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**Equity of national publicly funded health insurance scheme
under universal health coverage agenda: a systematic
review of studies conducted in Africa**

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Equity of national publicly funded health insurance scheme under universal health coverage agenda: a systematic review of studies conducted in Africa

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Keyword: *Equity, Health insurance schemes, universal health coverage, Africa, PROGRESS-Plus*

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Abstract

Background:
The implementation of publicly funded health insurance schemes (PFHIS) is the major strategy to drive progress and achievement of universal health coverage (UHC) by 2030. We appraised evidence on the equity of insurance schemes across Africa.

Methods: We conducted a systematic review of published studies that assessed equity in health insurance schemes implemented under the UHC agenda in Africa. Six databases, Web of Science, Medline, CINAHL, Scopus, Cochrane Library, EMBASE and World Bank eLibrary, were searched; we operationalised the PROGRESS-Plus equity framework to assess equity areas.

Result: Forty-five studies met the inclusion criteria and were included in the study, in which 90% assessed equity by socioeconomic status. Evidence showed that rural residents, those self-employed or working in the informal sector, men, those with lower educational attainment, and the poor were less likely covered by health insurance schemes. Broadly, the insurance schemes, especially, community-based health insurance (CBI) schemes improved utilisation by disadvantaged groups, however, the same groups were less likely to benefit from health services.

Conclusion: Evidence on equity of PFHIS is mixed, however, CBI schemes seem to offer more equitable coverage and utilisation of essential health services in Africa

Keyword: *Equity, Health insurance schemes, universal health coverage, Africa, PROGRESS-Plus*

INTRODUCTION

Universal health coverage (UHC) is a current rallying point for policymakers, development partners, and government agencies in development and global health. From being a healthcare system strengthening strategy, popular in developed countries before 2005, it has become a global health priority championed by the World Bank and World Health Organisation (WHO).^{1,2}

UHC aims to ensure everyone, irrespective of their socioeconomic status, has access to required and affordable health services.^{3,4} Therefore, it is being praised for its ability to solve the unfinished health concerns from the millennium development goal (MDGs) era as well as emerging concerns.^{4,5} Nevertheless, UHC has been criticised as being an ambitious goal and lacking consensus on the definition of its components.²

The clear path to UHC, strongly advocated for by the WHO, is the significant reduction in out-of-pocket (OOP) health expenditure through introduction of prepayment schemes such as compulsory health insurance, or a taxation system.^{6,7} As early as 2003, Ghana adopted a social health insurance system to advance the goal of UHC, which was funded by value added tax (VAT) and monthly premium payments.^{8,9} Rwanda has received global commendation for the huge advances made in extending UHC through CBI.^{10,11} Other African countries such as South Africa, Tanzania, and Nigeria have also implemented health insurance schemes.

In efforts to streamline policy and implementation discourse around UHC, the World Bank and WHO developed the 3-dimensional “coverage box”. The length of the box is used to explain “who is covered by UHC”, depth for “which interventions are covered by UHC” and the height for “the percentage of cost covered by UHC”.¹² In most countries, even when they targeted “100% coverage”, services are either limited to minimum packages or implemented strategically for selected programmes such as maternal and child health; or for specific populations, usually the employed or the poorest population.^{1,13} This has led to increased focus on equity of UHC policies and implementation.

As implementation of health insurance schemes is a key strategy in pursuit of UHC, this study aims to investigate and generate robust evidence of the equitability of publicly funded health insurance schemes (PFHIS) in Africa. We focused on PFHIS as private insurance schemes are usually marketised, often the reserve of the wealthy, or offered to employees, thus clearly reflecting inequities in access in most cases.¹⁴

METHODS

The protocol for this systematic review study was registered on PROSPERO in March 2019, CRD42019125896.¹⁵

Search Strategy

Guided by the PRISMA guideline for systematic reviews,¹⁶ a thorough systematic search of literature was initially conducted in August 2019 and updated in January 2020 with no date restrictions. The following databases: Web of Science, Medline, CINAHL, Scopus, Cochrane Library, EMBASE and World Bank’s eLibrary were searched to identify published articles that reported the equity of public health insurance schemes implemented in Africa [See

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Supplementary 1 for more details]. We operationalised the concept of equity in this study using the PROGRESS-Plus framework ^{17,18}. PROGRESS stands for: **P**lace of residence; **R**ace/ethnicity/culture/language; **O**ccupation; **G**ender/sex **R**eligion; **E**ducation; **S**ocioeconomic status; **S**ocial capital. The “Plus” is used for context-specific equity gaps when available.

Screening & Study Selection

The screening and selection were done by two reviewers in duplicate based on a priori inclusion and exclusion criteria [see Box 1]. Identified citations were transferred to Endnote software to remove duplicates. The titles and abstracts of all the remaining citations were screened using Rayyan QCRI software.¹⁹ Full texts of all potentially relevant articles were screened against the inclusion and exclusion criteria and disagreements were resolved by consensus.

Box 1: Inclusion and Exclusion criteria

Eligibility Criteria
Inclusion criteria:
<ul style="list-style-type: none">▪ assessed a publicly funded health insurance scheme▪ provided empirical evidence (quantitative or qualitative) on the equity of access to health services and/or financing of health insurance schemes across at least one area of the PROGRESS-Plus framework▪ for multi-country studies, included studies must be conducted in at least one African country and provide disaggregated findings for the African countries involved▪ must be published or translated in the English language due to lack of funding, time and language resources for non-English studies
Exclusion criteria:
<ul style="list-style-type: none">▪ assessed health services or interventions related to UHC without being explicit about health insurance implementation▪ focused on private health insurance only▪ multi-country studies but did not report data for African counties separately▪ reviews, pilot studies, editorials or commentary▪ did not assess equity in any of the PROGRESS-Plus framework▪ reported equity in health outcome after implementation of public health insurance

Data Extraction & Quality Appraisal

A pre-established standardised data extraction form was used to extract relevant information from the articles as showed in **Supplementary material 2**. The quantitative studies were assessed for risk of bias using the Cochrane’s Risk of Bias in Non-randomised Studies of Interventions tool²⁰ (Figure 2). The Joanna Briggs Institute’s Critical Appraisal Tool²¹ was used to conduct quality appraisal for the qualitative articles included in this study. Data extraction and quality appraisal was done in duplicates by SSA, DM and EAO. Discrepancies between the authors were resolved through discussion.

Data Analysis & Synthesis

Given the wide variation in the population, study designs, and outcome measures, we considered that a meta-analysis will not be suitable. The findings from the included studies were systematically synthesised and descriptively presented. Specifically, thematic analytical technique was applied to the findings from the included studies, hence, key emerging themes

from the findings were identified and summarised to present evidence on equity of PFHIS in Africa.

RESULTS

Study Characteristics and flow

The process of study selection is shown in Fig. 1. Overall, the literature searches yielded 916 citations. After review of abstracts and titles, 124 articles were selected for full-text screening, eighty-eight studies did not meet the inclusion criteria. The detailed characteristics of the 45 included studies are in Supplementary file 2.

Thirty-five of the 45 studies included in this review were purely quantitative studies: 34 cross-sectional studies and one randomised control trial (RCT). Six studies were qualitative: four of were mixed methods. Studies from Ghana were most numerous (n= 25). All the papers were published between 2009 – 2020.

Quality appraisal of included studies

Figure 2 shows the visual outcome of the risk of bias for the quantitative studies. Sixteen of the 35 quantitative studies had bias linked to confounding, 21 studies gave no information about how missing data were managed. Overall, 13 studies had at least serious bias issues, 20 were assessed to have moderate bias and four studies had low bias [Supplementary material 3].

The six qualitative studies were all assessed to be of good quality except one²² which failed to address the following: “statement locating researchers culturally” and the possible “influence of researcher on the studies and vice versa” [Supplementary material 4].

Place of Residence: A total of 15 (31%) of included studies assessed equity in this domain. Among these, social health insurance (SHI) schemes were reported in all except for one that reported a CBI scheme²³. Thirteen of the 15 studies were conducted in Ghana, place of residence was mostly defined as urban and rural, two studies used proximity to nearest health facility, and one compared two cities within the same country.

Twelve studies assessed equity of enrolment and coverage rate comparing urban and rural residence. All SHI studies^{22,25-28} except one²⁴ reported increasing odds of enrolment and coverage for urban residents compared with rural residents. Rural residents were more likely than urban residents to be enrolled in CBI according to a study in Rwanda. Residing in slums in Kenya was not associated with coverage or enrolment onto a public health insurance scheme.²⁹ Also, residence within one hour radius to nearest facility attenuates the negative impact of deprived socioeconomic characteristics in the two studies conducted in Ghana.^{30,31}

Two studies^{31,32} assessed utilisation of health services under this domain, they reported that place of residence was not associated with utilisation of basic chronic care in South Africa, but rural residents were less likely than urban residents to utilise basic chronic care in Ghana. Proximity to health facility was reported to encourage utilisation of health care services in

Ghana. Finally, a study reported inequity in the financing of PFHIS between two cities in Ghana; premium payment was reported to be more progressive in Kumasi than in Accra.³³ The lack of uniformity in guidelines for population targeting and difference in charging for premium payments were identified as the reasons.

Race/Ethnicity/Culture: Studies in this domain are few, two studies were identified. Significant difference in coverage of health insurance between ethnic groups was reported in Northern Ghana³⁴ while in Kenya, insignificant differences in coverage of health insurance between ethnic groups²⁹ were reported. Inequity in this domain might be country-specific, however, the number of studies is too few to make a definitive conclusion.

Occupation: Seven studies assessed equity of health insurance schemes by occupational status. Six studies assessed coverage of SHI schemes, and one other study assessed coverage and utilisation health services under voluntary health insurance scheme (VHI). Two studies conducted in Ghana reported that coverage increased significantly among informal compared with formal employees.^{35,36} Dake, 2018 added that professional women were less likely to be covered by NHIS while professional men are more likely than their counterparts in manual or informal sector.³⁶ The studies from Kenya, Nigeria, South Africa, and Sudan all reported that formal or skilled employees were more likely to be covered by SHI. On utilisation of health services under VHI in South Africa,³⁷ lower paid workers were less likely to use outpatient health services (0.5 visit per month compared with 1.0 visit by high-paid workers). Hospitalisation for low-paid workers was not covered under the VHI scheme. Even when proximity to health facilities were controlled for in a study in Ghana, self-employed workers were reported to benefit less in utilisation of health services.³¹

Gender/Sex: Seven (15%) of the included studies assessed equity in gender; six studies assessed SHI schemes in Ghana and Kenya; one assessed the CBI scheme in Rwanda. Generally, females were more likely to be covered by SHI schemes in Ghana and Kenya, but females in formal sectors are less likely to be covered when compared with their male counterparts^{29,36,38}. At household level, two studies from Ghana reported contradictory findings. In contrast to the earlier study by Jehu-Appiah et al²⁴, a more recent study reported that coverage of SHI schemes is more concentrated in male-headed households.³⁹ This was supported by another study conducted on CBI schemes in Rwanda.²³ Finally, gender was not found to be associated with regression of premium payment.³³

Religion: Six (13%) studies assessed equity of SHI schemes by religion. These were all conducted in Ghana. They all reported that Christians are more likely to be enrolled in SHI schemes than other religions, although two studies^{25,30} found that Muslims are also more likely to be covered than traditionalists. More specific findings showed that Christians are more likely to have enrolled irrespective of their level of income,²⁴ while Muslims in informal sector are more likely to be covered by SHI scheme than other religions within the informal sector²⁵. On utilisation, traditionalist was the only group that were significantly less likely to utilise needed health services when compared to Christians and Muslims.⁴⁰

Education: Nine (19.5%) studies assessed equity of insurance schemes in this domain. All of the studies that focused on SHI schemes reported that those with higher educational attainment were significantly more likely to be covered except for the CBI scheme study from Rwanda²³. The latter study reported that those with vocational education were more likely to be covered than those with university education. Two studies on utilisation^{31,40} reported that those with

more education in Ghana is more likely to utilise health service under the SHI scheme. Even though larger reduction in catastrophic health spending was reported among those with higher educational attainment:³¹ premium payment toward insurance was more regressive among those with higher education.³³

Socioeconomic Status (SES): Most studies reported this domain (90%), broadly, SES was reported at household wealth, and few used income levels. Of the 42 studies, 23 (54%) assessed equity in enrolment and coverage of public health insurance schemes. The findings from these studies were largely consistent as they reported that individuals and households in the wealthiest quartiles were more covered than those in the lowest quartile. Most of the studies also suggested improved equity between those in upper and middle class. Few studies used the concentration index to analytically evaluate equity in coverage and reported pro-rich distribution of health insurance coverage.^{39,41,42} Only one CBI study in Rwanda was pro-poor coverage of insurance reported⁴³ while studies from Nigeria and a more recent one from Rwanda reported insignificant inequity in insurance coverage between poor and non-poor.^{44,45} Three qualitative studies found that respondents in both focus group discussion (FGD) and key informant interview reported that there was no discrimination in schemes as people can join irrespective of their SES.^{46,47}

Eleven studies reported on equity in utilisation of health services under PFHIS. The findings reported by these studies were mostly consistent as those in higher SES groups were more likely to use both in-patient and outpatient services^{32,43} and have more access to essential drugs.⁴⁸ One Ghanaian study reported that the poorer groups were less likely to seek health care during their more recent episode of ill-health despite being estimated to have more need for health services.⁴⁰ Some of these studies used concentration index and benefit analysis to provide stronger evidence of equity of utilisation.^{43,49-53} Two studies reported different findings; an insignificant difference in CBI scheme in Rwanda⁴⁵ and a study conducted in Tunisian found pro-poor distribution of benefits in both national and community-based health insurance schemes⁵¹.

Eleven studies reported on equitable financing; most of the studies conducted financial incidence analysis using Kakwani Index to assess the progressivity of the funding sources used for SHI or VHI. With the exception of one study,³⁵ VAT used in Ghana and Tanzania were found to be progressive, the same with premium contributions from formal sector, which usually take form of payroll deductions. However, premium contribution by informal sector in Ghana and contribution into Community-based health insurance in Tanzania were found to be regressive in four studies.^{33,49,52,54} The only study from Rwanda⁵⁵ reported that the premium contribution toward CBI was progressive. One qualitative study from Uganda⁴⁷ also reported inequity in premium contribution for CBI schemes as both rich and poor pay the same amount for the scheme. Finally, a study from Nigeria reported that the registration cost was highest in poor groups.⁴⁴ We summarised the evidence synthesised from each domain in Table 1.

Finally, outside the PROGRESS-Plus domain, we also observed that some studies assessed the equity of different types of public health insurance schemes or packages implemented across African countries. Eight (17%) of the 45 studies included in this review assessed equity of national or CBI schemes. In terms of coverage, PFHIS in Sudan had more coverage than insurance schemes implemented and funded by States/regional governments,²² they were more likely to increase utilisation of health services and more progressive payment in Tanzania.^{51,72} However, more women were more likely to be covered by CBI than NHIS in Togo.⁷³ A

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qualitative study ⁴⁷ assessed equity in different types of CBI schemes implemented in Uganda; despite the fact that they were all operating within the same area, inequity existed between types of CBI schemes and access to NCD-related services.

DISCUSSION

Main findings

We found that about 50% of publications on equity of PFHIS in Africa were conducted to assess Ghana’s national health insurance scheme. This was expected as Ghana adopted a social health insurance system to advance the goal of UHC as early as 2003.⁵⁶ Most of all included articles (65%) reported on the equity of enrolment and coverage of insurance schemes, however, few studies provided high quality evidence. Evidence from studies on utilisation of health services and financing of health insurance schemes are mostly quantitative, using rigorous analytic techniques such as concentration index and benefit analysis while some used regression and controlled for health need – an important concept in measuring utilisation ^{57,58}.

Of the included studies, equity aggregated by SES was most reported, followed by studies aggregated by place of residence, and gender. This probably reflects one of the overarching aims of UHC and implementing insurance schemes - to protect citizens from financial risks associated with health spending.^{4,59} Out-of-pocket health spending - the payment made directly by individuals or households at the time using health care ^{60,61} - is the predominant source of health care financing in most LMICs.^{62,63} Coupled with the bottlenecks and poor operational structures of health care systems, these usually have adverse consequences on access and utilisation of health services.^{64,65} Implementing health insurance schemes is one of the key strategies to address these challenges, with a common goal of “Leaving no one behind”. The findings from this systematic reviews are mixed but on average, poorer populations are less likely to be covered by insurance schemes than rich populations, they are also less likely to utilise health care services despite having more need ^{32,39–41} and they may pay more premium than the richest groups, especially those in the informal sector. ^{52,66} However, there are indications that inequity in coverage, access to health services, and financing of health insurance schemes have reduced overtime.

At the initial stage of implementing most social or health interventions, privileged groups, educated, urban residents and the rich, usually benefit first; therefore, inequity takes time to reduce.^{67,68} The Inverse Equity Hypothesis has been found to apply in many circumstances especially in low-income countries.^{69,70} Many African countries such as Nigeria, Kenya, and Ghana kick-started the implementation of their health insurance schemes with formal sector or government employees.¹ Such “incremental approach” in UHC implementation strategy has its roots in the Germany’s Bismarck health system model and has been criticised for its anti-poor approach because only a small fraction of population is in formal employment in most LMICs.⁷¹ CBI schemes in Rwanda and Tanzania seem to be exempted^{51,55} even though their sustainability has been questioned.

Policy Implications

The findings from this review showed that those from higher SES, urban residence, more educated and those in formal employment were more likely to be covered or enrolled in insurance schemes. Most countries require citizens to enroll in health insurance schemes by paying for registration. This alone exposes families to catastrophic health spending through high out-of-pocket payment to access health services, constitute barriers to disadvantaged groups, thus widening the inequity gap.^{26,74,75,76} Also, a large percentage of the population in African countries are employed in the informal sector and reside in rural settings.^{71,77} This has posed serious challenges to implementing effective health insurance schemes that will cover the whole population. Different strategies such as implementation of CBI schemes for the poor, premium payment for the informal sector and use of techniques to identify poor and exempting them from enrolment or registration fees, are key to implementing effective health insurance schemes with wide coverage.

It is noteworthy to mention that gender was not associated with regressive premium payment. This might be linked to user-fee exemption interventions and internationally funded-programmes implemented across African countries to battle reproductive, and maternal problems affecting women in the region. Also, there is a need to also focus on broader socioeconomic, systemic, and corruption-related issues that are reported as banes to the development and effectiveness of health care systems in LMICs.⁷⁸

Strengths, Limitations and Conclusion

This is probably the first systematic review study that explored the equity of PFHIS implemented across Africa. One of the strengths of this study is the use of the PROGRESS-Plus framework to conceptualise equity beyond SES. This study involves an extensive search of seven databases and stringent systematic methods. However, this study is not without limitations. Only studies published in English were included, there are some parts of Africa that use French and Portuguese as official languages; this might affect generalisability of the findings in this study. On the average, our conclusions were drawn from studies with moderate bias, and we could not provide country-specific conclusions. Nevertheless, with the dearth or absence of systematic review studies in this area, our findings provide a first indication on the equitability of health insurance schemes implemented across Africa, as it related to achievement of UHC goals. Generally, access to health services by disadvantaged groups improves when health insurance schemes offer greater opportunities for their enrolment and coverage. However, inequities are more visible in utilisation of health services and financing of health insurance schemes.

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Conflict of Interest: No conflict of interest

Ethical Approval: The data used for study is available in public domains, ethical approval is not required.

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For Peer Review

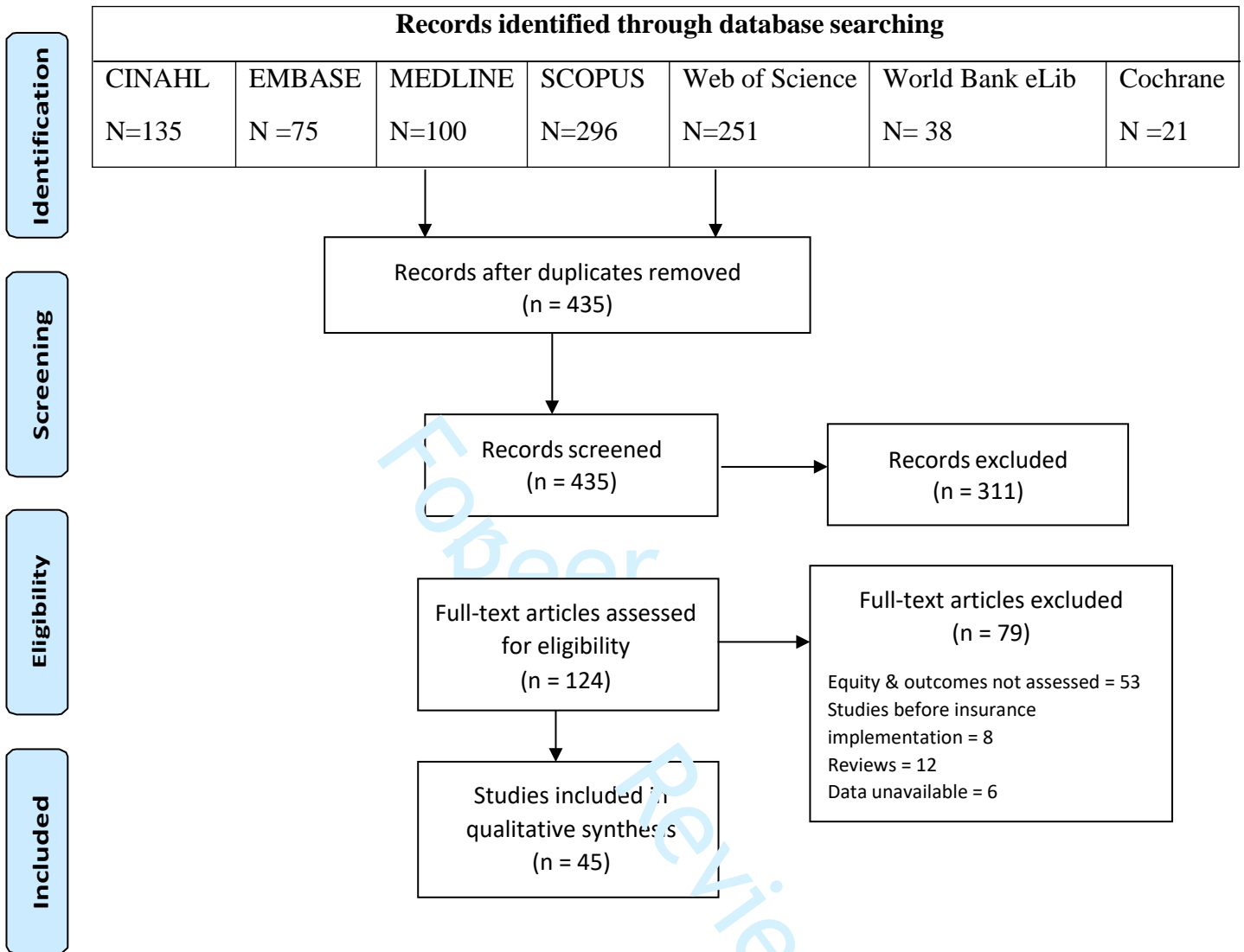


Fig 1: Adapted Prisma flow chart










Study	Risk of bias domains							Overall
	D1	D2	D3	D4	D5	D6	D7	
Witter and Garshong, 2009								
Akazili, et al 2014								
Akazili et al, 2012								
Alshamsan et al, 2017								
Amporfu, 2013								
Aryeetey et al, 2012								
Ataguba, 2016								
Ataguba, 2018								
Chomi, et al, 2014								
Dake, 2018								
Dzakpasu et al, 2012								
Goeppel et al, 2015								
Goudge et al, 2018								
Kazungu and Barasa, 2017								
Kotoh and Van der Geest, 2015								
Mati1 et al, 2017								
Mills et al, 2012								
Nyandekwe et al, 2014								
Parmar et al, 2013								
Akazili1et al 2011								
Johnson et al, 2016								
Finnoff, 2016								
Jehu-Appiah et al, 2011								
Kusi et al, 2016								
Kuure et al 2015								
Kwarteng et al, 2020								
Liu et al, 2019								
Mtei et al, 2012								
Onwujekwe et al, 2009								
Vaughan et al, 2016								
Agasha et al 2019								
Navarrete et al, 2019								
Kimani et al,								
Williams et al								
Sarpong et al								
Duku, 2018								
Eric Nsiah-Boateng et al, 2019								




Domains:
D1: Bias due to confounding.
D2: Bias due to selection of participants.
D3: Bias in classification of interventions.
D4: Bias due to deviations from intended interventions.
D5: Bias due to missing data.
D6: Bias in measurement of outcomes.
D7: Bias in selection of the reported result.

Judgement
 Critical
 Serious
 Moderate
 Low
 No information

Figure 2: Risk of Bias of included study assessed using the Cochrane’s ROBINS-I Tools

Table 1: Summary of inequity in coverage, utilisation, and financial protection

PROGRESS-Plus Domain	UHC Domains	SHI			CBI			VHI			Total	Overall remark/Conclusion
												
Place of residence	Enrollment	11	1	-	1						13	Urban residence has positive effect on both enrolment and utilisation except in CBI schemes. Inadequate evidence for financial protection
	Utilisation	1		1							2	
	Financial Protection	1									1	
Ethnicity/Race/Culture and language	Enrollment	1		1							2	Limited evidence
	Utilisation										0	
	Financial Protection										0	
Occupation	Enrollment	2	4								6	Formal and skilled employees more likely to be enrolled, with mixed result in Ghana. NO evidence for utilisation and financial protection
	Utilisation								1		2	
	Financial Protection										0	
Gender/Sex	Enrollment					1					1	Limited evidence
	Utilisation										0	
	Financial Protection						1				1	
Religion	Enrollment	6									6	Christian and Muslims are likely to be enrolled, limited evidence for utilisation.
	Utilisation	1									1	
	Financial Protection										0	
Education	Enrollment		6		1						7	Higher educational attainment has positive effect on enrolment but limited evidence on utilisation and financial protection
	Utilisation		2								2	
	Financial Protection	1									1	
Socioeconomic Status	Enrollment	3	18	2							23	Individuals or belonging to households in poorest quartile has negative effect on enrolment and utilisation and while it has more positive effect on financial protection.
	Utilisation		9		1		1				11	
	Financial Protection	6	3		1	1					11	

 Positive association;
  Negative association;
  not statistically significant

Supplementary I: Example of search strategy adopted in Sopus

		SCOPUS	
ID	NAME	Query	Citation
#5	Combined	(TITLE-ABS-KEY (equit* OR inequit* OR equali* OR inequali*)) AND ((TITLE-ABS-KEY ("universal health coverage" OR "universal health insurance" OR "universal healthcare" OR " national health insurance" OR "social health insurance" OR "community health insurance" OR "community-based health insurance")) AND (rwanda OR benin OR guinea-bissau OR senegal OR "Burkina Faso" OR "Sierra Leone" OR burundi OR somalia OR "Central African Republic" OR liberia OR "South Sudan" OR chad OR madagascar OR tanzania OR malawi OR togo OR "Congo Democratic Republic" OR "Democratic Republic of the Congo" OR mali OR uganda OR eritrea OR mozambique OR zimbabwe OR ethiopia OR gambia OR niger OR sudan OR swaziland OR "Cabo Verde" OR "Cape Verde" OR lesotho OR cameroon OR "Congo Republic" OR "Ivory Coast" OR "Cote d'Ivoire" OR tunisia OR djibouti OR morocco OR egypt OR ghana OR nigeria OR papua "New Guinea" OR zambia OR kenya OR "Sao Tome and Principe" OR algeria OR namibia OR gabon OR angola OR botswana OR "South Africa" OR libya OR "Equatorial Guinea"))	296
#4	UHC/African countries	(TITLE-ABS-KEY ("universal health coverage" OR "universal health insurance" OR "universal healthcare" OR " national health insurance" OR "social health insurance" OR "community health insurance" OR "community-based health insurance")) AND (rwanda OR benin OR guinea-bissau OR senegal OR "Burkina Faso" OR "Sierra Leone" OR burundi OR somalia OR "Central African Republic" OR liberia OR "South Sudan" OR chad OR madagascar OR tanzania OR malawi OR togo OR "Congo Democratic Republic" OR "Democratic Republic of the Congo" OR mali OR uganda OR eritrea OR mozambique OR zimbabwe OR ethiopia OR gambia OR niger OR sudan OR swaziland OR "Cabo Verde" OR "Cape Verde" OR lesotho OR cameroon OR "Congo Republic" OR "Ivory Coast" OR "Cote d'Ivoire" OR tunisia OR djibouti OR morocco OR egypt OR ghana OR nigeria OR papua "New Guinea" OR zambia OR kenya OR "Sao Tome and Principe" OR algeria OR namibia OR gabon OR angola OR botswana OR "South Africa" OR libya OR "Equatorial Guinea")	1,056
#4	Equity/UHC	(TITLE-ABS-KEY (equit* OR inequit* OR equali* OR inequali*)) AND (TITLE-ABS-KEY ("universal health coverage" OR "universal health insurance" OR "universal healthcare" OR " national health insurance" OR "social health insurance" OR "community health insurance" OR "community-based health insurance"))	1,485
#3	African countries	rwanda OR benin OR guinea-bissau OR senegal OR "Burkina Faso" OR "Sierra Leone" OR burundi OR somalia OR "Central African Republic" OR liberia OR "South Sudan" OR chad OR madagascar OR tanzania OR malawi OR togo OR "Congo Democratic Republic" OR "Democratic Republic of the Congo" OR mali OR uganda OR eritrea OR mozambique OR zimbabwe OR ethiopia OR gambia OR niger OR sudan OR swaziland OR "Cabo Verde" OR "Cape Verde" OR lesotho OR cameroon OR "Congo Republic" OR "Ivory Coast" OR "Cote d'Ivoire" OR tunisia OR djibouti OR morocco OR egypt OR ghana OR nigeria OR papua "New Guinea" OR zambia OR kenya OR "Sao Tome and Principe" OR algeria OR namibia OR gabon OR angola OR botswana OR "South Africa" OR libya OR "Equatorial Guinea"	517,968
#2	UHC	TITLE-ABS-KEY ("universal health coverage" OR "universal health insurance" OR "universal healthcare" OR " national health insurance" OR "social health insurance" OR "community health insurance" OR "community-based health insurance")	20,538
#1	Equity/inequity	TITLE-ABS-KEY (equit* OR inequit* OR equali* OR inequali*)	471,150

Supplementary file 1.
SCOPUS – searched 20/2/2020 Search by using following instruction
Use an asterisk (*) for **truncation**.
Put quote marks (" ") around **phrases**.
[TIAB] = title and abstract **SCOPUS**

Part A: Overall risk of bias ratings by study and corresponding reasons
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S/N	Author, Year	Overall ROBINS -I Tool	Comments/Reasons
1.	Witter and Garshong, 2009	Overall – Critical	No control for co-founding variables, no information on two domains, there is high risk of selective reporting
2.	Akazili, et al 2014	Overall – Moderate	Host of co-founders were adjusted for.
3.	Akazili et al, 2012	Overall – Moderate	No information on how missing data were handled
4.	Alshamsan et al, 2017	Overall – Serious	Descriptive and unadjusted estimates used, some possible cofounders missed: education and residence
5.	Amporfu, 2013	Overall – Moderate	Controlled for ability to pay; possible selection bias as participants were only from urban cities
6.	Aryeetey et al, 2012	Overall – Moderate	Missing cofounders, imbalance deviation across groups, No information on treatment of missing data.
7.	Ataguba, 2016	Overall – Moderate	No information on how missing data were dealt with, high potential for other cofounders such as education and occupation.
8.	Ataguba, 2018	Overall – Moderate	No information on how missing data were dealt with, high potential for other cofounders such as education and occupation.
9.	Chomi et al, 2014	Overall – Serious	Vast no of cofounders were adjusted for, selection strategy was appropriate and missing data was treated appropriately.
10.	Dake, 2018	Overall – Serious	
11.	Dzakpasu et al, 2012	Overall - Serious	Many cofounders were not included in the analysis.
12.	Goeppel et al, 2015	Overall – Serious	- Access to chronic care, which is none of the outcomes was self-reported, also comorbidity as a cofounder.
13.	Goudge et al, 2018	Overall – Serious	Health status, which is one of the key variables associated with the outcome measured was measured subjectively- self reported. No information on dealing with missing data
14.	Kazungu et al. 2017	Overall – Moderate	Vast number of cofounders were adjusted for and very high response rate,
15.	Kotoh, and Van der Geest, 2015	Overall – Serious	Missing cofounders, no information on missing data and qualitative responses not quoted
16.	Mati et al, 2017	Overall – Moderate	Various Confounding domains were adjusted for, but Missing data were excluded
17.	Mills et al, 2012	Overall - Serious	Important cofounders missing, no information on how missing data were treated and there is high potential for bias in measured outcomes as data were triangulated.
18.	Nyandekwe et al, 2014	Overall - Serious	Adequate information were not provided indifferent domains, analysis were mainly descriptive, therefore high potential for confounding bias
19.	Parmar et al, 2013	Overall - Moderate	Health status was not included in the multivariable analysis, therefore, bias for missing confounder and measurement of outcome (healthcare utilisation)
20.	Akazili et al 2011	Overall – Moderate	No information on how missing data were treated or handled
21.	Johnson et al, 2016	Overall – Low	Vast number of cofounders were included in analysis
22.	Finnoff, 2016	Overall – Moderate	No information on how missing data were treated or handled

Supplementary material 4: Overall risk of bias ratings for quantitative studies and corresponding reason

23.	Jehu-Appiah et al, 2011	Overall - Moderate	No information on how missing data were treated or handled
24.	Kusi et al, 2016	Overall - Serious	Only data from women were used and presented in analysis when respondents in the data used were head f household, this can give rise to bias in selection and reporting
25.	Kuure et al 2015	Overall – Moderate	No information on how missing data were treated and outcome variable was measured subjectively, self-reported.
26.	Kwarteng et al, 2020	Overall- Moderate	No information on how missing data were treated
27.	Liu et al, 2019	Overall - Moderate	No information on how missing data were treated, however, adequate steps were taken to measure the outcome variable more accurately
28.	Mtei et al, 2012	Overall -	No information on how missing data were treated, however, self-report was used to assess health needs and there are potentials for misclassification of intervention as other techniques were used to estimate insurance membership because the main dataset was collected a year before widespread of insurance scheme.
29.	Onwujekwe et al, 2009	Overall - Moderate	Important confounders such as education, religion were missing. There was no information on selection of respondent used in the study.
30.	Vaughan et al, 2016	Overall - Moderate	Missing data were excluded from the study but the percentage is small, less than 5%, confounding effect were not fully implemented in some aspect of the analysis.
31.	Agasha et al, 2019	(Overall – Serious	Many confounders not included in the multivariable analysis
32.	Navarrete et al, 2019	Overall - Low	Robust confounders included in analysis
33.	Kimani et al	Overall _ Moderate	No information of treatment of missing data during data collection and analysis.
34.	Sarpong et al.	Overall - Serious	Key confounder domains missing in analysis,
35.	Eric Nsiah-Boateng et al, 2019	Overall – Moderate	No information on how missing data was treated

PART B: Supplementary File 3: Quality appraisal for Qualitative studies using the Joanna Briggs Institute's Critical Appraisal Tool

Abbreviations;

Y – Yes

N – No

CT – Not clear

Authors	Is there congruity between the stated philosophical perspective and the research methodology?	Is there congruity between the research methodology and the research question or objectives?	Is there congruity between the research methodology and the methods used to collect data?	Is there congruity between the research methodology and the representation and analysis of data?	Is there congruity between the research methodology and the interpretation of results?	Is there a statement locating the researcher culturally or theoretically?	Is the influence of the researcher on the research, and vice-versa, addressed?	Are participants, and their voices, adequately represented?	Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?
Ashigbie et al, 2016	CT	Y	Y	Y	Y	CT	N	Y	Y	Y
Kotoh, and Van der Geest, 2015	Y	Y	Y	Y	Y	CT	N	Y	Y	Y
Salim et al, 2018	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
Mbogo and McGill, 2016	Y	Y	Y	Y	Y	CT	N	Y	Y	Y
Kyomugisha et al, 2009	Y	Y	CT	Y	Y	N	N	Y	Y	Y
Onwujekwe et al, 2019	Y	Y	Y	Y	Y	N	N	Y	Y	Y

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Supplementary File 2. Included Studies
The table is organised based on the study design used: Quantitative, Qualitative and Mixed method design
Abbreviations: SHI: Social Health Insurance; CBI: Community-based Health Insurance

S/N	Author(s), Publication Year	Country	Study Objective	Study Design	Data Source Sample Year of data collection	Type of insurance assessed UHC Outcome accessed	PROGRESS PLUS DOMAIN(S)	Major Findings
QUANTATIVE STUDIES								
1.	James Akazili, et al 2014	Ghana	To explores the extent to which the proposed pro-poor health insurance scheme is actually covering the poor and vulnerable in Ghana’s most impoverished region	Quantitative and Cross-sectional design	Ghana Essential Health Intervention Project (GEHIP) 5511 Women 2014	SHI Coverage of enrolment	Place of residence, socio-economic status, education	Those from richest household (4th and 5th quintiles) are more likely to be enrolled (OR:1.35 CI:1.11–1.63, OR:2.38, CI:1.96– 2.88) than those in lowest quintile. However, no differential difference in 2nd and 3rd quintile. In addition, those with informal employment (OR = 1.66), Muslims (OR:1.23), having more than primary education (OR:1.85) and those living in urban are more likely to be enrolled and benefit from national insurance scheme.
2.	James Akaziliet al, 2012	Ghana	To conduct a comprehensive assessment of the financing and benefit incidence of health services in Ghana.	Quantitative and Cross-sectional design & Official data	5th Ghana Living Standards Survey—GLSS 5: 36,488 Strategies for health Insurance for Equity in Less Developed Countries (SHIELD): 14,050 2005-2008	SHI Utilisation, Benefit and Financial Incidence	Socio-economic status	Personal income, Corporate (KI 0.075), VAT as national health insurance levy (KI 0.026) and import duty (KI 0.105) taxes were found to be progressive while the fuel levy tax was regressive. The financial incidence of NHI contribution was progressive in former sector while it was regressive (KI -0.408) in the informer sector. The distribution of total benefits from using health care in Ghana is pro- rich. The richest quintile gained almost double (24%) the benefits gained by the poorest (13%).

3.	Riyadh Alshamsan et al, 2017	Ghana, & South Africa	To assess and compare health system performance across six middle-income countries that are strengthening their health systems in pursuit of universal health coverage.	Quantitative and Cross-sectional design	World Health Organization Study on global AGEing and adult health: Adult 50yrs and above compared with adult 18-49yrs 2007-2010	SHI Cost and Access	Socio-economic status	In Ghana and South Africa, disparities in cost domain and access to healthcare were reported between affluent and poor groups
4.	Eugenia Amporfu, 2013	Ghana	To examine the vertical and horizontal equity of the premium collection of the National Health Insurance Scheme	Quantitative and Cross-sectional design & Official data	Primary data collection 1529/Men and women 2013	SHI Progressivity of premium payment	Socio-economic status, place of residence, education	Larger percentage of enrolment are from the Informal sector. Premium contribution was found regressive (KI -0.32), it was also more regressive in Kumasi than in Accra, among educated than uneducated but gender did not affect regressively
5.	Genevieve Cecilia Aryeetey et al, 2012	Ghana	To analyse the costs and evaluate the equity, efficiency and feasibility of four strategies to identify poor households for premium exemptions in Ghana's National Health Insurance Scheme (NHIS)	Quantitative and Cross-sectional design.	Primary data collection 439 households 2009	SHI/VHI Equity in coverage	Type of UHC interventions, Socio-economic status and place of residence	Overall, Mean Testing (MT) and geographical testing (GT) were found most equitable as they included more poor people in premium exemption. In semi-urban setting, only MT, and participatory wealth power (PWR) were equitable. However PWR is a limited strategy when fee exemption is the focus.
6.	John E. Ataguba, 2016	South Africa	To assess the progressivity over time can and show an indication of progress towards a 'more' progressive or a 'less' regressive health financing system	Quantitative and Cross-sectional design	Income and Expenditure Survey 24,000 & 31,400 2005 & 2010	SHI Direct tax, indirect tax, private health insurance OOP payment SHI/VHI	Socio-economic status	Health financing mechanisms that were progressive in 2005/06 became less progressive in 2010/11 while the regressive ones became more regressive between the two time periods
7.	John E. Ataguba, 2018	South Africa	To assess the progressivity of each health financing mechanism and overall financing system in SA	Quantitative and Cross-sectional design	Income and Expenditure Survey (IES) 27,665 2010-2011	Progressivity in Direct tax, VAT, Fuel levy,	Socio-economic status	Total taxes and indirect taxes regressive, however, OOP payment was only significant at $p < 0.1$. Direct tax and, medical contribution scheme, private health insurance was progressive pattern

8.	Veloshnee Govender et al 2013	South Africa	To analyse the coverage of the South African government health insurance scheme	Quantitative and Cross-sectional design	Primary data collection 1,329 currently employed civil servants 2008-2009	SHI/VHI Coverage	Gender, socioeconomic status and place of residence	Multivariate analysis showed that employees who were female, no longer married or cohabiting (i.e. divorced, separated, widowed), or in the lowest salary category were more likely to have enrolled in the government scheme. Similarly, those living in the relatively rural provinces (KwaZulu-Natal and North West) were less likely to be insured under the government scheme than the urban provinces. Member of NHIF were more educated (63%) and wealthy (405) than those in CHF. The majority of NHIF (66%) were more likely to seek for health care the same day they fell ill as compared to CHF (57%). Generally, health insurance does improve access to health care by reducing the financial barriers associated with utilisation of health services
9.	Eunice Nahyuha Chomi et al, 2014	Tanzania	To examines how the existence of multiple health insurance funds affects health care seeking behaviour and utilisation among members of the Community Health Fund (CHF), the National Health Insurance Fund (NHIF) and non-members in two districts in Tanzania	Quantitative and Cross-sectional design	Primary data collection 3290 individuals 2010-2011	CBI Coverage	Types of health insurance and socioeconomic status	
10.	Fidelia A. A. Dake, 2018	Ghana	To examine equity in coverage under Ghana's National Health Insurance Scheme (NHIS).	Quantitative and Cross-sectional design	Ghana Demographic and Health Survey (GDHS). 9389 individuals 2008	SHI/VHI Coverage	Sex, education, wealth and occupation, Place of residence	The results revealed that those with higher educational attainment, wealthier and females are more likely to be enrolled in the NHIS. In addition, male professional is more likely to be covered by NHIS while among females, professional were less likely to be covered when compared with their counterpart involved in manual jobs. The lack of coverage under the NHIS was more concentrated among the poor with men being more affected than women while coverage was more concentrated among the rich for both females and males.
11.	Susie Dzakpasu1 et al, 2012	Ghana	To assess the impact of Ghana's 2015 free delivery policy and 2008 policy on free national health insurance for pregnant women	Cluster randomised Controlled Trails (RCT)/ Pregnant women	Health and demographic surveillance system supporting the ObaapaVitA and Newhints cluster randomized controlled trials (RCTs) 11,856 women 2004-2009	SHI/VHI Coverage	Socio-economic status	Socioeconomic differentials in insurance coverage decreased significantly after the NHIS policy. 54.3% more women in the richest quintile compared to the poorest were insured. This difference decreased to 13.7% by September-November 2008, and to 11.4% by October-December 2009. The concentration index declined by 0.09 (p,0.001) in the month following the policy, compared to a decline of 0.009 per month in the months prior to the policy. The massive reduction was

found to be more associated with increases in coverage observed in poorer women.

12. Christine Goepfel et al, 2015	South Africa, Ghana	To assess universal health coverage for adults aged 50 years or older with chronic illness in China, Ghana, India, Mexico, the Russian Federation and South Africa	Quantitative and Cross-sectional design	The World Health Organization's (WHO's) Study on Global Ageing and Adult Health (SAGE) 6,631 individuals	SHI/VHI Utilisation	Socio-economic status, Sex and Place of residence	Access rates were highest for the richest household income quintile in both countries. In Ghana, there was a continuous gradient from poor to rich; concentration curves lay below the equity line, indicating that the rich had disproportionate access to chronic care. In South Africa, only small changes in the proportion with access were observed across the quintiles.
13. Jane Goudge et al, 2018	South Africa	To ask whether the new scheme has assisted in efforts to move towards UHC	Quantitative and Cross-sectional design	Primary data collection 1329 government employee 2007-2010	VHI for Government Employees Coverage of health insurance, utilisation of outpatient services	Types of insurance package, occupation	Less than one-fifth alone are covered by low-cost option of GEMS while majority were covered by the middle cost option. Membership of GEMS was most common among skilled civil servants and who had completed secondary education. The proportion of respondents reporting poor or very poor health status was relatively small (3.6%). Members of the more expensive packages reported a greater number of outpatient visits per month. A third of members of the low- and mid-cost insurance packages were taking chronic medication (29.2% - 31%), in comparison to half of the members of the most expensive package (52.5%)
14. Kazungu and Barasa, 2017	Kenya	To examine the levels, inequalities and factors associated with health insurance coverage in Kenya.	Quantitative and Cross-sectional design	Kenya Demographic and Health Survey (KDHS) 2009 and 2014 38,433 individuals 2009-2014	CBI Coverage	Socioeconomic status, gender and type of insurance	Coverage of NHIF increased by almost 8 folds while that of CBHI reduced within the study period. Health insurance coverage in men improved more (from 11.30% [95% CI 9.23–13.77] to 21.35% [95% CI 19.87–22.91]) compared to women (from 6.96% [95% CI 5.64–8.55] to 18.13% [95% CI 16.90–19.43]). It was also reported that it increased with

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socioeconomic status, urban residence and formal employment. Result from 2014 KDHS showed an overall pro-rich distribution of insurance coverage (CIX = 0.49 [95% CI 0.45–0.52]. However, CBHI was pro-rich as its concentration curve was closer to the line of equality

15. Komi Mati1 et al, 2017	Togo	To examine the effect of the newly introduced national health insurance plan on access to skilled birth attendance	Quantitative and Cross-sectional design	Togo Demographic and Health Survey 4826 women 2014	SHI/VHI	Socio-economic status and type of health insurance	Insurance coverage rates was recorded in 22 (1.1%) of the 1931 participants categorized as poor, compared with 174 (6%) of the 2722 listed as nonpoor. Poor women were less likely to be covered by the public scheme or private insurance and more likely to be covered by community insurance than nonpoor women
16. Médard Nyandekwe et al, 2014	Rwanda	To assess Rwanda UHC based mainly on Community-Based Health Insurance (CBHI) from 2000 to 2012; (ii) to inform policy makers about observed gaps for a better way forward	Quantitative and Cross-sectional design	CBHI data from 2000 to 2011/2012 fiscal years Not stated 2000-2012	CBI Coverage and utilisation	Socio-economic status	CBHI coverage increased from 7% in 2000 91% in 2012 with a light inflexion to 90.75 % in 2011/2012. Improvement of equity in the community health insurance system: 24.8% of subsidized vulnerable in 2011/2012 versus 24.1% living in extreme poverty. Premiums contribution is progressive in the new policy determined by socio economic category one belongs to from the implementation of New CBHI policy on 1st July, 2011.
17. Divya Parmar et al, 2013	Burkina Faso	To examine whether the community-based health insurance (CBHI) scheme in Burkina Faso has been effective in providing equitable healthcare access to poor individuals, women, children and those living far from health facilities	Quantitative and Panel Survey	NHD Household Survey (NHDHS) 7900 individuals 2004-2008	CBI Equity in enrolment and utilisation	Socioeconomic status	Concentration curves are below the line of equality, implying that enrolment is inequitable throughout 2004–08. However, the fact that the CC for 2007–08 (CI¼0.148, SE¼0.024) is closer to the line of equality than the CC for 2004–06 (CI¼0.413; SE¼0.019) implies that the proportion of poor enrolees increased after premium subsidies were introduced. No equity finding on utilisation except for comparing with those that do have access.
18. James Akazili1, John Gyapong and Diane McIntyre 2011	Ghana	To present the first comprehensive analysis of the distribution of health care financing in relation to ability to pay in Ghana	Quantitative and Cross-sectional design	Ghana Living Standard Survey (GLSS) 2005/2006 2005-2008	SHI	Socioeconomic status	Generally, direct tax (consisting of personal income and corporate tax) and indirect tax (consisting of VAT for national health insurance levy, fuel levy and import duty) were found to be progressive. However fuel levy was

regressive (KI -0.041) and direct direct to be most progressive.

19. Fiifi Amoako Johnson et al, 2016	Ghana	To investigate, the impact of maternity-related fee payment policies on the uptake of skilled birth care amongst the poor in Ghana	Quantitative and Cross-sectional design	Ghana Demographic and Health Survey (GDHS) 12,288 births	SHI/VHI Utilisation of skilled birth care	Socioeconomic status	When maternity care was integrated into the NHIS, the uptake of skilled birth care increased to 58%. However, if we compare uptake for the poorest women, the increase was not statistically significant, whilst the non-poor experienced significant increase over time (P<0.001. The CII revealed that though there was reduced inequity by wealth status during the NHIS, the rich-poor gap remained considerable high (CII 40.104, P<0.001).
20. Kade Finnoff, 2016	Rwanda	To examines the uptake of a Rwandan CBI scheme five years after the program was scaled up nationwide	Quantitative and Cross-sectional design	National Institute of Statistics Rwanda [NISR] 2006) Survey 34,785 Individuals 1990-2008	CBI Enrolment	Gender, socioeconomic status, place of residence, education	Members of female-headed households are much less likely (about two thirds less likely) to have MHI, the likelihood of MHI membership rises over wealth quintiles. Individuals living in rural areas were more than twice as likely to have MHI than their urban counterparts. The highest MHI rates were found with individuals with vocational education (post-primary); they were 1.56 times as likely as those with no education to have MHI. The lowest MHI rates were among university-educated individuals
21. Jehu-Appiah et al, 2011	Ghana	to evaluate equity in enrolment in the National Health Insurance Scheme (NHIS) in Ghana and assess determinants of demand across socio-economic groups.	Quantitative and Cross-sectional design	Primary data collection 3301 households in central and eastern region of Ghana 2009	SHI/VHI Enrolment	Gender, socioeconomic status, place of residence, education and religion	Across all socio-economic quintiles, higher education, religion, a female-headed household, and increase the odds of enrolling and remaining in the scheme and are significant at the 1% confidence level. However, urban residence decreases the odds of enrolment

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22. Kusi et al, 2016	Ghana	To explore whether dimensions of social exclusion explain why some groups of women are not benefitting from the scheme	Quantitative and Cross-sectional design	Primary data collection 4,050 households in 5 Districts in Ghana 2012	SHI Enrolment	Place of residence and socioeconomic status	The district of residence and whether a woman resides in urban location have positive effect on enrolment in the NHIS; compared with the Ejisu-Juabeng district in the Ashanti region, being in the Abura-Asebu-Kwamankese district in the Central region and the Savelugu-Nanton district in the Northern region reduces the odds of a woman's enrolment in the NHIS The probability of enrolling in the NHIS increases with an increase in household's wealth status. Women in the third wealth quintile are 1.9 times more likely to enrol in the NHIS compared to women in the first wealth quintile.
23. Kuuire et al 2015	Ghana	To examine the factors that influence health-care services utilization in a resource poor setting	Quantitative and Cross-sectional design	Primary data collection 1137 individual enrolled in NHIS 2011	SHI Utilisation	Socio-economic status, education, religion and place of residence	Individuals who are enrolled in the NHIS and belonged to the poor and poorest wealth quintiles were less likely to seek treatment in health facility during their last illness relative to their richest counterparts who are also enrolled in the NHIS (b ¼ 0.39, r , 0.01 and b ¼ 0.38, r , 0.001). Individuals who reported they had secondary education were less likely to seek treatment in a health facility during their last illness compared with their counterparts with tertiary education (b ¼ 0.62, r , 0.01). Compared with Christians, traditionalists had lower odds of seeking treatment in a health facility during their last illness (b ¼ 0.41, r , 0.01). Finally, Individuals who lived .5 km to ahealth facility were less likely to seek treatment in a health facility during their last illness compared with those who lived ,5 km from a health facility (b ¼ 0.72, r , 0.01)

24.	Kwarteng et al, 2020	Ghana	To assess the level of enrolment and factors associated with NHIS membership in two predominantly rural districts of northern Ghana after eight years of implementation, with focus on the poor and vulnerable populations.	Quantitative and Cross-sectional design	Primary data collection	SHI	Socio-economic status, place of residence, education and religion	The richest households had 5.8-fold, tertiary graduates had 4.6-fold, Urban residents had fourfold, females were likewise associated with 1.3-fold, and Muslims had 3.4-fold increased odds of being registered compared to traditional worshippers
					39,262 individuals from 9576 households.	Enrolment		
					2012			
25.	Liu et al, 2019	Rwanda	To investigate the inequality in medical care utilization and household catastrophic health spending (HCHS) between the poverty and non-poverty residents in rural Rwanda and their links with community-based health insurance (Mutuelles).	Quantitative and Cross-sectional design	Repeated cross-sectional EICV surveys by National Institute of Statistics of Rwanda	CBI	Socio-economic status	There was no significant increase in enrolment in Mutuelles between the poor and non-poor. Between 2005 and 2010, there was not significant difference in absolute and relative inequality (by poverty status) between mutuelles enrollee and those uninsured
			To explore the distribution of health care benefits and financing burden across socio-economic groups	Quantitative and Cross-sectional design	Tanzania Household Budget Survey (HBS) 2000/2001	Enrolment and utilisation		
26.	Mtei et al, 2012	Tanzania			14936 individuals	SHI & CBI	Socio-economic status	The NHIF was the most progressive source of financing health care as indicated by the Kakwani index (0.42) and the concentration curve which dominated the income Lorenz curve. However, contributions to the CHF were highly regressive, reducing the progressivity of insurance contributions overall. Nevertheless, the concentration index of the CHF was insignificant
					2005-2010	Utilisation, Benefit and Financial Incidence		
					12 201 individuals			
					2000-2001			
								For public providers, the concentration index was positive and the 45 degree line dominated the concentration curve, indicating a pro-rich distribution while the concentration index for faith-based providers was negative and the curve dominated the 45 degree line, indicating a pro-poor benefit. However, both were not significant. Overall, benefits from public and faith-based providers were almost evenly distributed unlike private for-profit providers that were highly pro-rich, with the poorest 20% accruing less than 5% of total benefit

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27.	Onwujekwe et al, 2009	Nigeria	To determine how equitable enrolment and utilization of community-based health insurance is in two communities with varying levels of success in implementing the scheme.	Quantitative and Cross-sectional design	Primary data collection 1071 individuals from 10 LGA in Anambra State Not Stated	CBI Enrolment and utilisation	Socio-economic status	Mean cost of registration was highest amongst the poorest in Igboekwu (N130.2, S.D. = 128.3) and highest amongst the poor group in Neni, however no significant differences among respondents from various socio-economic status groups in registration with CBHI and in facility utilization
28.	Vaughan et al, 2016	Nigeria	To conduct a benefit incidence analysis (BIA) of a Shell-sponsored community health insurance scheme in Nigeria to determine the extent to which the target group (the poor) was benefitting.	Quantitative and Cross-sectional design	Primary data collection 616 patients' hospital attendance 2012-2013	CBI Utilisation & BIA	Socio-economic status	The percentages of total utilization per quintile of socioeconomic status showed that poorer groups utilized less than their population shares of health services. According to the concentration indices and their dominance tests, both inpatient and outpatient care have weak regressive distributions ($p>0.05$). The poorest quintile (Q1) had the least benefit (both for outpatient and inpatient visits) (12%), while the richest quintile (Q5) received the greatest share of benefits (23%) when compared to its population share
29.	Lucia Fiestas Navarrete et al, 2019	Ghana	We test the impact of being insured on utilization and financial risk protection compared with no enrolment	Quantitative Cross-sectional	Ghana Living Standards Survey 72,372 2012-2013	SHI Utilisation and Financial Protection	Socioeconomic status, Occupation, Education, place of residence	The effect of health insurance on improved utilization is significantly larger among the poorest 40% of the population (18 p.p. increase), compared with that of the richest 40% (8 p.p. increase; $P=0.003$). When we disaggregate socioeconomic groups based on proximity to care, we find that vulnerable groups (i.e. individuals living in poorer, lower educated and self-employed households) benefit consistently less from health insurance when living outside a 1-h radius from the nearest hospital. The effect of health insurance on improved financial risk protection is larger among the poorest households (10 p.p. decrease in catastrophic expenditure), compared with that of the richest (6 p.p. decrease; $P<0.10$). We observe larger reductions of catastrophic health expenditure among households headed by members with higher compared with that of the lower education (14 p.p. vs 3 p.p.; $P<0.000$) and among households headed by employed,

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compared with that of the self-employed members (16 p.p. vs 6 p.p.; P¼0.04). When we disaggregate socioeconomic groups based on proximity to care, we consistently find that vulnerable groups who live farther than 1 h away from the nearest hospital benefit significantly less from the financial protection afforded by health insurance.

30.	Kimani et al 2012	Kenya	This paper examines the determinants associated with participation in the NHIF among residents of urban slums in Nairobi city	Quantitative Cross-sectional	Nairobi Urban Health and Demographic Surveillance System 16,400 individuals above age of 12yrs 2006-2007	SHI: National Hospital Insurance Fund (NHIF) Coverage/Enrolment	Occupation, Socioeconomic status, Gender, place of residence, education and ethnicity	Being employed in the formal sector was significantly associated with a higher probability of having public health insurance (unadjusted odds ratio (UOR) = 29.47; p < 0.001 and adjusted odds ratio (AOR) = 4.11; p < 0.001, respectively) relative to working in the informal sector Also, respondents in the poor category were significantly less likely to be members of the NHIF compared to those in the non-poor category In the unadjusted regression analysis, women were less likely to have been enrolled, however, in the adjusted analysis they were more likely to have participated in the program (AOR = 2.37; p < 0.001) Finally, after controlling for other confounding factors, age, education, slum of residence, and ethnicity were not significantly associated with participation in the health insurance program
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31.	Williams et al, 2017	Ghana	To investigate whether social exclusion, as measured through a sociocultural, political and economic lens, can explain poor enrolment rates of children.	Quantitative Cross-sectional	Ghana Demographic Health Survey 4050 Household 2012	SHI Coverage/Enrolment	Place of residence, Gender, Socioeconomic Status	Results across all models indicate that geographic residence, child health status and household head gender and insurance status significantly and consistently influence child enrolment. At both individual and household levels, children with mothers residing in urban, with male household head, educated, wealthier are more likely to be enrolled (at least 1.5times each).
32.	Sarpong et al, 2010	Ghana	To explore the association between socio-economic status (SES) and health insurance subscription to the Ghanaian National Health Insurance Scheme (NHIS)	Quantitative Cross-sectional	Primary data collection 7225 households 2008	SHI Coverage	socioeconomic status, Place of residence	The odds for subscription to the NHIS increased with SES after adjustment for the time required to travel to the nearest health facility. The odds for subscription to the NHIS decreased with increasing time required to get to the nearest health facility after adjusting for the SES.
33.	Jenna Dixon et al, 2011	Ghana	To present findings on the determinants of enrolment for Ghana's National Health Insurance Scheme (NHIS)	Quantitative Cross-sectional	Ghana Demographic Health Survey 4916 eligible women aged 15 -49 and 4568 eligible men aged 15 - 59 2008	SHI Coverage	Socioeconomic status, Place of residence,	Enrolment in the NHIS is generally not meeting the needs of the poor. Both male and females in richer wealth quintile are more likely to be covered by NHIS. Also, respondents with higher education and those residing in rural areas are more likely to enrol in the NHIS compared with the less educated and urban residents, respectively. We also take cognizance of the fact that residents of Northern Ghana, who are largely rural, are more likely to enrol compared with residents of Southern Ghana, which is largely urban. Finally, we find that Christians and Muslims in Ghana are more likely to have enrolled than those that identify as traditionalists or not having a religion

34.	Stephen Kwasi Opoku Duku, 2018	Ghana	To investigate the differences in the determinants of enrolment between the Greater Accra (GAR) and Western (WR) regions of Ghana to inform the NHIS reforms	Quantitative Cross-sectional	Client-oriented Health Insurance System in Ghana (COHEiSION) Project	SHI Coverage /Enrolment	Place of residence, Gender, Socioeconomic Status	The WR have a higher (54%) health insurance coverage than the GAR (45%) in the total sample. The results show that generally, sex, educational level, and wealth status are significant determinants of NHIS enrolment in both regions.
					1920 2012			For the total sample, females are significantly more likely to enrol in the NHIS than males for both the GAR and WR. having secondary level education and above significantly increases the likelihood of NHIS enrolment by 1.49 (CI = 1.00–1.11) times in the GAR and 1.62 (CI = 1.06–2.44) times in the WR respectively as compared to individuals with no formal education. Finally, in both regions, the richest were more likely to be enrolled than the poorest.
35.	Eric Nsiah-Boateng et al, 2019	Ghana	To examine equity in enrolment in the Ghana National Health Insurance Scheme (NHIS) to inform policy decisions on progress towards realisation of universal health coverage	Quantitative Cross-sectional	Ghana Living Standards Survey (GLSS 6)	SHI direct tax, indirect tax, private health insurance OOP payment	Socioeconomic status, Gender Occupation and Education	Results of the concentration curve analyses demonstrate that enrolment for NHIS within and between household was slightly more concentrated among poor households. Also, enrolment was more concentrated among households headed by males compared with those headed by females. In the multivariable regression, occupation was not significant while those with more education were more likely to be enrolled.
					16, 774 household heads 2012-2013			
QUALITATIVE STUDIES								
36.	Paul G. Ashigbie et al, 2016	Ghana	To examines the challenges and consequences of medicines management policies and practices under the NHIS as perceived by public and private service providers	Qualitative: Key informant interview	Primary data collection	SHI Access/Utilisation	Socio-economic status	NHIS has led to increased utilization of medicines, reporting: patients who could not afford to purchase medicines now have free access to them; and, the NHIS has enabled patients to stop purchasing incomplete doses of medicines, especially antibiotics
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37.	Gilbert Abotisem Abihiro et al, 2014	Malawi	To explored how rural communities experience and define gaps in universal health coverage in Malawi	Qualitative: FGD & KII	Primary research. FGD and Key Informant Interview 12 FGD and 8 KII	SHI: Essential Health Package Coverage, utilisation and out-of-pocket payment SHI	Socioeconomic status, place of residence	FGDs shows no exclusion of population groups based on their socioeconomic status but exclusion based on place of residence was reported. Respondents also reported inability to access basic services largely due to insufficiencies or unavailable of drugs and services.
38.	Anas Mustafa Ahmed Salim et al, 2018	Sudan	To explore health insurance services in Sudan from the perspectives of the insurers	Qualitative: In-depth interview	Primary data collection 2017	Coverage	Place of residence and occupation	NHIF and HIKS reached 71.5% and 50.7% of population respectively. However, considerable disparities in insurance coverage between rural and urban areas and between formal and informal sectors were recorded
39.	Barnabas Africanus Mbogo and Deborah McGill, 2016	Botswana	To explore perspectives on employed individuals regarding financing population-based health care interventions towards Universal Health Coverage (UHC) in order to make recommendations to the Ministry of Health on health financing options to cover population-based health services	Qualitative: In-depth interview	Primary data collection 15 IDI 2015-2015	SHI Coverage	Employment status and types of health insurance package	However, participants reported mixed concerns regarding limitations of health coverage schemes. Some participants felt that, health coverage schemes are discriminatory because low-scale employees and unemployed individuals are systematically excluded. Low and Middle premium benefit enrollees categorically experiences limited services coverage, thus financial and services coverage are not guaranteed.
40.	Kyomugisha et al, 2009	Uganda	To examine issues of equity and sustainability in CHI schemes, which are prerequisites to health sector financing.	Qualitative: Focus group discussion (FGD) and Key Informant Interview (KII)	Primary data collection 27 Not Stated	CBI Enrolment & Coverage	Socioeconomic status and types of insurance scheme	In the FGD, interviews perceived fairness in terms of non- discriminatory and voluntary joining of the schemes, allowing people to join irrespective of family background. However, KII reported inequitable payment as the poor and rich pay the same Inequity was also reported among types of health insurance schemes

41.	Obinna Onwujekwe et al, 2019	Nigeria	This paper sets out findings of an in-depth assessment of different health financing mechanisms in Nigeria	Document analysis, Qualitative analysis: KII	Governmental documents and records Primary research 32 KII NP - Not provided	SHI Coverage	Occupation	Majority of the respondents were of the opinion that although NHIS is designed such that benefit package is same for all enrollees, coverage of FSSHIP is only limited to Federal government employees and their dependents, and this category of people make up less than 5% of the population of Nigeria.
MIXED-METHOD STUDIES								
42.	Sophie Witter and Bertha Garshong, 2009	Ghana	To provide a preliminary assessment of the NHIS to date.	Mixed methods: routine data and key informant	Government of Ghana Budget Statements, Ministry of Health results of a three-country study on the equity of health system financing and service use.	SHI Coverage of interview	Place of residence, socio-economic sectional household survey, and In-depth interviews	13% membership in Central Region to 70% in Upper West in 2008. The formal sector, as would be expected, has not increased much Financial Statements, NHIA reports 54 KII 2005-2009
43.	Agnes Millicent Kotoh, and Sjaak Van der Geest, 2015	Ghana	To use a multi-level perspective as conceptual and	Mixed method: Cross-sectional methodological tool to examine why the NHIS is not reaching the poor as envisaged	primary data collection	SHI Coverage; design, observation and In-depth interviews	Socio-economic status	regressive. Findings show that the poor are less covered in the sector. There were notable differences in individuals, Qual: 40 KIIs"
44.	Anne Mills et al, 2012	Ghana, South Africa & Tanzania		To report the		Mixed method: Cross-		National Household surveys, Tax Authorities (Primary & Secondary) Not stated 2011

insurance and equity in taxes	stat us, Occ upat ion	over the past three years and only comprises 3% of registrants in 2008. By contrast, informalsector registrants have grown from 3% to 16% of the population. The indigent, however, fell from just under 4% of the population to 1% in 2008. VAT, which is the main funding source of NHIS was regressive while general tax (persona and other taxes) were mildly
enrolment		

SHI Coverage	Socio- economy cstatus	NHIS status across socio-economic categories with the poorest being the least covered: poorest 17.6 %, compared to the richest 44.4 % (p = 0.000). However, more poor renew their membership regularly than the rich. The poor seems to value health insurance more when they are enrolled than the poor. Direct taxes were progressive in all three countries. Indirect taxes were progressive in Ghana and Tanzania. The premium contributionfrom non-former sector is regressive in both country but the mandatory contribution by former-sector worker was progressive. Overall health-service benefits favoured the rich in all Ghana and only marginally in Tanzania.
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45.	Agasha et al, 2019	Uganda	To explore evidence showing that eQHB scheme affected access and utilization of health services at BCH	Mixed Methods: Routine data, Cross-sectional survey, FGD and KII	Hospital records, Primary data collection	CBI Coverage and utilisation	Occupation and Socioeconomic Status	Non-significant result in progress plus area. Only Occupation and SES. Former employee who used health services are less likely to be insured than famers, self-employed and those with no job. Also, households with more income using BCH are more likely to be insured. Only place of residence, more than 5km from community hospital was significantly associated.
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