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Institutional design features of health insurance subsidy programmes in Africa: a narrative review

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Abstract

Background To advance Universal Health Coverage (UHC), many countries have introduced Health Insurance Subsidy Programs (HISPs) to extend financial protection to poor and vulnerable populations by covering their insurance premiums. This study examined the institutional design of HISPs in Africa and their contribution to UHC goals, including equity, financial protection, and service coverage.

Methods We undertook a literature search on Google, Google Scholar, PubMed, Web of Science, Scopus and EconLit to identify published and grey literature on African countries with HISPs. HISPs were defined as government-driven health insurance programs that extend health insurance coverage to vulnerable groups by fully or partially subsidizing their insurance premiums. Screening and selection of relevant articles were done using Covidence. A total of 98 articles were reviewed, detailing the institutional design features of 25 HISPs in 18 African countries. Institutional design features of the HISPs were analysed using a framework adopted from Vilcu and Mathauer (2016).

Findings Our review identified 25 Health Insurance Subsidy Programs (HISPs) across 18 African countries. Institutional design features that promoted financial risk protection of vulnerable groups included full premium subsidisation, government financing, and the provision of comprehensive benefits packages. However, several design elements undermined effectiveness - most notably, the use of indirect targeting methods prone to high inclusion and exclusion errors, fragmented risk pools, and voluntary membership structures that reduced enrolment among healthy individuals. Implementation of partial subsidies, as observed in Burkina Faso's Assurance Maladie à Base Communautaire (AMBC), increased the risk of adverse selection, while restrictive definitions of indigence, as in Ghana, limited program reach.

Conclusion HISPs are a common mechanism for extending financial protection and health service access to vulnerable populations in Africa. However, their impact on UHC goals depends heavily on how they are designed and implemented. Achieving equity and financial protection will require aligning targeting mechanisms with local contexts, mandating enrolment where feasible, and ensuring predictable public financing.

Keywords Universal Health Coverage, Health insurance subsidy programs, Institutional design features, Vulnerable groups, Financial protection

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Introduction

Universal health coverage (UHC) is achieved when all people have access to quality healthcare services they need, whenever they need them, without suffering financial hardship [1]. In 2023, the World Health Organization (WHO) and the World Bank sounded the alarm: "The world is off track to make significant progress towards UHC (Sustainable Development Goals (SDGs) target 3.8) by 2030" [2]. They called for urgent action, especially by low- and middle-income countries (LMICs), to make progress towards UHC. Among the measures recommended for adoption was the removal of financial barriers to care for the poor and most vulnerable through the reduction of out-of-pocket payments for healthcare [2].

LMICs are increasingly turning to health insurance mechanisms to achieve UHC [3]. Health insurance arrangements entail pre-payment for healthcare and pooling of risks and income. The rationale for prepayment as a formidable strategy for achieving UHC is rooted in the observation that out-of-pocket (OOP) payments at the point of accessing healthcare expose individuals to financial hardship [4]. As a prepayment mechanism, health insurance averts financial hardship at the point of accessing healthcare services by fully or partially replacing OOP with prepayment [5]. Countries around the world have adopted various types of health insurance programs with social health insurance and community-based health insurance being the common forms [6].

Health insurance programs that rely on premium contributions from individuals, presuppose the ability of the individual to afford regular premiums. However, studies show that health insurance premiums remain unaffordable to many individuals in LMICs [7, 8]. As a result, many LMICs include health insurance subsidy programs (HISPs) to extend population coverage to the vulnerable [9]. Health insurance subsidy programs (HISPs) are government-driven programs that extend health insurance coverage to vulnerable groups by fully or partially subsidizing their insurance premiums [10]. Vulnerable groups are subsets of the population whose sociodemographic, geographic, or economic characteristics hinder or prevent their access to healthcare services [11]. Beneficiaries are required to pay premiums lower than the standard contribution (partial subsidization) or exempted altogether (full subsidization) [12].

The way HISPs are designed and implemented determines whether they achieve their intended goal of providing financial risk protection to vulnerable households and ultimately the achievement of universal coverage goals within a country. However, there is limited literature on the design of these programs particularly in LMICs. Most previous studies focusing on the HISPs in African countries are single-program or single-country studies [13–21]. The scope of most of these studies is either the broader government health insurance program or only specific design features of the HISP as opposed to all the design features.

While multi-country analyses have applied this framework to HISPs in Asia, Latin America, and the WHO European region, no such comprehensive assessment exists for Africa. This study addresses this gap by analysing the institutional design features of HISPs across African countries using the framework developed by Mathauer et al. [22], with the aim of generating region-specific insights into how design choices shape progress toward UHC. In doing so, it offers a critical foundation for evidence-based reforms to enhance the equity, efficiency, and effectiveness of subsidy programs on the continent.

Methods

This study employed a structured approach to identify and analyse the institutional design features of HISPs in African countries and their contribution to progress towards UHC. The methodological design was informed by previous multi-country reviews, particularly the analytical framework by Vilcu and Mathauer [23], and the literature review strategy used by Kutzin et al. [3] in their study of Eastern European subsidy programmes.

We began by identifying African countries that have implemented HISPs. This initial scoping phase involved reviewing global and regional databases, WHO reports, World Bank policy documents, and published and grey literature to determine which countries had health insurance programmes that subsidized coverage for vulnerable populations using public funds. HISPs were defined as publicly administered schemes, or components of broader insurance programs, that cover the health insurance premiums of individuals who are exempted from direct contribution based on defined eligibility criteria such as poverty, age, disability, or vulnerability status.

Once countries with HISPs were identified, a systematic literature search was conducted to obtain detailed information on the design features of the schemes. The search focused on each country and its specific HISP, using a combination of keywords including the name of the programme (where known), "health insurance subsidy," "government subsidised insurance," "exempted populations," and the name of the country. Literature searches were conducted using databases such as PubMed, Scopus, and Google Scholar, as well as official websites of international organisations such as WHO, the World Bank, and Results for Development. The search was limited to English-language sources published from the year 2000 onwards.

The time frame (publications from 2000 onward) was chosen to standardise the evidence base and to align with

the global resurgence of health system reforms under the Millennium Development Goals and the emergence of Universal Health Coverage as a central policy objective. However, schemes established before 2000 were included if they were documented in studies published within this period. Inclusion criteria required that documents describe at least one institutional design feature of a HISP, and that the program subsidise health insurance coverage for at least one defined group. Sources that only mentioned the existence of a scheme without describing its structure, enrolment process, financing, or service coverage were excluded. The screening and inclusion process followed PRISMA guidelines, and the number of sources identified, screened, and included is summarised in Fig. 1.

Analytical framework

Data extraction was guided by the Vilcu and Mathauer [23] analytical framework, which organises institutional design features of HISPs around the three health financing functions described in WHO (2010): revenue collection, pooling, and purchasing. This framework was adapted to focus on four main categories: eligibility and enrolment rules, financial arrangements, pooling arrangements, and purchasing arrangements, including benefit package design. Each scheme was analysed against these categories using available data (Table 1).

Progress toward UHC was assessed using the three dimensions of the UHC cube-population coverage, financial protection, and access to/utilisation of services. Indicators used included government health insurance coverage rates, the share of the subsidised among the insured population, reported inclusion and exclusion errors in targeting, the UHC Service Coverage Index, out-of-pocket (OOP) health expenditure as a percentage of current health expenditure, and the incidence of catastrophic and impoverishing health spending. These indicators were obtained from WHOs Global Health Observatory and country-specific reports. Country-level summaries were then compiled in a matrix mapping institutional design features to UHC outcomes, where data were available.

Results

The systematic literature search in four databases (PubMed, Web of Science, Scopus and EconLit) yielded 7251 studies. After removal of duplicates and screening, 65 studies were included. 33 additional studies were included following consultation with experts bringing the total number of studies included to 98 as illustrated in the PRISMA flow chart in Fig. 1

In Table 2, we summarise country population, gross domestic product, current health expenditure per capita, the HISP and year of introduction in the eighteen study countries for ease of comparison. Health insurance subsidy programs (HISPs) were identified in eighteen African countries. Namely: Algeria, Benin, Burkina Faso, Burundi, Cote d'Ivoire, Egypt, Ethiopia, Gabon, Ghana, Kenya, Mali, Morocco, Nigeria, Rwanda, Senegal, Tanzania, Tunisia, and Zambia. More than half of these countries are lower-middle-income countries, with only two countries (Algeria and Gabon) in the upper-middle-income category [41]. Most countries had only one HISP identified. However, more than one HISP was identified in Burkina Faso, Ethiopia, Kenya, Senegal and Tunisia. Kenya had the highest number of HISPs identified in one country, with four HISPs. The twenty-five HISPs studied were started between 1983 and 2019. Algeria (1983) and Burundi (1984) were the first of the study countries to introduce HISPs (Table 2).

Eligible population groups

Table 3 summarises the information on HISP institutional design features that determine eligibility and enrolment rules in all twenty-five HISPs studied. These include the eligible groups, the organisation responsible for their identification, targeting method employed, the type of membership of beneficiaries (mandatory or voluntary) and whether beneficiaries enrol themselves actively or are enrolled automatically.

Groups eligible for enrolment in the HISPs varied across the eighteen countries. Indigents, referring to the poor as defined by each country's eligibility criteria for enrolment in the HISP, were the most frequently occurring eligible population group. Indigents were the specifically eligible population group in Burkina Faso, Burundi, Côte d'Ivoire, Ethiopia, Gabon, Kenya's 'Health Insurance Subsidy Program', Mali, Rwanda, Senegal and Tunisia's Free Medical Assistance for the Poor (FMAP) [10, 14, 16, 19, 26, 27, 29, 30, 33, 37, 38, 44, 45, 61]. However, indigents were defined differently across the 21 HISPs targeting indigents. Five patterns were evident from the available data. The most common were the beneficiaries of a pre-existing safety net program (7 HISPs). Beneficiaries of a pre-existing safety-net program, usually already-identified indigents, are 'low-hanging fruit' when it comes to the administrative costs of identifying them. This is because documentation of the socioeconomic characteristics and unmet health needs of safety-net program beneficiaries is usually already available, as opposed to the rest of the population [65]. In Kenya, for example, the Health Insurance for the Elderly and People Living with Severe Disabilities (HIEPWSD) was initiated in 2014 to extend the National Health Insurance Fund coverage to the elderly and people living with severe disabilities who were beneficiaries of an existing safety-net program [32].

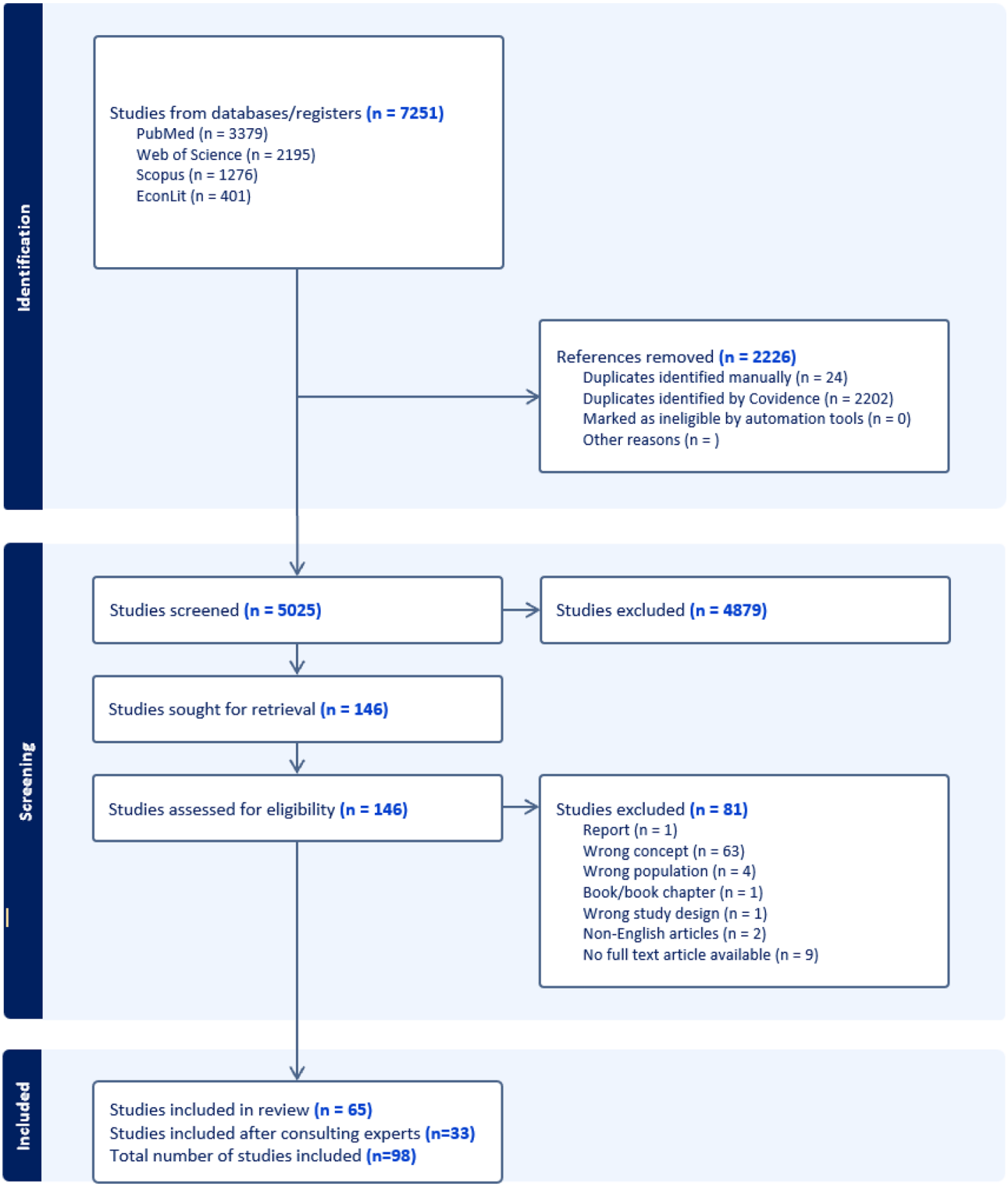

Fig. 1 PRISMA Model of literature screened and included

Two HISPs defined indigents as a given proportion of the national population, beginning from the poorest, based on income and assets. These were Burkina Faso's AMBC (poorest 20%) and Mali's RAMED (poorest 5%) [20, 33]. The remainder used descriptive sociodemographic criteria of an indigent. Gabon's GIS specified a numerical threshold of income below which one was considered an indigent [30]. Benin's RAMU, considered

Table 1 Analytical framework

Institutional design aspect	Related policy choices	Intermediate output indicators	UHC progress indicators
Eligibility and enrolment rules			
Groups eligible for exemption from contributions/subsidization	Definition of vulnerability (e.g. low income, poverty, informal sector, children, pregnant women)	Share of eligible among the bottom two income quintiles and other vulnerable groups	Total population coverage (i.e. enrolment in health insurance fund), differentiated along income quintiles
Targeting method	E.g. universal (based on a very broad criterion such as residence or no employment in the formal sector), indirect (based on socio-demographic, socio-economic or geographic characteristics usually correlated with poverty and vulnerability), direct (through a means assessment or proxy means testing); different targeting approaches can be in place at the same time for different groups	Share of the exempted/subsidized within total (insured) population; share of the exempted/subsidized among those being targeted for exemption/subsidization (targeting effectiveness of the system), Income groups exempted/subsidized	
Enrolment process	Active enrolment by the beneficiary or automatic enrolment by the authorities		
Type of membership of the exempted/subsidized	Voluntary or mandatory		
Organization responsible for identification	E.g. insurance company; central, regional, local government		
Financial arrangements			
Degree of subsidisation/co-contribution	Full or partial (a co-contribution is required)	Share of the exempted/subsidized within total (insured) population; share of the exempted/subsidized among those being targeted for exemption/subsidization (importance of budget transfers)	
Type of transfer logic	Individual-based (a specific amount is being paid for each exempted individual) or lump-sum (a lump sum transfer for the entire population is made)		
Calculation logic to determine the amount of funds to be transferred	E.g. based on regular contribution levels, minimum or average wages, specific percentage of the government budget, negotiated by the government		
Financing source of the budget transfers	E.g. general government revenues from central or sub-national levels, earmarked government revenues, transfers from other health insurance funds (cross-subsidization), donor funding	Sufficient funding for a comprehensive benefit package Level of cross-subsidisation from contributions	Financial protection (incidence of catastrophic/impoverishing health expenditure); Access to services
Pooling arrangements			
Type of pool(s) (general)	Single fund or multiple funds	Degree of fragmentation Size and composition of pools Level of cross-subsidization	Equity in access. Equity in financing
Type of pool (exempted/subsidized)	Exempted/subsidized integrated in the pool with contributors, or separate pool for the exempted/subsidized		
Type of health insurance affiliation membership of the contributors	Voluntary or mandatory		Financial protection
Purchasing arrangements and benefit package design			
Range of services covered by the benefit package	E.g. comprehensive, in-patient focus, out-patient focus, pharmaceuticals, dental care, indirect costs (e.g. transportation)		Financial protection, Access (utilization rates), Equity in access
	Different or same package as that for contributors	Efficiency	
Degree of cost-sharing	Cost-sharing mechanisms (e.g. co-insurance, co-payment, deductible) and rates		
Provider-payment mechanisms	Type of payment and rate	Efficiency	

a household poor if its per capita food expenditure fell below a predefined threshold [25].

Three Health Insurance Subsidy Programmes (Burkina Faso's RAMS, Burundi's CAM and Tunisia's FMAP) were characterised by non-transparent eligibility criteria. In Burkina Faso's RAMS, whereas social workers under the Ministry of Social Action and National Solidarity (MASSN) select the beneficiaries deemed to

Table 2 Country overview

Country (World Bank country income classification, 2023)	Population (2023) (World Bank, 2025)	Gross Domestic Product (US$) (2023) (World Bank, 2025)	Current Health Expenditure per Capita (US$) (2021) (World Bank, 2025)	Name of the scheme(s) (and its abbreviation)	Year of introduction of the HISP
Algeria (Upper-middle)	46164219	247.63 billion	204.57	Caisse Nationale de Sécurité Sociale des Non-Salariés (CASNOS)	1983 [24]
Benin (Lower-middle)	14111034	19.68 billion	35.13	'Régime d'Assurance Maladie Universelle' (RAMU)	2018 [25]
Burkina Faso (Low)	23025776	20.32 billion	56.95	Assurance Maladie à Base Communautaire (AMBC)	Subsidisation introduced in 2007 [20]
				Mutual Health Support Network (Réseau d'appui aux mutuelles de santé– RAMS)	2012 [26]
Burundi (Low income)	13689450	2.64 billion	24.27	Carte d'assistance médicale (CAM)	1984 [27]
Côte d'Ivoire (Lower-middle)	31165654	78.88 billion	81.87	Medical Assistance Scheme (RAM)	2014 [28]
Egypt (Lower-middle)	114535772	396 billion	179.68	School Health Insurance Programme (SHIP)	1992 [17]
Ethiopia (Low)	128691692	163.7 billion	26.48	Integrated Safety Net Program (ISNP)	2005 [16]
				Community Based Health Insurance (CBHI) scheme	2011 [29]
Gabon (Upper-middle)	2484789	19.39 billion	233.87	Gabon Indigents Scheme (GIS)	2007 [30]
Ghana (Lower-middle)	33787914	76.37 billion	100.00	National Health Insurance Scheme (NHIS)	2004 [31]
Kenya (Lower-middle)	55339003	108.04 billion	94.67	Linda Mama (The Free Maternity Services) Programme	2013 [32]
				Health Insurance for the Elderly and People with Severe Disabilities Program	2014 [32]
				Health Insurance Subsidy Program (HISP)	2014 [32]
				Secondary School Medical Scheme (EduAfya)	2018 [32]
Mali (Low)	23769127	20.66 billion	40.12	Régime d'Assistance Médicale (RAMED)	2011 [33]
Morocco (Lower-middle)	37712505	144.42 billion	221.11	Régime d'Assistance Médicale (RAMED)	2008 [34]
Nigeria (Lower-middle)	227882945	363.85 billion	83.84	Free Maternal and Child Health program (FMCHP)	2009 [35]
Rwanda (Low)	13954471	14.1 billion	60.22	Mutuelles de santé (Mutuelles)	Subsidization introduced in 2007 [36]

Table 2 (continued)

Country (World Bank country income classification, 2023)	Population (2023) (World Bank, 2025)	Gross Domestic Product (US$) (2023) (World Bank, 2025)	Current Health Expenditure per Capita (US$) (2021) (World Bank, 2025)	Name of the scheme(s) (and its abbreviation)	Year of introduction of the HISP
Senegal (Lower-middle)	18077573	30.85 billion	71.22	la Couverture Maladie Universelle	Subsidization introduced in 2014 [14]
				Programme National de Bourses de Sécurité Familiale (PNBSF)	2013 [10]
Tanzania (Lower-middle)	66617606	79.06 billion	37.16	Tumaini la Mama	2010 [37]
Tunisia (Lower-middle)	12200431	48.53 billion	265.46	Free Medical Assistance for the Poor (FMAP)	1998 [38]
				Medical Assistance Schemes (MAS)	1991 [39]
Zambia (Lower-middle)	20723965	27.58 billion	75.34	National Health Insurance Scheme (NHIS)	2019 [40]

be vulnerable, a study conducted in 2013 reported that "the selection criteria were not known" [26]. In Burundi, "indigent or vulnerable people" are eligible for the zero-contribution category. However, the responsibility for determining and verifying eligibility is delegated to local administrative structures [66]. In Tunisia, where the National Program of Aid to Needy Families (PNAFN) manages the Free Medical Assistance Program (FMAP) for the poor, a study conducted by the World Bank in 2014 reported that "eligibility criteria are not transparent" [67].

Other frequently occurring groups in the lists of eligible population groups were children under 18 years of age (ten HISPs), people living with disabilities (Algeria, Zambia, Kenya's HIEPWSD and Zambia's NHIS), pregnant women (Ghana, Nigeria, Tanzania and Kenya's Linda Mama) and the elderly (Ghana, Zambia, Kenya's HIEPWSD and Senegal's CMU) [14, 19, 24, 32, 35, 37, 40, 51]. The threshold of age above which an individual was considered an elderly person eligible for HISP coverage was 70 years in Ghana's NHIS and Kenya's HIEPWSD [32, 52]. In Senegal's la Couverture Maladie Universelle it was 60 years, and in Zambia's NHIS, 65 years [14, 40]. In some countries, the exemption threshold for subsidized enrolment does not align with the statutory retirement age, suggesting a potential period during which retirees may not be covered through contributory arrangements. However, this does not necessarily imply a lack of protection, as individuals may be beneficiaries of other social assistance or pension programs. For example, in Ghana, the statutory retirement age is 60 years, while eligibility for exemption under the health insurance program begins at 70 years [68].

The requirement to verify pregnancy status in HISPs targeting pregnant women was explicitly documented in Ghana's NHIS and Nigeria's FMCHP. In Ghana, eligibility for the maternal exemption requires certification of pregnancy by a medical officer, which involves verification at a health facility to complete the certification [65]. In Kenya, under the Linda Mama program, enrolment can occur at the point of care without prior certification, representing a less formalized process that may facilitate enrolment for women in underserved areas [32]. Differences also emerged in the duration of coverage. In Ghana, coverage is available throughout pregnancy and for up to three months postpartum, aligning with key maternal health service needs. However, in Kenya, Linda Mama extends coverage to one year postpartum for both the mother and child, which may offer greater continuity of care, particularly for newborn services, immunisation, and postnatal visits. Conversely, Tanzania's Tumaini la Mama program covers only the first three months postpartum [18, 37]. For HISPs targeting children or students, most programs clearly defined age cut-offs-typically up

Table 3 Eligibility and enrolment

Country & Subsidy Programme	Entitled groups	Organization responsible for identification	Targeting method employed	Type of membership	Enrolment process
Algeria					
Caisse Nationale de Sécurité Sociale des Non-Salariés (CASNOS)	People with disabilities, military veterans, apprentices, trainees, students, poor households reached by the social safety net, unemployed persons signing on at unemployment offices [24]	CASNOS [24]	Categorical [24]	Mandatory [42]	Active enrolment by the beneficiary [42]
Benin					
Régime d'Assurance Maladie Universelle' (RAMU)	Poor and vulnerable people [25]	RAMU [43]	A combination of community-based targeting and proxy mean testing [25]	Mandatory by law [25]	Active enrolment by the beneficiaries [25]
Burkina Faso					
Assurance Maladie à Base Communautaire (AMBC)	The poorest 20% of households [20]	AMBC [44]	Community wealth-ranking [20]	Voluntary [20]	Active enrolment by beneficiaries [44]
Mutual Health Support Network (Réseau d'appui aux mutuelles de santé– RAMS)	Poor people [26]	The Ministry of Social Action and Solidarity (ministère de l'Action sociale et de la Solidarité nationale– MASSN [26]	"The selection criteria used in the two provinces are not known." [26]	Voluntary [26]	Active enrolment by beneficiaries [26]
Burundi					
Carte d'assistance médicale (CAM)	Very poor members of the community [27]	CAM [27]	Not reported	Voluntary [27]	Active enrolment by beneficiaries [27]
Côte d'Ivoire					
Medical Assistance Scheme (RAM)	"Economically disadvantaged or needy individuals" [45]	National Health Insurance Fund (CNAM) [46]	Proxy means testing [47]	Voluntary [47]	Active enrolment by CNAM [47]
Egypt					
School Health Insurance Programme (SHIP)	All individuals between 6 and 18 years old, and currently attending school [48]	Health Insurance Organization [17]	Categorical [17]	Mandatory [17]	Automatic enrolment by the Health Insurance Organization [17]
Ethiopia					
Integrated Safety Net Program (ISNP)	Indigent households, defined as not having any sources of income and remittances and without able-bodied labour to work and earn [16]	Local governments at the Kebele (ward) level [49]	Community-based targeting [49]	Voluntary [29]	Not clear
Community Based Health Insurance (CBHI) scheme	The poorest households, that cannot afford to pay the insurance premium, defined as indigents [29]	Local governments at the Kebele (ward) level [49]	"The selection of which households qualify as indigents is decided by the kebeles (wards) themselves." [29]	Voluntary (Hirvonen et al., 2021)	Active enrolment by the beneficiaries [50]
Gabon					
Gabon Indigents Scheme (GIS)	Gabonese of both genders who are at least 16 years of age and whose income is less than the minimum guaranteed interoccupational wage of Gabonese Franc (CFAF) 150,000 per month, or about US$250. Children under 16 years of age are considered beneficiaries of insured parents [30]	National Health Insurance and Social Welfare Fund (CNAMGS) [30]	Categorical [30]	Mandatory [30]	Active enrolment by the beneficiaries [30]

Table 3 (continued)

Country & Subsidy Programme	Entitled groups	Organization responsible for identification	Targeting method employed	Type of membership	Enrolment process
Ghana					
National Health Insurance Scheme (NHIS)	Indigents, pregnant women, children under 18 years, elderly individuals over 70 years, SSNIT pensioners and beneficiaries of the Livelihood Empowerment Against Poverty [51, 52]	District-wide Mutual Health Insurance Schemes (DMHIS) [53]	Categorical [52]	Enrollment is mandatory by law, but there are no penalties for those not enrolled. [51]	Active enrollment by the beneficiaries [54]
Kenya					
Linda Mama (The Free Maternity Services) Programme	Kenyan pregnant women and their infants for their first year of life [19]	NHIF in partnership with healthcare facilities offering maternal and child health services [19]	Categorical [19]	Voluntary [18]	Active enrolment by the beneficiary [32]
Health Insurance for the Elderly and People with Severe Disabilities Program	All the elderly and persons with severe disabilities receiving cash transfers under the Ministry of Labour and Social Protection's "Inua Jamii" program and where applicable one spouse and up to five dependents [32]	The Ministry of Labour and Social Protection [32]	A combination of community targeting, direct targeting based on a proxy means test and categorical targeting i.e. at least one member over 65 or living with severe disabilities [55]	Mandatory [55]	Automatic enrolment by the MOH [56]
Health Insurance Subsidy Program (HISP)	Households in the Orphans and Vulnerable Children Cash Transfer program run by the State Department for Social Protection [56, 57]	The Ministry of Health using data from the Ministry of Labour and Social Protection [56]	Proxy means testing in combination with community verification was used to target the poorest in the list maintained by the Ministry of Labour and Social Protection [58]	Mandatory [58]	Automatic enrolment by the MOH [58]
Secondary School Medical Scheme (EduAfya)	All students in public secondary schools in Kenya during their four-year study period [57]	NHIF [57]	Categorical [32]	Mandatory [59]	Automatic enrolment by the secondary school [59]
Mali					
Régime d'Assistance Médicale (RAMED)	The poorest 5% of the population ("any person deprived of resources and recognised as such by the local authority covering them") "The status of indigence is considered temporary and the insured members' cards are renewed annually." [33, 43]	The Agence Nationale d'Assistance Médicale(ANAM) [33]	Means and proxy-means testing [43]	Voluntary [43]	Active enrolment of beneficiaries by Agence Nationale d'Assistance Médicale (ANAM) [43]
Morocco					
Régime d'Assistance Médicale (RAMED)	Poor and vulnerable populations [60]	The Ministry of Interior [60]	A combination of proxy means testing and community targeting [60]	Voluntary [60]	Active [60]
Nigeria					
Free Maternal and Child Health program (FMCHP)	Pregnant women up to 6 weeks after giving birth and their children until their 5th birthday [35]	The National Health Insurance Scheme (NHIS) [35]	Categorical [35]	Mandatory [35]	Automatic enjoyment of benefits [35]
Rwanda					

Table 3 (continued)

Country & Subsidy Programme	Entitled groups	Organization responsible for identification	Targeting method employed	Type of membership	Enrolment process
Mutuelles de santé (Mutuelles)	Households in CBHI Category I of 3 based on income and assets, comprised of "Destitute or very poor households" [61]	The Ministry of Local Government through the "Ubudehe" programme [62]	Community-based targeting [63]	Initially voluntary, became compulsory in 2007 [62]	Active enrolment by the beneficiary [36]
Senegal					
la Couverture Maladie Universelle	Poor households, people living with disabilities, children under 5 years of age and people 60 years of age or older in the poorest income bracket or if they are living with disabilities [14]	The National Family Security Grant Programme [14]	Categorical [14]	Voluntary [64]	Active enrolment by the beneficiaries [64]
Programme National de Bourses de Sécurité Familiale (PNBSF)	Beneficiaries of the Programme National de Bourses de Sécurité Familiale (PNBSF) cash transfer [10]	Programme National de Bourses de Sécurité Familiale (PNBSF) [10]	Categorical [10]	Mandatory [10]	Automatic enrolment by the CBHI [10]
Tanzania					
Tumaini la Mama	Free NHIF membership for poor pregnant women residing in Mbeya, Tanga, Songwe, Mtwara and Lindi regions for up to three months after delivery and CHF membership for their family members for a year from the date of enrollment (CHF) [37]	Tanzania National Health Insurance Fund (NHIF) [37]	Geographical targeting in most districts and individual targeting in wealthy districts. Indirect for family members [37]	Voluntary for the pregnant woman and mandatory for the family members [37]	Active enrolment by the beneficiaries and automatic enrolment for their family members [15]
Tunisia					
Free Medical Assistance for the Poor (FMAP)	Poor and near-poor households [38]	The Ministry of Social Affairs (MOSA) [38]	Means testing and categorical testing [38, 39]	Mandatory [38]	Automatic enrolment by FMAP [38]
Medical Assistance Schemes (MAS)	The most disadvantaged groups in the general population [39]	The Ministry of Social Affairs [39]	Means-testing [39]	Voluntary [39]	Active enrolment by the beneficiaries [39]
Zambia					
National Health Insurance Scheme (NHIS)	The poor, mentally ill, adults above 65 years, children below 18 years and other groups as identified by the Minister for Health [40]	National Health Insurance Management Authority (NHIMA) [40]	Categorical [40]	Mandatory [40]	Automatic enrolment [40]

to 18 years-ensuring alignment with secondary school coverage. However, Algeria's CASNOS did not specify who qualifies as a student [24] (Table 3).

Targeting approaches

Targeting techniques used by the twenty-five HISPs included indirect (categorical) demographic and geographic approaches, proxy means testing, community-based targeting and approaches that combined two or more methods. Categorical targeting based on sociodemographic criteria, used by ten HISPs, was the most common targeting technique. This appeared to be the simplest targeting approach since eligibility was based, in many cases, on observable criteria such as disability or being a student in a public school.

Notably, several schemes combined multiple targeting methods to improve the accuracy and credibility of identifying eligible households. In Benin's RAMU, for example, village committees first selected households perceived as poor based on local understanding of food insecurity. These households were then subjected to a proxy means test (PMT) by RAMU to validate eligibility. This approach aimed to leverage community knowledge while mitigating risks of elite capture-where influential community members might skew the process in favour of non-poor households [25]. Similarly, Côte d'Ivoire's RAM employed a PMT administered by the National Health Insurance Fund (CNAM), with results subsequently validated by community leaders and social centres, introducing a layer of local oversight [47]. In Kenya's Health Insurance for the Elderly and People with Severe Disabilities (HIEPWSD) program, subsidised insurance was provided to beneficiaries of an existing cash transfer program. This underlying program applied a multi-pronged targeting approach-combining community-based identification, categorical criteria (e.g., age or disability status),

and direct assessment through a PMT conducted using data collected during household visits [55]. These combination targeting methods help balance trade-offs between accuracy, transparency, and administrative feasibility, potentially reducing both inclusion and exclusion errors.

The most elaborate combination targeting approach reported was by far that used by Morocco's RAMED. The Ministry of Interior led identification efforts, leveraging its widespread local presence. Applicants completed an online form (available in Arabic and French), with social workers assisting illiterate individuals and conducting outreach in remote areas to reduce exclusion. Identity information was cross-checked against national e-ID and nonsubsidized SHI databases to prevent duplication and inclusion errors. Socioeconomic data, though largely unverified, were used to generate proxy means test (PMT) scores. Final beneficiary lists were determined by interministerial local committees composed of members from the Ministry of Health, the Ministry of Finance, the Ministry of Interior, and the Ministry of Social Development, consider the results of the PMT and come up with the list of beneficiaries. Applicants could appeal decisions to a provincial grievance committee if they are not satisfied with the decision of the local committee [60]. This combination of institutional coordination, data verification, and grievance mechanisms illustrates the multilayered structure of RAMED's targeting process and its emphasis on administrative oversight and accountability. On the other hand, there were HISPs in which targeting approaches were unclear. In the case of Burkina Faso's RAMS for example, the selection criteria are not known while in Ethiopia's CBHI, "the selection of which households qualify as indigents is decided by the kebeles (wards) themselves," but the targeting method is not specified [26, 29]. Targeting approaches may, however, be elaborately specified but be inapplicable in practice. For example, Ghanaian law defines an indigent as a person who: i) "is unemployed and has no visible source of income, (ii) does not have a fixed place of residence according to standards determined by the scheme, (iii) does not live with a person who is employed and who has a fixed place of residence and (iv) does not have any identifiable consistent support from another person" and by the means test [51]. However, the country's definition of indigent has been criticised as excluding almost everyone in practice with strict application, thus leaving the identification of indigents largely at the discretion of the district scheme offices [13, 54] (Table 3).

Type of membership and enrolment process

Membership in the HISPs studied was either mandatory (targeted individuals could not opt out) or voluntary. Thirteen of the twenty-five programs had mandatory membership, and among these, eight (Egypt, Nigeria, Zambia, Senegal's PNBSF, Tunisia's FMAP, and Kenya's HIEPWSD, HISP, and EduAfya) employed automatic enrolment. The remaining mandatory schemes required active enrolment by beneficiaries. Kenya's HISPs generally used automatic enrolment, except for Linda Mama, where pregnant women were required to enrol actively-either before or at the point of care (a practice known as post-identification, in contrast to the more common pre-identification).

Automatic enrolment, particularly when paired with categorical targeting, was more likely to achieve broader and more equitable coverage by removing the burden of action from beneficiaries. In contrast, schemes relying on active enrolment-such as Linda Mama-risked excluding eligible individuals, especially where outreach and awareness were weak. For example, Egypt's SHIP and Kenya's EduAfya both targeted school children and used automatic enrolment, but the responsible enrolment institutions differed: Egypt's Health Insurance Organisation handled enrolment, while in Kenya, public secondary schools enrolled students into NHIF. The type of enrolment for Ethiopia's ISNP could not be determined from the available literature.

Importantly, legal provisions for mandatory membership did not always translate into compliance. Ghana's NHIS is mandatory by law, yet in the absence of penalties or enforcement, enrolment remains voluntary in practice [51]. This highlights a gap between de jure institutional design and de facto implementation-a limitation this study may not fully capture, as it focuses on formal program rules rather than operational realities.

Insurance enrolment rates

Insurance enrolment trends across study countries

Table 4 depicts numerical figures of various measures of insurance enrolment rates. Insurance enrolment rates depict coverage. The share of the subsidised shows the scope of the HISP while inclusion and exclusion errors are a measure of targeting effectiveness. Insurance enrolment rates in government health insurance schemes varied considerably across the study countries. In Burkina Faso, enrolment in Community-Based Health Insurance (CBHI) groups was as low as 0.22% in 2018 [69]. In contrast, Rwanda's Mutuelles reported an enrolment rate of more than 85% in 2023 [63]. Rwanda's relatively high enrolment has been attributed to a range of supportive measures, including widespread public sensitisation through state-organised community events, local radio, religious institutions, markets, and cooperatives. The country also leveraged an extensive network of approximately 45,000 community health workers serving over 14,000 villages. Local governments were subject to performance contracts that incorporated enrolment targets,

Table 4 Insurance enrolment rates

Country & subsidization scheme	Total insured population (in %)	Number/share of subsidized within total population	Number/share of subsidized within total insured population (in %)	Exclusion error	Inclusion error
Algeria					
Caisse Nationale de Sécurité Sociale des Non-Salariés (CASNOS)	2001 - more than 85% of the population (twenty-five million people) [24]	Not reported	Not reported	Not reported	Not reported
Benin					
Régime d'Assurance Maladie Universelle' (RAMU)	2007–4.5% [25]	Not reported	Not reported	Not reported	Not reported
Burkina Faso					
Assurance Maladie à Base Communautaire (AMBC)	2006–1.1% 2007–11.1%	Not reported	Not reported	Not reported	Not reported
Mutual Health Support Network (Réseau d'appui aux mutuelles de santé– RAMS)	2009–8.6% in the 2011–0.01% (181 mutuals with only 260,000 beneficiaries) 2018–0.22% [26, 69]	Not reported	Not reported	Not reported	Not reported
Burundi					
Carte d'assistance médicale (CAM)	31% of households (402533 cards) – 2013 2% of the population in Community Based Health Insurance schemes – 2015 [27]	Not reported	Not reported	Not reported	Not reported
Côte d'Ivoire					
Medical Assistance Scheme (RAM)	13% – 2022 [70] 12.9%* – 2023 [45, 71]	Not reported	Not reported	"Of the people who had received health insurance cards, only 2% were extremely poor - despite that this was target population for the program" – 2022 [70]	Not reported
Egypt					
School Health Insurance Programme (SHIP)	1965–0.14 million 1987–3.75 million 1988–5% 1989–25% 1993–14 million people [17]	61% – 1995 71% – 1996 [48]	1995–71% of all school-age children (15 million school children) [17]	Over 30% of school age children coming from households in the lowest income quintile are not enrolled in school [17]	Not reported
Ethiopia					
Integrated Safety Net Program (ISNP)	2012–41% 2013–48% 2020–50% [16, 29]	Not reported	Not reported	Not reported	Not reported
Community Based Health Insurance (CBHI) scheme		Not reported	Not reported	Not reported	Not reported
Gabon					

Table 4 (continued)

Country & subsidization scheme	Total insured population (in %)	Number/share of subsidized within total population	Number/share of subsidized within total insured population (in %)	Exclusion error	Inclusion error
Gabon Indigents Scheme (GIS)	45% – 2012 [72]	Not reported	33% [30]	Not reported	Not reported
Ghana					
National Health Insurance Scheme (NHIS)	Percentage of Ghanaian population who are active members of NHIS: 2005–6 2006–11 2007–30 2008 - 44 2009 - 48 2010 - 33.1 2011 - 33.4 2012 - 35 2013 - 382,014/15 - 40 2019 - 40 [13, 13, 31, 53, 73, 74]	*Approximately 28% (2019)	70% (2008) 70% (2013) [73] "more than 60%" "Close to 70%" (2019) [52]	Only 29% of individuals in the first quintile were active members in 2008 [51]	Not reported
Kenya					
Linda Mama (The Free Maternity Services) Programme	9.7 (2003) 10.0 (2007) 17.1 (2013) 16 (2015/16) 19.9(2018) 26(2022) "Approximately 25%" (2023) [58, 75, 76]	987122 (2016/17) 1231200 (2019/20) 1163712 (2020/21) 1186004 (2021/22) [56]	Not reported	Not reported	Not reported
Health Insurance for the Elderly and People with Severe Disabilities Program		231000 (2017/18); 42000 (2016–2018) 58800 (2019–22) [32, 56]	Not reported	Not reported	Not reported
Health Insurance Subsidy Program (HISP)		219200 (2015/16), 155519 (2016/17), 181700 (2017/18) 253400 (2019–22) [32, 56]	Not reported	Not reported	65% in quintiles four and five (2015) [58]
Secondary School Medical Scheme (EduAfya)		2700000 students (2018) [32]	Not reported	Not reported	Not reported
Mali					
Régime d'Assistance Médicale (RAMED)	13% – 2019 [77]	2016–1% [43]	Not reported	Not reported	Not reported
Morocco					
Régime d'Assistance Médicale (RAMED)	16.4% – 2002 52% – 2018 [24, 60]	Not reported	25% – 2015 19% – 2016 29% – 2018 [60]	Not reported	Not reported

Table 4 (continued)

Country & subsidization scheme	Total insured population (in %)	Number/share of subsidized within total population	Number/share of subsidized within total insured population (in %)	Exclusion error	Inclusion error
Nigeria					
Free Maternal and Child Health program (FMCHP)	"less than 10%"—2024 [78]	2019 - 1.5 million people covered [35]	Not reported	Not reported	Not reported
Rwanda					
Mutuelles de santé (Mutuelles)	Percentage of Rwandese population who are active members of Mutuelles: 2003–7 2004–27 2005–44 2006–73 2007–75 2008–85 2009–86 2010–91 2011/12 - 91 2012/13 - 80.7 2013/14 - 74 2014/15–76.5 2015/16–82 2016/17 - 84 2017/18 - 83 2023 - "Over 85" [62, 63, 79–81]	16% (2009) 24.8% (2010–2012) [62, 63, 82]	Not reported	14% of the poorest Rwandans were not enrolled in the category entitled to exemptions (2006) [62] Only 16% of Rwandans subsidized despite 57% being poor and 37% extremely poor [82]. 9% of uninsured households were in category 1 in 2013 [36]	69.7% of category I members were not in quintiles 1 and 2 (2014) [36]
Senegal					
la Couverture Maladie Universelle	2012–20% 2018 - 49.6% Between 2012 and 2018, the number of beneficiaries covered by a community based health insurance increased from 421670 to 3000837 "Less than 5%"—2023 [14]	Not reported	Not reported	Not reported	Not reported
Programme National de Bourses de Sécurité Familiale (PNBSF)	Not reported	Not reported	Not reported	Not reported	Not reported
Tanzania					

Table 4 (continued)

Country & subsidization scheme	Total insured population (in %)	Number/share of subsidized within total population	Number/share of subsidized within total insured population (in %)	Exclusion error	Inclusion error
Tumaini la Mama	10 – CHFs (2007) 9.2 - CHFs (2016) 25 – CHFs (2018) 26 - CHFs; 8 –NHIF (2019) 24 - CHFs 9 - NHIF (2020) 8 – NHIF (2021) [83–87]	14440 women (*less than 1%) (2013/2014) [15]	Not reported	Not reported	Not reported
Tunisia					
Free Medical Assistance for the Poor (FMAP)	88% – 2008 68% – 2013 [38, 39]	27% – 2011 230000 households – 2015 [38, 88]	Not reported	Not reported	Not reported
Medical Assistance Schemes (MAS)		22% – 2008 21% – 2016 [39, 88]	Not reported	12% of the population is uninsured either because they work in the informal sector or are unemployed "a significant number of low-income households remain excluded from the MAS subsidized regime" [39]	Not reported
Zambia					
National Health Insurance Scheme (NHIS)	2022–35% [40]	Not reported	Not reported	Not reported	Not reported

*Figures estimated by the authors based on available data

creating strong incentives to prioritise insurance uptake. However, this performance pressure also contributed to challenges such as data inflation, with reports of falsified CBHI enrolment figures in 2014 and 2015. Legal action was taken against some officials in response, as a deterrent and to reinforce accountability [62].

Several health insurance subsidy programmes (HISPs) faced significant barriers to enrolment, particularly among vulnerable groups. In Burkina Faso's AMBC, the initial premium levels were unaffordable for many poor households. A subsequent policy revision in 2007, which halved premiums for the poorest 20% of households, led to increased enrolment among this group [44]. In the case of RAMS, also in Burkina Faso, some individuals declined enrolment, citing dissatisfaction with the scope of coverage. Given that RAMS provided only a partial subsidy, some potential beneficiaries may have deemed the cost-benefit trade-off unfavourable. Additional barriers stemmed from implementation challenges, such as the failure to involve Mutual Health Organisations (MHOs) in the beneficiary selection process (MHOs are a form of Community-Based Health Insurance). This resulted in some enrolees being located in areas without functioning MHOs or at significant distances-up to 20 kilometres-from the nearest facility where services could be accessed [26].

Inclusion and exclusion errors in HISPs

Data on the share of the subsidized population and the extent of inclusion and exclusion errors in HISPs was limited. However, among programs where such data were available, both inclusion and exclusion errors were found to be high. In Côte d'Ivoire's Medical Assistance Scheme, for example, it was reported that in 2022, only 2% of the beneficiaries were extremely poor, despite this group being the target population [70]. In Kenya, 65% of the "Health Insurance Subsidy Program" beneficiaries in 2015 were in quintiles four and five [89]. In Rwanda, 69.7% of category I members were not in quintiles 1 and 2 in 2014 [36]. In Ghana's NHIS, only 29% of individuals in the first quintile were active members in 2008 [51]. Even in Rwanda, which had the highest insurance enrolment rates, only 16% of Rwandans were subsidised despite 57% being poor and 37% extremely poor [82]. Comparatively across countries, even in contexts with relatively high insurance coverage, inefficiencies in targeting and enrolment remain evident, indicating that administrative and operational challenges persist in reaching intended beneficiaries (Table 3).

Financing arrangements

In Table 5, we have summarised HISP institutional design features that demonstrate the financial arrangements of the HISPs. The level of subsidisation was either full or partial and transfer of funds based on the number of individuals to be subsidised or a different factor. Calculation logic of the subsidy was likewise based on contribution levels of contributing members or another factor, generally based on the financing source of the subsidy.

Most HISPs offered a full subsidy of the insurance premium or the cost of insurance for beneficiaries. However, six out of the twenty-five HISPs (Algeria's, Burundi's, Egypt's, Gabon's and Burkina Faso's two) provided only a partial subsidy [17, 20, 24, 26, 27, 30]. Two schemes-Tunisia's FMAP and MAS-adopted a tiered approach, offering a full subsidy to the most vulnerable beneficiaries and a partial subsidy to others [38]. In some schemes, beneficiaries were also required to share the cost of services at the point of care. For instance, Algeria's CASNOS, Burundi's CAM, and Gabon's GIS required a 20% copayment, while Burkina Faso's RAMS required beneficiaries to pay between 20 and 30% of service costs [26, 27, 51, 96]. In AMBC, also in Burkina Faso, beneficiaries received only a 50% subsidy on insurance premiums [20]. The method for calculating the subsidy amount varied across countries. In most cases, it was based on the contribution was levels of contributing members and the number of beneficiaries. Egypt's SHIP, however, determined the subsidy amount based on an estimate of total healthcare costs under the programme, while Tunisia's MAS based it on the cost of services in public healthcare facilities [17, 39].

All the HISPs received funding for subsidies from their respective governments. Funding by a subnational government was reported in Kenya, Morocco and Nigeria. In Kenya, two of the forty-seven counties (Kiambu and Kisumu) funded the NHIF monthly premium of KES500 (USD3.5) for poor and vulnerable households in the respective counties [97, 98]. In Nigeria's FMCHP, "the focal states were expected to contribute counterpart funding to match the grant from the federal government" [35]. In Morocco's RAMED, local governments made an annual contribution of DH 40 (US$4) per poor individual living in their catchment area. This source of funds was in addition to the individual contributions of vulnerable beneficiaries who made an annual per capita contribution of DH 120 (US$12) with a cap of DH 600 (US$60) per household [60]. Five of the HISPs (Ghana's NHIS, Rwanda's Mutuelles, Tanzania's Tumaini la Mama and Kenya's Linda Mama and HISP) received funding from donors or development partners but also had concurrent government funding for subsidisation.

In all study countries, except Gabon's HISP, the transfer of funds for subsidisation to the purchasing bodies was based on the number of individuals and households to be covered (individual-based). In Gabon's GIS, however, the subsidy is not based on the number of individuals insured. Instead, a lump-sum amount is transferred

Table 5 Financing arrangements

Country & Subsidization Programme	Level of subsidization	Transfer mechanism of subsidy	Calculation logic of subsidy	Financing source of subsidy
Algeria				
Caisse Nationale de Sécurité Sociale des Non-Salariés (CASNOS)	Partial and for "some illnesses and certain categories of persons" full [24]	Individual-based [90]	Based on contribution levels of contributing members (7% of salary) [90]	The government of Algeria and cross-subsidization from contributors' contributions [24]
Benin				
Régime d'Assurance Maladie Universelle' (RAMU)	Full [25]	Individual-based [25]	Based on contribution levels of contributing members (7500 CFA francs [USD 13] per person per year) [25]	The annual premiums of affiliates, the state budget including taxes allocated to health insurance (taxes on mobile telephony, taxes on financial transactions outside the West African Economic and Monetary Union and excise duties on heavy vehicles), the budget of local governments and subsidies from development partners [25]
Burkina Faso				
Assurance Maladie à Base Communautaire (AMBC)	Partial [20]	Individual-based [20]	Based on contribution levels of contributing members (4000 CFA francs [USD 7] per person per month) [20]	Not reported
Mutual Health Support Network (Réseau d'appui aux mutuelles de santé– RAMS)	Partial [26]	Individual-based [26]	Based on contribution levels of contributing members (800 CFA francs [USD 1.6]) [26]	The Ministry of Social Action and Solidarity (ministère de l'Action sociale et de la Solidarité nationale – MASSN) [26]
Burundi				
Carte d'assistance médicale (CAM)	Partial [27]	Individual-based [27]	Based on the price of the medical insurance card (3000 Burundi Francs [US$ 2] per household) [27]	The Ministry of Health Partial [27]
Côte d'Ivoire				
Medical Assistance Scheme (RAM)	Full [45]	Individual-based [45]	Based on contribution levels of contributing members (4800 CFA francs per person [USD7.80] per beneficiary per year) [45]	The Government of Côte d'Ivoire [91]
Egypt				
School Health Insurance Programme (SHIP)	Partial [17]	Individual-based [17]	Based on an estimate of the expected total expenditure on healthcare costs for the program [17]	A combination of an annual premium of four Egyptian pounds (USD 1.2) per child from the parents, matched by general government revenues, a cigarette tax earmarked for the SHIP, and co-payments. [17]
Ethiopia				
Integrated Safety Net Program (ISNP)	Full [16]	Individual-based [16]	Based on regular contribution levels (ETB 100 [USD 0.8]) [16]	Ethiopian government [16]
Community-Based Health Insurance (CBHI) scheme	Full [29]	Individual-based [29]	Based on regular contribution levels (ETB 240 to ETB 360 [USD5.50 to USD 8.26] per indigent household annually) [29]	Cross-subsidisation from collected insurance premiums and subsidies from the federal-, regional- and woreda-level government funds [29]
Gabon				
Gabon Indigents Scheme (GIS)	Partial [30]	"An aggregate amount not paid according to the number of insured" [30]	Based on the contribution levels of contributing members (In 2011, annual claims spending per capita was approximately 25,000 CFA francs [USD53]) [30]	The Compulsory Health Insurance Tax (Redevance Obligatoire à l'Assurance Maladie, ROAM), a tax corresponding to 10% of turnover excluding taxes of mobile telephone companies, and 1.5% of the amounts excluding taxes of money transfer out of the Economic and Monetary Community of Central Africa (CEMAC) zone [30]

Table 5 (continued)

Country & Subsidization Programme	Level of subsidization	Transfer mechanism of subsidy	Calculation logic of subsidy	Financing source of subsidy
Ghana				
National Health Insurance Scheme (NHIS)	Full [54]	Individual-based [52]	Based on regular contribution levels (exact amount unavailable) [51]	The National Health Insurance Levy (NHIL), Social Security and National Insurance Trust (SSNIT) deductions, premium payments by informal sector members, fees charged by the Authority and development partners. [13]
Kenya				
Linda Mama (The Free Maternity Services) Programme	Full (Orangi et al., 2021)	Individual-based [32]	Based on contribution levels of contributing members (KES 500 [USD 3.5]) [18]	The Government of Kenya (GOK), World Bank and the Japanese International Cooperation Agency [19, 92]
Health Insurance for the Elderly and People with Severe Disabilities Program	Full [32]	Individual-based [32]	Based on contribution levels of contributing members (KES 500 [USD 3.5]) [32]	The GoK [32]
Health Insurance Subsidy Program (HISP)	Full [58]	Individual-based [32]	Based on contribution levels of contributing members (KES 500 [USD 3.5]) [58]	The World Bank Group, JICA and the Government of Kenya (GoK) [32]
Secondary School Medical Scheme (EduAfya)	Full [56]	Individual-based [32]	KES1350 (USD 10) per student, per year [92]	The GoK [32]
Mali				
Régime d'Assistance Médicale (RAMED)	Full [33]	Individual-based [33]	Not clear	The government of Mali [33]
Morocco				
Régime d'Assistance Médicale (RAMED)	Full for the poor and partial for the 'vulnerable' [60]	Individual-based [60]	Based on regular contribution levels (an annual per capita contribution of DH 120 [US$12]) [60]	"The individual contributions of vulnerable beneficiaries (an annual per capita contribution of DH 120 [US$12] with a cap of DH 600 [US$60]) per household, local governments (an annual contribution of DH 40 [US$4] per poor individual living in their catchment area), and the general budget [60]
Nigeria				
Free Maternal and Child Health program (FMCHP)	Full [35]	Individual-based [35]	Based on contribution levels of contributing members (₦50000 to ₦150000 [USD120 to USD360) [35]	The focal states and the federal government of Nigeria [35]
Rwanda				
Mutuelles de santé (Mutuelles)	Full [36]	Individual-based [93]	Based on premium stratification according to income and assets [80]	The GoR and Donors [94]
Senegal				
la Couverture Maladie Universelle	Full [14]	Individual-based [14]	Based on premium stratification according to income and assets [14]	The Senegalese government [14]
Programme National de Bourses de Sécurité Familiale (PNBSF)	Full [10]	Individual-based [10]	Based on premium stratification according to income and assets [10]	The Senegalese government [10]
Tanzania				
Tumaini la Mama	Full [37]	Individual-based [37]	Based on contribution levels of contributing members (6% of an employee's monthly salary) [95]	The German Development Bank: KfW and Tanzania's NHIF [37]
Tunisia				
Free Medical Assistance for the Poor (FMAP)	Full for the poor and partial for the vulnerable [38]	Individual-based with regional quotas applied to determine the number of beneficiaries [38, 39]	Based on contribution levels of contributing members (10 Tunisian dinars [USD 3]) per month [38]	Central government of Tunisia [38]

Table 5 (continued)

Country & Subsidization Programme	Level of subsidization	Transfer mechanism of subsidy	Calculation logic of subsidy	Financing source of subsidy
Medical Assistance Schemes (MAS)	Full in the "Free Medical Cards" scheme and partial in the 'Reduced-Fee Plan' [39]	Individual-based with regional quotas applied to determine the number of beneficiaries [39]	Based on the cost of healthcare services in the public sector [39]	The Ministry of Social Affairs [39]
Zambia				
National Health Insurance Scheme (NHIS)	Full [40]	Individual-based [40]	Based on contribution levels of contributing members (1% of their declared monthly income, with a minimum contribution of 60 Zambian Kwacha (ZMW) [USD 4] per month) [40]	The government of Zambia. However, "there are currently no committed financial resources to finance the poor through the NHIS" [40]

from the funding agent to the purchasing body. This approach is driven by the source of funding: the Ministry of Finance earmarks revenue from taxes levied on mobile phone companies and money transfer services for healthcare. The total amount collected is periodically transferred to the National Health Insurance and Social Coverage Fund (NHISCF), which acts as the purchasing agency for the GIS. The NHISCF then reimburses healthcare providers for services delivered to GIS beneficiaries through its regional offices [30].

Other countries, including Benin, Egypt, and Ghana, also relied on earmarked funding sources for their HISPs [13, 17, 25]. In Ghana, for instance, 74% of the National Health Insurance Fund is financed through the National Health Insurance Levy-a 2.5% Value Added Tax-while 20% comes from 2.5% of the contributions made by formal sector workers to the Social Security and National Insurance Trust (SSNIT) [54]. Similarly, Egypt's SHIP was financed through a blend of parent premiums, general tax revenue, and a dedicated cigarette tax, while Gabon's GIS relied on levies from mobile phone and money transfer services [17, 30]. In contrast, Zambia lacks a committed source of funding for subsidising the poor through its NHIS. This absence of dedicated financing poses a risk of underfunding or non-implementation of subsidies altogether [40] (Table 4).

In several countries, poor planning and unresolved funding gaps have undermined the financial sustainability of HISPs and limited their capacity to offer adequate financial protection. In Burkina Faso's AMBC, for instance, offering partial premium subsidies led to adverse selection, as higher-risk individuals, though poor, were more likely to enrol in the voluntary programme. This created financial strain on the community-based insurance schemes and highlighting the importance of anticipating such unintended effects when designing financing arrangements. Providing full subsidies may be a more effective alternative in such cases [20]. Similarly, in Burundi's CAM and Egypt's SHIP, the failure of governments to allocate sufficient and increasing resources over time to match rising programme costs posed a threat to the sustainability of these schemes [17, 27] (Table 5).

Pooling arrangements across HISPs

Table 6 compares pooling arrangements of all the study HISPs, including the type of membership of contributors. Pools could be multiple or single, integrated or separate and the type of membership of contributors either mandatory or voluntary. Pooling arrangements varied significantly across the HISPs studied, with fourteen countries operating multiple risk and income pools for different population groups. This fragmentation was driven by a mix of historical, administrative, and policy factors. For instance, Tanzania maintained 27 pools-26 regional iCHF pools and one national pool under the NHIF [37]. Similarly, in Benin, RAMU remained a separate pool due to delays in legal and policy reforms necessary for integration [25]. In Kenya, although there are four HISPs, pooling is split into three distinct arrangements: Linda Mama, HIEPLWSD and the EduAfya schemes are integrated into the NHIFs "SupaCover" pool, while the Health Insurance Subsidy Programme (HISP) operates its own separate pool [58]. Such fragmentation increases administrative complexity, limits cross-subsidisation between high- and low-risk groups and can result in inefficiencies that weaken financial protection and equity.

Among the HISPs operating in countries with multiple pools, only eleven were integrated with contributory schemes. However, in six of these cases (both HISPs in Burkina Faso, Ethiopia and Senegal respectively), the membership of contributors was voluntary, which undermines the diversity and size of the financial risk pool [10, 14, 16, 20, 26, 29]. Tunisia exemplifies the risks associated with partial integration: while FMAP is integrated into a

Table 6 Pooling arrangements

Country & Subsidization Programme	Single/multiple pool(s) for different population groups	Integrated/separate pool for the subsidized and contributors	Type of membership of contributors
Algeria			
Caisse Nationale de Sécurité Sociale des Non-Salariés (CASNOS)	Multiple [90]	Separate [90]	Mandatory [90]
Benin			
Régime d'Assurance Maladie Universelle' (RAMU)	Multiple [25]	Separate [25]	Mandatory [25]
Burkina Faso			
Assurance Maladie à Base Communautaire (AMBC)	Multiple [26, 44]	Integrated [20]	Voluntary [20]
Mutual Health Support Network (Réseau d'appui aux mutuelles de santé– RAMS)		Integrated [26]	Voluntary [26]
Burundi			
Carte d'assistance médicale (CAM)	Multiple [27]	Separate [27]	Mandatory [27]
Côte d'Ivoire			
Medical Assistance Scheme (RAM)	Multiple [91]	Separate [91]	Mandatory [91]
Egypt			
School Health Insurance Programme (SHIP)	Multiple [17]	Separate [17]	Mandatory [17]
Ethiopia			
Integrated Safety Net Program (ISNP)	Multiple [16]	Integrated [16]	Voluntary [16]
Community Based Health Insurance (CBHI) scheme		Integrated [29]	Voluntary [29]
Gabon			
Gabon Indigents Scheme (GIS)	Multiple [30]	Separate [30]	Mandatory [72]
Ghana			
National Health Insurance Scheme (NHIS)	Single [31]	Integrated in the national scheme [31]	Enrollment is mandatory by law, but there are no penalties for those not enrolled [51]
Kenya			
Linda Mama (The Free Maternity Services) Programme	Multiple: 1. The national scheme dubbed "SupaCover" forms the largest pool, encompassing contributory members, Linda Mama beneficiaries and beneficiaries of the Health Insurance for the Elderly and People with Severe Disabilities Program 2. The Civil Servants' Scheme forms the second pool, comprised of government employees. 3. The HISP beneficiaries comprise another pool. [58, 76]	Integrated in the national scheme [76]	Mandatory for formal sector workers but voluntary for informal sector workers [58]
Health Insurance for the Elderly and People with Severe Disabilities Program		Integrated in the national scheme [76]	
Health Insurance Subsidy Program (HISP)		Separate [58]	
Secondary School Medical Scheme (EduAfya)		Integrated in the national scheme [76]	
Mali			
Régime d'Assistance Médicale (RAMED)	Multiple [33]	Separate [33]	Mandatory [33]
Morocco			
Régime d'Assistance Médicale (RAMED)	Multiple [60]	Separate [60]	Mandatory [60]
Nigeria			
Free Maternal and Child Health program (FMCHP)	Single [35]	Integrated [35]	Initially voluntary, became mandatory in 2022 [78]
Rwanda			

Table 6 (continued)

Country & Subsidization Programme	Single/multiple pool(s) for different population groups	Integrated/separate pool for the subsidized and contributors	Type of membership of contributors
Mutuelles de santé (Mutuelles)	Single since 2015, previously multiple: 1. 30 district risk pools for the CBHI 2. The national risk pool which encompasses RAMA and MMI [80]	Integrated in the CBHI [99]	Mandatory by law but voluntary in practice [100]
Senegal			
la Couverture Maladie Universelle	Multiple [14]	Integrated [14]	Voluntary [10]
Programme National de Bourses de Sécurité Familiale (PNBSF)		Integrated [10]	
Tanzania			
Tumaini la Mama	Multiple: 1. NHIF 2. iCHFs [37]	Poor pregnant women and their infants are integrated into the NHIF and their family members in the respective region's CHF [37]	NHIF membership is mandatory for government employees but voluntary for informal sector workers. Membership in the CHF is voluntary [87]
Tunisia			
Free Medical Assistance for the Poor (FMAP)	Multiple [38, 39]	Integrated [38]	Mandatory [101]
Medical Assistance Schemes (MAS)		Separate [39]	
Zambia			
National Health Insurance Scheme (NHIS)	Single [40]	Integrated [40]	Mandatory [40]

pool with contributors, the MAS scheme remains separate, leaving it more vulnerable to financial shocks due to its narrower risk base [38, 39].

In contrast, a smaller group of countries-Ghana, Nigeria, Rwanda, and Zambia-had a single national pool encompassing all population groups [31, 35, 40, 80]. In these settings, contributor membership was mandated by law, contributing to larger and more diverse pools and enhancing the financial sustainability of both the HISPs and the broader national health insurance systems. However, even in these countries, enforcement of mandatory enrolment varied. For instance, while enrolment in Ghana's NHIS is compulsory by law, the absence of penalties for non-compliance has rendered it effectively voluntary [51] (Table 6).

Purchasing arrangements and benefit package design

Table 7 provides a comparative summary of the benefit package design, provider payment mechanisms, and cost-sharing arrangements across the 25 HISPs included in this study. We found that benefit package design varied across the HISPs studied, with implications for both equity and financial protection. Of the 25 schemes examined, 19 provided a comprehensive benefit package-typically including both inpatient and outpatient services-while 5 (Tunisia's two HISPs, Nigeria's FMCHP and Burkina Faso's RAMS) offered more limited coverage [14, 26, 35, 38, 39]. In 15 of the schemes, beneficiaries received the same package as contributors, supporting equity in access to services. However, in the remaining schemes, subsidised beneficiaries received a narrower range of services or faced restrictions in the facilities they could access, raising concerns about vertical inequities within health systems.

In Tunisia's FMAP for instance, the absence of specific entitlements left beneficiaries vulnerable to denial of services [38]. Similarly, Zambia's NHIS lacked clarity regarding the scope of covered services at the time of reporting, potentially undermining trust and uptake [40]. In Morocco's RAMED, subsidised members had more limited access compared to contributors, particularly in private sector settings, and faced additional gatekeeping for higher-level care [60].

Several schemes restricted access for subsidised members to public facilities only-effectively rationing care based on subsidy status. In Benin's RAMU and Tunisia's MAS, for instance, beneficiaries were confined to public sector providers, where service availability was often constrained due to underfunding. In Benin, poor service quality in public facilities discouraged enrolment, despite the legal mandate to join the scheme [25]. In Tunisia's MAS, essential services and medications were frequently

Table 7 Benefit package design and purchasing arrangements

Country & Subsidization Programme	Scope of benefit package		Provider payment methods	Degree of cost-sharing by beneficiaries
	Services covered	Compared to regularly insured population		
Algeria				
Caisse Nationale de Sécurité Sociale des Non-Salariés (CASNOS)	Comprehensive [96]	Less than the National Social Insurance Fund for Employees (CNAS) [96]	Reimbursement [24]	Copayment of 20% of the cost of service but there is no copayment for "difficult childbirth, family planning, incubation of newborns, blood and plasma transfusions, costs over a certain limit, and if the insured has an approved chronic disease, is an old-age, disability, or survivor pensioners with monthly incomes below the legal monthly minimum wage." [96]
Benin				
Régime d'Assurance Maladie Universelle' (RAMU)	Comprehensive [25]	Less - restricted to public sector facilities [25]	Fee for service [25]	No copayment at Health centre and 20% of cost of services at hospital level except the poor [25]
Burkina Faso				
Assurance Maladie à Base Communautaire (AMBC)	Comprehensive [20]	Same [20]	Annual capitation [102]	No copayment [20]
Mutual Health Support Network (Réseau d'appui aux mutuelles de santé– RAMS)	Outpatient [26]	Same [26]	Fee-for-service [103]	A co-payment of 20% to 30% of the total amount of the services depending on the mutual covering them, except for a single mutual in Sanematenga which covered all the expenses.[26]
Burundi				
Carte d'assistance médicale (CAM)	Comprehensive [27]	Same benefit package for all [27]	Reimbursement [27]	A co-payment of 20% was introduced in 1996 [27]
Côte d'Ivoire				
Medical Assistance Scheme (RAM)	Comprehensive [45]	Same [46]	Reimbursement [91]	No copayment [45]
Egypt				
School Health Insurance Programme (SHIP)	Comprehensive [17]	Same [48]	Reimbursement [17]	No copayment [48]
Ethiopia				
Integrated Safety Net Program (ISNP)	Comprehensive [16]	Same [16]	Reimbursement [16]	No copayment [16]
Community-Based Health Insurance (CBHI) scheme	Comprehensive [29]	Same [16]	Reimbursement [16]	No copayment [16]
Gabon				
Gabon Indigents Scheme (GIS)	Comprehensive [30]	Same [30]	Fee-for-service and hospitalization days [30]	20% of cost of services for common illnesses and 10% for chronic diseases. No copayment for maternity, dialysis and cancer treatments [30]
Ghana				
National Health Insurance Scheme (NHIS)	Comprehensive [53]	Single benefit package for all [53]	Ghana Diagnosic Related Groupings (G-DRGs) financing for services and fee-for-service for medicines [104]	No co-payment only an annual registration fee for all except indigents and pregnant women [51]

Table 7 (continued)

Country & Subsidization Programme	Scope of benefit package		Provider payment methods	Degree of cost-sharing by beneficiaries
	Services covered	Compared to regularly insured population		
Kenya				
Linda Mama (The Free Maternity Services) Programme	Comprehensive [18]	Same to the maternity benefits under the national scheme [57, 76]	Reimbursement through predetermined case-based and fee-for-service rates [18]	None [18]
Health Insurance for the Elderly and People with Severe Disabilities Program	Comprehensive [32]	Same to the national scheme but less than the enhanced schemes [57, 76]	Capitation, case-based payments, fee for service and rebates (per diem) [57]	None [76]
Health Insurance Subsidy Program (HISP)	Comprehensive [58]			
Secondary School Medical Scheme (EduAfya)	Comprehensive [59]			
Mali				
Régime d'Assistance Médicale (RAMED)	Comprehensive [33]	Equivalent to that received by beneficiaries of the AMO, excluding the cost of speciality medicine [33]	Not reported	Not clear
Morocco				
Régime d'Assistance Médicale (RAMED)	Comprehensive [60]	Less than the Assurance Maladie Obligatoire (AMO) – lack of access to care in private hospitals and gatekeeping of secondary and tertiary hospitals applies to RAMED beneficiaries only [60]	ANAM does not yet purchase health care services and is not yet a full-fledged purchasing agency" [60]	None [60]
Nigeria				
Free Maternal and Child Health program (FMCHP)	Outpatient services at primary healthcare centres [35]	Same [35]	Capitation and fee-for-service [35]	None [35]
Rwanda				
Mutuelles de santé (Mutuelles)	Comprehensive [105]	Single benefit package for all CBHI members [94]	Capitation and fee-for-service payments [80]	None [93]
Senegal				
la Couverture Maladie Universelle	Outpatient (only essential healthcare services) [14]	Less [14]	Not reported	None [14]
Programme National de Bourses de Sécurité Familiale (PNBSF)	Comprehensive [10]	Same to that of other CBHI members [10]	Not reported	None [10]
Tanzania				
Tumaini la Mama	Comprehensive [95]	Pregnant women's benefit package is that of the NHIF and the family members' is that of the respective region's CHFs [87, 95]	Reimbursed fee-for-service for the NHIF and capitation for the CHF [95]	None [87]
Tunisia				
Free Medical Assistance for the Poor (FMAP)	"The FMAP does not include a specific benefits package for beneficiaries" [38]	Not applicable as "FMAP does not include a specific benefits package for beneficiaries" [38]	Reimbursement [38]	No copayments for beneficiaries of free healthcare but "Patients with a reduced tariffs card must pay a copayment (ticket modérateur) for hospital visits" [38]

Table 7 (continued)

Country & Subsidization Programme	Scope of benefit package		Provider payment methods	Degree of cost-sharing by beneficiaries
	Services covered	Compared to regularly insured population		
Medical Assistance Schemes (MAS)	Not clear – "public sector healthcare services" [39]	Less than the formal mandatory insurance (MHI) and limited to only the public sector [39]	Reimbursement [39]	None [39]
Zambia				
National Health Insurance Scheme (NHIS)	Comprehensive [106]	Single benefit package for all [40]	A mix of fee-for-service, case-based and Diagnosis-Related Groups [40]	No co-payments [40]

unavailable, compromising the intended protection for low-income groups [39].

Cost-sharing arrangements also varied and had important implications for financial protection. Most HISPs exempted subsidised members from copayments entirely. However, some, such as Algeria's CASNOS and Gabon's GIS, required copayments of 20% for general services, though exemptions were made for specific categories such as maternity care or chronic illness. Burkina Faso's RAMS imposed copayments ranging from 20% to 30%, depending on the mutual (community-based health insurance group) [26]. These out-of-pocket payments at the point of service can undermine equity by deterring use among the poor, even when they are formally insured.

Provider payment mechanisms ranged from capitation and case-based payments to fee-for-service and reimbursement. These mechanisms were not always aligned with benefit package design. For example, Ghana's NHIS used a mixed model-Diagnosis Related Groups (DRGs) for services and fee-for-service for medicines-while Kenya applied case-based reimbursement and fee-for-service under Linda Mama [18, 104]. The variation in payment design reflects differing priorities regarding provider incentives and expenditure control.

Financial protection

Table 8 presents trends in financial protection and service utilization indicators in countries that implemented Health Insurance Subsidy Programmes (HISPs). Specifically, it summarizes changes in out-of-pocket (OOP) expenditure as a share of current health expenditure, the incidence of catastrophic and impoverishing health spending, and the UHC service coverage index as a proxy for healthcare utilization. However, it is important to note that changes in financial protection and healthcare utilization reflect multiple contributing factors, with the introduction of HISPs representing only one of them. Available data indicate that OOP expenditure declined in thirteen of the study countries within the timeframe covered by their HISPs. However, data on catastrophic and impoverishing expenditure were mixed–a positive pattern was observed across all countries in terms of healthcare utilization (Table 8).

Discussion

The objective of this study was to describe the institutional design features of HISPs in Africa and their contribution to progress towards UHC in the respective countries. The design of the HISP included the eligibility and enrolment rules, targeting approaches, financial arrangements, purchasing and benefits package design. We found some notable institutional design features of the HISPs in the eighteen African countries studied that have plausibly facilitated financial risk protection of vulnerable groups in the respective countries. These include the targeting of indigents, full subsidization of beneficiaries, funding of HISPs by national governments and the provision of a comprehensive benefits package by most HISPs studied. Certain institutional design features were also identified as limiting the effectiveness of the programs, such as overreliance on indirect targeting approaches, fragmentation of income and risk pools, and the voluntary nature of membership for both HISP beneficiaries and contributors in health insurance schemes. These design features were examined in relation to the key goals of Universal Health Coverage-namely, promoting equity in access to healthcare, ensuring financial protection, and expanding service coverage.

A key marker of equity is the extent to which access to healthcare is based on need rather than the ability to pay. In this regard, many of the HISPs reviewed made deliberate efforts to prioritise indigent populations. In ten countries, including Rwanda, Kenya, Gabon, Côte d'Ivoire, and Tunisia, the schemes were designed to explicitly target the indigent, reflecting a shared understanding of this group's disproportionate vulnerability in accessing healthcare [2].

However, the effectiveness of these targeting mechanisms varied depending on the method used. While categorical targeting was administratively straightforward, it often resulted in significant inclusion errors. Proxy means testing and community validation approaches,

Table 8 Financial protection

Country, Health Insurance Subsidy Programme & Year of Introduction	Change in OOP as a share of current health expenditure since the year the HISP was introduced	Incidence of catastrophic expenditure (at a 10% threshold unless otherwise stated)	Incidence of impoverishing expenditure (Population pushed below the $3.65 a day poverty line by household health expenditures)	Changes in utilization rates of health care services after introduction of subsidization scheme
Algeria				
Caisse Nationale de Sécurité Sociale des Non-Salariés (CASNOS) (1983)	12.74% increase (25.79% to 38.53%) (2000–2021) [71]	Not reported	Not reported	UHC service coverage index increased from 56 to 74 (2000–2021) [107]
Benin				
Régime d'Assurance Maladie Universelle' (RAMU) (2018)	3.06% increase (45.57% to 48.63%) (2018–2021) [71]	11.11% – 2003 6.67% – 2011 5.55% – 2015 15% – 2018 [108]	1.76% – 2003 1.31% – 2011 0.91% – 2015 3.88% – 2018 [109]	UHC service coverage index increased from 21 to 38 (2000–2021) [107]
Burkina Faso				
1. Assurance Maladie à Base Communautaire (AMBC) (2007) 2. Mutual Health Support Network (Réseau d'appui aux mutuelles de santé– RAMS) (2012)	7.26% increase (27.39% to 34.65%) (2007–2021) [71]	10.98% – 1998 8.46% – 2003 3.52% – 2009 3.13% – 2014 8.37% – 2018 [108]	0.85% – 1998 0.99% – 2003 0.83% – 2009 0.93% – 2014 2.35% – 2018 [109]	UHC service coverage index increased from 15 to 40 (2000–2021) [107]
Burundi				
Carte d'assistance médicale (CAM) (1984)	35.78% decrease (61.14% to 25.36%) (2000–2021) [71]	2% – 1998 12.46% – 2006 3.29% – 2013 4.77% – 2020 [108]	0.12% – 1998 1.17% – 2006 0.58% – 2013 [109]	UHC service coverage index increased from 19 to 41 (2000–2021) [107]
Côte d'Ivoire				
Medical Assistance Scheme (RAM) (2014)	18.8% decrease (51.14% to 32.34%) (2014–2021) [71]	17.77% – 1985 16.77% – 1986 11.29% – 1987 12.31% – 1988 13.24% – 1992 19.77% – 1998 18.47% – 2002 17.44% – 2008 12.43% – 2014 8.33% – 2018 [108]	3.51% – 1985 2.45% – 1986 3.22% – 1987 4,38% – 1988 3.03% – 1992 2.95% – 1998 3.01% – 2002 3.25% – 2008 2.58% – 2014 2.46% – 2018 [108]	UHC service coverage index increased from 22 to 43 (2000–2021) [107]
Egypt				

Table 8 (continued)

Country, Health Insurance Subsidy Programme & Year of Introduction	Change in OOP as a share of current health expenditure since the year the HISP was introduced	Incidence of catastrophic expenditure (at a 10% threshold unless otherwise stated)	Incidence of impoverishing expenditure (Population pushed below the $3.65 a day poverty line by household health expenditures)	Changes in utilization rates of health care services after introduction of subsidization scheme
School Health Insurance Programme (SHIP) (1992)	7.59% decrease (62.49% to 54.9%) (2000–2021) [71]	7.66% – 1997 12.57% – 2008 26.2% – 2012 31.22% – 2015 31.14% – 2017 [108]	3.28% – 2008 6.66% – 2012 6.16% – 2015 6.54% – 2017 [108]	UHC service coverage index increased from 50 to 70 (2000–2021) [107]
Ethiopia				
1. Integrated Safety Net Program (ISNP) (2005) 2. Community Based Health Insurance (CBHI) scheme (2011)	5.66% increase (31.34% to 37%) (2005–2021) [71]	1.58% – 1999 0.82% – 2004 1.88% – 2011 2.12% – 2015 3.48% – 2018 [108]	0.31% – 1999 0.28% – 2004 0.42% – 2011 1.01% – 2015 [108]	UHC service coverage index increased from 13 to 35 (2000–2021) [107]
Gabon				
Gabon Indigents Scheme (GIS) (2007)	28.76% decrease (50.53% to 21.77%) (2007–2021) [71]	5.67% – 2005 3.83% – 2017 [108]	1.05% – 2005 0.83% – 2017 [108]	UHC service coverage index increased from 28 to 49 (2000–2021) [107]
Ghana				
National Health Insurance Scheme (NHIS) (2004)	20.75% decrease (48% to 27.25%) (2004–2021) [71]	4.73% – 1991 5.97% – 1998 3.11% – 2005 1.48% – 2012 1.33% – 2016 [108]	0.54% – 2016 [108]	UHC service coverage index increased from 24 to 48 (2000–2021) [107]
Kenya				
1. Linda Mama (The Free Maternity Services) Programme (2013) 2. Health Insurance for the Elderly and People with Severe Disabilities Program (2014) 3. Health Insurance Subsidy Program (HISP) (2014) 4. Secondary School Medical Scheme (EduAfya) (2018)	9.36% decrease (32.13% to 22.77%) (2013–2021) [71]	5.55% – 2005 5.19% – 2015 [108]	1.23% – 2005 1.23% – 2015 [108]	UHC service coverage index increased from 44 to 53 (2010–2021) [107]
Mali				

Table 8 (continued)

Country, Health Insurance Subsidy Programme & Year of Introduction	Change in OOP as a share of current health expenditure since the year the HISP was introduced	Incidence of catastrophic expenditure (at a 10% threshold unless otherwise stated)	Incidence of impoverishing expenditure (Population pushed below the $3.65 a day poverty line by household health expenditures)	Changes in utilization rates of health care services after introduction of subsidization scheme
Régime d'Assistance Médicale (RAMED) (2011)	15.91% decrease (50% to 34.09%) (2011–2021) [71]	7.02% – 1994 3.38% – 2006 4.41% – 2009 2.56% – 2011 3.46% – 2014 2.13% – 2015 1.95% – 2016 1.51% – 2017 2.06% – 2018 1.8% – 2019 1.7% – 2021 [108]	0.41% – 1994 1.06% – 2006 0.83% – 2009 1.2% – 2011 0.97% – 2015 [108]	UHC service coverage index increased from 20 to 41 (2000–2021) [107]
Morocco				
Régime d'Assistance Médicale (RAMED) (2018)	2.23% decrease (46.99% to 44.76%) (2018–2021) [71]	4.15% – 1998 11.5% – 2000 22% – 2006 13.4% – 2013 8.2% – 2019 [108]	1.4% – 1998 2.28% – 2000 3.42% – 2006 4.48% – 2013 [108]	UHC service coverage index increased from 41 to 69 (2000–2021) [107]
Nigeria				
Free Maternal and Child Health program (FMCHP) (2009)	1.77% increase (74.47% to 76.24%) (2009–2021) [71]	22.53% – 2003 24.77% – 2009 18.87% – 2010 16.88% – 2012 18.53% – 2015 15.79% – 2018 [108]	4.22% – 2003 3.68% – 2009 3.6% – 2010 3.44% – 2012 1.41% – 2018 [108]	UHC service coverage index increased from 20 to 38 (2000–2021) [107]
Rwanda				
Mutuelles de santé (Mutuelles) (2007)	2.37% decrease (12.5% to 10.13%) (2007–2021) [71]	8.44% – 2000 2.35% – 2005 1.63% – 2013 1.15% – 2016 [108]	0.39% – 2000 0.27% – 2005 0.24% – 2013 0.21% – 2016 [108]	UHC service coverage index increased from 26 to 49 (2005–2021) [107]
Senegal				
1. la Couverture Maladie Universelle (2014) 2. Programme National de Bourses de Sécurité Familiale (PNBSF) (2013)	7.93% decrease (55.24% to 47.31%) (2013–2021) [71]	1.6% – 2001 1.38% – 2005 3.33% – 2011 6.86% – 2018 [108]	0.68% – 2001 1.31% – 2005 0.83% – 2011 2.65% – 2018 [108]	UHC service coverage index increased from 21 to 50 (2000–2021) [107]
Tanzania				

Table 8 (continued)

Country, Health Insurance Subsidy Programme & Year of Introduction	Change in OOP as a share of current health expenditure since the year the HISP was introduced	Incidence of catastrophic expenditure (at a 10% threshold unless otherwise stated)	Incidence of impoverishing expenditure (Population pushed below the $3.65 a day poverty line by household health expenditures)	Changes in utilization rates of health care services after introduction of subsidization scheme
Tumaini la Mama (2010)	7.93% decrease (55.24% to 47.31%) (2010–2021) [71]	(At 40% threshold) 18% – 2014 7.1% – 2024) [110, 111]	Not reported	UHC service coverage index increased from 33 to 43 (2010–2021) [107]
Tunisia				
1. Free Medical Assistance for the Poor (FMAP) (1998) 2. Medical Assistance Schemes (MAS) (1991)	4.89% decrease (38.63% to 33.74%) (2000–2021) [71]	16.33% – 1995 22.54% – 2000 21.91% – 2005 16.69% – 2010 16.74% – 2015 [108]	2.28% – 1995 3.49% – 2000 2.7% – 2005 1.25% – 2010 0.47% – 2015 [108]	UHC service coverage index increased from 44 to 67 (2000–2021) [107]
Zambia				
National Health Insurance Scheme (NHIS) (2019)	0.17% decrease (7.25% to 7.08%) (2019–2021) [71]	4.96% – 1996 2.79% – 2004 1.85% – 2006 0.29% – 2010 0.28% – 2015 [108]	4.87% – 2017 [108]	UHC service coverage index increased from 28 to 56 (2000–2021) [107]

which were used in a smaller number of countries, offered more precision but introduced implementation complexity and costs. For example, in Côte d'Ivoire, only 2% of HISP beneficiaries were among the extremely poor-the intended target group-illustrating the shortcomings of flawed identification systems [70]. In Ghana, a restrictive legal definition of indigence constrained enrolment among the poor unless local implementers exercised discretion. Income-testing methods have been shown to be plagued with high exclusion errors in social protection programs in different parts of the world. These limitations are not unique to health insurance programs: a global review of social protection programs found that most poverty-targeted schemes miss between 50 and 80% of their intended beneficiaries, with exclusion errors especially high in programs relying on proxy means tests or income-based targeting. Where the aim is to cover the poor, universal selection is preferrable as it minimises exclusion errors. Where the goal is to reach the poor, universal or near-universal approaches have been found to perform better in minimizing exclusion and promoting equity [112].

Pooling arrangements also influenced equity outcomes. In countries with multiple or fragmented pools, such as Tanzania and Kenya, opportunities for cross-subsidisation were limited, reinforcing inequities and undermining efficiency [37, 58]. In Tunisia, the Free Medical Assistance for the Poor (FMAP) was integrated with contributors, but the Medical Assistance Schemes (MAS) remained separate, exposing the latter to greater financial vulnerability [38, 39]. In contrast, countries such as Ghana, Rwanda, and Zambia implemented single, integrated risk pools that facilitated redistribution and financial solidarity between population groups [31, 40, 80]. These examples demonstrate that integrated pooling structures, particularly when combined with mandatory membership for contributors, are more likely to support equitable outcomes.

In terms of financial protection, thirteen of the countries experienced a reduction in out-of-pocket (OOP) expenditure as a share of current health expenditure following the introduction of HISPs. Countries with relatively large-scale indigent-targeted schemes-such as Rwanda, Kenya, Mali, and Gabon-also reported reductions in the incidence of catastrophic and impoverishing health expenditures. These improvements suggest that where HISPs were adequately resourced, well targeted, and aligned with broader health system reforms, they contributed meaningfully to shielding poor households from the financial consequences of seeking care.

However, this was not universally the case. In Ethiopia, for example, OOP expenditure and the incidence of catastrophic spending continued to rise, despite the existence of two HISPs [108, 113]. This may be attributed to the

small scale of the programmes relative to the country's population and health system needs. Similarly, in Burkina Faso, Senegal, and Tunisia, the findings were mixed and did not demonstrate a clear protective effect [108, 113]. In some cases, limited subsidisation also undermined financial protection. Partial subsidies, as seen in Burkina Faso's AMBC, increased the risk of adverse selection by discouraging healthier individuals from enrolling. Since individuals were required to pay a portion of the premium, those with a higher perceived need for healthcare were more likely to enrol, leading to a disproportionate concentration of high-risk beneficiaries in the scheme. similarly, co-payments in schemes like Gabon's GIS and Algeria's CASNOS placed financial strain on already vulnerable groups [20, 24, 30]. Even when exemptions were officially in place, inconsistent implementation often left beneficiaries exposed. Conversely, schemes that provided full subsidies and eliminated cost-sharing at the point of use-such as Kenya's Linda Mama, Ghana's NHIS, and Rwanda's Mutuelles-were more effective in delivering financial protection [19, 52, 62].

Access to and utilisation of services was shaped by benefit package design and the scope of services covered under the HISP. Twenty of the 25 schemes provided comprehensive benefit packages that included both outpatient and inpatient care. In fifteen countries, beneficiaries received the same entitlements as contributory members, which helped to promote fairness. However, in some contexts, subsidised beneficiaries were entitled to a more limited set of services or faced restrictions in where they could access care. In Tunisia's MAS and Benin's RAMU, for example, access was restricted to public sector facilities, which were often under-resourced and poorly equipped. In Benin, this led to dissatisfaction and declining enrolment despite the legal mandate to join the scheme [25, 38]. Similarly, Tunisia's FMAP lacked a clearly defined benefit package, placing beneficiaries at risk of being denied essential services [38]. In contrast, countries that ensured uniform benefit packages, unrestricted provider access, and strong provider payment systems-such as Ghana, Rwanda, and Zambia-demonstrated better performance in expanding service use [40, 53, 105].

The UHC service coverage index, used here as a proxy for utilisation, improved in all study countries following the introduction of their respective HISPs. This trend suggests a general increase in access to essential health services, although the scale and speed of improvement varied by country. In countries where HISPs were implemented as part of broader health financing and delivery reforms, such as in Ghana and Rwanda, the improvements were more substantial [31, 99]. However, service utilisation gains were also contingent on the readiness of health systems to absorb increased demand-underscoring the importance of aligning financial protection reforms with supply-side capacity.

Supply-side capacity is concerned with the production of health care services (supply) while demand-side is concerned with addressing economic and other barriers individuals may have to accessing care (demand) [114]. HISPs are generally demand-side interventions as they seek to remove financial barriers to access to healthcare. However, a focus on demand-side interventions without a corresponding strengthening of supply-side capacity hampers progress towards UHC. This was the case with Benin's RAMU and Tunisia's RAMU, where beneficiaries only had access to relatively low quality healthcare services in public sector facilities [25, 38]. Supply-side capacity can be strengthened through improvement of the quality, accessibility and attractiveness of healthcare services offered [114].

These findings highlight the importance of institutional design in shaping UHC progress. Countries that achieved more favourable outcomes across the three UHC dimensions shared common features: well-targeted and inclusive eligibility rules, integrated risk pools, predictable and diversified funding sources, comprehensive and uniform benefit packages, and minimal cost-sharing. Where these elements were lacking or weakly implemented, progress was limited or uneven. While institutional design is not the only factor influencing UHC outcomes-political commitment, health system readiness, and economic context also matter-it remains foundational. Aligning HISPs with broader health financing reforms and ensuring coherence across the functions of revenue collection, pooling, and purchasing are essential to advancing equitable, efficient, and sustainable health coverage.

Strengths and limitations

A key strength of this review is its structured comparative analysis of HISPs across 25 African countries using a framework grounded in WHOs health financing functions and UHC goals. This approach enables a nuanced understanding of how design features such as targeting, pooling, and benefit packages influence outcomes related to equity, financial protection, and service utilisation.

However, the review has three main limitations. First, it relies solely on secondary data, and in several cases, the data were incomplete or inconsistently reported across countries-particularly in relation to enrolment figures, targeting accuracy, and financial protection outcomes. Second, while the review identifies associations between HISP design and UHC progress, it does not establish causality, as other health system and contextual factors may also have influenced observed outcomes. Thirdly, the literature search was limited to English-language sources due to resource constraints. This restriction may have led to underrepresentation of evidence from francophone

countries, where substantial documentation on health insurance and social protection schemes exists in French. Consequently, observed gaps in reporting for some countries may reflect language-related publication bias rather than a lack of available information.

Conclusion

This review of Health Insurance Subsidy Programmes (HISPs) in Africa underscores the critical role of institutional design in advancing Universal Health Coverage (UHC). While most countries recorded some improvement in population coverage, financial protection, and service utilisation following the introduction of HISPs, the magnitude and consistency of these gains were largely shaped by how the programmes were structured and implemented. Schemes that featured inclusive targeting, comprehensive and equitable benefit packages, integration into broader risk pools, and sustained public financing were more likely to deliver on UHC goals. Conversely, fragmentation, underfunding, and limited entitlements weakened impact and reinforced inequities. These findings reaffirm that HISPs, when thoughtfully designed and embedded within coherent health financing systems, can be powerful tools for expanding coverage to vulnerable populations and strengthening the foundations of equitable health systems. Improvement of these institutional design features or adoption of features conducive to progress towards UHC in their place is recommended. An incremental approach may be used where there is limited fiscal space.

Further research should evaluate the implementation of HISP institutional design features. There is a need to assess the impact of individual HISPs on the financial protection and utilization rates of the target population groups. For individualised recommendations, further research should explore the practical context-specific steps HISPs can take to enhance their contribution towards UHC, including appropriate actuarial and feasibility studies.

Policy recommendations

1. HISPs should clearly specify the groups they aim to cover-particularly indigent and vulnerable populations-and adopt targeting approaches suited to the country's data and administrative context. For instance, poverty can be defined based on income or expenditure thresholds, and where feasible, a verified means test should be used. In contexts where data systems are limited, proxy means testing can be adopted as an alternative.
2. Because of contextual factors, targeting methods should be transparent, practical, and piloted before full-scale implementation. Combining different approaches-such as proxy means testing followed by local verification-can enhance accuracy. Countries should also establish appeal mechanisms to allow for redress in cases of exclusion or erroneous inclusion. Continuous monitoring and evaluation of targeting and enrolment processes is essential to refine and improve performance over time.
3. To reduce fragmentation and enhance equity, HISPs should be embedded in single national health insurance schemes. Countries with multiple pools should work toward consolidation. A single, mandatory national pool increases the size and diversity of the risk pool, enabling better cross-subsidisation between population groups. Enforcement of mandatory enrolment-supported by penalties for non-compliance-is necessary to prevent adverse selection and ensure financial sustainability.
4. All members, including subsidised beneficiaries, should receive a uniform, comprehensive benefit package that includes both inpatient and outpatient services. Clearly communicating these entitlements to the public is crucial for promoting equity and ensuring transparency in service delivery.
5. HISPs should offer full premium subsidies to eligible beneficiaries. Even minimal beneficiary contributions or co-payments at the point of service can deter care-seeking among the poor and vulnerable. Removing these financial barriers is essential for achieving equitable access and meaningful financial protection.
6. Governments should earmark funds specifically for health insurance subsidies, with allocations based on the number of individuals to be covered and associated administrative costs. Funding projections should account for expected population growth and inflation in healthcare costs to ensure long-term sustainability.
7. Overcoming demand-side barriers through HISPs must be complemented by improvements in service availability. Policymakers should ensure that essential health services are accessible, of good quality, and adequately staffed and equipped. Without addressing supply-side constraints, gains in insurance coverage may not translate into real improvements in access or health outcomes.

Appendix I: Representative Database Search String

PubMed Search String

(Concept 1 – Health insurance subsidy programs) Insurance, Health"[Mesh] OR "health insurance subsid*" OR "health insur*" OR "Subsidized health insur*" OR "universal health insur*" OR "mandatory health insur*"

OR "premium exempt*" OR exempt* OR subsid* OR zero-premium*

AND

(Concept 2 – Institutional design features)

Eligib* OR vulnerab* OR "Beneficiary identif*" OR beneficiar* OR "Poverty"[Mesh] OR indigent* OR poor OR poverty OR "low income" OR "low-income" OR "low-income household" OR "low-income famil*" OR pregnant OR elder* OR disab* OR orphan* OR child* OR "inclusion error*" OR "exclusion error*" OR informal OR "informal sector" OR "informal sector worker*" OR target* OR "universal target*" OR "direct target*" OR "indirect target*" OR "categorical target*" OR "geographic target*" OR "community-based target*" OR "means test*" OR "means-test" OR "proxy means test*" OR "demographic target*" OR enrol* or member* OR "Health insurance premium*" OR premium* OR financ* OR sourc* OR earmark* OR contribut* OR Pool OR fund* OR cross-subsid* OR fragment* OR "Benefit packag*" OR co-insur* OR co-pay* OR provider-payment* OR fee-for-service OR "fee for service" OR capitation OR case-based OR rebate* OR "diagnostic related group*" OR portab* OR empanel*

AND

(Concept 3 – Africa)

Africa[MH] OR Algeria[TIAB] OR Angola[TIAB] OR Benin[TIAB] OR Botswana[TIAB] OR Burkina[TIAB] OR "Upper Volta"[TIAB] OR Burundi[TIAB] OR Urundi[TIAB] OR Cameroon[TIAB] OR Cameroons[TIAB] OR "Cape Verde"[TIAB] OR "Cabo Verde"[TIAB] "Central African Republic"[TIAB] OR Chad[TIAB] OR Comoros[TIAB] OR "Comoro Islands"[TIAB] OR Comores[TIAB] OR Congo[TIAB] OR DRC[TIAB] OR Zaire[TIAB] OR "Cote d'Ivoire"[TIAB] OR "Ivory Coast"[TIAB] OR Djibouti[TIAB] OR Obock[TIAB] OR "French Somaliland"[TIAB] OR Egypt[TIAB] OR Eritrea[TIAB] OR Eswatini[TIAB] OR Ethiopia[TIAB] OR Gabon[TIAB] OR "Gabonese Republic"[TIAB] OR Gambia[TIAB] OR Ghana[TIAB] OR "Gold Coast"[TIAB] OR Guinea[TIAB] OR Guinea-Bissau[TIAB] OR Kenya[TIAB] OR Lesotho[TIAB] OR Basutoland[TIAB] OR Liberia[TIAB] OR Libya[TIAB] OR Madagascar[TIAB] OR "Malagasy Republic"[TIAB] OR Malawi[TIAB] OR Nyasaland[TIAB] OR Mali[TIAB] OR Mauritania[TIAB] OR Mauritius[TIAB] OR Morocco[TIAB] OR Mozambique[TIAB] OR Namibia[TIAB] OR Niger[TIAB] OR Nigeria[TIAB] OR Rwanda[TIAB] OR RuandaUrundi[TIAB] OR "Sao Tome and Principe"[TIAB] OR Seychelles[TIAB] OR Senegal[TIAB] OR "Sierra Leone"[TIAB] OR Somalia[TIAB] OR "South Africa"[TIAB] OR Sudan[TIAB] OR Swaziland[TIAB] OR Tanzania[TIAB] OR Togo[TIAB] OR "Togolese Republic" OR Tunisia[TIAB] OR Uganda[TIAB] OR Zambia[TIAB] OR Zimbabwe[TIAB] OR Rhodesia[TIAB]

Search run on 11th October 2024 with the filter: years 2000 to date.

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Author contributions
BM and EB conceptualised and designed the study. AW and BM analysed the data. AW drafted the work, and BM and EB provided substantive revisions. All authors reviewed and approved the submitted version.

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Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

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The authors declare no competing interests.

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