

BMJ Open Effectiveness of a free maternal healthcare programme under the National Health Insurance Scheme on skilled care: evidence from a cross-sectional study in two districts in Ghana

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ABSTRACT

Objectives In her quest to reduce maternal mortality, Ghana introduced a free maternal healthcare programme under the National Health Insurance Scheme. This study aimed to evaluate if women registered with the insurance had a better chance of accessing maternal healthcare services in two districts in Ghana.

Setting We conducted a cross-sectional quantitative study involving household interviews of all women of the reproductive age group (15–49 years) residing in Kintampo North Municipality and Kintampo South District in Ghana from May to July 2015. Logistics regression analysis at 95% CI was used to determine the independent associations between maternal health insurance and use of antenatal care, facility-based delivery and postnatal care services.

Participants Women who had children aged 3–12 months were selected to take part in the study.

Results We observed that women with insurance are 39.5 times more likely to have a maximum of six antenatal care visits and 2.6 times more likely to have an average of four antenatal care visits than those without insurance. Additionally, they are 5.3 times more likely to have facility-based delivery than those without insurance. An association was also found between postnatal care use and insurance as women who do not have insurance are 12.0 (1/0.083) times more likely to receive postnatal care than those with insurance.

Conclusions Pregnant women who registered with health insurance had at least four antenatal care visits and delivered in a health facility. However majority of them did not go for postnatal care.

BACKGROUND

One of the Millennium Development Goals (MDG5A) called for 75% reduction in global maternal mortality ratio (MMR) between 1990 and 2015.¹ Within 300 months after this target was set, MMR dropped by almost 44% to an estimated 216, with an 80% uncertainty interval (UI) of 207 and 249 maternal deaths per 100 000 live births in 2015 compared to 1990 MMR of 385 per 100 000 live births

Strengths and limitations of this study

- This study offers insight into the effect of maternal health insurance on all aspects of maternal health services.
- This study used multistage sampling to select communities and participants which potentially permitted representativeness as well as diverse responses.
- There might have been potential for recall or memory bias as the data are obtained from a cross-sectional household interview; however, we asked follow-up questions to minimise it.

with UI of 359–427. The global lifetime risk of maternal death also dropped considerably from 1 in 73 to 1 in 180.¹ No country in the MDG regions was able to achieve a 75% reduction in the MMR target. However, each of them made some effort after the United Nations announced MDGs in 2000. The estimated annual global MMR reduction rate between 2000 and 2015 was 3%. This was higher than the reduction rate of 1.2% between 1990 and 2000. This acceleration of progress reflects a widespread escalation of efforts to reduce maternal mortality, stimulated by MDG5.²

Building on the momentum generated by MDG5, the Sustainable Development Goals are also calling for an acceleration of the present improvement to meet a universal MMR of 70 maternal deaths per 100 000 live births, or less, by year 2030, in order to end all preventable maternal mortalities.^{3–5} In order to achieve this universal aim, countries will need to reduce their MMR by at least 7.5% each year between 2016 and 2030. The effective strategy for meeting this ambitious goal requires appropriate interventions, including access to and use of skilled care during pregnancy and an appropriate plan for financing

universal access to this intervention.⁴ However financial constraints are one of the major barriers to healthcare for marginalised sections of the society, including parturient women in many low-income and middle-income countries. Hence, several countries in Sub-Saharan Africa began implementing policies in their quest to make deliveries or healthcare for mothers and children free or almost free to meet the MDGs.^{6–9}

Preliminary data of the Ghana Maternal Health Survey which became available at the start of 2008 indicated that the country was off-track to meet the maternal health targets of MDGs due to the low coverage of facility-based deliveries with its associated high institutional maternal mortality rate. It was then declared a national emergency that called for action.¹⁰ In the same year, Ghana introduced a free maternal healthcare programme (FMHCP) under the National Health Insurance Scheme (NHIS). The policy exempted pregnant women from paying premium for fresh registration or renewal of membership and processing fees. They are also given access to general medical benefits covered by the scheme, and a comprehensive maternal benefit package covering antenatal,

delivery and postnatal care as well as neonatal care for infants for 3 months.^{10–13} A total of 774 009 pregnant women had registered with the programme as of the end of 2013. We conducted this study to ascertain the effectiveness of registration with the programme on access to maternal healthcare services. We hypothesise that pregnant women who are registered with health insurance have more access to antenatal care facility-based delivery and postnatal care.

MATERIALS AND METHODS

Study design

We conducted a cross-sectional quantitative study from May to July 2015. Household questionnaires were administered to 343 women of the reproductive age group 15–49. Women who had children aged between 3 and 12 months were selected to participate in the study. The aim was to identify how the FMHCP under the NHIS could be used to enhance skilled care in two districts in Ghana.

Table 1 Correlation between characteristics of respondents and access to insurance

Variables	Frequency, n=342 (%)	Insured, n=131 (%)	Not insured, p values, n=211 (%)
Age			P=0.058
15–24	104 (30)	30 (23)	74 (35)
25–34	166 (49)	71 (54)	95 (45)
35–49	72 (21)	30 (23)	42 (20)
Place of residence			P=0.000
Urban	195 (57)	97 (74)	100 (47)
Rural	145 (43)	34 (26)	111 (53)
Marital status			P=0.000
Married	283 (83)	125 (95)	158 (75)
Single	59 (17)	6 (5)	53 (25)
Employment			P=0.000
Unemployed	112 (32)	27 (21)	85 (40)
Manual job	95 (28)	28 (21)	67 (32)
Skilled job	135 (40)	76 (58)	59 (28)
Education			P=0.000
Never	126 (37)	23 (18)	103 (49)
Primary	106 (31)	36 (27)	70 (33)
Secondary	92 (27)	55 (42)	37 (17)
Tertiary	18 (5)	17 (13)	1 (1)
Religion			P=0.348
Christian	241 (71)	98 (75)	143 (68)
Muslim	80 (23)	27 (20)	53 (25)
Traditionalist	21 (6)	6 (5)	15 (7)
Insurance status			
Yes	131 (38)		
No	211 (62)		

Sampling procedure

The study adopted the multistage sampling method. The two capital towns of Kintampo North Municipality (KNM)-Kintampo and Kintampo South District-Jema were purposefully selected. A stratified sampling method was employed to select the four subdistricts according to their categorisations. The names of the communities in each subdistrict were compiled and simple random sampling (lottery) was used to select one community from each of them. A systematic sampling was used to select houses. Every third house was selected, and nursing mothers who fell within the target group were identified and interviewed. Where there was more than one eligible respondent in a house, only one of them was randomly selected, through balloting, to participate in the study. On the other hand, where there was no eligible respondent, interviewers moved to the next house. Interviews were conducted in the local language (Twi).

Sample size determination

The proportion of facility-based deliveries (66.3%) in KNM in 2013 was used to determine the sample size for the study, where n represents the required sample size, t the confidence level at 95% (standard value of 1.96), p the estimated prevalence of 66.3% facility-based delivery and m the margin of error at 5% (standard value of 0.05). Therefore, a sample size of 343 nursing mother was estimated as indicated below:

$$n = t^2 \times p(1-p) / m^2$$

$$n = (1.96)^2 \times 0.663(1-0.663) / 0.05^2$$

$$1.96^2 = 3.8416$$

$$1 - 0.663 = 0.337$$

$$0.05^2 = 2.5 \times 10^{-3}$$

$$(3.8416 \times 0.663 \times 0.337) = 0.8583325296$$

$$0.8583325296 / (2.5 \times 10^{-3}) = 343.33$$

$$n = 343$$

Data collection and instruments

We designed a household questionnaire which was pretested in Tuobodom, the capital town of Techiman

North District. This was to ensure validity and reliability and to check ambiguities. With the pretest feedback, we reworded the questions to carry the intended meaning to ensure that they could be translated directly into the local language. We also arranged the questions orderly. The choice of the district was informed by the fact that it has similar characteristics as that of the study districts. The pretesting revealed weaknesses in the questionnaire, which were subsequently addressed before its application on the field. It also helped to reduce biases.

We recruited and trained two male research assistants who were fluent in the participants' local language (Twi). Interviewers approached women with respect and sought informed consent from each woman before completing the questionnaire. On average, an interview took 25 min. Women were interviewed using a questionnaire comprising three main sections: the first section consists of demographic characteristics (age, marital status, education, employment and religion). The second set of questions probed into the enrolment into the FMHCP, whereas the third section asked questions about access to and use of antenatal care service, place of delivery as well as postnatal care service.

Outcome variables

Overall, three outcomes on the use of maternal healthcare service were used to assess the effect of maternal health insurance status: antenatal care, facility-based delivery and postnatal care. Antenatal care was defined as care that women obtained from their healthcare providers during pregnancy. Delivery was defined as delivery attended by healthcare professionals, whereas postnatal care was defined as care that women received from their healthcare providers after delivery. Facility-based delivery was coded as 'place of delivery', and hospital or home and postnatal care was coded 'yes/no' based on whether women received it or not. To measure the degree of satisfaction on health services after delivery, a question on satisfaction with three levels was asked: dissatisfaction,

Table 2 Logistic regression of marital status, employment, place of resident and education versus insurance

Variable	B	SE	Wald	df	Significance	Exp(B)	95% CI for exp(B)	
							Lower	Upper
Education			46.542	3	0			
Primary*	-4.388	1.141	14.784	1	0	0.012	0.001	0.116
Secondary	-3.362	1.132	8.821	1	0.003	0.035	0.004	0.319
Tertiary	-1.999	1.13	3.13	1	0.077	0.136	0.015	1.24
Marital status (married vs no)	2.509	0.532	22.251	1	0	12.288	4.333	34.845
Employment (unemployed)			10.463	2	0.005			
Manual job	0.765	0.38	4.063	1	0.044	2.149	1.021	4.522
Skilled job	1.112	0.347	10.273	1	0.001	3.039	1.54	5.997
Place of residence (urban vs rural)	-0.401	0.307	1.711	1	0.191	0.67	0.367	1.221

*Reference group.

Table 3 Binary logistic regression of antenatal care and insurance

Variables	B	SE	Wald	Significance	Exp(B)	95% CI for exp(B)
Antenatal care visit						
>4 visits: insurance						
Yes	5.979	0.659	82.2	0	39.5	10.84 to 72.553
No*	0					
<4 visits: insurance						
Yes	0.937	0.411	5.196	0.073	2.553	1.14 to 5.714
No*	0					
Folic acid						
Yes	-5.852	0.737	62.989	0	0.03	0.001 to 0.07
No*	0					
Tetanus injection						
Yes	-4.632	0.864	71.754	0	0.045	0.023 to 0.245
No*	0					

*Reference Group.

average satisfaction and high satisfaction. Antenatal care was measured using two main variables: antenatal visit and antenatal prevention. Antenatal visit was classified into two categories: those who had four or more antenatal visits and those who had less than four. Antenatal prevention care was defined by two other variables: receiving folic acid and receiving tetanus injection.

Data entry and statistical analysis

The responses to household questionnaires administered to the 343 participants were entered into Microsoft Excel 2007 with restrictions to minimise entry errors and exported into IBM Statistical Package for Social Sciences (SPSS) V.22. Only one uncompleted questionnaire was rejected, and data analysis consisted of descriptive analyses and frequencies for all variables of interest. Logistic regression (binomial and multinomial) was used for the correlation between insurance and antenatal care, facility-based delivery and postnatal care, and also to understand if satisfaction after delivery is influenced by insurance. Analysis was conducted using 95% CI, and a p value less than 0.05 was considered significant.

Patient and public involvement

We did not involve patients and the public in the design of the study.

Ethics and consent to participate

At the community level, participants were asked to read and sign the consent form either in English or in Twi prior to the interviews. Participants were assured of the confidentiality of their response and their null association with it at present or in the future. In addition, they were assured that their participation would not affect their relations with health institutions or the NHIS at present or in the future and that refusal to participate would not attract any penalty.

RESULTS

Background characteristics of respondents

Table 1 shows that over 50% of the women reside in urban areas and that vast majority (83%) are married. Forty per cent were in skilled job, whereas 37% had never been to school. Most of the women (71%) are Christian.

Association between characteristics of respondents and access to insurance

Table 1 shows that employment, place of residence, marital status and education influence access to insurance (p=0.000).

Table 2 indicates that married women are 12.288 times more likely to have insurance than non-married women.

Table 4 Multivariate logistic regression between insurance and facility-based delivery

Variables	B	SE	Wald	Significance	Exp(B)	95% CI for exp(B)
Place of delivery						
Health facility	3.967	0.42	89.34	0	5.281	2.320 to 12.02
Home*	0					

*Reference group.

Table 5 Correlation between insurance and postnatal care

Variables	Insured	Not insured	Total	P values
Postnatal				
Yes	29 (8%)	63 (18.5%)	92 (26.5%)	0.007
No	102 (30%)	148 (43.5%)	250 (73.5%)	
Total	131 (38%)	211 (62%)	342 (100%)	

Additionally, women who engage in manual jobs are 2.149 times more likely to register for insurance than those who are unemployed, and those with a skilled job are 3.039 times more likely to register for insurance than those who are unemployed.

Correlation between insurance and antenatal care, facility-based delivery and postnatal care

Antenatal care

Two variables—antenatal care visit and antenatal prevention care (receiving folic acid and receiving tetanus injection)—were measured.

Table 3 indicates that women with insurance are 39.5 times more likely to have several antenatal care visits (more than four visits) than those without insurance. Also those who have insurance are over 62 and 71 times more likely to get folic acid and tetanus injection, respectively, than those without insurance.

Facility-based delivery

Table 4 indicates that women with insurance are 5.281 times more likely to deliver at a health facility than those without insurance.

Postnatal care

As shown in table 5, the percentage of women with insurance and who have received postnatal care was low (8.5% of participants).

Table 6 indicates that there is a negative association between postnatal care use and insurance as women who do not have insurance are 12.04 (1/0.083) times more likely to receive postnatal care than those with insurance.

Interpretations

Taking confounding variables into consideration, table 6 shows the following:

- ▶ Women with skilled job are 5.435 times more likely to have insurance than those unemployed.
- ▶ Women with manual job are 3.409 times more likely to have insurance than those unemployed.

- ▶ Women with insurance are 2.004 times more likely to have more antenatal care visits than those without insurance.

- ▶ Women with insurance are 1.117 times more likely to deliver in hospital than those without insurance.

In table 7 we considered education, employment, place of residence and marital status as confounders.

DISCUSSION

This study aimed to evaluate if women registered with insurance had a better chance of accessing maternal healthcare services in two districts. Background characteristics such as marital status, education, age, place of residence, employment and religion affect women's health-seeking behaviours. In this study, registration with health insurance is associated with women who are married, have skilled job and are employed. This may be because the majority of the participants were educated and live in urban areas, and as a result they are aware of the effects of health insurance enrolment on access to and use of maternal health services. This is in line with similar previous studies.^{14 15}

This study examined how the FMHCP under the NHIS could be used to enhance women's access to and use of maternal healthcare services. The study findings indicate that maternal health insurance status plays a significant role in the use of maternal healthcare services. Thus, women who have registered with health insurance have a better opportunity for antenatal care, facility-based delivery and postnatal care compared with those who are not registered. This could be attributed to the fact that the programme has removed financial barriers which hitherto prevented women from accessing these services.

Our study findings are in line with previous studies reporting that women who register with health insurance have more access to antenatal care, facility-based delivery and postnatal care services. Browne *et al* observed a higher frequency of antenatal care use among women

Table 6 Binary logistic regression between insurance and postnatal care use

Variables	B	SE	Wald	Significance	Exp(B)	95% CI for exp(B)
Postnatal care use						
Yes	-2.492	0.266	88.023	0.014	0.083	0.049 to 0.139
No*	0					

*Reference group.

Table 7 Multivariate logistic regression

Variable	B	SE	Wald	df	Significance	Exp(B)	95% CI for exp(B)	
							Lower	Upper
Education			14.171	3	0.003			
Primary (1)	-4.535	2.116	4.592	1	0.032	0.011	0	0.679
Secondary (2)	-3.649	2.081	3.075	1	0.08	0.026	0	1.536
Tertiary (3)	-2.094	2.091	1.003	1	0.317	0.123	0.002	7.427
Employment			7.67	2	0.022			
Skilled job (1)	1.693	0.692	5.979	1	0.014	5.435	1.399	21.109
Manual job (2)	1.226	0.565	4.72	1	0.03	3.409	1.128	10.307
Marital status (married)	2.991	0.831	12.957	1	0	19.902	3.905	101.419
Place of residence (urban)	0.839	0.556	2.276	1	0.131	2.313	0.778	6.875
Antenatal care visit (more than 4)	5.526	0.825	44.87	1	0	2.004	0.375	4.02
Place of delivery (hospital)	2.141	0.789	7.362	1	0.007	1.117	0.725	2.552
Postnatal care (yes)	0.356	0.622	0.327	1	0.567	1.427	0.422	4.831

Reference group: uneducated (education), unemployed (employment), single (marital status), rural (place of residence), less than four visits (antenatal care), home (place of delivery), no postnatal care (postnatal care).

enrolled on NHIS after using nationally representative GHDS data.¹⁶ Similarly, others reported significant impact of free maternal care on facility delivery in the Brong Ahafo Region, which is consistent with the findings of our study.^{17 18} Another study which supports our findings reported that women with health insurance are 47% more likely to use facility-based delivery compared with those who are not registered.¹⁹ However, some other studies do not support our findings. One study reported that the introduction of NHIS has had no effect on the use of maternal healthcare services,²⁰ whereas another argued further that the introduction of the NHIS rather had a negative effect on the utilisation of maternal health services.²¹

Antenatal care is very crucial as far as the health of the mother and her child is concerned. It is during this period in pregnancy that infections or diseases which may threaten the mother or the child's life are detected and treated. Again, during antenatal care, pregnant women are taught to recognise signs of complications in pregnancy and taught what actions to take. The kinds of food women should eat in addition to several precautionary measures they need to take to ensure safe delivery are also taught, and therefore women who have access to antenatal care services have a better chance of safe delivery, thereby reducing maternal mortality.²²

A number of earlier studies have explored the association between health insurance enrolment and access to and use of antenatal care visits and skilled delivery. Some of these studies did not report the effect of receiving at least four antenatal care visits. This study contributes to the existing information by adding that women registered with health insurance have a greater chance of accessing maternal healthcare services.

These findings are not peculiar to Ghana because in Kenya the introduction of free maternal healthcare service policy gave rise to an increase in facility delivery.²³ A systematic review conducted by Comfort and others in which they assessed the effects of health insurance on the use of maternal health services found a positive association between insurance and antenatal care attendance, facility-based delivery and skilled attendance at birth in various Sub-Saharan African, Asian, South American and Eurasian countries.¹⁹

Although the results of our study also revealed an association between maternal insurance status and postnatal care services, the likelihood that women will return for postnatal care especially within the first 24 hours was lower compared with antenatal care and delivery. This could be attributed to the fact that as women with NHIS mostly do not encounter complications during labour, the need to access postnatal care service reduces. Another reason may be that women are not well educated about the differences between child welfare clinic and postnatal care, because of which they may prefer the former to the latter. It must however be noted that postnatal care is very critical as far as the health of the mother and the baby is concerned. During postnatal care, any abnormalities in the newborn

could be detected and possibly treated. In the same way, any postbirth complication developed by the mother could be treated. This is in line with earlier studies which disclosed that most Sub-Saharan African women opted for antenatal care and delivery at a hospital but did not support postnatal care services.²⁴ This is exemplified in the Democratic Republic of Congo, where as high as 93% of pregnant women received antenatal care and skilled birth attendance, but only 35% of birthing women received postnatal care.²⁵ Additionally, fewer than 20% of Kenyan women used postnatal care services.²⁶ This is not peculiar to Ghana and Africa, a study in China reported that in 991 out of 1442 women who did not go for postnatal care, 65% did not know about it, whereas 24% deemed it unnecessary.²⁷

This study is the first of its kind to be conducted in the two studied districts after the implementation of the programme in the country. On 1 July 2008, Ghana introduced the programme under the NHIS. The programme exempted pregnant women from paying premium for fresh registration or renewal of membership and processing fees. They were also provided access to general medical benefits covered by the scheme, and a comprehensive maternal benefit package covering antenatal, delivery and postnatal care as well as neonatal care for infants for 3 months. Prior to this programme, only delivery was free.¹⁰ Notably, even under this exemption scheme, care is often not totally free because of associated out-of-pocket expenses such as transportation, hidden charges, purchasing of prescribed items for delivery and laboratory pregnancy test, which place limitations on women's access and use of maternal healthcare.²⁸

The strength of our study is that it offers insight into the effect of maternal health insurance on all aspects of maternal health services (antenatal care, delivery and postnatal care). Also it used multistage sampling to select communities and participants who potentially permitted representativeness as well as diverse responses. The limitation, on the other hand, is that it does not have the effect of the health insurance on the quality of care provided to women. This has previously been identified as an inherent challenge in insurance-associated studies. Use of maternal health services itself does not ensure enough quality of care, and therefore the evidence that health insurance affects quality of care is inconclusive.¹⁶ Additionally, a limitation to be considered in interpreting the results presented in this article is the potential for recall or memory bias as the data are obtained from a cross-sectional household interview and do not include health facility data on service use and insurance status. However, we asked follow-up questions to identify if women paid any money in the course of receiving free maternal services. Again, the study may not be able to indicate the association between NHIS status and access to maternal health services in its entirety since it only included registered members. Future studies could compare both groups.

Efforts to reduce MMR by providing women access to and use of facility-based delivery requires a holistic approach, and

our study findings will inform policy makers that provision of health insurance is one possible intervention to ensure women's access to facility-based delivery.

CONCLUSIONS

The results indicate that pregnant women who registered with health insurance had at least four antenatal care visits and delivered in a health facility. However, the majority did not go for postnatal care. There is a need to educate pregnant women to register with insurance and go for postnatal care since this could help reduce MMR in the two studied districts.

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Competing interests None declared.

Patient consent Not required.

Ethics approval Ethical approval for the study was provided by the Ethics Committee of School of Public Health, Shandong University, China (ID no 201520001), and the Ghana Health Service Ethical Review Committee (GHS-ERC: 18/04/15). The Ghana Health Service Ethical Review Committee further provided approval for those who could not read to invite other people to serve as witnesses for them, and in the case of minors (those aged 15–17 years) consent was sought from their parents prior to the interview.

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Data sharing statement No additional data are available.

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