

Impact of Community-Based Strategies to Improve Adherence to Seasonal Malaria Chemoprevention in Two Community Health Centers of the Sélingué Health District, Mali

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Abstract

Original Research Article

Background: Seasonal malaria chemoprevention (SMC) is one of the key malaria control strategies targeting children under five years of age in Mali, and has been extended to children up to 10 years in the Sélingué Health District. It aims to prevent malaria during the high transmission season. This study aimed to evaluate the impact of community-identified and implemented strategies to improve adherence to SMC treatment in the Sélingué Health District from September to October 2023. **Methods:** This was an action research study based on community-level interventions designed to improve adherence to SMC. Individual interviews were conducted with SMC implementation stakeholders, and a community diagnosis was carried out. A post-campaign survey was conducted in two health areas to determine adherence rates to the SMC treatment regimen. **Results:** A total of 8 community leaders and 29 SMC implementation actors and agents participated in individual interviews and the community diagnosis, which led to the identification and implementation of 10 interventions in the health areas of Binko and Tiègouécourouni. Post-intervention survey results from the SMC campaign showed an improvement in coverage rates from 89% to 95% (n = 220) in Tiègouécourouni, and an increase in adherence rates from 79.5% to 89.5% (n = 228) in Binko. **Conclusion:** This study highlights the importance of participatory strategies tailored to local sociocultural contexts. It underscores the need to strengthen community engagement and adapt interventions to local realities in order to improve adherence to SMC treatment.

Keywords: Adherence; Seasonal Malaria Chemoprevention (SMC); children aged 0–10 years; Sélingué Health District; Mali.

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INTRODUCTION

Malaria remains the leading cause of morbidity (37.7%) and mortality (24.4%) in Mali [1]. Seasonal malaria chemoprevention (SMC) is a cornerstone strategy for preventing malaria in children under five during high transmission seasons [2]. The standard three-day SMC regimen requires direct supervision by community distributors for the first dose, while parents oversee administration of the second and third doses [3,4]. Studies have demonstrated a protective efficacy of 88.2% (95% CI: 78.7–93.4) for SMC, with an average coverage rate of around 76% across four monthly rounds [5]. High and sustained SMC coverage is essential to reducing malaria burden, however full benefits depend on strict adherence to the treatment regimen [6]. Non-adherence often results from factors such as children's absence during distribution, parental forgetfulness, lack

of information about campaign schedules, and insufficient interpersonal communication [7]. In Mali, community-level shortcomings have been reported in the implementation of SMC. Studies indicate that out of ten children who receive the first dose, only four to six complete the second, and among them, merely three to four take the third dose, according to field distribution agents [8]. Reported causes of poor adherence include children's absence during household visits, parental forgetfulness, limited awareness of distribution schedules and campaign timing, and weak interpersonal communication [3,8]. These gaps highlight an urgent need for strategies to strengthen adherence to the second and third doses of the SMC regimen. This community-based action research study aimed to evaluate the impact of locally identified and implemented strategies to improve SMC adherence in the Sélingué Health District.

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METHODS

Study setting:

The study was conducted in the Sélingué Health District (Sikasso Region), approximately 130 km from Bamako. Two community health centers (CSComs) were selected: Binko and Tiègouécourouni.

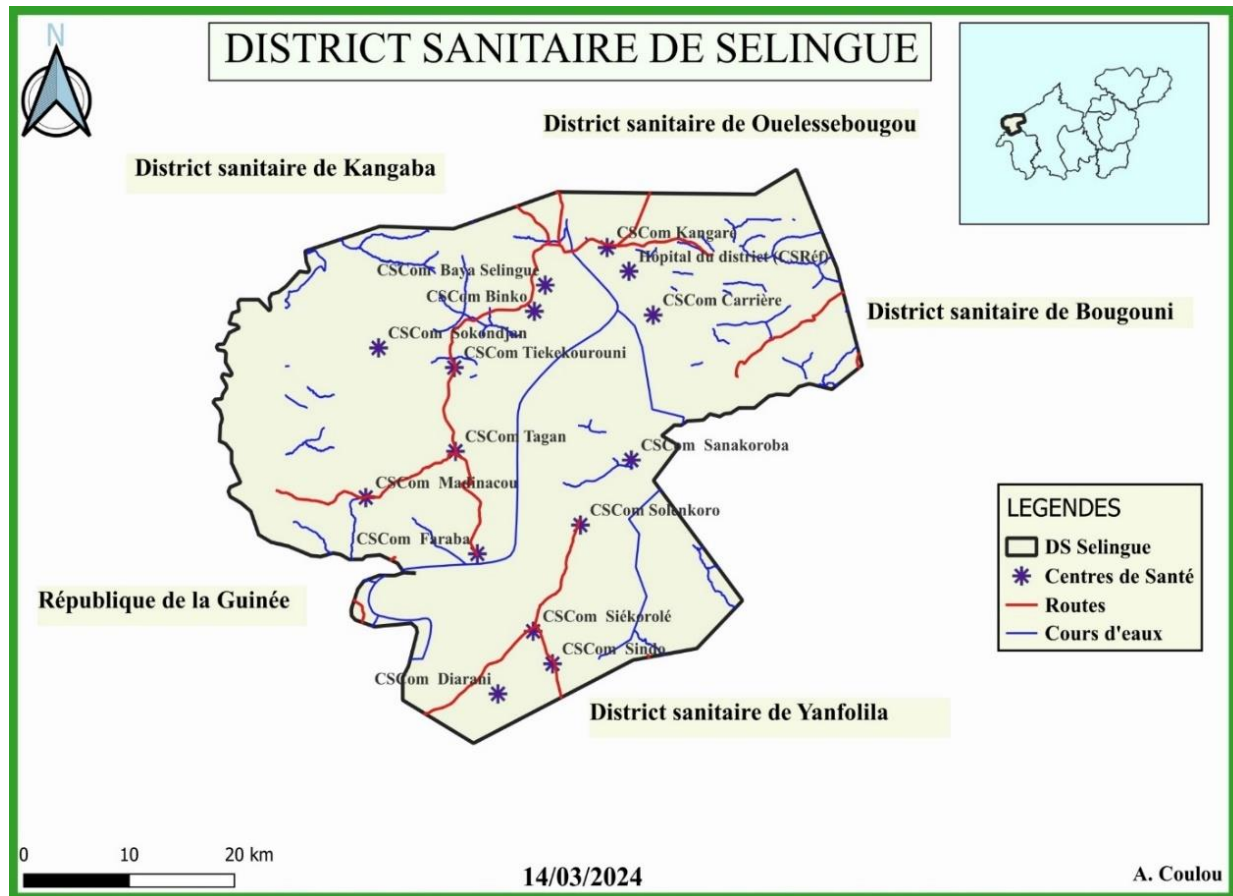


Figure 1: Health map of the Sélingué Health District

Study design and period:

This was an action research project based on community interventions developed through participatory diagnosis. The study assessed the indirect

impact of these interventions using post-campaign surveys conducted between September and December 2023, covering the last two SMC rounds (September and October).

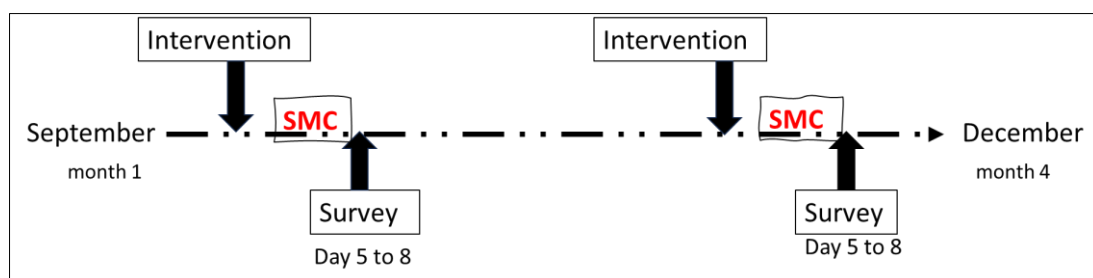


Figure 2: Conceptual plan for the study in the Sélingué Health District in 2023

Participants:

- **Community diagnosis:** Included the district malaria focal point, community development officers, CSCom Technical Directors, community health workers, drug distributors, and local leaders (village chiefs, religious leaders, women's and youth representatives).
- **Adherence survey:** Targeted parents or guardians of children aged 3 to 120 months residing in the selected areas during the third and fourth SMC rounds. Children not eligible for SMC at the time of data collection (those with fever, severe illness, on antimalarial treatment, or with chronic disease) and

parent or guardians who refused to participate were not include.

Tiègouécourouni was surveyed using a structured questionnaire via KoboCollect. Trained field teams verified SMC cards and remaining drug blister packs after obtaining informed consent.

Sampling and data collection:

A stratified probabilistic sample of 189 respondents of which 107 in Binko and 82 in

Table 1: Sample Size Calculation by Health District

Aire de Santé	N _i	P _i	Q _i	P _i Q _i	N _i P _i Q _i	W _i	ni	ni
Tiegoouécourouni	2044	0,85	0,15	0,13	260,61	0,43	81,3	82
Binko	2685	0,85	0,15	0,13	342,34	0,57	106,8	107
Total	4729				602,95	1,00	188,1	189

Data analysis:

Table 2: Variables operational definitions

Variable	Definition	Calculation	Final Value
SMC coverage (survey)	Number of children aged 3 to 120 months who received the corresponding SP/AQ dose	$(\text{Children who received SP/AQ} \div \text{total eligible children surveyed}) \times 100$	%
Treatment adherence	Number of children aged 3 to 120 months who completed the SMC regimen, verified by SMC card and/or empty blister pack	$(\text{Children completing the regimen} \div \text{children who received SP/AQ}) \times 100$	%

Data were validated daily, cleaned by a data manager, and analyzed using Stata 14 and Microsoft Excel 2021. Descriptive statistics and frequency distributions were used to examine SMC coverage and adherence indicators.

Ethical considerations:

Ethical approval was obtained from the national ethics committee. Participation was voluntary, with verbal or written informed consent required. Confidentiality was strictly maintained.

RESULTS

Community diagnosis

A total of 8 community leaders, 29 health personnel, and members of the local population participated. Ten strategies were identified to improve adherence; six were implemented in Tiègouécourouni and three in Binko.

Key interventions

Table 3: Distribution of health areas by strategies identified and implemented by stakeholders

Identified strategy by stakeholders	Implemented in Tiègouécourouni	Implemented in Binko
Use of community radio for pre-campaign awareness through interactive programs with a health professional	No	Yes
Support from the community health association (ASACO) mobilization teams	Yes	Yes
Training of community members for awareness activities (ASACO members, community relays, drug distributors, traditional and community leaders)	Yes	No
Involvement of village chiefs, religious leaders, women's leaders, youth representatives, and school/medersa directors in community mobilization	Yes	No
Household visits by distribution agents on days 2 and 3 to check or assist with administration of remaining doses	Yes	No
Identification and engagement of trusted individuals in each village to assist with community awareness	Yes	No
Improvement of drug palatability to enhance child acceptance	No	No
Scheduling the start of the SMC campaign with the beginning of the rainy season (June) to minimize adverse effects	No	No
Increasing the number of SMC rounds from four to five per season	No	No
Motivation and incentives for Community Health Center Technical Directors (DTCs)	Yes	Yes

In total, ten community strategies were identified and endorsed to improve adherence to the SMC treatment regimen. Among these, six strategies were implemented in CScOm 1 (Tiègouécourouni) and three in CScOm 2 (Binko). The selection reflected the communities' own prioritization and operational capacity rather than any pre-defined ranking of interventions.

Post-campaign survey findings

A total of 438 parents or guardians were surveyed (Tiègouécourouni: 210; Binko: 228). Most respondents were women (93.2%), and the 73% (n=320) had no formal education.

SMC card availability and update

Table 4: Distribution of respondents according to the availability and update status of their SMC card during the first visit, post-SMC 2023 campaign survey

Variable	Category	Tiègouécourouni		Binko		Total	
		n	%	n	%	n	%
Availability of SMC card	No	67	66.3	9	7.8	76	35.2
	Yes	34	33.7	106	92.2	140	64.8
Total (N)		101	100	115	100	216	100
Card update status	No	27	79.4	28	26.4	55	39.3
	Yes	7	20.6	78	73.6	85	60.7
Total (N)		34	100	106	100	140	100

Table: Distribution of respondents according to availability and update status of the child's health record, second round, post-campaign survey CPS 2023

Variable	Category	Tiègouécourouni		Binko		Total	
		n	%	n	%	n	%
Availability of child's SMC card	No	43	39.4	10	8.8	53	23.9
	Yes	66	60.6	103	91.2	169	76.1
	Total (N)	109	100	113	100	222	100
Card update status	No	18	27.3	20	19.4	38	22.5
	Yes	48	72.7	83	80.6	131	77.5
Total (N)		66	100	103	100	169	100

Overall, during the first survey round, 64.8% (n = 216) of children had an SMC card, and among them, 60.7% (n = 140) were up to date. Card availability was considerably lower in Tiègouécourouni compared to Binko, 33.7% vs. 92.2%, respectively as was the proportion of updated cards 20.6% vs. 73.6%.

In the second survey round, 60.6% (n = 109) of respondents in Binko reported having an SMC card, with 72.7% (n = 66) of those cards up to date. Card availability was again higher in Tiègouécourouni (91.2%) than in Binko (60.6%), while the proportion of updated cards was 72.4% in Binko and 80.6% in Tiègouécourouni.

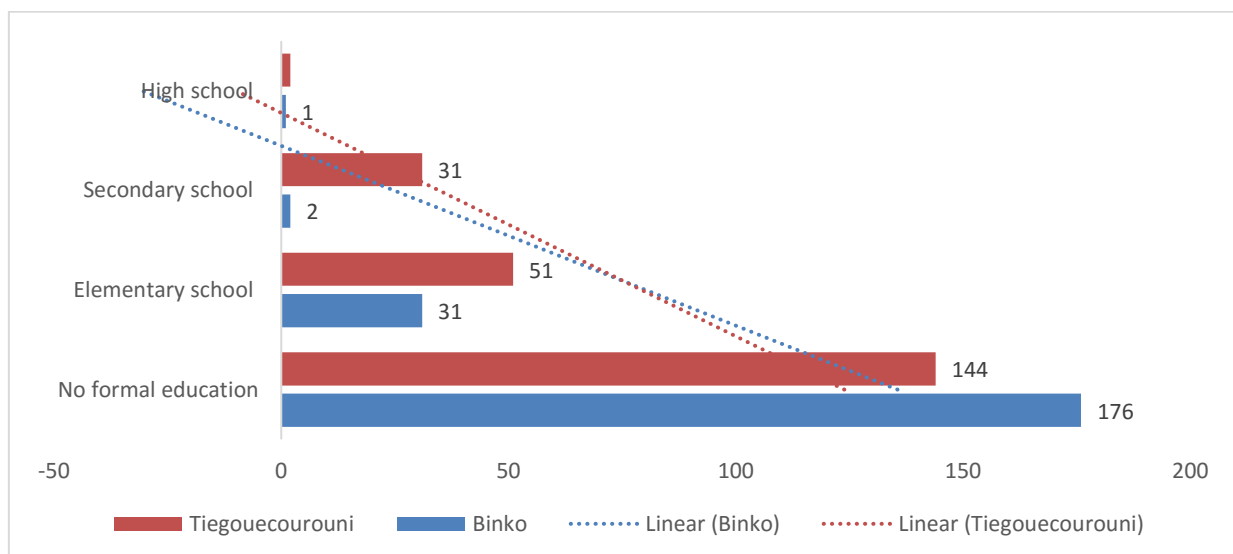


Figure 3: Distribution of respondents by educational level in Binko and Tiègouécourouni 2023

SMC coverage:

Coverage rates increased from 89% (n=101) to 97% (n=115) in Binko but decreased slightly from 95% (n=109) to 93% (n=113) in Tiègouécourouni.

Adherence to treatment:

Adherence improved in both sites from 92.2% to 93.3% in Tiègouécourouni and from 79.5% to 89.5% in Binko between the two survey rounds.

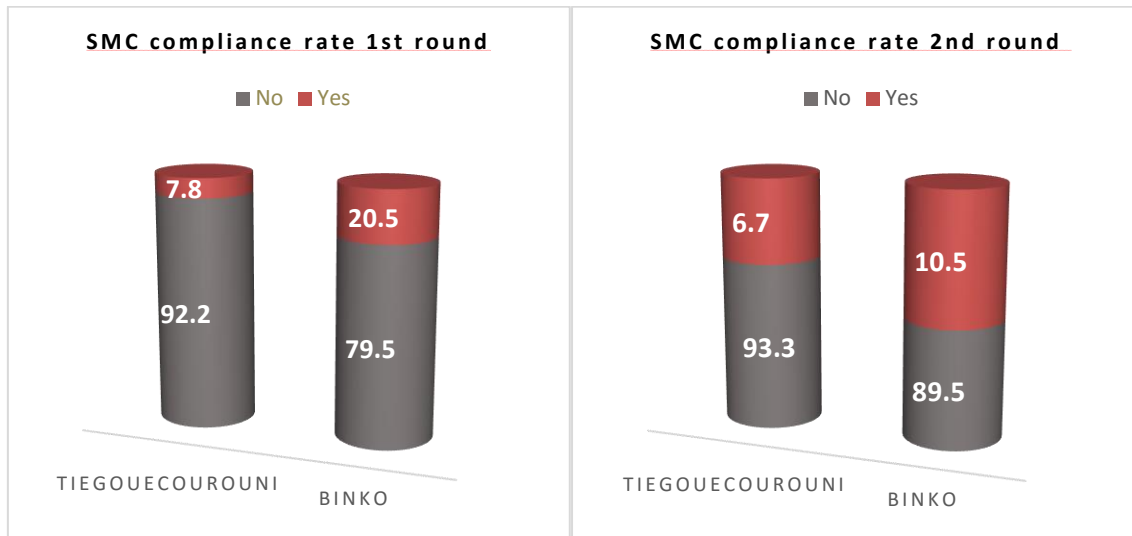


Figure 4: Distribution of cases according to compliance with the CPS treatment regimen during the first and second rounds, post-campaign survey CPS 2023 in Tiègouécourouni and Binko

DISCUSSION

Strategies to Improve Adherence to SMC

The community strategies identified were categorized and implemented both before and during the SMC campaign.

pre-campaign interventions included:

- Capacity building for community leaders, relays, and other influential figures to enhance communication and mobilization around SMC in Tiègouécourouni, and
- The use of local radio for pre-campaign sensitization through an interactive broadcast with a health worker, along with engagement of the Technical Director (DTC) in research activities in Binko.

During the campaign, community relays conducted household follow-up visits on the second and third days to monitor adherence to the treatment regimen.

Household visits by community relays have previously been reported as effective in improving SMC adherence in similar studies conducted by Lasmi *et al.*, [9].

Sociocultural Aspects

The study revealed a strong predominance of female participants, even though interviews were initially designed to target household heads. This finding aligns with previous research highlighting the critical role of women in monitoring children's treatment adherence during SMC, as noted by Lasmi *et al.*, [9]. However, a paradox remains: several studies have also

shown that women limited decision-making autonomy in some communities can negatively affect adherence to health interventions. The educational level of respondents also emerged as a key factor influencing SMC adherence particularly in Binko, compared with Tiègouécourouni. According to Dicko *et al.*, [10], caregivers with only primary education were significantly more likely to have non-compliant children than those with no formal education, suggesting that schooling alone may not ensure full comprehension or commitment to the regimen.

SMC Coverage and Treatment Adherence

Results showed a positive variation in SMC coverage rates in Tiègouécourouni, increasing from 89% to 95%, while a slight decline was observed in Binko, from 97% to 93%, between the first and second post-campaign survey rounds. Similar results were obtained by Koko DC in the Dosso region of Niger [11]. The strong performance in Tiègouécourouni may be attributed to the active involvement and support of community leaders traditional and religious chiefs, school directors, and other influential figures reflecting genuine community engagement. The importance of these actors was supported in Eva Legendre's study [12]. In Binko, although local radio sensitization was effectively implemented, the limited involvement of other community actors (with the DTC as the main driver) and external factors such as school reopening in October and the harvest season may have contributed to the observed decrease in coverage. Nevertheless, the national target of at least 90% coverage [13] was achieved in both sites, along with an improvement in the proportion of updated SMC cards.

Adherence to the SMC treatment regimen improved in both sites. In Binko, adherence increased notably from 79.5% to 89.5% (a 10-percentage-point rise) between survey rounds. The effectiveness of community radio broadcasts in this setting is particularly noteworthy: interactive programs between health workers and community members helped address caregivers' concerns, build trust, and strengthen compliance with treatment. The adherence rates observed in this study are comparable to those reported by Dicko *et al.*, [10], where non-compliance ranged between 11.4% and 18%. Similar progress was achieved in a randomized trial of community interventions with or without reminders to improve SMC (70.6% vs 52.0%) [14]. but remain slightly lower than those reported by Diawara *et al.*, who found a non-compliance rate of 2.3% [15].

The substantial improvement in Binko, despite a slight decline in overall coverage, underscores the potential impact of interactive communication through community radio. This medium allowed direct engagement with caregivers, enhancing understanding, confidence, and motivation to complete the SMC regimen. Similar findings have been reported in studies conducted in Burkina Faso and Niger, which also demonstrated the effectiveness of community radio in promoting participation in public health campaigns [2]. Improving adherence through healthcare personnel assistance in addressing the concerns of the population is supported by I in his study in Ghana [16].

CONCLUSION

Community-led interventions significantly improved adherence to SMC treatment in the two study sites. Active participation of local leaders, targeted communication, and household follow-ups proved effective in enhancing both coverage and adherence. Despite logistical and analytical limitations, these findings underscore the importance of context-adapted, participatory approaches to malaria prevention. Future programs should further institutionalize community engagement to ensure sustainability and maximize SMC impact.

REFERENCES

1. National Malaria Control Program (PNLP). *Programme National de Lutte contre le Paludisme au Mali*. Bamako : PNL ; 2021.
2. ACCESS-SMC Partnership. Effectiveness of seasonal malaria chemoprevention at scale across West and Central Africa: an observational study. *Lancet*. 2020 ;396 :1829–1840. [https://doi.org/10.1016/S0140-6736\(20\)32227-3](https://doi.org/10.1016/S0140-6736(20)32227-3)
3. Coulibaly S. Analysis of SMC implementation strategies among children aged 3–59 months in the Sénou health area, Bamako District, Mali. *Mali Public Health*. 2019.
4. Diarra NH, Ly BA, Sangho O, Traoré FB. Improving the quality of SMC implementation. *Mali Santé Publique*. 2021 ; XI (1).
5. Baba E, *et al.*, Effectiveness of seasonal malaria chemoprevention in West and Central Africa: an observational study. *Lancet*. 2020; 396:1829–1840.
6. World Health Organization. *Field Guide: Seasonal Malaria Chemoprevention with Sulfadoxine–Pyrimethamine and Amodiaquine in Children*. Geneva : WHO ; 2013.
7. Koko DC. Analysis of attitudes and practices influencing adherence to SMC treatment in Dosso Region, Niger. *Public Health and Epidemiology*. 2021.
8. Diarra NH. Community perceptions of seasonal malaria chemoprevention in the Koulikoro District, Mali. Master's thesis in Public Health, 2020.
9. Lasmi K, *et al.*, Barriers to quality delivery of SMC in Chad and Burkina Faso: caregivers' and distributors' perspectives. *Malaria Journal*. 2024; 23:216.
10. Dicko I, *et al.*, Factors influencing non-compliance with SMC in rural and peri-urban areas of Ouélessébougou Health District, Mali, 2022. *Rev Mali Infect Microbiol*. 2024;12(2).
11. Koko, DC, Maazou, A., Jackou, H. *et al.*, Analyse des attitudes et des pratiques influençant l'adhésion à la chimioprévention saisonnière du paludisme chez les enfants de moins de 5 ans dans la région de Dosso au Niger. *Malar J* 21, 375 (2022). <https://doi.org/10.1186/s12936-022-04407-z>
12. Legendre, L, Ndiaye A, Sougou NM *et al.*, Prospective acceptability of mass drug administration for malaria in Kedougou region in Senegal : a mixed method study. *Malaria Journal*, 23:279 (2024). <https://doi.org/10.1186/s12936-024-05078-8>
13. PNL. *National Malaria Control Program*. 2021. Available at: <https://pnlp.ml/cps/>
14. Nkosi-Gondwe T, Robberstad B, Mukaka M, Idro R, Opoka RO, Banda S, *et al.*, Adherence to community versus facility-based delivery of monthly malaria chemoprevention with dihydroartemisinin-piperaquine for the post-discharge management of severe anemia in Malawian children : A cluster randomized trial. *PLoS ONE* 16(9): e0255769(2021). <https://doi.org/10.1371/journal.pone.0255769>
15. Diawara, F., Steinhardt, L.C., Mahamar, A. *et al.*, Measuring the impact of seasonal malaria chemoprevention as part of routine malaria control in Kita, Mali. *Malar J* 16, 325 (2017). <https://doi.org/10.1186/s12936-017-1974-x>
16. Ayamba, E.Y., Dzotsi, E.K., Dormechele, W. *et al.*, Evaluation of seasonal malaria chemoprevention implementation in the Upper East region of Northern Ghana. *Malar J* 24, 123 (2025). <https://doi.org/10.1186/s12936-025-05322-9>

