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Towards the Universal Health Coverage in Ghana: An exploratory, cross-sectional study on the National Health Insurance Scheme

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Abstract

Introduction: This study is aimed to analyze the progress towards the attainment of Universal Health Coverage (UHC) in Ghana after the establishment of the 'National Health Insurance Scheme' (NHIS), which is a universal health care system created in 2003 to guarantee the right of care for all.

Method: A cross-sectional survey was conducted in 2017 on 300 adult participants, who were recruited by a convenience random sampling from subscribers of the formal and informal sectors, living in Accra, Ghana. A questionnaire *ad hoc* was administered to study subscribers' perceived quality of healthcare services delivered by NHIS and their perception about UHC and two discrete indicators of healthcare system performance such as Universal Healthcare Access (UHA) and Financial Risk Protection (FRP). Data analysis was conducted through SPSS 21 and AMOS 21, employing basic analysis such as reliability, principal component and model fit analysis. Additionally, the structural model analysis was conducted to examine the relationship

between antecedent and outcomes variables.

Results: In our study, positive perception of NHIS services enjoyed during the last year was predictive of FRP (CR = 5.324, $P < 0.001$), UHA (CR = 3.736, $P < 0.001$) and UHC (CR = 4.159, $P < 0.001$) of NHIS. In addition, UHA and FRP were found to be good predictors in the relationship between perceived quality of healthcare services delivered by NHIS and UHC (CR = 5.823, $P < 0.001$ and CR = 2.097, $P < 0.05$, respectively).

Discussion and Conclusion: Findings of our study showed that perceived quality of healthcare services delivered by NHIS may play a certain role on the attainment of UHC both directly and by mediating effects of UHA and FRP. Therefore, good healthcare services provided by NHIS can promote universal healthcare access and financial risk protection as major catalysts towards the attainment UHC in Ghana.

KEY WORDS: Financial risk protection; health insurance; healthcare cost; moral hazard; universal care access; universal health coverage.

Riassunto

Introduzione: Questo studio è stato realizzato con l'obiettivo di esaminare i progressi fatti per il raggiungimento della copertura sanitaria universale (UHC) in Ghana dopo l'istituzione dello Schema Assicurativo Nazionale, che è un servizio sanitario universalistico creato nel 2003 per garantire il diritto alla salute a tutti.

Metodi: Uno studio trasversale è stato condotto nel 2017 su 300 partecipanti adulti, che sono stati recrutati attraverso un campionamento casuale di convenienza tra gli iscritti dei settori

formali ed informali coperti dallo schema, residenti ad Accra, nel Ghana. Un questionario ad hoc

è stato somministrato per studiare la qualità percepita dagli iscritti dei servizi sanitari offerti dallo

Schema, nonchè la percezione della UHC e di due indicatori discreti di performance dello

Schema quali l'accesso universale alla cura (UHA) e la protezione dal rischio finanziario (FRP).

L'analisi dei dati è stata condotta con lo SPSS 21 ed AMOS 21, impiegando analisi di base come

l'affidabilità, l'analisi delle componenti principali ed un modello di adattamento. Inoltre, è stata

condotta un'analisi strutturale del modello per esaminare la relazione tra variabili predittive e

variabili outcomes.

Risultati: Nel nostro studio, la percezione positiva dei servizi offerti dallo Schema utilizzati

durante l'anno precedente è stata predittiva del FRP (CR = 5.324, *P* < 0.001), dell'UHA (CR =

3.736, *P* < 0.001) e dell'UHC (CR = 4.159, *P* < 0.001) dello Schema. Inoltre, l'UHA ed il FRP si

sono rivelati dei buoni predittori nella relazione tra la qualità percepita dei servizi offerti dallo

Schema e l'UHC (CR = 5.823, *P* < 0.001 e CR = 2.097, *P* < 0.05, rispettivamente).

Discussione e Conclusione: I risultati del nostro studio hanno evidenziato che la qualità

percepita dei servizi sanitari offerti dallo Schema può esercitare un certa influenza nel

raggiungimento della copertura sanitaria universale sia direttamente che mediante l'UHA e

l'FRP. Pertanto, servizi sanitari di alta qualità forniti dallo Schema possono promuovere l'UHA

ed il FRP come importanti catalizzatori per il raggiungimento della copertura sanitaria universale

in Ghana.

TAKE-HOME MESSAGE: In this Accra-based, exploratory study, healthcare services

provided by NHIS can promote universal healthcare access and financial risk protection as major

catalysts towards the attainment of Universal Health Coverage in Ghana.

INTRODUCTION

Background

Globally, there is a need to ensure that healthcare financing systems guarantee the right to Universal Healthcare Coverage (UHC) as a basic right for all. However, in most countries like Ghana, UHC can be only achieved through the support of huge government expenditures by direct and indirect taxes and donor funding [1]. Ghana has a universal health care financing system, the so-called 'National Health Insurance Scheme' (NHIS), which is a social intervention program introduced by the government to provide financial access to quality health care for residents in Ghana and moving towards UHC using more equitable financing mechanisms.

The NHIS is funded by taxes and premium paid by informal sector subscribers, whereas government allocation complements the funding of the scheme. NHIS subscribers fall into two broad groups, the informal and exempt groups. It is only the informal group that pays a premium,

whereas members of the exempt group, for instance, children, pregnant women, elderly, indigents or persons affected by mental disorders, do not pay it [2].

As Averill and Marriott [3] stated, NHIS relies on subscriber premium, indirect taxation, employee contributions, and government support. Therefore, the pluralistic sources of funding combine aspects of global NHIS best practices from both major capitalist economies and the social National Health Service approach of the United Kingdom. However, access and utilization of public healthcare services can be hindered since the majority of residents from the informal group are voluntarily required to pay insurance premium before enrollment regardless of the amount paid through indirect taxes. Similarly, although the absence of mandatory medical screening can prevent adverse selection, it can have huge consequences on the financial sustainability of the system, because it limits early disease detection and the ability to forecast healthcare expenditure.

The National Health Insurance Scheme (NHIS) was established under Act 650 of 2003 by the Government of Ghana, and technically requires all citizens to be enrolled in some form of health insurance coverage, be it private coverage, the NHIS coverage, or a combination of the two. However, in practice, there is no enforcement of this rule and many citizens are without health insurance coverage of any kind [4].

Although healthcare in Ghana has improved since the introduction of the National Health Insurance Act in 2003, the healthcare system is still facing a number of challenges, particularly in rural areas. The large majority of patients develop illnesses related to water and poor sanitation, such as malaria, cholera, and typhoid, and HIV/AIDS remains the leading cause of many deaths [5].

According to research [3, 6], the elimination of 'cash and carry' by Ghana's national health system in 2013 has mitigated the sufferings of citizens that were caused by the difficult access to care. However, there are still challenges that augment a need for empirical research for studying potential effects exerted by NHIS subscriptions on UHC using a holistic approach.

Theoretical evidence suggests that either voluntary or mandatory subscription to National Health Insurance (NHI) systems may facilitate the fulfillment of UHC in three dimensions of population, services, and cost covered [7]. Despite this, it is important to note the more important role carried out by financing strategies for the attainment of universality in healthcare coverage.

Several scholars [6, 8, 9], have pointed out the importance of Universal Healthcare Access (UHA) and Financial Risk Protection (FRP) to ensure that NHIS reaches universal healthcare coverage, which represents the ability of all people to obtain the health services they need without encountering financial risk and hardships as a result of unaffordable out-of-pocket payments [10]. Universal healthcare access (UHA) is the opportunity or ability to do both of these things [11]. UHC is not possible without UHA, but they are not the same thing.

Financial risk protection is an integral component of UHA and is the ability of a health system to protect households or individuals from out-of-the-pocket catastrophic health expenditure exceeding 40% of the annual household expenditure [9].

The concept of universal healthcare access infers that individuals should be able to have access to quality health promotion, prevention, treatment, rehabilitation, and other related-healthcare services needed. For this purpose, it is demanded that there should be equity in healthcare for the elimination of financial risk and impoverishment due to out of pocket payment for healthcare services [12].

A major goal of public health insurance implementation is to achieve universality and equity in health insurance through the existence of universal access and financial risk protection. The effect of public health insurance on the attainment of universal healthcare coverage is underpinned by the level of healthcare service package, direct healthcare cost, and population coverage. According to WHO, the implementation of public health insurance is likely to have a relationship with UHC [10]. The presence of financial risk protection and universal healthcare access may increase the level of universal healthcare coverage. Based on these assertions, it is important to examine whether the voluntary NHIS subscription in Ghana limits or facilitates UHA and FRP and, as a consequence, whether it may influence the achievement of UHC.

Therefore, this paper attempts to elucidate the structural linkages in the causal relationship between the Ghanaian NHIS subscription and UHC, taking into account the roles played by UHA and FRP in order to provide theoretical and empirical insight for enhancing Ghana's NHIS. Based on empirical data, our study is aimed to establish the existence of relationships between variables, such as national health insurance subscription, universal healthcare access, financial risk protection, and universal health coverage.

Theoretical framework and study objectives

The relationships between NHIS, FRP, UHA, and UHC

Past research [13–16], showed that implementation of NHIS has an influence on UHA and FRP, as it ensures that individuals have an opportunity to receive the necessary healthcare services and, at the same time, adequate protection from high healthcare expenditure. Universal healthcare access entails the opportunity to receive holistic healthcare services. Hence, universal health coverage cannot be accomplished without the presence of universal healthcare access.

Stuckler et al [17], indicated that the term UHA has been equated to UHC in some studies. Though there is seemingly close semblance between UHC and UHA, both concepts vary in terms of scope and roles. Whereas UHC focuses on the benefits of all citizens by supportive medical care and safety, UHA places the emphasis on the process of attaining healthcare services. Consequently, in this study UHC and UHA have been considered as two different constructs. The three dimensions of UHA are physical accessibility, financial accessibility, and acceptability. The dimension of physical accessibility is the availability of good healthcare services within reasonable reach of every person who needs them, and it consists of opening hours, appointment systems and organization of several aspects of service. The dimension of financial affordability is related to a measure of people's ability to pay for services without incurring financial hardship. It comprises the price of healthcare services, the indirect and opportunity cost within the wider health financing system and household income level. The dimension on acceptability rims on people willing to seek for healthcare services. Acceptability can be influenced by the views on service effectiveness, social and cultural factors such as language, age, gender, ethnicity or religion of the health provider that can encourage people to seek for healthcare services [18].

An extensive literature review revealed that there are spatial, financial and medical cover rates that determine the level of universal health coverage in health insurance [7, 18]. UHC framework suggests that universal coverage in healthcare systems progressively operate in several dimensions. These dimensions include service packages that cover over 80% of the entire population, an increased share of pooled funds accounting for the main source of funding for healthcare and eventual reduction in copayments by those accessing the healthcare services [7].

The concept of financial risk protection through health insurance can be linked to the ex-ante decision model, which emphasizes how an individual pays a fair premium when he or she is healthy in exchange for the transfer of cost burden when in need of healthcare services. This allows subscribers to mitigate the high cost associated with ill-health. Conversely, the ex-post decision models can also be applied when subscribers have utilized health care services [19]. According to several studies [6, 20], the NHIS should seek to protect people from catastrophic health expenditure and financial risk, which is likely to emerge from the payment of excessive health care cost. In Ghana, NHIS strives to reduce direct out-of-pocket payments (OPP) through insurance pre-payment and risk pooling activities. Studies have revealed that the presence of health insurance positively may influence a reduction in catastrophic health expenditure. Past research [9] highlighted that catastrophic health expenditure occurs when OPP for healthcare cost exceeds 40% of household payment capacity based on total living costs, with the exception of grocery expenses that affect the household's capacity to pay. A household's capacity to pay is defined as effective income remaining after basic subsistence needs have been met. Effective income is considered as the total consumption of expenditure of the household, which in many countries is a more accurate reflection of purchasing power than income reported in household surveys [9]. Among the indirect indicators is the proportion of an individual's OPP to the total health expenditure and the proportion of government health expenditure in relation to Gross Domestic Product [18]. It has been indicated that 1% increase in the proportion of total health expenditure as a result of out-of-pocket payments is associated with an average increase in the proportion of households facing catastrophic payments by 2% [21]. Because patients who face catastrophic health expenditure may not be able to cope with health costs, social systems such as

national health insurance or tax-funded health systems that protect households from catastrophic health expenditure are expected to mitigate the effects of healthcare expenditure.

Therefore, the aim of this study is to examine: 1) the effects of perceived quality of healthcare services delivered by NHIS on Universal Healthcare Access and Financial Risk Protection, and 2) the effects of perceived quality of healthcare services delivered by NHIS on Universal Health Coverage. Therefore, we formulated the following hypotheses:

H1: (High-quality healthcare services provided by) NHIS exerts a significant effect on UHA;

H2: (High-quality healthcare services provided by) NHIS exerts a significant effect on FRP;

H3: (High-quality healthcare services provided by) NHIS has a significant influence on UHC.

Mediation roles of UHA and FRP on the relationship between NHIS and UHC

This study examines the inter-linkages between NHIS, UHA, FRP, and UHC. In agreement with past studies [6, 22], two linkages (direct and indirect) are needed for mediation to occur in structural equation modeling (SEM). The examination of the role of UHA and FRP as *mediators* in the relationship between NHIS and UHC requires the existence of a cause-effect structural linkage between the constructs. There would be a direct or indirect linkage between NHIS and UHC. Moreover, NHIS would exercise some causal effects on UHA and FRP, which are the constructs that may, in turn, facilitate the achievement of UHC. A thorough review of the literature on health insurance depicts that UHA and FRP may promote the attainment of UHC. Firstly, UHA ensures equity in health care access when subscribers need healthcare services. Secondly, FRP resolves the healthcare financing problems encountered by individuals and their households [9]. This is supported by Kawabata et al [23] who demonstrated that the subscription

to NHIS reduces the basic living expenditure for households dealing with healthcare costs. Finally, although some studies [6, 18] showed a positive relationship between NHIS and UHC, the dearth of knowledge on this issue requires more analysis on how UHA and FRP may accentuate the effect exerted by NHIS on UHC.

Therefore, based on past research [8] the following hypotheses were advanced:

H4: UHA may mediate the relationship between NHIS and UHC;

H5: FRP may mediate the relationship between NHIS and UHC.

METHODS

Study design and population

This was a cross-sectional study conducted between January and October 2017 in Accra, Republic of Ghana. Accra is the capital city of Ghana and is situated along the west coast of Africa. Accra is inhabited by about 2.7 million people and has the highest population density in Ghana due to rural-urban in-migration and a high population growth rate. It has been estimated that over 54% of the Accra's population are under 24 years old [24]. There are no sharp distinctions between the rural and urban areas, however, distinctions can be drawn from the type of housing, economic activities (farming and fishing for rural areas) and access to key infrastructural services such as healthcare.

The sample size was calculated by Accra's population, which was found to be around 2.7 million people in 2017. Using a 95% confidence interval and 5% margin of error, the calculated minimum sample size was expected to be 384, which was modified to 390 to compensate for incomplete questionnaires. Population target comprised only households, for which one or more members had used at least one type of healthcare service in the previous year. The sampling unit

was the household and the survey questionnaires were administered to the heads ($n = 300$) of each household who accepted to participate in the research. The participants were enrolled via a random convenience sampling method to include residents from both residential and low-income areas. The sample of households was drawn from a list of addresses generated by a list of households obtained from the municipal health information management systems of some healthcare facilities in La Nkwantanang and Ga East Municipalities, with stratified sampling in the intervention neighborhood. Out of 390 sampled addresses, 390 households were contacted. The rate of respondents was 300 (77%).

Study Instruments

Data were collected using a questionnaire that was developed and pretested with a random sample of 15 head of households and, afterward, administered to the head of each household by face-to-face interviews. The study questionnaire included items on socio-demographic data of the participants (age, gender, educational level, type of health insurance and occupations, income level, household size, rural or residential areas), items about positive (high) quality perception of healthcare services released by NHIS and enjoyed by at least one member of the household in the previous year, and items on their perception about UHC, and two discrete indicators of healthcare system (NHIS) performance such as Universal Healthcare Access (UHA), regarding levels of access to healthcare services released by NHIS, and Financial Risk Protection (FRP) about financial protection, with a special focus on equity of NHIS services.

According to Dixon et al [4], subscribers' views about National Health Insurance System (NHIS) may be explained through their perception and knowledge on the importance of being registered into a public health insurance system. Consequently, the variables study about NHIS were drawn

on the basis of the residents' perception, provided by subscription to National Health Insurance System. Items, therefore, focused on the quality and effectiveness of the services enjoyed in the study area. The residents' perception was measured in line with both their expectation and current experience. Finally, findings from reliable sources were used to create UHC variables ('population, services and cost cover rates by healthcare system') [10, 17], UHA variables ('spatial access, financial accessibility, and acceptability') [18], and FRP variables ('the extent of out-of-pocket payment due to healthcare cost and the economic burden of healthcare cost on the individual and households') [5, 7, 25].

We also adopted the five dimensions of access, as defined by the ACCESS Framework, already used in past research on this issue in African context: availability, accessibility, affordability, adequacy, and acceptability [26].

Availability refers to the type of services offered, whether human and other resources are sufficient to meet the demand, and to the knowledge and skills of service providers. Accessibility indicates the proximity of the health care facilities to their homes. Affordability refers to the direct costs of care as well as indirect costs such as travel costs, lost time and loss of income. Adequacy may be defined as the organisation of care, and the extent to which services met the expectations of users. Acceptability includes stringent confidentiality policies and practices of healthcare organizations, providers acknowledged negative attitudes, stigma and discrimination issues. It also includes barriers with regards to the acceptability of services, particularly in the form of provider attitudes and the impact of diagnosis-based organisation of services on confidentiality and poor communication [26, 27]. Table 1 shows details about items and labels of the study variables.

Table 1. Items of the questionnaire survey.

Latent Construct Area	Measured Construct Item	Label
NHIS	Healthcare services met my family's needs	NHIS1
	I was satisfied with healthcare services delivered by NHIS	NHIS2
	Care by NHIS was respectful and culturally appropriate	NHIS3
	Healthcare services delivered by NHIS were beneficial for my family	NHIS4
	NHIS provided a quality service	NHIS5
FRP	There was no catastrophic health expenditure for my family due to out-of-pocket payments	FRP1
	I don't feel impoverished due to out-of-pocket payments	FRP2
	The healthcare system was economically sustainable for my family	FRP3
	The NHIS subscription costs are right	FRP4
	There is equity in subscription fees among individuals	FRP5
	Additional payments do not affect my economic status	FRP6
	The price of healthcare services is affordable and acceptable	FRP7
UHA	Health care facilities are available and accessible, by considering several organizational aspects including opening hours and appointment systems	UHA1
	Healthcare access is timely	UHA2

	Health care facilities accredited by NHIS are equally distributed in the territory	UHA3
	The hospital-admission system is easy to understand	UHA4
	There are no problems to reach healthcare services with roads, transport, safety and security	UHA5
UHC	Healthcare system is cost-effectiveness	UHC1
	Healthcare services costs are sufficiently covered by NHIS	UHC2
	Healthcare services are available and accessible to all members of my households	UHC3
	All the children of my family are vaccinated	UHC4
	Healthcare emergency assistance is adequately covered	UHC5
	My family has access to prescribed drugs (e.g. drugs are covered by the NHIS)	UHC6

For each item, the answer was ranked on a five-point Likert scale (from 1 = strongly disagree, to 5 = strongly agree). The higher scores fit the higher performance levels in respective areas. Some of the items for analyzing the study areas were from past research conducted by one of the authors of this research, about the mediation role of UHC in the effect of NHIS on perceived satisfaction with health service quality carried out in South Korea [8].

Statistical Analysis

Data analysis was conducted through SPSS 21 and AMOS 21, employing basic analysis such as

reliability, principal component and model fit analysis. Additionally, the structural model analysis was conducted to examine the relationship between antecedent and outcomes variables. The mediation effect of UHA and FRP on UHC was analyzed through bootstrapping analysis. As shown by Barroso et al [28], structural equation modeling (SEM) provides test multiple regressions among constructs. It is important to highlight that structural equation models have the capacity to combine factor and path analysis into the single statistical model. The most common SEM software packages include LISREL, Mplus, and AMOS. Among these software packages, AMOS was used in analyzing the structural model for this research. For data analysis, Cronbach alpha was calculated to determine the internal consistency among the questionnaire items measured on the respective latent constructs. According to Wortzel [29], the study results are highly reliable if the Cronbach's alpha is comprised between 0.70 and 0.98. Based on the research objectives and hypothesis, a dimension reduction through exploratory factor analysis was employed after a preliminary normality test. Furthermore, our study employed the construct validity test approach instead of the content or criterion validity approaches in measuring the construct reliability due to the specifications of the model hypothesized in the study. Both convergent and discriminant validity were established before examining and modifying the model fit parameters. The study established the direct and indirect relationships about answers concerning NHIS, UHA, FRP, and UHC as latent variables and their specific measures. Finally, we employed the bootstrapping approach as advocated by Preacher and Hayes [30] to test the mediation role of UHA and FRP in the relationship between NHIS and UHC.

Ethical consideration

Participation in our study was voluntary and verbal consent was obtained from participants during data collection after a thorough explanation of the purpose of the study. Potential risks and benefits of participation in the study were explained to the respondents. Confidentiality of information and anonymity of respondents were maintained throughout the survey. Our study followed the ethical guidelines for research published by the Helsinki Declaration [31].

RESULTS

With regard to socio-demographic data of participants ($n = 300$), 45.3% were males and 39% of them were composed by the 20-29 years group. A total of 98% of the respondents were enrolled in the public NHIS, whiles 2% in both public NHIS and private health insurance schemes (PHIS). Majority of the respondents (55.3%) were self-employed and most of the respondents (87.7%) were from low-income group (< 500 USD). Less than half (37.7%) of households were composed of 2-4 members.

Table 2. Socio-demographic data of participants ($n = 300$).

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	136	45.3
	Female	164	54.7
Age	20-29 years	177	39.0
	30-39 years	87	29.0
	40-49 years	45	15.0
	50-59 years	41	13.7
	60 years and above	10	3.3
Education	None	37	12.3
	Elementary School	43	14.3
	Middle School	71	23.7
	High School	75	25.0
	Tertiary/University	69	23.0

	Other	5	1.7
Type of Health Insurance	NHIS	294	98.0
	Both NHIS and PHIS	6	2.0
Occupation	Self-employed	166	55.3
	Salaried Professional	42	14.0
	Mid-level Staff	45	15.0
	Student	28	9.3
	Unemployed	15	5.0
	Other	4	1.3
Monthly Income (US Dollar)	Below $500	263	87.7
	$500-1499	35	11.7
	$1500-2499	2	0.7
Household Size	1 person	28	9.3
	2-4 people	133	37.7
	5-7 people	101	33.7
	8 people and above	58	19.3

Measured Items and Reliabilities

The Cronbach's alpha measure was employed to determine the internal consistency of the measured variables used in this research. Based on the theoretical underpinnings of the constructs, the demographic variables were excluded in the reliability testing.

Table 3. Measured items and reliability analysis.

Construct	Number of measured items	Mean	Standard Deviation	Cronbach Alpha
NHIS	5	3.306	1.594	.952
FRP	7	2.860	1.402	.937
UHA	5	3.062	1.495	.947
UHC	6	2.972	1.404	.934

In our study, Cronbach's alpha values related to study items were optimal (NHIS = .952, UHA = .947, FRP = .937, UHC = .934, Overall = .700).

Further exploratory factor analysis was conducted among the variables after that Cronbach alpha values were obtained. The rotated component matrix showed an acceptable level of alignment based on the factor loading values that were greater than .70 in all the four latent dimensions.

Table 4. Principal component analysis on measured items.

Measured Items	Rotated Component Matrix			
	Component (Factor Loadings)			
	1	2	3	4
FRP1	.880			
FRP5	.861			
FRP7	.859			
FRP4	.848			
FRP2	.827			
FRP3	.796			
FRP6	.776			
UHC5		.887		
UHC2		.855		
UHC3		.841		
UHC4		.834		
UHC1		.815		
UHC6		.774		
NHIS3			.937	

NHIS1				.907	
NHIS2				.882	
NHIS4				.867	
NHIS5				.838	
UHA3					.918
UHA5					.904
UHA2					.901
UHA1					.899
UHA4					.795
	Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
	a. Rotation converged in 5 iterations.				
	Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.905; Total Percentage of Variance Explained: 78.51%				

It is valuable that the Kaiser-Meyer-Olkin value as .905 demonstrated the robustness of the data confirming the adequacy of the sampling. The factor analysis was enhanced by the 78.51% out of the total percentage of variance explained. These results facilitated the need to establish construct validity in this study through a structural equation analysis using AMOS 23.
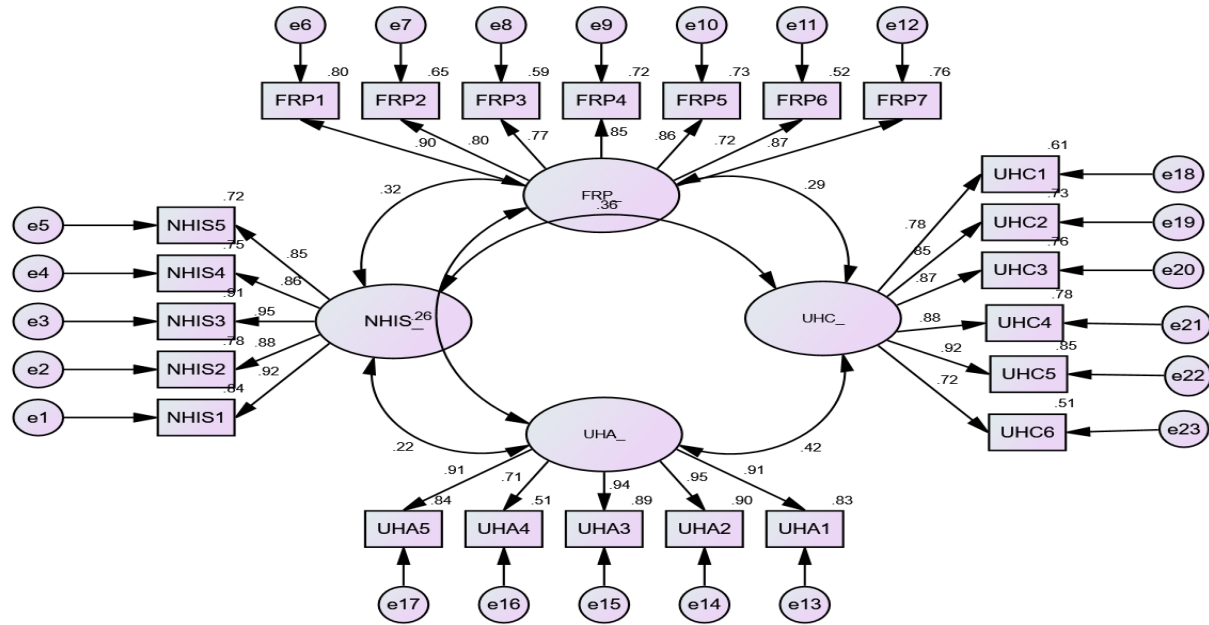
Figure 1. Construct Validity Analysis: Confirmatory Factor Analysis using AMOS.

The initial model analysis was undertaken through confirmatory factors analysis. All the latent constructs showed positive correlation values. The correlation values ranged from .22 ($P < 0.05$) between NHIS and FRP to .42 ($P < 0.001$) between UHA and UHC. The existence of positive correlations among all the latent constructs as confirmed by the 0.196 benchmark supported the subsequent calculation of convergent and discriminant validity.

Convergent Validity

The statistical examination of convergent validity was focused on factor loadings, average variance extracted (AVE) and composite reliability (CR) based on the measured variables for this study. Kaynak et al [32] have indicated that in order to establish convergent validity through confirmatory factor analysis, the factor loadings of the measured variables from each of the

latent construct must be greater than or equal to 0.5, the AVE must be greater than or equal to

0.50 and composite reliability must be greater than or equal to 0.70.

Table 5. Convergent Validity Analysis.

Latent Construct	Measured Construct		Label	Estimate	CR	AVE
NHIS	Healthcare services met my family's needs		NHIS1	.919	0.952	0.800
	I was satisfied with healthcare services delivered by NHIS		NHIS2	.881		
	Care by NHIS was respectful and culturally appropriate		NHIS3	.954		
	Healthcare services delivered by NHIS were beneficial for my family		NHIS4	.864		
	NHIS provided a quality service		NHIS5	.851		
FRP	There was no catastrophic health expenditure for my family due to out-of-pocket payments		FRP1	.895	0.937	0.682
	I don't feel impoverished due to out-of-pocket payments		FRP2	.804		
	The healthcare system was economically sustainable for my family		FRP3	.770		
	The NHIS subscription costs are right		FRP4	.849		
	There is equity in subscription fees among individuals		FRP5	.856		
	Additional payments do not affect my economic status		FRP6	.725		

	The price of healthcare services is affordable and acceptable	FRP7	.869		
UHA	Health care facilities are available and accessible by considering several organizational aspects including opening hours and appointment systems	UHA1	.913	0.950	0.793
	Healthcare access is timely	UHA2	.950		
	Health care facilities accredited by NHIS are equally distributed in the territory.	UHA3	.943		
	The hospital-admission system is easy to understand	UHA4	.711		
	There are no problems to reach healthcare services with roads, transport, safety and security	UHA5	.914		
UHC	Healthcare system is cost-effectiveness	UHC1	.782	0.935	0.706
	Healthcare services costs are sufficiently covered by NHIS	UHC2	.853		
	Healthcare services are available and accessible to all members of my households	UHC3	.870		
	All the children of my family are vaccinated	UHC4	.881		
	Healthcare emergency assistance is adequately covered	UHC5	.921		
	My family has access to prescribed drugs (e.g. drugs are covered by the NHIS)	UHC6	.716		

	CFA Model Fit Outcome: CMIN/DF: 2.478, RMR: .060, RMSEA: .070, GFI: .859. NFI: 920, IFI: 951, CFI: .951, TLI: . 944

The results showed in Table 5 indicate that all of the measured factors had significant factor loadings that exceeded the 0.50 benchmark opined by Kim [22]. Subsequent computations also revealed AVE values of greater than 0.50 for each latent construct. The NHIS construct had CR of 0.952 and AVE of 0.800, whereas the FRP construct had 0.937 CR and 0.682 AVE. The UHA construct had 0.950 CR and 0.793 AVE, whereas the UHC construct had 0.935 CR and 0.706 AVE. It is also interesting to note that all these results emerged with an acceptable CFA model fit outcome (CMIN/DF: 2.478, RMR: .060, RMSEA: .070, GFI: .859. NFI: 920, IFI: 951, CFI: . 951, TLI: .944). Therefore, it was confirmed that all the latent constructs had composite reliability values greater than 0.70. These findings confirmed the establishment of convergent validity for this study.

Discriminant Validity

Discriminant validity analysis was established through an examination of the inter-correlation of the latent variables and values of the square roots of the AVE for each of the latent constructs. The computation of AVE, composite reliability (CR), maximum shared variance (MSV) and maximal reliability (MR (H)) were also employed in the establishment of the discriminant.

Table 6. Discriminant Validity Test.

Latent Construct	CR	AVE	MSV	MaxR(H)	NHIS_	UHA_	FRP_	UHC_
NHIS	0.952	0.800	0.127	0.981	**(0.895)**			
UHA_	0.950	0.793	0.181	0.966	0.221***	**(0.891)**		
FRP_	0.937	0.682	0.100	0.986	0.316***	0.259***	**(0.826)**	
UHC_	0.935	0.706	0.181	0.989	0.356***	0.425***	0.285***	**(0.840)**
P <.001*, P <.005 **, P <.05* Note: Square root of the AVE in parenthesis**								

The presence of significant correlations among all the latent variables, as indicated by inter-correlation values greater or equal to .20 and the attainment of AVE square root values that are relatively higher than the inter-correlation co-efficient within each respective diagonal scale, confirmed discriminant validity for this study. These findings are in agreement with Kline's [33] recommendation on the confirmation of discriminant validity test in quantitative analysis.

Hypothesized model assessment

Based on the research purpose and theoretical basis of this study, a causal model was constructed with latent and measured variables. A model fit analysis was undertaken as a fundamental requirement to ascertain the adequacy of the hypothesized model after the validity analysis. The establishment of model fit took into account critical absolute fit indicators such as root mean square error of approximation (RMSEA) and goodness of fit index (GFI) and the incremental fit indicators such as comparative fit index (CFI) and Tucker-Lewis index (TLI).
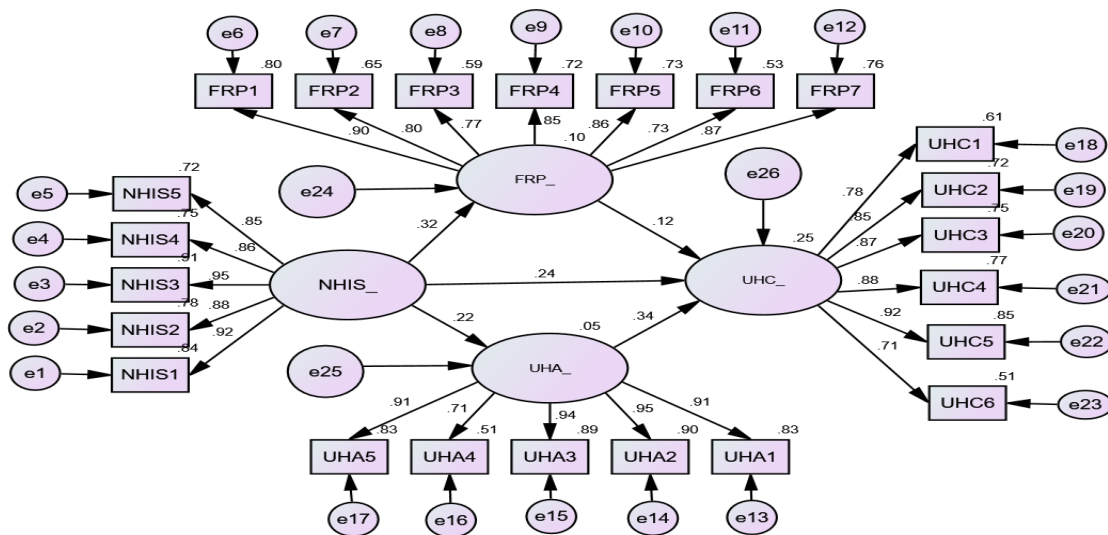
Figure 2. Standardized Path of the Hypothesized Model.

From the hypothesized model, the incremental fit index (IFI) of .949, CFI of .949, TLI value of .943, RMSEA value of .0071 and root mean square residual (RMR) of .093 necessitated the application of the modification index (MI) and modification change (par change).

Modification of the Hypothesized model

The first modified model was created by establishing a covariance between e24 <--> e25, which are the error terms that represent the financial risk protection and universal healthcare access as mediators. This led to a modification index (MI) of 11.179 and par change of .219, which helped increase the fit indices for the alternative model. Further suggestions led to the creation of covariance between the error terms e18 <--> e23 on the UHC construct (hospital availability and accessibility, and availability of prescribed drugs), which was associated with an MI of 20.961 and a par change of .182.

Table 7. Modification of the hypothesized model.

Path	Modification Index	PAR Change
e24 <--> e25	11.179	.219
e18 <--> e23	20.961	.182
e10 <--> e11	15.412	.112

In addition, the need for adequate model fit necessitated the creation of covariance between e10 <--> e11, which represent equity in subscription charges between individuals and workers and PHI does not affect my finances within the FRP construct. This covariance had an associated MI of 15.412 and par change of .112. The application of the MI and par changes on the hypothesized model led to the attainment of an enhanced alternative model for this study.

The alternative model was enhanced to test the hypotheses that were developed based on literature review and it helped to accept the limits of the model fit index. According to Marsh and Hocevar [34], X2/df between 1.00 – 5.00 is an indicator of good fit. Hu and Bentler [35], also assert that RMSEA and RMR values < 0.06 and < 0.08 are acceptable fit indicators. A benchmark of GFI as established by Jöreskog and Sörbom [36], justifies the acceptance of > 0.8 as an indicator of good fit. Bollen [37], also postulates that an IFI > 0.9 is acceptable, while Bentler and Bonnet [38], designated a CFI of > 0.9 as a good fit model. The TLI indicator as formulated by Tusker and Lewis [39], asserts that TLI closer to 1.00 supports the idea of a good fit model.

Table 8. Model fit Indicators for the hypothesized and alternative models.

Index	X²/df	RMSEA	GFI	IFI	RMR	CFI	NFI	TLI
Acceptable Benchmarks	1.00-5.00	<0.08	>0.8	>0.9	<0.08	>0.9	>0.9	0.00-1.00
Hypothesized Model	2.517	.071	.856	.949	.093	.949	.918	.943
Alternative Model	2.327	.067	.870	.956	.059	.956	.926	.950
Source	Marsh and Hocevar (1985)	Hu and Bentler (1999)	Joresborg and Sorborm (1988)	Bollen (1989)	Hu and Bentler (1999)	Bentler & Bonett (1980)	Bentler & Bonett (1980)	Tusker and Lewis (1973)

Based on a comparative examination of the inadequacies in the hypothesized model, an alternative model was adopted due to an improved RMSEA (.056) and RMR (.058). There were also improvements in the GFI (.836), IFI (.925), CFI (.924) and TLI (.917). Therefore, the alternative model was employed in the hypothesis and bootstrapping tests for mediation analysis in the study.

Alternative Model Assessment

Diamantopoulos and Siguaw [40] are of the view that structural model analysis is conducted to determine whether the theoretically conceptualized relationships between the constructs are supported by the data. The significance of the standardized path of the hypothesized model was

demonstrated through the Structural Equation Model. It has been asserted that a significant path

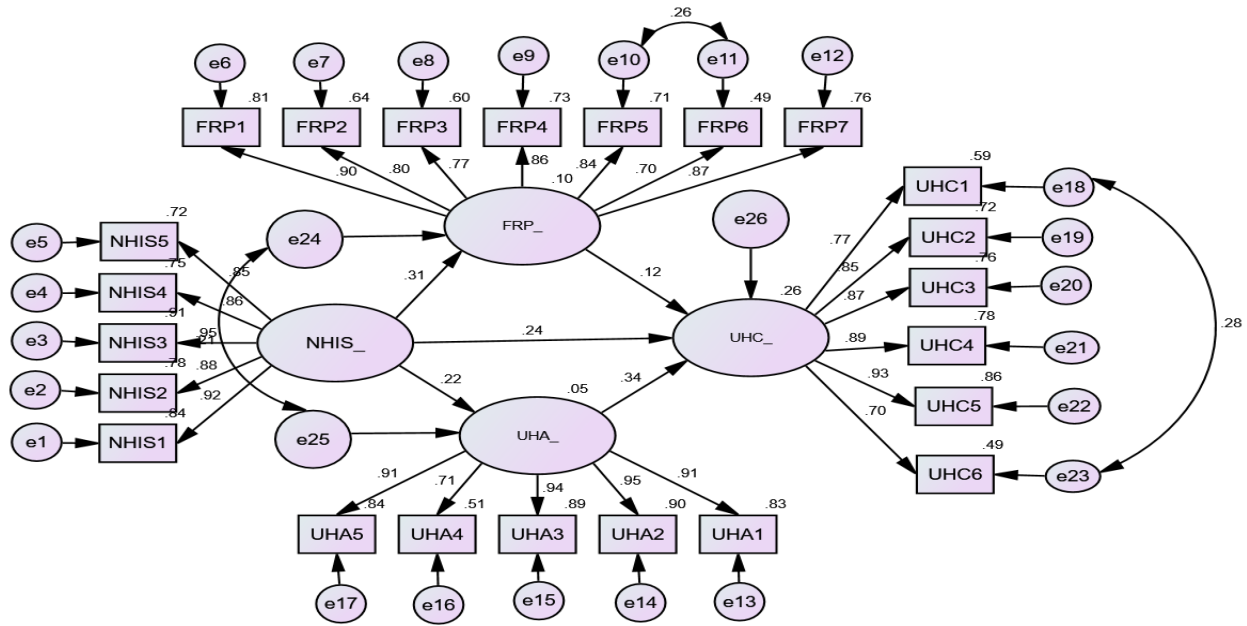should have a p-value of < 0.05 and t value of > 1.96.

Figure 3. Standardized Path of the alternative model.

The alternative model vividly depicts that there is a positive effect of NHIS on UHC. It is

important to note that NHIS has a positive effect on FRP and UHC. The model also exhibits the

effects of FRP and UHA on UHC. These structural linkages necessitated the examination of the

direct hypothesis formulated in the study.

Table 9. Direct Hypothesis Test.

Path	Unstandardized Estimate	Standardized Estimate	S.E.	C.R.	P	Results
FRP_<---NHIS_	.290	.314	.054	5.324	***	Significant
UHA_<---NHIS_	.211	.221	.056	3.736	***	Significant

UHC_<---NHIS_	.197	.241	.047	4.159	***	Significant
UHC_<---FRP_	.108	.122	.051	2.097	.036	Significant
UHC_<--UHA_	.290	.340	.050	5.823	***	Significant

It was observed that NHIS has a significant effect on FRP as signified by a critical ratio of 5.324 and p-value < .001, which led to the confirmation of H2. Similarly, NHIS had a significant effect on UHA (CR = 3.736, P < .001) which confirmed H1. The effect of NHIS on UHC was confirmed by CR of 4.159 (P < .001), which resulted in the acceptance of H3. Furthermore, FRP had a significant effect on UHC (CR = 2.097, P < .05) The UHA construct had also a significant effect on UHC (CR = 5.823, P < .001). In sum, the hypothesized constructs were all accepted, but it was necessary to ascertain the exact levels of indirect effects through the mediation variables.

Table 10. Mediation Effect Test.

Mediation Hypothesis	Standardized Total Effects	Direct Effect	P Value	Indirect Effect	P Value (BC)	Standard Error	95% BC CI Lower Bound Value	95% BC CI Upper Bound Value	Results
NHIS→FRP	.314	.314	.002	.113	.002	.031	.058	.180	Partial Mediation
FRP→UHC	.122	.122	.029						
NHIS→UHC	.355	.241	.001						
NHIS→UHA	.221	.221	.002	.113	.002	.031	.058	.180	Partial Mediation
UHA→UHC	.340	.340	.002						
NHIS→UHC	.355	.241	.001						
NHIS→FRP→ UHA→UHC	**.355**	**.241**	**.001**	**.113**	**.002**	**.031**	**.058**	**.180**	**Partial Mediation**

The outcome of the bootstrapping mediation test demonstrated the existence of partial accentuation effects of FRP and UHA in the relationship between NHIS and UHC. Based on the guidelines of [30, 41–43], it was observed that the rate of direct effect (CR= .241, $P <$.001) was greater than the indirect effect (CR = .133, $P <$.002). This attests that the antecedent construct (NHIS) has a significant direct effect on the consequent construct (UHC), hence the rejection of full mediation effect. However, H4 and H5 were accepted as having partial mediation since the lower bound and upper bound values of the bias-corrected confidence interval at 95% fell outside the range of 0.000. It was, therefore, ascertained that FRP and UHA partially mediated the effect of NHIS on UHC.

DISCUSSION

The results from the hypotheses tested proved that NHIS had a statistically significant effect on UHA (CR = 3.736 and $P <$ .001) and FRP (CR = 5.324, $P <$ .001). Our study further showed that NHIS had a statistically significant effect on UHC (CR = 4.159, $P <$ .001). The acceptance of H1 could be attributed to the numerous opportunities that have been granted by NHIS in Ghana. Such opportunities include the elimination of the issues related to the fee-for-service system, the so-called '*cash and carry*' and the ability of subscribers' to meet their health care needs. Moreover, UHA and FRP had also significant effects on UHC (CR = 2.097, $P <$ .05; CR = 5.823, $P <$ .001, respectively). The acceptance of both H4 and H5 was confirmed even when there were minimum effects of UHA and FRP on UHC. Probably, the fact that cash and carry has been eliminated resulted in more opportunities for NHIS partner facilities and households within the lowest income groups to access healthcare services. Subsequently, the acceptance of the mediating roles of UHA in the effect of NHIS on UHC could be attributed to the chance to meet

people's healthcare needs, enjoying the benefits of preventive and curative healthcare. The observed mediating role of FRP between NHIS and UHC may be well explained by the financial protection gained from guaranteed medical expenditure that has been provided by the public national insurance system. No fear of high economic risk associated with unforeseen illness gave trust and confidence to most subscribers.

Therefore, findings from our empirical study suggest that in Ghana the enrolment in a public national health insurance system (NHIS) grants UHA and FRP to residents, which in turn may influence the achievement of UHC. This finding confirms that an effective health insurance system permits people to access healthcare regardless of time and cost, protecting individuals and households from incurring in excessive healthcare costs, thereby preventing from the catastrophic effects associated with unexpected health expenditure. Probably, a public social security system like NHIS in Ghana may guarantee FRP and, subsequently, UHC. This finding is supported by Yawson et al [6], who showed that, before the adoption of NHIS, user fees to cover costs led to delays in healthcare-seeking behavior and lower health care access among the extremely poor segments of the population.

The existence of partial mediation effect of UHA and FRP on UHC could be attributed to the inability of our current NHIS to achieve universality in terms of population and service coverage, due to the fact that subscription is not mandatory. These findings are supported by several studies [44, 45], who indicated that despite the improvement of Ghana's healthcare system, household spending on healthcare still remains high in this country. Therefore, despite efforts by the government through the NHIS in Ghana, the healthcare coverage rate is still relatively low. This could be due to the lack of mandatory nature of the subscription.

Furthermore, out-of-pocket payments account as the primary source of healthcare financing in several low and middle-income countries, like Ghana. Healthcare financing through the out-of-pocket system is still a barrier to access, contributing to household poverty and low revenue generation, promoting perverse incentives and breeding bureaucracy and corruption [46]. These anomalies are expected to be corrected by a comprehensive, mandatory health-insurance system, yet NHIS remains voluntarily and relies on pluralistic sources of funding, which leave segments of the population outside the health safety net.

As stated by WHO, universal health coverage prevails when all people receive the needed quality health services without suffering financial hardships based on utilization of health services and the economic consequences of using such health services [10]. According to WHO, Ghana has expanded its national health insurance coverage in 2008 to include free healthcare services delivery to all pregnant women, only due to political reasons and as a result of its election period. This affirms the assertion that the desire to increase universal health coverage can be politically motivated and, as a consequence, an increased government commitment can lead to the attainment of full universal healthcare coverage in Ghana. Recent research indicated that the implementation of national health insurance in Ghana has increased health coverage, health sector financial resource availability, health service utilization, decreasing out-of-pocket payments and catastrophic expenditures for health care [47]. However, with respect to the physical accessibility dimension, it has been revealed that Ghana has poor UHA because one-quarter of the total population live over 60 km from a health facility where a doctor can be consulted and access to skilled birth attendance is only 46% in the country [3].

As per Bristol [48], the rise in national incomes and the burden of non-communicable diseases

requires an intensified demand for quality and affordable healthcare for all the population. In an attempt to expand universal health coverage, Ghana raised consumption taxes by 2.5% through NHIS levy and taxes account for over 61% of the entire budget for the national health insurance scheme [48]. The dearth of knowledge has been whether the increase in taxes has led to an increase in national health insurance subscription and utilization. Studies have shown that, the commitment to attain universal health coverage depends on the extent of revenue collection, prepayment and risk pooling, which seeks to avoid over-reliance on direct payment, coverage for the poor, which includes special package to enroll the poor, and the application of trade-offs in terms of population coverage, costs and scope of benefit package [49].

According to Akazili et al [50], more urban residents in Ghana have been enrolled in the national health insurance than rural residents and the variations are attributed to the involvement of many urban residents in informal sector employment, which allow them to make direct health insurance payment in the form of social security contributions through their monthly salaries. The variations in rural and urban health insurance subscription imply that some segments of the population residing in rural areas are not covered by the national health insurance and this issue can contribute to the lack of full universal coverage in Ghana. Therefore, there is a need for a progressive enrollment policy that seeks to increase subscription and sustain the means of health insurance finance in Ghana.

Study limitations

This study has some limitations. In literature, to our knowledge, there are no validated tools to measure UHC, UHA, and FRP. Moreover, items about the study variables of the questionnaire used were not quantitative measures, but they were related to subjective perceptions of

participants. However, we used items from a questionnaire already validated in past research [8, 4]. Finally, the cross-sectional nature of the study made it difficult to establish any causal relationships between predictor and outcome variables.

CONCLUSION

The attainment of full universal health coverage based on the national health insurance system can be accomplished through strong commitments and continuous improvement in universal health care access and availability of financial risk protection. These efforts have yielded numerous benefits such as timely access to effective preventive and curative healthcare, reduction in moral hazard and increased utilization of healthcare services. The findings from this study augmented the need to examine the mode of subscription in both the voluntary and mandatory dimensions and how the pluralistic methods of financing can be reduced to widen the healthcare safety net in Ghana. Despite the challenges within the health insurance systems, in our study, residents perceived that the current NHIS have made positive impacts on the attainment of universal healthcare coverage. It is therefore important to examine these findings in the policy perspective in order to improve the critical points of Ghana's healthcare delivery system.

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