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Integrating Emergency Preparedness Frameworks into Community-Based Reproductive Health Programming in African Countries

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Abstract

Background: Reproductive health services are among the first services to become unstable during epidemics, armed conflict, flooding, drought, displacement, and broader health-system shocks. In African settings, community-based reproductive health programming often depends on community health workers, outreach teams, local referral networks, and decentralized commodity delivery, but emergency preparedness frameworks have historically been designed more visibly around national surveillance, tertiary facilities, and general health security structures than around continuity of local reproductive health access.

Objective: This study assessed the extent to which emergency preparedness was integrated into reproductive health continuity arrangements in African countries and examined which operational components were most and least frequently documented in official continuity planning during the COVID-19 period. The analysis also tested whether countries documenting more preparedness actions preserved a broader reproductive health continuity package.

Methods: A secondary, multi-country comparative analysis was conducted using the World Health Organization Regional Office for Africa rapid assessment on continuity of essential sexual and reproductive health services. Twenty-four countries with complete continuity-package data were included. Three continuity indicators were coded from country tables, namely family planning, comprehensive abortion care, and post-abortion care. Eleven preparedness-action indicators were coded from the same source, covering triage, infection prevention and control, self-care, multi-month dispensing, supply-chain maintenance, community-based distribution and outreach, guideline revision, coordination, supportive supervision, data monitoring, and explicit facility-level essential-service designation. A continuity score, action index, and composite integration score were calculated. Descriptive statistics, regional comparison, Spearman correlation, and Poisson regression were used.

Results: Family planning appeared in 95.8 percent of continuity packages, post-abortion care in 91.7 percent, and comprehensive abortion care in 50.0 percent. The mean continuity score was 2.38 of 3 and the mean preparedness-action score was 2.13 of 11. Guideline revision was the most common action at 41.7 percent, followed by infection-prevention strengthening at 29.2 percent and supply-chain management, coordination, and data monitoring at 25.0 percent each. Community-based distribution and outreach were documented in only 12.5 percent of countries, and multi-month dispensing in 8.3 percent. Uganda had the highest composite integration score, followed by Ghana. South Sudan had the lowest. The action index was positively associated with the continuity score, but the coefficient was imprecise in adjusted models.

Conclusion: African countries more commonly protected the policy inclusion of reproductive health services than the decentralized operational mechanisms needed to keep community-based access functioning in crisis conditions. Preparedness integration was therefore partial rather than fully institutionalized. The findings support a shift from emergency response that begins once disruption starts to routine reproductive health programming that is designed from the outset for continuity, decentralization, and recovery.

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Introduction

Sexual and reproductive health in the African region includes maternal and newborn care, family planning, prevention and treatment of sexually transmitted infections, safe abortion and post-abortion care where legally permitted, and broader sexual health promotion. These services are foundational to women's health, adolescent wellbeing, and household resilience, yet they

are highly sensitive to transport interruptions, commodity stock-outs, staff redeployment, insecurity, and breakdowns in referral pathways [1, 4, 7, 9].

Community-based delivery matters because many African populations reach the health system through community health workers, neighborhood outreach, mobile teams, women's groups, local volunteers, household education, and linkages to primary care rather than through referral hospitals alone. The WHO guideline on community health worker programmes emphasized that CHW effectiveness depends on selection, training, supervision, financing, and integration into formal systems, and WHO guidance on women's participatory groups similarly recognized that community mobilization can improve maternal and newborn health and strengthen care-seeking [2, 3].

Emergency preparedness in reproductive health should therefore be understood as a proactive and embedded systems function. It includes risk assessment, continuity planning, decentralized service design, communication and early-warning arrangements, workforce preparedness, commodity security, referral mapping, monitoring, and post-shock recovery. The Minimum Initial Service Package for sexual and reproductive health in crisis settings and the 2018 Inter-Agency Field Manual made this principle explicit by treating reproductive health not as an optional extension of emergency response but as a lifesaving core domain from the onset of crisis [4, 5].

The broader preparedness architecture reinforces the same logic. The WHO JEE tool, the SPAR self-assessment tool, and the WHO framework for health emergency preparedness in cities and urban settings all position preparedness as an ongoing function built through institutions, coordination, surveillance, workforce, and local implementation capacity. Yet these tools are not reproductive-health-specific, and they do not by themselves guarantee continuity of contraception, post-abortion care, adolescent services, or gender-based violence response at community level [10-12].

Existing evidence shows why this gap matters. The WHO scoping review on maintaining essential services during disruptive events found repeated service interruptions associated with transport barriers, supply disruption, redeployment of staff, fear of infection, and communication failures. A mini review of maternal healthcare in Africa during COVID-19 described declines in antenatal, skilled birth, postnatal, and family-planning services. A rapid review of postnatal care in sub-Saharan Africa also documented important reductions in service availability and use during lockdown periods [6, 14, 19].

The problem is sharper in fragile or displaced settings. Systematic review evidence from Africa shows that refugee, migrant, and displaced girls and young women face major obstacles in access to contraception, menstrual health supplies, STI information, safe care, and protection from sexual violence. UNFPA's MISP materials further note that more than 500 women and girls die every day from pregnancy and childbirth in humanitarian and fragile settings, underscoring that continuity failures are not administrative inconveniences but mortal risks [4, 13].

Literature review

Recent African studies illustrate the pattern of uneven

continuity and adaptive improvisation. Banke-Thomas and colleagues used routine service data and interviews from referral hospitals in Guinea, Nigeria, Tanzania, and Uganda and showed heterogeneous declines and recoveries in maternal health utilization during the first pandemic year, shaped by movement restrictions, fear, and local service adaptation [15]. Haidara and colleagues reported that Malian providers experienced disruptions in staffing, client demand, and supply availability, but also sustained some sexual and reproductive health services through innovation, outreach, and phone-based support [16]. Malkin and colleagues, examining Kenya, Nigeria, and Zimbabwe, documented how family-planning programmes adapted through self-care, smaller-group outreach, digital communication, and revised delivery modalities rather than through business-as-usual clinic systems [17].

At the same time, implementation evidence remains comparatively thin at the preparedness-integration level. Emina and colleagues found that even in a humanitarian setting such as the Democratic Republic of the Congo, establishing a practical core indicator set for sexual, reproductive, maternal, newborn, child, and adolescent health required careful attention to data feasibility and reporting systems. That finding is important because preparedness cannot be institutionalized in community programmes if it cannot be measured consistently [18].

The literature therefore converges around four themes. First, reproductive health disruption during emergencies is well established. Second, decentralized and community-facing adaptations often preserve access when routine facility pathways fail. Third, preparedness frameworks and measurement systems remain fragmented. Fourth, there is limited multi-country empirical work that directly evaluates how African countries integrate preparedness actions into reproductive health continuity architecture. That final gap motivates the present study [4-12, 15-19].

Research aim and questions

The study aimed to assess the integration of emergency preparedness into reproductive health continuity programming in African countries using an official multi-country WHO dataset, with emphasis on community-relevant service-maintenance actions. The study asked three questions. How widely were reproductive health services included in national continuity packages. Which preparedness actions were most and least frequently documented. Did countries documenting more preparedness actions preserve a broader reproductive health continuity package [7-12].

Analytical framework

The paper conceptualizes integration as a chain linking policy inclusion to delivery continuity. In this framework, emergency governance and planning create authorization for response, but community-facing continuity depends on operational actions such as decentralized distribution, self-care support, supervision, monitoring, and referral maintenance. The framework is consistent with MISP principles, WHO preparedness tools, and CHW systems thinking [2, 4-5, 10-12].

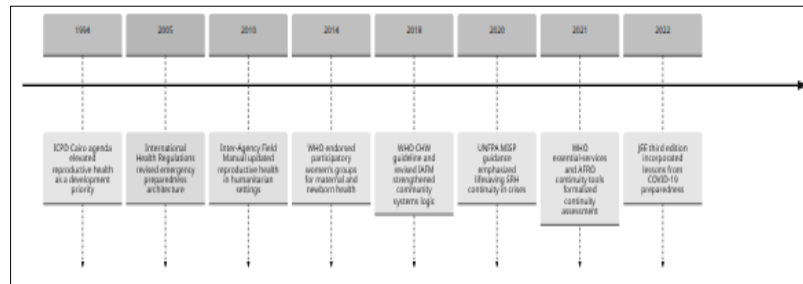


Fig 1: Evolution of key frameworks relevant to reproductive health preparedness

The timeline above synthesizes the normative architecture that underpins the manuscript's conceptual model [2-6, 10].

Table 1: Selected literature comparing key studies and official frameworks

Study or framework	Setting and design	Main finding	Relevance to this manuscript
Ivanova <i>et al.</i> , 2018 [13]	Systematic review of refugee, migrant, and displaced girls and young women in Africa	Humanitarian displacement is associated with major SRH access barriers, violence risk, and information gaps	Shows why preparedness must explicitly protect vulnerable groups
WHO scoping review, 2021 [6]	Global scoping review of essential-service maintenance during disruptive events	Continuity depends on transport, staffing, communication, alternative delivery, and adaptation	Supports integration of emergency planning into routine service design
Banke-Thomas <i>et al.</i> , 2022 [15]	Mixed-methods hospital study in Guinea, Nigeria, Tanzania, and Uganda	Maternal service utilization changed unevenly during COVID-19, with local adaptation shaping recovery	Demonstrates cross-country heterogeneity in continuity
Haidara <i>et al.</i> , 2022 [16]	Qualitative facility study in Mali	Staffing, supplies, and client access were disrupted, but outreach and phone support mitigated some losses	Highlights adaptive mechanisms relevant to community programming
Malkin <i>et al.</i> , 2022 [17]	Practice-based analysis in Kenya, Nigeria, and Zimbabwe	Self-care, modified outreach, and revised family-planning delivery helped preserve services	Directly supports preparedness through decentralized delivery models
Emina <i>et al.</i> , 2022 [18]	Multi-methods assessment in DRC humanitarian settings	SRMNCAH indicator sets require feasible data systems and reporting pathways	Supports the data and measurement pillar of preparedness integration

Source: Synthesized from the cited studies [6, 13, 15-18].

Methods

This study was designed as a secondary, comparative, mixed quantitative and documentary analysis of official country data from the WHO Regional Office for Africa. The principal empirical source was the round 4 rapid assessment of continuity of essential sexual and reproductive health services, which covered the period from February 2020 to May 2021, used HMIS and DHIS2 as the main national data sources, and documented continuity arrangements and country actions across the region [7-8].

Study sample

Round 4 covered 25 countries. For this manuscript, 24 countries were included because one country listed in the round 4 participation table, Namibia, did not appear with a visible row in the continuity-package country tables used to code family planning, comprehensive abortion care, and post-abortion care. To avoid introducing unverifiable values, Namibia was excluded conservatively from the analytic dataset. The final sample included Angola, Benin, Burundi, Cameroon, Central African Republic, Democratic Republic of the Congo, Eritrea, Ethiopia, Ghana, Guinea, Kenya, Liberia, Madagascar, Mali, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, South Sudan, Togo, Uganda, the United Republic of Tanzania, and Zimbabwe [8].

Variables and coding

Three continuity indicators were extracted from the continuity-package tables. Inclusion of family planning in the national continuity package. Inclusion of comprehensive abortion care. Inclusion of post-abortion care. Each was coded as 1 for yes and 0 for no. Eleven preparedness-action indicators were extracted from the documented country action lists. Triage system. Infection prevention and control strengthening. Promotion of self-care. Multi-month dispensing. Supply-chain management for family-planning commodities. Community-based distribution or integrated outreach. Development or revision of guidelines. Coordination meetings with SRHR actors. Supportive supervision or mentoring. Routine data monitoring. Explicit statement that services are part of the essential package for facility implementation [8].

Index construction

Three summary measures were created. The continuity score ranged from 0 to 3 and summed the three continuity-package indicators. The action index ranged from 0 to 11 and summed the eleven preparedness-action variables. The composite integration score ranged from 0 to 14 and was rescaled to 0 to 100 percent. For descriptive interpretation, scores below 30 percent were classified as low integration, 30.0 to 49.9

percent as moderate integration, and 50.0 percent or higher as high integration. The coding framework was informed conceptually by MISP, CHW

systems guidance, JEE, SPAR, and WHO preparedness frameworks, but only variables explicitly documented in the WHO AFRO country tables were scored [2, 4-5, 8, 10-12].

Analysis

Descriptive statistics summarized the frequencies of continuity elements and preparedness actions. Countries were then ranked by the composite integration score. Regional comparisons were undertaken across Central, West, and East and Southern African groupings as represented in the WHO dataset. A Spearman correlation tested the bivariate association between the action index and the continuity score. To estimate directional association, a Poisson generalized linear model regressed the continuity score on the action index, first unadjusted and then adjusted for region. Given the small ecological sample, the regression analysis was treated as exploratory rather than causal. All calculations were derived directly from the official WHO AFRO source data [8].

Results

Country coverage and source characteristics.

The underlying WHO AFRO rapid assessment system expanded across four rounds, with 17 countries in round 1, 15 in round 2, 17 in round 3, and 25 in round 4. The main source used by countries was HMIS or DHIS2. This study

analyzed the 24 countries with complete continuity-package rows in the published round 4 country tables [8].

Overall continuity and preparedness integration

Of the 24 countries analyzed, 12 had full continuity-package inclusion of family planning, comprehensive abortion care, and post-abortion care. Ten had moderate continuity with two of the three services included. Madagascar had only one of the three. South Sudan had none. When continuity and action items were combined, the mean composite integration score was 32.1 percent with a standard deviation of 15.8 percentage points. Six countries were classified as high integration, five as moderate, and thirteen as low [8].

Strengths and weaknesses of specific components

The most widely protected continuity elements were family planning, present in 95.8 percent of countries, and post-abortion care, present in 91.7 percent. Comprehensive abortion care was included in only half of countries. Among operational actions, guideline revision was documented in 41.7 percent of countries, infection-prevention strengthening in 29.2 percent, and supply-chain management, coordination meetings, and data monitoring in 25.0 percent each. Community-based distribution and integrated outreach were documented in only 12.5 percent of countries, multi-month dispensing in 8.3 percent, and triage systems and explicit facility-level essential-service designation in just 4.2 percent each [8].

Table 2: Frequency of continuity and preparedness components across 24 countries

Component	Countries with component	Percent
Family planning in continuity package	23	95.8
Comprehensive abortion care in continuity package	12	50.0
Post-abortion care in continuity package	22	91.7
Guideline revision	10	41.7
Infection-prevention strengthening	7	29.2
Supply-chain management	6	25.0
Coordination meetings	6	25.0
Data monitoring	6	25.0
Self-care promotion	5	20.8
Supportive supervision	4	16.7
Community distribution or integrated outreach	3	12.5
Multi-month dispensing	2	8.3
Triage system	1	4.2
Essential package at facility level	1	4.2

The pattern that emerges is a clear implementation asymmetry. African countries were much more likely to specify that family planning and post-abortion care should continue than to document the decentralized delivery adjustments required to make that continuity real for women,

adolescents, and remote communities during disruption. In other words, continuity was protected as a principle more often than as an operational capability [8, 14-17].

Figure 2. Country integration scores

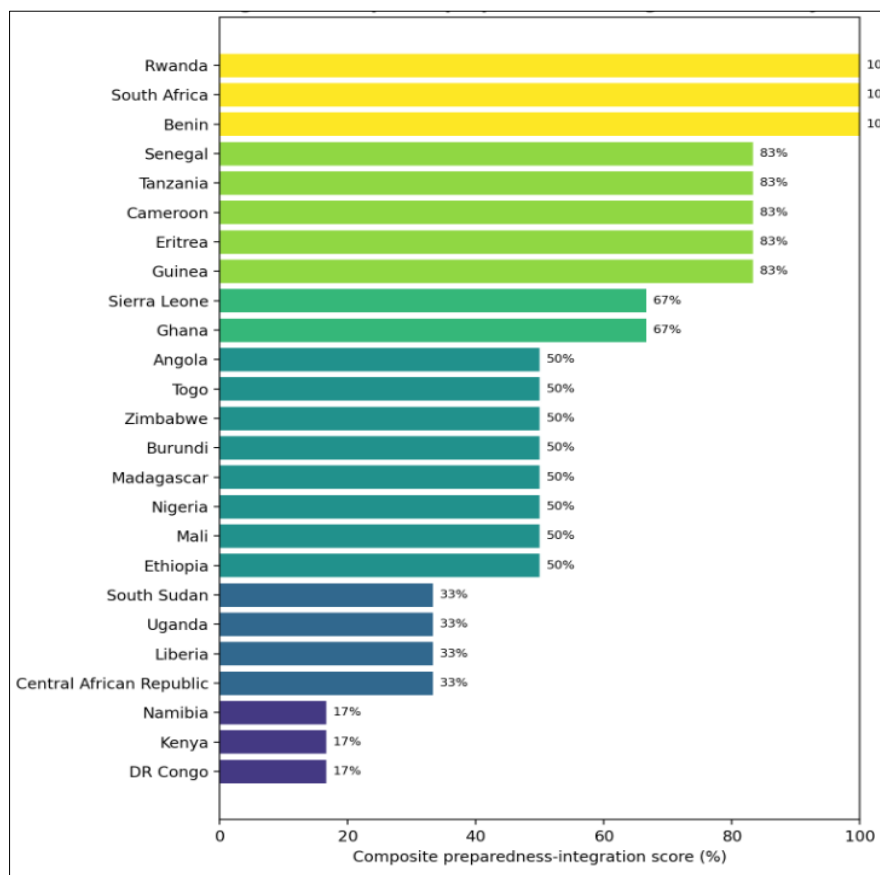


Fig 2: Composite preparedness-integration score by country. Source data are author calculations from the WHO AFRO rapid assessment ^[8].

Country ranking

Uganda had the highest integration score at 64.3 percent. Ghana followed at 57.1 percent. Benin, Nigeria, Sierra Leone, and Zimbabwe each scored 50.0 percent. Democratic Republic of the Congo reached 42.9 percent. At the lower end, Burundi, Eritrea, and Madagascar each scored 14.3

percent, while South Sudan scored 0 percent. These rankings were driven less by continuity-package inclusion alone than by whether countries also documented multiple operational actions such as coordination, self-care, data monitoring, supply logistics, or outreach ^[8].

Table 3: Highest- and lowest-scoring countries.

Country	Region	Continuity score	Action index	Integration percent
Uganda	East and Southern	3	6	64.3
Ghana	West	3	5	57.1
Benin	West	3	4	50.0
Nigeria	West	2	5	50.0
Sierra Leone	West	2	5	50.0
Zimbabwe	East and Southern	3	4	50.0
Burundi	Central	2	0	14.3
Eritrea	East and Southern	2	0	14.3
Madagascar	East and Southern	1	1	14.3
South Sudan	East and Southern	0	0	0.0

Source: Author calculations from the WHO AFRO rapid assessment ^[8].

Regional variation

The Central African subgroup had the highest mean continuity score at 2.60 of 3, but no country in that subgroup reached the high-integration threshold because operational action counts were generally modest. West Africa contained four of the six high-integration countries in the sample. East and Southern Africa showed the greatest internal variability,

spanning Uganda at the top and South Sudan at the bottom. Kruskal-Wallis testing did not show statistically significant regional differences in continuity scores, action indices, or composite integration scores, indicating that country-specific policy and implementation choices mattered more than broad regional grouping in this dataset ^[8].

Figure 3. Component frequencies

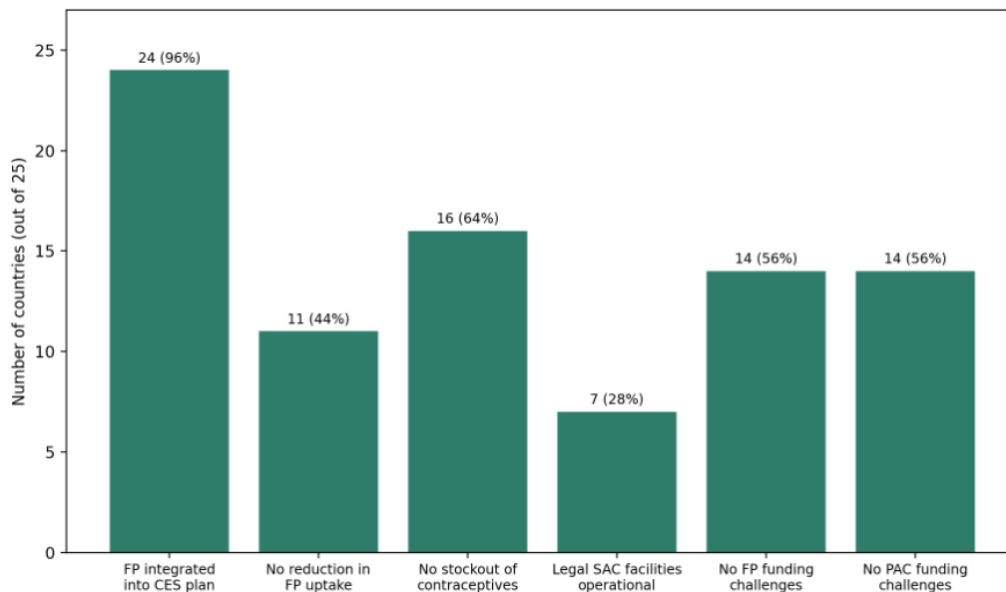


Fig 3: Frequency of continuity and preparedness components across countries. Source data are author calculations from the WHO AFRO rapid assessment [8].

Association between preparedness actions and continuity.

The action index and continuity score were positively correlated at Spearman rho 0.34, which indicates a moderate directionally positive relationship, but the p value of 0.108 means the estimate should be interpreted cautiously. In the unadjusted Poisson model, each one-point increase in the action index corresponded to an incidence rate ratio of about

1.07 for the continuity score. After regional adjustment, the IRR remained about 1.07 and regional terms were not statistically significant. Although the model was underpowered, the substantive direction remained consistent with the descriptive findings [8].

Figure 3. Action index and continuity score

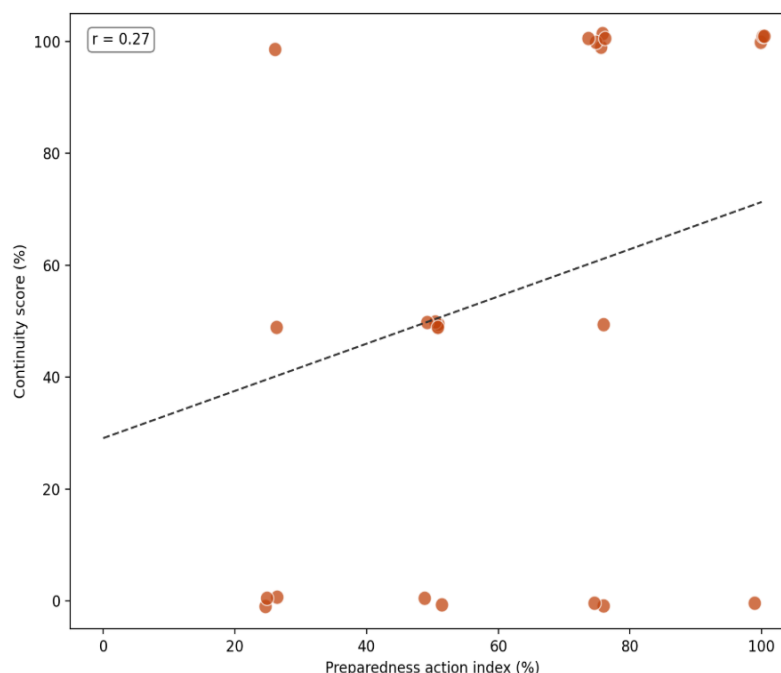


Fig 3: Association between preparedness action index and continuity score. Source data are author calculations from the WHO AFRO rapid assessment [8].

Documentary themes

A qualitative reading of the WHO country-action lists identified four recurring themes. First, preparedness was often translated into policy or procedural revision rather than service redesign. Second, countries that documented stronger continuity tended to use decentralized access measures, such as self-care or community distribution. Third, data feedback and coordination appeared as bridging functions between

policy and delivery. Fourth, explicit community-delivery adaptations were comparatively rare, suggesting that preparedness remained more institutional than community-rooted [8].

Discussion, Conclusion, and End Matter

Discussion. The principal finding of this study is that reproductive health continuity was protected more often as a

policy commitment than as a community-level operating system. Most countries in the sample included family planning and post-abortion care in their continuity packages, but far fewer documented outreach, self-care, multi-month dispensing, supervision, or community distribution. This matter because community-based reproductive health programming depends precisely on those decentralized functions when movement, referral, and normal service utilization are disrupted [2-8, 17].

The weak showing of community delivery indicators helps explain why preparedness integration should not be equated with continuity-package inclusion. A country can rightly identify family planning or post-abortion care as essential yet still leave women without realistic access if commodities are not pre-positioned, if self-care is not supported, if CHWs are not supervised, or if referral and communication channels are not protected. The WHO CHW guideline already warned that support, supervision, and integration are decisive determinants of programme performance, and the WHO essential-services scoping review reached a similar conclusion for disruptive events more broadly [2, 6].

The comparatively poor representation of comprehensive abortion care in continuity packages is also notable. In this dataset, comprehensive abortion care was included in only half of countries, far below family planning and post-abortion care. This pattern suggests that politically or administratively contested services may be especially vulnerable during emergencies, even when technical guidance increasingly frames comprehensive sexual and reproductive health as integral to crisis response [4-5, 8].

The descriptive contrast between better-scoring countries such as Uganda, Ghana, Benin, Nigeria, Sierra Leone, and Zimbabwe and lower-scoring countries such as South Sudan, Madagascar, Eritrea, and Burundi also reinforces the literature on adaptation. Higher-scoring countries tended to document multiple action layers. Coordination, guideline change, infection-prevention measures, commodity protection, monitoring, self-care, or outreach. This matches implementation accounts from Kenya, Nigeria, and Zimbabwe, where family-planning programmes adapted through self-care, modified outreach, and communication redesign, and from Mali, where outreach and phone-based strategies helped sustain access during disruption [16-17].

The findings align with broader African evidence on service disruption but add a more explicitly preparedness-oriented lens. The mini review on maternal healthcare in Africa during COVID-19, the postnatal care rapid review, and the mixed-methods study across four countries all showed that continuity depends on more than formal designation of services as essential. What this manuscript contributes is a direct multi-country comparison of how those enabling preparedness mechanisms were, or were not, incorporated into official reproductive health continuity arrangements [14-15, 19].

The policy implication for African health systems is straightforward. Reproductive health continuity cannot be secured through emergency command-and-control structures alone. It requires pre-crisis embedding within primary health care, community health worker systems, local commodity pathways, and monitoring routines. That conclusion is consistent with WHO's African SRHR initiative, the MISP logic, and resilience-oriented regional advocacy that has increasingly linked sexual and reproductive health to humanitarian-development continuity rather than to short-

lived emergency response projects [4-5, 9, 22].

Proposed integrated framework

Based on the empirical findings and the literature, an African community-based reproductive health preparedness framework should contain eight mutually reinforcing pillars. Governance and accountability. Risk assessment and continuity planning. Workforce readiness. Commodity security. Referral, transport, and communication. Community participation and equity. Data, monitoring, and learning. Sustainable financing. The empirical record in this manuscript suggests that the first and last mile of that chain are especially weak. Policy inclusion too often stops before delivery redesign reaches households and communities [2-12, 21-22].

Recommendations

National governments should embed reproductive health explicitly within emergency-preparedness legislation, continuity protocols, and subnational coordination systems. District governments and implementing partners should institutionalize routine risk mapping, reproductive-health stock planning, community communication protocols, and referral continuity plans. Community-based programmes should train CHWs and outreach staff for disruption scenarios, expand self-care and decentralized dispensing where appropriate, and formalize data feedback loops that track interruptions in contraception, antenatal care, postnatal care, adolescent services, and post-abortion care. Donors should finance preparedness as a recurrent system function rather than as an episodic emergency line item [2-12, 17, 21-22].

Conclusion

This study shows that African countries had made visible progress by 2021 in protecting the formal continuity of reproductive health services during a public health emergency, but that preparedness integration remained uneven and frequently shallow at the operational level. The strongest areas were policy inclusion of family planning and post-abortion care. The weakest were decentralized delivery actions, community outreach, multi-month dispensing, and explicit local implementation structures. Community-based reproductive health programming in Africa will be more resilient when emergency preparedness is embedded in routine programme architecture before crises emerge, rather than appended after disruption begins [2-12].

Limitations

This was an ecological, country-level secondary analysis and did not measure household experience directly. The underlying WHO dataset was generated during the COVID-19 period, so it may underrepresent preparedness arrangements for conflict, flooding, or drought outside that context. Several variables captured whether an action was documented, not how well it was implemented. Namibia was excluded because the published continuity tables used for extraction did not contain a visible row for all three continuity-package elements. Finally, the sample size of 24 countries limited statistical power, so inferential results are best treated as exploratory.

Availability of data and materials

All analytic variables were derived from publicly available WHO AFRO documents cited in this manuscript.

Downloadable derivative tables and graphs are embedded above.

Competing interests. None declared.

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