Original Article

The impact of community outreach intervention on national health insurance enrolment, knowledge and health services utilisation: evidence from two districts in Ghana

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ABSTRACT

Background: Several low- and middle-income countries implementing health insurance programmes are challenged with increasing coverage of the poor and the informal sector workers, resulting in low population coverage and weak risk-pool. In this evaluation study of the National Health Insurance Scheme (NHIS) in Ghana, we examined effects of combined information, education and communication (IEC) and community outreach registration intervention on enrolment, health insurance knowledge, and healthcare utilisation.

Methods: We employed a quasi-experimental design to assign study participants into treatment and control groups in two districts (Kadjebe and North Tongu) of the Volta region of Ghana after a baseline study in 2015. Participants in the treatment group received the IEC and on-site registration intervention for a period of nine months (April–December 2018). A follow-up survey using interviewer-administered questionnaire was conducted in January 2019 to collect data in the intervention and control districts. A total of 1,199 individuals participated in the pre- and post-intervention survey. We examined the data using descriptive statistics and difference-in-differences analysis.

Results: The IEC-Community outreach registration intervention significantly increased enrolment in the intervention group by 15.8 percentage points, compared to the control group. It also increased healthcare utilisation in the intervention group by 18.5 percentage points, relative to the control group. The intervention, however, had no significant effect on participants' knowledge of the NHIS.

Conclusion: The study demonstrates that integrated IEC and community outreach registration improves enrolment of people in remote areas, as well as utilisation of health services. Policy makers need to consider these findings in their decisions to accelerate progress towards realization of universal health coverage.

Keywords: Health knowledge; Health insurance enrolment; Health care utilisation; Universal health insurance; Ghana

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Conflict of Interest

Nsiah-Boateng E, Musah M, Danso Akuamoah C, Asenso-Boadi F, Andoh-Adjei FX, Dsane-Selby L are employees of the National Health Insurance Authority; however, their affiliations did not influence findings of the study in anyway. Yang DH, Jung H, Kim Y, Kim BG, Kim C, Kim W declare that they have no potential conflicts of interest.

Author Contributions

Conceptualisation: Nsiah-Boateng E, Musah M, Yang DH, Jung H, Kim Y, Kim BG, Kim C, Asenso-Boadi F, Kim W, Andoh-Adjei FX, Selby LB. Formal analysis: Nsiah-Boateng E. Methodology: Nsiah-Boateng E, Musah M, Asenso-Boadi F, Andoh-Adjei FX, Yang DH, Kim BG. Software: Nsiah-Boateng E. Writing - original draft: Nsiah-Boateng E, Musah M. Writing - review & editing: Nsiah-Boateng, Andoh-Adjei FX, Asenso-Boadi F, Jung H, Danso Akuamoah C, Selby LB.

INTRODUCTION

Many low- and middle-income countries (LMICs) are experimenting with various health financing mechanisms such as social health insurance (SHI) schemes to accelerate efforts towards universal health coverage (UHC).¹⁻³ Countries such as Germany, Japan, Austria, South Korea, Belgium, and Israel are on record to have achieved UHC through SHI.² Whilst coverage expansion took several decades in some countries, other countries such as South Korea, achieved UHC in a relatively short time.⁴

Ghana's quest to achieve UHC started in the 1990s with implementation of community-based health insurance (CBHI) schemes in few districts of the country. These CBHI schemes were spearheaded by non-governmental organisations (NGOs) with support from the international communities.^{5,6} Evidence shows that the CBHI schemes covered less than one percent of the population and limited benefits package, mainly inpatient services.⁶ Thus, majority of the population were paying out-of-pocket (OOP) for healthcare services, popularly referred to as "cash and carry" system. This situation created gap in financial access to healthcare services, resulting in inequity and worsened health outcomes, and in some cases avoidable deaths.⁷⁻⁹ Recognising these challenges, the country introduced the National Health Insurance Scheme (NHIS) in 2003 through the passage of the National Health Insurance Act (Act 650 of 2003) and Legislative Instrument (LI) 1809.¹⁰ The policy objective of the scheme is to offer financial risk protection to all Ghanaians and legally resident non-Ghanaians against the need to pay OOP at the point of service use.⁹

Since its establishment, the NHIS has been providing financial access to healthcare services for members of the scheme and contributing to the financial resource of healthcare providers. Nonetheless, the overwhelming initial popularity of the NHIS has not translated into high enrolment and regular renewal of membership in recent years. Enrolment peaked during the early years of implementation and stagnated around 40% of the population between 2011 and 2015.¹¹ Although every health insurance system, much so a practically voluntary system such as the NHIS, is subject to the natural attrition of its members, high drop-out rates are a huge concern especially for realising the overarching goal of UHC.

In respect of the above-mentioned challenge, a community outreach registration intervention was piloted in the Kadjebi, Ketu North, and North Tongu districts of the Volta region, from October 2016 to December 2018 in two phases, in collaboration with the Korea Foundation for International Healthcare (KOFIH). Prior to the intervention study, a baseline study was conducted in 2015 in the region, which revealed that distance to the NHIS district office and lack of knowledge of the scheme were major barriers to enrolment.¹¹ These findings informed the design of the community outreach intervention, which comprised expansion of unit-based registration centres and information, education and communication (IEC) to address the identified enrolment challenges and boost enrolment in the NHIS.

Phase one of the intervention occurred from October 2016 to July 2017 and the findings showed significant improvement in enrolment in the Kadjebi district, where the expansion of the unit base registration centres took place. The IEC had little effect on enrolment in the Ketu North district, which was one of the intervention districts. In view of these findings, the pilot project was scaled up (phase II) only in the Kadjebi district from April to December 2018 with the hope to achieve more significant improvements in enrolment. In this paper, we investigated the effect of the intervention on NHIS enrolment and knowledge. We

hypothesized that bringing the registration closer to the communities would increase enrolment in the NHIS and participants' knowledge of the scheme. We also investigated the effect of the intervention on utilisation of healthcare services 12 months prior to the follow-up survey.

A few intervention studies have been conducted in Ghana^{12,13} and other LMICs.^{14,16} These studies employed similar interventions (subsidies, on-site enrolment/convenience sign-up, and education/information) and found short-term (12 months) positive and significant effects on health insurance enrolment. However, there are conflicting effects of the interventions on participants' knowledge of health insurance and utilisation of healthcare services. Whilst some of the studies found positive and significant effects of their interventions on participants' knowledge of the health insurance programme^{12,14} and healthcare utilisation,¹² others found no significant effects.^{13,15,16} Our study used only combined IEC and expansion of unit-based registration centres (community outreach registration) intervention to provide different perspective on how the intervention would affect enrolment in the NHIS without providing subsidies to participants.

The NHIS operates a decentralized system with the National Health Insurance Authority (NHIA) as the administrator of the scheme and a regulator of health insurance schemes (both public and private) in Ghana. The NHIA has over 160 district offices across the country, in line with provisions in Act 650 of 2003 and the subsequent Act 852 in 2012.^{17,18} These district offices educate the general public and beneficiaries, enrol persons and renew their membership in the scheme. The activities of these district offices are supervised by regional offices who report directly to the head office. The head office bears overall responsibility for the activities of both the district and regional offices.

The NHIS is a hybrid of social health insurance and CBHI systems, funded through a statutory fund, the National Health Insurance Fund (NHIF). The major contributor to the NHIF is the National Health Insurance (NHI) levy which is a 2.5% value added tax (VAT) on selected goods and services. Other sources of revenue to the fund include a mandatory 2.5 percentage points deduction from formal sector workers' social security contribution managed by the Social Security and National Insurance Trust (SSNIT), sector budgetary support allocated by the Parliament of Ghana, income accruing to the NHIF from investment and premiums, and fees charged by the NHIA in the performance of its functions.¹⁸

There are different categories of membership for the scheme: SSNIT contributors; SSNIT pensioners, persons below the age of 18 years; and pregnant women. Others are indigents; persons aged 70 years and above; and the informal sector workers. Apart from the SSNIT contributors and the informal sector workers, all other categories are exempted from premium payments. However, the exempt groups pay registration fee of Ghana Cedis (GHS) 8.00 (US \$1.51) and renewal fee of GHS 5.00 (US \$0.94) except for the pregnant women and indigents, who are exempted from payment of both premium and registration fee.¹⁸ By law (NHIS Act 852 of 2012), the premium for the informal sector is income adjusted, but in practice this has been difficult to implement. Therefore, members pay a flat fee determined by the NHIA, which ranges from GHS 15.00 to 24.00 or US \$2.83–4.52 (exchange rate in October 2019: US \$1=GHS 5.30) per year. However, the SSNIT contributors' premiums are income-rated and are deducted from their payrolls at source. The premium payers (SSNIT contributors and informal sector workers) also pay registration and renewal fees.

The NHIS benefits package covers about 95% of disease conditions afflicting majority of the population. The disease conditions broadly comprise outpatient and inpatient

services, including general consultation, requested investigations and medications on the NHIS medicine list.⁹ Other specific services covered by the scheme are oral health services, maternity care, and emergencies. Currently, there are over 4,000 public and private credentialed healthcare providers across the country, providing services to the members of the scheme. These services are reimbursed using case-based payment system (Ghana Diagnostic Related Groupings [G-DRG]) and fee-for-services (for medications only).

METHODS

Study design

This study employed a quasi-experimental design (pre-test-post-test control group design) with one treatment group (Kadjebi district) and one control group (North Tongu district), all in the Volta region. The Kadjebi district was selected for the mobile outreach registration (expansion of unit-based registration centres) because it had the lowest NHIS enrolment among the two districts studied, as a result of geographical barrier. The community members lived at a considerable distance from the NHIS registration office or centre. Thus, the implementers created 13 registration points in the communities across the intervention district in addition to the NHIS district office to serve the 98 identified communities. Other factors that influenced selection of the intervention district were distance to healthcare centres and the prevailing poor economic conditions. Besides, there was an ongoing KOFIH and Ministry of Health intervention on Maternal and Child Health in another district in the Volta region, which informed our selection of the 2 districts to avoid contamination.

The selected communities were supported with three very small aperture terminal (VSAT) equipment to improve mobile network and connectivity, and additional Biometric Membership System (BMS) application platforms from the NHIA to enable the printing of NHIS membership cards. In addition, communities were continually sensitized through radio discussions, jingles, dawn broadcasts and Live Presenter Mentions (LPMs) on the local radio station in the Kadjebi district (intervention site). Given the considerable distance between the intervention and control districts, as well as low coverage range of the radio station, the IEC component of the intervention had no contamination effect on the findings. The intervention lasted for a period of nine months (April–December 2018), followed by a post-intervention survey in both intervention and control districts in the first week of January 2019.

Study area

The study was conducted in the Kadjebi and North Tongu districts of the Volta Region. **Supplementary Table 1** summarizes demographic, economic and health-related characteristics of the 2 study areas. In the 2010 census, Kadjebi district had a population of 59,900 and growth rate of 2.3% and North Tongu, 89,777 with a growth rate of 2.7%. The major ethnic groups in the 2 study districts are Ewe and Akan. Majority of the population are literates, and the average household size is less than 5 persons. The main economic activities are crop and fish farming; few of the population engaged in sales and services.

Sampling design and selection of participants

We adopted the two-stage stratified sampling design for this study. The sample population comprised a probability sample of all households in the two districts selected for the survey. The sampling frame for the household survey was the Ghana Statistical Service (GSS) list of all the delineated 117 enumeration areas (EAs) in the Volta region used for the 6th round of

the Ghana Living Standard Survey (GLSS6). These EAs served as the primary sampling units (PSUs) in the 2 selected districts, and they were 27 (Kadjebi district) and 13 (North Tongu district). The second stage was a systematic selection of 15 households from each EA in each of the intervention and control districts using an interval of 4. A household roster was used to list all members of the selected households and basic demographic information, including age, sex, and relationship to the head of the household. A Kish selection grid,¹⁹ which is a pre-assigned table of random numbers, was used to randomly select a respondent from the household roster to be interviewed. Respondents signed or thumb printed on the informed consent forms, to indicate their willingness to participate in the survey.

Data analysis

First, we explored characteristics of the intervention and control groups at baseline using descriptive analysis. Mean and standard deviation of demographic, economic and health-related variables were determined for all the respondents and separately for the intervention and control groups. The differences in means of the variables between the intervention and control groups were also estimated, and t-test performed to identify statistical significance.

We also applied difference-in-differences analysis by using the “diff” command in STATA²⁰ to evaluate effect of the intervention on the three outcome variables: 1) NHIS enrolment; 2) NHIS knowledge; and 3) healthcare utilisation measured by health facility visit in the last 12 months. This analytical technique has been used in other studies to evaluate effect of social protection programmes in Ghana and other sub-Saharan Africa (SSA) countries.^{13,21,22} The difference-in-differences technique addresses potential endogeneity bias or unobserved time-variant variables of the intervention, which are correlated with the outcomes of interest or dependent variables.^{23,24} We estimated the intervention effect by comparing the average outcomes in the intervention group (Kadjebi district) and control group (North Tongu) before and after implementation of the intervention using linear regression, equation 1.²⁰

$$Y_i = \beta_0 + \beta_1 \cdot \text{period}_i + \beta_2 \cdot \text{treated}_i + \beta_3 \cdot \text{period}_i \cdot \text{treated}_i + e_i \dots (1)$$

Where:

Y : outcome variable; i : individual/participant; β_0 : is the mean outcome for the control group (North Tongu district) on the baseline; $\beta_0 + \beta_1$: is the mean outcome for the control group in the follow-up; β_2 : is the single difference between treated (Kadjebi district) and control (North Tongu district) groups on the baseline; $\beta_0 + \beta_2$: is the mean outcome for the treated group on the baseline; $\beta_0 + \beta_1 + \beta_2 + \beta_3$: is the mean outcome for the treated group in the follow-up; β_3 : is the difference-in-differences (DID) or impact;

The independent variables were the intervention districts (treated district = 1/control district = 0); the time the intervention started (period), with before the intervention (pre-intervention period) = 0/after intervention (post-intervention period = 1); and the difference-in-differences estimator (period*treated). STATA version 13 (StataCorp, College Station, TX, USA) was used to analyse the data.

Ethics statement

The study obtained ethical clearance from the Ghana Health Service Ethical Review Committee (GHS-ERC 27/05/14). All participants signed or thumb-printed the informed consent form before the interviews were conducted.

RESULTS

Characteristics of the survey participants

Table 1 summarizes demographic, economic and health-related characteristics of the survey participants for the intervention (Kadjebi district) and control (North Tongu) groups at baseline. There were no significant differences in all the three outcome measures (enrolment, NHIS knowledge, healthcare utilisation) and other socio-demographic, economic and healthcare related characteristics between the intervention and control groups. However, there were few characteristics that showed significant differences between the 2 groups: distance to the nearest NHIS office; being a Christian; belonging to an Ewe ethnic group; having a chronic disease 12 months prior to the baseline survey; self-reported good health; and residing in the rural area.

Approximately, 46% of the participants had valid NHIS card at the time of the baseline survey; 61.2% were knowledgeable of the NHIS; and 72.1% visited healthcare facility 12 months prior to the survey. The average age of the study participants was 38.9 years (standard deviation [SD]=13.62) and 61.9% were females. Survey participants also had on average 5 persons per household (SD=2.49); 65.2% were married; 84.8% were employed; and 5.4% reported being wealthy. The health-related characteristics further showed that 84.8% had infectious diseases 12 months prior to the survey; and 58.9% reported good health status. On average, participants travelled 18.7 km to the nearest NHIS office; 4.6 km to the nearest healthcare facility, and 14.9 km to their preferred healthcare facility for services.

Table 1. Individual and household characteristics of study participants at baseline (n=599)

Variable	All (Pooled sample)		Control group (North Tongu district)		Intervention group (Kadjebi district)		Difference
	Obs	Mean	Obs	Mean	Obs	Mean	
Outcome measures							
Enrolment (active member)	599	0.461	200	0.480	399	0.451	0.029
NHIS knowledge	596	0.612	200	0.598	396	0.614	−0.020
Healthcare utilisation	592	0.721	200	0.740	392	0.712	0.028
Demographic characteristics							
Female	596	0.619	200	0.630	396	0.614	0.016
Age	599	38.963	200	39.850	399	38.519	1.331
Rural resident	599	0.529	200	0.615	399	0.486	0.129 ^b
Household size	599	5.060	200	5.090	399	5.045	0.045
Ewe	597	0.668	200	0.980	397	0.511	0.469 ^c
Christian	599	0.816	200	0.930	399	0.759	0.171 ^c
Married	597	0.652	200	0.680	397	0.637	0.043
Post-primary education	514	0.802	174	0.845	340	0.779	0.065
Economic characteristics							
Employed	592	0.848	200	0.820	392	0.862	−0.042
Reported annual income	477	2,730.811	195	2,578.651	282	2,836.028	−257.377
Self-reported wealth	594	0.054	198	0.076	396	0.043	0.033
Health-related characteristics							
Distance to nearest NHIS office (km)	599	18.663	200	13.022	399	21.490	−0.8469 ^c
Distance to nearest healthcare facility (km)	580	4.645	199	4.237	381	4.858	−0.621
Distance to preferred healthcare facility (km)	550	14.896	200	13.971	350	15.424	−1.453
Infectious disease in last 12 months	599	0.848	200	0.835	399	0.855	−0.019
Chronic disease in last 12 months	599	0.149	200	0.195	399	0.125	0.070 ^a
Other diseases in last 12 months	599	0.259	200	0.250	399	0.263	−0.130
Self-reported good health	595	0.589	200	0.440	395	0.666	−0.226 ^c

^a $p < 0.05$; ^b $p < 0.01$; ^c $p < 0.001$.

Impact of the intervention on NHIS enrolment

Over the pre- and post-intervention period, NHIS enrolment increased among the intervention group (Kadjebi district) from 45.1% to 58.1% and decreased among the control group (North Tongu district) from 48% to 45.2% (Table 2). Overall, the IEC-Community outreach registration intervention significantly increased NHIS enrolment in the intervention group by 15.8 percentage points ($p < 0.05$), relative to those in the control group.

Impact of the intervention on healthcare utilisation

Over the study period, both intervention (Kadjebi district) and control (North Tongue district) groups recorded reduction in healthcare utilisation, however, that of the control group was bigger (Table 3). Healthcare utilisation among the intervention group decreased from 71.2% to 67.9% and that of the control group reduced from 74% to 52.3%. In all, the IEC-Community outreach registration intervention significantly increased healthcare utilisation by 18.5 percentage points in the intervention group, compared to the control group.

Impact of the intervention on NHIS knowledge

Knowledge of the NHIS increased among the intervention (Kadjebi district) and control (North Tongue district) groups over the pre- and post-intervention period from 61.8%–65.3% and 59.8%–61.5%, respectively (Table 4). The combined IEC-Community outreach registration intervention, however, had no significant effect on NHIS knowledge in the intervention group, compared to the control group.

Table 2. Impact estimates of IEC-Community outreach registration on NHIS enrolment (n=1,199)

Outcome variable	NHIS enrolment	Standard error	t	P>t
Before				
Control	0.480			
Treated	0.451			
Diff (T-C)	-0.029	0.043	-0.67	0.503
After				
Control	0.452			
Treated	0.581			
Diff (T-C)	0.129	0.043	2.99	0.003 ^a
Diff-in-Diff	0.158	0.061	2.59	0.010 ^a

R-square: 0.01. Means and standard errors are estimated by linear regression.

IEC = information, education and communication; NHIS = National Health Insurance Scheme.

^a $p < 0.01$.

Table 3. Impact estimates of IEC-Community outreach registration on healthcare utilisation (n=1,190)

Outcome variable	Healthcare utilisation	Standard error	t	P>t
Before				
Control	0.740			
Treated	0.712			
Diff (T-C)	-0.028	0.040	-0.70	0.484
After				
Control	0.523			
Treated	0.679			
Diff (T-C)	0.157	0.040	3.89	0.000 ^a
Diff-in-Diff	0.185	0.057	3.24	0.001 ^a

R-square: 0.02. Means and standard errors are estimated by linear regression.

IEC = information, education and communication.

^a $p < 0.01$.

Table 4. Impact estimates of IEC-Community outreach registration on NHIS knowledge (n=1,185)

Outcome variable	NHIS knowledge	Standard error	t	P>t
Before				
Control	0.598			
Treated	0.618			
Diff (T-C)	0.020	0.019	1.08	0.281
After				
Control	0.615			
Treated	0.653			
Diff (T-C)	0.039	0.019	2.06	0.040 ^a
Diff-in-Diff	0.019	0.026	0.70	0.483

R-square: 0.01. Means and standard errors are estimated by linear regression.

IEC = information, education and communication; NHIS = National Health Insurance Scheme.

^ap<0.05.

DISCUSSION

The study evaluated effect of a combined IEC and community outreach registration intervention on NHIS enrolment, NHIS knowledge and healthcare utilisation. The findings show that the intervention significantly improved enrolment in the NHIS in the intervention group (Kadjebe district), compared to the control group (North Tongu district). The plausible explanation is that taking the integrated education and registration closer to the people in their communities reduces transportation and time costs associated with going to the NHIS office to register, as found in a similar study where time and transport costs were barriers to enrolment in the health insurance scheme in Nicaragua.¹⁵ The average distance of travelling to the NHIS office (15 km) in the intervention district, as shown by this present study is considerably long. This geographical barrier and associated time and transport costs prevent people from enrolling in health insurance programmes, as evidenced in earlier studies.^{11,25} Our findings also corroborate similar studies in Ghana^{12,13,26} and other LIMCs,^{14,15} where engagement with the community and informal sector workers on health insurance products and provision of convenient registration points or centres yielded positive and significant effect on enrolment in the health insurance programmes. The study, however, shows a fall in enrolment in the control group (North Tongu district) over the pre-post intervention period. Although the reasons for the decline in enrolment could not be readily ascertained in this study, factors including poverty, lack of awareness of membership expiry dates, long waiting times at the NHIS office, and perceived poor quality of care are possible causes, as found in an earlier study in the region.¹¹

Findings of the study also reveal that the IEC-Community outreach registration intervention had a positive and significant ripple effect on healthcare utilisation, probably because participants who received the intervention now have financial access to healthcare services. Thus, they may not have to pay out-of-pocket at the point of service use, as evidenced in other studies that health insurance removes financial barrier to healthcare services, thereby increasing access to and utilisation of services,²⁷⁻³¹ as well as improving equity. Other plausible reasons for the positive effect of the intervention on healthcare utilisation are adverse selection and demand-side moral hazard. The community outreach registration might have influenced high patronage of people with medical conditions, who hitherto were unable to visit healthcare facility for treatment due to financial constraints. Others might also want to test the system, thereby making frivolous visits to healthcare facilities, as found in a previous study on the NHIS in northern Ghana.³² Our finding is also consistent with similar studies in Ghana^{5,12,26,33-36} and elsewhere,^{37,38} where the insured were more likely to access

healthcare services than the uninsured. It, however, contradicts a study by Thornton et al.,¹⁵ where recipients of information and on-site health insurance registration intervention had no significant increase in their overall utilisation of health services, a year after the intervention. Again, the present study shows a relatively higher reduction in healthcare utilisation in the control group (North Tongu district) from the pre- to the post-intervention period, which could be attributed to healthcare provider related factors such as long waiting times for care and perceived poor quality of care, as shown in a related study in the region.¹¹ The observed decline in enrolment in the control group could also account for this occurrence, consistent with other studies in Ghana^{29,31} and Ethiopia,³⁹ where health insurance coverage showed positive and significant association with healthcare utilisation especially at formal settings such as hospitals and clinics. Besides, it is plausible that participants in the control group have lower unmet needs than those in the intervention group.

The IEC-Community outreach registration intervention, however, shows no improvement on participants' knowledge of the NHIS, consistent with a similar study in Kenya¹⁴ but contradicts one in Nicaragua, where participants' knowledge, assessed by their awareness of the health insurance product, increased significantly due to provision of a six-month subsidy.^{15,16} The possible explanation for the lack of improvement in participants' knowledge of the NHIS observed in this study is that the IEC was not aggressively pursued as a separate intervention. It was mainly in the form of announcement of the visiting days for the community outreach registration and the cost of registration, that is, premium and membership card processing fees to be paid during registration. Nonetheless, participants who enquired about the benefits of the scheme were educated or sensitized by the NHIS officials. Thornton et al.¹⁵ and Hatt et al.¹⁶ also found in their study that receipt of information about health insurance alone did not increase participants' knowledge of the insurance product but provision of subsidies did improve their knowledge significantly.

Our findings suggest that the IEC-Community outreach registration intervention could improve enrolment in remote areas of the country where there is high incidence of poverty, considerable distance to health insurance registration office or centres, and poor internet connectivity, as Ghana strives for attainment of UHC (SDG 3.8). Other studies, however, have shown that facilitating enrolment by providing education, on-site registration and subsidies only yield short term effects.^{12,14,26} Therefore, this study's intervention could be used to complement other registration strategies such as the NHIA's innovative mobile renewal system where members can conveniently renew their membership using their mobile phones. The findings also indicate that the intervention could improve utilisation of healthcare services, which may eventually improve health outcomes of the insured. However, more innovative strategies are required to deepen members' knowledge of the NHIS towards enrolment and to help them derive maximum benefits from the scheme regarding healthcare services covered.

It is worth mentioning that one major strength of this study is the involvement of key stakeholders in the design and implementation of the intervention, for example, the Korean Partners (KOFIH, Seoul National University), local government officials, healthcare services providers, chiefs and other opinion leaders. The zeal of the regional and district NHIS officers also contributed immensely to the success of the project. However, operational challenges including poor internet connectivity and lack of electricity in some of the communities hampered the enrolment process. For example, VSAT signal strength was limited as a result of topographical features of the community. Some of these challenges were addressed by switching internet service providers whenever the internet connectively

was poor. Commercial 2G mobile network was used when VSAT connection was unavailable. Nevertheless, on-site subscription was severely challenged when both VSAT and 2G mobile network were unavailable, requiring relocation of the registration centre. Another challenge was the variation in the design of the project by making one of the intervention groups (Ketu North district) in Phase one, a control group in Phase two. This design variation made it difficult to have a pure baseline to warrant the use of difference-in-differences analysis or pre- and post-estimation approach to evaluate impact of the IEC-community outreach intervention. However, this analytical challenge was resolved by dropping Ketu North district as a control district in the analysis to be able to use the difference-in-differences analytical technique to address potential unobservable selection bias or endogeneity.

In conclusion, the study demonstrates that an integrated IEC and community outreach registration intervention could improve enrolment in the NHIS and accelerate progress towards realization of UHC, including access to healthcare services and essential medicines for improved health outcomes. In respect of these findings, we recommend that Management of the NHIS adopts IEC and community outreach registration strategies in their policy decisions to increase population coverage in hard-to-reach communities of the country towards UHC. We also recommend further research to evaluate effect of the intervention on out-of-pocket expenditure and long-term effect (3 years and above) of the intervention on enrolment in the scheme.

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SUPPLEMENTARY MATERIAL

Supplementary Table 1

Socio-demographic and health-related characteristics of the study areas

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REFERENCES

1. Xu K, Evans DB, Carrin G, Aguilar-Rivera AM. *Designing Health Financing Systems to Reduce Catastrophic Health Expenditure*. Geneva, Switzerland: World Health Organization; 2005.
2. Carrin G, James C. *Reaching Universal Coverage via Social Health Insurance: Key Design Features in the Transition Period*. Geneva, Switzerland: World Health Organization; 2004.
3. Carrin G, James C. Social health insurance: key factors affecting the transition towards universal coverage. *Int Soc Secur Rev* 2005;58(1):45-64.
[CROSSREF](#)
4. Kwon S. Thirty years of national health insurance in South Korea: lessons for achieving universal health care coverage. *Health Policy Plan* 2009;24(1):63-71.
[PUBMED](#) | [CROSSREF](#)

5. Blanchet NJ, Fink G, Osei-Akoto I. The effect of Ghana's National Health Insurance Scheme on health care utilisation. *Ghana Med J* 2012;46(2):76-84.
[PUBMED](#)
6. Atim C, Sock M. *An External Evaluation of the Nkoranza Community Financing Health Insurance Scheme, Ghana. Technical Report No. 50*. Bethesda, MD: Partnerships for Health Reform Project, Abt Associates Inc.; 2000.
7. Waddington CJ, Enyimayew KA. A price to pay: the impact of user charges in Ashanti-Akim district, Ghana. *Int J Health Plann Manage* 1989;4(1):17-47.
[CROSSREF](#)
8. Waddington C, Enyimayew KA. A price to pay, part 2: the impact of user charges in the Volta region of Ghana. *Int J Health Plann Manage* 1990;5(4):287-312.
[CROSSREF](#)
9. Ministry of Health (GH). National health insurance policy framework for Ghana. Revised version [Internet]. https://www.ghanahealthservice.org/downloads/NHI_policy_framework.pdf. Updated 2004. Accessed December 17, 2017.
10. Kotoh AM, Van der Geest S. Why are the poor less covered in Ghana's national health insurance? A critical analysis of policy and practice. *Int J Equity Health* 2016;15(34):34.
[PUBMED](#) | [CROSSREF](#)
11. Agyepong IA, Abankwah DN, Abroso A, Chun C, Dodoo JN, Lee S, et al. The “Universal” in UHC and Ghana's National Health Insurance Scheme: policy and implementation challenges and dilemmas of a lower middle income country. *BMC Health Serv Res* 2016;16(1):504.
[PUBMED](#) | [CROSSREF](#)
12. Asuming OP, Kim HB, Sim A. Long-run consequences of health insurance promotion: evidence from a field experiment in Ghana [Internet]. <https://ideas.repec.org/p/iza/izadps/dp11117.html>. Updated 2017. Accessed November 6, 2019.
13. Duku SK, Nketiah-Amponsah E, Fenenga CJ, Arhinful DK, Janssens W, Pradhan M. The effect of community engagement on healthcare utilization and health insurance enrolment in Ghana results from a randomized experiment [Internet]. <http://papers.tinbergen.nl/18017.pdf>. Updated 2018. Accessed March 17, 2018.
14. Chemin M. Informal groups and health insurance take-up evidence from a field experiment. *World Dev* 2018;101:54-72.
[CROSSREF](#)
15. Thornton RL, Hatt LE, Field EM, Islam M, Diaz FS, González MA. Social security health insurance for the informal sector in Nicaragua: a randomized evaluation. *Health Econ* 2010;19 Suppl:181-206.
[PUBMED](#) | [CROSSREF](#)
16. Hatt L, Thornton R, Magnoni B, Islam M. Extending social insurance to informal sector workers in Nicaragua via microfinance institutions: results from a randomized evaluation [Internet]. https://pdfs.semanticscholar.org/a101/ee772a33a9cd18a210f9a90f9997646d79.pdf?_ga=2.268792369.1592462702.1570680037-566407651.1570680037. Updated 2009. Accessed March 12, 2020.
17. National Health Insurance Authority (GH). National Health Insurance Act 2003, Act 650. Accra, Ghana: National Health Insurance Authority; 2003, 1-39.
18. International Labour Organization (GH). *National Health Insurance Act, 2012 (Act 852)*. Accra, Ghana: International Labour Organization; 2012, 1-55.
19. Németh R. *Respondent Selection within the Household - A Modification of the Kish Grid*. Hungary: Eötvös Loránd University; 2002.
20. Villa JM. Simplifying the estimation of difference in differences treatment effects with Stata. Munich, Germany: Munich Personal RePEc Archive; 2012.
21. McKinnon B, Harper S, Kaufman JS. Who benefits from removing user fees for facility-based delivery services? Evidence on socioeconomic differences from Ghana, Senegal and Sierra Leone. *Soc Sci Med* 2015;135:117-23.
[PUBMED](#) | [CROSSREF](#)
22. Andoh-Adjei FX, Boudewijns B, Nsiah-Boateng E, Asante FA, van der Velden K, Spaan E. Effects of capitation payment on utilization and claims expenditure under National Health Insurance Scheme: a cross-sectional study of three regions in Ghana. *Health Econ Rev* 2018;8(1):17.
[PUBMED](#) | [CROSSREF](#)
23. Bamberger M, White H. Using strong evaluation designs in developing countries: experience and challenges. *J Multidiscip Eval* 2007;4(8):58-73.
24. Leeuw F, Vaessen J. Impact evaluations and development: NONIE guidance on impact evaluation [Internet]. <http://documents.worldbank.org/curated/en/411821468313779505/pdf/574900WP0Box351BLIC10nonie1guidance.pdf>. Updated 2009. Accessed March 15, 2020.

25. Fenny AP, Kusi A, Arhinful DK, Asante FA. Factors contributing to low uptake and renewal of health insurance: a qualitative study in Ghana. *Glob Health Res Policy* 2016;1:18.
[PUBMED](#) | [CROSSREF](#)
26. Asuming PO. *Getting the Poor to Enroll in Health Insurance, and Its Effects on Their Health: Evidence from a Field Experiment in Ghana*. New York, NY: Columbia University; 2013, 1-63.
27. National Development Planning Commission. *2008 Citizens' Assessment of the National Health Insurance Scheme: Towards a Sustainable Health Care Financing Arrangement That Protects the Poor*. Accra, Ghana: National Development Planning Commission; 2009.
28. Dalinjong PA, Laar AS. The national health insurance scheme: perceptions and experiences of health care providers and clients in two districts of Ghana. *Health Econ Rev* 2012;2(1):13.
[PUBMED](#) | [CROSSREF](#)
29. Fenny AP, Asante FA, Enemark U, Hansen KS. Malaria care seeking behavior of individuals in Ghana under the NHIS: are we back to the use of informal care? *BMC Public Health* 2015;15(370):370.
[PUBMED](#) | [CROSSREF](#)
30. Andersen R, Newman JF. Societal and individual determinants of medical care utilization in the United States. *Milbank Q* 2005;83(4):1-28.
[CROSSREF](#)
31. Fenny AP, Asante FA, Arhinful DK, Kusi A, Parmar D, Williams G. Who uses outpatient healthcare services under Ghana's health protection scheme and why? *BMC Health Serv Res* 2016;16(1):174.
[PUBMED](#) | [CROSSREF](#)
32. Debpuur C, Dalaba MA, Chatio S, Adjuik M, Akweongo P. An exploration of moral hazard behaviors under the national health insurance scheme in Northern Ghana: a qualitative study. *BMC Health Serv Res* 2015;15(1):469.
[PUBMED](#) | [CROSSREF](#)
33. Fiestas Navarrete L, Ghislandi S, Stuckler D, Tediosi F. Inequalities in the benefits of national health insurance on financial protection from out-of-pocket payments and access to health services: cross-sectional evidence from Ghana. *Health Policy Plan* 2019;34(9):694-705.
[PUBMED](#) | [CROSSREF](#)
34. Bonfrer I, Breebaart L, Van de Poel E. The effects of Ghana's National Health Insurance Scheme on maternal and infant health care utilization. *PLoS One* 2016;11(11):e0165623.
[PUBMED](#) | [CROSSREF](#)
35. Mensah J, Oppong JR, Schmidt CM. Ghana's National Health Insurance Scheme in the context of the health MDGs: an empirical evaluation using propensity score matching. *Health Econ* 2010;19 Suppl:95-106.
[PUBMED](#) | [CROSSREF](#)
36. van der Wielen N, Channon AA, Falkingham J. Does insurance enrolment increase healthcare utilisation among rural-dwelling older adults? Evidence from the National Health Insurance Scheme in Ghana. *BMJ Glob Health* 2018;3(1):e000590.
[PUBMED](#) | [CROSSREF](#)
37. Ahmed S, Sarker AR, Sultana M, Chakrovorty S, Ahmed MW, Dorin F, et al. The impact of community-based health insurance on the utilization of medically trained healthcare providers among informal workers in Bangladesh. *PLoS One* 2018;13(7):e0200265.
[PUBMED](#) | [CROSSREF](#)
38. Robyn PJ, Fink G, Sié A, Sauerborn R. Health insurance and health-seeking behavior: evidence from a randomized community-based insurance rollout in rural Burkina Faso. *Soc Sci Med* 2012;75(4):595-603.
[PUBMED](#) | [CROSSREF](#)
39. Tilahun H, Atnafu DD, Asrade G, Minyihun A, Alemu YM. Factors for healthcare utilization and effect of mutual health insurance on healthcare utilization in rural communities of South Achefer Woreda, North West, Ethiopia. *Health Econ Rev* 2018;8(1):15.
[PUBMED](#) | [CROSSREF](#)