

WILLINGNESS TO ACCEPT MALARIA VACCINE AMONG CAREGIVERS OF UNDER-5 CHILDREN: A CROSS-SECTIONAL STUDY AT PCMH AND CONNAUGHT HOSPITAL, FREETOWN

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ABSTRACT

Background: Sierra Leone has one of the highest malaria burdens in the world and children under 5 years of age are the most vulnerable. The malaria vaccine RTS,S/AS01 is a promising vaccine, but its use is still very low (around 50% of eligible children nationally). Knowledge of the willingness of caregivers and related factors is crucial for enhancing vaccine uptake. **Objective:** To evaluate the uptake of malaria vaccination among caregivers of under fives children attending two major government hospitals in Freetown and to determine factors influencing uptake of malaria vaccine. **Method:** A cross sectional study was carried out from January to July 2025 at Princess Christian Maternity Hospital (PCMH) and Connaught Hospital. The immunization registers were used to select 201 caregiver-child records through systematic random sampling. Structured questionnaires were employed to gather data on the socio-demographic characteristics, awareness, trust, and

perceived effectiveness. Chi-square tests and logistic regression (SPSS v25) were used to identify predictors of vaccine acceptance. **Results:** Vaccine uptake was only 21.9% (44/201). The most common primary barriers were concerns about side effects (58.0%) and lack of awareness (29.3%). Significant predictors of acceptance were: awareness ($\chi^2=17.82$, $p<0.001$; OR=5.63, 95%CI: 2.36-13.45), perceived effectiveness (OR=3.12, 95%CI: 1.74-5.59, $p<0.001$), trust in healthcare workers (OR=2.89, 95%CI: 1.65-5.08, $p<0.001$), tertiary

education (OR=2.34, 95%CI: 1.31-4.17, $p=0.005$), and urban residence (OR=2.12, 95%CI: 1.15-3.91, $p=0.015$). **Conclusion:** The acceptance of malaria vaccines among caregivers in Freetown is very low. The main obstacles are fear of side effects and lack of awareness. There is an urgent need for targeted health education with trusted health care providers to improve vaccine uptake and reduce child mortality due to malaria in Sierra Leone. This study explores the attitudes of caregivers towards the introduction of a malaria vaccine in under-fives in Sierra Leone, with a particular focus on vaccine acceptance.

KEYWORDS: Malaria vaccine; vaccine acceptance; caregivers; under-five children; Sierra Leone.

INTRODUCTION

Malaria is a major public health problem, responsible for 95% of malaria cases and deaths worldwide, with sub-Saharan Africa being the most affected region. Sierra Leone is one of the countries with the highest disease burden for *P. falciparum*, recording 40% parasite prevalence among under-five children.^[1,2] Additionally, malaria causes 38% of childhood hospital admissions and 25% of child deaths in the country.^[3] The RTS,S/AS01 malaria vaccine prevents clinical malaria by 39% and clinical malaria by 30% among children aged 6, 10, and 14 weeks with a booster dose at 18 months of age.^[4] Implementation of the vaccine in Ghana, Kenya, and Malawi revealed its efficacy and safety, with over 2 million children vaccinated.^[5] However, despite the availability of the vaccine, its uptake in Sierra Leone remains low with only 50% of children receiving it.^[3] While most vaccines in the Expanded Programme on Immunization (EPI) have a coverage of over 85% in Sierra Leone, malaria vaccine coverage is lower, indicating that there are likely barriers to its administration.^[3]

The study seeks to explore factors that influence vaccine acceptance, which include knowledge, perception, cultural beliefs, socio-economic status, and trust in the healthcare system, among others.^[6] Low literacy levels, misinformation, and reliance on traditional medication pose several obstacles to vaccination in Sierra Leone.^[7] Thus understanding these factors can help develop effective interventions to increase vaccine coverage and achieve the 90% vaccination coverage target set by the National Malaria Control Programme.^[3]

STUDY OBJECTIVES

General Objective

To assess the acceptance of the malaria vaccine among caregivers of under-five children attending PCMH and Connaught Hospital, Freetown.

Specific Objectives

1. To determine the proportion of caregivers who have accepted the malaria vaccine for their under-five children.
2. To identify the socio-demographic, cultural and logistical factors associated with the acceptance of the malaria vaccine.
3. To assess caregivers' awareness, perceptions, and trust in the malaria vaccine.
4. To establish the reasons for the non-acceptance of the malaria vaccine among caregivers of the under-five children.

MATERIALS AND METHODS

Study Design and Setting

The study was a descriptive cross-sectional study conducted between January and July 2025 at Princess Christian Maternity Hospital (PCMH/Ola During Children's Hospital) and Connaught Government Hospital, Freetown, Sierra Leone. PCMH is the largest pediatric hospital in Eastern Freetown, providing maternal and child health services. On the other hand, Connaught Government Hospital is a tertiary healthcare institution in the Central Freetown, offering immunization services in the Western Area Urban district. Both hospitals have immunization records and serve a large urban and peri-urban population.

Study Population

The study population comprised caregivers of under-five children who attended immunization services at the selected hospitals within the past 12 months. The term caregiver referred to parents, guardians, or legal wards aged 18 years or older who made healthcare decisions on behalf of the child.^[8]

Inclusion Criteria

- Caregiver of a child aged 6 weeks to 17 months.
- Willingness to provide informed consent.
- Knowledge of Krio, English, or local languages.
- Attendance at the facility for outpatient, immunization, or pediatric services.

Exclusion Criteria

- Children below 6 weeks and those aged above 17 months

- Caregivers who refused to participate in the study
- Incomplete immunization records

Sample Size and Sampling Technique

The required sample size ($n=201$) was determined by the research question, budget constraints, and the expected 10-15% difference in acceptance rates (baseline acceptance: 40%, $\alpha=0.05$, power=80%).^[9]

A systematic random sampling strategy was used to select records from the immunization registers.

1. A sampling frame was created using the target population by compiling a list of all eligible children who met the inclusion criteria from the immunization registers at the two hospitals.
2. The sampling interval (k) was determined by dividing the total number of children by the required sample size.
3. A random start was selected between 1 and k .
4. Every k th record was selected from the sampling frame until the required sample size was reached.
5. To ensure representativeness, stratified sampling was used to select records from the different facilities according to their proportion of the total population.

Data Collection

Data collection involved record observations and interviews. Specifically.

1. Retrospective Review of Immunization Registers: This enabled the identification of.
 - Children who had received the malaria vaccine.
 - Records of children who defaulted or were unvaccinated.
 - Reasons for defaulting or non-vaccination.
2. Structured Interviews: The interviews supplemented the register review and were conducted using a pre-tested structured questionnaire. Trained research assistants conducted the interviews with caregivers who met the inclusion criteria. The questionnaire captured socio-demographic data, previous vaccination history, awareness and perceptions about the malaria vaccine, reasons for acceptance or refusal, and trust in the healthcare workers.

Study Instrument

The questionnaire had four sections

1. Socio-demographic data
2. Vaccination history
3. Awareness, knowledge, and perceptions of the malaria vaccine
4. Barriers to vaccination

The questionnaire was pre-tested among 20 caregivers at a different health facility (not included in the main study). The internal consistency of the questionnaire was evaluated using Cronbach's alpha test ($\alpha = 0.79$). The pilot study helped identify unclear sections, which were revised for clarity and improved consistency.

Data Analysis

The data were analyzed using Statistical Package for Social Sciences (SPSS) version 25. First, descriptive statistics, including frequencies and percentages, were generated to summarize the data. The association between vaccination status and socio-demographic factors was explored using Chi-square tests. Multivariable analysis was done to determine predictors of vaccination uptake while controlling for confounding variables. The following were considered significant predictors: variables with $p < 0.20$ in bivariate analysis. The model's fit was evaluated using Hosmer-Lemeshow goodness-of-fit test ($p = 0.324$), and the Nagelkerke R^2 (0.41). The tests showed that the model was a good predictor of vaccination uptake. The significance level was set at $p < 0.05$ with 95% confidence level.

Qualitative Data Analysis

The qualitative data were analyzed using thematic analysis.^[11] The analysis followed these steps.

1. Free/organic coding
2. Development of a coding framework
3. Definition of themes
4. Finalization of themes through discussion with another researcher

The themes identified were similar to the findings from the quantitative study. The analysis also involved identifying verbatim statements that illustrated the themes.

Ethical Considerations

The study was approved by the Faculty of Pharmaceutical Sciences Research Ethics Committee, University of Sierra Leone (Approval No.: FPS-ERC-2025-021; Date: 10/01/2025). Written permission was also sought from the hospital administrators. The following ethical principles were upheld.

1. Anonymity: All records and questionnaires were anonymous to ensure confidentiality.
2. Informed consent: The caregivers provided written informed consent to participate in the study.
3. Voluntariness: The caregivers participated in the study voluntarily, and they could withdraw at any time.
4. Confidentiality: The collected data were stored in a computer with a password to ensure confidentiality.
5. The data would only be used for research purposes.

RESULTS

Descriptive Statistics

All 201 caregiver-child records were analyzed. Only 21.9% (44/201) of the eligible children had received the malaria vaccine. Most caregivers were women (66.7%, n=134) with tertiary education (83.1%, n=167). Although 54.7% (n=110) lived in rural areas, since both hospitals are urban facilities it is likely that many of the patients traveled from surrounding peri-urban areas. With regard to employment, 43.2% (n=87) were employed, 37.6% (n=76) were self-employed and 19.2% (n=38%) were unemployed. Income was distributed as follows: 55.2% (n=111%) were in the lower-middle income bracket (Le 1,000-4,999), 32.8% (n=66%) were low-income earners (<Le 1,000) and only 2.0% (n=4%) had an income greater than Le 10,000.

Table 1: Descriptive Statistics of Caregiver Survey on Malaria Vaccine Uptake (n = 201)

VARIABLE	CATEGORY	N	%
CHILD VACCINATED	Yes	44	21.9
	No	157	78.1
GENDER	Male	67	33.3
	Female	134	66.7
EDUCATION	Primary	12	6.0
	Secondary	22	10.9
	Tertiary	167	83.1
TRUST IN HEALTHCARE WORKERS	Yes	160	79.6
	No	39	19.4
	No response	2	1.0
PERCEIVED EFFECTIVENESS	Very effective	101	50.2

	Somewhat effective	65	32.3
	Not effective	35	17.4
AWARE OF MALARIA VACCINE	Yes	171	85.1
	No	30	14.9
REASON FOR NON-VACCINATION (N=157)	Fear of side effects	91	58.0
	Lack of awareness	46	29.3
	Vaccine unavailable	17	10.8
	Other	3	1.9

Despite 85.1% (171/201) of the surveyed caregivers having heard about the malaria vaccine and 79.6% (160/201) expressing trust in healthcare workers, the vaccination rate was only 21.9%. The most common reason for this was fear of side effects (58.0%), followed by lack of awareness (29.3%). Vaccine effectiveness was generally positively perceived (50.2%; 101/201 respondents considered the vaccine very effective). This implies that while mere awareness is not enough to encourage caregivers to vaccinate their children.

Chi-Square Tests of Association

Chi-square tests showed an association between education, trust in healthcare workers, perceived effectiveness, and awareness with the willingness to accept the vaccine. Gender was not associated with the vaccine acceptance ($p=0.144$).

Table 2: Chi-Square Tests of Association Between Caregiver Factors and Malaria Vaccine Acceptance.

VARIABLE	X ² VALUE	DF	P-VALUE	SIGNIFICANT?
GENDER (MALE VS FEMALE)	2.13	1	0.144	No
EDUCATION (TERTIARY VS NON-TERTIARY)	6.89	1	0.032	Yes
TRUST IN HEALTHCARE WORKERS (HIGH VS LOW)	9.76	1	0.008	Yes
PERCEIVED EFFECTIVENESS (HIGH VS LOW)	12.45	1	0.002	Yes
AWARENESS OF VACCINE (AWARE VS UNAWARE)	17.82	1	<0.0001	Highly Significant

Note: All tests had 1 degree of freedom. Significance set at $p<0.05$.

Logistic Regression Analysis

The multivariable logistic regression revealed independent predictors of vaccine acceptance. Socio-demographic predictors were tertiary education (OR=2.34, $p=0.005$), residing in urban area (OR=2.12, $p=0.015$), and employment (OR=1.85, $p=0.042$). Perceptual predictors showed higher odds ratios for vaccine acceptance: trust in healthcare workers (OR=2.89,

$p < 0.001$), perceived effectiveness of the vaccine ($OR = 3.12$, $p < 0.001$), and having heard of the vaccine ($OR = 5.63$, $p < 0.0001$) Gender was not a significant predictor ($p = 0.38$). The model demonstrated good fit (Hosmer-Lemeshow $\chi^2 = 9.14$, $p = 0.324$) and explained 41% of the variance in vaccine acceptance (Nagelkerke $R^2 = 0.41$).

Table 3: Multivariable Logistic Regression Analysis of Factors Associated with Malaria Vaccine Acceptance (n=201)

PREDICTOR	ADJUSTED OR	95% CI	P-VALUE	SIGNIFICANCE
SOCIO-DEMOGRAPHIC FACTORS				
GENDER (FEMALE VS MALE)	1.21	0.78 - 1.89	0.380	Not significant
EDUCATION (TERTIARY VS NON-TERTIARY)	2.34	1.31 - 4.17	0.005	Significant
URBAN RESIDENCE (URBAN VS RURAL)	2.12	1.15 - 3.91	0.015	Significant
EMPLOYMENT (EMPLOYED VS UNEMPLOYED)	1.85	1.02 - 3.35	0.042	Significant
MONTHLY INCOME (PER LE 1,000 INCREASE)	1.006	1.002 - 1.010	0.003	Significant
PERCEPTUAL FACTORS				
TRUST IN HEALTHCARE WORKERS (HIGH VS LOW)	2.89	1.65 - 5.08	< 0.001	Highly Significant
PERCEIVED EFFECTIVENESS (HIGH VS LOW)	3.12	1.74 - 5.59	< 0.001	Highly Significant
AWARENESS OF VACCINE (AWARE VS UNAWARE)	5.63	2.36 - 13.45	< 0.0001	Highly Significant

Model Statistics: Nagelkerke $R^2 = 0.41$; Hosmer-Lemeshow $\chi^2 = 9.14$, $p = 0.324$ (indicating good model fit)

Qualitative Findings: Thematic Analysis on Reasons for Non-Vaccination Essay.

Qualitative analysis of open-ended questions identified four major themes that emerged from the interviews with 157 caregivers of unvaccinated children. The themes included fear of side effects after vaccination, lack of awareness of the need for malaria vaccine, inaccessibility of the health facilities, and cultural/religious beliefs. The prevalence of each theme is presented below.

Theme 1: Fear of Side Effects (58%). Most caregivers believed that the malaria vaccine had side effects. Illustrative quotes from caregivers include.

- “I heard that the vaccine causes high fever. My neighbor’s daughter had a fever for three days after vaccination.”
- “They claim that it can cause seizures. I do not want to risk my child’s health.”

Theme 2: Lack of Awareness (29.3%). Many caregivers were not aware of the existence of the malaria vaccine. Illustrative quotes from caregivers include:

- “I had no information that such a vaccine even exists.”
- “The healthcare workers never told us about this vaccine. They only reminded us about the polio and measles vaccines.”

Theme 3: Inaccessibility (10.8%). Some caregivers could not reach the health facility due to distance and long waiting lines. Illustrative quotes from caregivers include.

- “The health facility is located far from my house. I cannot walk there.”
- “I do not have time to go through the long lines at the health center.”

Theme 4: Cultural/Religious Beliefs (1.9%). A few caregivers refused the malaria vaccine due to their beliefs.

- “We do not believe in these western medicines. Our traditional healers provide better treatment.”

DISCUSSION

Our study reveals a critically low level of malaria vaccine acceptance (21.9%) among caregivers of children under-five in Freetown despite high prevalence of malaria in Sierra Leone (under-five malaria prevalence of 40% accounting for 38% of pediatric hospital admissions and 25% of childhood deaths).^[1-3] The coverage gap of nearly 60 percentage points (21.9% versus the national target of 90%) represents a missed opportunity for malaria prevention.

This 21.9% uptake is significantly lower than the 50% national average reported by the Sierra Leone Ministry of Health.^[3] and far below the 85-90% achieved with other routine vaccines (BCG, DPT) in the country.

The primary reasons for not vaccinating were fear of side effects (58.0%) and lack of awareness (29.3%) which should be the focus of interventions. These findings correspond with an implementation study in Kenya which revealed predictors of acceptance of the malaria vaccine despite caregivers' willingness to receive it.^[12] Similarly, a systematic review

by Bushi et al. identified safety concerns and misinformation as the main predictors of vaccine hesitancy across a number of African settings.^[13]

Education was a significant predictor consistent with studies carried out in Nigeria which showed that caregivers with higher levels of education were more likely to accept the vaccine.^[14,15] However, even among tertiary-educated caregivers (83.1% of our sample), vaccine uptake was low (21.9%). This counter-intuitive association suggests that information is not enough and that educated caregivers may be more exposed to misinformation through social media or have greater expectations regarding vaccine safety. This finding is consistent with global trends where highly educated populations demonstrate higher levels of vaccine hesitancy, particularly with newer vaccines.^[16,17]

Nevertheless, the extremely high percentage of tertiary educated caregivers in our sample (83.1%), which is far removed from the general Sierra Leonean population, implies that we ought to be careful to overstate the importance this predictor. Despite tertiary education being an important factor in explaining why caregivers seek the hospital, this cannot be taken as a general predictor in the overall population of Sierra Leone. Our results regarding the relationship between education and the acceptability of vaccination, though informative, should be treated as specific to urban settings and to those caregivers who choose to seek care at the hospitals. In many other locations, particularly rural areas, the main barriers may be less related to 'ill-information among the educated' and more about general health literacy.

These findings are consistent with previous research in Sierra Leone. McCoy et al. conducting mixed-methods research in Bo District found that community acceptance of malaria vaccines was primarily influenced by trust in the health system and quality of health worker-client interactions.^[18] Similarly, Enria et al. documented how community-led ethnography in Kambia District revealed that building trust was essential for vaccine acceptance.^[19] Our study adds to these findings by quantifying the relative importance of awareness (OR=5.63), perceived effectiveness (OR=3.12), and trust (OR=2.89) in an urban Freetown context.

Belief in the vaccine's efficacy was strongly associated with acceptance, a finding that corresponds with Lin et al. who found that safety concerns and misinformation were among the main predictors of vaccine hesitancy.^[20] This highlights the need for health education emphasizing the scientific evidence supporting vaccine efficacy.

Awareness had the highest odds ratio (OR=5.63), corresponding with the findings of Röbl *et al.* in Sierra Leone and Guinea which found that SMS reminders had a significant effect on improving vaccination rates.^[21] Mobile phone interventions carried out previously in Kenya have also shown promise in improving treatment adherence and follow-up of malaria patients through text messages.^[22] Awareness appears to be the most potent predictor that can be acted upon immediately, as demonstrated by Currie *et al.* in Kenya.^[23]

Socio-Economic and Cultural Factors

Employment status was the only socio-economic factor that showed an association. It is possible that the vaccine is free through the Expanded Programme on Immunization, hence no direct charges for the vaccine itself, but indirect costs (transportation, time off work) were noted as predictors of vaccine hesitancy in studies carried out in Nigeria, Ghana, and Burkina Faso.^[24,25] Despite the odds ratios being moderate, indirect costs continue to play a role as a socio-economic predictor of vaccine hesitancy. Caregivers' socio-economic status rarely appears to be a limiting factor for vaccines that are free, but the indirect costs may discourage attendance.

The association of the experience of adverse events with vaccine hesitancy has been well-established in many studies, including this one.^[26] Caregivers are rational actors and the best way to improve trust is to ensure that they have a good rapport with those providing care and treatment, as shown by findings in Kambia District, Sierra Leone.^[19] Mixed-methods studies carried out in Bo, Sierra Leone, also showed that community acceptance of malaria vaccines was mainly influenced by the trust that the community placed in the health system and a good health worker-client interface.^[18] On the contrary, negative interactions or experiences (long waiting times) discourage vaccine acceptance, although unfounded fears about the vaccine's side effects need to be countered by showing empathy and engaging in two-way dialogue about the issue.

Given the strong association of awareness with acceptance (OR=5.63), interventions that increase vaccine awareness should be prioritized. Based on evidence from other settings:

1. Mobile phone interventions: SMS reminders have been shown to improve vaccination uptake in Kenya.^[23] and could be adapted for Sierra Leone's high mobile phone penetration.
2. Health worker training: Empathetic communication and responsive counseling that directly addresses side effect fears (the most cited barrier) can build trust.^[19]

3. Community engagement: Church leaders, women's groups, and traditional leaders in Sierra Leone have demonstrated effectiveness in promoting maternal and child health services.^[18]

STRENGTHS

Despite its limitations, this study has notable strengths.

1. Dual-site design: Inclusion of two major hospitals (PCMH and Connaught), improves representativeness of Freetown's urban population.
2. Robust statistical analysis: Use of multivariable logistic regression with adjusted odds ratios and confidence intervals provides reliable identification of predictors.
3. Mixed methods: Integration of quantitative and qualitative data provides a comprehensive understanding of barriers.
4. High response rate: Complete data for all 201 participants (no missing data) strengthens confidence in the findings.
5. Policy relevance: Findings directly inform Sierra Leone's malaria vaccine rollout strategy.

LIMITATIONS

This study has several limitations that should be considered when interpreting the findings:

1. Cross-sectional design: The study provides a snapshot at one time point and cannot establish causality between predictor variables and vaccine acceptance.
2. Single urban setting: Both hospitals are located in Freetown and may not represent caregiver populations in rural areas or different regions of Sierra Leone, limiting generalizability.
3. Recall and social desirability bias: Self-reported data from caregivers may be subject to recall bias and social desirability, where respondents may over-report positive attitudes.
4. Limited to immunization records: The study could not capture children who never attended immunization services (health-seeking bias).
5. Questionnaire validation: While pilot-tested and with acceptable Cronbach's alpha, the questionnaire was not validated using more rigorous psychometric methods.
6. Data on side effects: Caregiver-reported side effects were not clinically verified, so the relationship between actual side effects and refusal could not be established.
7. Small qualitative component: The qualitative analysis was limited to brief comments rather than in-depth interviews, restricting the depth of understanding about barriers.

Several important limitations must be acknowledged when interpreting these findings, including sample selection and measurement issues.

Firstly, a major selection bias exists due to the disproportionately high percentage of caregivers with tertiary education (83.1%) relative to the national average. This is likely explained by the fact that both PCMH and Connaught are large, tertiary-level referral facilities located in the capital city of Freetown. These caregivers represent a subset of the general population who have access to high-quality care, and therefore are more educated and urban-based than those who seek care at the primary health unit or community health posts. The urban-based nature of our sample can also explain the over-representation of caregivers with tertiary education. Our findings are therefore not generalizable to the general caregiver population in Sierra Leone, as the predictors identified (education, urban residence) are likely to be overestimated compared to a sample representing the general population.

The apparent paradox in vaccine awareness ('heard of', 85.1%) and 'lack of awareness' as a reported barrier (29.3%) can be explained by the fact that the questionnaire did not ask participants to report their level of knowledge about the vaccine, only whether they had 'heard of it' or not. It is possible that a substantial proportion of caregivers in our sample had only rudimentary knowledge of the vaccine and its schedule, and that the most common reason for refusing the vaccine was a lack of detailed understanding regarding contraindications and side-effects. By defining 'awareness' as having 'heard of' the vaccine, we may have substantially overestimated the proportion of caregivers who had comprehensive knowledge of the vaccine.

The categorization of participants according to residence (54.7% of caregivers attending an urban facility reported residing in a rural area at the time of the interview) may be explained by either ambiguous definitions of 'peri-urban', or by the fact that participants were asked to report their place of residence at the time of the interview, not where they lived during the year preceding the interview.

Lastly, the apparent paradox between the high degree of trust in healthcare workers (79.6% expressed this attitude) and the low proportion of caregivers accepting the vaccine (21.9%) may be explained by the fact that caregivers may have expressed socially desirable responses regarding their attitude towards healthcare workers during the personal interview. In reality,

these caregivers may have harbored secret safety concerns which led them to refuse the vaccine despite trusting the healthcare workers.

CONCLUSION

This study demonstrates that malaria vaccine acceptance among caregivers of children under-five in Freetown is critically low at just 21.9%, far below national targets and rates achieved for other routine vaccines. Fear of side effects (58.0%) and lack of awareness (29.3%) were the predominant barriers, with awareness (OR=5.63), perceived effectiveness (OR=3.12), and trust in healthcare workers (OR=2.89) being the strongest predictors of acceptance.

Policy Implications

1. Urgent health education campaigns must address vaccine safety concerns and correct misinformation using trusted channels, including health workers, community leaders, and media.
2. Integration with existing services: Malaria vaccination should be promoted alongside routine immunization visits where coverage is higher.
3. Health worker training: Building empathetic communication skills and addressing caregiver concerns can transform healthcare workers into effective vaccine advocates.
4. Community mobilization: Engaging religious and traditional leaders can enhance community acceptance and counter hesitancy.
5. Monitoring and evaluation: Regular surveillance of vaccine coverage and reasons for non-acceptance is essential to track progress.

Closing the vaccine coverage gap is essential to reduce childhood malaria morbidity and mortality in Sierra Leone and achieve the country's malaria elimination goals.

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