

Background

Research has shown that health shocks have large negative impact on uninsured poor households in developing countries (Xu et al, 2003; Gertler & Gruber, 2002; Fu, 1999). Yet many people in developing countries lack of access to adequate health care leads to poor health and the absence of risk pooling and insurance result in health-related poverty (WHO, 2000). In response, in the last two or so decades many developing countries have instituted social health insurance schemes to help the poor overcome financial barriers to health care utilization¹. However, enrollment in SHIs remain very low especially among the poorest households (Pauly et al 2008; Chankova et al 2008; Gine et al, 2007; Hsiao and Shaw, 2007; Jowett 2003). Understanding the reasons for the low take-up of insurance is of immense research and policy interest. Yet, there is a dearth of rigorous empirical evidence on the reasons for the low take-up and effect of enrollment in SHIs on utilization of services, out-of-pocket expenses and health from developing countries².

This paper provides experimental evidence on the factors underlying the low enrollment in SHIs among the poor and the impact of insurance coverage on utilization of services, financial protection and health outcomes using Ghana's National Health Insurance Scheme (NHIS), a generous nationwide social health insurance program, as a case. I introduced three randomized interventions - an education campaign, subsidy for the purchase of insurance and convenient process of signing up for insurance - and their interactions in Wa West District of the Upper West region of Ghana, a poor rural agrarian district with low enrollment in the NHIS. The education campaign provided basic information about the NHIS including registration information, premiums and benefits of the scheme as well as general education on the importance of being insured. The convenient registration intervention allowed selected households to sign up for insurance in the comfort of their community rather than traveling several miles to a fixed registration point. The subsidy intervention randomly gave households three levels of subsidies: amounts equivalent to 1/3, 2/3 and full monetary cost of enrolling in the NHIS.

My preliminary results suggest that providing information and subsidies had substantial effects on enrollment but my convenience intervention had no effect. I also find that enrollment is associated with increased utilization of health care services. Importantly, although education and subsidy each had strong effect on enrollment, it is only the combination of education and subsidy that had an effect on utilization of health care services. On-going analysis is looking at the possible heterogeneous responses to interventions, and in utilization of service, price elasticity of demand for insurance and effect of insurance coverage on out-of-pocket medical expenses and health status (self-reported and objective)

¹ Examples include Colombia's Regimen Subsidiado, Georgia's Medical Insurance Program (MIP), Phillipine's National Health Insurance Program, Kenya's National Social Health Insurance Schemes, Mexico's Seguro Popular, Nicaragua's Instituto Nicaraguense de Seguridad Social (INSS) and Nigeria's National Health Insurance Scheme.

² Thornton et al (2010) and King et al (2009) who evaluate health insurance programs in developing countries using randomized experiments are important exceptions.

Variable	Full	Control mean	subsidy minus control	Educ. minus control	Conve. minus control	Edu/conv minus control	sub/conve minus control	sub/educ minus control	All 3 minus control
Observations (N)	4625	1313	709	327	604	328	481	300	561
Age	32.956	34.313	0.842	1.661	2.129	0.856	1.930	-1.532	1.102
Male	0.483	0.476	-0.009	-0.014	0.015	-0.023	0.020	-0.022	-0.032
Has some formal education	0.335	0.337	0.025	0.030	-0.006	0.148*	0.038	0.045	-0.019
Has a health condition [≥ 6 months]	0.070	0.072	0.002	0.011	-0.000	0.012	-0.018	0.004	-0.002
Has been ill in the last month	0.120	0.109	-0.003	-0.030	0.040	0.031	-0.033	-0.027	-0.018
Has recently visited health facility	0.067	0.065	-0.002	-0.003	0.007	-0.005	-0.024	-0.008	0.008
Made out of pocket expense	0.126	0.133	0.001	0.007	0.020	-0.032	-0.013	-0.017	0.007
Health expend. in last month [GHC]	11.95	13.07	3.827**	-1.283	1.213	2.519	-2.666	0.020	2.226
Number of times expects to be sick	3.140	3.122	-0.331	0.573	0.493	0.065	-0.415	0.199	-0.407
Probably will be sick in the next year	0.447	0.468	0.004	0.059	0.008	0.040	-0.028	0.033	0.059
Expected health expend. [GHC]	17.05	20.469	3.069	4.733	4.046	3.282	4.084	4.177	2.527
Knowledge of NHIS (raw score)	10.710	10.576	0.044	-0.409	-0.353	-0.289	-0.068	-0.055	0.008
Ever enrolled in NHIS	0.374	0.338	-0.084	-0.085*	-0.022	-0.022	-0.091*	-0.074	0.070
Currently enrolled in NHIS	0.205	0.201	0.011	-0.045	-0.006	-0.056	-0.024	0.011	-0.011
Re-enrolled in NHIS	0.629	0.700	0.023	0.102	0.013	0.123	0.108	0.136	0.132
Christian	0.432	0.422	-0.048	0.090	0.005	-0.091	0.014	-0.207**	-0.067
Dagaaba	0.502	0.438	-0.046	-0.045	0.015	-0.015	0.041	-0.170*	-0.059
In poorest quintile	0.200	0.216	0.025	0.018	-0.051	0.045	0.082**	0.044	0.051
Number of children under 18	3.874	3.697	-0.050	-1.006	-0.116	0.166	-0.787	0.536	-0.946
Head is male	0.800	0.808	-0.007	-0.076	0.095*	-0.069	-0.008	-0.081	-0.062
Owns farming land	0.509	0.480	-0.217*	-0.020	0.013	0.058	-0.067	0.105	-0.027
Owns a mosquito net	0.590	0.544	-0.084	-0.106	0.135	-0.031	0.128*	-0.125*	0.029
Distance to NHIS regist. (km)	18.436	21.286	-2.001	0.087	5.236**	2.119	-3.246	0.071	2.981
Distance to health fac. (km)	5.359	5.501	0.981	1.092	0.049	-0.119	0.563	1.290	-0.982

a: out of 18 questions about the NHIS. Standard deviations are in brackets. 1\$ = 1.5 GHC. *, ** and *** denote statistical significance at 10%, 5% and 1% levels respectively. All tests of differences adjust standard errors for intra-cluster (intra-village) correlation

Table 4 First-Stage results: Effect of interventions on enrollment into insurance

Outcome variable: indicator = 0 for not enrolled, 1 for enrolled						
	(1)	(2)	(3)	(4)	(5)	(6)
Education only	0.229** (0.105)	0.208** (0.083)	0.156** (0.080)	0.147** (0.072)	0.261*** (0.096)	0.050 (0.072)
Subsidy only	0.365*** (0.064)	0.372*** (0.054)	0.361*** (0.050)	0.370*** (0.049)	0.328*** (0.063)	0.408*** (0.050)
Conve regist.	0.046 (0.082)	0.039 (0.062)	0.035 (0.048)	0.013 (0.048)	-0.022 (0.060)	0.016 (0.070)
Educ & conve reg	0.203* (0.113)	0.197* (0.110)	0.157* (0.095)	0.186* (0.108)	0.223* (0.127)	0.170 (0.140)
Subsidy & conve reg.	0.429*** (0.063)	0.396*** (0.062)	0.368*** (0.061)	0.354*** (0.066)	0.363*** (0.074)	0.340*** (0.077)
Subsidy & educ	0.551*** (0.071)	0.562*** (0.066)	0.499*** (0.065)	0.525*** (0.070)	0.607*** (0.081)	0.444*** (0.079)
Subsidy&educ&conve	0.523*** (0.054)	0.531*** (0.058)	0.495*** (0.057)	0.455*** (0.064)	0.470*** (0.072)	0.444*** (0.063)
Individual controls	N	Y	Y	Y	Y	Y
Household controls	N	N	Y	Y	Y	Y
Community controls	N	N	N	Y	Y	Y
N	4298	4298	4298	4298	1995	2303
F-statistic	18.54	20.73	19.07	21.216	19.41	20.57
R²	0.1738	0.2527	0.2713	0.2773	0.2986	0.2817

Notes: Robust standard errors clustered at community level reported in brackets. *, ** and *** denote statistical significance at 10%, 10 and 1% levels respectively. F-statistic is for excluded instruments (interventions). Individual controls are: age group (<18 years, 18-69, and 70+), gender, education status, indicator for having ever registered with the NHIS at baseline, and indicator having visited a health facility at baseline. Household controls are: household size, religion, ethnicity and wealth index (poor third, middle third and rich third). Community controls are: distance to nearest health facility, distance to NHIS registration center. Columns (5) and (6) restricts sample to adults aged 18 and above and children under 18 respectively.

IV estimates: Effect of insurance on utilization of healthcare services

Dep. variable:	Visited health facility in the last 4 weeks		Visited health facility in last 6 months		# of facility visits in last 6 months		visited health facility for malaria treatment	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Insured	0.122** (0.054)	0.140*** (0.052)	0.133*** (0.051)	0.151*** (0.055)	0.297*** (0.115)	0.324*** (0.125)	0.036** (0.016)	0.038** (0.015)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
N	4298	4298	4298	4298	4298	4298	4298	4258
R ²	0.0182	0.0755	0.0204	0.0672	0.0196	0.0514	0.0023	0.0134

Notes: Robust standard errors clustered at community level reported in brackets. *, ** and *** denote statistical significance at 10%, 5 and 1% levels respectively. Controls include both individual-level and household/community-level variables. Individual-level controls are: age-group (<18 and 70+, 18-69 is omitted), gender, indicator for having a health condition, indicator for visiting a health facility at baseline, education status. Household/community-level controls are: household wealth (poorest third and richest third, middle third omitted), household size, religion, ethnicity, distance to nearest health facility and distance to NHIS registration point.

ITT (reduced-form) estimates: Effect of treatment on utilization of health services

Dependent variable:	Visited facility in last 4 weeks		Visited facility in last 6 months		# of visits in last 6 months		Visited facility for malaria treatment	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Education	0.012 (0.028)	0.019 (0.027)	0.017 (0.030)	0.024 (0.027)	0.075 (0.080)	0.103 (0.068)	0.013 (0.010)	0.016 (0.091)
Subsidy only	0.016 (0.023)	-0.015 (0.020)	-0.012 (0.022)	-0.009 (0.018)	0.006 (0.052)	-0.005 (0.051)	0.005 (0.007)	0.002 (0.006)
Conve. regist.	- 0.009 (0.024)	-0.026 (0.02)	0.009 (0.022)	-0.019 (0.023)	0.025 (0.052)	-0.008 (0.070)	-0.000 (0.008)	-0.001 (0.009)
Educ & conve	0.068 (0.052)	0.041 (0.048)	0.077 (0.054)	0.050 (0.049)	0.072 (0.074)	0.073 (0.087)	0.006 (0.013)	0.004 (0.015)
Subsidy & educ	0.124*** (0.032)	0.106*** (0.032)	0.137*** (0.038)	0.122*** (0.040)	0.313*** (0.045)	0.285*** (0.054)	0.010 (0.010)	0.010 (0.009)
Subsidy & conve	0.001 (0.039)	0.005 (0.040)	0.012 (0.037)	0.014 (0.036)	0.043 (0.071)	0.023 (0.090)	0.006 (0.009)	-0.000 (0.009)
Subsidy&educ&conve	0.110*** (0.026)	0.106*** (0.031)	0.107*** (0.025)	0.109*** (0.029)	0.208*** (0.051)	0.252*** (0.062)	0.032*** (0.007)	0.033*** (0.010)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
N	4298	4298	4298	4298	4298	4298	4298	4298
R²	0.0193	0.0844	0.0206	0.0752	0.0214	0.0838	0.058	0.0118

Notes: Robust standard errors clustered at community level reported in brackets. *, ** and *** denote statistical significance at 10%, 10 and 1% levels respectively. Controls include both individual-level and household/community-level variables. Individual-level controls are: age-group (<18 and 70+, 18-69 is omitted), gender, indicator for having a health condition, indicator for visiting a health facility at baseline, education status. Household/community-level controls are: household wealth (poorest third and richest third, middle third omitted), household size, religion, ethnicity, distance to nearest health facility and distance to NHIS registration point.