

Protecting Rwanda's Children: Enhancing Malaria Prevention Strategies for Under-Fives

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KEY MESSAGES

Despite a decreasing malaria burden in children under 5, it remains a notable health concern in Rwanda due to their vulnerability, emphasizing the necessity for strengthened prevention measures.

To lessen the malaria burden, it is crucial to expand the coverage and effectiveness of prevention strategies, address root causes contributing to the rise in cases, and prioritize vulnerable populations, particularly children under 5.

PROBLEM STATEMENT

Across Africa, malaria cases increased from 232 million in 2020 to 234 million in 2021, with children under five accounting for 78.9% of all malaria-related deaths in the region [1]. In Rwanda, *Plasmodium falciparum* is the primary cause of malaria, and *Anopheles gambiae* serves as the dominant vector [2]. Children under five years old and pregnant women are particularly vulnerable to the disease's worst outcomes [3,4]. This susceptibility derives from their higher risk of severe illness and complications as a result of their low immunity [5]. Rwanda has made remarkable strides in reducing the malaria burden through interventions such as prompt diagnosis and treatment, the distribution of Long-Lasting Insecticidal Nets (LLINs), and the implementation of Indoor Residual Spraying (IRS) [6]. Despite

these endeavors, malaria cases in children under 5 are still rising, and their vulnerability could lead to a resurgence of malaria cases unless preventive measures are reinforced and sustained (Figure 1).

In Rwanda, the distribution of Insecticide-Treated Nets (ITNs) is primarily limited to pregnant women and children under one year. Children one year and above don't get ITNs [7]. This, coupled with a lack of an early warning system, lack of awareness, inadequate mobilization, restricted coverage of IRS (only 13 districts), low community compliance with ITNs and IRS, a lack of evaluation of community adoption of preventive measures, and disruption of malaria services due to the COVID-19 pandemic have contributed to a rise in malaria cases among children under five in Rwanda.

To tackle this pressing health challenge requires

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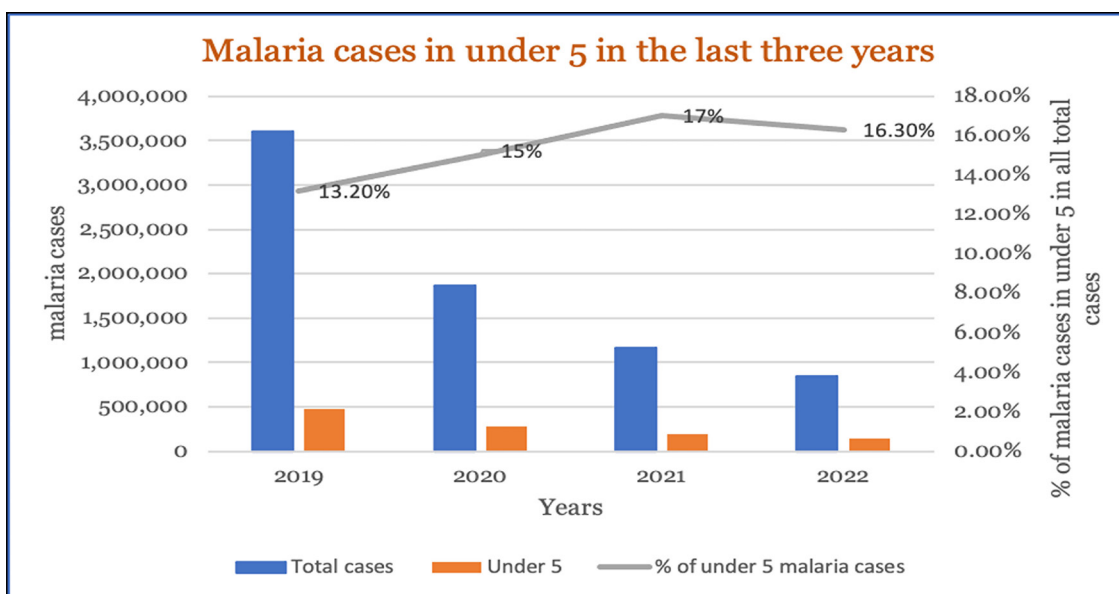


Figure 1: Malaria prevalence in under five children in the last three years

improving the effectiveness of existing prevention strategies, broadening their coverage, and addressing the underlying causes contributing to the rise in malaria cases among vulnerable populations, specifically children under five years in Rwanda.

POLICY OPTIONS

Status Quo: *Limited ITN Distribution and IRS Coverage*

What: Continue with the existing policy of prompt diagnosis and treatment, distributing ITNs to pregnant women, children under one-year-old and others through mass campaigns maintaining IRS coverage in the current 13 districts.

Why: Maintaining the status quo will continue to provide some level of protection to pregnant women and very young children while avoiding additional resource allocation and logistical challenges associated with expanding preventive measures.

Feasibility: High. The status quo is feasible since it requires no changes to existing programs or resource allocation. However, it is unlikely to sufficiently address the increasing malaria burden among children under 5 years in Rwanda.

Policy Option 1: *Expand ITN Distribution*

What: Broaden the distribution of ITNs to include

all children under 5 years and all pregnant women in Rwanda, prioritizing high-risk regions.

Why: Expanding ITN distribution will provide better protection against malaria for vulnerable populations, especially children under 5 years, and reduce the malaria burden.

Feasibility: Medium. This option would require additional resources and funding for ITN procurement, but it builds on existing infrastructure and programs, making it a scalable approach.

Policy Option 2: *Enhancing early detection system*

What: Strengthening early detection systems by utilizing malaria surveillance data to promptly identify malaria outbreaks in children under 5 before their escalation [8]. Engaging the community health workers (CHWs) in detection systems in order to raise community awareness of the outbreak, enabling timely and adherence to implementation of preventive measures.

Why: Using malaria surveillance data and engaging the CHWs in detection systems will facilitate monitoring community-based reporting systems, consistent evaluation of community uptake of preventive measures and assessing interventions efficacy. This will enable use of targeted interventions in a timely manner, consequently alleviating the malaria burden in children under 5.

Feasibility: High. This option leverages pre-existing reporting systems rendering it a cost

Table 1: Cost-effectiveness of the proposed policy options

Policy Options	Expand ITNs Distribution	Early Warning System
Expected number of QALYs	285,000	334,000
Estimated QALYs annually	121,000	170,000
Estimated cost to the government	\$51,000	\$32,000
Cost of QALYs gained	\$42,000	\$23,000

ITN: Insecticide-Treated Nets; QALY: Quality-adjusted life year

Table 2: Feasibility of both policy options

Policy option	Early detection system	Expand ITNs
Political Feasibility	Highly Feasible	Highly Feasible
Operational Feasibility	Highly Feasible	Somewhat Feasible

ITN: Insecticide-Treated Nets

effective and sustainable approach; nonetheless, it will require investment in community awareness campaigns, the establishment of communication channels to notify the CHWs about the outbreak and provision of training for them.

Economic evaluation of policy options showed that early detection systems will have the highest public health impact per dollar invested (Tables 1 and 2), making it the most cost-effective option. A supported implementation plan and agreed-upon budget will be essential for success.

NEXT STEPS AND RECOMMENDATIONS

Enhancing the early Detection System is both cost-effective and feasible.

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For the successful implementation of this strategy, firstly, it is imperative to collaborate with the government, local and international organizations, and other stakeholders to leverage resources and expertise. Secondly, it is crucial to strengthen reporting systems to ensure timely detection of malaria outbreaks and establish efficient communication channels to notify the CHWs. Moreover, engaging CHWs in community awareness campaigns can play a pivotal role in educating communities about malaria symptoms and prevention measures. By involving CHWs in these initiatives, we can foster a deeper understanding of the disease and empower communities to take proactive steps in combating malaria.

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