Health insurance systems in five Sub-Saharan African countries: Medicine benefits and data for decision making ☆

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ABSTRACT

Medicine benefits through health insurance programs have the potential to improve access to and promote more more effective use of affordable, high quality medicines. Information is lacking about medicine benefits provided by health insurance programs in Sub-Saharan Africa. We describe the structure of medicine benefits and data routinely available for decision-making in 33 health insurance programs in Ghana, Kenya, Nigeria, Tanzania and Uganda.

Most programs surveyed were private, for profit schemes covering voluntary enrollees, mostly in urban areas. Almost all provide both inpatient and outpatient medicine benefits, with members sharing the cost of medicines in all programs. Some programs use strategies that are common in high-income countries to manage the medicine benefits, such as formularies, generics policies, reimbursement limits, or price negotiation. Basic data to monitor performance in delivering medicine benefits are available in most programs, but key data elements and the resources needed to generate useful management information from the available data are typically missing.

Many questions remain unanswered about the design, implementation, and effects of specific medicines policies in the emerging and expanding health insurance programs in Sub-Saharan Africa. These include questions about the most effective medicines policy choices, given different corporate and organizational structures and resources; impacts of specific benefit designs on quality and affordability of care and health outcomes; and ways to facilitate use of routine data for monitoring. Technical capacity building, strong government commitment, and international donor support will be needed to realize the benefits of medicines coverage in emerging and expanding health insurance programs in Sub-Saharan Africa.

1. Introduction

Health insurance is intended to reduce the financial burden of purchasing health care by pooling funds and sharing the risk of unexpected health events. Risk sharing mechanisms are particularly important in Sub-Saharan Africa where most countries dedicate insufficient resources to health care and most health care, including medicines, is financed out-of-pocket (Table 1) [1–4].

Twenty African countries (including Ghana, Kenya, Nigeria, Tanzania, and Uganda) have undertaken surveys to measure price, availability and affordability of medicines with support from the World Health Organization (WHO) and Health Action International (HAI) [5]. Medicine prices vary in and across countries, availability is low in the public sector, private sector prices are higher and patients usually pay for medicines out-of-

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Table 1
Health financing by country.

Country	Ghana		Kenya		Nigeria		Tanzania		Uganda	
Year	1995	2008	1995	2008	1995	2008	1995	2008	1995	2008
General government health expenditure (GGHE) (% of total)[a]	38.9	49.7	42.7	37.4	21.7	24.7	40.1	65.6	29.4	22.6
Private health expenditure (PvtHE) (% of total)[b]	61.1	50.3	57.3	62.6	78.3	75.3	59.9	34.4	70.6	77.4
GGHE as % of general government expenditure[c]	8.1	7.6	6.3	7.1	7.1	6.5	9.1	16.2	10.1	10.3
Social security funds as % of GGHE[d]	0.0	37.4	11.8	9.1	0.0	0.0	0.0	3.2	0.0	0.0
Private health insurance expenditure as % of PvtHE[e]	6.0	5.9	7.6	8.8	2.4	3.1	4.5	10.4	0.3	0.2
Out-of-pocket health expenditure as % of PvtHE[f]	78.9	79.3	79.3	77.3	95.0	95.8	83.5	75.0	78.9	51.0

Source: National Health Accounts, Country Health Information [4].

[a] The sum of outlays by government entities for health which includes transfer payments to households to offset medical care costs as a percent of total health expenditure in the country.

[b] The sum of outlays by private entities for health as a percent of total health expenditure in the country.

[c] The sum of outlays by government entities for health as a percent of the consolidated outlays of all levels of government.

[d] The sum of outlays on health by government-run social security institutions or national health insurance agencies as a percent of general government health expenditure.

[e] The sum of outlays by private health insurance institutions for a basket of benefits provided to contractually or voluntarily enrolled beneficiaries.

[f] The sum of direct payments by households for health as a percent of private health expenditure.

pocket [5], generally 9–25 times the international reference price for the lowest-priced generic medicines and more than 20 times international reference price for originator products [6]. Strengthening health insurance programs could improve the availability and affordability of essential medicines. The WHO Regional Committee for Africa has adopted a regional health financing strategy that recommends the development of prepayment schemes to expand health insurance coverage and reduce out-of-pocket payments [3].

Many types of national, social, private, and community-based health insurance schemes [7] are emerging and expanding in Sub-Saharan Africa. Since independence, most Sub-Saharan African countries have been trying to implement Bismarckian social health insurance systems [8] that cover mostly formal sector employees with joint contributions by the employee and employer. To extend insurance coverage to the self-employed and informal sectors, private and community-based health insurance schemes (CHIS) have emerged, currently comprising over 600 community-based health insurance schemes in 11 West African countries [9]. For example, in Ivory Coast the number of functional CHIS grew from 9 in 1997 to 47 in 2006 covering more than half a million beneficiaries [9]. In Ghana, the number of CHIS grew from 2 in 1995 to 78 in 2004 [10].

Health insurance coverage can increase access to care and protect households from the detrimental economic effects of ill-health [11–14]. Health insurance schemes often provide coverage for inpatient care to mitigate sudden high financial burden due to hospitalization [15]. However, households in low and middle-income countries (LMIC) spend large proportions of out-of-pocket health care expenditures on medicines [11,12,16]. In 2002, households in low income countries that earned less than US$1 per day devoted 53% of their health care expenditures to medicines [17] and for almost half of poor households, medicines accounted for all health care spending [12]. Extending health insurance coverage to outpatient medicines could reduce out-of-pocket medicines expenses, ensure greater access to essential medicines, and provide incentives for appropriate use [18].

To provide responsive and affordable coverage for medicines, health insurance programs can employ a range of strategies to select and purchase products, design reimbursement policies, contract with providers, and manage utilization of medicines and other health care services [11,19–21]. Key tools include formularies with generics and cost-sharing policies; price negotiations with manufacturers; active purchasing of quality services from providers; and care management and improvement through targeted interventions and appropriate financial incentives [19].

One key to successful medicine benefit management is routine monitoring of medicines utilization and costs, using data that health insurance programs routinely have about their enrollees, health service providers, types of services used, and expenses incurred. Effective monitoring systems enable health insurance programs to track the impact of policies and programs to improve care and health among their members [11].

To our knowledge, almost no published information exists on the scope of medicine benefits provided by Sub-Saharan Africa health insurance programs or on what data these programs have available to monitor performance or evaluate effects of changes in medicines coverage. In this paper, we describe selected health insurance programs in Ghana, Kenya, Nigeria, Tanzania and Uganda, their medicine benefits, and the routine data available to them.

2. Materials and methods

We developed a survey to assess program structure, characteristics of medicine benefits, and availability of routine data for decision making in health insurance systems, borrowing from previous work on social health insurance in developing countries [22]. After field testing in insurance programs in five countries (Korea, Mexico, Philippines, Thailand, United States), we modified the survey for use in Sub-Saharan Africa as part of the Medicines and Insurance Coverage (MedIC) Initiative, an interdisciplinary global partnership focused on improving medicines policy decision making in health care organizations and insurance schemes [23]. A glossary of terms explaining key concepts and an explanatory guide accompanied the survey.

Table 2

Health insurance programs by country.

Country	Ghana	Kenya	Nigeria	Tanzania	Uganda	Total
Programs targeted	4	22	39	7	10	82
Programs responding	3 (75%)	9 (41%)	19 (49%)	5 (71%)	5 (50%)	41
Programs included in final analysis	3 (75%)	8 (36%)	12 (31%)	5 (71%)	5 (50%)	33

Table 3

Characteristics of health insurance programs.

Country	Ghana	Kenya	Nigeria	Tanzania	Uganda	Total
Number of programs analyzed	3	8	12	5	5	33
Corporate Status[a]	(1)	(8)	(5)	(4)	(4)	(22)
Public	1	0	2	1	0	4
Parastatal	0	0	2	1	0	3
Private	0	8	5	4	4	21
For profit	0	8	4	1	4	17
Not for profit	1	0	2	0	0	3
Non-governmental organization	0	0	0	0	0	0
Membership	(3)	(8)	(12)	(4)	(5)	(32)
Compulsory for all members	0	0	1	1	0	2
Compulsory for some, voluntary for others	0	0	7	0	2	9
Voluntary for all members	3	8	4	4	3	22
Groups covered	(3)	(6)	(11)	(3)	(5)	(28)
Entire population	3	3	0	0	1	7
Government employees	0	2	11	2	3	18
Specific professional groups	0	3	0	2	2	7
Private sector employees	0	6	10	2	5	23
Self-employed	0	2	7	3	4	16
Informal workers	0	1	1	2	3	7
Pensioners	0	0	1	1	3	5
Children (under 12)	0	3	3	0	4	10
Specific communities	0	0	1	1	1	3
Unemployed	0	0	0	0	2	2
Poor	0	0	0	0	0	0
Regional Distribution	(3)	(8)	(11)	(5)	(5)	(32)
Mostly urban	2	5	8	4	5	24
Mostly rural	0	0	0	0	0	0
Both urban and rural, about equally	1	3	3	1	0	8
Sources of Revenue	(3)	(4)	(12)	(4)	(4)	(27)
Contributions	3	4	12	4	0	23
Subsidies from government	0	1	10	0	0	11
Subsidies or donations from national NGOs	0	0	0	0	0	0
Subsidies or donations from international organizations	0	0	1	0	0	1
Earmarked taxes	1	0	0	0	0	1
Loans	0	0	0	0	0	0
Revenue from sales	1	3	1	2	4	11
Interest on investments	3	2	3	2	3	13
Health facilities managed	(3)	(8)	(6)	(5)	(5)	(27)
Hospitals	0	0	6	1	1	8
Primary care clinics	0	0	6	2	1	9
Pharmacies	0	0	6	1	1	8
Dentist/optician offices	0	0	6	1	1	8
Laboratories	0	0	6	1	1	8
Not applicable	3	8	5	3	4	23
Health insurance benefits	(3)	(8)	(11)	(5)	(5)	(32)
Primary care outpatient visits	3	7	11	5	5	31
Preventive services	0	0	7	1	4	12
Specialist outpatient visits	3	7	10	5	5	30
Laboratory services	3	8	11	5	5	32
Diagnostic services	3	8	10	5	5	31
Hospital inpatient care: boarding and lodging	3	7	10	4	4	28
Hospital inpatient care: medical treatment	3	7	10	5	4	29
Emergency room care	3	7	9	5	5	29
Maternity care	3	8	10	5	3	29
Inpatient medicines	3	8	10	5	4	30
Outpatient medicines	3	8	10	5	5	31

Note: Numbers in parentheses indicate the number of programs responding to each question.

[a] Some programs checked more than one corporate status category.

With support from WHO-contracted data collectors from their network of National Program Officers and consultants, health insurance programs in Ghana, Kenya, Nigeria, Tanzania, and Uganda completed the survey between September and November 2008. Data collectors first identified and hand-delivered surveys to 82 health insurance programs, mostly located in large urban centers; a total of 41 programs (50% response) returned surveys, of which 33 (40% of total) had data complete enough to be included in the final analysis (Table 2). In Ghana, Tanzania, and Uganda population coverage estimates were available and surveyed programs covered between 0.4% and 53% of the country population. Insurance programs were assured that their responses would only be presented in aggregate with no individual program identified. We entered and checked data in Excel 2007 and produced summary tables using SPSS version 16.

We describe, by country, characteristics of the responding insurance programs, medicine benefits provided, routine enrollment and utilization data available, and perceived barriers to using these data for policy decision making. The number of completed responses varied by question and country, with fewer responses for questions about medicine cost sharing mechanisms, use of formularies, and perceived problems with medicine benefits. Because of these variable response rates, we report the number of programs responding to each question.

3. Results

3.1. Characteristics of health insurance programs

Most of the 33 health insurance programs were private for-profit schemes; only four of 22 programs reporting (two in Nigeria, and one each in Ghana and Uganda) were public (Table 3). Members in most programs were voluntary enrollees living in urban areas, primarily government or private sector employees or self-employed. Two schemes were compulsory for eligible members and some covered the entire population or included pensioners. Only two programs in Uganda covered the unemployed, and none covered the poor.

Most health insurance programs relied on premium contributions from members, although some relied on revenue from sales and interest on investments. In Nigeria, 10 of 12 programs depended on subsidies from the government. Almost no programs received subsidies or donations from national non-governmental organizations (NGO), international organizations, or earmarked taxes. Except for Nigeria, it was uncommon for health insurance programs in these countries to manage health facilities such as hospitals, primary care clinics, pharmacies, dentist/optician offices, or laboratories. Almost all programs reported covering primary care outpatient visits and inpatient medical treatment and some reported covering preventive health services.

3.2. Medicine benefits of health insurance programs

All health insurance programs except one reported covering inpatient medicines, and all programs reported providing outpatient medicine benefits. Programs reported using medical need and cost-effectiveness criteria for establishing their current medicine benefits; some programs also noted taking account of equity considerations, financial constraints, and preferences of stakeholders in medical societies and industry (Table 4). Only 15 of 31 health insurance programs had a formulary list of covered medicines, while only 11 of 31 used negative lists of medicines excluded from reimbursement. Seven programs utilized both formularies and negative lists to manage medicine benefits and 11 used neither. Where formularies existed, they were generally updated annually or more frequently.

Many programs covered all inpatient and outpatient prescription medicines and most covered syringes or devices used to administer medicines; some insurance programs covered non-prescription medicines but only one program in Tanzania covered traditional, complementary and alternative medicines. Most health insurance programs based their decisions about which medicines to cover on national medicines regulatory authorities' approval which requires meeting regulatory standards of quality and safety. Five programs stipulated a minimum period on the market before a medicine was covered. In Nigeria, Tanzania, and Uganda, most insurance programs also reported listing on the National Essential Medicines list, cost-effectiveness, and availability at negotiated prices as criteria for coverage.

Most health insurance programs (18 of 23 reporting) required that inpatient and outpatient medicines be dispensed as generics. About half of the programs required that members obtain covered medicines at specific pharmacies in public facilities. A slightly higher number (16 of 23 reporting) required that health insurance programs pre-approve certain medicines before dispensing. In addition, some programs (9 of 23 reporting) capped the maximum reimbursement for medicines that are covered, and a few limited the quantities of covered medicines. Most members in these insurance programs were required to share in the cost of medicines, although civil servants were exempt from cost sharing in several Nigerian insurance plans. Few programs ($n = 6$ for inpatient and $n = 8$ for outpatient medicines) replied to questions about cost-sharing strategies and only one program in Kenya and five and seven programs, respectively, in Nigeria reported using reference pricing, fixed copayments, and fixed coinsurance as cost sharing strategies.

Many health insurance programs perceived problems with their medicine benefits. The most common serious problem noted (in 12 of 18 plans reporting) was provider complaints about delays in settling claims. Programs reported fraud almost as frequently as a serious problem. Problems more commonly reported as minor, although still perceived by some plans as serious, included provider and member complaints about administrative issues, delays in settlement of claims, cost sharing burden, and limitations to the medicine benefits. In general, few insurance programs reported problems with member complaints about eligibility for the medicine benefits or lack of transparency.

Table 4
Medicine benefits of health insurance programs.

Country	Ghana	Kenya	Nigeria	Tanzania	Uganda	Total
Number of programs analyzed	3	8	12	5	5	33
Medicine benefits provided (inpatient/outpatient)	(3/3)	(8/8)	(12/10)	(5/5)	(4/5)	(32/31)
Yes, provided from the beginning	3/3	7/7	12/9	5/5	4/5	31/29
Criteria to establish current medicine benefits	(3)	(7)	(10)	(3)	(5)	(28)
Medical need or importance	3	6	10	3	5	27
Cost-effectiveness	3	7	7	2	5	24
Equity	1	0	2	0	3	6
Financial constraints	0	0	3	0	1	4
Stakeholder preferences	2	1	1	1	1	6
Access to medicine benefits (all members)	(3)	(7)	(11)	(4)	(5)	(30)
Inpatient medicines	3	7	11	4	4	29
Outpatient medicines	3	7	11	4	5	30
Source of medicines dispensing	(3)	(7)	(10)	(4)	(3)	(27)
Pharmacies in public facilities	2	2	9	4	0	17
Private retail pharmacies	3	7	7	4	1	22
Pharmacies in NGO/mission facilities	2	1	2	4	1	10
Pharmacies in other types of clinics	1	1	10	2	1	15
Pharmacies run by the health insurance system	0	1	5	1	3	10
Existence of formulary	(3)	(7)	(11)	(5)	(5)	(31)
Yes	1	1	8	2	3	15
No	2	6	3	3	2	16
Update frequency of formulary	(1)	(2)	(9)	(2)	(4)	(18)
More frequently than once a year	1	0	2	1	2	6
Yearly	0	0	2	1	2	5
Every 2–5 years	0	1	2	0	0	3
Less frequently than every 5 years	0	1	3	0	0	4
Medicines Covered (all medicines)	(1)	(4)	(10)	(4)	(5)	(24)
Inpatient medicines	1	4	3	4	0	12
Outpatient medicines	1	4	4	4	2	15
Prescription-only medicines	1	4	2	4	1	12
Non-prescription (over the counter) medicines	0	1	0	4	1	6
Traditional, complementary, and alternative medicines	0	0	0	1	0	1
Devices: Needles/syringes to administer covered medicines	1	4	7	4	5	21
Negative list	(3)	(7)	(12)	(4)	(5)	(31)
Yes	1	2	5	1	2	11
No	2	5	7	3	3	20
Criteria to decide medicines covered (yes)	(3)	(7)	(11)	(4)	(5)	(30)
Regulatory authority approval	2	7	8	4	5	26
On the market for a certain time	0	1	3	0	1	5
Must be listed on insurance formulary	1	1	7	1	1	11
Must be listed on national essential medicines list	0	0	8	4	5	17
Must be shown to be cost-effective	1	0	8	4	5	18
Must be available at certain negotiated price	1	0	8	4	5	18
Restrictions on inpatient medicines	(1)	(4)	(10)	(3)	(5)	(23)
Medicines must be prescribed by generic name or INN	1	1	10	2	3	17
Medicines must be dispensed as generics	0	3	9	3	3	18
Medicines must be obtained in a specific pharmacy	0	4	0	3	5	12
Some medicines must be pre-approved	0	3	6	3	4	16
For some medicines, only limited quantities are covered	0	1	1	0	1	3
Medicines are covered up to a maximum cost	0	4	4	0	2	10
Restrictions on outpatient medicines	(1)	(5)	(10)	(3)	(4)	(23)
Medicines must be prescribed by generic name or INN	1	1	10	2	3	17
Medicines must be dispensed as generics	0	3	9	3	3	18
Medicines must be obtained in a specific pharmacy	0	5	1	2	3	11
Some medicines must be pre-approved	0	3	6	2	4	15
For some medicines, only limited quantities are covered	0	2	1	0	1	4
Medicines are covered up to a maximum cost	0	5	3	0	1	9
Cost sharing for medicines (inpatient/outpatient)	(0/0)	(1/1)	(5/7)	(0/0)	(0/0)	(6/8)
Reference price	0/0	0/0	1/2	0/0	0/0	(1/2)
Fixed co-payment	0/0	1/1	3/4	0/0	0/0	(4/5)
Fixed co-insurance	0/0	0/0	5/7	0/0	0/0	(5/7)
Population exposed to cost sharing	(3)	(7)	(6)	(4)	(5)	(25)
Civil servants	3	7	1	4	5	20
Poor	3	7	5	4	5	24
Dependents	3	7	3	4	5	22
Children	3	7	5	4	5	24
Pensioners	3	7	6	4	5	25
Surviving dependents	3	7	6	4	5	25
Unemployed	3	6	6	4	5	24

Table 4 (*Continued*).

Country Number of programs analyzed	Ghana 3	Kenya 8	Nigeria 12	Tanzania 5	Uganda 5	Total 33
Chronically ill	3	7	6	4	5	25
Perceived problems with medicine benefits (serious/minor)	(0/2)	(5/3)	(6/7)	(2/2)	(4/4)	(17/18)
Providers complain about delay in payment	0/2	2/2	6/5	0/2	4/1	12/12
Fraud	0/2	5/1	1/2	2/2	3/1	11/8
Members complain about need to limit care due to cost	0/1	1/1	5/2	0/0	0/1	6/5
Providers complain about administrative issues	0/1	1/3	3/6	0/2	1/3	5/15
Members complain about limited medicine benefits	0/1	1/2	3/4	0/2	1/4	5/13
Providers complain about limited medicine benefits	0/1	1/1	3/4	0/1	1/4	5/11
Members complain about administrative issues	0/2	1/2	2/5	0/0	1/3	4/12
Members complain about cost-sharing burden	0/0	1/0	3/2	0/0	0/0	4/2
Members complain about delay in reimbursement	0/1	2/1	0/7	0/1	1/1	3/11
Members complain about eligibility for medicine benefits	0/0	0/1	1/2	0/0	1/0	2/3
Only members with high needs enroll in medicine benefits	0/0	1/2	0/1	0/1	0/2	1/6
Lack of transparency of medicine benefits	0/0	0/0	1/2	0/0	0/0	1/2

Note: Numbers in parentheses indicate the number of programs responding to each question.

3.3. Data available in health insurance programs

The majority of health insurance programs reported that they routinely collected and computerized demographic, pharmacy, hospitalization, and outpatient visit data. However, programs often failed to gather specific data elements related to enrollees, health service providers, procedures, outpatient visits, hospitalizations, and medicines (Table 5).

Almost all programs recorded their members' age and gender; some also recorded socioeconomic group, employment status, and enrollment period of the member (particularly relevant where membership is voluntary). Most systems recorded provider name, type, and address, but only some collected clinician age, gender, or specialty.

Health insurance systems routinely collected data on hospital admission and discharge dates, diagnoses, charges to the insurer, and amount reimbursed, but seldom were diagnoses coded for efficient summary analysis. Similarly, most health insurance programs always recorded inpatient and outpatient procedure dates, descriptions, charges to the insurance system, and amounts reimbursed, but only about one-third of systems computerized charges to patients and less than a fifth coded procedure data (using International Classification of Diseases (ICD), Current Procedural Terminology (CPT), or other coding systems). Similar types of data were collected for outpatient visits.

Nearly all programs recorded dispensing (or prescribing) dates, charges to the insurance system, and amounts reimbursed for medicines. Only about two in three systems captured generic name, dosage form, strength, and dose of dispensed medicines. Medicine codes, generic vs. brand indicators, and charges to the patient were not typically available.

Most health insurance programs reported that they supplied individual and institutional providers with reports about cost, utilization, and appropriateness of use of medical services and medicines. However, most noted important barriers to using available data for routine monitoring, including lack of interest by high level policy makers; poor institutional support; lack of data to monitor cost, utilization, and appropriateness of medicine use; inadequate computer systems or financial resources; and lack of trained staff.

3.4. Improving medicine benefit management

We asked health insurance program officials to report the three most important questions they would like to answer about medicines policy or coverage issues in their schemes. Most respondents stated questions that indicated an underlying concern about expanding pharmacy budgets or about how to address product selection, cost, and cost-effective use of medicines. Respondents also wondered about how to set and control medicines prices, combat counterfeit medicines, reduce polypharmacy, and implement specific medicines management approaches (e.g., drug formularies, reference pricing, exclusions lists, and case management). Most respondents also raised questions about how to manage the use of brand medications, improve adherence to generic prescribing, and respond to quality concerns of patients and providers about generic medicines. Some also asked about how to assess the effectiveness of newer, costly therapies (e.g., monoclonal antibodies for cancer treatment) and how to implement computerized data management.

4. Discussion

To our knowledge, this is the first paper to characterize the scope of medicines coverage in public and private health insurance systems in Sub-Saharan Africa [19]. We also summarize key characteristics of these insurance systems as well as the data they have available to assess and improve medicine benefit management.

4.1. Characteristics of health insurance programs

Health insurance programs in Sub-Saharan Africa are evolving in various forms. In Ghana private health insurance programs are initiated exclusively by communities, while the rapidly expanding National Health Insurance Program is run by the government [10]. In Nigeria, most insurance programs are owned by private investors and shareholders [24]. Some programs in Nigeria, Tanzania, and Uganda own hospitals or clinics and employ their own full-time staff. It is uncertain what impact corporate status or ownership of the delivery system by the insurers has on medicines coverage or benefit management. Some stud-

Table 5
Data available in health insurance programs.

Country	Ghana	Kenya	Nigeria	Tanzania	Uganda	Total
Number of programs analyzed	3	8	12	5	5	33
Data routinely collected (collected and computerized)	(2)	(7)	(8)	(5)	(5)	(27)
Enrollee demographic data	2	6	8	3	4	23
Pharmacy claims data	2	7	3	4	4	20
Hospitalization claims data	2	7	6	5	5	25
Outpatient visit data	2	7	6	4	5	24
Enrollee data elements (always on claim)	(3)	(6)	(6)	(4)	(5)	(24)
Age	2	6	6	4	3	21
Gender	3	5	6	4	5	23
Employment status	1	3	5	1	1	11
Socio-economic group	0	1	1	0	1	3
Enrollment period	0	3	3	0	1	7
Benefit package type	2	4	6	1	2	15
Health service provider data elements (always on claim)	(3)	(8)	(12)	(5)	(5)	(33)
Provider name	3	8	12	5	5	33
Provider code	1	3	9	1	2	16
Provider type	3	6	11	4	5	29
Provider address	0	5	9	3	4	21
Age (for individual providers)	0	2	3	0	0	5
Gender (for individual providers)	0	2	3	0	2	7
Specialty (for individual providers)	0	3	4	1	2	10
Hospitalization data elements (always on claim)	(3)	(7)	(12)	(5)	(5)	(32)
Admission diagnosis description	3	7	9	5	5	29
Admission diagnosis code (ICD codes)	1	3	2	2	0	8
Admission diagnosis code (non-ICD)	0	2	1	1	0	4
Discharge diagnosis description	1	5	3	4	4	17
Discharge diagnosis code (ICD)	0	1	1	1	0	3
Discharge diagnosis code (non-ICD)	1	1	3	0	0	5
Admission date	3	7	12	5	5	32
Discharge date	3	6	12	5	4	30
Hospital charges to insurance	3	6	11	5	5	30
Hospital charges to patient	0	5	3	0	3	11
Procedure data elements (always on claim)	(3)	(7)	(10)	(5)	(5)	(30)
Inpatient procedure description	2	6	8	3	5	24
Inpatient procedure code (ICD or CPT)	0	2	3	0	0	5
Inpatient procedure code (non-ICD, non-CPT)	1	2	1	0	0	4
Inpatient procedure date	2	7	5	4	5	23
Outpatient procedure description	2	5	5	4	5	21
Outpatient procedure code (ICD or CPT)	0	2	2	1	0	5
Outpatient procedure code (non-ICD, non-CPT)	1	2	1	0	0	4
Outpatient procedure date	3	7	7	5	5	27
Procedure charges to insurance	3	7	10	5	5	30
Procedure charges to patient	0	5	2	0	3	10
Outpatient visit data elements (always on claim)	(3)	(7)	(9)	(5)	(5)	(29)
Outpatient visit diagnosis description	2	7	7	3	5	24
Outpatient visit diagnosis code (ICD)	0	3	4	2	0	9
Outpatient visit diagnosis code (non-ICD)	0	3	2	2	0	7
Outpatient visit date	3	7	7	5	5	27
Outpatient visit charges to insurance	3	7	9	5	5	29
Outpatient visit charges to patient	0	5	2	0	3	10
Medicines data elements (always on claim)	(3)	(6)	(10)	(5)	(5)	(29)
Drug code	1	2	2	0	0	5
Generic name	1	3	7	5	4	20
Brand name	0	4	5	2	1	12
Dosage form	1	5	5	4	5	20
Strength	1	2	4	4	4	15
Dose prescribed	1	5	6	5	5	22
Quantity prescribed	3	4	5	5	2	19
Generic vs. brand status	1	0	2	0	0	3
Date prescribed	3	6	7	5	5	26
Date dispensed	1	6	7	4	5	23
Quantity dispensed	1	4	9	5	4	23
Prescriber identification	1	6	4	4	3	18
Dispenser identification	1	5	2	2	2	12
Charge to insurance	3	6	10	5	5	29
Charge to patient	0	5	3	0	3	11
Data on amount reimbursed (yes)	(3)	(8)	(12)	(4)	(5)	(32)
Medicines	3	7	10	4	4	28
Medical/surgical supplies and devices	3	7	8	3	4	25
Hospitalizations	3	8	12	4	5	32

Table 5 (*Continued*)

Country	Ghana	Kenya	Nigeria	Tanzania	Uganda	Total
Outpatient visits	3	8	11	4	5	31
Procedures	2	7	10	4	4	27
Reports for individual and institutional providers (yes)	(0)	(7)	(9)	(2)	(5)	(23)
Cost of medical services	0	5	9	2	5	21
Cost of medicines	0	4	8	2	4	18
Utilization of medical services	0	7	8	2	4	21
Utilization of medicines	0	5	7	2	3	17
Appropriateness of medical services	0	4	8	1	2	15
Appropriateness of medicines use	0	3	8	1	2	14

Note: Numbers in parentheses indicate the number of programs responding to each question.

ies suggest that community involvement in the set-up and running of programs may be an important determinant of their success and sustainability [25].

The majority of health insurance programs responding to our survey indicated that most of their members constituted voluntary enrollees employed in the formal sector. There was little evidence that health insurance programs covered pensioners, informal sector workers, the unemployed, or the poor. Other studies have found that the relatively wealthy members of a community are more likely to enroll in community-based health insurance programs and enrollment rates in these programs are usually between 1% and 10% [26]. Providing inpatient and outpatient medicines coverage that is customized to meet the demands of the local population may be one strategy to attract less wealthy members to community-based health insurance schemes [17]. A robust regulatory framework may also facilitate expansion of health insurance coverage to the poor [26]. For instance, mandating health insurance for all public and private sector employees enabled an additional 3.5 million people to obtain health insurance coverage in Morocco for the first time [27]. Furthermore, universal coverage that enables everyone in the population to access affordable health care when needed is a WHO priority for countries to improve quality health care, reduce poverty, and meet development goals [28,29]. Delineating the scope of universal coverage and defining an effective, affordable minimum medicine benefits package will be crucial steps in the process of providing health care for all.

4.2. Medicine benefits of health insurance programs

Households use savings, sell assets, procure loans or borrow from family and friends to cope with high out-of-pocket payments [30], and approximately 30% of households in 15 Sub-Saharan Africa countries financed their healthcare by borrowing or selling assets [31]. Out-of-pocket payments can lead to impoverishment when payment is required to access health care services and when households do not have the ability to pay [13]. In 2002, about one in five households (one in four among the poor) in low income countries spent potentially catastrophic proportions of their available resources on health care; for 40–50% of households, all health care spending was on medicines [12]. Health insurance may prevent impoverishment from catastrophic health events. Where benefits are generous and copayments affordable, benefi-

ciaries generally have greater access to health care services [9]. Well-designed medicine benefit packages are therefore urgently needed to protect households from economic burden and facilitate affordable, equitable access to quality use of essential medicines.

We found that nearly all of the 33 health insurance programs in five Sub-Saharan African countries that responded to this survey covered inpatient and outpatient medicines approved by their country's regulatory authority. All programs required some level of cost sharing for medicines by members; however, we do not know the magnitude of cost sharing by households. Previous studies have found that less than half of insurance programs globally impose co-payments, deductibles, or reimbursement ceilings [26] and in the limited literature on community-health insurance programs in low-income countries, 32% of publications mention a medicines copayment [17]. Cost-sharing can disproportionately burden lower-income groups [29,32]. To realize the potential of medicines coverage, benefit policies and patient out-of-pocket contributions need to be carefully structured to provide patients with adequate access to affordable essential medicines and promote their appropriate use, while discouraging inappropriate use.

A formulary is a key tool to facilitate cost-effective use of medicines [33]. Fewer than half of the programs responding (15 out of 31) reported that they maintain formularies. We found that some programs combine formularies and negative lists to control medicines utilization, but many programs have neither a formulary nor a negative list. These findings point to an urgent need for improving formulary design and medicine benefit management of health insurance programs in Sub-Saharan African countries.

4.3. Problems in managing medicine benefits

Two-thirds of health insurance programs mentioned fraud as a serious problem in managing their medicine benefits. Fraudulent activities by providers and/or patients adversely impact the efficiency of health insurance systems. To sustain benefits, health insurance programs depend on maintaining transparency of interactions [24]. The first rural health insurance program in Kenya experienced difficulties with fraudulent claims, as well as adverse selection of members in chronic ill-health which led to overuse of health services [25]. Some measures implemented to overcome these difficulties included mandating group membership to expand the risk pool, using photo identification cards, requiring patients to declare chronic

illnesses before enrolling, implementing copayments for medicines, strengthening routine management of records, and implementing staff and member education [25]. Some studies suggest that community participation and local ownership may decrease the potential for abuse [10]. As health insurance data systems advance, systems will be able to routinely monitor claims for fraud [34].

Important problems with administering medicine benefits mentioned by respondents generally centered on the key issue in medicines coverage: how to assure access to needed medicines for members in an ethical, cost-effective way. Providers and members were reported to complain frequently about administrative issues, cost-sharing burden, and limitations in medicine benefits. Insurance programs reported problems in developing and enforcing treatment guidelines, and implementing generic prescribing and substitution policies. Experience exists in successfully implementing these strategies in established insurance systems in high-income countries [20,21]. Health insurance programs in Sub-Saharan Africa could benefit from evaluating experiences from other developing and developed countries' settings, but there is a crucial need to adapt policy approaches to meet the unique features of their settings.

4.4. Data available in health insurance programs

To better manage medicine benefits and reduce fraud, programs need to monitor the cost, quantity, and type of medicines prescribed by providers and used by members. As payment systems, insurance programs generate routine data about the services they reimburse. Despite missing key data elements, all programs we studied could implement basic monitoring of medicines expenditures by patient and encounter type. However, few programs have such systems in place.

The health insurance programs we studied seldom code and computerize data on health providers, dispensed medications, inpatient and outpatient procedures, type of outpatient visit, or diagnoses. Coded data are essential for programs to efficiently monitor utilization, identify fraud, and profile high risk providers and patients. Health insurance programs need to improve the quality of the data available to them for these purposes [7,14,22]. This requires trained professionals, more powerful computer systems, and evolving analysis algorithms [24], all of which require sufficient financing. Computerized data on member eligibility, pre-existing conditions, and claims limits in one African system have facilitated production of routine reports for monitoring utilization and setting premiums [25]. Routine monitoring of data on patients, prescribers, and services provided is essential for managing a sustainable medicine benefits. Investments are needed to develop robust drug and diagnostic coding systems appropriate to the African setting, since systems in common use tend to be specific to the US or European health care systems [25–29], although experiences in medicine benefits and diagnostic coding from a health insurance administration company in South Africa may be useful for other African countries [35].

The programs we surveyed required resources to implement data coding systems, introduce or strengthen computerized data management, improve efficiency, monitor price and utilization of medicines and build policy analysis capacity.

4.5. Study limitations

The present study has several limitations. First, the MedIC Health Insurance survey was completed voluntarily by a convenience sample of insurance programs in selected countries. The results may not be representative of the entire spectrum of health insurance programs in five Sub-Saharan African countries. Nevertheless, these are the first data available on medicine benefits from a range of health insurance programs in five Sub-Saharan African countries. Second, the small number of insurance programs does not allow us to examine the impacts of insurance program characteristics (like corporate ownership, revenue sources) on medicine benefits. Finally, the insurance programs themselves provided all information in the survey; they may have described the desired state of medicine benefits and data systems, rather than the actual situations.

5. Conclusions

The lack of comprehensive information on medicine benefits in Sub-Saharan African health insurance programs led us to survey health insurance program characteristics, medicine benefits, and data available for decision-making in five Sub-Saharan African countries with different types of insurance infrastructure. Encouragingly, all programs surveyed provided medicine benefits, although the extent of medicines coverage (type of medicines and percentage of cost) compared to population need is unclear and challenges exist in the ability of these programs to provide effective and efficient benefits. We found that concerns about fraud pose a serious problem in medicine benefit design, threatening the efficiency of health insurance systems and the sustainability of medicines supply. To reduce fraud, health insurance programs may strengthen transparency through improved record management systems, provider and member education, mechanisms to integrate local population ownership and joint decision-making, and expanded risk pooling that could mitigate the effects of adverse selection. Data to answer basic questions about the performance of medicine benefit policies exist in most programs, but further developments in data systems are needed to increase efficiency and accountability.

Most questions about the design, implementation, and outcomes of medicine benefit policies in emerging and expanding health insurance programs in Sub-Saharan Africa remain unanswered, including questions about the impacts of corporate status, revenue sources, structural relationships with health care facilities and dispensaries, and membership profiles. Capacity building for medicines policy decision making is needed to strengthen existing systems. Health insurance systems in Sub-Saharan Africa would benefit from concerted efforts to answer questions about best policy structures in a given environment. Strong government commitment and international donor support will be needed to expand medicines coverage through health insurance systems, regardless of their structure, to

the poor and most vulnerable groups of the population in Sub-Saharan Africa.

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