

A Health Systems Strengthening Initiative in Rural Ghana: The Impact of the Ghana Essential Health Interventions Program on Use of ANC services

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This paper presents the effects of a health systems strengthening program on use of ANC services in rural northern Ghana. The Ghana Essential Health Interventions Program (GEHIP) tested the proposition that strengthening health system building blocks at the district level could lead to improvements health system functioning and improve maternal and child health outcomes. The interventions included expanding the range of primary health care functionality; training volunteers the in WHO “integrated management of childhood illness” regimen; simplifying and improving information systems; assuring appropriate logistics and supplies; developing a tool for budgeting that links financial planning with burden of disease; and redirecting leadership training to community engagement and resource mobilization. Interventions were implemented 3 district with another four districts are comparison. Our results show that GEHIP did not increase the use of ANC services but rather improved the quality of ANC services received

Table 2.1: Descriptive Statistics

Characteristic	Baseline		End line	
	Intervention	Comparison	Intervention	Comparison
Number of children	1240	1281	1980	1942
Mother's age				
15-19 years	5.71%	5.79%	3.69%	4.58%
20-24 years	19.25%	23.08%	17.98%	22.50%
25-29 years	24.23%	22.28%	23.18%	25.28%
30-34 years	21.37%	22.13%	21.21%	20.39%
35-39 years	16.80%	16.02%	19.34%	15.19%
40-44 years	9.87%	8.33%	10.96%	9.01%
45-49 years	2.77%	2.38%	3.64%	3.04%
Mother's education				
No formal education	67.90%	74.71%	67.53%	70.55%
Primary/Middle school/JHS	28.06%	22.56%	25.96%	24.92%
Secondary plus	4.03%	2.73%	6.52%	4.53%
Mother's marital status				
Never married	3.57%	2.83%	2.78%	3.04%
Married	92.13%	93.54%	91.46%	92.38%
Divorced/widowed/separated	4.30%	3.62%	5.76%	4.58%
Mother in polygamous marriage				
Yes	30.89%	29.98%	30.51%	28.06%
No	69.1%	70.02%	69.49%	71.94%
Mother's religion				
Christian	55.08%	45.86%	56.46%	53.24%
Traditional	17.26%	14.92%	11.01%	10.56%
Islam	24.19%	35.23%	31.11%	33.06%
No religion	3.47%	3.98%	1.41%	3.14%
Mother's ethnicity				
Buli	30.73%	0.16%	29.44%	0.15%
Frafra	26.05%	40.91%	21.36%	47.63%
Kusasi	19.11%	39.73%	20.40%	33.37%
Others	24.11%	19.20%	28.79%	18.85%
Mother's occupation				
No Occupation			10.71%	12.87%
Farming	52.66%	41.17%	49.65%	34.14%
Trading	20.32%	19.38%	16.52%	21.42%
Hairdressing/dressmaking	10.40%	15.47%	13.69%	14.78%
Student	1.53%	1.80%	1.72%	1.65%
Others	15.08%	22.19%	7.73%	15.14%
Mother currently enrolled in NHIS				
Yes	41.85%	41.45%	48.38%	42.89%
No	58.15%	58.55%	51.62%	57.11%
Had ANC				
Yes	96.61%	94.38%	96.05%	94.80%
No	3.39%	5.62%	3.95%	5.20%
Month of first ANC: mean (std. dev.)				
Had ANC from skilled personnel				
Yes	95.97%	93.67%	99.53%	99.35%
No	4.03%	6.33%	0.47%	0.65%
Had complete ANC				
Yes	58.06%	58.16%	86.79%	77.29%
No	41.94%	41.84%	13.21%	22.71%

Note: The unit of observation/analysis in this table is children.

Table 2.2: Effect of GEHIP on Use ANC Services

VARIABLES	ORs	95% CI	ORs	95% CI
GEHIP intervention district	1.762**	(1.124 - 2.761)	1.889***	(1.180 - 3.022)
Follow-up	1.087	(0.680 - 1.738)	1.102	(0.676 - 1.795)
GEHIP intervention* follow-up	0.759	(0.417 - 1.382)	0.799	(0.431 - 1.482)
Age group: 15-19 (ref)			1.000	
Age group: 20-24 years			1.849**	(1.057 - 3.235)
Age group: 25-29 years			1.840**	(1.025 - 3.303)
Age group: 30-34 years			1.637	(0.881 - 3.042)
Age group: 35-39 years			1.777	(0.885 - 3.565)
Age group: 40-44 years			1.430	(0.720 - 2.840)
Age group: 45-49 years			0.889	(0.360 - 2.194)
Marital status: never married (ref)			1.000	
Marital status: married			1.125	(0.542 - 2.338)
Marital status: divorced/widowed			0.624	(0.264 - 1.474)
Education: No formal education (ref)			1.000	
Education: Primary/JHS			1.132	(0.774 - 1.656)
Education: secondary plus			0.648	(0.344 - 1.220)
NHIS: Not currently enrolled (ref)			1.000	
NHIS: currently enrolled			1.240*	(0.991 - 1.551)
Wealth index: Poorest			1.000	
Wealth index: Poorer			1.134	(0.815 - 1.576)
Wealth index: middle			1.651**	(1.085 - 2.513)
Wealth index: Richer			1.527**	(1.019 - 2.288)
Wealth index: Richest			1.210	(0.771 - 1.899)
Occupation: No occupation			1.000	
Occupation: farming			1.389	(0.839 - 2.299)
Occupation: trading			1.462	(0.776 - 2.755)
Occupation: hairdressing/dressmaking			0.858	(0.484 - 1.521)
Occupation: student			0.962	(0.306 - 3.030)
Occupation: Others			0.850	(0.539 - 1.341)
Religion: Christian			1.000	
Religion: Traditional			0.946	(0.633 - 1.415)
Religion: Islam			0.921	(0.655 - 1.295)
Religion: No religion			0.814	(0.413 - 1.603)
Ethnic group: Buli (ref)			1.000	
Ethnic group: Frafra			1.360	(0.798 - 2.318)
Ethnic group: Kusasi			1.050	(0.617 - 1.787)
Ethnic group: Others			0.831	(0.477 - 1.449)
Locality: Urban			1.000	
Locality: semi-urban			1.491	(0.795 - 2.794)
Locality: rural			1.529	(0.792 - 2.952)
Constant	16.729***	(11.885 - 23.546)	3.607*	(0.979 - 13.282)
Observations		6,374		6,374
Pseudo R2		0.0050		0.0278
Wald Chi-square		9.05		93.66

Notes: OR is Odd-ratios; 95% CI is 95% confidence interval. The dependent variable in each regression takes a value 1 if the mother attended ANC during the pregnancy and 0 otherwise. Table reports results from logistic regression models. In all regressions, standard errors are clustered at the enumeration area level. *** p<0.01, ** p<0.05, * p<0.1

Table 2.3 Effect of GEHIP on the Quality of ANC Services

VARIABLES	Coefficient	95% CI	Coefficient	95% CI
GEHIP intervention district	0.014	(-0.315 - 0.344)	-0.014	(-0.341 - 0.312)
Follow-up	0.483***	(0.226 - 0.739)	0.477***	(0.227 - 0.727)
GEHIP intervention* follow-up	0.193	(-0.123 - 0.510)	0.212	(-0.094 - 0.518)
Age group: 15-19 (ref)			0.000	
Age group: 20-24 years			0.134	(-0.072 - 0.341)
Age group: 25-29 years			0.217**	(0.030 - 0.403)
Age group: 30-34 years			0.160	(-0.062 - 0.382)
Age group: 35-39 years			0.254**	(0.028 - 0.479)
Age group: 40-44 years			0.277**	(0.050 - 0.503)
Age group: 45-49 years			0.088	(-0.356 - 0.532)
Marital status: never married (ref)			0.000	
Marital status: married			0.061	(-0.232 - 0.354)
Marital status: divorced/widowed			0.037	(-0.263 - 0.336)
Education: No formal education (ref)			0.000	
Education: Primary/JHS			0.074	(-0.018 - 0.166)
Education: secondary plus			0.005	(-0.127 - 0.137)
NHIS: Not currently enrolled (ref)			0.000	
NHIS: currently enrolled			-0.009	(-0.100 - 0.083)
Wealth index: Poorest			0.000	
Wealth index: Poorer			0.183*	(-0.004 - 0.370)
Wealth index: middle			0.245**	(0.055 - 0.435)
Wealth index: Richer			0.348***	(0.144 - 0.551)
Wealth index: Richest			0.287***	(0.074 - 0.500)
Occupation: No occupation			0.000	
Occupation: farming			-0.072	(-0.204 - 0.059)
Occupation: trading			0.006	(-0.149 - 0.161)
Occupation: hairdressing/dressmaking			0.019	(-0.108 - 0.147)
Occupation: student			-0.176	(-0.663 - 0.311)
Occupation: Others			0.021	(-0.156 - 0.199)
Religion: Christian			0.000	
Religion: Traditional			0.023	(-0.083 - 0.128)
Religion: Islam			-0.115	(-0.278 - 0.048)
Religion: No religion			-0.185	(-0.487 - 0.117)
Ethnic group: Buli (ref)			0.000	
Ethnic group: Frafra			-0.121	(-0.298 - 0.057)
Ethnic group: Kusasi			-0.163*	(-0.356 - 0.030)
Ethnic group: Others			-0.196*	(-0.411 - 0.018)
Locality: Urban (ref)			0.000	
Locality: semi-urban			0.069	(-0.126 - 0.264)
Locality: rural			0.068	(-0.102 - 0.239)
Constant	-0.371***	(-0.644 - -0.098)	-0.704**	(-1.247 - -0.162)
Observations		5,886		5,886
R-squared		0.037		0.050
F-statistic		25.98		6.59

Notes: OR is Odd-ratios; 95% CI is 95% confidence interval. The dependent variable was generated from a principal component score from the following indicator variables for the following services received during ANC: being weighed, having blood pressure checked, height being measured, urine being tested, stomach being measured, and heart rate being measured. In all regressions, standard errors are clustered at the enumeration area level. *** p<0.01, ** p<0.05, * p<0.1

Table 2.4 Effect of GEHIP Quality of ANC Services

VARIABLES	Took antimalarial		Took dewormer		Tetanus injection	
	ORs	95% CI	ORs	95% CI	ORs	95% CI
GEHIP intervention district	1.56**	(1.09 - 2.21)	1.23	(0.87 - 1.73)	1.16	(0.90 - 1.48)
Follow-up	1.02	(0.75 - 1.38)	1.05	(0.83 - 1.32)	0.87	(0.69 - 1.09)
GEHIP intervention* follow-up	1.03	(0.66 - 1.62)	1.19	(0.85 - 1.67)	1.54**	(1.08 - 2.19)
Age group: 15-19 (ref)	1.00		1.00		1.00	
Age group: 20-24 years	1.19	(0.79 - 1.80)	1.04	(0.81 - 1.35)	1.32	(0.94 - 1.86)
Age group: 25-29 years	1.23	(0.83 - 1.81)	0.98	(0.75 - 1.29)	1.27	(0.88 - 1.83)
Age group: 30-34 years	1.60**	(1.06 - 2.43)	1.08	(0.82 - 1.42)	1.57**	(1.07 - 2.30)
Age group: 35-39 years	1.42	(0.90 - 2.23)	0.95	(0.68 - 1.34)	1.49**	(1.03 - 2.17)
Age group: 40-44 years	1.25	(0.79 - 1.98)	0.93	(0.69 - 1.25)	1.50*	(0.95 - 2.35)
Age group: 45-49 years	1.18	(0.63 - 2.18)	0.93	(0.62 - 1.39)	1.16	(0.71 - 1.89)
Marital status: never married (ref)	1.00		1.00		1.00	
Marital status: married	1.12	(0.59 - 2.15)	1.12	(0.81 - 1.55)	1.14	(0.78 - 1.67)
Marital status: divorced/widowed	0.76	(0.38 - 1.51)	0.82	(0.51 - 1.33)	0.78	(0.48 - 1.28)
Education: No formal education (ref)	1.00		1.00		1.00	
Education: Primary/JHS	1.13	(0.91 - 1.42)	1.09	(0.94 - 1.27)	1.06	(0.89 - 1.27)
Education: secondary plus	0.70*	(0.47 - 1.05)	1.21	(0.94 - 1.55)	0.72	(0.48 - 1.10)
NHIS: Not currently enrolled (ref)	1.00		1.00		1.00	
NHIS: currently enrolled	1.19*	(0.99 - 1.43)	0.98	(0.88 - 1.10)	1.09	(0.95 - 1.25)
Wealth index: Poorest	1.00		1.00		1.00	
Wealth index: Poorer	1.27*	(0.96 - 1.68)	0.99	(0.83 - 1.18)	1.28**	(1.03 - 1.58)
Wealth index: middle	1.37**	(1.01 - 1.84)	1.15	(0.97 - 1.36)	1.44***	(1.17 - 1.76)
Wealth index: Richer	1.85***	(1.29 - 2.64)	1.34***	(1.07 - 1.68)	1.58***	(1.26 - 1.97)
Wealth index: Richest	1.71***	(1.25 - 2.34)	1.32**	(1.05 - 1.66)	1.43***	(1.15 - 1.77)
Occupation: No occupation	1.00		1.00		1.00	
Occupation: farming	1.36*	(0.97 - 1.90)	1.27*	(0.96 - 1.68)	1.08	(0.80 - 1.47)
Occupation: trading	1.09	(0.76 - 1.57)	1.11	(0.82 - 1.51)	1.09	(0.79 - 1.50)
Occupation: hairdressing/dressmaking	1.23	(0.80 - 1.89)	1.08	(0.81 - 1.44)	0.89	(0.64 - 1.22)
Occupation: student	1.18	(0.58 - 2.40)	0.75	(0.45 - 1.26)	0.79	(0.43 - 1.47)
Occupation: Others	1.01	(0.72 - 1.41)	0.88	(0.65 - 1.19)	0.77	(0.54 - 1.10)
Religion: Christian	1.00		1.00		1.00	
Religion: Traditional	0.79	(0.58 - 1.09)	0.83*	(0.68 - 1.00)	0.84*	(0.68 - 1.03)
Religion: Islam	0.81	(0.61 - 1.08)	0.77**	(0.63 - 0.94)	0.78**	(0.62 - 0.97)
Religion: No religion	0.61**	(0.40 - 0.92)	0.70*	(0.48 - 1.02)	0.73	(0.48 - 1.10)
Ethnic group: Buli (ref)	1.00		1.00		1.00	
Ethnic group: Frafra	1.20	(0.83 - 1.74)	1.69***	(1.30 - 2.20)	1.27*	(0.97 - 1.66)
Ethnic group: Kusasi	0.90	(0.58 - 1.39)	1.76***	(1.29 - 2.40)	1.07	(0.79 - 1.45)
Ethnic group: Others	0.75	(0.50 - 1.14)	1.30**	(1.02 - 1.65)	0.93	(0.66 - 1.33)
Locality: Urban (ref)	1.00		1.00		1.00	
Locality: semi-urban	1.04	(0.63 - 1.70)	1.01	(0.63 - 1.62)	1.06	(0.70 - 1.60)
Locality: rural	1.24	(0.82 - 1.88)	1.31	(0.88 - 1.94)	1.26	(0.83 - 1.92)
Constant	2.41*	(0.99 - 5.87)	0.67	(0.36 - 1.26)	1.67	(0.80 - 3.49)
Observations	6,378		6,378		6,378	
Pseudo-R ²	0.0259		0.0186		0.0209	
Wald Chi-square	132.76		182.02		225.24	

Notes: OR is Odd-ratios; 95% CI is 95% confidence interval. Table reports results from logistic regression models. In all regressions, standard errors are clustered at the enumeration area level. *** p<0.01, ** p<0.05, * p<0.1