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The Effect of Community Engagement on Healthcare Utilization and Health Insurance Enrolment in Ghana: Results from a Randomized Experiment

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**The Effect of Community Engagement on Healthcare Utilization and Health Insurance
Enrolment in Ghana**

Results from a Randomized Experiment

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Abstract

Background: Health insurance enrolment in many Sub-Saharan African countries is low, even with highly subsidized premiums and exemptions for vulnerable populations. This paper evaluates the impact of a community engagement intervention implemented in Ghana with the aim of improving clients' perceptions on service quality and subsequently improving healthcare utilization and health insurance enrolment.

Method: We used a panel data of 6,937 individuals from a cluster randomized controlled trial conducted in 64 communities in two regions in Ghana. A random half of communities received the intervention after a baseline survey in April 2012; the remaining communities served as controls. A follow-up survey was conducted in March 2014 to evaluate the intervention. Ordinary Least Squares regression estimations were used to measure the intervention's impact on quality perceptions, and on healthcare utilization and health insurance enrolment for the full and balanced samples of all household members as well as the uninsured at baseline.

Results: In the short term (12 months) the intervention did not produce any significant impact on perceptions of service quality, healthcare utilization or health insurance enrolment in the targeted population. It however reduced the frequency of illness by 13.8 percentage points, suggesting an overall improvement in health status. It also resulted in a 7.2 percentage points increase in insurance enrolment for the uninsured.

Conclusion: Community engagement has the potential to motivate service providers to improve quality of care. However, this may not lead to improved perception of service quality, and increased healthcare utilization in the short term. Still, engaging clients in community discussions on quality improvements can effectively enhance health insurance uptake among those who were previously uninsured. Further long-term intervention is necessary to investigate its long-term effects.

1. Introduction

Health insurance is generally believed to be one of the most effective mechanisms that provide financial protection to households in terms of access to healthcare services. However, enrolment and renewal in health insurance in many countries are low, even with premium exemptions for vulnerable populations and highly subsidized premiums [1]. This low enrolment in health insurance is true of many Sub-Saharan African countries, particularly in Ghana (38% of population), where this study was conducted [2]. The barriers to low enrolment in health insurance have been documented to include socio-economic factors such as age, sex, income, education and geographic factors such as distance to health facility and distance to health insurance office [3-9]. Other studies have also examined the relationship between quality of healthcare and the decision to enroll in health insurance and found perceived high-quality healthcare to be significantly associated with increased health insurance enrolment [10-13].

This paper seeks to ascertain whether engaging clients and the community in healthcare delivery and health insurance provision processes will lead to increased healthcare utilization and health insurance enrolment. Doll (1974) emphasized the importance of finding out what clients and the community at large think about the services they receive and the need to provide client-centered services through community engagement and participation [14]. The impact of community engagement on the quality of some social services have subsequently been well studied [15-19]. Other studies have examined the effect of community engagement on the quality of healthcare and found that it leads to improvement in both quality and quantity of healthcare provision [20, 21]. These studies have thus shown that community engagement can lead to improved quality; while higher service quality in turn is associated with increased enrolment in health insurance. However, very little is known of the direct impact of community engagement on health insurance enrolment.

This paper provides a rigorous impact evaluation of community engagement intervention that involved clients in the improvement of healthcare delivery and health insurance provision in Ghana. The intervention engaged clients in quality assessment and feedback activities to stimulate client participation in service provision processes such that services and resources are

tailored to their needs in a client-centered way. The intervention was expected to enhance information provision and trust building between service providers and clients. The impact evaluation is based on a sample of 6,937 individuals from a randomized controlled trial conducted in the catchment area of 64 primary health facilities in the Western and Greater Accra regions in Ghana. Thirty-two communities received the intervention after a baseline survey in April 2012 among a representative sample of 1,920 households.

The intervention was implemented for the duration of nine months, starting in May 2013. Three months after the intervention ended, a follow-up survey was conducted in March 2014 among the same sample to evaluate its impact. The evaluation was conducted to ascertain whether community engagement impacted positively on early treatment of illness and diseases, through increased frequency of health facility visits and ultimately, increased health insurance enrolment.

2. Design and implementation of the Community Engagement intervention

The widespread poor health in most Sub-Saharan African countries has been attributed to lack of affordable and good quality healthcare services [22, 23]. An increasing number of countries in the region are therefore embracing social health insurance as a means of facilitating financial access to primary healthcare services. Ghana was among the first Sub-Saharan African countries that piloted community-based health insurance in the 1990s and eventually implemented a National Health Insurance Scheme (NHIS) in 2004. The scheme provides coverage for both outpatient and inpatient services, and drugs for about 95% of the burden of disease in Ghana.

After a decade of implementation, the NHIS has significantly increased healthcare utilization and improved health outcomes. Over the period, out-patient visits by insured clients increased from 0.6 million in 2005 to 27.4 million in 2013. In-patient admissions increased from 28,906 in 2005 to 1.61 million in 2013 [24]. Healthcare indicators also saw significant improvements over the 10 years period. The under-five mortality rate decreased from 111 in 2005 to 72 in 2012, whilst the maternal mortality rate decreased from 470 in 2005 to 380 in 2012. The percentage of live births attended by skilled health personnel increased from 47% in 2004 to 68% in 2011. In terms of health financing indicators, out-of-pocket expenditure on health as a percentage of total expenditure on health decreased from 45% in 2007 to 29% in 2012 [24].

In spite of these achievements, enrolment in the NHIS is still low and as of 31st December 2013, active membership was 10.15 million, representing 38% of the Ghanaian population [2]. Recent research has identified the barriers to optimal enrolment in the NHIS to include inadequate information on benefit package, poor attitude of health staff, long waiting times, unfair queuing system at health facilities and poor quality of services [9]. The National Health Insurance Authority (NHIA) in 2010 requested for further studies on the barriers to health insurance enrolment as well as interventions that would effectively address these barriers. As a response to this call, the Client-Oriented Health Insurance System in Ghana (COHEISiON) Project was initiated in 2011 which led to the design and implementation of a community engagement intervention that is evaluated in this paper.

The intervention design was based on the premise that involving clients in planning, provision and monitoring of healthcare and health insurance services is an important ingredient for increased healthcare utilization and health insurance enrolment because engagement ensures better understanding of the service delivery processes, builds risk awareness among clients and improves service quality [14, 25]. Moreover, a qualitative study conducted at the start of the project with clients, providers and insurers revealed that perceptions on what constitutes good quality services differ among these three actors [26]. Improved mutual understanding would enable providers and insurers to address non-technical quality concerns as perceived by clients. The engagement intervention was therefore designed and implemented in the intervention communities to identify gaps in service provision and provide feedback to healthcare providers and NHIS for redress. Community Engagement uses existing community groups or associations in assessing healthcare providers and the NHIS district offices to identify service quality gaps. The assessment employed elements of the MyCare tool [26]. The MyCare tool is an instrument used to elicit clients' perception of service quality. It contains both qualitative and quantitative questions on 10 predefined topics, six for healthcare providers and four for NHIS. These topics were selected based on careful analysis of quality gaps from the baseline data. The six areas where the healthcare providers were assessed included Attitude of staff, Punctuality of staff, Information provision, Availability of drugs, Queueing system and Opportunity to provide feedback/dissatisfaction with services. The four areas where the NHIS offices were assessed were

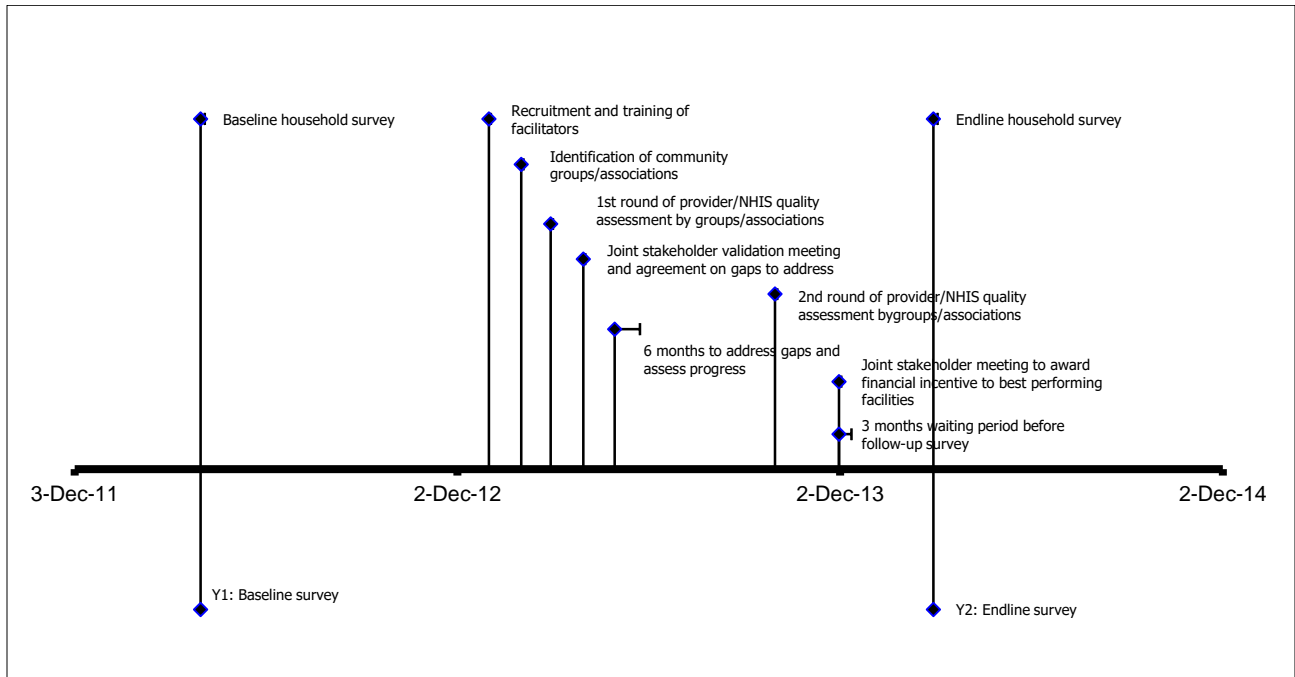
Information provision, Enrolment/renewal process, Delivering benefit package promised and Opportunity to provide feedback/dissatisfaction. The MyCare tool employs a cyclical process where clients, healthcare providers, and the NHIS are engaged in assessing and improving healthcare and health insurance services.

Trained facilitators identified and selected two registered and well-known community groups or associations (e.g. Farmers Association, Cultural Group, Church etc.) with at least 20 members per catchment area of the randomly assigned intervention facilities. Consent of participation was obtained from the leadership of the selected groups or associations. The provider and NHIS assessments were conducted in the form of focus group discussion (FDG) at scheduled meetings of the groups or associations and facilitated by a trained facilitator. Two weeks after the (FGD) the facilitators presented the findings to each group for them to validate the findings and agreed on the service delivery gaps to be addressed by each health facility and NHIS district office. Each group selected a liaison person from among them to work with the facilitator to inform the provider and NHIS of the identified quality gaps. Joint stakeholders' meetings involving the heads of intervention health facilities, district managers of NHIS, facilitators and liaison persons were held at the regional capitals of the two project regions to discuss the assessment reports. Realistic improvement plans with timelines and indicators for all stakeholders to monitor progress were agreed upon. The improvements plans were then prioritized on how they should be addressed. It took the facilitators 3 working days to carry out the assessment activities.

The healthcare providers and NHIS were allowed a period of 6 months to address the identified quality gaps after which the same community groups or associations assessed them based on recent 6 months experiences. The best performing health facilities (16 out of 32) were rewarded with GH¢1,000 (\$335) each for good performance.

The intervention was implemented for a period of 9 months. Figure 1 presents the timelines of activities for the implementation of the intervention.

Figure 1: Timeline of Project Implementation Activities



3. Methodology

Study Design

The COHEiSION project was conducted in the Greater Accra and the Western region of Ghana. These regions are situated in the Eastern and Western coast of Ghana respectively with contrasting differences in urban and rural populations. The Greater Accra Region that includes the capital city of Ghana, has a largely urban population of about four million, accounting for 16.3% of the national population while the Western region has a predominantly rural population of about two million representing 9.6% of the national population [27]. These two regions were purposively selected to provide the rural/urban balance as well as the socio-economic structure representative of Ghana.

The project was implemented within a randomized control trial (RCT) design based on a three-stage stratified sampling procedure. At the first stage, 16 NHIS districts schemes were purposively

selected (eight from each region). Sixty-four (64) primary healthcare facilities, four in each of the 16 districts, were purposively selected at the second stage. At the third stage, thirty (30) households were randomly sampled from the catchment area of the selected health facilities to make a total sample of 1,920 households. The 64 health facilities were then randomly allocated into the control (32 facilities) and intervention (32 facilities) arms of the project. More details follow in the paragraphs below.

Selection of NHIS Districts

Sixteen (16) out of the 25 NHIS districts schemes in the two study regions were purposively selected for the project based on principal component analysis (PCA) to ensure comparability of the schemes for evaluation purposes (eight districts in each region). To achieve this, district level data on total population, NHIS enrolment coverage, total number of NHIA accredited health centers/clinics and urban or rural categorization of the 10 and 15 NHIS district schemes in the Greater Accra and the Western regions, respectively, was used. Two urban NHIS district schemes serving one large administrative district in the Greater Accra region and three remote and hard to reach NHIS districts schemes in the Western region were excluded from the selection due to logistical and financial constraints. Principal component analysis (PCA) was employed to generate scores for the districts schemes using the population, enrolment rate, accredited facilities per 1000 population and non-accredited facilities per 1000 population data. In each region, 8 district schemes with similar PCA scores were selected for the project.

Selection of Primary Healthcare Facilities

Sixty-four (64) primary healthcare facilities were purposively selected for the project, four in each selected district scheme. To ensure comparability of selected health facilities, data on the NHIS accreditation score marks (urban/rural, private/public, range of services, staffing, environmental and infrastructure, basic equipment, organization and management, safety and quality management and out-patients care) of all accredited primary health care facilities in the 16 selected district schemes were used. PCA was employed to generate scores for all the accredited primary healthcare facilities. In each district, 4 health centers/clinics with PCA scores around the

average PCA score were selected. Thirty-two (32) primary healthcare facilities from each region were thus selected.

Sampling of Households

A total of 1,920 households were randomly sampled from the catchment area of 64 selected health facilities. Because a complete list of all households in the catchment area was not available, enumeration area (EA) maps obtained from the Ghana Statistical Services was used to list all residential buildings within 10km radius of the catchment area of each selected health facility. Thirty (30) residential buildings were randomly sampled within the catchment area of each health facilities. The random sampling was such that the number sampled from each EA has probability proportional to the number of buildings listed in that EA. Finally, 30 households (one from each sampled residential buildings) were randomly sampled. The households within each residential building were identified based on the project's definition of household as consisting of a person or group of related or unrelated persons, who live together in the same housing unit, who acknowledge one adult male or female as the head of the household, who share the same housekeeping and cooking arrangements, and are considered as one unit. Thus, 960 households were randomly sampled from each region to make up the total of 1,920 households for the baseline survey.

Sample Size Determination

The sample size for the household survey was calculated such that it would be able to detect a minimum effect size of 5.0 percentage point on active enrolment in the NHIS as the main outcome variable. Active enrolment at baseline was 0.38 (38%) on average, with a standard deviation of 0.5 (50%). The inclusion of a baseline and an endline measurement of enrolment reduces the amount of residual variation. However, correlation between the baseline and endline outcomes was unknown at the start of the study. Based on the premise that people who enroll in the current year are most likely to enroll the following year, this correlation was assumed to be relatively high and set at 0.8. Further, the random assignment of the intervention at the health facility level introduces a cluster effect, increasing the required sample size. The intra-cluster

correlation coefficient (ρ) was assumed to be relatively low at 0.02. Based on Killip et al., [28], we calculated a sample of 30 households in the catchment area of each of the 64 selected health facilities for a total sample size of 1,920 households to be able to detect an effect of 5.0 percentage points at an intra-cluster correlation of 0.02, or an effect of 10 percentage points when the intra-cluster correlation increases to 0.10.

Randomization of health facilities into treatment and control

In each district scheme, out of the 4 selected health facilities, 2 facilities were randomly assigned to the treatment and 2 were assigned to the control. The randomization of the health facilities into the treatment and control was jointly done by the research team and representatives of the NHIS. The name of each health facilities was written on a piece of paper and for each district the 4 pieces of paper with the facilities name on them was placed in a dark plastic bag. Two facilities were randomly picked without replacement and assigned to the treatment and the 2 remaining in the plastic bag are assigned to the control.

Data Collection

Structured household questionnaires were developed to collect data on demographic and socio-economic characteristics; health status and healthcare utilization, as well as health insurance enrolment of all individual household members at the baseline and follow-up household surveys. In addition, household heads were interviewed on their perceptions of quality of healthcare and NHIS services in both rounds of the survey. The questionnaires were administered either in English or one of the two local languages Fante and Ga of the Western and Greater Accra regions respectively by experienced and trained interviewers who were fluent in English and the local languages.

With this design, a baseline household survey was conducted in 2012 at the catchment area of the 64 selected health facilities. In 2013, the Community Engagement intervention was designed and implemented for 9 months at the catchment area of the 32 intervention facilities. Three months after the implementation of the intervention, a follow-up survey was conducted in 2014 at the catchment area of the 64 health facilities to interview the same households who were interviewed at the baseline.

Ethical Review

Ethical clearance for the study was obtained from the Ghana Health Service (GHS) Ethical Review Committee (ERC) [clearance numbers: GHS-ERC: 18/5/11 and GHS-ERC 08/5/11]. Informed consent was also obtained from individual respondents in the communities. Literate respondents provided written informed consent while illiterate respondents thumb-printed the informed consent form before participating in the study.

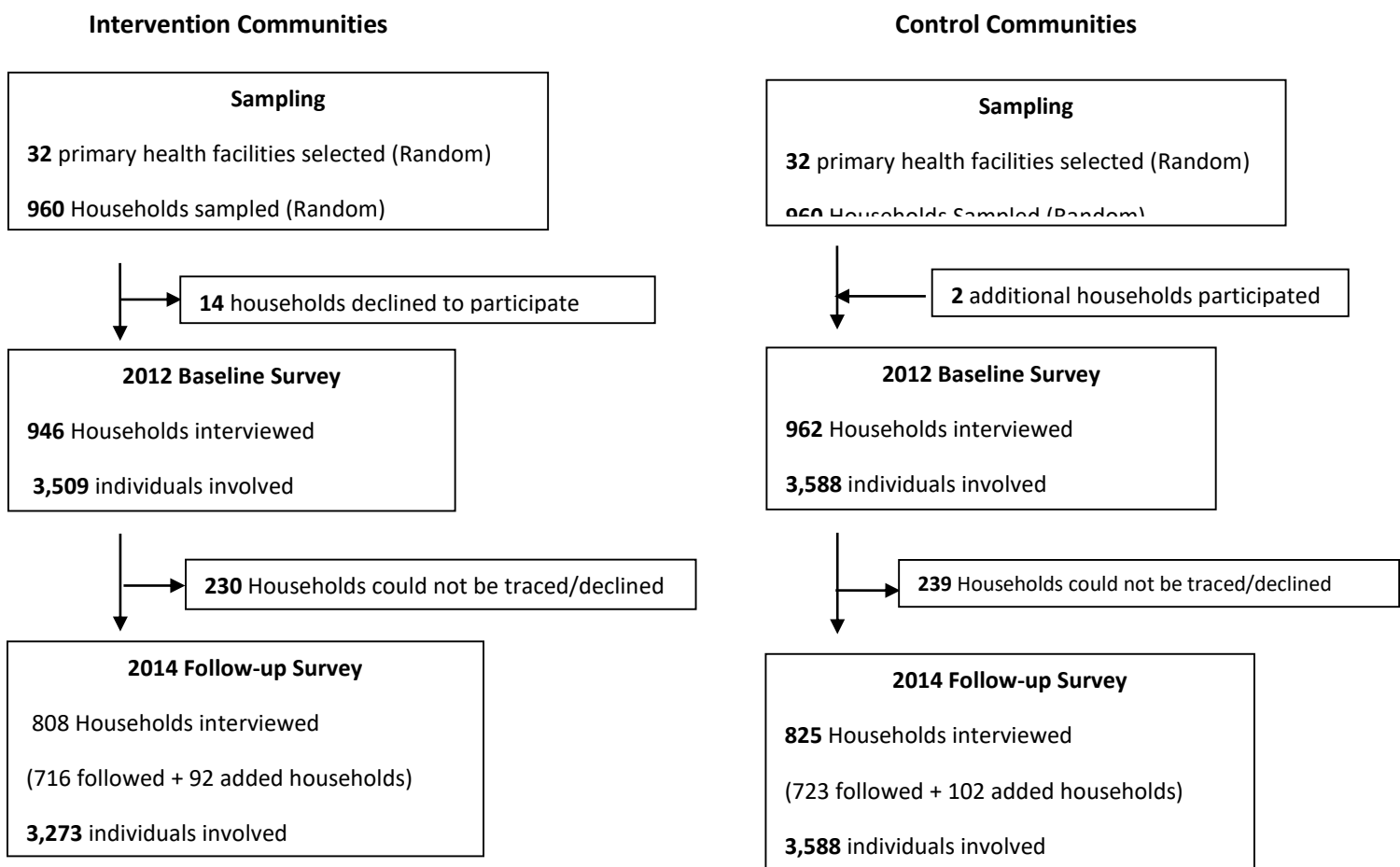
Response Rate

Out of the estimated sample of 1,920 households (960 each in the intervention and control group), 1,908 were interviewed at the baseline involving 7,097 individuals. 14 households in the intervention communities declined to participate in the baseline survey leaving 946 households representing a 98.5% response rate, involving 3,509 individuals. In the control communities, two additional households were sampled to bring the total households interviewed to 962 involving 3,588 individuals. During the follow-up survey, out of the 1,908 households interviewed at the baseline, 1,439 (716 households in the intervention and 723 in the control group) representing a 75.4% overall tracking rate, involving 5,451 individuals, were followed up. This represents our balanced sample of individuals who participated both in the baseline and the endline survey. In the intervention communities at the follow-up, 230 households could either not be traced, had moved or declined to participate leaving 716 households (involving 2,774 individuals). In the control communities, 239 households could either not be traced, have moved or declined to participate leaving 723 households (involving 2,677 individuals). However, 92 additional households in the intervention community and 102 additional households in the control communities were sampled to bring the total number of households interviewed at follow-up to 1,633 (808 in the intervention and 825 in the control) representing 3,273 and 3,588 individuals respectively to bring the total number of individuals interviewed at endline to 6,481. Figure 2 below summarizes the number of households and individuals interviewed in the intervention and control areas at the baseline and follow-up surveys.

Outcome Measures

The main outcome of interest was whether the community engagement intervention resulted in an increase in health insurance enrolment in the intervention communities. Other outcomes of interest were the impact of the intervention on frequency of reported illness and the frequency of health facility visits. To understand the pathways through which the interventions may affect reported illness, frequency of health facility visits and health insurance enrolment, we examine the impact of the intervention on perceived quality of healthcare and NHIS services.

Figure 2: Participation in the 2012 and 2014 Surveys



Enrolment in health insurance was defined as the voluntary payment of registration fee and premium to acquire insurance membership card for informal sector employees; the payment of registration fee to acquire health insurance membership card for formal sector employees or the

issuance of a health insurance membership card to an individual under any of the categories of the NHIS premium exemption policy (children under 18 years, people 70 years and above, Social Security and National Insurance Trust (SSNIT) pensioners, pregnant women, Indigents and Livelihood Empowerment Against Poverty (LEAP) beneficiaries) at the time of the interview. Insurance enrolment was measured with a dichotomous variable equal to 1 if the individual is insured and 0 if otherwise.

The frequency of illness was measured with a continuous variable indicating the number of times a respondent reported ill within the last 6 months prior to the survey. Frequency of health facility visits in the last 6 months prior to the survey was also measured with a continuous variable indicating the number of visits to a modern orthodox healthcare provider such as health center, clinic, maternity home, private doctor/nurse practice or hospital. The frequency of health facility visit was unconditional on illness such that people who were never ill were included with a zero (0) facility visit.

Perceived quality of healthcare and health insurance services were defined and measured at the level of the household head as satisfaction or agreement on a Likert scale from 1 representing strong disagreement/dissatisfaction to 5 representing strong agreement/satisfaction to various statements about the quality of healthcare and NHIS services. Perception of healthcare quality was measured based on 10 statements while that of NHIS service quality was measured based on 9 statements as shown in Appendix 1. These statements were subsequently summarized using factor analysis into 4 factor scores each, based on factor loadings and Cronbach's alpha greater than 0.5. The 4 factors for perception on healthcare quality are; (1) Complaint lodging, handling and feedback; (2) Respect, compassion and friendliness of health staff; (3) Adequacy of Information provision and service delivery and; (4) Satisfaction with waiting time. The 4 factors for the NHIS service quality are; (1) Information, service delivery and NHIS benefit; (2) ID card production and distribution; (3) Registration fee and annual premium and; (4) office location and opening hours. A 5th factor score, "overall healthcare quality" and "Overall NHIS service quality" were computed as the average scores of the 4 factor scores for the healthcare and NHIS quality respectively. The 5 factors each for healthcare quality and NHIS quality, their perception statements, factor loadings and Cronbach's alphas are presented in Appendix 1.

Statistical Estimations

The difference in health insurance enrolment, frequency of illness and frequency of outpatients' visit from the baseline in 2012 to the follow-up in 2014 between the intervention and control communities (Difference-in-Difference) were pre-defined as the outcome to measure the impact of the intervention. The differences in the perceived quality of healthcare and NHIS services from the baseline in 2012 to the follow-up in 2014 between the intervention and control communities were used to investigate the pathways through which the intervention may have impacted on the main outcomes of interest.

Data was analyzed using Stata (version 12.1). Bivariate analysis (Pearson Chi-square test for categorical variables and t-test for continuous variables) correcting for clustering at the health facility level was done to compare the differences in demographic and socio-economic characteristics between the control and intervention communities at the baseline (N=7097), as well as compare differences in health insurance enrolment, frequency of illness, frequency of outpatient's visits, and perception of healthcare and NHIS service quality.

Ordinary least square (OLS) regression was used to evaluate the impact of community engagement on the outcome variables. With the panel structure of the data, we estimated a series of OLS regression of the form:

$$Y_{igt} = \beta_g + \beta_2 t + \beta_3 (J_g \cdot t) + \beta_k X_{igt} + \varepsilon_{igt} \quad (1)$$

Where Y_{igt} is the outcome of interest (perception of healthcare and NHIS services quality, frequency of illness, healthcare utilization and health insurance enrolment) for individual i living in the catchment area of facility g at time t . J_g is the dummy which equals 1 for the treated in the treatment group (1=treatment group, 0=control group), i indexes individuals, t , indexes time periods (1=post-treatment, 0=pre-treatment), X_{igt} is a set of individual characteristics and ε_{igt} is the error term. Thus, in equation (1), the treatment and control groups and the pre- and post-treatment periods are indicated with two dummies and then interacted. The treatment and control group and pre- and post-treatment period interaction coefficient β_3 is the treatment effect.

To evaluate the impact of the community engagement on perceptions of healthcare and NHIS services quality, we first performed an OLS regression estimation for each perception of quality variable on the full (unbalanced) sample of household heads and then on the balanced sample with demographic and socio-economic controls and health facility fixed effects. Multi-collinearity diagnostics was conducted on all control variables prior to their inclusion in the regression model and none had a variance inflation factor (VIF) above 10.0.

For the impact of community engagement on frequency of illness, health care utilization and health insurance enrolment, we started with a simple OLS regression without controls but with health facility fixed effects. We then added demographic and socio-economic controls to the specification. For this analysis, we evaluated the impact of the intervention on the sample of household heads only, on the sample of all household members, and finally a sample of household members who did not have health insurance during the baseline survey. For each of these sub-samples, we performed the regressions estimations on the full (unbalanced) sample and then on the balanced sample.

4. Result

Characteristics and Balance of the Baseline Sample

The characteristics of respondents for the full sample at baseline and the balanced sample at follow-up are reported in Table 1. The demographic characteristics of respondents at the baseline are reported in columns 1-3 in Panel A of Table 1. The average age of respondents was approximately 26 years with majority (54%) of them being females. A little over half of them (51%) live in rural communities. Most (89%) of them were Christians with an average household size of approximately 5 people.

Panel B, columns 1-3 of Table 1 presents the socio-economic characteristics of respondents at baseline. On average, 49% of respondents had completed primary education or above. Approximately 43% of respondents were in gainful employment in the last 12 months prior to the baseline survey and the average annual household expenditure was GH¢3,972.09.

Table 1: Comparison of the Intervention and Control Group at Baseline

	2012 Baseline Survey (N=6937)							Balanced Sample at Baseline (N=5335)						
	# Obs.	Mean	Std. Err.	Intv.	Contl.	Diff.	P-val.	# Obs.	Mean	Std. Err.	Intv.	Contl.	Diff.	P-val.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Panel A. Demographic														
Average Age	6937	26.19	0.412	26.45	25.95	0.494	0.551	5335	26.25	0.449	26.52	25.96	0.56	0.537
% Females	6937	54.43	0.680	54.93	53.95	0.977	0.479	5335	54.28	0.738	54.79	53.77	1.02	0.491
% Living in Rural Communities	6937	50.97	6.381	51.85	50.13	1.721	0.893	5335	53.36	6.448	55.12	51.57	3.55	0.784
Average Household Size	6937	4.84	0.081	4.84	4.83	0.010	0.950	5335	4.78	0.085	4.79	4.78	0.01	0.985
% Christians	6937	89.48	0.991	89.23	89.71	-0.483	0.808	5335	89.47	1.037	89.35	89.59	-0.24	0.908
Panel B. Socio-Economic														
% Primary Education & above	6937	48.97	1.583	49.71	48.26	1.449	0.650	5335	49.07	1.668	50.26	47.86	2.39	0.473
% Employed	6937	42.69	0.594	43.05	42.36	0.683	0.567	5335	43.37	0.624	43.99	42.75	1.24	0.322
Average Annual Household Expenditure (GH¢)†	6803	3972.09	446.80	4581.10	3392.61	1188.49	0.191	5241	3917.10	539.73	4482.17	3348.36	1033.81	0.292
Panel C. Healthcare Utilization Rate														
% sick in last 6 months	6937	31.01	1.754	29.64	32.33	-2.696	0.443	5335	30.55	1.785	29.18	31.96	-2.78	0.435
% visiting health facility in last 6 months	6937	38.47	1.835	38.88	38.08	0.795	0.829	5335	39.25	2.019	39.24	39.27	-0.03	0.994
Panel D. Insurance Enrolment Rate														
% Currently Insured	6937	41.98	1.594	44.54	39.50	5.04	0.111	5335	41.74	1.644	44.25	39.19	5.06	0.125
Panel E. Household Head's Perception of healthcare Quality (N=1908)														
Average perception on Overall Healthcare quality	1908	0.000	0.028	0.007	-0.007	0.014	0.797	1502	0.005	0.029	0.012	-0.003	0.015	0.805
Average perception on Complaint lodging, Handling & Feedback	1849	0.000	0.037	0.022	-0.021	0.043	0.557	1463	0.002	0.039	0.033	-0.029	0.063	0.418
Average Perception on Respect, Compassion & Friendliness	1886	0.000	0.032	0.001	-0.001	0.001	0.983	1488	0.003	0.034	-0.000	0.006	-0.006	0.921
Average Perception on Information & Service delivery	1868	0.000	0.029	-0.006	0.006	-0.012	0.845	1475	0.004	0.029	-0.011	0.019	-0.029	0.612
Average perception on Waiting time	1790	0.000	0.037	0.014	-0.014	0.028	0.710	1412	0.009	0.041	0.027	-0.008	0.035	0.666
Panel F. Household Head's Perception of NHIS Service Quality (N=1908)														
Average Perception on Overall NHIS Quality	1908	0.000	0.017	-0.023	0.022	-0.045	0.179	1502	-0.005	0.017	-0.027	0.018	-0.046	0.186
Average Perception on Information & Service provision	1882	0.000	0.035	-0.049	0.048	-0.097	0.162	1483	0.001	0.034	-0.059	0.062	-0.122*	0.075
Average Perception on ID card Production & Waiting time	1880	0.000	0.026	-0.032	0.031	-0.063	0.229	1482	0.002	0.026	-0.029	0.032	-0.061	0.237
Average Perception on Registration fees & Annual Premium	1887	0.000	0.029	-0.021	0.021	-0.042	0.470	1489	-0.022	0.029	-0.031	0.013	-0.018	0.764
Average perception on Office Location & Opening Hours	1883	0.000	0.032	0.009	-0.009	0.019	0.764	1485	-0.001	0.032	0.007	-0.009	0.016	0.804

Source: COHEiSION Project data; **Note:** The Sample size for Panels E and F are small because the perception questions were posed to only the household heads instead of all members of the households; P-values and standard errors are robust and corrected for clustering at the health facility level; Intv. = Intervention group; Contl. = Control group; Diff. = Difference; P-val. = P value; #Obs. = Total Observation; † The US Dollar Exchange rate as at 31st January, 2017 was \$1=GHS¢4.2; *: p<0.10, **: p<0.05, ***: p<0.01

Panel C, columns 1-3 of Table 1 presents the health status and health care utilization rate of respondents. Approximately one third (31%) of respondents were sick and 38% visited a health facility for healthcare services within the last 6 months prior to the baseline survey. Less than half (42%) of respondents were currently insured with the NHIS at the time of the baseline survey (Panel D of Table 1).

Panel E, columns 1-3 of Table 1 presents the average perception of household heads on 5 indicators of healthcare quality. The average perceptions of household heads on all the indicators were approximately 0.000 given the factor analysis construction that normalized the mean at zero with a standard deviation of one.

Finally, Panel F, columns 1-3 of Table 1 presents the average perception of household heads on 5 indicators of NHIS service quality. Just like that healthcare quality, the average perception of household heads on all the indicators were also approximately 0.000 given the factor analysis construction that normalized the mean at zero with a standard deviation of one.

Differences in Characteristics between Intervention and Control Respondents at Baseline

Columns 4-7 of Table 1 compare respondents' characteristics between the intervention and control communities at baseline. The differences were all small and statistically insignificant. This underscores the fact that randomization resulted in two comparable samples, and that the control group represent an adequate counterfactual for the intervention group.

Columns 8-14 of Table 1 also compare the characteristics between the intervention and control communities for the balanced sample at baseline. The differences in characteristics between the intervention and control communities were also small and statistically insignificant.

Attrition analysis

Ordinary least square regression correcting for socio-economic characteristics and clustering at the health facility level was done to predict the correlates of attrition and ascertain whether being in the Intervention communities predicts attrition.

Table 2: Correlates of Attrition for Descriptive Statistics

	Baseline Sample	
	(1)	(2)
Intervention	-0.042 (0.298)	0.025 (0.821)
Female	0.006 (0.515)	0.008 (0.569)
Age	0.000 (0.502)	0.000 (0.867)
Christian	0.009 (0.923)	0.013 (0.861)
Household size	0.011 (0.140)	0.010 (0.416)
Rural Community	-0.075 (0.064)	-0.046 (0.491)
Primary Education and above	-0.005 (0.707)	0.009 (0.647)
Worked	-0.017 (0.252)	-0.009 (0.679)
Annual Household Income	0.000 (0.939)	0.000 (0.951)
Intervention * Female		-0.004 (0.826)
Intervention * Age		0.000 (0.698)
Intervention * Christian		-0.033 (0.655)
Intervention * Household size		0.002 (0.875)
Intervention * Rural Community		-0.062 (0.435)
Intervention * Primary Education and above		-0.031 (0.272)
Intervention * Worked		-0.017 (0.552)
Intervention * Annual Household Income		0.000 (0.959)
Number of Observations	6803	6803

Source: COHEISION Project data; P-values are in parenthesis; P-values and standard errors are robust and corrected for clustering at the health facility level; *: p<0.10, **: p<0.05, ***: p<0.01. Model (1) is without treatment interaction and Model (2) is with treatment interaction

Table 2 presents the correlates of follow-up attrition for descriptive characteristics. The dependent variable is a dummy which is equal to 1 if the individual dropped out of the sample and 0 if otherwise. From Table 2, receiving the engagement intervention does not significantly predict attrition, neither do any of the descriptive characteristics significantly predict attrition (Column 1). Similarly, when individual characteristics are interacted with the treatment variable and controlling for descriptive characteristics, receiving the intervention did not significantly predict attrition (Column 2).

Table 3: Impact of Community Engagement on Household Heads' Perception of Healthcare Quality

	Overall Healthcare Quality		Complaint Lodging & Feedback		Respect & Friendliness of Staff		Information & Service Delivery		Waiting Time	
	Full sample	Balanced Sample	Full sample	Balanced Sample	Full sample	Balanced Sample	Full sample	Balanced Sample	Full sample	Balanced Sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Time Period	0.027 (0.075)	0.013 (0.081)	0.043 (0.100)	0.028 (0.105)	0.024 (0.079)	0.019 (0.083)	0.023 (0.073)	0.000 (0.079)	0.016 (0.094)	0.005 (0.102)
Impact of CE	-0.039 (0.097)	-0.025 (0.104)	-0.077 (0.128)	-0.060 (0.137)	-0.030 (0.103)	-0.032 (0.111)	-0.028 (0.099)	-0.002 (0.105)	-0.026 (0.131)	-0.010 (0.139)
Controls Included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Facility fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.039 (0.044)	-0.019 (0.050)	-0.125 (0.082)	-0.143* (0.085)	0.281*** (0.053)	0.191*** (0.062)	0.057 (0.063)	0.007 (0.070)	-0.063 (0.065)	-0.132 (0.079)
Observations	3515	2916	3456	2877	3493	2902	3475	2889	3397	2826

Source: COHEiSION Project data; Note: Standard errors are in parenthesis; P-values and standard errors are robust and corrected for clustering at the health facility level; Control variables for the estimation were religion, household size, sex of household head, employment status of household head, educational level of household head; *: p<0.10, **: p<0.05, ***: p<0.01

Table 4: Impact of Community Engagement on Household Heads' Perception of NHIS Service Quality

	Overall Healthcare Quality		Complaint Lodging & Feedback		Respect & Friendliness of Staff		Information & Service Delivery		Waiting Time	
	Full Sample	Balanced Sample	Full Sample	Balanced Sample	Full Sample	Balanced Sample	Full Sample	Balanced Sample	Full Sample	Balanced Sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Time Period	0.002 (0.055)	-0.018 (0.053)	0.012 (0.094)	-0.042 (0.094)	0.034 (0.084)	-0.004 (0.084)	-0.047 (0.044)	-0.004 (0.041)	0.010 (0.075)	-0.023 (0.076)
Impact of CE	0.005 (0.075)	0.018 (0.075)	-0.011 (0.125)	0.048 (0.126)	-0.056 (0.110)	-0.032 (0.109)	0.098 (0.066)	0.035 (0.064)	-0.008 (0.116)	0.022 (0.120)
Controls Included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Facility Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.030 (0.041)	-0.097* (0.049)	-0.001 (0.068)	-0.064 (0.074)	0.061 (0.046)	-0.001 (0.056)	0.002 (0.074)	-0.017 (0.081)	-0.180*** (0.063)	-0.303*** (0.069)
Observations	3515	2916	3489	2897	3487	2896	3494	2903	3490	2899

Source: COHEiSION Project data; Note: Standard errors are in parenthesis; P-values and standard errors are robust and corrected for clustering at the health facility level; Control variables for the estimation were religion, household size, sex of household head, employment status of household head, educational level of household head; *: p<0.10, **: p<0.05, ***: p<0.01

Impact of Community Engagement on Perception of Healthcare and NHIS Service Quality

The impact of the community engagement intervention on household heads' perception on five indicators of healthcare quality is presented in Table 3. The interventions did not have any significant impact on all the five indicators of perception of healthcare quality either for the full sample or the balanced sample (Table 3).

The impact of community engagement intervention on five indicators of NHIS service quality is also presented in Table 4. Again, the community engagement intervention did not have a significant impact on any of the indicators of perception of NHIS service quality either for the full or the balanced sample (Table 4).

Impact of Community Engagement on Healthcare Utilization and Health Insurance Enrolment

The results of the impact of community engagement intervention on the frequency of illness, frequency of health facility visits and health insurance enrolment are presented in 5 (all household members) and 6 (all uninsured household members).

For the sample of all household members, the intervention resulted in a significant 11.3 percentage points and a 13.8 percentage points reduction in the frequency of illness of the full and balanced samples estimation with controls, respectively. The intervention however, did not have any significant impact on the other outcomes of interest (the frequency of health facility visits and health insurance enrolment) either for the full or balanced samples (Table 5).

Table 6 presents the results of the impact of community engagement on a sample of household members who did not have health insurance at baseline. The interventions resulted in a significant 9.4 percentage points and 10.0 percentage points reduction in the frequency of illness of the full and balanced samples estimation with controls, respectively. The intervention also resulted in a 7.2 percentage points significant increase in health insurance enrolment for the balanced sample estimation with controls. The intervention however did not have any significant impact on the frequency of health facility visits either for the full or balanced samples (Table 6).

Table 5: Impact of Community Engagement on all Household Members Health Status, Health Facility Visits and Health Insurance Enrolment

	Frequency of Illness				Frequency of Health Facility Visit				Health Insurance Enrolment			
	Full Sample		Balanced Sample		Full Sample		Balanced Sample		Full Sample		Balanced Sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Time Period	0.416*** (0.036)	0.426*** (0.037)	0.438*** (0.042)	0.449*** (0.042)	-0.018 (0.032)	-0.015 (0.031)	0.002 (0.036)	0.005 (0.035)	-0.023 (0.026)	-0.022 (0.026)	-0.036 (0.027)	-0.034 (0.027)
Impact of CE	-0.124** (0.056)	-0.113** (0.056)	-0.148** (0.063)	-0.138** (0.062)	-0.062 (0.045)	-0.045 (0.045)	-0.080 (0.048)	-0.063 (0.048)	0.033 (0.032)	0.012 (0.032)	0.051 (0.033)	0.026 (0.033)
Controls Included	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Facility Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.245*** (0.017)	0.345*** (0.043)	0.307*** (0.023)	0.434*** (0.052)	0.328*** (0.013)	0.362*** (0.053)	0.366*** (0.016)	0.416*** (0.052)	0.374*** (0.008)	0.481*** (0.038)	0.339*** (0.010)	0.448*** (0.044)
Observations	13071	13071	10483	10483	13071	13071	10483	10483	13071	13071	10483	10483

Source: COHEiSION Project data; **Note:** Standard errors are in parenthesis; P-values and standard errors are robust and corrected for clustering at the health facility level; Control variables for OLS estimation were sex, religion, household size, employment status, educational level; *: p<0.10, **: p<0.05, ***: p<0.01

Table 6: Impact of Community Engagement on Uninsured Members Health Status, Health Facility Visits and Health Insurance Enrolment

	Frequency of Illness				Frequency of Health Facility Visits				Health Insurance Enrolment			
	Full Sample		Balanced Sample		Full Sample		Balanced Sample		Full Sample		Balanced Sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Time Period	0.443*** (0.033)	0.448*** (0.035)	0.456*** (0.039)	0.459*** (0.040)	0.049 (0.034)	0.050 (0.034)	0.057 (0.040)	0.057 (0.040)	0.363*** (0.032)	0.365*** (0.032)	0.342*** (0.031)	0.345*** (0.031)
Impact of CE	-0.116** (0.051)	-0.094* (0.051)	-0.126** (0.059)	-0.100* (0.058)	-0.071 (0.049)	-0.052 (0.051)	-0.070 (0.054)	-0.047 (0.054)	0.083** (0.038)	0.057 (0.038)	0.103*** (0.038)	0.072* (0.038)
Controls Included	No	yes	No	yes	No	yes	No	yes	No	yes	No	yes
Facility Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.279*** (0.020)	0.285*** (0.045)	0.320*** (0.025)	0.345*** (0.051)	0.315*** (0.018)	0.315*** (0.062)	0.363*** (0.021)	0.380*** (0.058)	-0.029*** (0.011)	0.115*** (0.036)	-0.013 (0.013)	0.140*** (0.040)
Observation	10159	10159	8256	8256	10159	10159	8256	8256	10159	10159	8256	8256

Source: COHEiSION Project data; **Note:** Standard errors are in parenthesis; P-values and standard errors are robust and corrected for clustering at the health facility level; Control variables for OLS estimation were sex, religion, household size, employment status, educational level; *: p<0.10, **: p<0.05, ***: p<0.01

5. Discussion

These findings first of all indicate that stimulating client participation in healthcare and NHIS service provision processes might not lead to significant improvements in perceptions of healthcare and health insurance quality in the short term when their quality concerns are not quickly addressed. The expectation was that community engagement would identify service delivery gaps in greater depth and detail, such that when these gaps were fed back to service providers, it would stimulate a better and holistic appreciation of clients' concerns. Providers were then expected to be motivated to implement efficient strategies towards the provision of client-centered quality services. Clients (both insured and uninsured) were subsequently expected to respond to the improved quality of services by visiting health facilities early in times of ill health, and enroll in health insurance to avoid out-of-pocket payments.

Despite the prior expectations, the interventions did not result in significant improvements of client perceptions— neither in terms of quality of healthcare nor with respect to quality of insurance service provision in the general population. The interventions however resulted in a 13.8 percentage points reduction in the frequency of illness in the balanced sample. Healthcare utilization, measured as the frequency of health facility visits, did not change significantly, although the consistently negative impact coefficients are suggestive of a decreasing trend in treatment areas. Impact on health insurance enrolment is not significant for the overall population either. However, when the analysis is restricted to household members who were not insured at baseline, the results show a significant 7.2 percentage points increase in health insurance enrolment.

Several hypotheses might explain why community engagement failed to impact positively on clients' quality perceptions. On the one hand, it is possible that service providers indeed intended to implement strategies to improve quality in those areas as identified by clients. However, the intensity and degree of these improvement strategies may have been dependent on availability of funds, and other health system structures. If healthcare and insurance providers lack financial resources to train staff on for instance customer relations, then improvement in quality may be minimal. The improvement strategies implemented by health facilities and insurance schemes

may hence have been too limited to positively impact clients' perception of service quality. On the other hand, it could be that the community engagement intervention lacked proper incentives for health providers and insurance scheme managers to address client concerns, with no change in quality as a result.

A third potential explanation is that quality did in fact improve, but that changes were not picked up by our measurement instruments. This explanation is supported by findings of two other studies published as part of the same COHEiSION research project. Alhassan et al. [37] found that the engagement intervention induced changes not so much in the quality domains as addressed in the household survey, but rather in terms of staff motivation, cordiality and attitude towards clients. In addition, Fenenga et al [38] found that community engagement led to improved active collaboration and communication among clients, healthcare providers and insurers; feelings of urgency and voice among clients who were enabled to express their preferences, offer suggestions and ventilate concerns. This explanation might hence account for at least part of the insignificant findings, while also allowing for significant changes in health status and health insurance enrolment among (subsamples of) our study population.

The impact analysis indicates a systematic decrease in the reported frequency of illness in the treatment areas compared to the control areas. This could be as a result of people seeking prompt and appropriate healthcare (either because they have become more appreciative of the quality of care, or because they are financially protected through increased insurance uptake) and – while at the health facility, they may have received additional preventive services or ensured that other health complaints were addressed. It is also possible that the intervention made people to become more aware of the risk of infections and illness and invested more in preventive health and timely treatment to avoid more serious complications at a later stage.

Despite the evidence being suggestive of improved health status among the treatment population, we do not find a significant change in health care utilization, neither among the total population nor among individuals who were uninsured at baseline. It may be that poor quality of services is not the most important barrier to healthcare utilization for most clients. Duku et al. [39] found within the same COHEiSION research project the insured feel they receive poor quality

of care and therefore their perception of service quality are far more negative than that of the uninsured. Direct cost of care – particularly to the uninsured, as well as indirect cost of care such as transportation and opportunity cost of time spent at the facility to both the insured and uninsured, have been documented in other studies as important barriers to healthcare utilization [29 - 32]. If direct and indirect cost of care are unaffordable and the insured feel having an insurance card gets them poor quality, improving the quality of care alone may not be sufficient to increase health care utilization or health insurance enrolment.

It is also possible that the lack of significant findings on utilization are due to two counterbalancing effects: On the one hand, improved health status due to earlier consultations may have decreased the need for health facility visits while on the other hand, improved quality of care and financial protection may have led to a greater demand for formal care. Further research is necessary to investigate which of these mechanisms have been at work.

Although, the results do not show a significant impact on insurance enrollment for the overall population, we do find a substantial effect of 7.2 percentage points on insurance uptake among individuals who were not insured at baseline. This suggests that community engagement did encourage the uninsured to enroll, who might otherwise have opted out of insurance for fear of receiving poor quality care, in line with the findings of Duku et al. [39].

Despite the impact on new uptake being sizeable and significant, a substantial portion of the population remained uninsured. A recent study [35] that assessed the determinants of insurance enrolment among Ghanaian adults revealed that socio-economic factors such as being employed or being in the higher income brackets significantly predict health insurance enrolment. So even if there were some moderate improvements in insurance scheme service quality, they may not have been sufficient to counteract other enrolment considerations.

Other major barriers to NHIS enrolment have been documented to include delays in provider reimbursements and NHIS registration, stock-outs, ID card production and renewal processes, inconvenience of NHIS office location and inadequate information provision on the NHIS benefit package [33, 34]. In fact, the problem of delayed provider reimbursement had become incessant during the period of the intervention with intermittent withdrawal of services by the Christian

Health Association of Ghana (CHAG) during which insured clients were 'compelled' to pay out-of-pocket. The fact that the engagement intervention did not impact positively on the perceptions of these service quality indicators suggests that many of the quality areas of concern to clients did not receive adequate attention from NHIS managers or that improvements were too limited to strongly affect uptake.

The limited impact of the community engagement intervention may also be partly due to the short-term (12 months) implementation period of the study. Further long term implementation research is needed to establish its impact on healthcare utilization and health insurance enrolment.

Finally, we note that the project team could not fully control the enrolment activities conducted by the NHIS and other NGO's in some of the project communities towards the end of the study period. In early 2014 – just about 2 weeks before the COHEiSION Project endline survey, the NHIA with the support of other NGO's, embarked on an NHIS information and sensitization campaign, including free enrolment of poor and vulnerable people in three intervention and three control communities in the Western region [36]. This activity, which educated community members in both the treatment and the control group on the importance of health insurance and also enrolled indigents and poor people for free might have suppressed the overall effect of the engagement intervention on insurance enrolment. However, excluding these six intervention and control communities from the analysis does not significantly affect the results.

6. Conclusion

This paper evaluated the impact of community engagement on health care utilization and health insurance enrolment in two regions in Ghana. The interventions encouraged community groups' involvement and participation in the assessment and quality improvements of healthcare and health insurance services provision. We found that in the short term (12 months), the interventions did not have a measurable impact on the perceptions of service quality indicators. Neither did it have a significant impact on healthcare utilization. It however reduced the

frequency of illness among the population in treatment areas by 13.8 percentage points, suggesting an overall improvement in their health status. In addition, it resulted in a 7.2 percentage point increase in health insurance enrolment of members in the intervention communities who were uninsured at baseline.

These findings presuppose that in the short term, community engagement may improve health-related behavior, health outcomes, and health insurance enrolment, even if our survey instruments were not able to capture significant changes in clients' perception of quality. While this study provides an important starting point in understanding the impact of community engagement in the short term, further research is needed to broaden the understanding of the major barriers to healthcare utilization and health insurance enrolment and impact of community engagement through enhanced information provision, trust building and accountability, continuous stakeholder feedback systems, adequate provider incentives, improved provider efforts and provision of quality services in the long term. The ease of implementation and the moderate cost associated with implementing community engagement makes it worthy of further long term implementation study.

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Appendix 1: Perception Factors with their Factor Loadings and Cronbach's alpha

Healthcare Quality Score Factors	Perception Statements	Factor loadings	Cronbach's Alpha (α)
Complaint Lodging, Handling and Feedback	How satisfied are you with the place/desk for lodging complaints at the facility?	0.87	0.92
	How satisfied are you with the process of lodging complaint at the facility?	0.91	
Respect, Compassion and Friendliness of health Staff	How satisfied are you with the complaint handling and feedback by the health facility?	0.87	0.77
	The Docs./Med. Assistants/Nurses are compassionate and very supportive	0.81	
	The Docs./Med. Assistants/Nurses treat me respectfully	0.80	
Adequacy of Information Provision and Service Delivery	There is a well-organized and fair queuing system	0.53	0.82
	How satisfied are you with the services provided by the health facility?	0.51	
	How satisfied are you with the information provided by the health facility?	0.53	
Satisfaction with Waiting time	I don't have to wait for a long time to see a doctor/medical assistant	0.63	0.65
	How satisfied are you with the waiting time at the facility?	0.63	
NHIS Quality Score Factors	Perception Statements		
Information, Service Delivery and NHIS Benefit	How satisfied are you with the services provided by the district NHIS office?	0.79	0.76
	How satisfied are you with the information provided by the district NHIS office?	0.78	
	How satisfied are you about the benefit you derive from the NHIS?	0.53	
ID Card Production and Distribution	The distribution of NHIS cards is convenient	0.49	0.53
	How satisfied are you with the NHIS registration and renewal process?	0.49	
Registration Fees and Annual Premium	The premium for the NHIS package is too high	0.79	0.85
	The registration fee is too high	0.79	
Office Location and Opening Hours	The district scheme office location is convenient	0.62	0.66
	The district scheme office opening hours is convenient	0.62	