As noted in Section 2, these groups were initially exempt from paying premiums.

**Table 4 Regression Results – Membership Groups**

<b>VARIABLES</b>	<b>ln(Inf. Sector)</b>	<b>ln(SSNIT)</b>	<b>ln(Child)</b>	<b>ln(Above 70)</b>	<b>ln(Poor)</b>
Post	0.3582*** (0.045)	0.1411*** (0.052)	0.4146*** (0.049)	0.0331 (0.057)	2.0077*** (0.198)
Intervention	0.4095*** (0.141)	-0.0787 (0.194)	0.4113*** (0.137)	-0.0008 (0.162)	0.2009 (0.325)
DD Estimator	-0.3843*** (0.062)	-0.1553** (0.077)	-0.4141*** (0.066)	-0.1513* (0.087)	-0.6978*** (0.236)
ln(Poverty)	-0.2528** (0.101)	-0.4999*** (0.126)	-0.2321** (0.090)	-0.2126** (0.099)	-0.3052* (0.153)
ln(Population)	0.3804** (0.161)	0.4190* (0.233)	0.3072** (0.122)	0.2404 (0.168)	0.5545** (0.220)
Constant	5.6674** (2.139)	3.8806 (3.028)	6.7485*** (1.669)	5.6275** (2.195)	0.8445 (2.895)
Observations	260	260	260	260	260
R-squared	0.407	0.412	0.430	0.211	0.392

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Concerning membership, the impact from the onset of capitation in intervention districts is greatest among those in the informal sector, children, and the poor. Perhaps unsurprisingly, this latter group experienced the largest relative decline in memberships at almost a 70

percent reduction. The other two groups, children and informal sector workers, experienced declines in membership of 41 and 38 percent, respectively. Notably, the smallest impact seems to concern those over the age of 70, whereby membership only decreased by 15 percent, plausibly the result of health being more price inelastic with age (or among those more likely to become ill).

#### **4.4 Impact of Capitation on Inpatient Department Utilization and Cost**

The results above suggest that the capitation policy had its desired effect in terms of reducing outpatient cost and utilization within targeted districts. However, given the possibility of utilization shifting and/or cost offsets, it would be naïve to ignore IPD cost and utilization, whereby capitation had no *direct* impact. Thus, for the capitation policy to have had its intended impact, without the concern of fiscal externalities, IPD cost and utilization should have been unaffected by this policy. Yet, as noted below, this is not the case which suggests that capitation may have had spill-over effects in terms of cost offsets.

Results, again based on 260 observations, are presented below in Table 5. In columns 1 and 3, my results from Table 2 concerning OPD cost and utilization are re-presented in order to compare with IPD cost and utilization. Estimates are once again produced using OLS with the inclusion of the two control variables, district population and poverty prevalence. Concerning OPD cost, Table 2 results suggest there was a statistically significant difference between the control and treatment districts before the intervention,

with the treatment districts predicted to have a 56 percent higher level of cost. Moreover, OPD cost in control districts did not statically change when comparing time periods. However, OPD cost in the treatment districts decreased by 38 percent after the capitation policy was introduced. Also, results suggest that OPD utilization was 47 percent higher in treatment districts before the intervention. But, although utilization continued to increase among control districts, with an increase of about 36 percent, OPD utilization declined in the treatment districts by 48 percent after the capitation policy was introduced.

**Table 5 Regression Results (OPD Cost & Utilization, IPD Cost & Utilization)**

<b>VARIABLES</b>	<b>ln(OPD Cost)</b>	<b>ln(IPD Cost)</b>	<b>ln(OPD Utilization)</b>	<b>ln(IPD Utilization)</b>
Post	0.1378 (0.091)	0.2970** (0.121)	0.3603*** (0.084)	0.5261*** (0.105)
Intervention	0.5638*** (0.185)	0.0847 (0.187)	0.4650** (0.184)	0.4463* (0.257)
DD Estimator	-0.3812*** (0.107)	0.2884** (0.139)	-0.4806*** (0.094)	-0.0586 (0.149)
ln(Poverty)	-0.2995*** (0.098)	-0.2353** (0.112)	-0.2372** (0.105)	-0.0634 (0.135)
ln(Population)	0.5080*** (0.181)	0.5216*** (0.173)	0.4161** (0.174)	0.4752** (0.190)
Constant	8.7035*** (2.306)	7.3529*** (2.287)	7.2627*** (2.284)	2.9422 (2.560)
Observations	260	260	260	260
R-squared	0.385	0.318	0.297	0.180

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0

Notably, these results stand in stark contrast to those found with respect to IPD cost and utilization. Regarding IPD cost, while there was no statistical difference between the control and treatment districts prior to the introduction of the capitation policy, both observed an increase in such cost during the 2012-2014 policy period. More specifically, control districts experienced a 30 percent rise in cost with treatment districts incurring an additional 29 percent – hence, almost twice the increase in percentage terms. The fact that IPD cost increased dramatically during the capitation policy period is quite surprising given IPD utilization in these districts remained statistically unchanged. This result is particularly concerning given the capitation policy was OPD related, thus suggesting that there may be unintended consequences – i.e., a fiscal negative externality - resulting from this cost-reduction strategy.

## **5 DISCUSSION AND CONCLUSIONS**

### **5.1 Discussion**

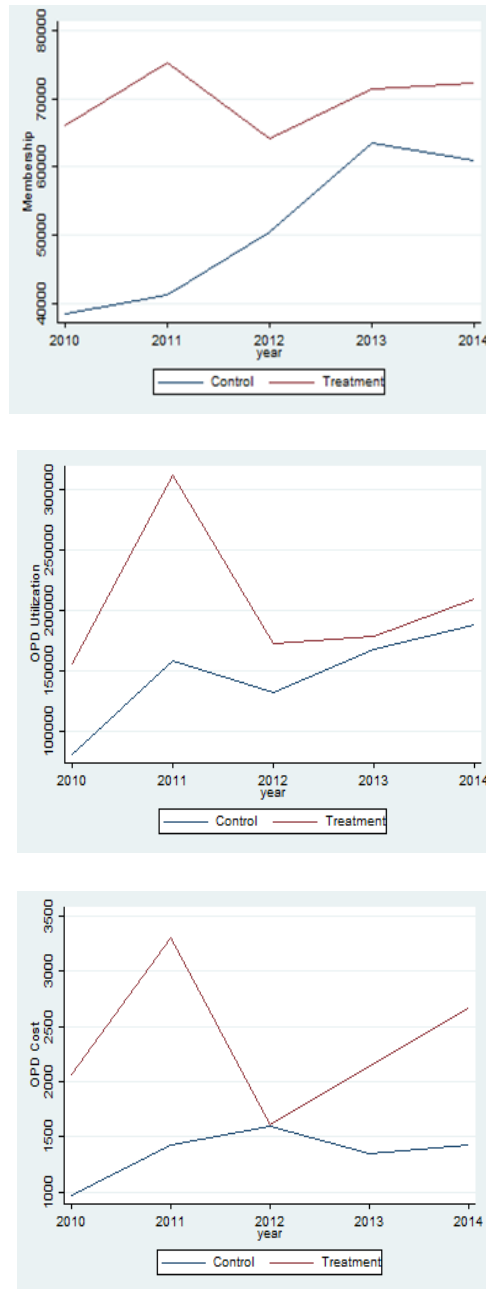
This goal of this paper is to evaluate the impact of a less generous health insurance capitation policy on health insurance membership, OPD health care utilization and OPD cost in Ghana. A capitation pilot policy in 2012 was introduced in select regions as part of the provider payment mechanism by the NHIA with the intention of reducing health care utilization and their associated costs. The results from this study suggest that the capitation policy significantly reduced health insurance membership, likely the direct result of a reduction in quantity demanded given an increase in insurance price. In particular,

membership in the Ashanti intervention district decreased by almost 40 percent, relative to the control districts of Volta and the Central Region, after the introduction of capitation in 2012. Additionally, relative to Volta and the Central Region, OPD utilization and cost in Ashanti fell by 48 and 38 percent respectively in this capitation era. Capitation had its intended effect concerning OPD-related matters.

Corroborating evidence of the efficacy of capitation exists with respect to a study for primary outpatient services in Zhuhai, China by Glazier et al. (2009). The authors find that capitation worked to control the costs of health care services. In their study, OPD cost had been increasing rapidly prior to implementation of the capitation payment system but increased at a much lower rate after the implementation. Comparatively, my study as depicted in Figure 2 finds that capitation had a negative effect in 2012, which was the first year of implementation, after which utilization and costs started to increase again but at a slower rate. Notably, the capitation system in Zhuhai, China was implemented alongside a pay-for-performance model with a ‘robust’ monitoring system, which sought to regularly check the behaviors of providers, likely contributing to the slowed growth observed in the Chinese study. Alternatively, Andoh-Adjei et al. (2016b) stated that in Ghana, clinical audit activities by the NHIA which exposes fraudulent claims by health care providers, and the consequential court action taken against them, may have contributed to the observed slowed growth in utilization and claims expenditures.



**Figure 2 Membership, Utilization, and Cost Trends Pre and Post Capitation**



Andoh-Adjei et al. (2018a) stated that the capitation payment had only a small effect in terms of reducing membership and renewal rates rate in the Ashanti region. Instead, they argue that factors other than the capitation payment, including the benefit package, along

with provider and personal factors, may have played a more significant role in a subscribers' enrolment and renewal decisions within treatment districts. For instance, the benefit package under NHIS was a major factor that influenced people's decision to enroll or renew their membership. In particular, people perceived the benefit package as being too limited in scope, as illustrated by the following statement:

*“It is not exhaustive enough; the number of drugs that is covered is limited. You would go to the hospital, and they'll tell you: these drugs are not covered by health insurance”.*  
(Andoh- Adjei et al. (2018a)

Hence, the Andoh-Adjei et al. (2018b) argument is that individuals would rather pay for 'good medication' than pay the insurance contribution.

Under the provider factors, quality of care was a key influence on the renewal decision among respondents. According to Andoh Adjei et al. (2018a), the quality of treatment depends on how promptly the NHIS settles health care providers' claims. Delays in settling providers' claims affect the services received by subscribers. Hospital staff may pay more attention to clients who have money and are ready to pay-out-pocket than in the case of insurance subscribers. This is illustrated by the following quote from the above paper:

*“They will not treat you well, will not accept your card and will not even look at you”.* (Andoh Adjei et al. (2018a)

The impact from reduced the membership caused OPD health care utilization and OPD cost to decrease as a result of the policy. According to Andoh -Adjei et al. (2018b) before the policy implementation (2009-2011) the total OPD utilization and cost in both groups

were experiencing increasing trends of health care utilization. Findings from my study indicate that the total number of OPD visitations per year and annual OPD costs decreased in the intervention region as compared to the control regions. Thus, OPD utilization and cost results conform with the objective of the NHIA in that capitation would reduce the unnecessary usage of services and related costs.

However, I also find that capitation brought about some unintended consequences, which need be addressed. The impact of capitation was greatest among the most vulnerable in society – i.e., the greatest declines in membership were observed among the poor (70 percent), along with large declines within the informal sector (38 percent) and with respect to children (41 percent). However, the membership decline for the elderly population was far less pronounced as a result of capitation, at about 15 percent – a finding that is only statistically significant at the 10 percent level. I posit that this latter result is due to the elderly population having a greater degree of price inelasticity when it comes to demand for health care services. This corroborates Van der et al. (2018) who find that older adults demand increased levels of health care as the probability of illness and disability rises with age. Moreover, they find that there is a smaller likelihood of the elderly dropping out of insurance coverage when compared against younger adults.

For the capitation policy to have had its intended impact, IPD cost and utilization should have been unaffected by this policy. However, my results show that capitation may have had spill-over effects in terms of cost-shifting. While IPD utilization in the intervention districts remained statistically unchanged, IPD cost increased by almost 30 percent during

the capitation policy period. It is possible that the increase in IPD cost among intervention districts was due to the fact that a different payment mechanism was used for IPD services. According to Koduah et al. (2016), inpatient care is mostly provided, with evidence of a referral from a PPP, at higher-level facilities such as district, regional, specialist, and teaching hospitals, where payments to these facilities are done using G-DRGs and the associated medicines are paid for using FFS. Since capitation is mainly for OPD-related costs, my results suggest that while there was a decrease in OPD cost after capitation was introduced in Ashanti, there was also an increase in IPD cost. This shows that capitation may have led to an increase in referrals which caused cost shifting from OPD to IPD as also argued by Amporfu et al. (2016). This finding is similar to a study in Vietnam where capitation led to a reduction in OPD health care utilization and cost, but also had a negative impact on insurance members whereby hospitals scaled down service provision to the insured and increased provision to the uninsured (who continue to pay out-of-pocket on a fee-for-service basis).

The findings of this study also expand on the RAND Health Insurance Experiment which concluded that cost-sharing<sup>15</sup> reduced ‘inappropriate or unnecessary’ medical care but also decreased ‘appropriate or needed’ medical care (Newhouse, 1993). Furthermore, a study in the US by Chandra et al. (2007) supported the results that capitation led to cost shifting from OPD to IPD. Their findings revealed that there were substantial offset effects in terms

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<sup>15</sup> The NHIS benefit package does not cover all OPD and IPD services. Therefore, there is the need for subscribers sometimes have make out-of-pocket payment or ‘top-ups’ when seeking health care.

of increased hospital utilization in response to the combination of higher copayments for physicians and prescription drugs. These offset effects were found to be concentrated among patients for whom medical care is presumably efficacious - e.g., those with a chronic disease.

More corroborating evidence can be found in Dijk et al. (2017) which examined a policy change in the Netherlands. Their findings assert that cost sharing led to an increase in physician-initiated contacts among socially insured consumers, relative to privately insured consumers, when the payment method for socially insured consumers was changed from capitation to a combined capitation and fee for service method and privately insured consumers remained under capitation. Their analyses also suggested that the higher increase in physician-initiated utilization for socially insured consumers was primarily apparent in non-chronically ill consumers.

## **5.2 Conclusion**

Findings from this study have important policy implications. The analysis revealed that capitation resulted in reductions to outpatient utilization within intervention districts, thereby having met the expectations of the NHIA – i.e., that capitation would reduce or slow down rising levels of utilization and claims cost. Capitation also reduced membership. Even though Andoh-Adjei et al. (2018a) suggested that capitation had little or no effect on membership, Opoku et al. (2014) did find that capitation reduced membership in Ghana. They suggested that educating insurance members and stakeholders on capitation was not

properly done, and this led to many members exiting the insurance program. The implications of this study suggest that health policy makers in Ghana note that capitation appears to control cost and utilization regarding OPD health care delivery. However, they will have to also consider how the reduction in OPD cost and utilization impact the health outcomes among the most vulnerable who are likely to exit the insurance program.

Findings from this analysis revealed that, even with a reduction in OPD utilization and cost, IPD cost increased. This IPD cost increase was not anticipated and therefore suggests that there were unintended effects of capitation – i.e., it introduced a negative fiscal externality regarding cost offsetting. Therefore, efficiency markers should account for the fact that vulnerable groups were made worse off by capitation, and that increases in IPD cost were also incurred. That is, these concerns must be weighed against the reduction in OPD utilization and cost, which were thought to improve the efficiency of the health insurance model. This supports a study in by Nguyen et al. (2013) where capitation led to a reduction in OPD health care utilization and cost but had a negative impact on insurance members in that, hospitals scaled down service provisions to the insured and increased provisions to the uninsured (who continued to pay out-of-pocket on a fee-for-service basis). Further studies should be conducted on how to mitigate, if not minimize, these unintended effects of capitation.

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## APPENDIX

Figure A. 1 Map of Ghana by Regions



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