Strengthening Malaria Control:

Feasibility and acceptance of R21 Vaccine and IPTc (Intermittent Preventive Treatment) among children in Kule Refugee Camp, Ethiopia

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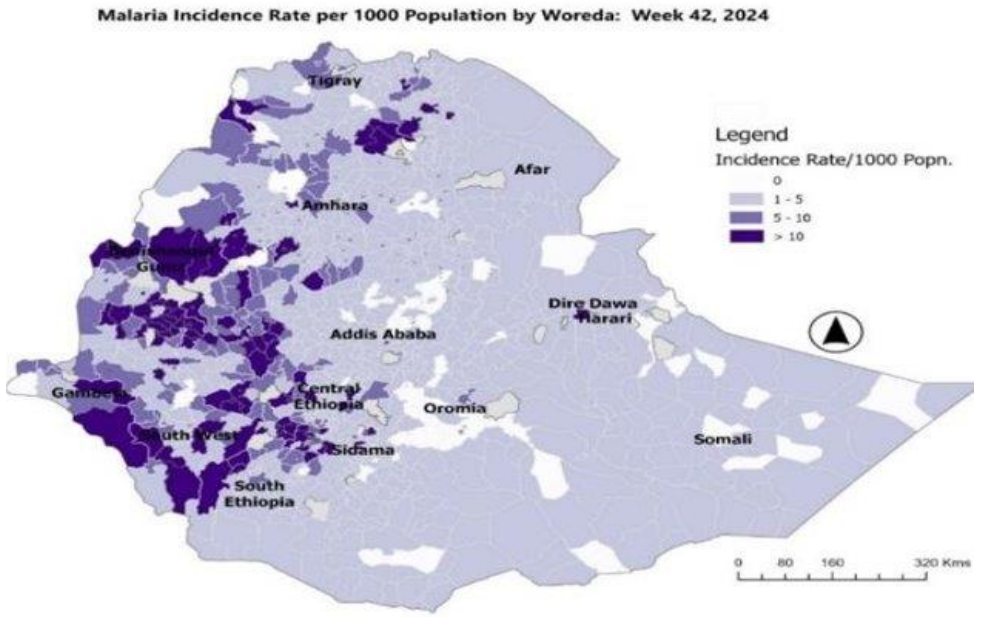
Conflicts of Interest

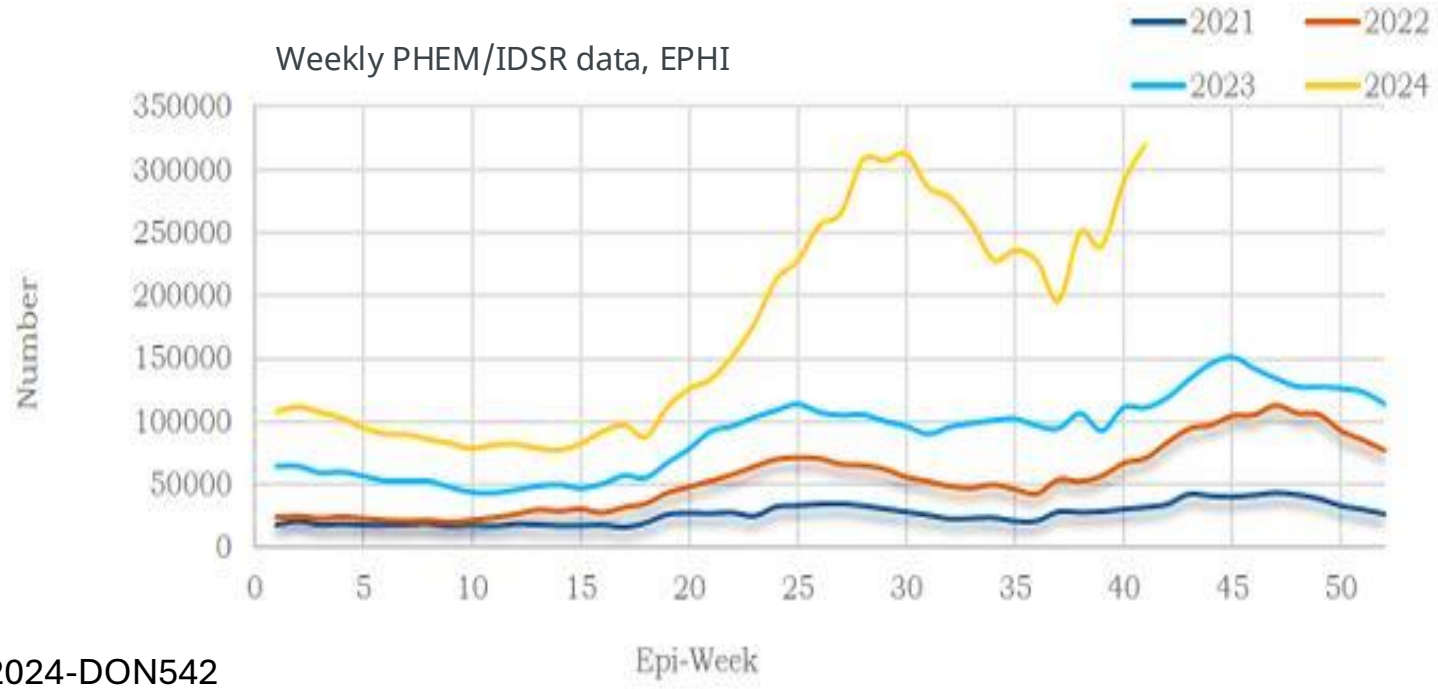
All authors declare no competing interests.

SCIENTIFIC DAYS

Malaria in Ethiopia

Malaria poses an important public health challenge in Ethiopia





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Malaria in Ethiopia

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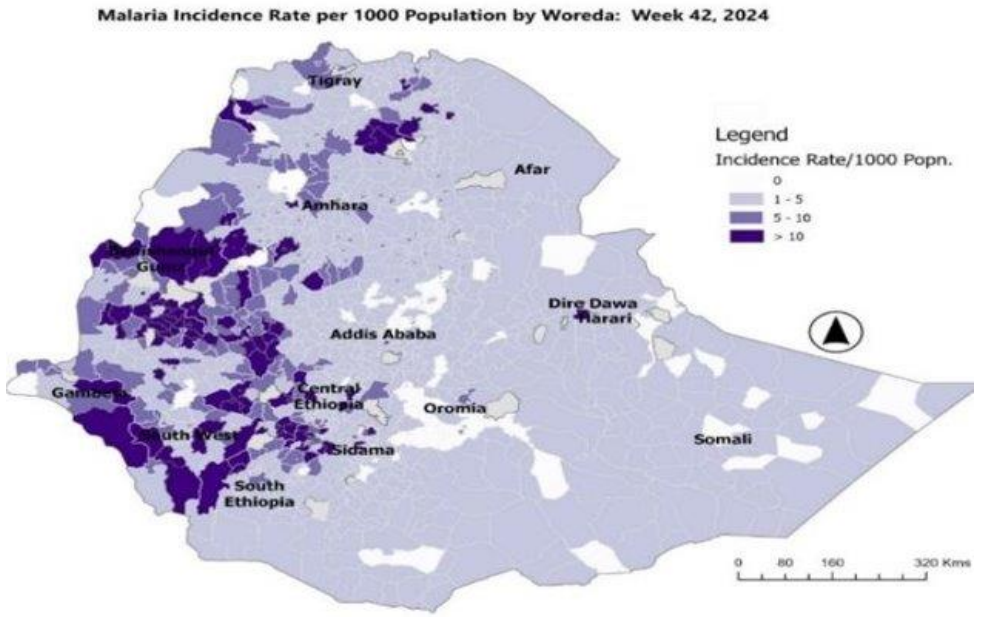
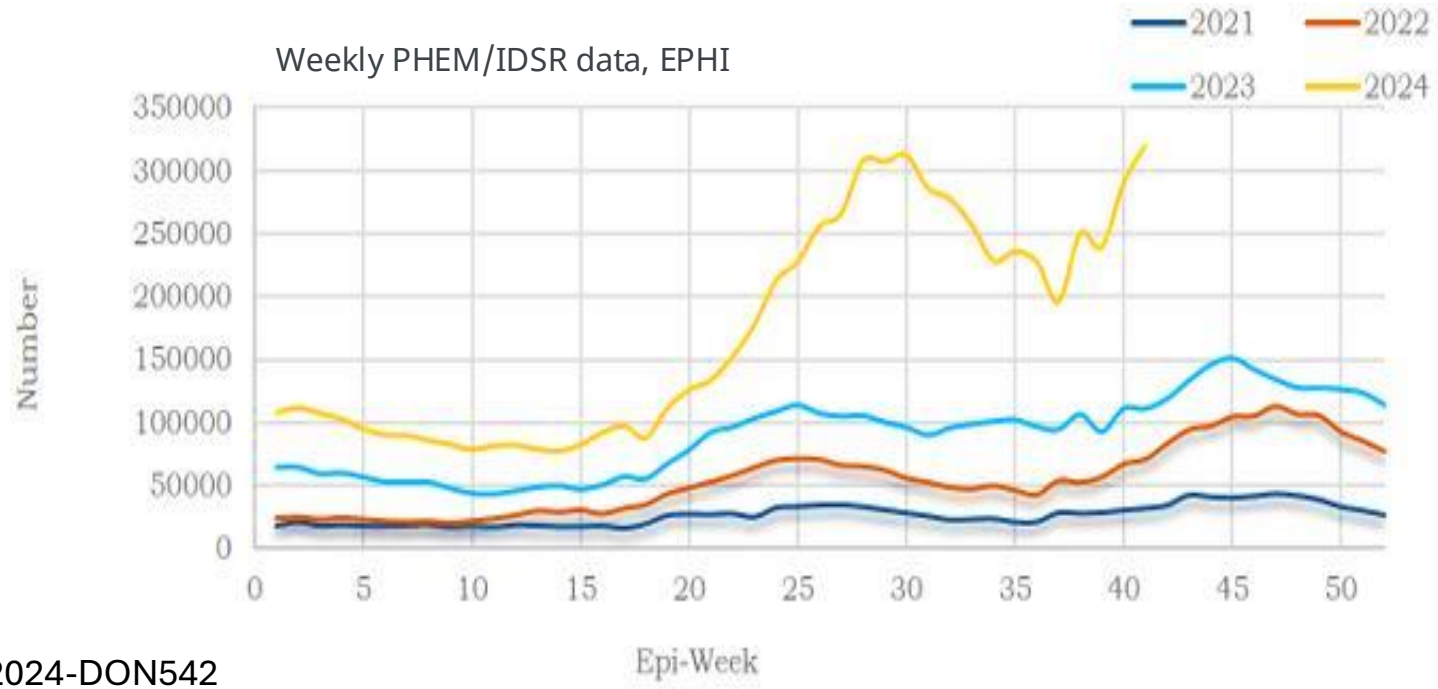
- Around 69% of population in these areas are at risk where periodic outbreaks contribute up to 20% of child deaths under the age of five





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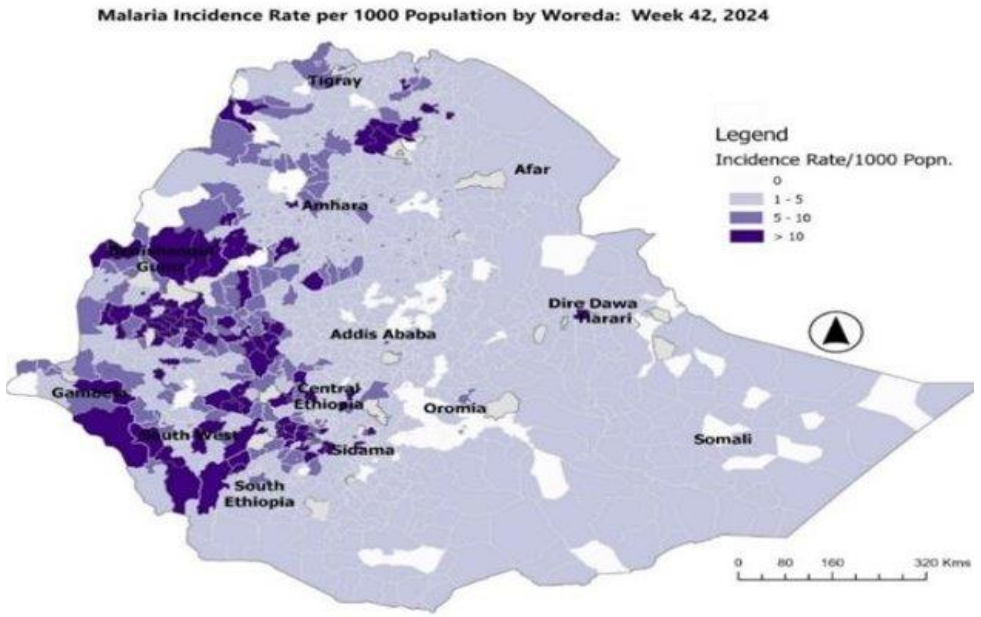
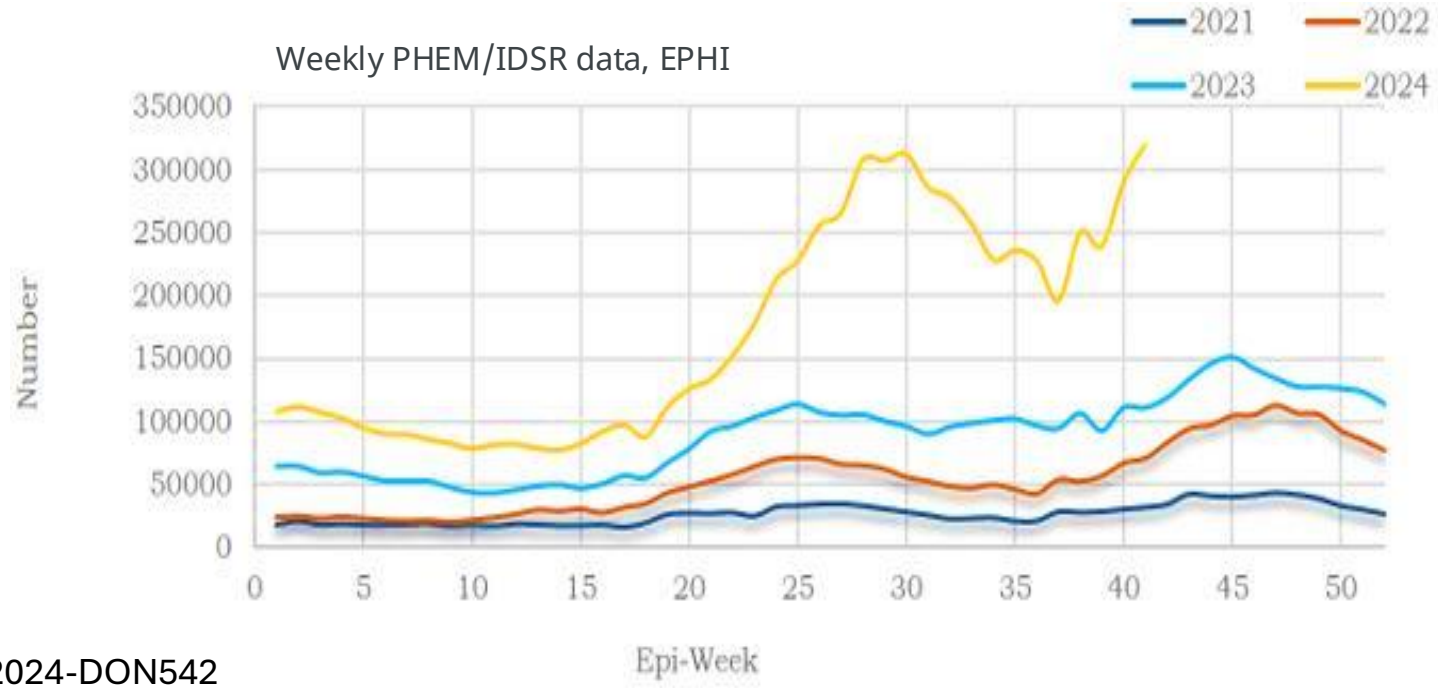
From 2020 to 2024, there has been an increase in the number of annual cases

- Over 7.3 million cases and 1,157 deaths reported in 2024, marking the highest annual caseload in seven years





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Malaria in Kule Refugee Camp, Gambella

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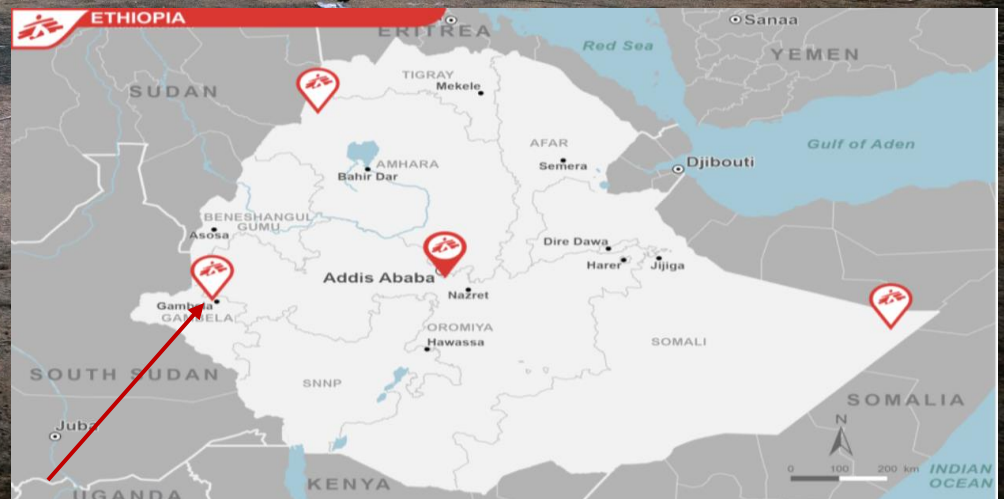
  - e.g. resistance, climate change, changing vector biology, mobile population



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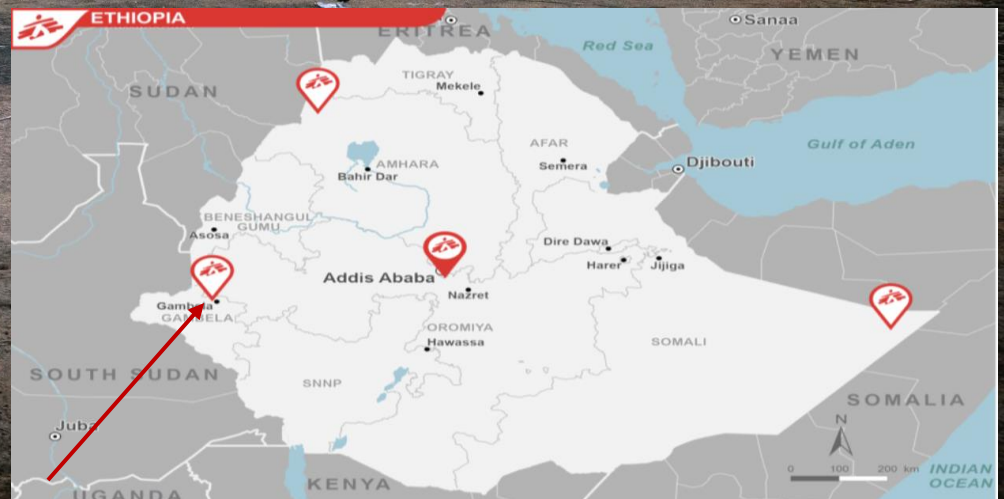

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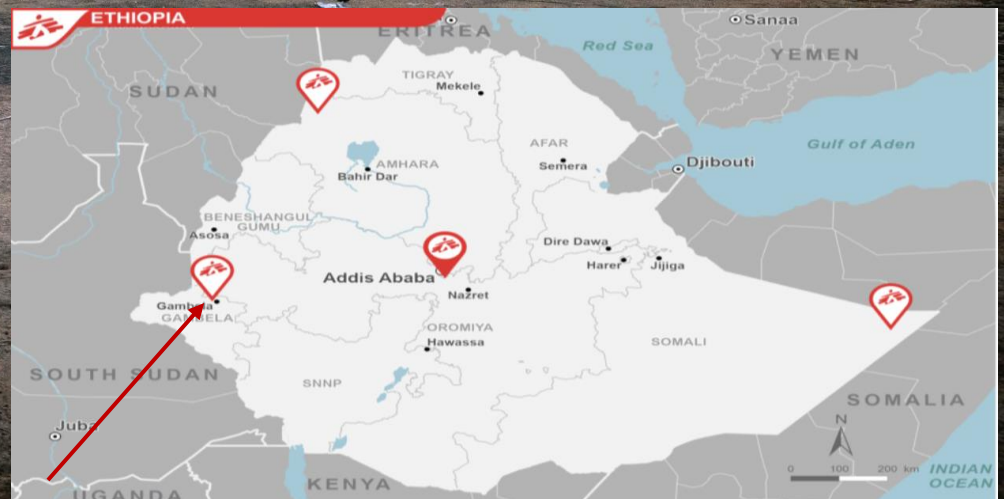
  - R21 Malaria vaccine: 3 doses, one month apart for children aged 5-36 months
  - IPTc (Intermittent Preventative Therapy for children) using DHAPQ: at least 3 doses, one month apart for children aged 3-59 months



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Specific objective 1: To determine the **uptake of R21 vaccine and IPTc** at the refugee camp level among children

Specific objective 2: To describe the post-intervention **acceptability** and **perceived impact** of the malaria vaccine and IPTc among community members

Design, methods and participants

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Mixed Methods study design with qualitative and quantitative methods

- Intervention commenced in August 2024
- Children residing in Kule Refugee Camp during the implementation of interventions

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Quantitative

- Vaccine coverage survey
  - **Uptake of R21 and IPTc**
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Qualitative

- Key Informant Interviews (KIIs) and FGDs (Focus Group Discussions)
  - Conducted after 1st round and after intervention

- **15 FGDs** with:
  - Mother & fathers, community health workers, camp leaders, health services providers
- **21 KIIs** with:
  - Religious leaders, female representatives, local & international stakeholders
- **Analysis:**
  - Thematic analysis undertaken by developing a systematic coding framework
  - NVIVO ©15 used for data management

R21 and IPTc coverage survey sample

Characteristics	Households N = 892[1]	Households N = 667[1]	Children N = 1,162[1]
Consenting households	887 (99%)		
Households with children eligible for R21/IPTc		667 (100%)	
Number of children eligible for R21			
R21 eligible			697 (60%)
R21 ineligible			465 (40%)
Number of children eligible for IPTc			
IPTc eligible			1160 (99.8%)
IPTc ineligible			2 (0.2%)

[1]n (%)

Results R21 and IPTc coverage survey

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Uptake of R21

Characteristic	Total (N)	Count (n)[1]	95% CI
Vaccination status	**683**		
Fully vaccinated		599 (88%)	85%, 90%
Partially vaccinated (2 doses)		46 (6.7%)	5.1%, 8.9%
Partially vaccinated (1 dose)		12 (1.8%)	1.0%, 3.1%
Unvaccinated		26 (3.8%)	2.6%, 5.5%

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Uptake of IPTc

Characteristic	Total (N)	Count (n)[1]	95% CI
IPTc status	**1,160**		
Full IPTc treatment		1,003 (86%)	84%, 88%
Partial IPTc treatment (2 doses)		92 (7.9%)	6.5%, 9.6%
Partial IPTc treatment (1 dose)		26 (2.2%)	1.5%, 3.3%
No IPTc treatment		39 (3.4%)	2.5%, 4.6%

[1]n (%)

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R21 vaccine and IPTc coverage: explanatory results

MOBILITY: Caregiver travel was the main reason for incomplete vaccination (79%) and IPTc (71%)

- Population movement, health center distances, and transport gaps
- Call to **diversifying access modes** e.g., Mobile clinics and door-to-door services.

As community health workers, we associate with the community. Parents who have vaccinated their children often share their positive experiences, which helps others understand. [CHW FGD1]

We are grateful to MSF for having mobilizers who inform us about these programs. Initially, we were hesitant, but later, when they explained things to us at home, we understood that taking the vaccine three times every three months helps keep children healthy, [Parent FGD2]

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DROPOUT REDUCTION: Dropout rates increased by 2% (round 1-2) to 7-8% (round 2-3) for R21, indicating need for strategies to maintain adherence.

- Driven by scheduling conflicts, waiting times, and unclear follow-up on next dose.
- **Poor dialogue and lack of reminders required adaptation of engagement and social messaging with leaders**

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LOW SIDE EFFECTS reporting (11% for R21, 10% for IPTc), mostly mild (headache/fever). Minimal **concerns/hesitancy** reported (0.9% for R21, 1.2% for IPTc).

- **IPTc** faced stronger hesitancy due to its **unfamiliarity** and **association with treatment** rather than prevention.

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Societal proof, hesitancy without rejection and building trust.

We know that malaria comes from dirty water and mosquitoes. That's why we clear bushes and stagnant water. The vaccine is new, but cleaning our area and sleeping under the net is what we already know. [FGD parent]

- Local views connect malaria to the environment and daily life, offering valuable perspectives to enhance biomedical prevention efforts.

Many people didn't know about the vaccine. It was the first time they heard about it. So, initially, there were mixed reactions. But as time went on, it became clear that the vaccine could help reduce the impacts of malaria.... some people are now accepting it, KII, Religious leader.

- Social proof and leadership endorsement are critical for building trust, addressing new vaccine-related concerns, and shifting community perceptions to support malaria vaccine uptake. IPTc association to treatment underscored the need for targeted communication.

I feel confident because the community is well informed, and everyone feels free to get vaccinated without hesitation [FGD CHW]

Programme delivery, scalability and Post-Vaccination Support & Monitoring

What we need is proper coordination between those giving the malaria drug and those giving the vaccine, they should speak the same language__ [Caregiver, FGD]

- Sustaining success in prevention campaigns with new tools requires a shift in approach.

After the first dose, they came to my house and asked if my child had any problem. That was good. It made me feel safe." — [Mother, FGD]

- 2-way dialogue to address inconsistent information and systematic follow-up visits.

For sustainability,…..awareness, acceptance by the population, resource mobilization, and partnerships with other organizations are all vital for sustainability, [KII MSF-M]

- Health system investment in staff, timely data monitoring and supply management.

Opportunities for scale up

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Concerns and Hesitancy

Develop clear, evidence-based messaging to address concerns and build trust

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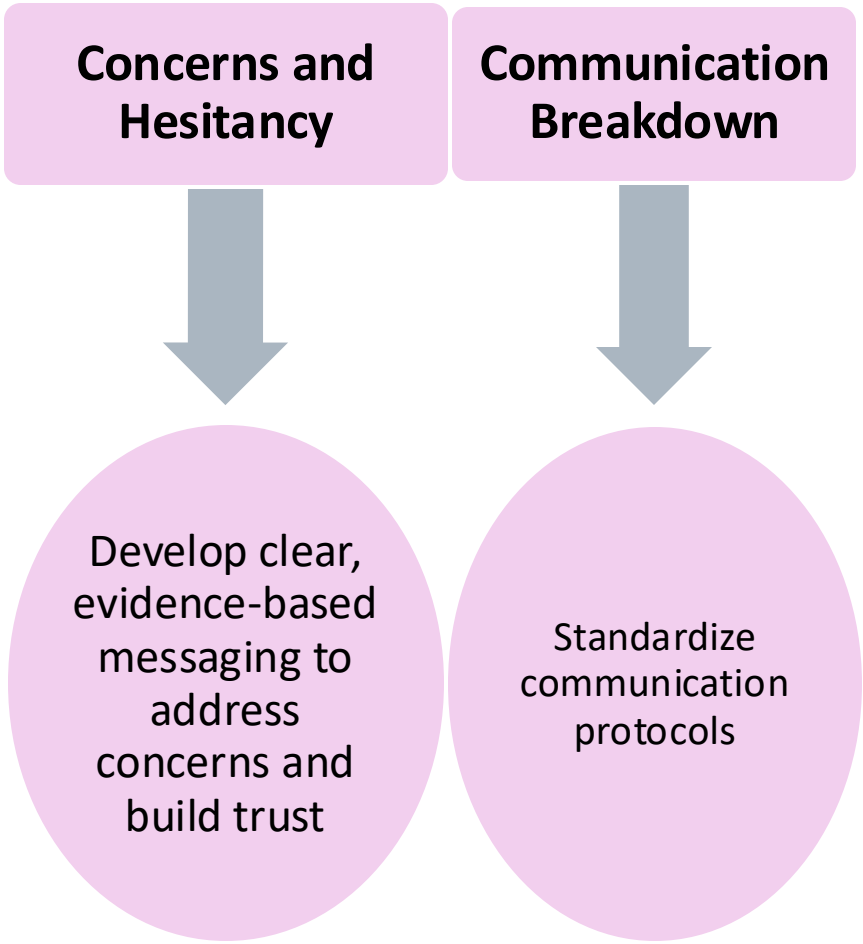

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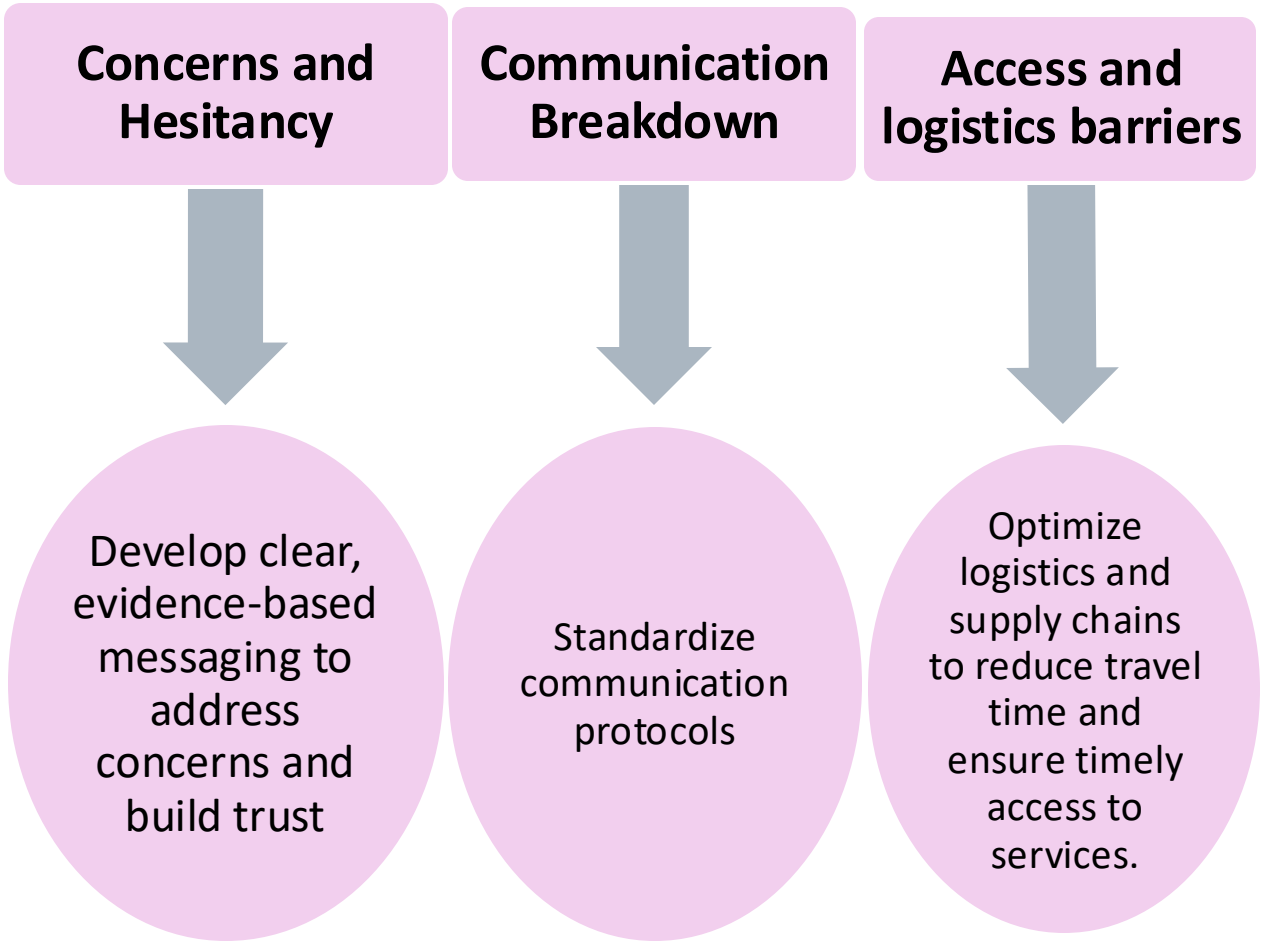

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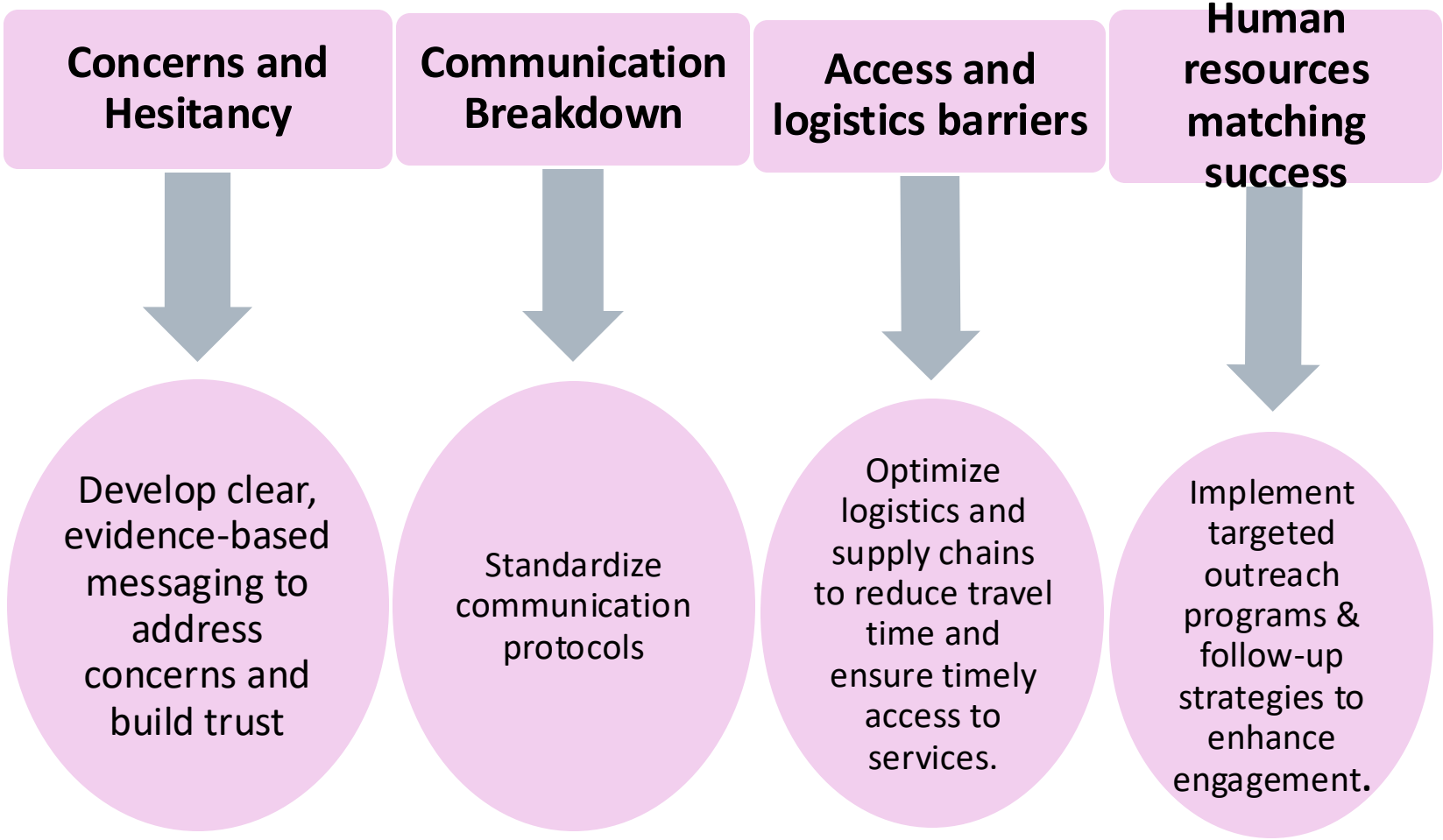

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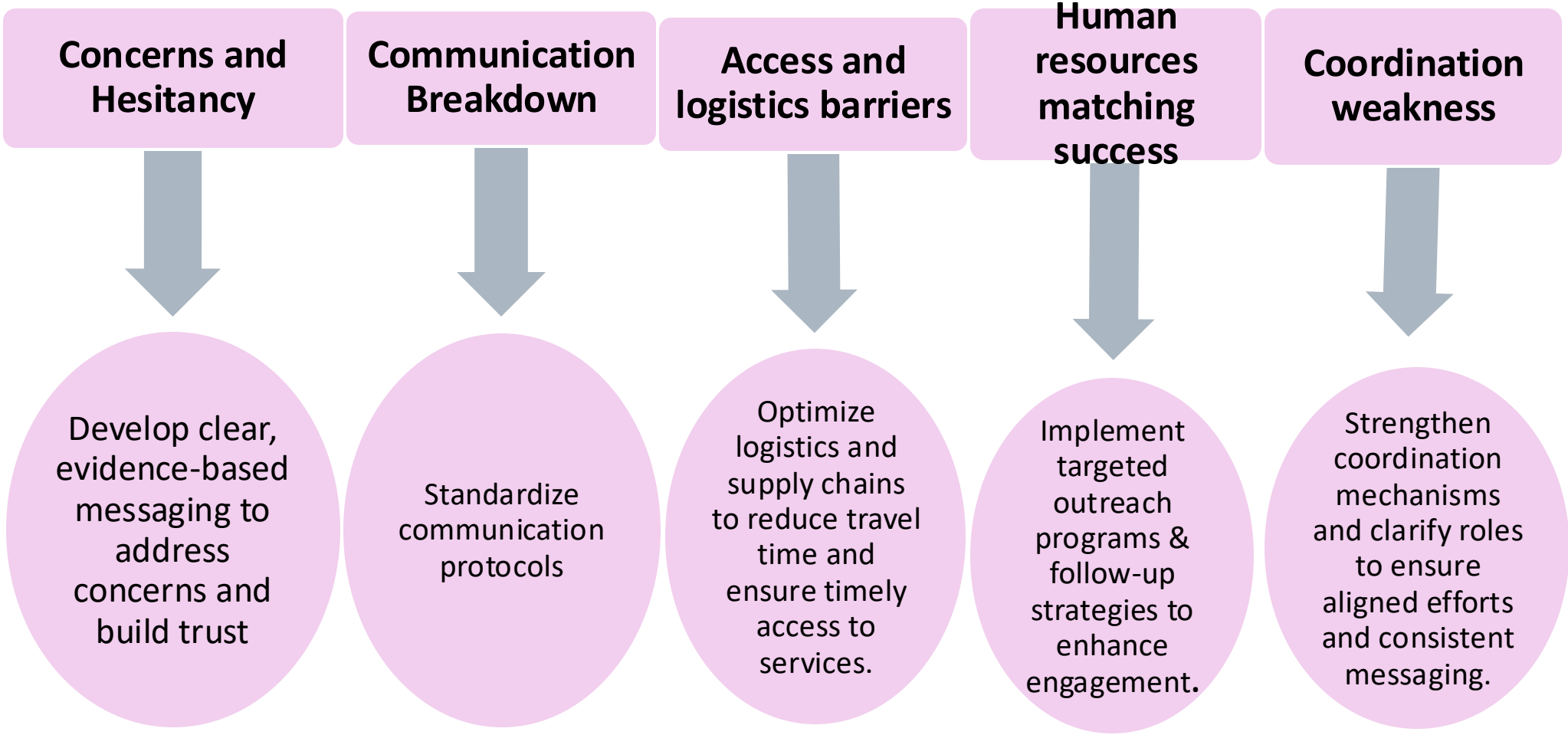

Opportunities for scale up

Concerns and Hesitancy	Communication Breakdown	Access and logistics barriers	Human resources matching success	Coordination weakness	Structural monitoring gaps
Develop clear, evidence-based messaging to address concerns and build trust	Standardize communication protocols	Optimize logistics and supply chains to reduce travel time and ensure timely access to services.	Implement targeted outreach programs & follow-up strategies to enhance engagement.	Strengthen coordination mechanisms and clarify roles to ensure aligned efforts and consistent messaging.	Invest in robust data management systems to improve tracking, feedback collection, and post-care support.

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- Shift from NGO-led to government-led systems.
- Align with Ethiopia's health system for long-term success

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5 STRONG SYSTEMS AND COORDINATION

Align government, NGOs, and leaders on timelines.

- Use simple tools to track uptake and feedback.
- Run programs with both scientific and social trust.

Conclusion

Strong Uptake, Low Hesitancy:

- Integrating R21 & IPTc into malaria control is feasible but it requires a multidimensional approach
- Flexible Design Worked, program adapted after Round 1

Trust Was Key:

- Addressing both correct and incorrect assumptions and empowering leaders to build trust
- Trust enhanced by tailored communication, and visible health benefits enabled acceptance

Local Fit Matters (blended scientific and local knowledge):

- Malaria prevention efforts must go beyond medicine, **success** depends on strong early community engagement, clear information, and reliable access to services.

Acknowledgments

- MSF and MoH staff and other key local stakeholders
- Parents, carers, children participating in the study

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