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Maternal and child health: Community-based Intermittent Preventive Treatment (IPTc) and the pre-referral use of Artesunate Rectal Capsules (ARC) in children under 5 years of age with severe malaria



Final Report

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List of acronyms and abbreviations

ABBREVIATIONS	DEFINITIONS
CHW	Community health worker
CDS	Health Development Committee
SMC	Seasonal malaria chemoprevention
WHO	World Health Organization
IPT	Intermittent Preventive Treatment
IPTc	Community-based Intermittent Preventive Treatment
DOT	Directly Observed Treatment
CPN	Prenatal consultation
ARC	Artesunate rectal capsule
SP	Sulfadoxine-pyrimethamine
NMCP	National Malaria Control Program
MPAG	Malaria Policy Advisory Group
PSE	Plan for an Emerging Senegal
DSISS	Health and Social Information System Division
MYF	Médina Yoro Foula
DHIS2	District Health Information Software 2
DSDOM	Home care provider
VAD	Home visit
CVAC	Monitoring and Alert Committee
LLIN	Long-lasting insecticide-treated bednets
ICP	Head nurse
WRA	Women of reproductive age
IRS	Indoor residual spraying
SWOT	Strengths, Weaknesses, Opportunities and Threats
MNCH	Maternal, newborn and child health
CBO	Community-based organization

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SSI	Semi-structured interview
PECADOM +	Integrated home care for mother and child
ANSD	National Agency for Statistics and Demography
HIV	Human immunodeficiency virus
AIDS	Acquired immunodeficiency syndrome
<i>ACRONYMS</i>	<i>DEFINITIONS</i>
UNICEF	United Nations Children’s Fund
OWOD	USAID project involved in the fight against malaria, family planning, reproductive, maternal, newborn, child and adolescent health (RMNCAH), Water, Hygiene and Sanitation (WASH), nutrition, universal health coverage and improvements in the healthcare system
ECOBANK	Pan-African bank offering banking services in sub-Saharan African states
CHILD FUND	International organization active in child protection, improving the financial position of households, early childhood development, WASH and food security
AMREF	African Medical and Research Foundation
ENDA-SANTE	An entity of the international organization Enda-Tiers monde, which supports vulnerable groups in defending their right to access information and adequate health services
<i>TERMS</i>	<i>DEFINITIONS</i>
Bàjjenu gox	A neighborhood godmother actively involved in raising awareness of health issues at the community level
Jura	Gold-panning sites

Executive summary

The overall aim of this study was to understand the determinants linked to the acceptability of community-based IPT and the use of artesunate rectal capsules (ARC) by health workers and communities in improving health indicators.

The qualitative approach employed consisted in conducting interviews with different categories of actors (decision-makers, health workers, community health workers, beneficiaries) to understand the perception and acceptability of these interventions.

At the end of this study, several results (evidence) emerged, which can be organized as follows:

Summary of results

Objective A: Gather experiences/acceptance of pregnant women and other community members of community-based IPT; factors in the acceptability and non-acceptability of artesunate rectal capsules (ARC) from healthcare system stakeholders and beneficiaries;

- **IPTc:** The source of women's incomplete uptake of the four doses of SP lies primarily at organizational level. It concerns both the supply of SP to healthcare providers and the home care providers who are responsible for ensuring that women receive it. The shortages we see are not conducive to optimal supply. Secondly, communication is sometimes lacking. IPTc can be seen as a way of keeping women in the villages and preventing them from coming to prenatal consultations. These misunderstandings are not conducive to acceptance by head nurses, who are keen to maintain their prenatal consultation indicators. For the women, when the last prenatal consultations are equated with receiving drugs intended for HIV-positive women, this does nothing to boost their self-esteem. Last but not least, motivation levels among home care providers are sometimes very low. Considered as receiving support from healthcare facilities, which communities liken them to, they are victims of a lack of community solidarity. Unable to work in the fields, they are not compensated either by the community or by the healthcare system, which puts them in a precarious position. Added to this is the need to travel, which entails transport costs that are not always covered by the IPTc. In some areas, this results in CHWs abandoning their work in favor of more lucrative and less thankless activities.

As far as acceptability among women is concerned, uptake is improved by taking into account their needs, the times that suit them and the difficulties they face. Acceptability therefore depends on whether or not home care providers and other community workers are able to negotiate with women to get them to sign up to IPTc.

- **ARC:** While the use of ARC is recognized as a highly relevant strategy in isolated areas, in practice there seems to have been some misunderstanding of the messages conveyed to community workers. ARC is perceived as a drug of last resort. Its use is considered to arise because current prevention methods have not been followed: seasonal malaria chemoprevention (SMC) in children, the use of LLINs, etc. Thus, the use of ARC seems to be equated with failure to attain the goal of "zero malaria".
- The lack of rigorous monitoring of ARC also seems to play a part in the lack of consideration given to this intervention, which appears to be of secondary importance.

- Added to this are the many and varied tricks used by those who are required to use it. Another criticism of this molecule is that some parents consider it to be curative and don't bring their children for referral, arguing that they are recovering or that they 'can't afford to make the trip, which is expensive for deprived families.

Objective B: Analyze the referral conditions of children suffering from severe malaria and living in areas with high malaria-related maternal and neonatal mortality, far from urban centers where skills and technical facilities are concentrated.

- In the surveyed areas of Kédougou and Kolda, service conditions, especially during the rainy season, are sometimes extreme and require considerable resources to bring children to the health post for a consultation, and to refer them to the central level if their condition worsens.
- Motorbikes and three-wheeled vehicles (sometimes carts) are the main forms of transport between villages and health facilities. Both regions face a lack of paved roads and public transport. This sometimes results in recourse to neighboring countries (Gambia), considered by the population to be more accessible culturally, geographically and sometimes financially. In the Kolda region, some villages are a long way from the regional capital, not to mention the physical and financial costs involved. This should encourage joint initiatives at border health facilities, but also provide more resources for referrals to better-equipped facilities.

Objectif C: Understand how Digital Health can strengthen the continuum of care for mother and child and the technical capacity of the healthcare system to make profitable use of digital monitoring and reporting tools.

- The use of digital health offers real benefits in the medical monitoring of mother and child. An alert system helps avoid delays in taking SP. Some organizations are helping the healthcare system by donating tablets for faster reporting (Amref in Kolda) and sending real-time data on a patient for referral. For children suffering from severe malaria, the receipt of information by the pediatrician at the health center or hospital to which they are referred can save time and improve their vital prognosis. Another innovation relates to a television station (Tace Art TV) set up by the people of Kolda to provide health information in the region. These health programs, notably “Vendredi santé”, offer women an innovative forum to ask questions about their health, including IPTc. Health workers are more or less familiar with digital tools.
In Kédougou, digital health is less dynamic. The region is both geographically and digitally isolated. Villages have neither electricity nor stable telephone networks. Despite this, Kédougou has a digital strategy that draws on the lessons learned from Covid-19 for a very isolated region. Kédougou intends to build on this digital potential to facilitate data feedback, even in the event of a pandemic. For the time being, however, this strategy is still in the planning stage.

Lessons learned and recommendations

1 — At institutional level, an appropriate institutional framework is essential for efficient malaria control.

In Senegal, an institutional framework gives greater responsibility to health workers operating at peripheral level in the fight against malaria. Workers are aware of the importance and necessity of IPTc and ARC in the fight against malaria, given the geographical and economic configuration of localities. On the other hand, not all districts have the same assets to fight malaria. Not all interventions receive the same attention from health authorities and healthcare providers, and this is reflected in the low level of involvement of partners in the extension and sustainability of ARC.

Recommendation 1:

At national level:

- Prevent periods of uncertainty between the withdrawal of one funding partner and the installation of another;
- Increase levels of engagement with ARC, a strategy that appears to be poorly monitored and promoted

2 — At organizational level, the incomplete number of prenatal consultations (and therefore SP) stems from shortcomings linked to healthcare organizations:

- o There are many shortcomings in the system: availability of products, high-quality human resources, necessary equipment. An example is the shortage of pregnancy tests in a rural maternity unit, which could jeopardize the achievement of all MNCH coverage targets: prenatal consultations, IPT, etc. In addition, malaria control strategies require better training for CHWs working in rural maternity units, accompanied by motivation (logistical, financial, etc.) to enable these community workers to better meet the growing expectations of the healthcare system.
- o Digital data reporting systems help to overcome geographical and financial barriers. However, isolated areas, poor electrification and the instability of the Internet – where it exists – are obstacles to these digital strategies. Taking these various structural factors into account would enable us to reflect on the adaptability of these tools in these isolated areas.

Recommendation 2:

- o Improve the SP supply circuit by avoiding breaks in the supply chain. This also means combating information withholding strikes, which weaken the system and undermine its ability to anticipate and make evidence-based decisions;
- o Review communication around ARC to make it more positive, and consider it at its true value in cases of severe malaria referral;
- o Better train rural maternity health workers in early pregnancy detection;
- o Make pregnancy tests available to rural maternity units;
- o Facilitate exchanges of Amref's digital experience in Kolda on monitoring pregnant women in favor of ARC.

3 — At the community level, communicating is good, but listening to patients' needs is even better!

- o The study shows that strategies specifically targeting vulnerable groups (women with

unwanted pregnancies) ensure that the individual and collective needs expressed by women are adequately and efficiently addressed. This way of accommodating women's expectations and negotiating care seems more in line with social reality. It also leads to better results.

- In Senegal, the fight against malaria is inextricably linked to the commitment of community health workers. They work in the front office in the implementation of all community interventions. From IRS service providers to digital data reporters for digital health, through to LLIN distributors and drug administrators for SMC, IPTc and ARC, they have become the linchpin in the implementation of interventions. However, it is important to overcome two pitfalls in order to strengthen the content of their contribution to the healthcare system. Firstly, the delegation of tasks relating to medical procedures such as the administration of SP at home and the use of ARC must not be used as barometers to assess their performance. This allows unethical practices vis-à-vis the public. Nor should the trust placed in them overshadow the strict supervision of their actions. Ongoing refresher courses through regular training would enable us to get the most out of these workers. Better motivation and reflection on their supposed voluntary work could also consolidate their role.

Recommendation 3:

- Promote the mediation role of care groups;
- Promote contracting with CBOs to implement community health activities;
- Develop attentive listening and professional flexibility in dealing with women

Chapter I: Study background, rationale and methodology

Malaria remains a major concern in endemic countries such as Senegal. In 2021, the WHO African region accounted for some 95% (234 million) of the world's estimated cases (WHO, 2022). Mother-child pairs (or pregnant women and children under 5) remain among the most exposed groups. This is the reason for targeting these two categories, which appear to be among the most vulnerable to malaria.

In 2021, of the 40 million pregnant women living in 38 countries in the WHO's Africa region where transmission is moderate to high, 13.3 million (32%) were exposed to malaria infection during pregnancy. Better still, West Africa posted the highest prevalence of malaria exposure during pregnancy (40.7%), ahead of Central Africa (39.8%) and East and Southern Africa (20%) (Malaria World Report, 2022).

The placenta is the preferred site for *Plasmodium* during pregnancy. Pregnant women are therefore highly susceptible to *Plasmodium falciparum* infection, unlike women who are not pregnant. Malaria infection in pregnant women is accompanied by maternal anemia. The resulting nutritional deficiencies for the fetus can lead to abortion, intrauterine delay, death in utero and prematurity (Oumarou, 2020). To avoid the consequences of malaria during pregnancy, it is important that pregnant women living in malaria-endemic areas are on anti-malaria drugs.

The WHO recommends preventive strategies during pregnancy, with the administration of intermittent preventive treatment (IPT). IPT for malaria with SP is recommended for pregnant women living in malaria-endemic areas, with at least three doses administered from the second trimester onwards. This intervention represents an alternative prevention strategy whose efficacy has been demonstrated by several studies conducted in Africa in reducing the rate of placental infestation by *Plasmodium Falciparum*, low birth weight and severe anemia during pregnancy. Taking SP must be observed by a qualified professional at the health facility (Konaté, Yaro, Ouédraogo, et al., 2011).

However, the success of such a program depends not only on the efficacy of the drug used and its availability, but also on compliance with the guidelines by pregnant women and health workers. In Senegal, IPT is implemented at the operational level (health posts and centers), but the expected results in terms of coverage (three doses of SP during pregnancy) have not yet been achieved. In fact, this classic strategy of administering SP under DOT to pregnant women at health posts or centers with one-month appointments has encountered difficulties in implementation.

These difficulties include shortages of SP, the unavailability of pregnant women due to workload, delays in prenatal consultations, the isolation of certain areas, especially during the winter, and mistrust of the procedure.

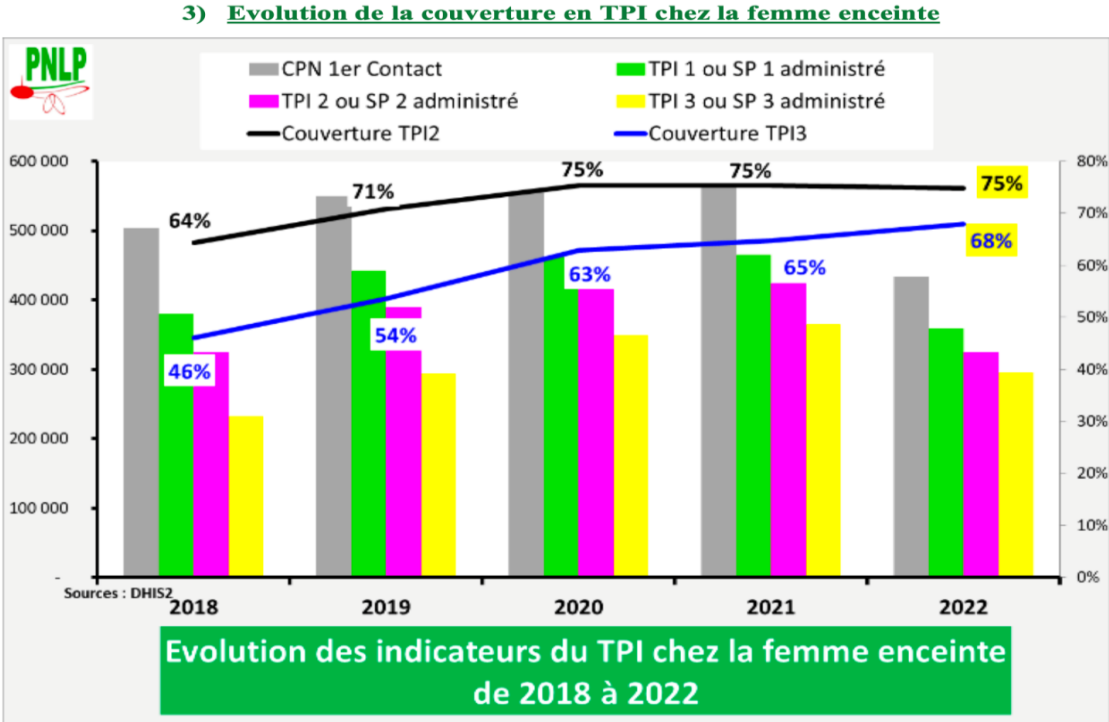
Thus, organizational determinants, local practices and beliefs, notably the use of traditional

medicine, the role of people in the immediate environment of the pregnant woman (husband, mother, mother-in-law, etc.) and who exert an influence over health care-seeking behaviors, seem to have reduced the scope of this intervention.

So, it’s not surprising that, a few years ago, Senegal had one of the lowest rates in West Africa: 6% in 2010 and 1% in 2016. This rate continues to fall, with an estimated 30% reduction in cases between 2015 and 2016. However, despite the progress made over the past ten years, disparate levels of IPT2 and IPT3 coverage are still observed in some districts of Senegal, as evidenced by routine (IPT3: 62.9% in 2020) and survey data (38% in 2021). In 2020, 445,313 cases of malaria were recorded, of which 8,063 were women, and 373 deaths, of which 5 were pregnant women.

Senegal’s experience as a country that did not implement the TIP-TOP project led it to set up a two-year IPTc trial. Over the two years of the program in the 15 districts involved, the completion rate for prenatal consultations (at least four visits) remained similar, with an average of 55.6% in 2020 and 58.3% in 2021, while IPT3 increased from an average of 48.7% in 2019 to 55.9% in 2020 and 62.9% in 2021 (MPAG, 2023:15).

Figure 1: Evolution of IPT coverage in pregnant women



Source: Epidemiological bulletin

The NMCP epidemiological bulletin reports on the situation in 2022 for TP2 and TP3.

Drugs and LLIN 2022		
SP	SP administered to pregnant women	1,100,929
IPT	PT2 coverage	74.9%
	PT3 coverage	68.0%

Source: Epidemiological bulletin 2022

In light of this situation, the NMCP, with the support of its partners, has set up a community-based approach to delivering IPT to pregnant women. The approach consists of community health workers distributing SP to pregnant women from the second trimester onwards, following a census of this target population.

However, these strategies only achieve coverage of between 60 and 65%. *How can we increase the coverage of IPTc in areas with a high incidence of malaria? What additional efficient and effective strategies can be put in place to eliminate malaria in mother and child?*

Recent meetings (2023) of the Malaria Policy Advisory Group (MPAG) provide some reassuring insights into the use of IPT-c in Senegal: “The IPTc approach has strengthened the credibility of CHWs, as well as the acceptability and uptake of IPTc for pregnant women. Challenges include the need for a steady supply of products, regular supervision and adequate funding. Key requirements for IPTc include a steady supply of SP, regular supervision by qualified staff in health facilities and stable funding. A small incentive payment to CHWs for home visits was essential to motivate them” (MPAG, 2023: 16).

In addition to the IPTc challenge, another challenge to malaria control in Senegal is the issue of referral of patients in hard-to-reach areas with limited technical facilities and human resources. These referrals are particularly important for categories vulnerable to malaria, such as pregnant women and infants.

As for ARC, “Since 2006, the World Health Organization (WHO) has recommended rectal artesunate (RAS) as an effective treatment for severe malaria prior to hospitalization. RAS rapidly eliminates 50% or more of malaria parasites within 6 to 12 hours. In a controlled trial reported in 2009, pre-referral RAS was shown to reduce mortality or permanent disability by up to 50% in children under 6 years of age who had not reached a referral facility for more than six hours” (WHO, MPAG, 2023a).

To protect these vulnerable groups, particularly children, treatment with artesunate rectal capsules (ARC) remains a suitable medical indication, but is still insufficiently used and evaluated. However, this drug, in the form of gel capsules, can be used at community level to maintain the vital signs of malaria-infected children living in hostile environments, while awaiting appropriate and comprehensive care in a dedicated health facility.

At its last meeting, the WHO MPAG (2023: 8) concluded that: “Countries that are already implementing or considering implementation of RAS for pre-referral treatment of severe

malaria need to strengthen all aspects of the continuum of care for a severely sick child – from community health workers being adequately trained and stocked for giving RAS in the areas where it is most needed, to ensuring rapid transfer and access to referral facilities where a complete course of post-referral treatment is given as per WHO recommendations for the treatment of severe malaria.” What about the red zone districts in southern Senegal?

The NMCP has decided to introduce ARC in all regions of Senegal to facilitate the management of severe malaria cases in the most appropriate health facilities. But what are the challenges posed by such an approach? Is patient referral taking place within an optimal framework of patient safety?

The use of ARC is shown to be particularly effective where travel is difficult. Its ability to treat a patient who has to wait remains an important opportunity to be considered both in isolated areas, with limited service capacity, and in the face of a pandemic such as Covid-19. How can we use the potential of ARC in areas – such as southern Senegal – that need it most?

Lessons learned from Covid-19 and implications

The Covid-19 pandemic showed that all the efforts made in the fight against disease can quickly be called into question in the event of a health emergency where travel is restricted. Pregnant women and children can be the main victims of malaria-related deaths. The current healthcare system remains inadequate due to an ever-increasing demand for healthcare, leading to difficulties in accessing quality maternal and child healthcare services for pregnancy, newborn and post-partum care in disadvantaged peri-urban and rural areas that have faced enormous travel difficulties. Against this backdrop, care provision needs more than ever to adapt to conditions where access to care is difficult, for example due to remoteness and distance. This underscores the relevance of capacity-building approaches for grassroots actors (CHWs) and improving survival conditions for critically ill patients (severe malaria).

What about digital health?

Digital health or e-health has become a central issue in strategies to improve access to healthcare, particularly in remote and isolated areas. It encompasses radio, cell phones, computers, the Internet, satellite link systems and computer applications. The WHO has thus developed a global strategy for digital health 2020-2024, which aims to “improve the health of everyone, everywhere, by accelerating the development and adoption of appropriate digital health strategies to rapidly achieve the health-related Sustainable Development Goals” (Diop Ly & Mbaye, 2022).

Senegal is aligning itself with this global trend through its Plan Sénégal Émergent (Plan for an Emerging Senegal – PES), with a focus on the priority areas of reducing maternal, neonatal and infant mortality, malaria, and communicable and non-communicable diseases (Diop Ly & Mbaye, 2022). Senegal has thus drawn up a Digital Health Strategic Plan 2018-2023, one of the main objectives of which is to facilitate —the collection of health and social data in real time for informed decision-making. “Through this plan, it is expected that information and

communication technologies will take on a more important role in diagnosis and treatment, but also in disease monitoring and prevention” (Diop Ly & Mbaye, 2022).

In Senegal, digital health is an important component of the “Digital Senegal 2025” strategy”. A budget of 36 billion FCFA (just over 58 million dollars) is earmarked for the health sector. The aim is to set up a national patient records management platform; a universal, secure health card; a telemedicine development project (telediagnosis, teleconsultation); a system for controlling counterfeit medicines; and an emergency communications management service for monitoring pregnant women and burn victims (PSSD 2018-2023).

Since 2014, the Health and Social Information System Division (DSISS) within the Senegal Ministry of Health and Social Action (MSAS) has been coordinating the rollout of District Health Information Software 2 (DHIS2), a platform for reporting and analyzing health and social data. In collaboration with the technical departments of other ministries, the DSISS is responsible for formalizing E-health in Senegal, drawing in particular on the experience of using digital tools in the fight against Covid-19 (Ly & Mbaye, 2022). Currently, the “Cellule santé digitale, carte sanitaire et observatoire de la santé” coordinates the digital health unit.

These platforms lend themselves to the transmission of data from patients – or, more generally, healthcare users – whether pregnant women or children suffering from malaria in the case of community-based IPT, or the use of ARC for severe cases.

These technologies make it possible to share information and support decision-making by improving the vital prognosis of patients (remote consultations, patient monitoring, collection and transmission of health information or supply and management of medicines and consumables), who can be monitored remotely and their referrals accompanied by information from actors with higher technical platforms (cf. Weil et al., 2013).

How do these international and national strategies translate into digital health (or e-health) practices in the most remote and isolated areas, particularly for pregnant women and children aged 0 to 10? What contribution could digital health or e-health make to data production and monitoring of malaria control interventions at community level?

I. Study objectives

The general objective of this intervention was to understand the socio-cultural and professional determinants linked to the acceptability of community-based IPT, but also the use of ARC by health workers and communities in improving health indicators.

More specifically, the aim was to:

- ☛ Gather evidence on current practices and experiences of healthcare providers and community health workers on IPTc/ARC;

- ☞ Gather experiences/acceptance among pregnant women and other community members of community-based IPTc;
- ☞ Gather factors of acceptability and non-acceptability of the artesunate rectal capsule from care system stakeholders and parents/caregivers;
- ☞ Collect practices and tools used to support referrals and counter-referrals;
- ☞ Analyze the referral conditions of children suffering from severe malaria and living in areas with high malaria-related maternal and neonatal mortality, far from urban centers where skills and technical facilities are concentrated.

II. Methodology

The methodological approach was qualitative. It focused on three main themes: IPTc, ARC in mother and child survival in the face of malaria and, secondarily, digital health.

1. Type of study

We had proposed a qualitative survey focused on taking into account and describing the viewpoints, perceptions, experiences and testimonies of various women who receive IPTc and health workers who use ARC and digital health in their care and referral activities.

2. Study area

The research was carried out in the districts of Kolda and Kédougou, which still have a relatively low SP3 rate (63.9% and 66.5% respectively in routine data). Two regions are in the red zone, characterized by high malaria rates. The inaccessibility of these areas was an important factor in the analysis of distance for referrals and the added value of ARC.

2.1. Intervention site selection criteria

- Village with high endemicity
- Implementation of IPTc as a malaria prevention intervention for pregnant women
- Implementation of ARC as a pre-referral intervention for severe malaria in children under 6
- Availability of inputs
- Knowledge and use of digital tools

2.2. Survey targets and sampling strategy

A purposive sampling technique was used to select study sites and interviewees. Within the chosen districts, study neighborhoods/villages were selected according to place of residence: urban, peri-urban and rural. In each locality, healthcare professionals, community health workers and communities (pregnant women, men, local leaders) were interviewed using dedicated tools. They were selected with the help of actors in each district, which act as focal points.

The **main targets** of the surveys were **pregnant women, community health workers** (community liaison officers, home care providers, *bàjjenu gox*)¹ involved in the provision of mother/child health services at health facility or community level, and parents of referred children. They informed us about the acceptability of IPTc.

Secondary targets – mainly for IPTc – are paramedical staff (head nurses, midwives, nursing assistants, local leaders, etc.) who work in collaboration with community IPTc staff. As far as ARC is concerned, the priority targets were health workers who are involved in the treatment of severe malaria and are integral to referrals. Their knowledge and experience of referral challenges and the benefits of using ARC were analyzed. This enabled us to look at the time needed for referrals and the constraints that may arise in relation to this strategy.

Then, in each locality, we looked at pregnant women who had used IPTc and community health workers who had been informed about or were working with IPTc to record their impressions. Head nurses (ICPs) were also interviewed to find out their perception of these interventions.

In the interests of diversification, we wanted to represent both men and women, taking into account their level of education and sociolinguistic diversity.

2.3. Data collection tools

To collect primary and secondary data, we used the following techniques: literature review, semi-structured interviews and focus groups.

- **Literature review:** the most recent data on the strategies promoted by the WHO and the countries concerned were used. Data at decentralized level (health districts, medical regions, health posts, etc.) were also used to analyze the implementation of IPTc, ARC and digital health. These documents enabled us to gain a better understanding of the services offered, the players involved, the availability of inputs and the volume of activities. This enabled us to carry out as exhaustive an analysis as possible of the district's situation in terms of the IPTc, ARC and e-health packages.
- **In-depth individual interviews:** these were carried out with resource persons identified at regional, departmental and community levels, using semi-structured guides prepared in advance and adapted to each target group. Health workers involved in IPTc, ARC and e-health were also interviewed, as were community workers involved in dispensing IPTc.
- **Focus groups:** to learn more about the viewpoints of the resource persons, we organized focus groups with three categories of key players:
 - Young primiparous mothers (aged 18 to 25);
 - Multiparous women (aged 26 and over) who may or may not be members of associations (women's groups);
 - Community workers (community liaison officers, *bàjjenu gox*, home care providers) involved in IPTc and malaria management activities (notably use of ARC) at community level.

¹ These are the people who administer the ARC in the event of referral

They were organized into working groups to explore current activities at the study sites, and to discuss knowledge, assessment of IPTc provision, benefits and challenges in accessing RH services and malaria management. To structure these discussions, a guide was drawn up, based on themes with individually prepared questions.

2.4. Inclusion criteria

IPT

- Experience of IPT as a caregiver / beneficiary / decision-maker
- Experience of IPT as a patient or carer / decision-maker
- Experience in communication (leaders, etc.)
-

ARC

- Experience of ARC as a caregiver
- Experience of ARC as a patient or carer
- Experience in communication (leaders, etc.)

2.5. Non-inclusion criteria

IPT

- Anyone without experience of IPT
- Anyone who does not wish to participate and has not given their consent

ARC

- Anyone without experience of the ARC
- Anyone who does not wish to participate and has not given their consent

2.6. Data collection

The data collection team was organized into two groups to gather available district and regional data on IPTc, ARC and e-health. These two groups were then organized to collect information from resource persons and other stakeholders as identified in the research targets.

They were previously trained on the collection tools that enabled them to address the relevant themes concerning IPTc, ARC and e-health. The survey generated evidence on the current practices and experiences of women using IPTc, health workers (formal/professional and community-based). Stakeholders working with e-health tools were also asked about their experience of the benefits of digital tools by professional and community actors.

The discussions were recorded by Dictaphone (with the participants' consent) and organized by pairs of interviewers, Master's students in sociology/anthropology who had received the proper training, with real skills and experience in field surveys throughout Senegal and the linguistic diversity to be able to interview parents from several sociolinguistic backgrounds and

speaking several languages, who may have different sociocultural practices.

3. Data analysis and management

Qualitative data from individual interviews and focus groups were entered in Word. Observation data were also transcribed (observation notes) by the interviewers and form an integral part of the analysis corpus. Following transcription, the data were exported to Nvivo software for coding and categorization. In view of the depth/complexity of the textual data generated by the open-ended survey questions, a thematic analysis approach sensitive to grounded theory was adopted. The analysis was both deductive (based on a priori themes) and inductive (derived from participants' experiences and opinions not anticipated in advance). The analysis process involved familiarizing ourselves with the data by reading and re-reading the textual responses, in order to identify key themes that could form chapters in the final report.

4. Conceptual framework for data analysis

We opted for a content analysis based on qualitative indicators. Field notes, case study boxes and interview narratives were used to highlight stakeholders' perceptions of the various themes addressed in the individual and group interview guides. Photos and diagrams were used to illustrate certain assertions following the descriptions of local contexts. In addition, the Strengths, Weaknesses, Opportunities and Threats (SWOT) and Root Cause Analysis (RCA) analytical frameworks served as a conceptual framework for the empirical data.

5. Collection results

As part of the study, in-depth interviews and focus groups were conducted with various stakeholders in the Kolda and Kédougou regions. The following table summarizes the empirical data collected.

Table 1: Summary of interviews and focus groups conducted in Kolda and Kédougou

Levels	Keys informants		Keys Informants Interview Kolda	Keys Informants Interview Kédougou	Focus group Kolda	Focus group Kédougou
Regional	Health policy authorities	Primary care supervisor	1	1		
		RH coordinator	1	0		
		Malaria focal point	0	2		
	Healthcare	Doctors (MCA)	1	1		

Departmental	professionals	Nurses	2	3				
		Midwives	2	2				
		Primary care supervisor	1	1				
	Tace Art TV (e-health)		1	0				
Communities	Local leaders		1	3				
	Community health workers		20	16			2	0
	Nursing mothers							1
	Pregnant women		10	20			2	1
	Caregivers/mothers-in-law		11	10			3	3
	Decision-making fathers		/	1			2	2
Total			51	60	9	7		

A total of fifty-one (51) individual interviews were conducted in Kolda and sixty (60) in Kédougou with key informants to gather information on intermittent preventive treatment (IPTc) and the artesunate rectal capsule (ARC).

5.1. Confidentiality and anonymity

The principles of anonymity and confidentiality were omnipresent throughout the survey. No names or information (such as addresses) that could identify respondents were collected by the survey tools. Absolute confidentiality was maintained in this respect. A coding system was established for all information deemed sensitive. Particular emphasis is placed on these aspects when training data collection personnel. None of the interview guides or texts included personal identifiers that could be used to identify the interviewee. Furthermore, the data are analyzed in aggregate to preserve the anonymity of the participants.

Before starting the interviews, informants are asked to sign a letter of informed consent. The field teams ensured that consent was obtained from all interviewees before any information was collected. We ensured that all target surveys were conducted in strict compliance with ethical principles.

5.2. Difficulties encountered and limitations of the study

The field investigation was not without its difficulties. Foremost among these was the **remoteness of the investigation sites**, with an average six-hour drive per field day. The **unavailability of some key informants** at the time of the survey, such as the political authorities, was also a difficulty that we compensated for with telephone interviews. The **coincidence of the survey with the October campaign** was also a difficulty, given the unavailability of certain healthcare professionals, notably the midwife. Some focus groups with both pregnant women and decision-making fathers were not conducted properly: some pregnant women did not give the interviewer the choice of addressing all the essential points of the discussion, as they had to **prepare meals**; some decision-making fathers cut short the

discussion because it was **time for Friday prayers**. The survey would have been more scientific if the team had devoted more time to observing the attitudes and management practices of community workers in cases of severe malaria in children.

STUDY RESULTS

The results of the study are presented in five main chapters.

- **Chapter 1** reconstructs the process of implementing IPTc and ARC as additional malaria control interventions in two chronically endemic areas. It concerns the experiences and practices of healthcare providers in implementing the two interventions. A comparative approach between the two regions surveyed enables us to identify the scope and challenges, particularly of an organizational nature, faced by healthcare providers.
- In **Chapter 2**, the acceptability of IPTc and ARC is examined through the prism of the economic, health and physical conditions of demand for care from the public. Particular attention is paid to each intervention – IPTc and ARC – in each region.
- **Chapter 3** looks at the role of digital health in mother and child healthcare in cases of severe malaria.
- More concise than the previous chapters, **Chapter 4** focuses on identifying the bottlenecks intrinsic to the implementation of IPTc and ARC, as well as the operational actions required to achieve the primary objective of 80% coverage against malaria and the elimination of cases of severe malaria in mother and child.

Chapter I: Caregivers' experiences and practices

Introduction

This chapter presents the two interventions, IPTc and ARC, in the way they have been implemented as flagship interventions in the fight against malaria in the south of the country. It reviews the historical and contextual aspects that led to the introduction of these interventions. It also attempts to analyze the experiences and practices of healthcare providers in implementing these two interventions.

In the two regions surveyed, Kolda and Kédougou, the configuration of the two interventions is not the same. It does, however, demonstrate the scope and organizational challenges faced by healthcare providers in implementing IPTc and using.

I. Background and context

The fight against malaria in Senegal is based on several interventions: chemoprevention of seasonal malaria in children (3 to 59 months), universal long-lasting insecticidal net (LLIN) distribution campaign, indoor residual spraying (IRS) and intermittent preventive treatment (IPT) for pregnant women. These strategies have not yet succeeded in eradicating the disease. They have not achieved an 80% coverage rate, especially for the most vulnerable categories. Pregnant women face financial and geographical difficulties in accessing sulfadoxine-pyrimethamine (SP), which is preferentially administered during the **first** prenatal consultation in Directly Observed Treatment (DOT) at health facilities. Despite the goodwill and commitment of those involved, IPT3 coverage was very low in both regions, compared with the average coverage threshold of 80% set by the NMCP.

The two regions surveyed are hotspots in terms of malaria endemicity. However, considerable community health efforts have enabled Kolda and Kédougou to achieve a 100% completeness and promptness rate for malaria mortality.

Yes, there were years when we had an exorbitant number of malaria-related deaths in the region, but now there's a strike. Last year, if I'm not mistaken, we had no more than 20 cases of malaria. Now the strike means that we don't have exhaustive data, but there were years when we only had 86 cases of malaria-related deaths (SSI, planner, Kolda).

However, the poverty, isolation and remoteness of some villages from health facilities pose a real risk to maintaining this progress. The roads are barely passable, and women face numerous difficulties in getting to the health facility.

Photo 1: Image of isolated areas with stagnant water and impassable roads in the rainy season



Sidebar 1: Accessibility of health posts and the benefits of IPTc and ARC

Located in the south-east of Senegal, the Kédougou and Kolda regions are characterized respectively by mountainous roads and very remote, isolated villages. In Kédougou, for example, the Dimboly health post acts as a focal point for 16 villages, the closest of which is 1.5 km away (Woulaba). The furthest village is 24 kilometers away, and 5 farming hamlets are located between 11 and 30 kilometers away. Public transport is non-existent in these areas, and carts are highly unsuitable.

These areas are also marked by the precarious position of women, who have to walk to the health post. In addition to the lack of means of transport (motorcycle, public transport), there are financial difficulties, especially during the lean season (transport costs 1,200 FCFA).

In winter, the situation is exacerbated by the presence of stagnant water and rising water levels on the roads. In this context, local residents, like those of Lamé, are obliged to use pirogues or wait for the backwater to recede, while others, like those of Kaffori, located 8 km from the post, have to walk 4 hours to reach the post.

These geographical and economic difficulties underline the benefits and relevance of decentralizing IPT, as well as the availability of ARC in these hard-to-reach areas.

In response to the difficulties inherent in this hostile environment, community health workers have tried to provide solutions to protect pregnant women and children under 5, considered the most vulnerable categories, by bringing medicines to their homes. In 2020, the Covid-19 pandemic accelerated this process of community empowerment. Indeed, the containment situation had prevented many interventions from continuing. Although providers were reluctant to allow non-professionals to deliver medicines to the home, they eventually agreed to it.

Against all expectations, the involvement of community health workers led to greater access to medicines. However, as we shall see below, there is still some reluctance on the part of some paramedics, who still centralize the distribution of SP for pregnant women, thereby limiting the scope of this intervention.

2. The experience, role and responsibility of suppliers

IPTc and ARC are not implemented in all health facilities. Rural health posts, which act as focal points for remote or hard-to-reach villages, are chosen by head nurses to implement these two strategies.

2.1. Nurse supervisors and midwives as stock managers

Caregivers take on the role of supervisor (nurses) and stock manager (midwives) of SP and ARC drugs in a context of increasing demand for care and diminishing material and logistical resources to meet the expectations of the healthcare system.

“We’re the ones who supervise the activities of these community liaison officers, because they enable us to achieve our objective in terms of indicators. Also, we’re the ones who point out the workers in the villages where we have problems with appointments, or with keeping SP appointments” (SSI, doctor, Kolda).

Nurses take advantage of periodic outings facilitated by vehicles from the central level (ministry, medical region) to visit rural clinics and community sites. Failing on-site supervision, the nurses summon the home care providers to the health post to ask about their work.

“I don’t go out for supervision anymore. I wait for the monthly coordination meetings at the health post to collect data on drug use, ... including the artesunate rectal capsule [...] I ask them if they’ve had to use the rectal capsule and then enter their respective answers in the register. [...] No, I don’t ask to see the rectal capsule boxes. I trust them completely! And I know they work hard” (SSI, nurse, Kolda).

In some cases, this “passive supervision” has an impact on the reporting of actual malaria cases, particularly at cross-border care sites.

In addition, midwives are responsible for managing the SP stock and distributing drugs to the home care providers. Despite the absence of partners, some midwives, convinced of the positive contribution of community activities, give community workers access to SP to avoid any discontinuity in IPTc.

2.2. CHWs distributing SP and home care providers administering ARC

Acting under the responsibility of nurses and midwives, community workers, in particular home care providers, community liaison officers and *Bàjjenu gox*, are responsible for distributing SP to pregnant women. Home care providers also administer ARC to children suffering from

severe malaria. They are responsible for carrying out these activities. Each week, they make three (3) visits to pregnant women in return for a monthly financial incentive of 12,500 FCFA.

However, this voluntary activity is heavily dependent on the existence of partners to finance awareness-raising activities, integrated home visits and counseling of pregnant women. Despite all these strategies, completion of the four doses of SP has met with mixed fortunes.

3. Healthcare workers' experiences of IPTc

According to healthcare workers, the introduction of IPTc has lightened their workload. According to midwives, delegating the distribution of SP to community health workers means they can avoid time-consuming advanced strategies, which in turn means they can concentrate on their many other consultations.

“I think community IPT is a good thing for those of us who live in remote villages, because most women don't keep appointments as they should. Often, they falsify the appointments and when we go to the villages, we administer the SP” (SSI, home care provider, Kédougou).

3.1. Favorable perceptions of IPTc

For healthcare professionals in favor of IPTc, the distribution of SP at home should help achieve a better malaria coverage rate among pregnant women. Following this logic, healthcare professionals in Kolda have made it their priority to improve all indicators relating to mother and child health.

“IPTc protects pregnant women until they give birth. It protects the woman and her child against malaria. Every woman it helps can spread the word. If women use it and see results, it shows that IPTc is very effective. Weedi guiss bokku ci” (SSI, home care provider, Kolda).

“We've seen a reduction in malaria, but also that people now know the importance of IPTc. I can say that IPTc has strengthened our ties because when you tell a person something that interests them, you gain their trust (...) If you advise a person to do something and then they do it and get results, then they'll be eternally grateful and will believe in you. And if they get sick with malaria again, they'll also come and talk to you about it, because you helped them prevent the disease before (...) IPTc has reduced the abortion rate, the malaria mortality rate and the costs” (SSI, home care provider, Kolda).

The results obtained are correlated with the implementation of IPTc. It appears to be an effective, practical strategy that women can test themselves and gauge its effectiveness in preventing malaria in pregnant women.

3.2. Unfavorable perceptions of IPTc

Some nurses and midwives feel that the level of maternal and child health indicators does not

live up to the expectations of health officials, due to IPTc. Some of them have stopped encouraging IPTc.

“We have temporarily stopped the distribution of SP to pregnant women by community workers because we have noticed that women no longer keep prenatal consultation appointments. And some even continue to give birth at home. But these appointments are more important than simply distributing SP, as they provide an opportunity to discuss the risks of a home birth, family planning and other important issues with the woman” (SSI, midwife, Kédougou).

Thus, the “positive” view of IPTc on pregnant women’s health is not unanimous. Others take a “negative” view, seeing IPTc as an obstacle to compliance with prenatal consultations. The rationale behind this “negative” view will be discussed in the next section.

4. Organizational factors contributing to incomplete uptake of the four doses of S

There are many reasons why women fail to take all four doses of SP. They relate both to the organization of implementation (supply, communication and involvement of CHWs) and to the availability of the necessary gynecological equipment and resources.

4.1. IPTc incompatible with prenatal consultations

Some midwives see themselves as the guarantors of prenatal consultations, which they consider the gold standard for good pregnancy monitoring. For some of them, IPTc is sometimes incompatible with prenatal consultations. This leads them to centralize SP.

“Yes, some women have come to complain that I no longer give tablets to pregnant women, but I’ve explained to them that it’s the midwife who’s away. She’s the one in charge of implementing IPTc. If she’s not there, we won’t have any medication to give to pregnant women. That’s why I don’t give these medicines to pregnant women anymore” (SSI, community liaison officer, Kédougou).

Yet this centralization can hamper the completion of SP doses. At one health post, the absence of the midwife for health reasons caused a temporary halt to community distribution of SP. Due to a lack of drugs, community workers went for six months without distributing SP to pregnant women. That shows the limits of centralization.

4.2. Unavailability of pregnancy diagnostic products

Rural maternity units do not always have the products needed to detect pregnancy early. For example, in two rural maternity units visited, neither had a pregnancy test. Workers (CHWs and matrons) rely on palpation and personal expertise to determine who is pregnant. This approach does not allow for reliable pregnancy detection results. As a result, pregnancies have

been diagnosed late, preventing effective SP coverage for some pregnant women (see Appendix 1).

4.3. Delayed supply of SP

The context of strikes and the withholding of data by caregivers is not without consequences for the completeness of SP uptake. At certain times of the year, there are occasional supply shortages due to a lack of convincing data on the actual SP needs of health posts.

Although temporary, these shortages sometimes cause pregnant women to delay taking their first dose of SP, thus delaying other doses.

4.4. Adverse communication with rights holders

Communication strategy in the event of a shortage of SP is a determining factor in the completeness of SP doses. For example, at one point, there was a shortage of SP in Médina Yoro Foula (MYF). This meant that not all pregnant women could receive the third and fourth doses of SP. Providers chose to distribute SP only to the category of women considered most vulnerable to malaria, notably those living with HIV. This positive discrimination was based on “adverse communication”, favoring HIV-positive pregnant women to the detriment of others. This later led to reluctance to take IPT3. For fear of knowing their serostatus, of being stigmatized or other reasons, some pregnant women agree to take the first and second doses, but find it difficult to take the third.

4.5. CHW motivation as a determining factor

The degree of motivation of CHWs also influences the success of IPTc. Given the trend toward professionalization, CHWs tend to prioritize interventions for which they receive subsidies over others for which they receive little or no remuneration. Malaria control strategies are interconnected. The coincidence of malaria control activities with the winter period remains an important consideration. During the winter period, mobilized community workers are obliged to leave their profitable agricultural activities for the IPTc, which does not bring in any financial resources. As breadwinners for their respective families, community workers are tempted to abandon their IPTc activities (e.g. in Ninéfecha) in favor of the SMC campaign, which gives access to daily allowances granted by the health authorities (NMCP or partners). *“It’s hard to follow a campaign where you have no income when there are others that at least let you put food on the table”* (Home care provider, Kédougou).

In other words, the motivation of those who work on a daily basis is also a determining factor in their retention and their commitment to routine activities.

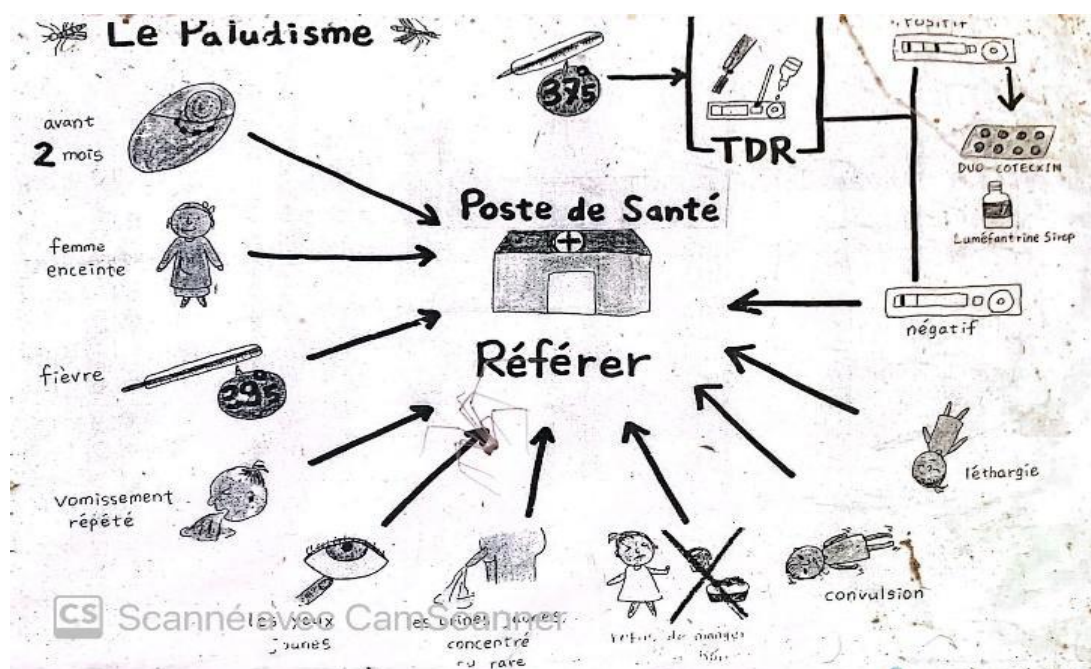
5. Caregivers’ experiences with the Artesunate Rectal Capsule (ARC)

ARC is presented as a medicine that enables referral of children with severe malaria under optimal conditions, in order to improve the child’s vital prognosis. The use of ARC is therefore justified in remote areas where geographical access to health facilities is difficult: villages that are isolated in winter, roads that are barely passable, absence of public transport, unavailability of motorcycles or, where applicable, lack of money to buy fuel... These are all difficulties that the inhabitants of the two districts surveyed – Médina Yoro Foula (MYF) and Kédougou – must contend with. Added to this is a national context in which 60% of the rural population live below the poverty line (ANSD, 2021). Having sufficient funds available to pay for patient referral remains out of reach for most households. During implementation, CHWs received a series of training sessions.

5.1. Training home care providers in the use of ARC

Home care providers and CHWs are responsible for administering the medicine in cases of severe malaria.

Photo 2: Roles and responsibilities of home care providers



Through training provided by the PECADOM+ program, they have benefited from capacity-building in the use of rectal capsules. In almost all the health facilities visited, ARC is still available in sufficient quantities (see Appendix 2). This is made possible by a directive from the National Malaria Control Program (NMCP) to make the medicine available in all remote areas where community workers have been trained to administer ARC. During the training, they were able to handle the medicine in capsule form, know when to administer it and the correct dosage according to well-defined criteria.

5.2. The use of ARC increases the vital prognosis for children

Rectal capsules offer several advantages. According to caregivers:

“It reduces mortality from severe malaria in children under five. Its usefulness lies in its ability to increase the child’s vital prognosis by stopping convulsions and lowering fever” (SSI, nurse, Kédougou).

In addition, given the low level of electrification, the possibility of keeping rectal capsules in the open air remains an aspect suited to these localities. However, despite all the training and information given on the use of ARC, its use is perceived as a factor in the failure of malaria prevention activities. In other words, the use of ARC is a sign that prevention has failed. Any talk of the importance of rectal capsules thus coexists alongside a perception of its use as synonymous with failure to implement the various prevention strategies (mosquito nets, SMC, etc.).

5.3. “The use of artesunate is a sign of poor performance!”

In the collective imagination of MYF healthcare workers, the use of artesunate rectal capsules for children under five years of age is a sign of poor performance in the preventive work carried out by community health workers. In a context where health facilities seek to achieve the goal of “zero cases of severe malaria”, this attitude constitutes a failure. Both community health workers and healthcare professionals were quick to express their relief when they were not using artesunate rectal capsules:

“Alhamdoulillah (Thank God) we haven’t reached this stage because we haven’t recorded any cases of severe malaria” (Focus group, CHW, Kolda).

“We haven’t used ARC, and we don’t want to, because we’re very focused on monitoring and treating cases of malaria. We diagnose and treat cases of malaria early. As a result, we don’t use artesunate because we don’t have any serious cases of malaria in the area” (Focus group, CHW, Kolda).

In this district, the use of ARC was soon associated with poor performance, justifying its use (cases of severe malaria) and counter-use (limited recourse to ARC) by healthcare providers, especially home care providers. Stakeholders’ accounts suggest that the use of rectal capsules is a default strategy, revealing a failure in the prevention chain.

5.4. Low frequency of use and forgetfulness of usage methods as a source of non-use

The low use of ARC means that this medicine is not very highly regarded in the anti-malarial arena.

“Since the implementation of malaria control strategies in KKT zones, there has been a reduction in severe malaria cases. We very rarely use rectal capsules. [...] Let’s say at the very most, we have two cases a year” (SSI, head nurse, Kédougou).

This low frequency of use creates memory bias regarding the correct method of using the ARC. This is the case in Tomboronkoto (Kédougou), where CHWs have difficulty introducing rectal capsules because they are no longer familiar with the exact procedure for the children's age groups.

“There are shortages of ACT and rectal capsules. Since we started training on them, we've never received the rectal capsules. When we place an order, they'll tell us there's a shortage of rectal capsules. I've never used them, or even held them in my hands, except during training between February and March. They say that the recto-caps are sold out, otherwise we would order them, but at the moment there's a shortage. It's disappointing. When you train someone on something, they should at least receive it once, but not in this case. I hear about it and I've been trained on how to use it, but that's it” (SSI, community worker, Kédougou).

In such a context, the benefits of the ARC are less obvious to the CHWs, at least for those who have not yet experienced it. The lack of understanding of ARC needs, even at central level, is no stranger to this. The context of withholding information with the strike under way at the time of the survey did not allow visibility of needs at the decentralized level.

5.5. Special use of ARC in cross-border areas

At cross-border health posts, its actual use is masked by a lack of monitoring tools and “passive supervision”. As a result, in cases of severe childhood malaria, some communities prefer to be referred to health facilities in countries bordering Senegal, which are deemed more accessible geographically and financially than those in Senegal. Understanding this rush, especially towards Gambia, some community health workers use the ARC and refer the patient without logging the case in the records of the health post they are attached to, for fear of seeing their commitment called into question by the head nurse of the post.

This frequent use of health facilities in Gambia is also linked to difficulties in assisting and accompanying the patient, as shown in the interview extract below:

“Here you are 15 km from Gambia and they have relatives in Gambia, so they tell you that going to Gambia is easier. They even have someone to help them. On the other hand, when we refer them to Kolda, they say they won't have any relatives” (SSI, senior midwife, Kolda).

6. Map of partners involved

The investment of partners is decisive for the adoption and implementation of community-based IPT. At times, partners support the Regional Health Departments (DRS) to continue community health activities. For example, the shortage of means of transport and the remoteness of localities led USAID's OWOD project and local firms (I-Cons) to provide the Kolda home care providers with a first batch of 54 bicycles to help them get around the villages, while ECOBANK and OWOD allocated sulfadoxine/pyrimethamine (SP) to the Regional Health Department as part of their corporate social responsibility. Other partners such as Child Fund, Amref, UNICEF and Enda-santé are also involved, financing awareness-raising activities on

community-based IPT. The table below lists all these partners.

Table 2: Mapping of partners involved in community-based health activities

Actors	IPTc	ARC	Roles & responsibilities	Source of financing
USAID OWOD	X		As part of their partnership with the medical region, the home care provider is supplied with SP drugs and bicycles for transport between sites	USAID
ECOBANK	X		Supply of SP as part of its corporate social responsibility (CSR) program	SARL
TACE ART TV	X		Promotion of malaria health interventions via digital platform & social media	LOCAL
Child Fund	X		Provision of bicycles for home care providers to travel between sites in their area of responsibility, and tablets to record and report data to the health post	USAID
AMREF			Midwives are provided with tablets to record pregnant women's appointment dates for SP administration	AFD
UNICEF	X		Financial support for malaria awareness campaigns	BM
ENDA-Santé	X		Organization & staging of sketches to convey malaria awareness messages	BM
AFRICARE	X		Setting up a women's group to support women in accessing health services	YAJENDE

Health authorities, partners and healthcare providers have successfully adopted community-based IPT. They direct their requests for support more towards IPTc than ARC, which seems to receive less attention from partners. Through partner-funded drug supplies and awareness-raising sessions, health authorities and healthcare providers have a good understanding of the benefits of community-based activities to combat malaria in mother and child.

Chapter II: Acceptability of IPTc and ARC populations

In this chapter, the acceptability of IPTc and ARC is examined through the prism of the economic, health and physical conditions of public demand for healthcare. Particular attention has been paid to each intervention – IPTc and ARC – in each region.

I. Acceptability of IPTc

Generally speaking, CHWs have been able to convince pregnant women of the benefits of taking SP during pregnancy. The benefits of SP are promoted through broad-spectrum communication, reaching all segments of the pregnant woman's family.

1. Broad-spectrum awareness

Awareness-raising concerns not only pregnant women, but also their husbands, who are called upon to understand the importance and effectiveness of taking SP during pregnancy. To convince husbands, the argument put forward by community workers is based on the benefits of community IPT. Indeed, SP is presented as a preventive medication that reduces the cost of care for pregnant women. The following story illustrates this acceptance, based on the experience of a family in a rural area:

“I once had an episode of malaria during my pregnancy. I was vomiting, cold, lethargic and aching all over. When I was taken to X hospital, the midwife told me I had malaria and gave me an infusion. [...] My husband took care of the payment. When I asked him how much he had paid, he was furious with me. Since then, he's been the one telling me to take SP” (Focus group, nursing mothers, housewife, Kédougou).

As far as the husband is concerned, his outgoings have increased because his wife did not take SP as instructed during pregnancy.

1.1. Appealing to the mother's sensibilities by explaining the consequences for the baby

The persuasion strategy can also be limited to pregnant women. In this case, the mother's well-being is discussed (no travel, better health), as is the baby's well-being. Pregnant women tell us about the reasons why they agree to take SP during pregnancy:

“It's true that malaria drugs are really worthwhile. If a pregnant woman doesn't take the medication she is given during pregnancy, her child will die of chronic malaria. It's a good idea to take the medication every month, because if the pregnant woman takes it, she won't get malaria and her child won't either. If she doesn't take the medicine, it can cause chronic malaria, and the child will die, and even the mother” (SSI, caregiver, Kolda).

The perceived effectiveness of IPT is a key determinant of the acceptability of this strategy.

1.2. Compromise between CHW and pregnant women on the timing of taking SP

Pregnant women with experience of the side effects of taking SP agree to take these drugs again, with the proviso that they change the time of day they take them. For example, they negotiate so that they can take SP in the evening. In their view, taking it in the morning on an empty stomach can cause dizziness, headaches and even vomiting. Some women arrange for the home care providers to come back in the evening after dinner to administer the SP.

“I never liked taking SP. The home care provider tended to show up very early in the morning to ‘demand’ that I take the tablets. So I refused, despite all the interventions, because I knew what was going to happen next. [...] I was going to get sick! Then she called me in to talk things over. I said I would have liked to take SP in the evening, after dinner, rather than in the morning before breakfast. So we came to an agreement” (nursing mother, Kolda).

With more attention paid to women’s expectations and needs, taking SP is easier for the vast majority of women during pregnancy. Despite this, pockets of resistance remain.

1.3. Women with unwanted pregnancies

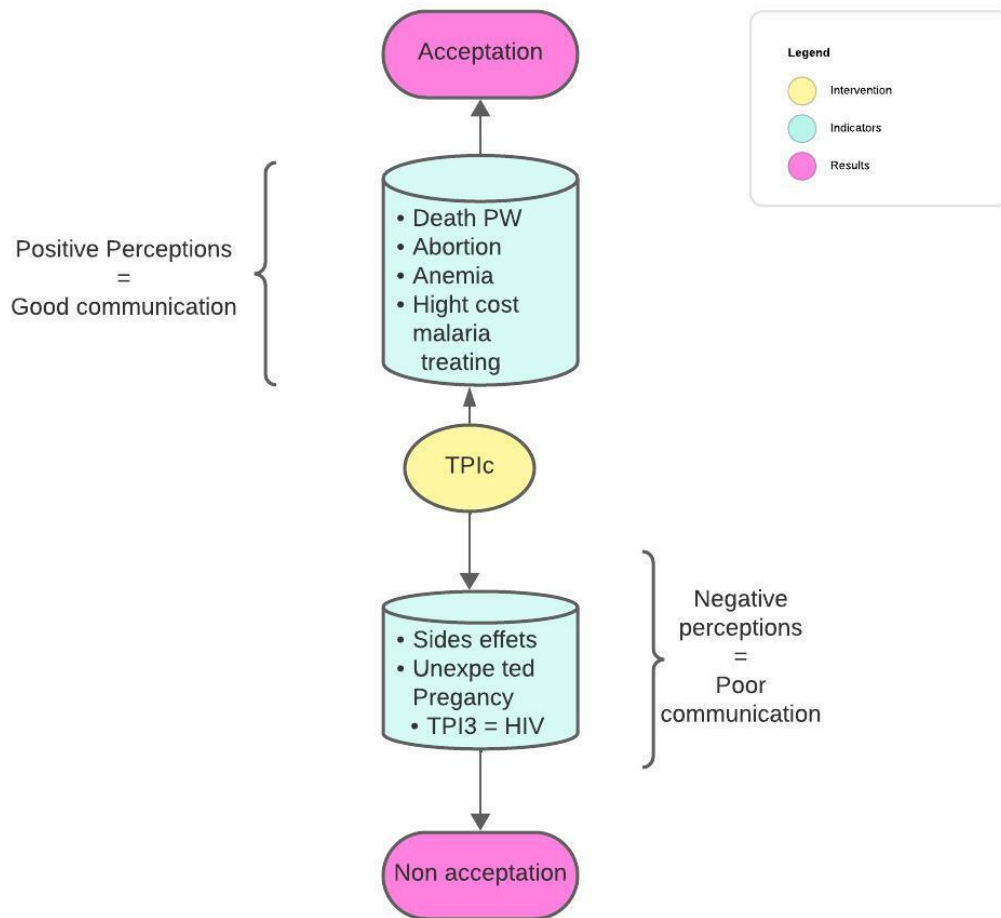
Pregnant women who refuse, mainly because of the side effects of SP taken on an empty stomach, cite their husband’s veto as a reason to avoid taking the other doses. Cases of reluctance are also noted among women with unwanted pregnancies. Women with unwanted pregnancies delay seeking care, and consequently miss their first prenatal consultation. Pregnancies outside marriage, closely spaced pregnancies and pregnancies at an advanced age generally put some women in an uncomfortable situation, leading them to hide their pregnancy for fear of the judgment of others and slander from neighbors and even family. Delay in revealing the pregnancy thus leads to incomplete prenatal consultations and, consequently, incomplete doses of SP.

1.4. Correlation between SP3 and HIV

As shown above, the lack of communication during episodes of SP shortages made some women reluctant to take doses of IPT3 and IPT4. To correct this correlation between IPT3 and HIV, community workers were mobilized to deliver the doses to the home of each pregnant woman and, at the same time, raise awareness of the importance of IPT3 and IPT4 for pregnant women.

The figure below summarizes the conditions that determine whether or not IPTc is acceptable. Good communication, focusing on the benefits of IPTc for both mother and child, makes it easier for women to accept the procedure. Conversely, poor communication about the side effects and types of beneficiaries are likely to make some women reluctant to use IPTc.

Figure 2: Acceptability and non-acceptability factors for IPTc



What about the use of ARC?

II. Acceptability of ARC

The caregivers interviewed had very little experience of using ARC to care for their children.

“It’s a piece of paper you give to the child. That’s all it is. If we’ve done something to him, we don’t know. They just tell us he’s got malaria and give us a piece of paper to go to hospital, but they don’t give him anything as far as I know” (Focus group, caregivers, farmer, Pulaar, Kédougou).

“If it’s simple malaria, we buy paracetamol and give him ACT free of charge, but if it’s so serious that he’s vomiting, we refer him to the health post” (Focus group, caregiver, farmer, Kédougou).

“We don’t really know if something is administered rectally. It’s just a piece of paper they give us” (Focus group, caregivers, shopkeeper, Pulaar, Kédougou).

1. Lack of awareness as a source of acceptance

Home care providers and nurses communicate laconically with parents about ARC, to avoid them being informed about the contribution of ARC and thus behaving in a negligent manner that is detrimental to their children:

“We don’t even want people to know about ARC. This could lead them to neglect other interventions such as SMC and sleeping under mosquito nets” (Focus group, home care provider, Kolda).

This lack of communication about ARC is a bottleneck that results in communities not knowing about the intervention and accepting it passively.

Sidebar 2 : Communication on the use of ARC – a reason for its failure?

The Médina Yoro Foulah health district has achieved remarkable results in malaria prevention, earning it first place at national level. Health interventions based on a typically community-based approach in this district have led to an increasing reduction in the incidence and mortality, or even the non-existence, of severe malaria in the most vulnerable categories (children under 5 and pregnant women). As a result, the use of the artesunate rectal capsule, which is supposed to be administered for the referral of cases of severe malaria in children under 5, is perceived as a “cause of failure” by healthcare providers and community health workers. In other words, in a context where health facilities are working towards the goal of “zero cases of severe malaria”, the use of ARC reflects the under-performance of preventive activities carried out by community health workers, under the umbrella of care providers. The following comments by a nurse are revealing: “I often tell my community health workers that the more cases of malaria we have detected, the harder we have worked, because whenever there are cases of malaria that leave an area where there is a home care provider and end up here, I call the community health workers and tell them that they must detect all these cases early, before they get here”.

2. Passive acceptance by mothers

Mothers and carers of children suffering from severe malaria are often unaware of the method used to treat the child. As one nurse put it:

“It (the rectal capsule) is very effective, because when you administer it to the child, over time, you see that it has an effect. But when you have to refer a serious case because he needs further tests, you can’t keep him. But when it is easy to administer it rectally, you can see that things start to improve. Because when the child starts having seizures or becomes delirious, we know we can’t keep him any longer, so we prepare our rectal capsules, administer them rectally and call the ambulance. Then we notify the parents that the child can no longer be kept here.” (SSI, nurse, Kolda)

This passive acceptance is the consequence of a lack of communication from healthcare providers about the medical procedure performed on the child. These deliberate omissions contribute to the lack of knowledge among parents and carers about the availability of ARC as a method of emergency malaria treatment for children. People’s lack of awareness of ARC

seems to be a deliberately orchestrated strategy to demonstrate the success of their community actions. However, although the public accepts the administration of artesunate to children suffering from severe malaria, the conditions for referral do not always follow the formal procedure of the Senegalese healthcare system: this is the case for referrals to cross-border health facilities.

3. Request for referral in Gambia versus the high cost of referral in Senegal

Referral conditions are chaotic, to say the least, in the villages we visited. Roads are rare. When they do exist, they are often made of laterite and are almost impassable. Very few health posts have ambulances. Three-wheeled vehicles, motorcycles and carts are still the main forms of transport for people:

Photo 3: Three-wheeled motorcycles used for patient referral



To reduce the cost of referrals, people are turning to parallel healthcare channels.

The average price of a referral is 7,700 FCFA, broken down as follows:

- 5000 FCFA for fuel;
- 300 FCFA for the consultation ticket;
- 2,400 FCFA for the prescription.

This amount is very high for most of the patients who come to the health posts in these rural areas, whose main occupation is farming.

“We live in a locality bordering Gambia. Before a health post was set up there, several cases of malaria were recorded, resulting in death. In the event of referral, we prefer Gambian health

facilities to Médina Yoro Foula or Kolda. [...] This choice is based on the socio- cultural proximity with the local inhabitants, the low cost of hospitalization and the hospitality of Gambian healthcare professionals, who put the person before money [...]. Yes, it's easy: once at the border, we present Gambian identity cards borrowed from close relatives. Some of us even have dual nationality” (Focus group, decision-making fathers, farmer, Médina Passy, Kolda).

4. Community solidarity for referrals

To facilitate access to healthcare for deprived families in the interior of Senegal, mutual aid mechanisms have been set up. For example, municipal councilors cover the costs for poverty-stricken families through the health post's Health Development Committee (CDS).

“Often when we do referrals, the parents tell us that they have no money. There are many welfare cases here and we can cover them all. Afterwards, they can go to see members of their family. If they have goats, sheep or cows, they can offer them as collateral so that we can lend them the money, or even sell a goat. There are also solidarity funds in the villages, which run on contributions from the local inhabitants. You can borrow money from the fund, and pay it back later when the child has recovered” (SSI, local leader, Kédougou).

Alternatively, borrowing money and/or a motorcycle to transport a patient are also popular solidarity practices.

5. The illusion of a cure: challenges after administrating ARC to a child

One of the major challenges of continuity of care lies in covering the distance between the village and the health post/center. This explains the pragmatic choice made by those accompanying patients to turn to health facilities in neighboring countries, or to make do with ARC as a treatment.

In this respect, the illusion of a cure is a real obstacle to seeking treatment. Administration of rectal capsules to children with severe malaria reduces the symptoms of the disease. This reduction in symptoms gives the impression of a cure for malaria.

“The rectal capsule is a pre-transfer treatment, not a complete treatment. It is often used in the treatment of severe cases of malaria, especially in children, and is very effective in this type of case; even if the child is having convulsions, with a dose of the rectal capsule, the child becomes stable after 15 to 20 minutes. However, the child still has to be monitored; the person accompanying the patient will tend to believe that the child is cured, but this is not the case” (SSI, home care provider, Kolda).

Caught between a rock and a hard place when it comes to the disease and referral fees, some parents opt for inaction and reluctantly decide to ignore the home care provider's instructions to take the child to the nearest health post.

On the strength of these experiences with the implementation of IPTc and the use of ARC, healthcare providers have put in place corrective measures with the support of partners in a bid to expand the reach of these two interventions.

III. Initiatives to improve IPTc and ARC indicators

With the support of partners, healthcare professionals have launched initiatives to consolidate IPTc and the use of ARC to improve maternal and child health in their areas of responsibility. These initiatives are sometimes regional, sometimes local, but always aimed at improving access to care for mother and child.

1. Contracting with community health workers

In Kédougou, to bridge the gap between the withdrawal of the Project-Neema partner (USAID) and the installation of the new Project-OWOD partner (USAID), health workers used other malaria interventions to convey information about IPTc. This “integrated strategy” involves using the platform provided by the SMC campaign to convey IPTc-related awareness-raising messages to women. By emphasizing voluntary commitment and giving back to the community, health workers succeed in making IPTc sustainable, despite the absence of a budget to motivate the CHWs. Through discussions, some midwives and head nurses try to galvanize the CHWs: “They’re your women, you’ve got to help them!”. This is how one midwife, whose unusual approach is based on close contact with community health workers, motivates and urges them to commit to the long-term future of the IPTc.

Sidebar 3: Biography of a community midwife

The midwife is 30 years old. After graduating as a state midwife, she joined the Tomboronkoto health post as a trainee and assistant to the head midwife. In 2016, she was a member of the Caritas project for three years, working to raise awareness among the local population. As part of this project, she had to visit villages from Monday to Thursday to vaccinate children. On her days off (Fridays, Saturdays and Sundays), she used her free time to volunteer in other maternity units in the district, supporting the midwives to keep her hand in. After gaining enough experience, she decided to stop her internship in 2018. The head nurse offered her the position of registered midwife to replace her former manager. Inspired by her experience in the community, she became concerned about the financial and geographical difficulties that people faced. She took the initiative of distributing SP at community level without notifying her Primary Health Care (PHC) supervisor. Amazed by her performance, the PHC supervisor asked her about her strategy at a coordination meeting: “We were asked for 83% and I had achieved 85% IPT3, then the PHC Supervisor told me that of all the service delivery points in the district, you were the only one to achieve this percentage. I told him I’m doing something you didn’t tell me to do, but I’m doing it anyway. He asked me what it was. I told him: I give a stock of SP to the Bâjjenu gox or to the care assistant to administer to pregnant women at home! That’s how they realized that by empowering community workers in a specific area (geography, gold mining activities, complex cultures, etc.), we could succeed in improving the uptake rate among pregnant women”. In this way, she has developed a certain familiarity with community workers, which is the basis for the continuity of IPTc, even in the absence of partners. By giving a pep talk (“these are your women, you’ve got to help them”) and emphasizing the value of CHWs in the villages, whom she defines as “the local doctors”, she encourages the community workers to continue their activities to save their people. This community

approach, coupled with the familiarity developed with community workers, is an important aspect in the success of IPTc, despite the difficulties and lack of financial support for CHWs.

Unlike in Kédougou, in Kolda the diversification of funding sources for community health activities has made it possible to avoid any discontinuity in IPTc implementation. ChildFund, Amref and OWOD are all involved in maternal and neonatal health, making available a package of integrated services combining prenatal consultations, FP and SP for pregnant women.

“At each post, there are workers who have organized themselves into CBOs. And these CBOs have contracts with NGOs. They provide a package of activities that we plan at district level, together with the chief medical officer during coordination meetings, who convenes the community workers to explain the package of services given to them, and signs the contract with the various partners. [...] The packages cover malaria and malaria prevention. So we give them the activities they’re going to carry out in the field.” (SSI, doctor, Kolda).

Various community solidarity bodies are working to combat malaria.

2. Care groups and Monitoring and Alert Committees in mother and child healthcare

The care group in Dimboly is a women’s group that supports women in keeping medical appointments. It has existed since 2015, thanks to the financial and technical support of Africare and Yajende, especially in the village of Kaffori, for which the Dimboly health post acts as a focal point. Through this group, women in precarious situations receive loans for IPT or prenatal consultations at a health post during pregnancy. The women contribute 100 francs per week to the group. This weekly contribution enables women to borrow up to 10,000 FCFA to cover referral costs.

In Diamanouta, members of the Monitoring and Alert Committee (CVAC) help workers conduct an early census of pregnant women and play a mediating role between the community liaison officers and women of reproductive age (WRA). The mothers-in-law, who sit on the Monitoring and Alert Committees, are involved in monitoring and raising awareness among their daughters-in-law during pregnancy. They accompany them to every appointment and make sure they take their medication

3. What can we learn from these two interventions?

IPTc and ARC have a real positive impact both in improving mother and child health coverage and in emphasizing the value of CHWs. Whenever partners are willing to finance activities and CHWs are empowered and motivated, health indicators improve. As a result, anchoring CHWs in the healthcare system can only be beneficial. With the necessary support, they can prevent many avoidable illnesses.

In Kolda, several cases of severe malaria among the population were recorded in 2014. To overcome this scourge, additional community strategies have been adopted in the region, following many other interventions, including indoor residual spraying (IRS), SMC and distribution of LLINs. Community-based Intermittent Preventive Treatment (IPTc) and the

provision of Artesunate Rectal Capsules (ARC) to treatment sites (361 throughout the region) managed by home care providers have facilitated early detection, leading to an increase in morbidity but a drastic reduction in mortality (source: Kolda Regional Health Department). Despite the reluctance of providers to decentralize SP at the community level, the approach of community health workers has paid off.

Their voluntary commitment is a key factor in the success of community interventions. To encourage their involvement, home care providers have been provided with bicycles by OWOD (USAID) and I-Cons (a road construction company) to help them get around the villages.

In Kédougou, community involvement is central to the continuity of IPTc. Examples of dedicated midwives demonstrate the importance of the community fabric in ensuring the continuity of IPTc, despite the absence of a financial partner. This community dynamism means valuing the activities of community workers in the villages and communicating with them. Some midwives, showing leadership, advise community workers to help their people, given that they are from the village. This encouragement to serve their community is what saves some interventions that are short on resources. By wanting to serve their village and protect women, initiatives such as IPTc are sustainable even in the absence of funding.

Therefore, the legitimacy of certain actors is the only driving force behind the continuity of interventions carried out by community workers accustomed to operating with no form of motivation other than their commitment, and which require daily travel and sacrifices. As a result, they have a significant loss of income, as they cannot cultivate their fields like all the other members of their communities, nor visit gold mining sites in areas where most community workers end up yielding to this temptation.

Chapter III: The role of digital health in protecting the mother and child from malaria

Generally speaking, digital health, also known as e-health, has become a central issue in strategies to improve access to healthcare, particularly in remote and isolated areas. Senegal is aligning itself with this approach by setting up the DHIS2 system. It enables healthcare professionals to report information to help them make decisions aimed at improving patients' vital prognosis. This makes remote monitoring possible, as well as diligent referral to healthcare establishments with higher technical platforms. In this chapter, we examine the role of digital health in protecting the mother and child from malaria. We will highlight the obstacles to this approach, showing the alternatives developed on the ground.

I. E-health in practice

E-health is a revolutionary means of overcoming some of the difficulties associated with geographical isolation. Its effectiveness not only enables better remote monitoring of health activities carried out at peripheral level, including community sites, but also saves on fuel costs generated during supervision. It has to be said, however, that this alternative is far from reaching its full potential, given the structural deficit in electrification and network coverage.

In addition to geographical isolation, digital isolation also obstructs the transmission of health data. Indeed, in most of the localities surrounding Médina Yoro Foulah, the Internet connection remains unstable. This leads to problems with data transmission in the DHIS2. At some health posts, healthcare providers are obliged to travel more than 2 kilometers to find a network, or to take photos, which they send to the regional health department, which then uploads them to the DHIS2.

Health workers in the Kédougou district face similar difficulties. Located just 20 kilometers from the town center, the Dimboly health post has problems accessing electricity. In Ninéfécha, solar panels are used to supply the health facility with electricity:

Photo 4: Solar panel used as a source of electricity



Despite these efforts, data upload to the DHIS2 online server remains impossible. Online reporting requires not only a stable electricity supply, but also network stability. However, the connection is so unstable that simple analog phones work better than smartphones.

II. More digital isolation in Kédougou than in Kolda

Digital data reporting systems help to overcome the geographical and financial barriers. However, the geographical isolation of localities means that electrification is poor and the network unstable. In villages such as Ninéfécha, Dimboly and Tomboronkoto, energy is mainly supplied by solar panels. However, these solar panels do not guarantee permanent availability of electricity. The resulting low level of electrification, combined with the instability of the telephone network, means that community workers are unable to report data properly. In such cases, community workers resort to other operators as a means of communicating with healthcare providers. Taking these various structural factors into account would enable us to reflect on the adaptability of these tools in these isolated areas.

III. Initiatives in progress

Yet, despite this context of digital restriction, CHWs in the two regions we visited rival each other when it comes to finding ingenious ways of sending information on their health-related activities to their superiors. For example, they use digital communication platforms such as WhatsApp to send photos of IPTc forms. Through this channel, they exchange information about their health-related activities in general. Topics relating to community-based IPT are also discussed, such as how to harmonize work at different sites, and what to do in the event of a refusal to administer SP.

Given the instability of some operators' phone networks, they are forced to use alternatives that enable more fluid communication about referral cases with other healthcare providers. Others simply send text messages, regarded as a faster and more efficient way of sharing patient information.

“We can use Kolda as an example, where the network isn't accessible everywhere. I know that with WhatsApp people manage to exchange data, but the Ministry has DHIS2. Sometimes you're somewhere where you can't connect to DHIS2. So what do they do? They go somewhere else to take photos of their data and they'll send me the data on WhatsApp and I'll enter it for them on DHIS” (SSI, planner, Kolda).

In Kolda more specifically, the locals set up a platform called “Tace Art TV” in 2019. It is active in promoting local health activities. A program called “*Vendredi santé*” talks about the lack of health information, improving attendance at health facilities, the problem of respondents in the healthcare system, FP and cervical cancer. The program also looks at how pregnant women take SP. *Tace Art TV* collaborates with community workers (*Bàjjenu gox* and community liaison officers) who submit topics for discussion. Programs are produced in two languages: Pulaar and Wolof, with televised interviews and live on-air access for questions.

As part of the “*Thiélal Mbandou*” (health and well-being) project for mothers and children, the NGO Amref has set up an app to better monitor and evaluate healthcare for these two target categories. The project was financed by the AFD (Agence Française du Développement) and the government of Madrid, with the aim of reducing maternal, neonatal and infant mortality in the three districts of the Kolda region (Kolda, Vélingara and Médina Yéro Foulah). In this context, an app was developed to facilitate coordination and fieldwork between community workers and healthcare providers. To that end, community workers and healthcare providers benefited from capacity-building and training in the use of the TL platform (“*Thiélal Mbandou*”, which means “health” in the Peul language) to ensure its proper implementation.

Healthcare providers were given a tablet and community workers a smartphone. The community workers were each required to make home visits in their area of responsibility to identify pregnant women, log them in their phones, and send everything to the healthcare provider responsible for that area. The women were then referred to the healthcare provider, which in turn had to register them in the tablet after a complete check-up, administer their first dose of SP and enter the date of their next dose of SP, with comments for the community worker who was to administer the next dose of SP. The tablet was configured in such a way that 72 hours from the date of the SP dose, a message was sent to the community worker's smartphone with the healthcare provider's comments as to whether it was the second dose or the third dose, or whether the woman had an appointment with the healthcare provider on any given date for her prenatal consultation. After receiving the message, the community worker administered the SP on time and passed on any message. However, the project ended in March 2023 and the tools (tablets and phones) either no longer work or are broken

Table 3: Factors hindering the effective implementation of digital health

FINAL REPORT ON COMMUNITY-BASED INTERMITTENT PREVENTIVE TREATMENT AND USE OF ARTESUNATE RECTAL CAPSULES

<i>Situation</i>	<i>Consequences for e-health</i>
Electricity	<ul style="list-style-type: none"> ● Low electrification ● Use of solar panels
Network	<ul style="list-style-type: none"> ● Network instability ● Network search (Free Mobile) ● Poor connection
Digital equipment	<ul style="list-style-type: none"> ● Unavailability of smartphones for community workers ● Lack of budget for communication ● Unavailability of digital tools for data reporting
Training	<ul style="list-style-type: none"> ● Lack of knowledge of digital data reporting tools ● Lack of e-health training ● Lack of education of community workers in the use of digital technology

Despite these structural constraints, CHWs are showing great resilience in carrying out their work, as has been the case in previous campaigns.

Sidebar 4: The history of malaria control through the lens of CHWs

In Senegal, the fight against malaria is inextricably linked to the commitment of community health workers. They are involved in every intervention. From IRS service providers to digital data reporters for digital health, LLIN distributors and drug administrators for SMC, IPTc and ARC, they have become the key players in the implementation of interventions. However, it is important to overcome two pitfalls in order to strengthen the content of their contribution to the healthcare system. Firstly, the delegation of tasks relating to medical procedures such as the administration of SP at home and the use of the ARC must not be used as barometers to assess their performance. This allows unethical practices vis-à-vis the public. Nor should the trust placed in them overshadow the strict supervision of their actions. Ongoing refresher training will ensure that we make the most of these “open-air” workers. Secondly, the widespread use of financial incentives could also consolidate their role. Their salaried status would enable paramedics, in direct contact with them, to reprimand them, particularly when they prioritize interventions not according to their clinical importance, but according to their financial contribution.

Chapter IV: Analytical synthesis of (SWOT) and (RCA)

Chapter 4 focuses on identifying the bottlenecks intrinsic to the implementation of IPTc and ARC, as well as the operational actions required to achieve the primary objective of 80% malaria coverage and the elimination of severe malaria in mother and child. A table of strengths, weaknesses, opportunities and threats (SWOT) will be used to analyze the first two themes (IPTc and ARC), while e-health will be the subject of an analysis of the root causes and conditions for its implementation to reinforce IPTc and the use of ARC.

I. Community-based Intermittent Preventive Treatment (IPTc)

Analysis of empirical data from the two regions surveyed highlights elements of IPTc that can be classified as strengths, weaknesses, opportunities and threats (SWOT). The table below provides a synoptic view of the situation in Kolda.

Table 4: SWOT analysis of IPTc in Kolda

Strengths	Weaknesses
<ul style="list-style-type: none"> - Training of community workers - Refresher training for home care providers - Availability of funds to motivate community workers (1500 F per home visit for each pregnant woman). - Donations of bicycles for home care providers - Commitment of workers - Increase in the number of sites: 361 PECADOM sites - Reduction in travel by pregnant women - Reduced costs for women and families - Campaign supervision (head nurse or district management team) - Facilitation of community workers for case follow-up - Availability of community workers to refer pregnant women at the first sign of pregnancy - Use of digital media (WhatsApp groups) to relay instructions and the schedule of IPTc activities, in order to facilitate work - Awareness-raising at mosques, where all fathers convey messages to the women at home 	<ul style="list-style-type: none"> - Shortage of SP at some posts
Opportunities	Threats
<ul style="list-style-type: none"> - Dynamic networks of community workers - Members of Monitoring and Alert Committees to monitor pregnant women with unwanted pregnancies (outside marriage, women of advanced age) - Distance between homes and health facilities - Expensive means of transport, such as “Jakarta motorcycles” (5000 F minimum to get around) 	<ul style="list-style-type: none"> - Strike by service providers (withholding of data) makes it difficult to monitor IPTc activities - Unstable telephone network limits the reporting of information - Head nurses who believe that fewer prenatal consultation appointments are kept as a result of IPTc

FINAL REPORT ON COMMUNITY-BASED INTERMITTENT PREVENTIVE TREATMENT AND USE OF ARTESUNATE RECTAL CAPSULES

<ul style="list-style-type: none"> - Isolated areas: difficult to access, impassable roads, no public transport - Refusal of pregnant women to take SP in the absence of their husbands 	
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Most of the elements regarded as strengths involve the community health workers. These include training, financial incentives, monitoring pregnant women at home and raising awareness of the importance of SP during pregnancy. The weaknesses are organizational. Stock-outs and the unavailability of tablets are the responsibility of the health authorities and healthcare workers (especially RH coordinators and midwives) respectively. There are numerous opportunities here, which need to be exploited to consolidate the already promising results achieved in this region. Particular attention should be paid to the organization and dynamism of networks of community workers, to ensure better implementation of IPTc. To achieve this, it will be necessary to provide better care for women who are victims of unwanted pregnancies, but also to succeed in putting in place strategies to strengthen access to SP and prenatal consultations without this being contradictory or conflicting.

In Kédougou, the situation is much the same, with a few differences.

Table 5: SWOT analysis of IPTc in Kédougou

Strengths	Weaknesses
<ul style="list-style-type: none"> - Reduction of geographical and economic barriers (bringing care closer to communities) - Reduced travel costs to collect SP from the health post - Increased IPT3 coverage since IPT decentralization from 45% to 60% 	<ul style="list-style-type: none"> - Temporary shortage of SP at health posts - Gap between projects: the transition between the two projects (USAID NEMA OWOD) disrupted the implementation of IPTc - Lack of motivation of community workers at some posts - Non-compliance with motivation commitments - Local authorities not involved in disseminating IPTC activities
Opportunities	Threats
<ul style="list-style-type: none"> - Provision of bicycles to motivate community workers - Contracting under way with community workers in November - Plan to contract community radio stations to provide information on malaria 	<ul style="list-style-type: none"> - Withholding information: lack of comprehensive IPTc data - Human resources difficulties: for the implementation of IPTc, CHWs are faced with insufficient human resources (Tomboronkoto) - Recommendation for 8 prenatal consultations has halted IPTc in Dimboly

Strengths include the reduction of geographical and financial barriers that limited access to care for many women, especially those living in remote areas. The impact of IPTc is also perceptible in the evolution of the coverage rate, which has risen from 45% to 60% in ten years. Weaknesses have also been noted, especially in terms of partnership (NGOs and administrative authorities) and the mechanisms for financially motivating those involved in implementation. The effectiveness of the contracting planned should help to overcome these weaknesses. In any case, particular attention needs to be paid to recruiting community workers (the “jura”, i.e. CHWs who abandon their work to go in search of gold), in order to reinforce communication on the complementary nature of mother and child health programs focusing on the mother/child pair.

In short, both regions face almost the same challenges with regard to IPTc stock-outs and the reporting of collected information. These situations are still linked to the withholding of information because of the strike and the transition linked to the end of the Neema project and the gradual start-up of OWOD. Clearly, however, IPTc works better in Kolda than in Kédougou, for the reasons listed above.

What about the use of ARC?

II. Artesunate rectal capsule (ARC)

The same analytical framework is used to account for the use of ARC in Kolda.

Table 6: SWOT analysis of ARC use in Kolda

Strengths	Weaknesses
<ul style="list-style-type: none"> - Training of community workers - Increase in the number of sites: 361 PECADOM sites - Facilitation of case follow-up by community workers - Effectiveness of rectal capsules 	<ul style="list-style-type: none"> - Out-of-date ARC at some posts versus sufficient quantities at others - Communication on rectal capsules - Low usage - Poor reporting - Passive supervision
Opportunities	Threats
<ul style="list-style-type: none"> - Managers of unselected facilities would like to have the rectal capsules available - Dynamic network of community workers - Referral to in neighboring countries - Isolated areas: difficult to access, impassable roads, no public transport 	<ul style="list-style-type: none"> - Expensive means of transport such as “Jakarta motorcycles” (5000 F minimum to get around) - Strike by service providers (withholding of data) makes it difficult to monitor ARC activities

The training of CHWs through annual refresher courses, the increase in the number of PECADOM+ sites and the effectiveness of rectal capsules (which can be stored in the open air, reduce fever, increase the waiting time for referral and vital prognosis) make it easy to monitor cases of children suffering from severe malaria. On the other hand, poor communication, leading people to believe that “the use of rectal capsules is a sign of poor performance”, is a huge constraint on the use of rectal capsules, as are shortcomings in reporting on the use of this product by the home care providers. However, some managers of non-eligible facilities still wish to benefit from this intervention. The possibility of referring patients to countries bordering Senegal also saves children’s lives. However, public transport to other areas would go a long way towards improving conditions of access to care.

In Kédougou, the use of ARC seems more of a problem than a solution.

Table 7: SWOT analysis of ARC use in Kédougou

Strengths	Weaknesses
<ul style="list-style-type: none"> - Training workers through the PECADOM+ program - Effectiveness of rectal capsules 	<ul style="list-style-type: none"> - Expiry of rectal capsules due to non-use (SMC) - Transfer logistics not covered for referrals (payment of 5000 Fr + 2400 FCFA for prescription + 300 FCFA for

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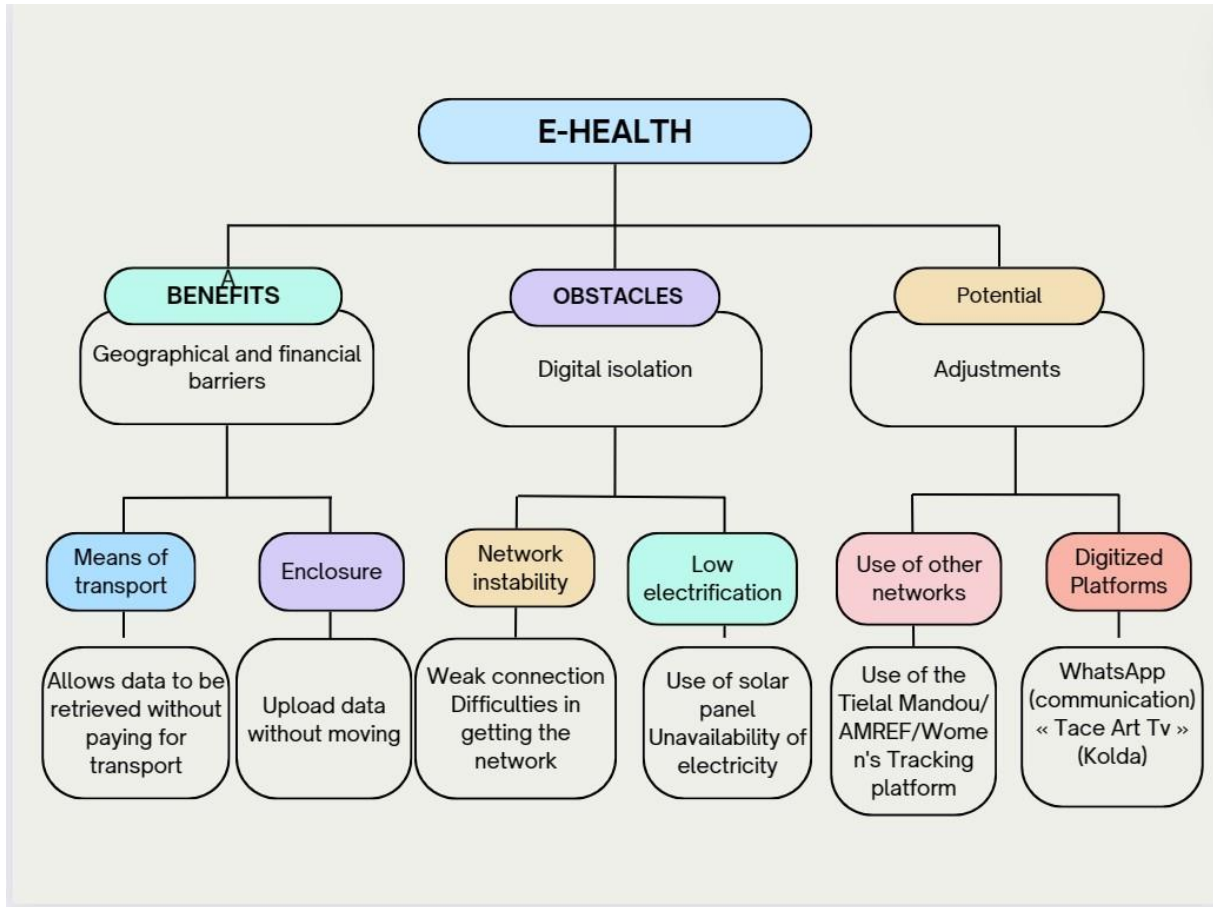
	<ul style="list-style-type: none"> - ticket) - Unavailability of Dimboly ambulance(three-wheeled motorcycle) - Lack of awareness-raising at community level (rectal capsules)
Opportunities	Threats
<ul style="list-style-type: none"> - Community involvement, making it possible to integrate awareness-raising into the SMC campaign - Existence of a care group: a women’s group that provides loans for referral costs 	<ul style="list-style-type: none"> - Lack of partners to provide rectal capsules and support related activities - Expensive transport for parents to ensure referral - Providers withhold information - Difficulties encountered by community workers in using rectal capsules due to inadequate training of home care providers and CHWs

The same success factors apply as in Kolda, except that no additional PECADOM+ sites have been set up in Kédougou, mainly due to the scarcity of community workers, but also the absence of funding partners. There are very few awareness-raising activities on rectal capsules, and adequate means of transport are rare. When they do exist, their cost is out of reach for mostly farming families whose income depends on the sale of harvest produce. However, there is hope in the form of “care groups”, which offer the possibility of loans in case of immediate need. It should also be noted that there are no partners supporting ARC activities in this region.

III. E~health

Digital tools are effective channels for data reporting that overcome geographical and financial barriers. But their use in Kolda and Kédougou remains limited, as can be seen in the figure opposite.

Figure 3: Analysis of the benefits and obstacles of e-health



In Kolda, the use of “Tace Art TV” (Kolda) helps to promote local healthcare activities. Financial support from Amref has also enabled the creation of a TL platform (“Thiélal Mbandou”) to evaluate mother and child healthcare. Unlike in Kolda, the CHWs in Kédougou do not use any digital platform to report or monitor patient care. Nevertheless, digital communication platforms (WhatsApp) are used by CHWs to send photos of IPTc forms. The lack of financial partners, poor electrification, network instability and the low economic level of CHWs hamper the adaptability of e-health in these digitally isolated areas.

Conclusion

The study revealed a number of lessons about how IPTc works. Geographical features, economic levels and structural difficulties all limit women's access to centralized IPT. The decentralization of IPT to the community level is therefore a response to the difficulties faced by pregnant women.

However, the functionality of this intervention is affected by major constraints, i.e. organizational, structural and financial factors. Community workers are frustrated by a strategy that mobilizes them on a daily basis, even though the expected benefits are not always apparent. It is only in areas where the workers are inherently committed that the strategy works. Moreover, the perceived competition between IPTc and prenatal consultations remains a threat that needs to be addressed.

Similarly, the illusion of eternal volunteerism on the part of CHWs and similar staff needs to be dispelled. CHWs, especially in certain areas, have a considerable loss of earnings, and the community solidarity that was supposed to facilitate their commitment to healthcare in their communities is not forthcoming. The sustainability of volunteering is therefore under serious threat, and with it the initiatives based on this approach.

Financial support is needed to encourage community workers to carry out awareness-raising activities and provide their own transport. Stock-outs of SP at health posts complicate the work of community workers and result in missed appointments for women.

As for rectal capsules, we are witnessing communication effects that have undermined the validity of the intervention. The negative perception of the use of rectal capsules has ultimately undermined the credibility of these medicines, which are perceived as proof of the failure of the worker dispensing them to prevent malaria. As a result, messages need to be better defined. Similarly, the tendency of some parents to make do with rectal capsules and ultimately not to take their children to referral facilities, even if this is for financial reasons, should also prompt health managers and decision-makers to put in place support strategies: delaying payments, providing support in the event of severe malaria, etc.

As for e-health, it remains in its infancy. Inadequate electrification and network instability in some isolated areas hamper the appropriate transmission of data by community health workers, despite the relevance of this practice in these isolated areas and during periods of restricted travel, such as those experienced during the Covid-19 pandemic.

Recommendations

At the end of this study, several recommendations were formulated for the different levels:

1 — At institutional level, an appropriate institutional framework is essential for efficient malaria control.

In Senegal, an institutional framework gives greater responsibility to health workers operating at peripheral level in the fight against malaria. Workers are aware of the importance and necessity of IPTc and ARC in the fight against malaria, given the geographical and economic configuration of localities. On the other hand, not all districts have the same assets to fight malaria. Not all interventions receive the same attention from health authorities and healthcare providers, and this is reflected in the low level of involvement of partners in the extension and sustainability of ARC.

Recommendations 1:

At national level:

- Prevent periods of uncertainty between the withdrawal of one funding partner and the installation of another;
- Increase levels of engagement with ARC, a strategy that appears to be poorly monitored and promoted.

2 — At organizational level, the incomplete number of prenatal consultations (and therefore SP) stems from shortcomings linked to healthcare organizations:

- There are **many** shortcomings in the system: availability of products, high-quality human resources, necessary equipment. An example is the shortage of pregnancy tests in a rural maternity unit, which could jeopardize the achievement of all MNCH coverage targets: prenatal consultations, IPT, etc. In addition, malaria control strategies require better training for CHWs working in rural maternity units, accompanied by motivation (logistical, financial, etc.) to enable these community workers to better meet the growing expectations of the healthcare system;
- Digital data reporting systems help to overcome geographical and financial barriers. However, isolated areas, poor electrification and the instability of the Internet – where it exists – are obstacles to these digital strategies. Taking these various structural factors into account would enable us to reflect on the adaptability of these tools in these isolated areas.

Recommendations 2:

- Improve the SP supply circuit by avoiding breaks in the supply chain. This also means combating information withholding strikes, which weaken the system and undermine its ability to anticipate and make evidence-based decisions;
- Review communication around ARC to make it more positive, and consider it at its true value in cases of severe malaria referral;
- Better train rural maternity health workers in early pregnancy detection;
- Make pregnancy tests available to rural maternity units;
- Facilitate exchanges of Amref's digital experience in Kolda on monitoring pregnant women in favor of ARC.

3 — At the community level, communicating is good, but listening to patients' needs is even better!

- The study shows that strategies specifically targeting vulnerable groups (women with unwanted pregnancies) ensure that the individual and collective needs expressed by women are adequately and efficiently addressed. This way of accommodating women's expectations and negotiating care seems more in line with social reality. It also leads to better results;
- In Senegal, the fight against malaria is inextricably linked to the commitment of community health workers. They work in the front office in the implementation of all community interventions. From IRS service providers to digital data reporters for digital health, through to LLIN distributors and drug administrators for SMC, IPTc and ARC, they have become the linchpin in the implementation of interventions. However, it is important to overcome two pitfalls in order to strengthen the content of their contribution to the healthcare system. Firstly, the delegation of tasks relating to medical procedures such as the administration of SP at home and the use of ARC must not be used as barometers to assess their performance. This allows unethical practices vis-à-vis the public. Nor should the trust placed in them overshadow the strict supervision of their actions. Ongoing refresher courses through regular training would enable us to get the most out of these workers. Better motivation and reflection on their supposed voluntary work could also consolidate their role.

Recommendation 3:

- Promote the mediation role of care groups;
- Promote contracting with CBOs to implement community health activities;
- Develop attentive listening and professional flexibility in dealing with women.

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Appendices

Appendix 1: Rural maternity unit without pregnancy tests in Kolda



Appendix 2: ARC availability and expiring unused drugs.

Note that the Acumal 200 pack shown here contains paraffin-based suppositories which are very different from the artesunate rectal capsules. The WHO prequalified artesunate rectal capsules, manufactured by Strides and Cipla have a gelatin shell which protects the drug matrix. These rectal capsules can be subject to multiple cycles of heating and cooling while maintaining their original shape. In contrast, paraffin-based suppositories melt at body temperature and cannot regain their original shape.



Appendix 3: Socio-environmental conditions of malaria endemicity



Appendix 4: Motorcycle used to transport patients to hospital

