

Equity and access in maternity care during Kenya's transition from free maternity care to social health insurance: a mixed-methods study in Homa Bay County

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Abstract

Background

Social health insurance is promoted as a pathway to universal health coverage, yet its equity effects during implementation remain poorly understood. We examined Kenya's 2024 transition from free maternity care (Linda Mama) to the contributory Social Health Insurance Fund (SHIF), focusing on maternal healthcare access in Homa Bay County. The study was nested within a larger maternal health research programme (C-it DU-it) established before SHIF, providing a rare opportunity to examine the major health financing reform as it unfolded.

Methods

Using a convergent mixed-methods design, we combined longitudinal survey data from 300 pregnant women followed from first antenatal care (ANC) contact to six weeks postpartum, including patient cost surveys at three ANC visits and one postnatal visit, as well as interviews and focus group discussions involving 124 pregnant and recently postpartum women recruited separately from the survey cohort, alongside healthcare providers, community health workers, and policymakers.

Results

SHIF enrolment increased from 46.0% (138/300) at first ANC to 84.5% (234/277) by six weeks postpartum, indicating many women gained coverage only after early pregnancy care. Enrolment was lower among adolescents and unemployed women, reflecting barriers related to identification documents, digital registration, premium payments, and gendered decision-making. Enrolled women were more likely to complete four ANC visits (75.5% vs 41.9%), receive recommended ANC tests (46.6% vs 27.9%), and deliver in a public facility (79.1% vs 51.2%). However, out-of-pocket payments persisted regardless of enrolment, while many lower-level (Levels 2–3) facilities were excluded from SHIF reimbursement eligibility, undermining financial protection and access in rural areas.

Conclusions

SHIF's early implementation reproduced, and in some cases amplified, existing inequities in maternal healthcare access, particularly for adolescents, women lacking identification documents, and users of lower-level facilities. Achieving equitable maternal coverage under SHIF will require not only enrolment, but timely and continuous coverage, effective reimbursement of lower-level facilities, and monitoring of exclusion, enrolment timing, and continuity. Without these safeguards, health financing reforms risk widening existing inequities.

Background

Universal health coverage (UHC), embedded in Sustainable Development Goal 3.8, aims to ensure all people can access essential health services without financial hardship (1). Maternal health is a particularly important indicator of UHC because pregnancy-related needs are time-sensitive, predictable and socially patterned. In sub-Saharan Africa, maternal mortality and barriers to quality maternity care remain disproportionately concentrated among poorer, rural and socially marginalised populations (2). Out-of-pocket (OOP) payments for maternal care continue to expose households to financial risk, especially where public facilities experience shortages of medicines, diagnostics and staff capacity (3, 4).

Social health insurance has been promoted in many low- and middle-income countries (LMICs) as a mechanism for prepayment, risk pooling and expanded access to maternal healthcare (5). Evidence from systematic reviews and country studies shows insurance coverage is often associated with increased utilisation of antenatal care (ANC) and healthcare facility delivery services, but effects on equity and financial protection are uneven (6, 7). Experiences from Ghana, Rwanda and other African settings suggest insurance reforms can increase average utilisation while leaving socioeconomic, geographic and gendered barriers unresolved (8, 9). Incomplete benefit packages, non-medical costs, informal payments and weak service readiness may limit financial protection, particularly for poorer and marginalised women, and those experiencing complications (10, 11).

Kenya reflects these broader patterns. Although maternal health indicators have improved over time, the maternal mortality ratio remains high, estimated at 355 deaths per 100,000 live births, with marked geographical and socioeconomic disparities (12). Since 2013, Kenya has implemented several financing reforms intended to reduce maternal health costs. The Free Maternity Services policy increased facility deliveries but was affected by delayed reimbursements, resource constraints and quality concerns (13, 14). The subsequent Linda Mama programme (Table S1), introduced in 2017 and administered through the National Hospital Insurance Fund (NHIF), expanded free maternity coverage to antenatal, delivery and postnatal care. Although it improved utilisation and reduced some direct payments, implementation was uneven, with delayed claims, incomplete contracting, supply-side constraints and persistent inequities (13, 15, 16).

In 2023, Kenya enacted the Social Health Insurance Act, replacing the NHIF with the Social Health Authority and introducing three funds: the Social Health Insurance Fund (SHIF), the Primary Healthcare Fund and the Emergency, Chronic and Critical Illness Fund, as part of a broader UHC reform agenda (17) (Table S1). Implementation began in October 2024 with enrolment taking place at community level (through community health providers) or at facility level (often during facility visits). While SHIF is contributory, the Primary Healthcare Fund and Emergency, Chronic and Critical Illness Fund are tax-funded and accessible to those registered with SHIF. SHIF aims to expand coverage through mandatory household enrolment, income-linked contributions, subsidies for vulnerable groups, digital registration and revised provider payment mechanisms. Contributions are determined through proxy means testing

(PMT), a method used to estimate household income or consumption based on observable characteristics such as household composition, housing quality, asset ownership, education, employment, health indicators, and location. Under the SHA, ANC coverage is paid through the tax-funded PHC fund while delivery falls under the contributory SHIF creating coverage gaps for delivery for those not able to pay their premiums. The shift from a tax-funded maternity programme to a broader contributory scheme raises important equity concerns about continuity of protection for the most vulnerable pregnant women (18). Pregnant women may be formally eligible for benefits, but access can depend on affordability, identity documentation, household bargaining power and service availability. These conditions are particularly consequential during early implementation, when policy rules, reimbursement systems and public understanding are still evolving.

Empirical evidence on how the transition to SHIF is shaping maternal health access and equity remains limited. More broadly, few studies are positioned to document major health financing reforms as they unfold, particularly across users and other health system stakeholders. This study was nested within the pre-existing

C-it DU-it maternal health research programme in Homa Bay County, which was already examining ANC uptake, quality of care, community quality improvement processes and patient-incurred costs before SHIF implementation. The introduction of SHIF therefore created an unusual opportunity to adapt ongoing longitudinal survey and qualitative data collection to examine how the transition was experienced in real time and across different levels of the health system. Existing studies often treat insurance coverage as a binary and relatively static status, yet for maternal healthcare the timing and continuity of coverage may be as important as enrolment itself. Because early ANC is critical for risk identification, prevention and linkage to care, coverage obtained late in pregnancy may offer incomplete protection. This study examines equity of maternal healthcare access during early SHIF implementation in Homa Bay County, a high burden area with poor maternal health outcomes. We analyse SHIF enrolment, service utilisation and care experiences during pregnancy and the early postnatal period among women and girls. The paper contributes to debates on social health insurance, effective coverage and equity-oriented UHC reform by showing how policy transitions intended to expand coverage can create new barriers for vulnerable groups when implementation systems do not actively prevent exclusion.

Methods

Study design

This study formed part of the NIHR-funded C-it DU-it research programme, introduced in 2022 to evaluate whether community and facility quality improvement teams can use routine data to improve ANC uptake and quality in Homa Bay County. The programme includes a pragmatic cluster-randomised trial, a realist evaluation of intervention mechanisms and context, and a nested health economics component assessing the costs of accessing maternal healthcare through patient cost surveys.

This paper draws on data from both the health economic and the realist evaluation studies using a convergent mixed-methods design to examine the equity implications of the transition to SHIF (19). The study was designed as an early implementation analysis rather than a causal evaluation of SHIF.

Conceptual framework

Our analysis was guided by Braveman and Gruskin's framework of health equity as the absence of systematic, avoidable and unjust differences in health and access to health resources between socially advantaged and disadvantaged groups (20). This framing directs attention to how social stratification and institutional arrangements shape access to care. Applied to maternal health and health financing, it highlights how design features of the system interact with existing inequalities.

We operationalised the framework across three linked domains (Figure 1): equity in SHIF enrolment and access, including timing and continuity of coverage; equity in utilisation and effective coverage, including ANC timing, delivery location and receipt of key service components; and equity in quality-related experience and financial protection, including service availability, perceived treatment, OOP expenditure and indirect costs. Differences were interpreted as inequities where they were patterned across population groups and plausibly linked to modifiable policy, health-system or wider structural factors.

Insert Figure 1 here

Mama to SHIF in Homa Bay County.

Study setting

The study was conducted in Homa Bay County in western Kenya, a predominantly rural setting on Lake Victoria characterised by high poverty, informal livelihoods, fishing and small-scale agriculture, and seasonal mobility. The county has among Kenya's poorest maternal and newborn health indicators and high HIV prevalence (12), and has been a focus of successive maternal health financing reforms (Table 1). Services are delivered through public, faith-based and private facilities, with community health promoters and assistants referring and linking households and providing follow up care. Kenya's health system is organised into levels of care, from community health services (Level 1), dispensaries and clinics (Level 2), and health centres and maternity centres (Level 3), to sub-county hospitals (Level 4), county referral hospitals (Level 5) and national referral hospitals (Level 6). For maternal healthcare, lower-level facilities (Levels 2–3) generally provide routine ANC, basic delivery and postnatal services, while higher-level hospitals (Levels 4–6) provide more comprehensive referral, emergency obstetric and newborn care. The county's socioeconomic profile, reliance on informal employment and poor maternal health outcomes, make it a relevant setting for examining how a contributory insurance reform shapes equitable maternal healthcare access.

Implementation timeline

To aid interpretation of early implementation findings, Table 1 summarises the relationship between policy transition and study data collection. SHIF implementation evolved during the C-it DU-it study period; findings therefore capture transitional implementation rather than a mature insurance scheme.

Insert Table 1 here

Study population and sampling

Quantitative component

Quantitative participants involved pregnant women residing within the catchment areas of 18 Level 3 public or faith-based facilities participating in the C-it DU-it trial. Facilities were purposively selected to capture variation in geography and service utilisation and were distributed across intervention and control arms. A total of 300 women were recruited primarily from ANC clinics at their first ANC visit where they responded to a patient cost survey. The survey was then repeated at participants' second and third ANC visits, and at six weeks postnatally. Eligibility criteria were: confirmed pregnancy; first ANC attendance; residence within the facility catchment area; and providing informed consent. The study was not designed, and the sample was not powered, to elicit causal inference but was sufficient to describe enrolment patterns and compare key maternal healthcare outcomes by SHIF enrolment status.

Qualitative component

Qualitative participants were purposively sampled to capture perspectives across the community and health system. A maximum variation sampling approach was used to ensure inclusion of individuals with diverse roles and experiences related to the SHIF and maternal health services. Participants included community health promoters (CHPs), community health assistants (CHAs), healthcare workers (HCWs), pregnant and recently postpartum mothers, community members (including local opinion leaders and male partners), and county and subcounty policymakers. Particular attention was given to including adolescents and others at risk of exclusion. Women were recruited through both facilities and household visits to reduce selection bias associated with facility-only sampling and to include women with varying engagement with services. Exit interviews and HCW interviews were conducted in a subset of seven trial facilities, comprising two control and five intervention sites. Data collection continued until thematic saturation was reached (21).

Data collection

Quantitative data were collected prospectively using a longitudinal patient cost survey administered at first ANC, a subsequent ANC visit, a later pregnancy visit and six weeks postpartum. The survey questionnaire was developed as part of the broader health economics study embedded within the C-IT DU-IT trial and was adapted from the WHO TB Patient Cost Survey framework for measuring patient-incurred costs in LMIC settings, including Kenya, both for people with TB and other conditions (22, 23). The survey captured SHIF enrolment status, ANC timing and frequency, place of delivery, receipt of selected maternal health services, direct medical and non-medical out-of-pocket expenditure, household

income and expenditure, and sociodemographic characteristics. An English-language version of the questionnaire used in this study is provided in Supplementary Material 2.

Qualitative data were collected during a second round of the realist evaluation. The semi-structured interview and focus group discussion topic guides were originally developed for the realist evaluation component of the C-IT DU-IT trial and included specific topics relating to SHIF. The guides explore participants' experiences of SHIF enrolment, affordability, enrolment requirements, understanding of entitlements, service availability, perceived changes following the transition to SHIF, and the effects of SHIF on maternal healthcare-seeking. English-language versions of the semi-structured interview and focus group discussion topic guides used in this study are provided in Supplementary Material 3. Experienced qualitative researchers conducted interviews face-to-face in English, Kiswahili or Dholuo, based on participant preference. Interviews lasted approximately one hour, were audio-recorded with consent, supplemented by field notes, transcribed verbatim and translated into English where required.

Data analysis

Quantitative data were analysed descriptively in R version 4.1.1. We summarised participant characteristics, SHIF enrolment, maternal health service use and OOP expenditure across survey rounds. Consistent with the study's aim of identifying equity-relevant patterns rather than estimating causal effects, analyses were stratified by SHIF enrolment status and selected social characteristics, including age, occupation, marital status and wealth quintile. Group differences were examined using chi-square tests for categorical variables and t-tests for continuous variables, as appropriate. Emphasis was placed on the direction, magnitude and policy relevance of observed differences rather than statistical significance alone. Findings are interpreted as descriptive patterns of association and integrated with qualitative data to examine the implementation processes through which inequities in access, utilisation and financial protection were produced.

Qualitative data were analysed thematically using deductive and inductive approaches (24). Transcripts were managed and coded in NVivo. An initial coding framework was developed from the equity framework and early reading of transcripts, then refined iteratively as new themes emerged. Multiple researchers, including the paper's authors, contributed to coding and met regularly to review coding decisions, compare interpretations and examine deviant cases. Analysis focused on how SHIF policy design and implementation shaped systematic differences in access, utilisation, affordability and experiences of care.

Integration of data

Quantitative and qualitative findings were integrated at the interpretation stage using a convergent approach (19, 25). Quantitative patterns in enrolment, service utilisation and expenditure were compared with qualitative accounts of registration, provider payment, facility readiness and user experience. Integration focused on convergence, complementarity and divergence across data sources. In the

results, qualitative evidence is used to explain observed quantitative patterns and to identify implementation mechanisms not inferred from survey data alone.

Results

Participant flow and sample characteristics

300 completed the baseline survey at first ANC, with equal numbers recruited from intervention and control trial arms. Follow-up varied by round: 257 women completed the second survey, 213 the third survey and 277 the six-week postpartum survey (Table 2). Participants had a median age of 25 years (IQR 21-30); most were aged 20-29 years, and nearly half reported no employment (Table S2).

Insert Table 2 here

The qualitative sample comprised 124 participants, including pregnant or recently postpartum women, community members, healthcare workers and county or sub-county health system decision-makers (Table 3; Table S3). Participants were drawn from the same communities rather than the survey cohort, although some overlap was possible because recruitment occurred in the same population.

Insert Table 3 here

Equity in SHIF enrolment

SHIF enrolment increased substantially during pregnancy and the early postnatal period (Table 4). At first ANC, 138/300 women (46.0%) were enrolled, increasing to 161/257 (62.7%) at the second survey, 153/213 (71.8%) at the third survey and 234/277 (84.5%) by six weeks postpartum. The increasing mean gestational age across survey rounds (Table 4) indicates many women obtained coverage only after their first ANC contact and after early pregnancy care had already occurred.

Insert Table 4 here

At first ANC, enrolment differed by age and occupation. Enrolled women were older than unenrolled women (mean 27.4 vs 24.2 years; mean difference 3.2 years, 95% CI 1.8-4.6; $p = 0.004$), while adolescents were more common among those without coverage (7/138, 5.1% vs 16/162, 9.9%). Women in income-generating work were more often enrolled (76/138, 55.1% vs 47/162, 29.0%; difference 26.1 percentage points, 95% CI 15.2-36.9; $p < 0.001$), whereas unemployed women and housewives were more frequent among those not enrolled (49/138, 35.5% vs 96/162, 59.3%). Household asset wealth was not clearly differentiated by enrolment status ($p = 0.170$), although the poorest quintile was more represented among unenrolled women (19/138, 13.8% vs 41/162, 25.3%). Marital status was not clearly differentiated ($p = 0.070$), although single women were more commonly not enrolled (17/138, 12.3% vs 29/162, 17.9%).

Administrative and digital barriers to enrolment

Qualitative data explained why enrolment was delayed or uneven. Across participant groups, identity documentation was described as a major barrier. Women without national identity documents experienced delayed or failed registration and, in some cases, disengaged from care:

“Most of these ladies... are not having identity cards. When they don’t have identity cards, registration becomes very difficult... they will be told ‘go and register’... if they don’t have [ID], they will go back [home].” (Sub-county official, #001).

Adolescents were particularly disadvantaged because many lacked identity documents and could not register independently. Participants contrasted this with Linda Mama, under which adolescents could more easily be registered using a guardian’s identification. Under SHIF, enrolment required either personal identification or linkage to an enrolled guardian, creating difficulties for adolescents who were orphaned, unsupported or disconnected from an enrolled adult:

“She has no parents... she is asked for ID.... So she can’t enrol [in SHIF] ...” (Sub-county official, #6).

“Those young girls have no ID, so when they come here they will not receive the first ANC services, because they can’t register for SHA

[SHIF]” (CHP, #48).

Migrants and refugees faced similar barriers where they lacked recognised documentation, and some reportedly avoided facilities because they lacked both SHIF and valid identity papers.

“The refugees... every time they come here it becomes an issue... fear coming to the facility because she doesn’t have SHA [SHIF], she doesn’t have the real ID, she doesn’t have the alien ID...” (Sub-county official, #6).

Digital registration added further constraints. Registration required phone access, one-time passwords and functioning systems. Poor connectivity, downtime and reliance on partners’ or shared phones reduced women’s autonomy and sometimes prevented completion of registration:

“She says the phone number is for a certain person... if they quarrel with the husband then the phone number is not working” (CHP, #26).

Financial, information and gendered constraints

Financial barriers were frequently reported. Participants described SHIF premium as difficult to afford, especially for households who are reliant on informal, irregular or seasonal income. The annual contribution set at a minimum of KES 3,600 (~USD 28), was widely perceived as unaffordable.

“Sometimes you find that the amount you have been allocated is so high that you cannot manage” (Recent mother, #31).

Household premiums were determined through means testing based on reported household assets, with CHPs supporting enrolment by collecting asset information used to set premium levels. Confusion about this process, and perceive unfairness in premium allocation, undermined trust in both CHPs and the insurance system. Participants questioned how premiums were calculated, why similar households received different payment obligations, and whether unaffordable or inaccurate assessments could be challenged:

“It is not fair... some pay KES 300 [~USD 2.30], some KES 500 [~USD 3.80] and others KES 1000 [~USD 7.70] and above” (Women representative, FGD4).

These constraints contributed to selective and episodic enrolment, with households registering only when illness or pregnancy made care likely rather than maintaining continuous coverage.

Information gaps compounded the problem: participants described limited community sensitisation and uncertainty about registration procedures, contribution levels, delivery costs, exemptions and benefit entitlements. Gendered household relations shaped women's ability to enrol and remain covered. Many depended on male partners for premium payments or phone access, as one woman stated:

“If I ask him for money for SHA[SHIF], he refuses. And the fight begins... I am like a prisoner” (Recent mother, #81).

These accounts suggest partner support and household bargaining power, rather than marital status alone, influenced enrolment opportunities.

Equity in maternal service utilisation and effective coverage

Maternal service use differed by SHIF enrolment status (Table 5). Enrolled women-initiated ANC earlier than unenrolled women, with mean gestational age at first visit of 16 versus 19 weeks. They were more likely to complete at least four ANC visits (104/138, 75.5% vs 68/162, 41.9%; difference 33.4 percentage points, 95% CI 22.9-43.8; $p < 0.001$), receive recommended ANC profile tests (64/138, 46.6% vs 45/162, 27.9%; difference 18.6 percentage points, 95% CI 7.8-29.4; $p = 0.023$), and deliver in a public facility (109/138, 79.1% vs 83/162, 51.2%; $p < 0.001$). Home delivery was more common among unenrolled women. First postnatal care attendance was high in both groups, with no clear difference by enrolment status (131/138, 95.3% vs 143/162, 88.4%; $p = 0.072$). These should be interpreted as equity-relevant descriptive patterns rather than causal effects of enrolment.

Insert Table 5 here

Qualitative findings contextualised these patterns. Providers reported reduced early ANC attendance during the initial implementation period, attributing this to uncertainty about what remained free, gaps in laboratory services and disruptions in reimbursement and commodities. Uninsured women were perceived to receive incomplete ANC, including restricted access to laboratory tests, supplements and other routine services. As these participants explained:

“Starting ANC is free... but the profile, lab—that is where the problem starts” (Sub-county official, #06).

“If you don’t have SHA[SHIF] ... you are limited to some services... even folic and iron” (Recent mother, #032).

Respondents linked these barriers to delayed care-seeking, referral fears and greater reliance on non-facility delivery, particularly among adolescents and women facing documentation or enrolment constraints. Conversely, several participants perceived SHIF enrolment as increasing willingness to seek care where women believed contributions would reduce point-of-care costs.

Equity in quality-related experience and service readiness

Basic ANC consultations were reported by all women across survey rounds, but receipt of specific service components varied after SHIF rollout (Table 6). Laboratory testing was similar by enrolment status at the first survey (133/137, 97.1% vs 156/160, 97.5%; $p = 0.824$), but was more common among enrolled women in the second survey (51/107, 47.7% vs 18/67, 26.9%; difference 20.8 percentage points, 95% CI 6.6-35.0; $p = 0.006$) and third survey (43/73, 58.9% vs 13/36, 36.1%; difference 22.8 percentage points, 95% CI 3.5-42.1; $p = 0.025$). Ultrasound access remained low overall, though it increased modestly among enrolled women and remained negligible among women without SHIF. Receipt of medicines and supplements were consistently reported across groups, while tetanus vaccination declined over time in both groups, suggesting broader service-delivery constraints rather than SHIF enrolment-specific differences.

Insert Table 6 here

Qualitative accounts indicated uneven effects on service readiness. Some respondents, particularly in Level 3 facilities and above, reported modest improvements from more regular reimbursements, including procurement of reagents and medicines and support for referrals:

“SHA[SHIF] is good... most facilities use that money to buy the reagents for ANC profile” (County official, #012).

However, lower-level facilities described disruption during the transition. Reclassification and provider contracting reportedly excluded many Level 2 and some Level 3 facilities from reimbursement eligibility. In rural areas, where these facilities are often the first point of maternity care, insured women could still face OOP costs for ANC or delivery at facilities unable to claim reimbursement, effectively paying both premiums and user charges. Providers described financial strain, reduced capacity to maintain service quality and uncertainty over continued maternity provision.

Participants described differential treatment by providers based on insurance status. Although policy required services regardless of enrolment, respondents suggested SHIF shaped care pathways and provider attitudes. Unenrolled women were often reported to receive a narrower package of care, typically limited to basic clinical examination without recommended investigations:

“Without SHA[SHIF]... they [healthcare professionals] just palpate... [pregnant mothers] walk away without lab works” (Sub-county official, #008).

“It is only bad when you don’t have SHA[SHIF]. If you don’t have it you can be treated badly, but if you have it, then it is good” (Recent mother, #083).

These perceived differences contributed to delayed or avoided facility care among some uninsured women.

Financial protection and out-of-pocket expenditure

Women continued to incur OOP costs during pregnancy despite SHIF coverage (Table 7). Total antenatal OOP expenditure was somewhat higher among enrolled women than unenrolled women (median KES 110, IQR 0-340, vs KES 100, IQR 0-240), although the difference was not statistically significant ($p = 0.1855$). Direct medical costs were zero at the median in both groups but higher on average among enrolled women (mean KES 213.3 +/- 544.3 vs KES 98.8 +/- 215.3; $p = 0.3004$), suggesting a small number of high-cost cases rather than a systematic difference. Direct non-medical costs and lost income were not clearly differentiated by enrolment status. These patterns likely reflect differences in service use, referral pathways, facility type or completeness of care, rather than a direct effect of enrolment.

Insert Table 7 here

Insert Table 8 here

For delivery and early postnatal care within six weeks, direct medical costs were lower among enrolled women than unenrolled women (median KES 330, IQR 0-750, vs KES 1,500, IQR 0-3,500; $p = 0.016$), and total OOP expenditure followed a similar pattern (median KES 350, IQR 50-800, vs KES 1,550, IQR 0-3,550; $p = 0.051$) (Table 8). SHIF Coverage did not eliminate costs: 61.0% of enrolled women still incurred some OOP medical expenditure for delivery or early postnatal care. Direct non-medical costs and lost income were low in both groups and did not differ clearly by enrolment status.

Qualitative data explained the persistence of costs. Participants attributed OOP payments to stock-outs of medicines and diagnostic supplies, unavailable services, gaps in SHIF benefits and care sought from private providers. In facilities not contracted to provide SHIF services, women could be asked to pay despite being insured

“I had paid [for SHIF]... and I am going back without the drugs... it will force me to look for money again” (Recent mother, #033).

These findings indicate nominal coverage did not guarantee financial protection.

Discussion

This study provides early implementation evidence on how Kenya's transition from free maternity care to the SHIF is reshaping equity in maternal healthcare. Drawing on mixed-methods data from the C-it DU-it research programme in a high-burden county, it offers a rare view of how a major financing reform unfolds. Although SHIF aims to advance UHC, its early implementation reproduced, and in some respect intensified, inequities in maternal health access through delayed and interrupted coverage, enrolment barriers, contribution requirements and uneven facility readiness. Inequities were shaped not only by whether women enrolled, but by when coverage began, whether it was sustained, and whether facilities could translate coverage into effective care. Although aggregate enrolment increased over pregnancy and the postnatal period, many women remained uninsured at first ANC and gained coverage only later in pregnancy or after delivery, when opportunities for preventive care and early risk detection may already have been missed.

These findings extend existing evidence on social health insurance in low- and middle-income countries, where insurance is often linked to greater service use but shows inconsistent effects on equity and financial protection (6, 7, 11). One explanation for this inconsistency may be methodological: coverage is often modelled as a static binary indicator, whereas actual access depends on the timing, continuity and administrative feasibility of enrolment. For time-sensitive services such as maternity care, delayed or interrupted coverage can erode the equity gains insurance is assumed to deliver.

Administrative design was a central mechanism generating inequity. Requirements for national identity documentation, digital registration and active premium status were not neutral technical features; they determined who could obtain coverage, how quickly, and how much autonomy. Adolescents, unemployed women and those with limited control over money or mobile phones were particularly vulnerable to delayed or unsuccessful registration. Viewed through Braveman and Gruskin's framework, these constitute institutionally produced inequities, consistent with evidence from other African insurance schemes linking administrative complexity, unaffordability and limited intra-household decision-making to lower enrolment and service use (8, 9, 26).

Emerging evidence suggests SHIF's means-testing may overestimate income among poorer households, assigning unaffordable contributions (27), consistent with participants' descriptions of premium assessments as opaque, inconsistent and burdensome. Perceived misclassification may drive delayed, selective or episodic enrolment, reinforcing inequities in the timing and continuity of maternal healthcare coverage. Premium assessment should be treated as a core equity mechanism within SHIF, not a neutral administrative procedure. Where assessment is opaque, inaccurate or difficult to contest, it risks delaying enrolment, undermining trust and weakening financial protection.

The shift from Linda Mama to SHIF reconfigured access in ways that disadvantaged women whose vulnerabilities often overlapped, including adolescents, women without identity documents, those in informal or unpaid work, and those with limited financial autonomy. These were not discrete groups: adolescents often lacked both identity documents and independent income, while women in unpaid or informal work frequently had limited control over money, phones and household decisions. Similar

patterns have been reported elsewhere in Africa, where moves from tax-funded to contributory insurance have increased utilisation while introducing new enrolment and compliance barriers(7, 28). Linda Mama was not without flaws, but its pregnancy-based entitlement avoided many registration and contribution barriers observed under SHIF. SHIF's contributory model may improve sustainability if implementation functions well, but risks shifting administrative and financial burdens onto women least able to bear them.

The observed differences in ANC completion, public facility delivery and receipt of selected ANC services by SHIF status are broadly consistent with prior research (7, 9, 29) but warrant cautious interpretation. Women who enrolled early may have differed in financial autonomy, health literacy, partner support and facility proximity, so observed differences likely reflect both the enabling effect of insurance and unequal capacity to obtain and sustain coverage. Moreover, benefits were unevenly distributed. SHIF appeared most beneficial for women who enrolled early, maintained active status and used contracted facilities with adequate commodities, echoing evidence from other African insurance contexts that coverage itself can stratify effective access (11, 30).

Supply-side readiness and strategic purchasing mediated SHIF's negative equity effects. Some facilities reported improved capacity to procure reagents or support referrals, while lower-level facilities experienced disruption where contracting and reimbursement requirements did not match the realities of rural maternity care, consistent with broader UHC evidence that demand-side financing cannot produce equitable access without matching service readiness, timely payment and reliable commodity supply (31-34).

Financial protection remained incomplete, in line with wider sub-Saharan African evidence (11, 30). Out-of-pocket costs persisted despite coverage, mainly because services, medicines or diagnostics were unavailable in public facilities, or because facilities lacked contracts for reimbursement. For UHC reforms, this underscores the need to measure effective financial protection across the continuum of pregnancy, delivery and postnatal care, not enrolment alone.

More broadly, these findings show how reforms intended to advance UHC can unintentionally widen equity gaps where implementation is not explicitly equity sensitive. A key question is whether the inequities observed reflect transitional implementation difficulties or more entrenched design features. Barriers linked to community sensitisation, provider uncertainty and digital disruptions may ease as implementation stabilises; those tied to documentation, means-tested contributions, mobile phone dependence and facility contracting are more structural, and may continue to disadvantage adolescents, migrants and women with limited financial autonomy unless addressed through active monitoring of exclusion and targeted protection for groups at risk of being left behind.

Policy implications

These findings have immediate implications for SHIF implementation in Kenya, and broader lessons for the growing number of LMICs transitioning from free or tax-funded maternity care to contributory social

health insurance in pursuit of UHC.

For Kenya, timely enrolment for pregnant women requires assisted registration at first ANC and during community outreach, with alternative pathways, such as temporary pregnancy-linked entitlement, for adolescents, refugees and women without identity documents (35, 36). Contribution and subsidy mechanisms should reflect irregular informal-sector incomes and women's limited financial autonomy; automatic or subsidised maternity coverage at pregnancy confirmation would align with progressive universalism and prevent delayed enrolment from undermining early ANC attendance (11, 37). Means-testing should be transparent, appealable and clearly communicated, with adequate training for health and community health workers involved in registration. Digital registration requires redesign for low-resource settings, including offline or assisted options, alternatives to one-time passwords tied to male-controlled phones (38), and reliable facility support. Provider payment and contracting should reflect rural realities, with clear reimbursement pathways, transitional financing where reclassification has disrupted claims, and support for diagnostics, medicines, referral and emergency obstetric care (39).

Beyond Kenya, the findings underline a broader policy risk: insurance reforms can expand formal coverage while weakening equitable access if implementation burdens fall on those least able to meet them. SHIF and similar UHC reforms should therefore be judged not only by aggregate enrolment, but by whether coverage is timely, continuous and usable at the point of care. Routine monitoring should track exclusion among adolescents, migrants, women without identity documents and those with limited financial autonomy, alongside service readiness, provider payment, out-of-pocket costs and differential treatment by insurance status.

Strengths and limitations

This study's mixed-methods design, combining longitudinal survey and qualitative data, strengthens the validity and interpretive depth of the findings and captures an early period in a major national financing reform. Several limitations warrant consideration. As the study was conducted in a single county during early implementation, findings may not generalise to other settings and may shift as SHIF matures. Facility-based survey recruitment likely excluded women who did not attend ANC, underestimating exclusion, although the qualitative component drew on both facility- and community-based participants. The quantitative analysis was not designed to establish causality, and SHIF enrolment may be confounded by autonomy, information, facility access and socioeconomic status. Follow-up varied across survey rounds, and expenditure data may be subject to recall bias and skewed cost distributions. Future research should examine longer-term effects on maternal health outcomes, financial protection, equity and quality across diverse Kenyan counties.

Conclusion

Kenya's transition from Linda Mama to SHIF offers an important test of whether contributory health insurance can advance universal health coverage without weakening protection for women and girls who already face barriers to care. Our findings suggest that, in its current form, SHIF has not delivered

equitable protection for all. Although enrolment increased substantially, access to both insurance coverage and maternity care remained contingent on identity documentation, digital registration, premium payment, and facility contracting arrangements - conditions that fell disproportionately on adolescents, women without identification documents, those in informal or unpaid work, and users of lower-level rural facilities. These findings demonstrate that enrolment figures alone are an inadequate measure of progress towards UHC. Equitable coverage hinges on whether women can enrol with ease, remain insured throughout pregnancy and childbirth, and obtain care at the facilities they actually use. Persistent out-of-pocket payments, together with the exclusion of many lower-level facilities from reimbursement, risk entrenching the very inequities SHIF was intended to redress. Addressing this will require equity-focused reforms: simplified enrolment procedures, alternative pathways for adolescents and undocumented women, maternity-linked protection independent of premium status, and reimbursement mechanisms that sustain frontline services. Ultimately, equitable progress towards UHC depends on coverage that is not only expanding but timely, continuous, and genuinely usable by those most at risk of exclusion.

Abbreviations

ANC: Antenatal care

CHA: Community health assistant

CHP: Community health promoter

CI: Confidence interval

ECCF: Emergency, Chronic and Critical Illness Fund

FGD: Focus group discussion

HCW: Healthcare worker

IQR: Interquartile range

KES: Kenyan shilling

LMIC: Low- and middle-income country

NHIF: National Hospital Insurance Fund

OOP: Out-of-pocket

PHC: Primary healthcare

PMT: Proxy means testing

REC: Research Ethics Committee

RH: Reproductive health

SD: Standard deviation

SDG: Sustainable Development Goal

SHA: Social Health Authority

SHIF: Social Health Insurance Fund

UHC: Universal health coverage

USD: United States dollar

WHO: World Health Organization

Declarations

Ethics approval and consent to participate

The study was conducted in compliance with the World Medical Association Helsinki Declaration on ethical conduct of research involving human subjects. Ethical approval was obtained from the Jaramogi Oginga Odinga Teaching and Referral Hospital Ethics Review Committee (ISERC/JOOTRH/676/22), the National Commission for Science, Technology and Innovation, and the Liverpool School of Tropical Medicine Research Ethics Committee (LSTM REC 22-069 and 22-073). Additional approval was granted by the Homa Bay County Ministry of Health. All participants were informed about the purpose, risks, benefits and procedures of the study and written informed consent was obtained prior to data collection. For participants under 18 years, assent was obtained alongside parental or guardian consent in accordance with national guidelines. All data were anonymised before analysis.

Consent for publication

Not applicable

Availability of data and materials

Data are available from the corresponding author on request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

Conception or design of the work: YA, LO, TT, HB, VD, SM, RM, AO, IO, MO, LO, MO, JO, TW, and MT. Data collection: YA, OA, RM, IO, MO, BO, GO, MO, and SO. Data analysis and interpretation: YA, LO, TT, GO, OA, HB, VD, SM, RM, AO, IO, MO, LO, MO, JO, BO, GO, MO, SO, MO, LO, MO, JO, TW, and MT. Drafting the article: YA, LO, TT, TW, and AO. Critical revision of the article: YA, LO, GO, OA, HB, VD, SM, RM, AO, IO, MO, LO, MO, JO, BO, GO, MO, SO, and MT.

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Tables

Tables 1 to 8 are available in the Supplementary Files section.

Figures

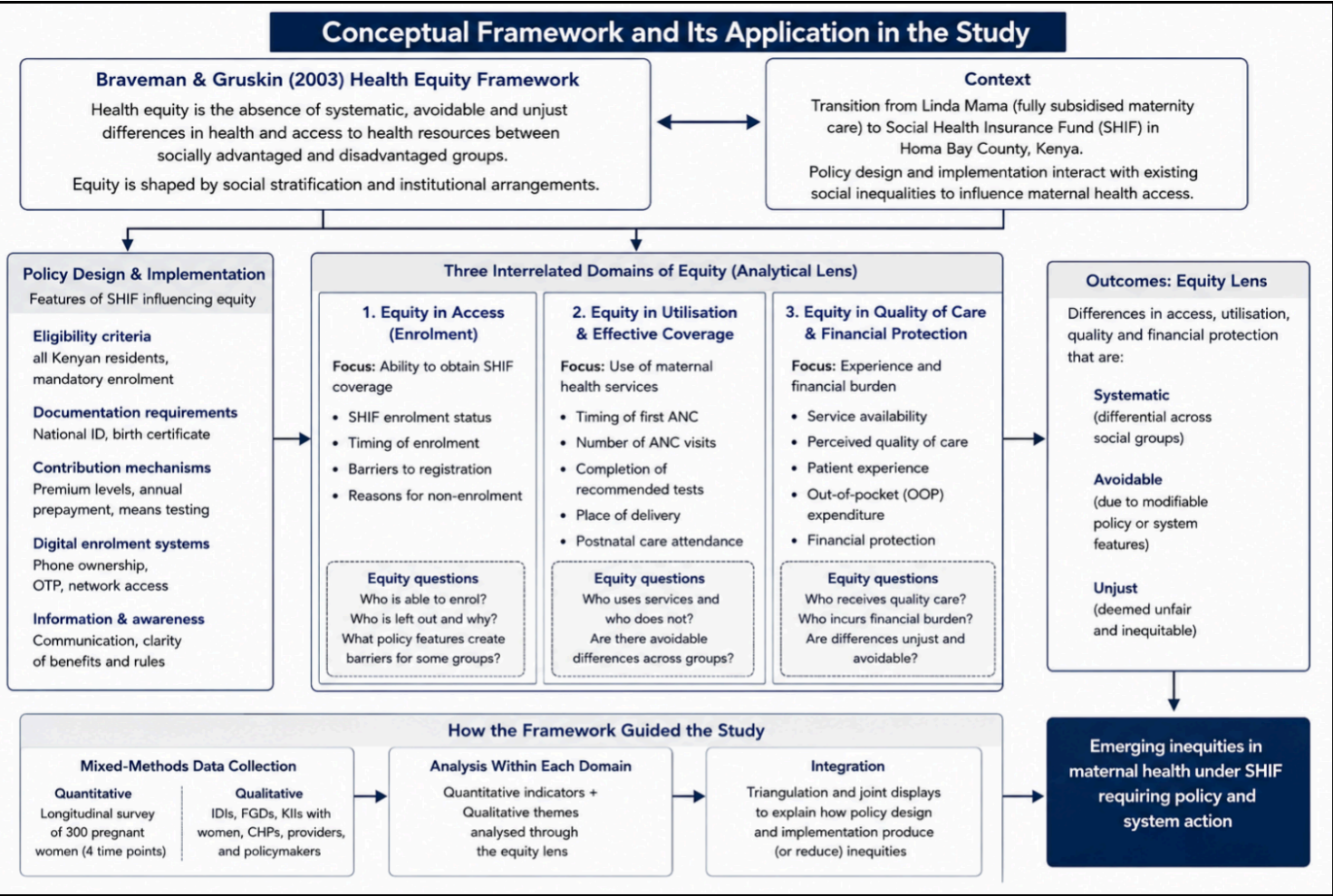


Figure 1

Conceptual framework guiding the analysis of equity implications of Kenya’s transition from Linda Mama to the Social Health Insurance Fund

Caption: Adapted from Braveman and Gruskin’s health equity framework, the figure illustrates how SHIF policy design and implementation features, including eligibility criteria, documentation requirements,

contribution mechanisms, digital enrolment systems, and information availability, may interact with existing social inequalities to influence maternal health equity. The framework guided analysis across three domains: (i) equity in access and enrolment, (ii) equity in utilisation and effective coverage, and (iii) equity in quality of care and financial protection. Mixed-methods findings were interpreted through an equity lens to identify systematic, avoidable, and unjust differences in maternal health service access, utilisation, quality, and financial protection during the transition from Linda Mama to SHIF in Homa Bay County.

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