



Socioeconomic and demographic correlates of nonenrolment onto the national health insurance scheme among children in Ghana: Insight from the 2017/18 Multiple Indicator Cluster Survey

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ABSTRACT

The goal of Ghana's health insurance scheme is to achieve universal coverage. Despite NHIS' benefits to children, not all children in Ghana are covered. This study investigates the sociodemographic covariates of nonenrolment onto the national health insurance scheme among children in Ghana. We used the child dataset of the 2017/18 Ghana Multiple Indicator Cluster Survey (G-MICS). We used STATA version 14 for the data analyses. We described each study variable using frequency and percentages. We used Poisson regression to estimate crude and adjusted prevalence ratios of the relationship between the covariates and the outcome variable. Approximately 57% of children were covered with health insurance in Ghana. In the adjusted multivariable model, male children, children within the ages of 10–14 or 15–17 years, and children who have some form of functional disability and those with no information on their functional disability status, children of mothers with lower than post-secondary education, and children residing in households of less than the fifth quantile on the household wealth index were associated with a higher likelihood of nonenrolment onto the national health insurance scheme. Finally, compared to the children in greater Accra, children in the other nine regions were associated with a lower likelihood of nonenrolment onto the national health insurance scheme. Given the results, improvement in health insurance coverage should be done, taking into consideration variations across the socio-demographic characteristics of the child, mother, and households.

1. Introduction

In health care, fair and equal access to health has become quintessential to the achievement of the Universal Health Coverage (UHC) (Palas et al., 2017). The World Health Organization defines UHC as people's access to health services without suffering financial hardship when paying for them (WHO, 2015). Inherent in this conceptualization is the question of equity, quality, and financial risk protection. To this end, countries across the globe have made health financing a priority; exploring different ways that are appropriate to the financing of health services (WHO, 2015).

In Ghana, one means of financing health care for the populace has been through the National Health Insurance Scheme (Van Der Wielen

et al., 2018). Before 2005, every Ghanaian had to pay before accessing healthcare (out-of-pocket financing), popularly known as 'cash and carry', and this was a significant barrier to accessing timely health care (Blanchet et al., 2012). The system of cash and carry cut off socioeconomically disadvantaged groups from accessing health care (Blanchet et al., 2012). In response to this inequality of access to healthcare, the Government of Ghana [GOG], through an act of parliament (ACT 650) set up the National Health Insurance Scheme [NHIS] in 2003 (Okoroh et al., 2018). The NHIS was backed by the National Health Insurance Regulations Legislative Instrument 1890, 2004 (Government of Ghana, 2004). In addition to other measures, the government of Ghana, therefore, introduced the national health insurance scheme to achieve universal coverage and to, among the many other programs, provide easy

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access to an acceptable quality package of essential healthcare and to reduce maternal and child morbidities and mortalities (Alhassan et al., 2016; Amo-Adjei et al., 2016; Government of Ghana, 2012).

One of the reasons for the introduction of the NHIS was to improve the gloomy statistics of maternal and child health measures of the early 2000s. In retrospect, maternal and child health outcomes, in general, has improved but they fall short of global targets (WHO, 2017; Ghana Statistical Service, 2014). Generally, Ghana has seen a significant improvement in its statistics on maternal and childhood morbidities and mortalities and the required basic childhood vaccinations (WHO, 2017; Ghana Statistical Service, 2014). Assisted health facility deliveries have improved from 47% in 2003 to 78.1% in 2017 (WHO/UNICEF, 2020). Maternal mortality has reduced from 484 per 100,000 live births in 2000 to 308 per 100,000 live births in 2017 (WHO, 2017). Basic vaccination coverage among children 12–23 months has improved from 69% in 2003 to 77% in 2014 (Ghana Statistical Service, 2014) [11].

Although these progress in child and maternal health outcomes are partly attributable to the national health insurance scheme program, the goal of universal coverage is far from being achieved by 2030. From the recent national health insurance report, only about 10,145,196 (representing 38% of the national population at the time) Ghanaians were enrolled onto the NHIS (Kipo-Sunyehzi et al., 2020; Authority, 2013). Enrolment proportion per the population in 2010, 2011, and 2012 were 33.1%, 33.4%, and 35%, respectively (Kipo-Sunyehzi et al., 2020). About half (47%) of the total enrollees in 2013 were children under 18 years of age (Authority, 2013). This representation is attributable to some pro-poor policies such as exempting children under 18 years from paying premiums on the NHIS policy and easy registration process facilitated by district health officials (National Health Insurance Authority, 2021). District health officials assist with the registration of people to the NHIS scheme by taking from enrollees basic demographic details such as name, date of birth and residence location (National Health Insurance Authority, 2021). However, other bottlenecks such as payment for the NHIS card processing and annual membership renewals might be preventing this population segment from full coverage (National Health Insurance Authority, 2021).

Notwithstanding the significance of health insurance to the well-being of children, health insurance coverage is unexpectedly low in Ghana (Wang et al., 2014). Studies have shown various socioeconomic and demographic factors to be associated with health insurance coverage. These factors include household income, household size, household wealth index, religion, household head's level of education, sex of household head, marital status, place of residence, occupation and morbidity (Ibok, 2012; Kimani et al., 2014; Mhere, 2013; Vellakkal, 2013). In Ghana, health insurance coverage studies have the following limitations: reliance on a non-current dataset, predicting health insurance coverage among reproductive age groups, focusing on certain regions of the country, and were qualitative with smaller sample sizes (Kipo-Sunyehzi et al., 2020; Andoh-Adjei et al., 2018; Amu et al., 2018; Duku et al., 2016). In the Ghanaian context, there is a paucity of literature that exclusively looks at both socioeconomic and demographic correlates of nonenrolment onto the NHIS among children. For this reason, this study investigates the socioeconomic and demographic covariates of nonenrolment onto the national health insurance scheme among children in Ghana using recent nationally representative data. The findings from this study are expected to inform policymakers about the specific areas that must be prioritized to increase NHIS coverage among children in Ghana.

2. Methods

2.1. Data and materials

We used the child dataset of the 2017/18 Ghana Multiple Indicator Cluster Survey (G-MICS). The dataset is weighted with a sample size of 30750, which is a nationally representative of children under 18 years.

The G-MICS collects data on multiple health, nutritional, socioeconomic indicators such as health insurance coverage, nutrition, malaria outcomes, and child marriage, among others. Details on the G-MICS design are sufficiently described elsewhere (Ghana Statistical Service, 2018). Regarding the response rate, data were collected on 99.76% of the expected children under 18 years to be interviewed (UNICEF, 2017). Interviews were conducted in English and four main local languages (Akan, Ga, Ewe, and Dagbani) (Ghana Statistical Service, 2018). Data collection started on 15th October 2017 and ended on 15th January 2018.

3. Measures

3.1. Outcome variable

The outcome variable in this study was “Health insurance coverage—National health insurance service/Community-based”. This was a dichotomous variable with a “Yes” or “No” response options where “Yes” indicates that the child is covered under the NHIS. The “No” was coded as “1” and “Yes” as “0” to predict nonenrolment onto the NHIS.

3.2. Correlates

We selected variables on children, their mothers, and their household and geographical conditions. These include children's age, gender, education, functional disability status, place of residence, the region of residence, household wealth index, mother's educational and functional disability status. The categories of the variables have not been recorded—they are used as presented in the dataset. The G-MICS operationalized functional disability as a child experiencing impairment in any of the following domains: seeing, hearing, walking, communication, learning, controlling behaviour, self-care, remembering, concentrating, accepting change, making friends, anxiety and depression (UNICEF, 2017).

3.3. Data analysis

We used STATA version 14 for the data analyses. We described each study variable using frequency and percentages. Given that the G-MICS is cross-sectional and based on multistage sampling design, we used the svy command in STATA to adjust for the sample design and the sample weight before doing the bivariate and the multivariable analyses. We used Poisson regression to estimate crude and adjusted prevalence ratios of the relationship between the covariates and the outcome variable. In cross-sectional surveys, scholars advised the use of Poisson regression to estimate prevalence ratios when the prevalence of the outcome of interests are above 10% or 12% (Barros and Hirakata, 2003; Santos et al., 2008; Zou, 2004; Zou and Donner, 2013). According to the scholars, using logistic regression to report odds ratios can result in bias estimation and reporting of the strength and direction of the association between the outcome and explanatory variables (Barros and Hirakata, 2003; Santos et al., 2008; Zou, 2004; Zou and Donner, 2013). Detailed reasons for choosing the Poisson regression to estimate prevalence ratios for dichotomous outcomes for cross-sectional data are sufficiently explained elsewhere (Barros and Hirakata, 2003; Santos et al., 2008; Zou, 2004; Zou and Donner, 2013).

3.4. Ethical considerations

The 2017–18 G-MICS reported that data on children under-14 were collected after verbal consent was obtained from parents/caretakers (Ghana Statistical Service, 2018). Children 15–17 years were interviewed directly after obtaining adult consent from their caretakers/parents (Ghana Statistical Service, 2018).

4. Results

4.1. Sample description

About 57% of children are covered with health insurance in Ghana. Majority of the children were males (50.68%), within the age group of 5–9 years (31.14%), had attained a pre-primary school education or not yet in school (42.03%), and had no functional disability (72.37%). Information on the mothers of the children in the study are as follows: many of their mothers had attained a pre-primary education (34.32%) and had no functional disability (71.75%). In terms of the household and geographical characteristics, most of the children came from poorest households (22.22%), lived in rural areas (57.02%) and the Ashanti region (23.51%). Details of the study sample description are reported in [Table 1](#).

4.2. Correlates of nonenrolment of children onto the national health insurance scheme in Ghana

In the adjusted multivariable model, male children [APR = 1.061, 95% CI: 1.007,1.118], children within the ages of 5–9 years [APR = 1.078, 95% CI: 1.003,1.158] or 10–14 years [APR = 1.218, 95% CI: 1.122,1.322] or 15–17 years [APR = 1.232, 95% CI: 1.114,1.363], and children who have some form of functional disability [APR = 1.194, 95% CI: 1.096,1.300] and those with no information on their functional disability status [APR = 1.431 95% CI: 1.327,1.545] were more likely to be uninsured. Compared to children whose mothers had attained post senior secondary education, children of mothers with no form of education or only pre-primary [APR = 1.354, 95% CI: 1.019, 1.798], or primary [APR = 1.461, 95% CI: 1.128, 1.685] or junior secondary [APR = 1.307, 95% CI: 1.014, 1.685] were more likely to be uninsured.

Compared to the richest households, children in the following households were associated with a higher likelihood of health insurance coverage: the poorest [APR = 2.001, 95% CI: 1.713,2.338], the poorer [APR = 1.627, 95% CI: 1.410,1.876], the middle [APR = 1.573, 95% CI: 1.370,1.806], and the richer [APR = 1.382 95% CI: 1.197,1.595]. Finally, compared to the greater Accra, children in the remaining nine regions were associated with a lower likelihood of nonenrolment onto the NHIS ([Table 2](#)).

5. Discussion

The study estimated the prevalence of health insurance coverage among children under 18 years and factors associated with its non-enrolment. In this paper, we found that approximately 57% of children have health insurance coverage in Ghana. The independent correlates of nonenrolment onto the national health insurance scheme were the gender, age and functional disability status of the child, educational level of the mother, household wealth and region of residence.

The overall national health insurance coverage among children (57%) is of public health concern because the findings imply that a significant proportion of children (43%) have no national health insurance coverage. This means that some parents, particularly those who cannot afford out-of-pocket payment may not seek health care for their children, and this can have dire consequences for the health and well-being of their children. Nevertheless, this coverage level among children is consistent with that recorded among the adult population in Ghana ([Amu et al., 2018](#)).

We found that children with a functional disability were more likely to be uninsured. This is a discouraging finding because individuals with disabilities in Ghana often face social, cultural and physical obstacles while seeking essential services ([Ghana, 2013](#)). A plausible explanation for this finding may be that parents of children with a functional disability may find it difficult to visit health centres to seek special care and this can prevent them from registering their children for health insurance. Given that health insurance does not cover transportation to a

Table 1
Summary statistics of study variables.

Variable	N (%)	A child covered with health insurance	
		Insured	Uninsured
	30,750 (100)	56.76	43.24
<i>Child level factors</i>			
A child has a functional disability	P ≤ 0.001		
No	22,253 (72.37)	59.46	40.54
Yes	5,114 (16.63)	49.99	50.01
No information	3384 (11.00)	49.29	50.71
Child gender	P = 0.452		
Boys	15,584 (50.68)	55.45	44.55
Girls	15,166 (49.32)	58.11	41.89
Child age	P ≤ 0.001		
≤ 5 years	8879 (28.87)	57.87	42.13
5–9 years	9,576 (31.14)	58.93	41.07
10–14 years	8,451 (27.48)	54.72	45.28
15–17 years	3,844 (12.50)	53.31	46.69
Child education status	P = 0.084		
Pre-primary or none	12,923 (42.03)	56.12	43.88
Primary	12,714 (41.35)	56.93	43.07
Post-primary	5,113 (16.63)	57.96	42.04
<i>Maternal level factors</i>			
Mother has a functional disability	P = 0.184		
Yes	2443 (7.94)	55.54	44.46
No	22,062 (71.75)	56.92	43.08
No information	6,245 (20.31)	56.69	43.31
Mother's education	P ≤ 0.001		
Pre-primary	10,553 (34.32)	56.03	43.97
Primary	6284 (20.43)	50.01	49.99
Junior secondary	10,377 (33.75)	57.55	42.45
Senior secondary	2452 (7.97)	65.44	34.56
Post-senior secondary	1084 (3.53)	75.91	24.09
<i>Household and geographical level factors</i>			
Household wealth index	P ≤ 0.001		
Poorest	6833 (22.22)	50.47	49.53
Poorer	6735 (21.90)	53.63	46.36
Middle	6257 (20.35)	54.37	45.63
Richer	5813 (18.90)	58.12	41.88
Richest	5112 (16.63)	70.68	29.32
Rural-urban residence status	P ≤ 0.001		
Urban	13,216 (42.98)	60.73	39.27
Rural	17,534 (57.02)	53.78	46.22
Region of residence	P ≤ 0.001		
Western	3094 (10.06)	51.11	48.89
Central	3126 (10.17)	45.24	54.76
Greater Accra	2806 (9.13)	48.37	51.63
Volta	2590 (8.42)	56.73	43.27
Eastern	3522 (11.45)	56.48	43.52
Ashanti	7231 (23.51)	55.95	44.05
Brong Ahafo	2935 (9.55)	76.71	23.29
Northern	3614 (11.75)	58.48	41.52
Upper East	1039 (3.38)	72.24	27.76
Upper West	793 (2.58)	60.87	39.13

health facility, nor does it cater for the equipment used by persons with disability ([Badu et al., 2015](#)), the national health insurance authority must make deliberate attempts to identify children with functional difficulties and cover aspects of the healthcare they need.

We found that children whose parents had lower levels of education were more likely to be uninsured compared to their counterparts whose parents had attained higher than secondary education. Our finding implies that lower maternal educational attainment was a hindrance to

Table 2
Socioeconomic and demographic correlates regressed upon national health insurance coverage status of children in Ghana.

Variable	PR [95% CI of PR]	APR [95% CI of APR]
<i>Child level factors</i>		
Child gender		
Girls	1	1
Boys	1.063* [1.006,1.124]	1.061* [1.007,1.118]
Child age		
≤ 5 years	1	1
5–9 years	0.975 [0.903,1.052]	1.078* [1.003,1.158]
10–14 years	1.075 [0.995,1.161]	1.218*** [1.122,1.322]
15–17 years	1.108* [1.011,1.215]	1.232*** [1.114,1.363]
Child education status		
Post-primary	1	1
Pre-primary or none	1.044 [0.955,1.140]	
Primary	1.024 [0.922,1.138]	
A child has a functional disability		
No	1	1
Yes	1.234*** [1.156,1.329]	1.194*** [1.096,1.300]
No information	1.251*** [1.167,1.339]	1.431*** [1.327,1.545]
<i>Maternal level factors</i>		
Mother has a functional disability		
No	1	1
Yes	1.032 [0.919,1.160]	
No information	1.005 [0.920,1.098]	
Mother's education		
Post-secondary	1	1
Pre-primary or none	1.825*** [1.406,2.369]	1.354* [1.019,1.798]
Primary	2.075*** [1.624,2.651]	1.461** [1.128,1.892]
Junior secondary	1.762*** [1.378,2.255]	1.307* [1.014,1.685]
Senior secondary	1.435** [1.101,1.869]	1.191 [0.918,1.546]
<i>Household and geographical level factors</i>		
Household wealth index		
Richest	1	1
Poorest	1.689*** [1.479,1.929]	2.001*** [1.713,2.338]
Poorer	1.581*** [1.392,1.769]	1.627*** [1.410,1.876]
Middle	1.556*** [1.367,1.771]	1.573*** [1.370,1.806]
Richer	1.428*** [1.234,1.653]	1.382*** [1.197,1.595]
Rural-urban residence status		
Urban	1	1
Rural	1.177** [1.054,1.315]	1.051 [0.953,1.163]
Region of residence		
Greater Accra	1	1
Western	0.947 [0.822,1.090]	0.762*** [0.672,0.863]
Central	1.061 [0.934,1.205]	0.861* [0.762,0.972]
Volta	0.838 [0.657,1.070]	0.595*** [0.468,0.758]
Eastern	0.843* [0.734,0.968]	0.657*** [0.579,0.746]
Ashanti	0.853* [0.730,0.997]	0.704*** [0.605,0.820]
Brong Ahafo	0.451*** [0.357,0.569]	0.335*** [0.265,0.423]
Northern	0.804** [0.701,0.922]	0.553*** [0.474,0.646]
Upper East	0.538*** [0.452,0.640]	0.344*** [0.285,0.415]
Upper West	0.758** [0.638,0.901]	0.496*** [0.412,0.598]
Strata		20
Primary sampling unit		660
Population size		30,750

PR: Prevalence ratio; APR: Adjusted Prevalence Ratio *p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001.

national health insurance coverage for children in Ghana. This finding agrees with previous reports on the positive effects of higher education on health insurance coverage among adult populations (Wang et al., 2017). This finding may probably be due to the reason that children whose parents have higher than secondary education usually have middle-high earning jobs. Hence, they have enough disposable income to pay for the card registrations and the annual renewal fees.

We also found that children from households in the lower wealth index were more likely to be uninsured. This was an interesting observation given that one would have expected that children from low-income households would have had high enrolment given the safety-net health insurance provides, especially because payment through out-of-pocket could be a real challenge to low-income households. Moreover, for the less wealthy households, health insurance would have served as a form of security guarantee from unforeseen health

emergencies and helps to reduce the risk of catastrophic health expenditure (Okoroh et al., 2018; Kumi-Kyereme et al., 2017). The findings contradict the results of Amu et al (Amu et al., 2018) who reported that the poorest in Ghana were most likely to have insurance coverage. However, our findings corroborate the results of other studies in Ghana which also reported low NHIS enrolment among the poor households (Wang et al., 2017; Dixon et al., 2011). This highlights a challenge to the initial goal of the NHIS which sought to increase coverage among the poor.

We also found a lower likelihood of nonenrolment onto the national health insurance scheme among children from nine (9) regions in Ghana relative to the greater Accra region. The Greater Accra region is the administrative and political capital region of Ghana. By its position and proximity to the health ministries and easy access to communication channels, one would have expected that residing in this region will serve as a protective factor for health insurance coverage.

Our results have several policy implications. First, even with the pro-poor policy of exempting children under 18 years from paying premiums, national health insurance coverage is still undesirably far from universal. In addition to exempting children from premium payment, the National Health Authority can consider exempting children from the payment of card processing fee charges and the annual renewals. Given that children with functional difficulties were at risk of nonenrolment, the National Health Insurance authority must strengthen its recruitment efforts by implementing pro-disability measures that vigorously identify and provide complete healthcare packages for them. Also, registrations for health insurance schemes can be extended to other centres such as schools, religious and other public places to reach out to almost every child in Ghana. Secondly, Given that children from households with relative to the least wealth and of parents with lower education have a higher likelihood of nonenrolment, pro-poor, pro-uneducated measures must be adopted to increase enrolment of children of parents who have socioeconomically disadvantaged conditions. Therefore, we recommend that the government must strengthen the health insurance scheme and make its subscription in seeking healthcare desirable to every population segment in Ghana.

The strength of this paper is that it has addressed the gap in the Ghanaian health insurance literature. Given that the data nationally represents the children under 18 population of Ghana, the results can be generalized. Despite the strengths, the results should be interpreted with the following limitation as a guide: significant relationships are merely associations and we make no causal conclusions.

6. Conclusion

In this paper, we found that 57% of children in Ghana are covered by the national health insurance. Age of the child, functional disability status of the child, educational level of the mother, household wealth and region of residence were independent predictors of nonenrolment onto the national health insurance scheme among children. The findings indicate that improvement in health insurance coverage should be done, taking into consideration variations across the socio-demographic characteristics of child, mother, and household. This will help to enhance Ghana's ability to work towards achieving Sustainable Development Goal 3 that seeks to ensure healthy lives and promote well-being for all of all ages.

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CRediT authorship contribution statement

Pascal Agbadi: Conceptualization, Methodology, Data curation, Formal analysis, Writing - original draft, Project administration. **Joshua Okyere:** Writing - original draft, Writing - review & editing. **Alberta Lomotey:** Supervision, Writing - review & editing. **Henry Ofori Duah:**

Conceptualization, Writing - original draft. **Abdul-Aziz Seidu**: Writing - original draft, Writing - review & editing, Validation. **Bright Opoku Ahinkorah**: Validation, Writing - original draft.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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