

SUNMAP 2 LONGITUDINAL STUDY QUARTERLY REPORT ON MALARIA SERVICE PROVISION

Kaduna (October – December 2020)



Copyright: London School of Hygiene & Tropical Medicine, 2021. [Licence: CC BY-NC-SA 3.0 IGO.](#)

Suggested Citation: Marks, S., and Avan, B. (2021). SuNMaP 2 longitudinal study: Quarterly report on malaria service provision, Kaduna (October-December 2020). London, London School of Hygiene & Tropical Medicine.

Acknowledgements: Many thanks to Malaria Consortium Nigeria for managing the data collection, with particular thanks to Chinazo Ujuju (Senior MEAL Specialist) and Mansur Darma (Data Analysis Specialist).

We would also like to thank the Kaduna data collection supervisor, Aliyu Araka, and team: Rose Anzizi; Usman Oluwaseyi Blessed; Gloria Bulus; Judith Dogo; Onyeabor-Nduka Joyce; Sofah Jonah Ndi; Justina Peter; Genchat Suzie Samuel; Umar Faruk Yakubu.

Lastly, our greatest thanks goes to all the households and health providers that participated in the SuNMaP 2 Longitudinal Study.

SuNMaP 2 Longitudinal Study Team: Dr Bilal Avan (Principal Investigator), London School of Hygiene & Tropical Medicine; Professor Joanna Schellenberg (Co-Principal Investigator), London School of Hygiene & Tropical Medicine; Sarah Marks (Co-investigator), London School of Hygiene & Tropical Medicine; Dr Seyi Soremekun (Co-investigator), London School of Hygiene & Tropical Medicine; Jyoti Shah (Study Administrator), London School of Hygiene & Tropical Medicine; Zelee Hill (Co-investigator), University College London; Dr James Tibenderana (Co-investigator), Malaria Consortium; Dr Olusola Oresanya (Co-investigator), Malaria Consortium Nigeria; Dr Dawit Getachew (Co-investigator), Malaria Consortium Nigeria; Dr Chinazo Ujuju (Co-investigator), Malaria Consortium Nigeria; Mansur Darma (Data Manager), Malaria Consortium Nigeria.

Written by: Sarah Marks & Bilal Avan, London School of Hygiene & Tropical Medicine.

Analysis by: Sarah Marks, London School of Hygiene & Tropical Medicine.

Design by: Sarah Marks, London School of Hygiene & Tropical Medicine.

Cover Image: Distribution of insecticide treated mosquito nets to pregnant women through the UK Foreign, Commonwealth, and Development Office's Support to the National Malaria Programme in Nigeria. Copyright: Malaria Consortium.

Funded by: UK Foreign, Commonwealth, and Development Office (FCDO).

Contact: Should you have any queries regarding this report, please contact London School of Hygiene and Tropical Medicine (sarah.marks@lshtm.ac.uk) or Malaria Consortium (c.ujuju@malariaconsortium.org).

CONTENTS

1. INTRODUCTION	1
2. METHODOLOGY.....	2
3. LGA CONTEXTUAL OVERVIEW	3
4. HOUSEHOLD SURVEY COVERAGE.....	4
5. DEMAND.....	5
5.1. MALARIA KNOWLEDGE	5
5.2. MALARIA BURDEN.....	5
5.3. CARE SEEKING BEHAVIOUR	6
5.4. COVERAGE OF KEY ANTIMALARIAL INTERVENTIONS.....	8
A. TREATMENT	8
B. PREVENTION.....	10
5.5. EQUITY.....	11
6. SURVEY COVERAGE OF HEALTH SERVICES	12
7. SURVEY COVERAGE OF HEALTH SERVICES	13
7.1. SERVICE AVAILABILITY	13
7.2. STOCK-OUTS	15
7.3. HEALTH WORKER KNOWLEDGE	17
7.4. HEALTH SYSTEM SUPPORT	19
8. SUMMARY	22
A. DEMAND.....	22
B. SUPPLY.....	24
9. REFERENCES	25

1. INTRODUCTION

Support to the National Malaria Programme phase II (SuNMaP 2) is a six-year programme (2018-2024) funded by the UK Foreign, Commonwealth, and Development Office (FCDO) and implemented in six states - Jigawa, Kaduna, Kano, Katsina, and Yobe in Northern Nigeria and Lagos. The programme is led by Malaria Consortium in partnership with the National and State Malaria Elimination Programmes, Abt Britain, Federation of Muslim Women's Association in Nigeria, the Health Policy Research Group of the University of Nigeria, Innovision, Mannion Daniels West Africa, Nigeria Interfaith Action Association, and Springfield Centre.

SuNMaP2 aims to sustainably address current programmatic and technical gaps in Nigeria's malaria control programme to facilitate the UK FCDO's eventual and responsible exit from bilateral malaria support in Nigeria. It is anticipated that SuNMaP 2 activities build on the successes of phase I (2008-2016) and lead to sustainable gains, including lives saved beyond the programme timeline. This will be facilitated by gradually phasing out support over the course of the programme - from capacity building in the initial years of the programme to mentoring in the final years of SuNMaP 2.

London School of Hygiene & Tropical Medicine (LSHTM) is leading a four-year longitudinal study of SuNMaP2 in two of the six SuNMaP 2 states, Kaduna and Kano. The primary objective of the longitudinal study is to assess SuNMaP 2's theory of change to inform the effectiveness of the UK FCDO's exit strategy from bilateral malaria funding in Nigeria. As part of the longitudinal study LSHTM is conducting ongoing quarterly assessments of malaria service provision. These quarterly assessments are intended to provide information to the State Malaria Elimination Programmes (SMEPs) in Kaduna and Kano, and SuNMaP 2 partners, on the degree to which the quality and coverage of malaria control interventions are being implemented; and whether coverage is sustained as partner support to the government is reduced. The results will be regularly shared in reports such as these with the SMEPs in Kaduna and Kano on a quarterly basis, and to the National Malaria Elimination Programme (NMEP) on an annual basis.

For further information about the SuNMaP 2 longitudinal study visit:

<https://www.lshtm.ac.uk/research/centres-projects-groups/sunmap2-longitudinal-study>

2. METHODOLOGY

The quarterly assessments of malaria service provision are undertaken using continuous survey methodology. The continuous survey consists of quarterly cross-sectional surveys of households and the health services catering to those households, including both primary and secondary care, as well as community-based care such as community health workers (CHWs), retail pharmacies and patent and proprietary medicine vendors (PPMVs). Sampling for the household survey is conducted through a two-stage process. Random cluster sampling is conducted using a primary sampling frame of census area units from the National Population Commission of Nigeria, stratified by local government area (LGA) and 30 census area units are independently selected for a different LGA in each state every quarter, starting October 2020 and ending March 2024.

Within each selected census area unit, a complete household listing of residences is conducted using census area mapping of households from the National Population Commission of Nigeria as a guide. This household listing for the census area is the second sampling frame, from which a random sample of 55 households are selected in the field.

During the continuous survey, quantitative data is collected on demand and supply side indicators of malaria service provision. Continuous survey data was exported from the electronic data collection forms and analysed using STATA 16 (StataCorp, Texas, USA). For this quarterly report small-area indicator estimates were calculated at LGA level from household and service delivery site data. Household data is presented by age, gender, and socio-economic group. Service delivery site data is presented by service delivery type. These LGA indicator estimates are based on data from a small sample of 30 clusters, therefore the quarterly estimates are for programme management purposes only.

Ethics approval for this study has been received from Kaduna State Health Research Ethics Committee; Kano State Health Research Ethics Committee; National Health Research Ethics Committee of Nigeria (Reference: NHREC/01/01/2007-02/10/2020); and LSHTM ethics (Reference: 18052).

Further information on the methods can be found in the study protocol available at: www.lshtm.ac.uk/research/centres-projects-groups/sunmap2-longitudinal-study#other-materials

3. LGA CONTEXTUAL OVERVIEW

During October to December 2020 data was collected from Soba LGA in Kaduna. A brief summary of contextual information for Soba LGA is summarised in figure 3.1, the information for which was obtained from district officials.

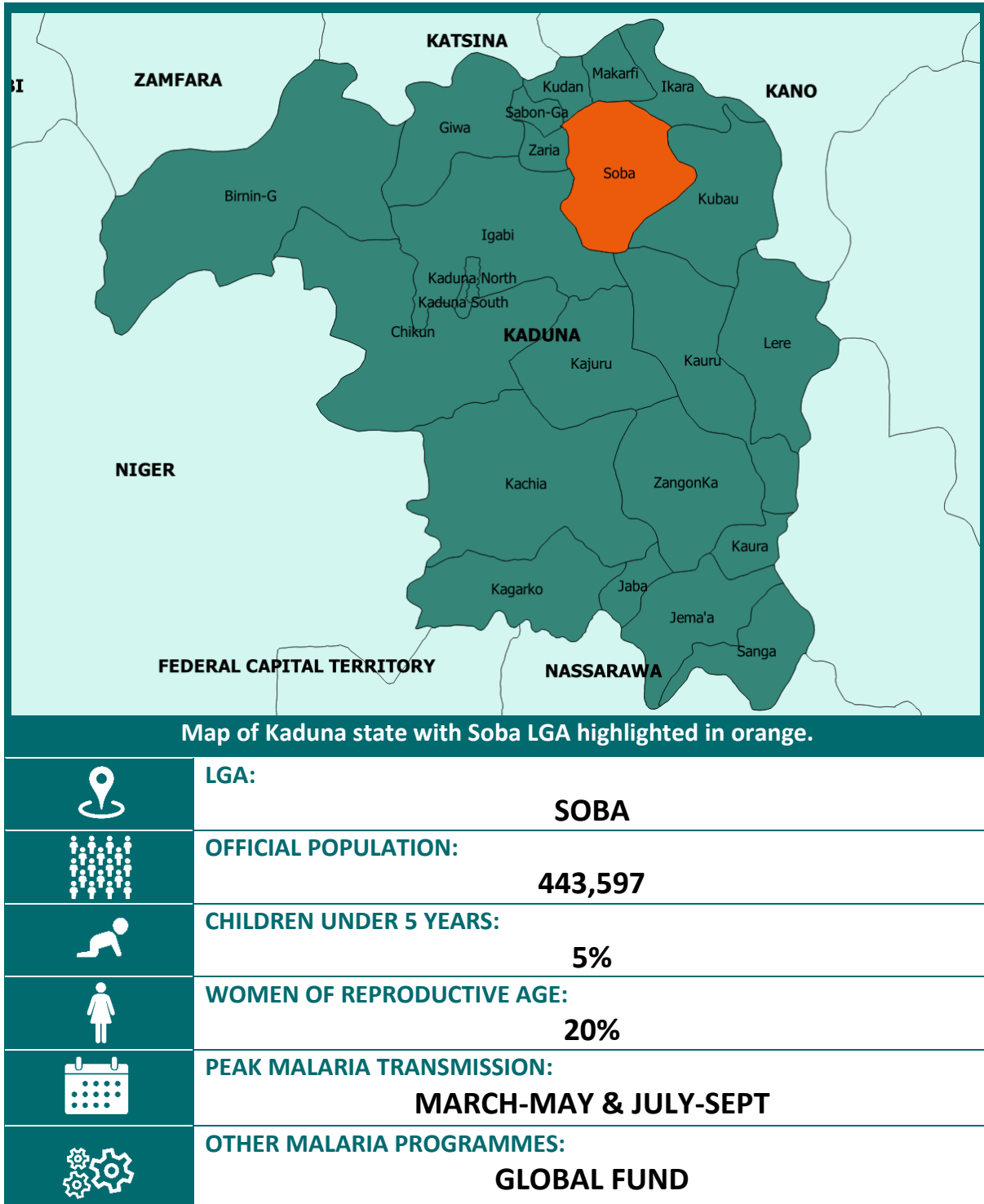


Figure 3.1. Infographic summarising contextual information for Soba LGA

Source: District Officials, SuNMaP 2 Longitudinal Study

4. HOUSEHOLD SURVEY COVERAGE

An overview of the households surveyed this quarter are summarised in tables 4.1 – 4.2.

Table 4.1. Overview of the household and individuals surveyed

Result	Eligible	Total Interviewed	
		#	%
Households	1650	1568	95.0%
Women aged 15-49 years	2153	1929	89.6%
Children <5 years	1939	1805	93.1%

Table 4.2. Household composition of those interviewed

Characteristic	Total
Mean size of households (N=1568, SD=3.5)	6.5
Household headship	
Male	81.2%
Female	18.8%
Households with pregnant women	8.6%
Households with children <5 years	31.6%

5. DEMAND



5.1. MALARIA KNOWLEDGE

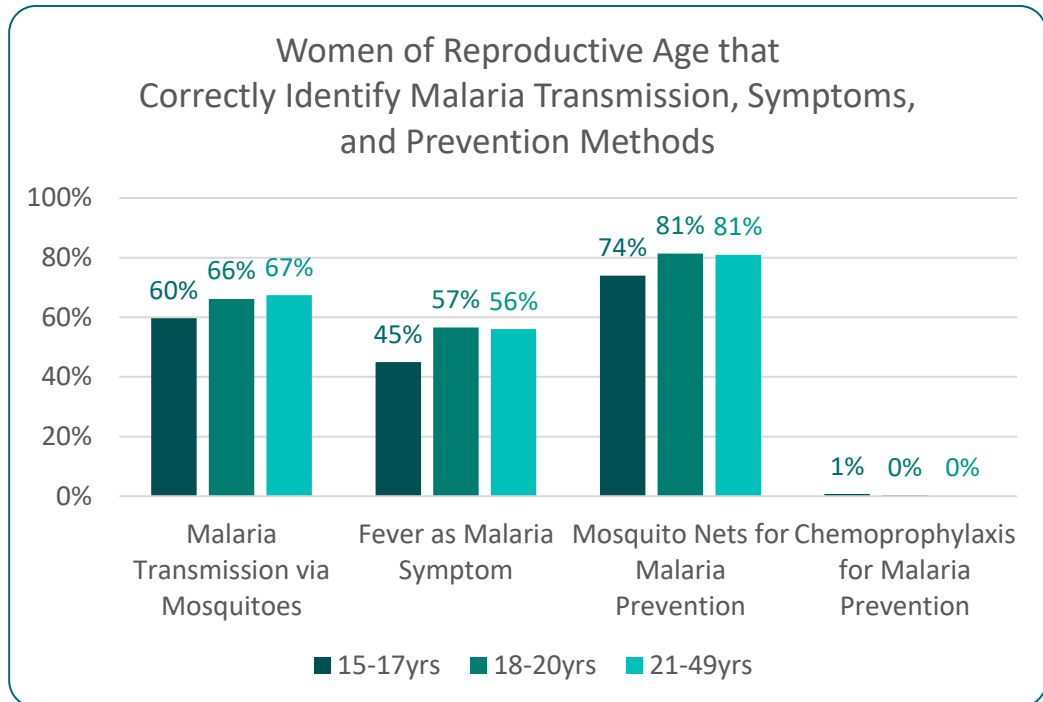


Figure 5.1.1

Women 15-17yrs (N=280); Women 18-20yrs (N=343); Women 21-49yrs (N=1306)

Source: Household Survey, SuNMAP 2 Longitudinal Study



5.2. MALARIA BURDEN

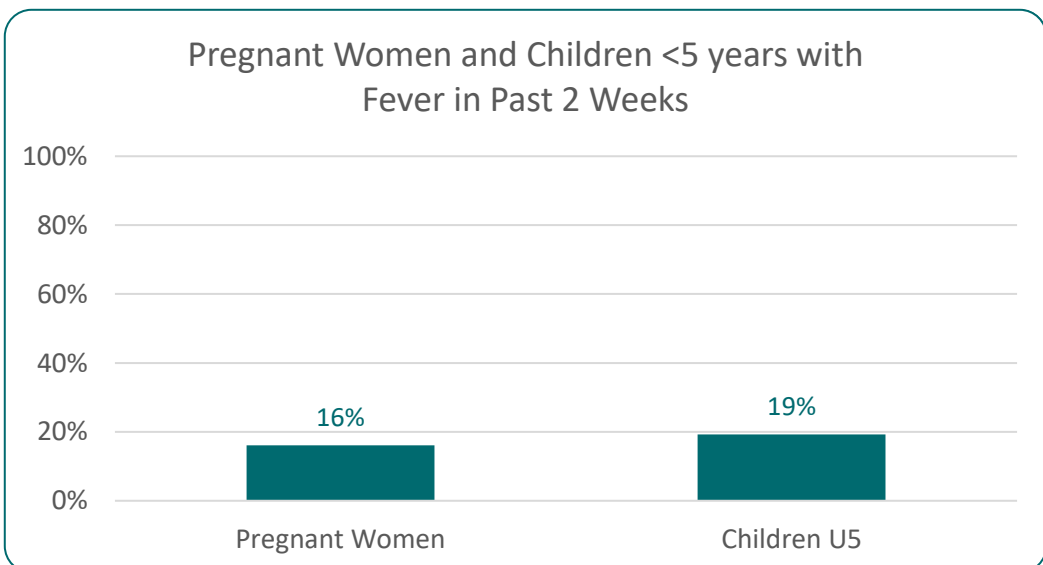


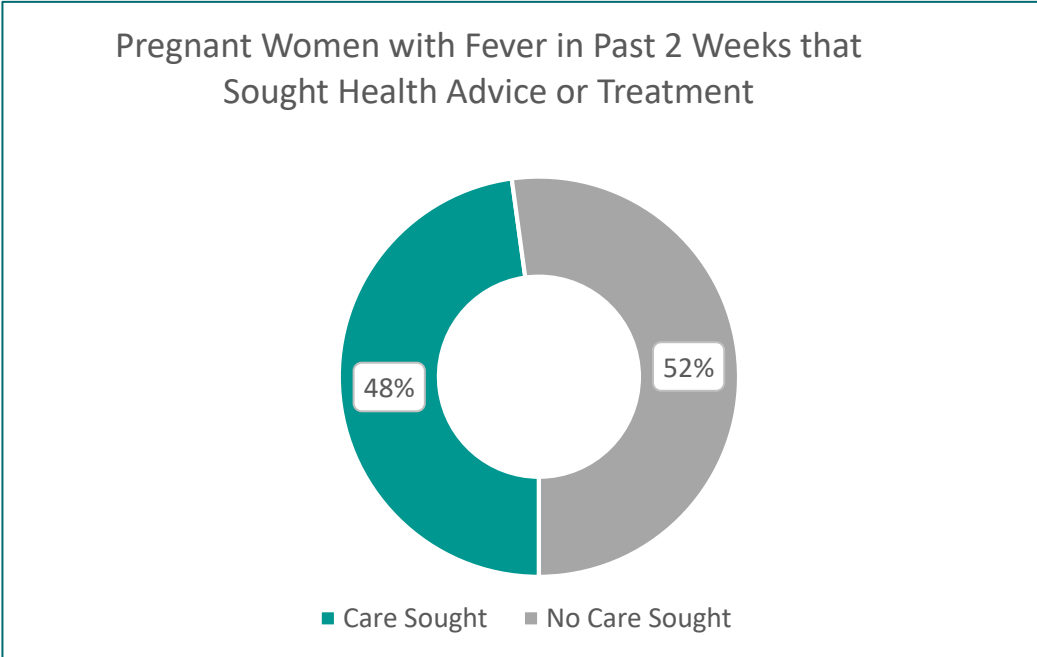
Figure 5.2.1

Pregnant women (N=143); Children <5 years (N=1805)

Source: Household Survey, SuNMAP 2 Longitudinal Study



5.3. CARE SEEKING BEHAVIOUR

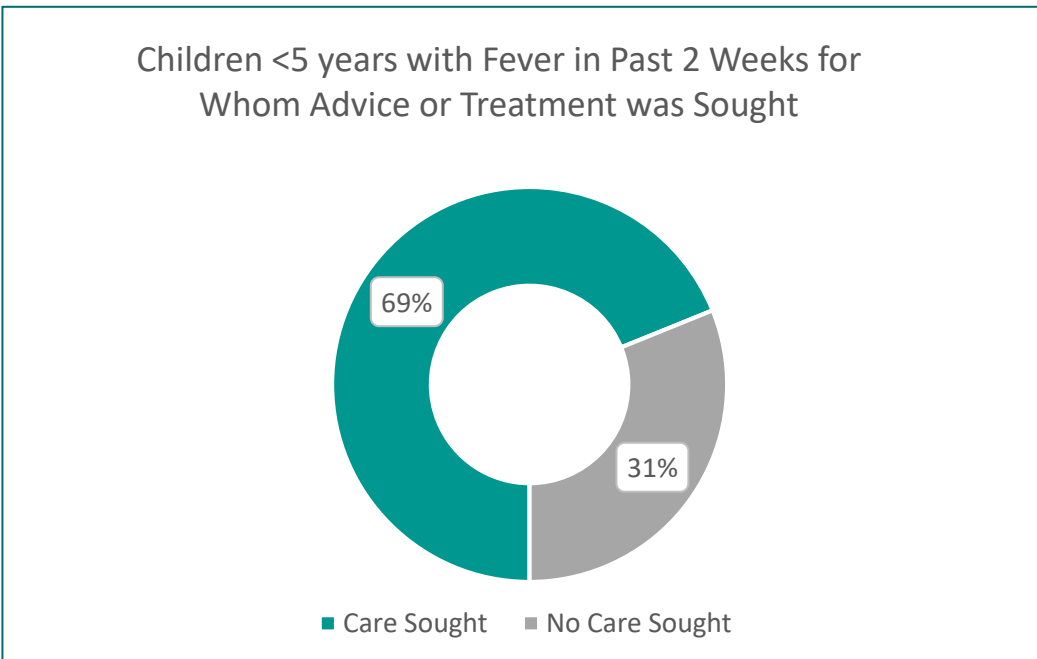


AVERAGE LENGTH OF TIME BETWEEN FEVER ONSET AND CARE-SEEKING FOR PREGNANT WOMEN: **1.4 Days**

Figure 5.3.1

Pregnant women with fever (N=23); Mean (N=11, SD=0.5 days)

Source: Household Survey, SuNMaP 2 Longitudinal Study



AVERAGE LENGTH OF TIME BETWEEN FEVER ONSET AND CARE-SEEKING FOR CHILDREN <5 YEARS: **1.8 Days**

Figure 5.3.2

Children <5 years with fever (N=347); Mean (N=239, SD= 1.2 days)

Source: Household Survey, SuNMaP 2 Longitudinal Study

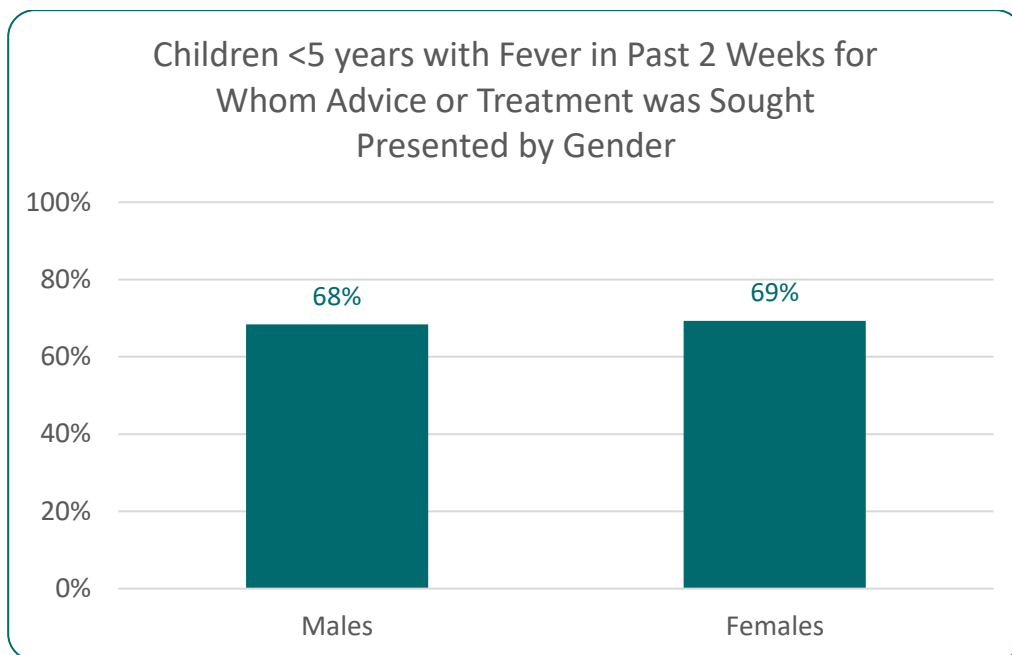


Figure 5.3.3

Male children <5 years with fever (N=171); Female children <5 years with fever (N=176)

Source: Household Survey, SuNMaP 2 Longitudinal Study

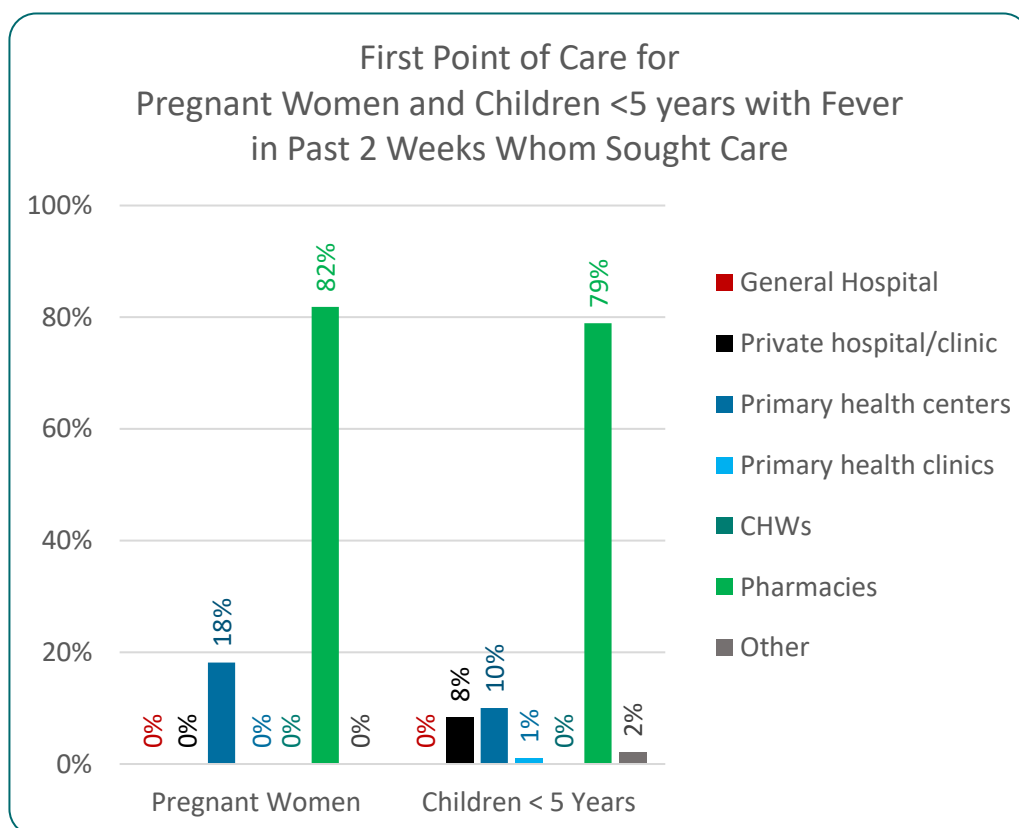


Figure 5.3.4

Pregnant women with fever that sought care (N= 11);

Children <5 years with fever that sought care (N= 239)

Source: Household Survey, SuNMaP 2 Longitudinal Study



5.4. COVERAGE OF KEY ANTIMALARIAL INTERVENTIONS

A. TREATMENT

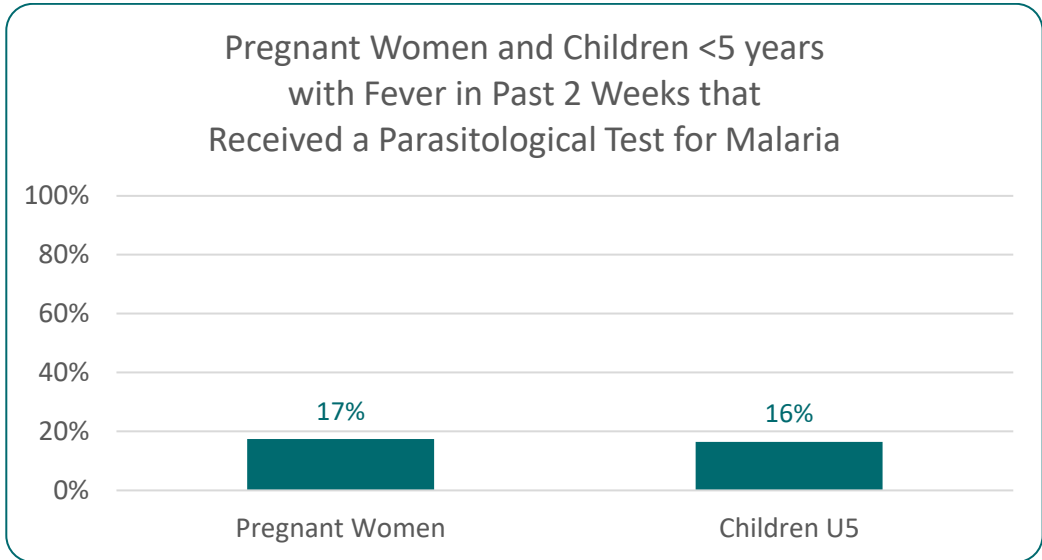


Figure 5.4.1

Pregnant women with fever (N=23); Children <5 years with fever (N=347)
Source: Household Survey, SuNMaP 2 Longitudinal Study

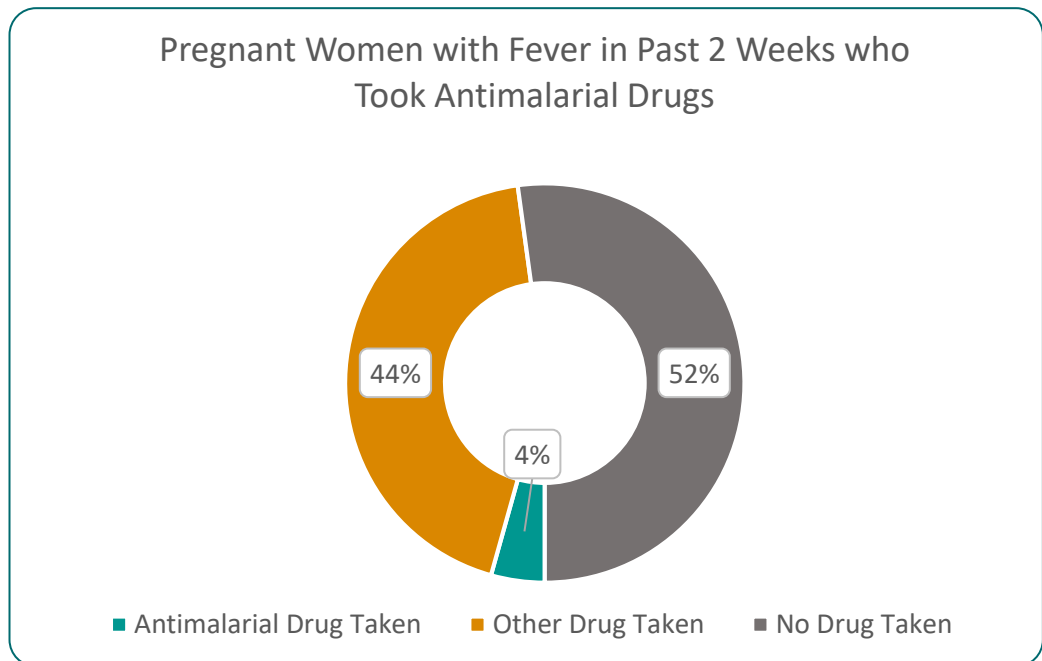


Figure 5.4.2

Pregnant women with fever (N=23)
Source: Household Survey, SuNMaP 2 Longitudinal Study

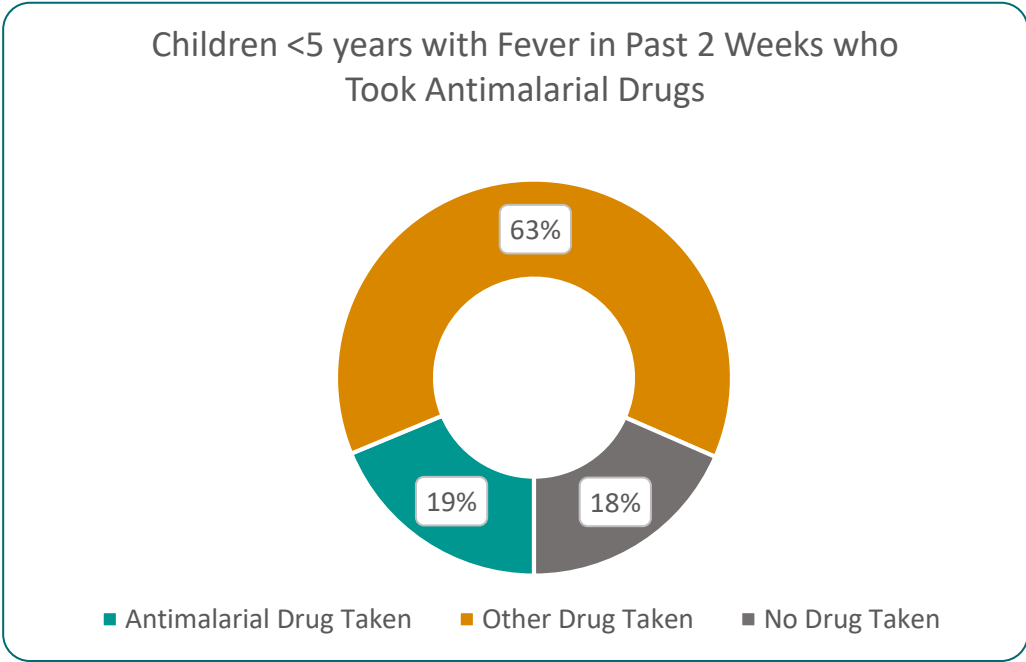


Figure 5.4.3
 Children <5 years with fever (N=347)
 Source: Household Survey, SuNMaP 2 Longitudinal Study

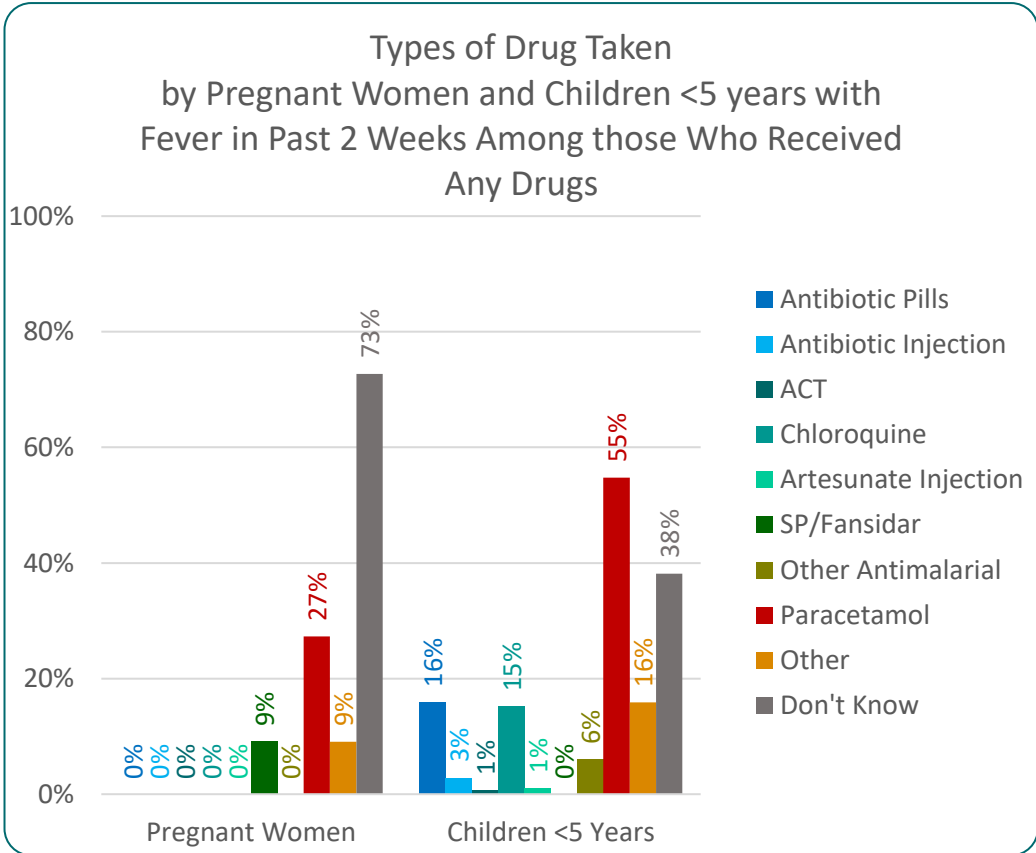


Figure 5.4.4
 Pregnant women with fever that received drugs (N=11); Children <5 years with fever that received drugs (N=283). Source: Household Survey, SuNMaP 2 Longitudinal Study

B. PREVENTION




	HOUSEHOLDS WITH AT LEAST ONE ITN:	34%
	PREGNANT WOMEN THAT SLEPT UNDER AN ITN:	68%
	CHILDREN <5 YEARS THAT SLEPT UNDER AN ITN:	58%

Figure 5.4.5
 Households (N=1568); Pregnant Women (N=143); Children <5 years (N=1805)
 Source: Household Survey, SuNMaP 2 Longitudinal Study

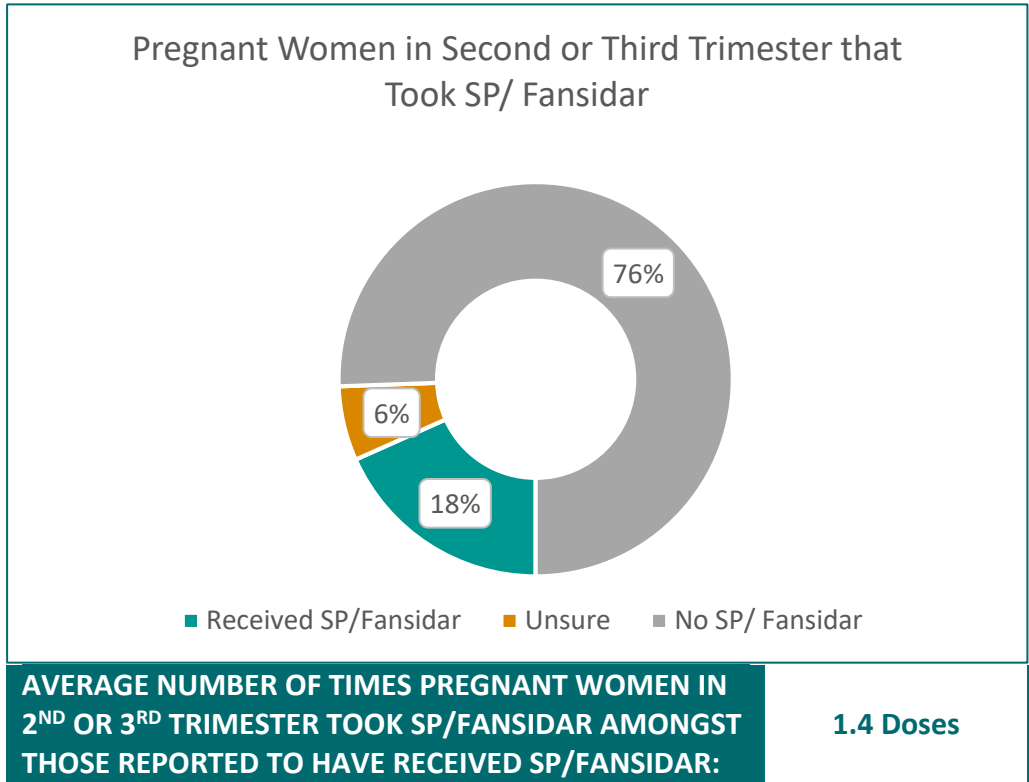


Figure 5.4.6
 Pregnant women in second or third trimester (N=131); Mean (N=24, SD= 1.8 doses)
 Source: Household Survey, SuNMaP 2 Longitudinal Study



5.5. EQUITY

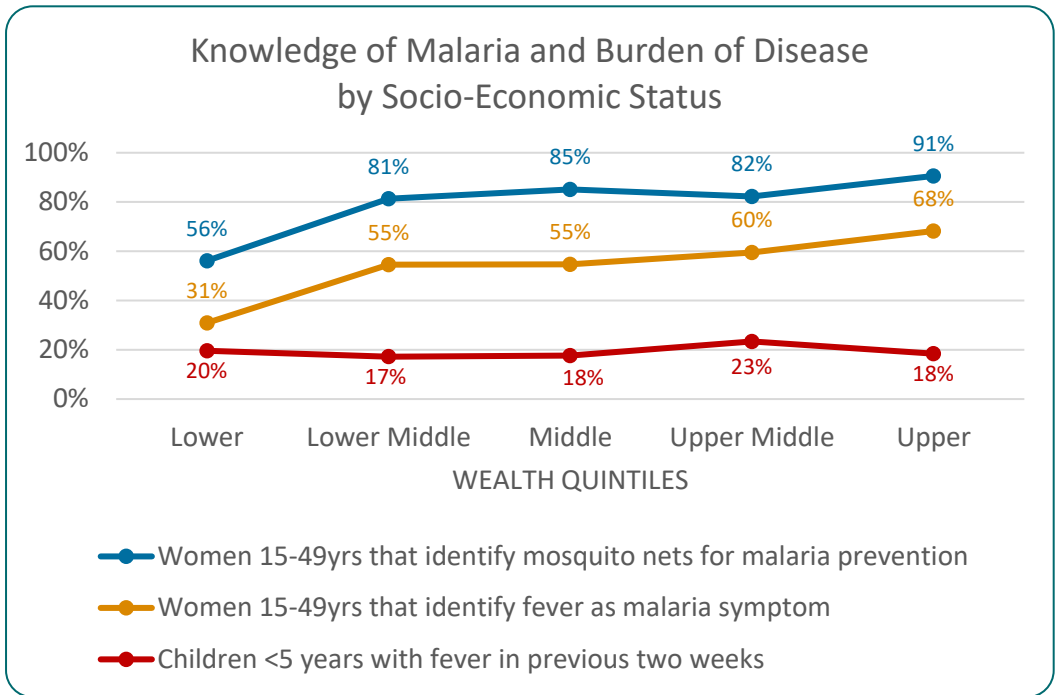


Figure 5.5.1

Women 15-49yrs (N=1,929); Children <5 years (N=1,805)

N.B. Pregnant women with fever not shown as sample too small for equity analysis.

Source: Household Survey, SuNMaP 2 Longitudinal Study

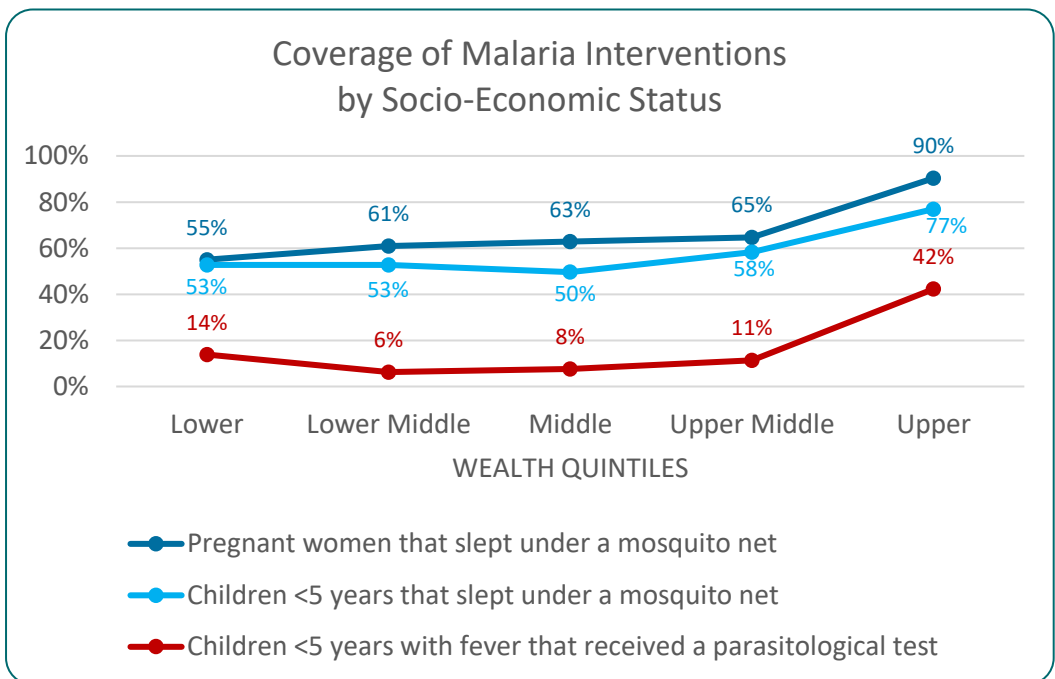


Figure 5.5.2

Pregnant Women (N=143); Children <5 years (N=1,805); Children <5 years with fever (N=347)

N.B. Pregnant women with fever that received parasitological test not shown as sample too small for equity analysis.

Source: Household Survey, SuNMaP 2 Longitudinal Study

6. SURVEY COVERAGE OF HEALTH SERVICES

The number of service delivery sites in Soba LGA reported operational by district officials during the time of survey and the number of these sites that were surveyed are summarised in table 6.1. The service delivery sites surveyed were the main Level II, Level I, and community health worker and pharmacy sites identified by the households in the survey areas for malaria services.

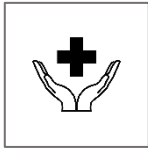
Table 6.1. Overview of the number of operational primary, secondary, and community-based care sites in the Soba Local Government Area and the number of sites surveyed

Health Service Delivery Types	Total Operational [^]	No. Surveyed (%)
Level II	2	1 (50%)
General Hospitals	1	1 (100%)
Cottage Hospitals	1	0 (0%)
Level I	61	22 (36%)
Primary Health Centres	11	4 (36%)
Primary Health Clinics	50	18 (36%)
Community-based Care	207	42 (20%)
Community Health Workers (CHWs)*	103	16 (16%)
Pharmacies**	104	26(25%)

Note: *Community health workers includes community-oriented resource persons (CORPs), community health influencers, promoters, and service (CHIPs) agents, community health extension workers (CHEWs) and junior community health extension workers (JCHEWs). CHEWs and JCHEWs are associated with Level I health facilities but conduct 60% and 80% of their work respectively in the community. Consequently, they have been listed under community-based care in the table as they were surveyed based on their identification as the main community health worker by the households in the areas surveyed. **Pharmacies includes PPMVs and retail pharmacies. [^] Total number operational as reported by the district officials during the time of survey.

To note that during this period LGA district officials reported that rapid diagnostic tests (RDTs) and antimalarials had not been delivered in the LGA for 2 months as a result of COVID-19 affecting the supplies to health facilities.

7. SURVEY COVERAGE OF HEALTH SERVICES



7.1. SERVICE AVAILABILITY

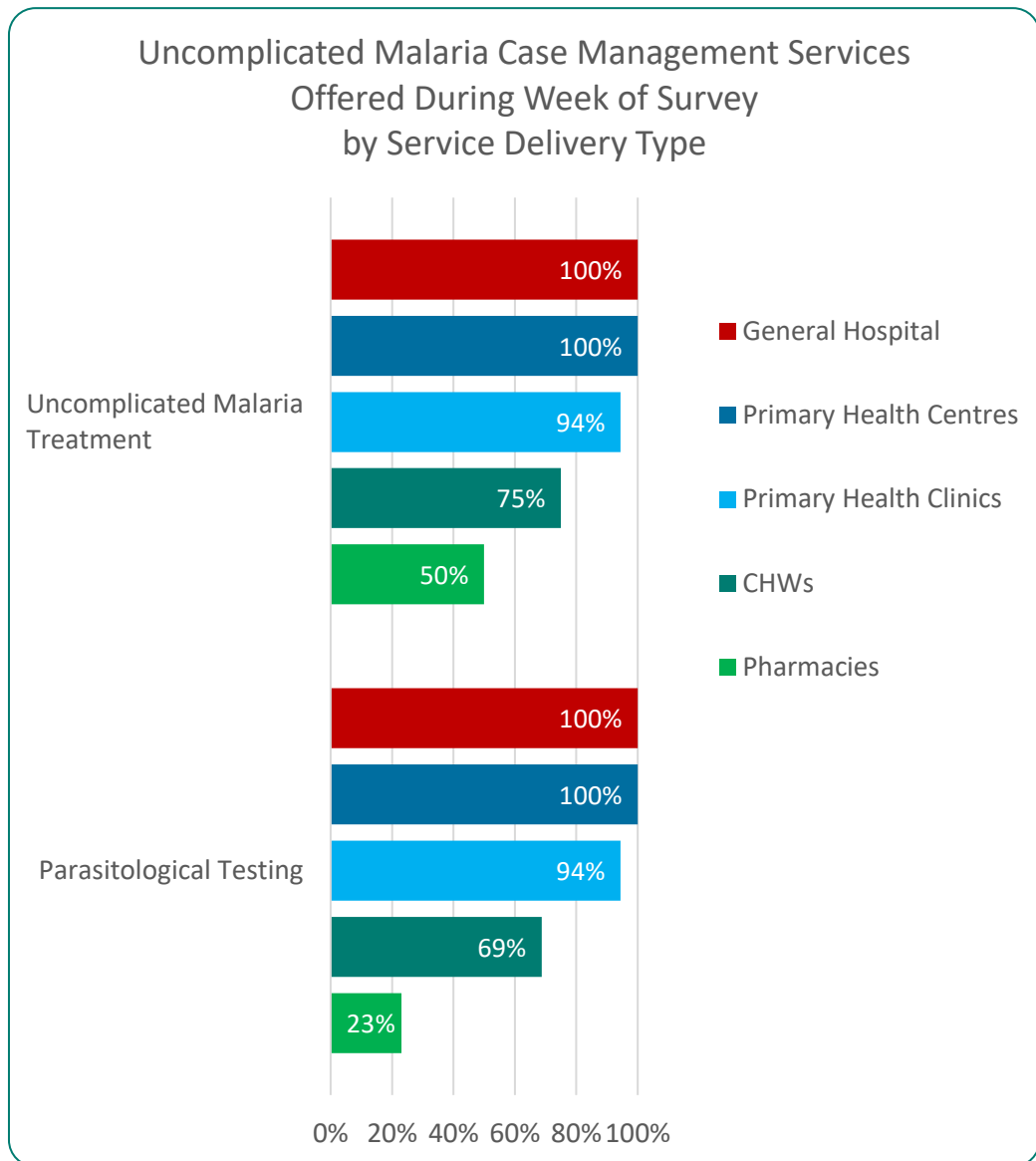


Figure 7.1.1

General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinics (N=18); CHWs (N=16); Pharmacies (N=26).

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study

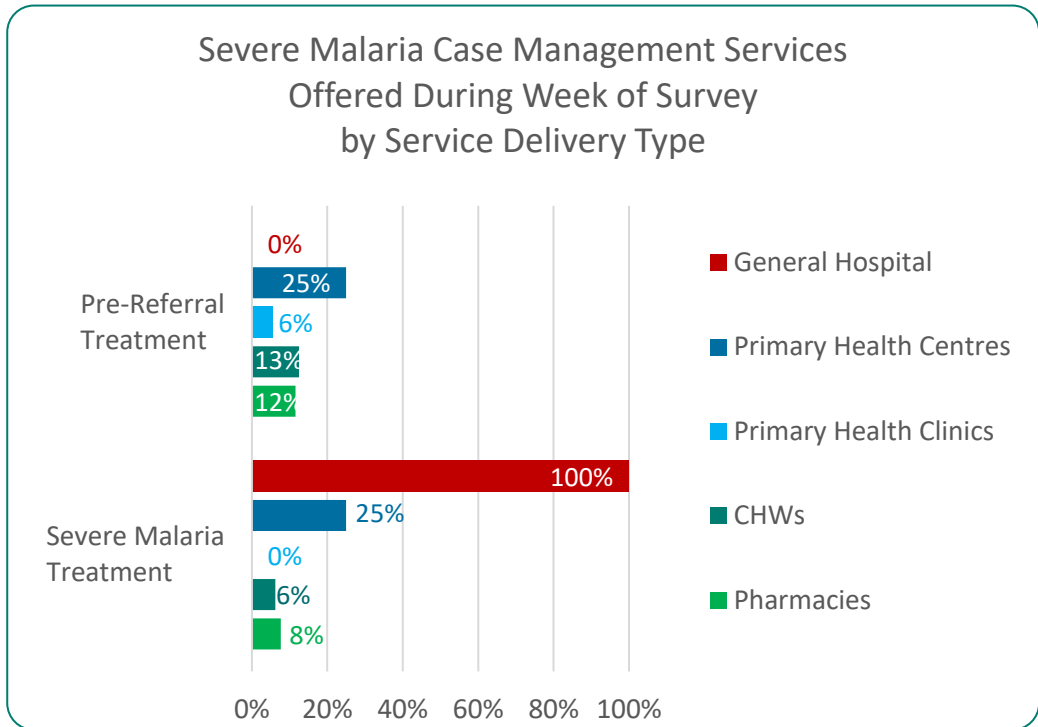


Figure 7.1.2

General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinics (N=18); CHWs (N=16); Pharmacies (N=26).

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study

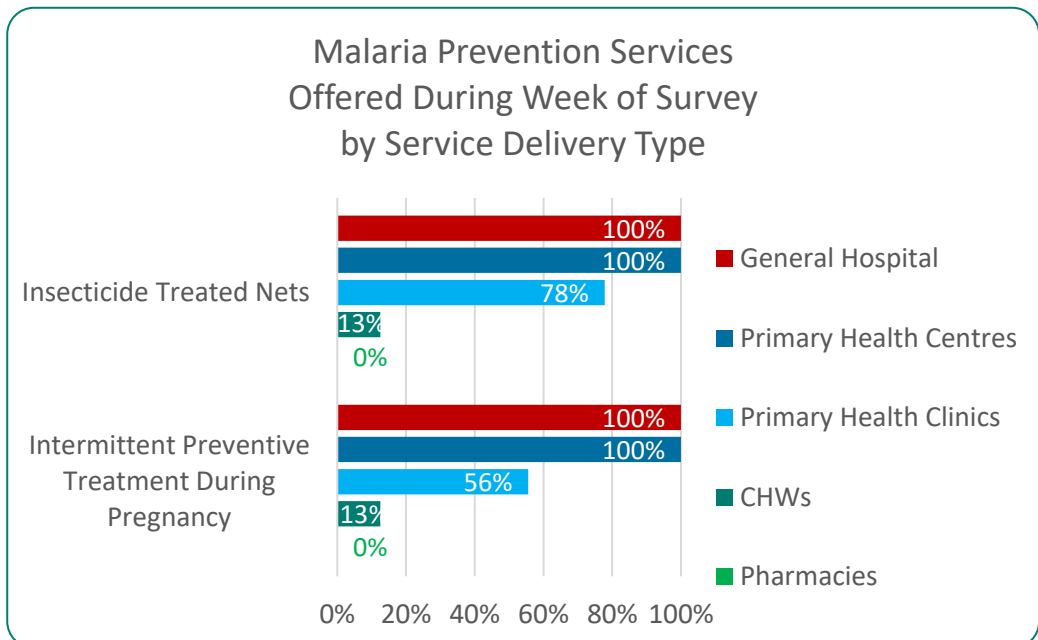


Figure 7.1.3

General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinics (N=18); CHWs (N=16); Pharmacies (N=26).

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study



7.2. STOCK-OUTS

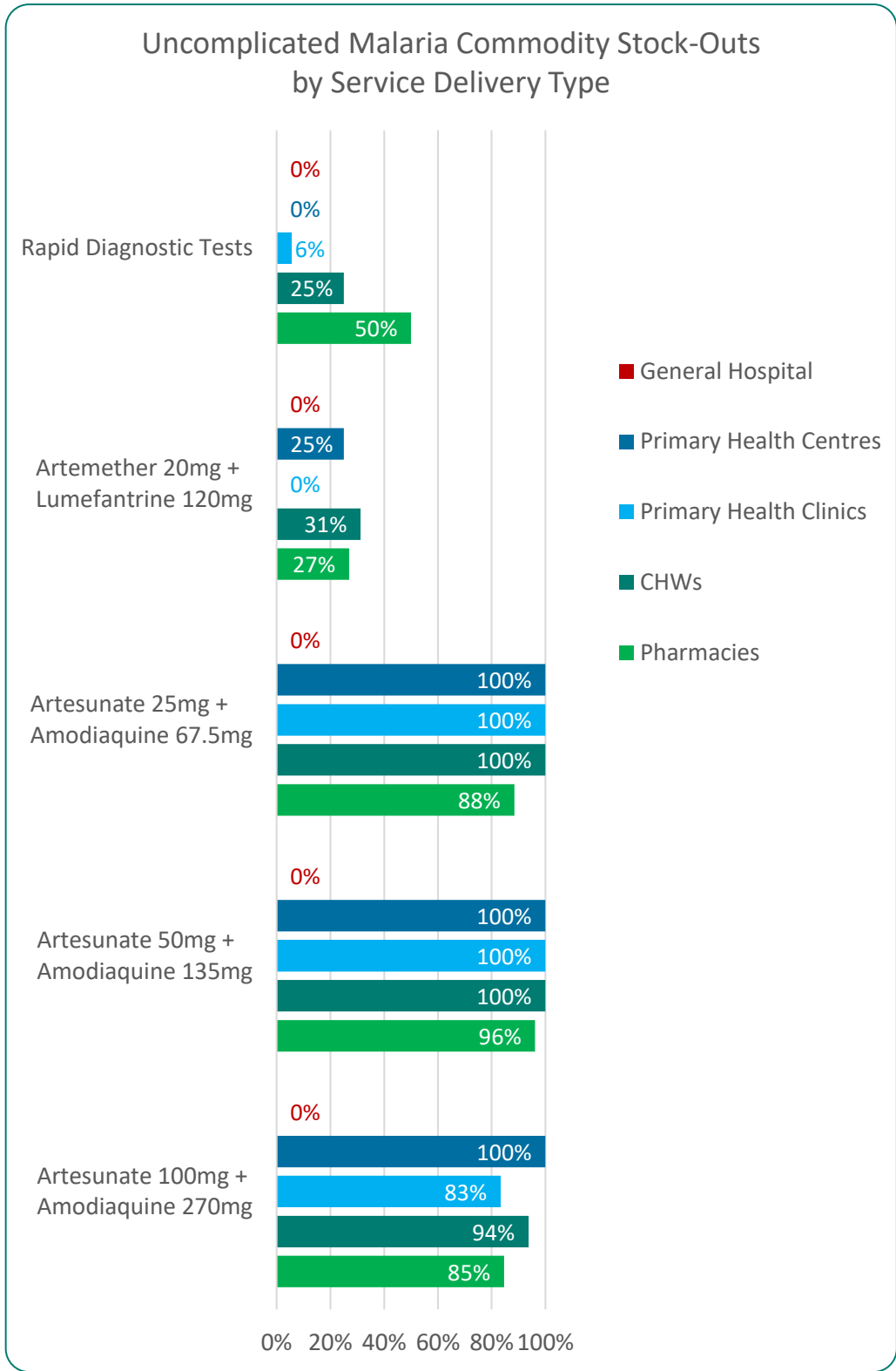


Figure 7.2.1

General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinics (N=18); CHWs (N=16); Pharmacies (N=26).

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study

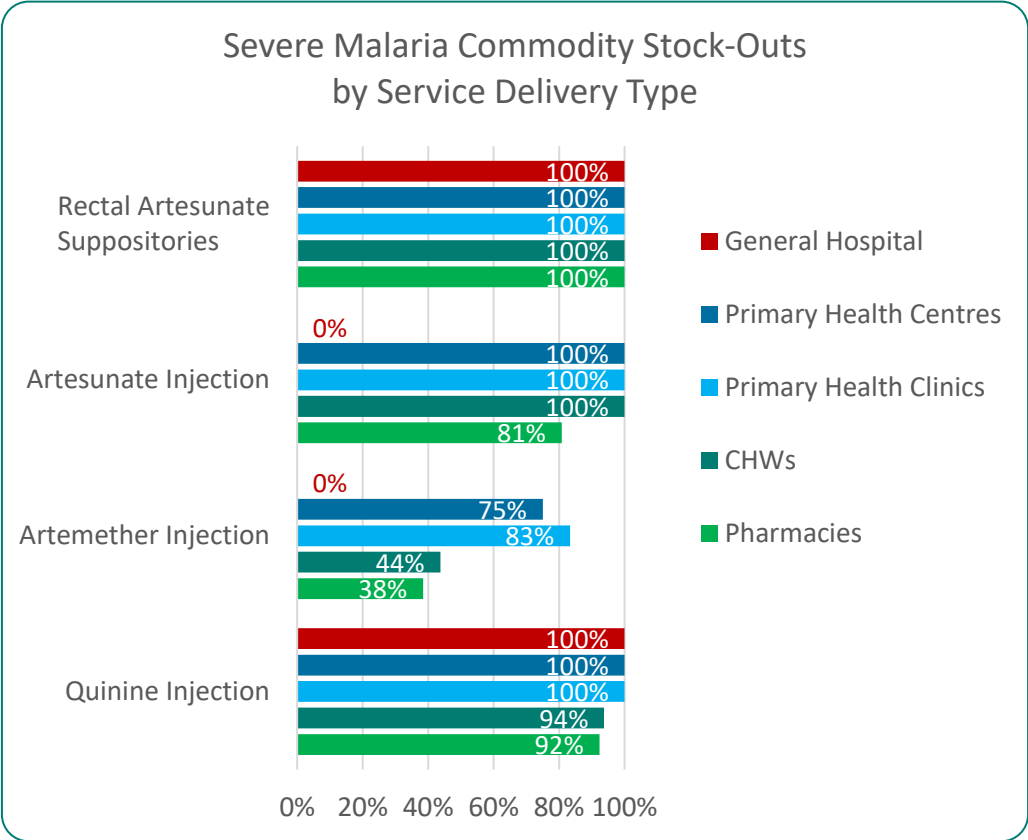


Figure 7.2.2
 General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinics (N=18); CHWs (N=16); Pharmacies (N=26).
 Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study

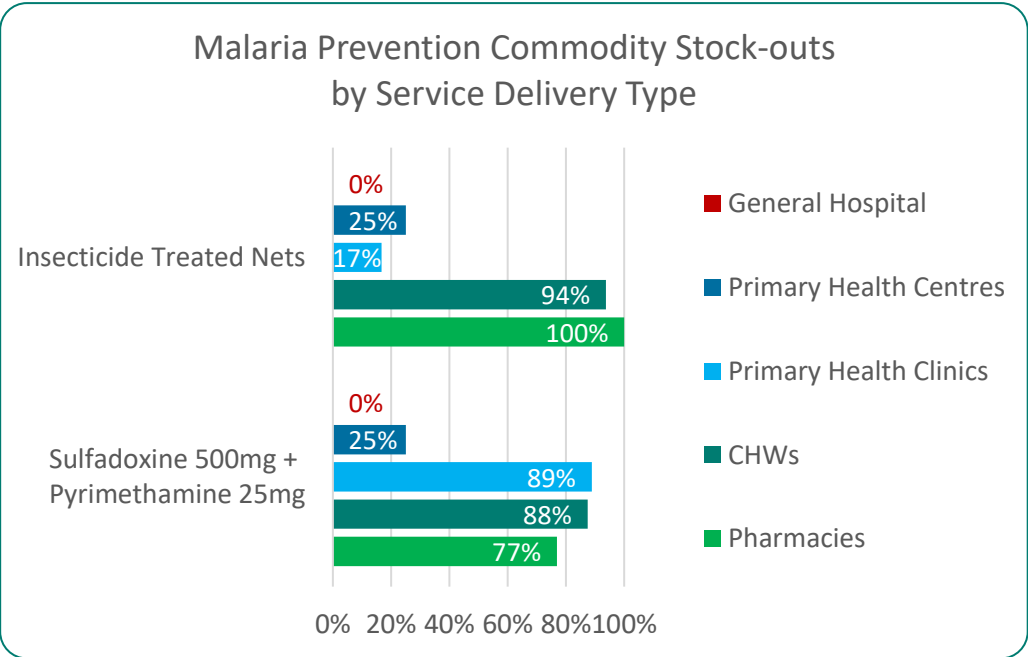


Figure 7.2.3
 General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinics (N=18); CHWs (N=16); Pharmacies (N=26).
 Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study



7.3. HEALTH WORKER KNOWLEDGE

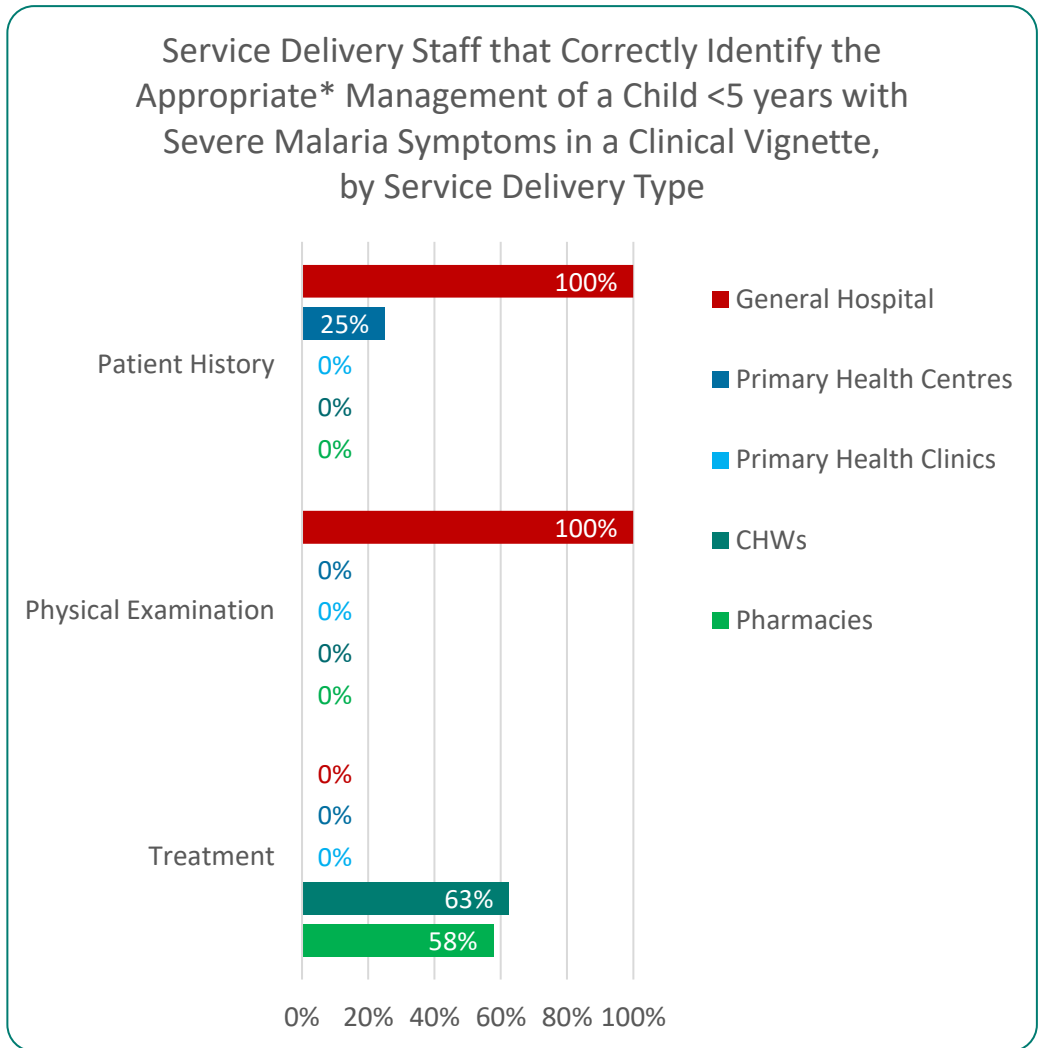


Figure 7.3.1

General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinics (N=18); CHWs (N=16); Pharmacies (N=26).

*Appropriate patient history was defined as enquiries regarding name, age, symptoms, first visit or revisit for same illness, previous prescribed medication for all service delivery types; Appropriate physical examination was defined for community-based care and level I health facilities as checking for general danger signs, temperature measurement, and determining length of fever (given that patients with general danger signs are to be referred to level health facilities for treatment without a malaria test). For level II health facilities correct physical exam was defined the same but with the addition of parasitological testing for malaria. Appropriate treatment was defined as referral to nearest health facility for community-based care with or without pre-referral treatment (first dose rectal artesunate or intramuscular artesunate and first dose of amoxicillin). For level I health facilities this was defined as referral to next level health facility and administration of pre-referral treatment (first dose rectal artesunate or intramuscular artesunate and first dose of amoxicillin). For level II health facilities appropriate treatment was defined as intravenous or intramuscular artesunate for at least 24 hours with or without accompanying antibiotic treatment given that the respondents were not given the result of the parasitological test in the scenario (1). All service delivery types were also permitted to give or not give paracetamol without affecting the outcome of the analysis.

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study

Service Delivery Staff that Correctly Identify the Appropriate Management of a Pregnant Woman in First Trimester with Uncomplicated Malaria in a Clinical Vignette, by Service Delivery Type

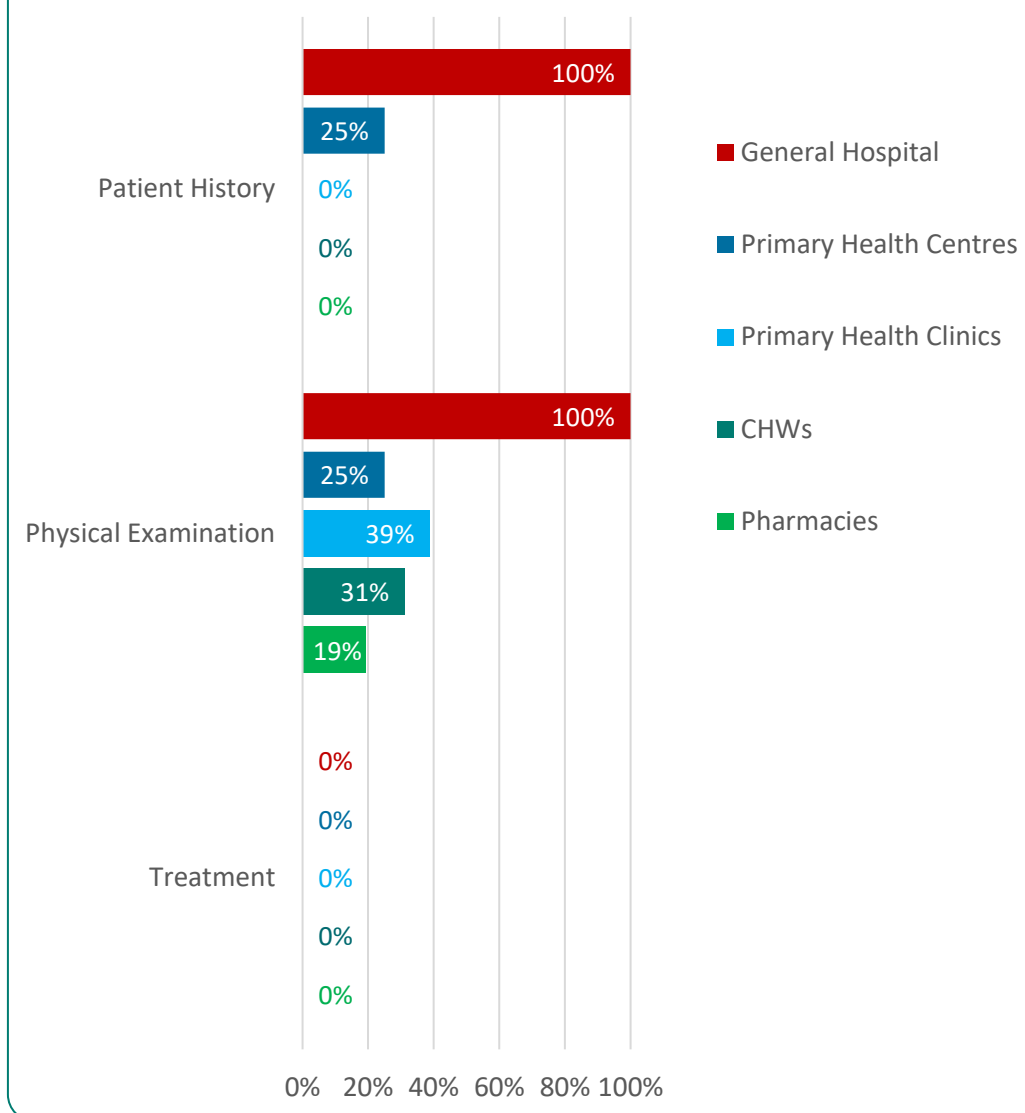


Figure 7.3.2

General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinics (N=18); CHWs (N=16); Pharmacies (N=26).

*Appropriate patient history was defined as enquiries regarding name, age, length of pregnancy, symptoms, first visit or revisit for same illness, and previous prescribed medication, for all service delivery types; Appropriate physical examination was defined for all service delivery types as checking for general and pregnancy danger signs, temperature measurement, determining length of fever, and conducting a parasitological test for malaria. Appropriate treatment for the pregnant woman in her first trimester was defined for all service delivery types as 3 day artemisinin combination therapy (ACT) or quinine tablets (+ clindamycin) for 7 days, with or without paracetamol (1, 2).

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study



7.4. HEALTH SYSTEM SUPPORT

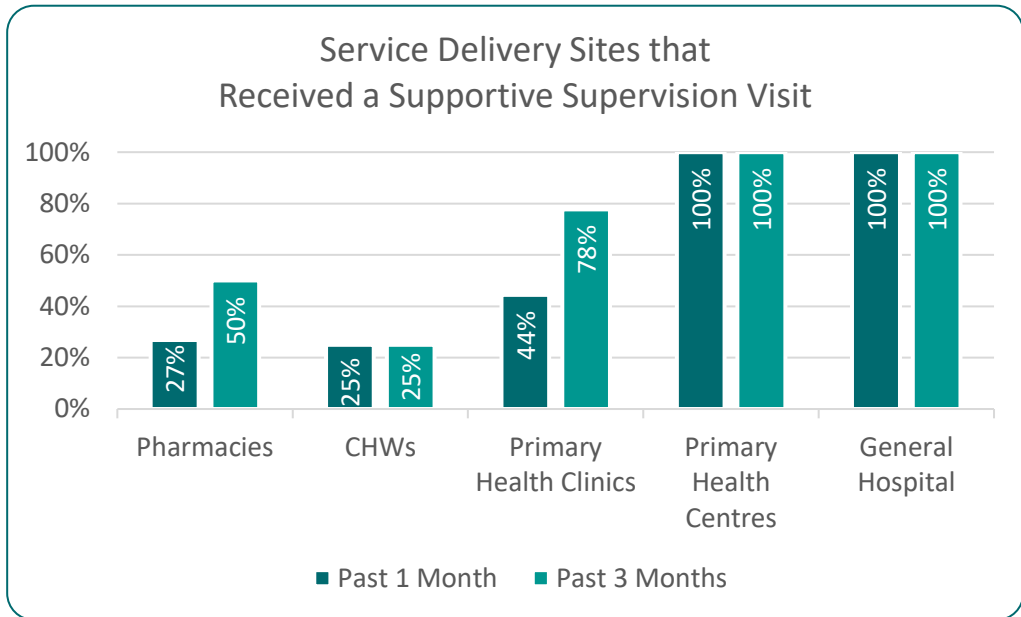


Figure 7.4.1

General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinics (N=18); CHWs (N=16); Pharmacies (N=26).

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study

AVERAGE NUMBER OF SUPPORTIVE SUPERVISION VISITS* OF THOSE THAT RECEIVED A VISIT IN THE PAST 3 MONTHS (TO NEAREST VISIT):		
	GENERAL HOSPITAL:	2
	PRIMARY HEALTH CENTRES:	6
	PRIMARY HEALTH CLINICS:	3
	CHWs:	2
	PHARMACIES:	1

Figure 7.4.2

General Hospital (N=1, SD=N/A); Primary Health Centres (N=4,SD=5 visits); Primary Health Clinic (N=14, SD= 1.6 visits); CHWs (N=4, SD=0.6 visits); Pharmacies (N=13, SD= 0.4 visits). *Monitoring visits in the case of pharmacies.

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study

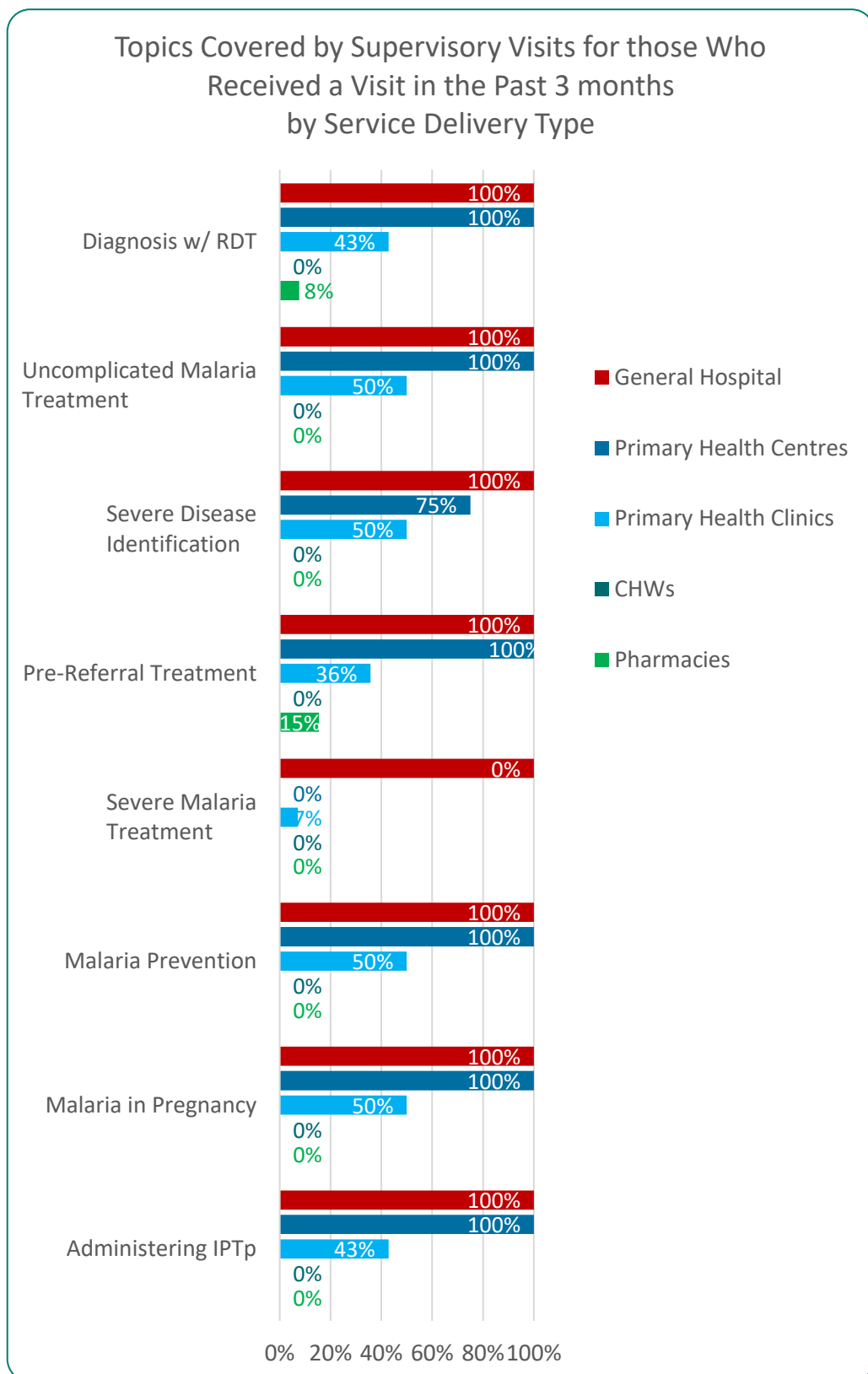


Figure 7.4.3

General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinic(N=14); CHWs (N=4); Pharmacies (N=13).

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study







 PROPORTION OF SERVICE DELIVERY SITES THAT WERE DISATISFIED WITH THE SUPERVISION RECEIVED IN THE PAST 3 MONTHS:		
	GENERAL HOSPITAL:	0%
	PRIMARY HEALTH CENTRES:	0%
	PRIMARY HEALTH CLINICS:	0%
	CHWs:	25%
	PHARMACIES:	0%

Figure 7.4.4

General Hospital (N=1); Primary Health Centres (N=4); Primary Health Clinic(N=14); CHWs (N=4); Pharmacies (N=13).

Source: Health Service Delivery Site Survey, SuNMaP 2 Longitudinal Study

8. SUMMARY

A. DEMAND

Households

- Awareness of malaria chemoprophylaxis, including intermittent preventive treatment during pregnancy (IPTp) and seasonal malaria chemoprevention, amongst women of reproductive age was very low ranging from 0-1% across all age groups (**figure 5.1.1**). Only 45%-56% of women of reproductive age could correctly identify fever as a main symptom of malaria. The equity analysis also showed that knowledge amongst women of reproductive age regarding fever as a malaria symptom and the use of insecticide treated nets (ITNs) for malaria prevention was fairly equitable amongst lower-middle to upper wealth quintiles (**figure 5.5.1**). However, knowledge amongst the lowest wealth quintile was 24% and 25% lower for these indicators when compared to the lower-middle quintile. The low level of awareness amongst women of reproductive age is concerning given that they are a key demographic in terms of achieving coverage of malaria interventions amongst the most vulnerable – pregnant women and children under 5 years old (U5).
- Amongst the households surveyed 34% had at least one ITN (**figure 5.4.5**). However, the average household size was 6.5 members (**table 4.2**) and the recommendation is for at least one ITN per two people in a household (3).

Pregnant Women

Treatment

- Amongst the pregnant women surveyed, 16% reported having fever in the two weeks previous to the survey (**figure 5.2.1**). Only 17% of pregnant women who had fever received a parasitological test for malaria (**figure 5.4.1**). Of those that sought care (48%) (**figure 5.3.1**), 82% visited a pharmacy as their first point of care (**figure 5.3.4**). Average length of time between fever onset and seeking care was 1.4 days (**figure 5.3.1**).
- Of the 48% of pregnant women with fever who took drugs, only 4% took antimalarials (**figure 5.4.2**). Of those that knew what drugs they had taken; the most commonly reported drug was paracetamol (**figure 5.4.4**). The recommended treatment for pregnant women in Nigeria with uncomplicated malaria is artemisinin-based combination therapy (ACT), of which 0% of pregnant women with fever reported receiving (1).

Prevention

- Sixty-eight percent of pregnant women slept under an ITN the previous night (**figure 5.4.5**). However, the equity analysis showed that 37% fewer pregnant women slept under an ITN in the poorest quintile compared to the wealthiest (**figure 5.5.2**).
- IPTp had not been taken by the majority (76%) of pregnant women surveyed in their second or third trimester (**figure 5.4.6**). Amongst those who had taken sulfadoxine-pyrimethamine (SP) the average number of doses was 1.4, below the recommended minimum of 3 (1).

Children Under 5 Years Old

Treatment

- The percentage of children U5 with fever in the two weeks previous to the survey was 19% (**figure 5.2.1**). This was comparative to the burden seen in pregnant women (16%).
- Amongst children U5 with fever in the two weeks previous to the survey, 16% received a parasitological test (**figure 5.4.1**), comparative with pregnant women with fever (17%). Equity analysis showed that despite a similar likelihood of fever in children U5 amongst the poorest and wealthiest quintiles surveyed (**figure 5.5.1**), there was a 28% difference in the coverage of parasitological testing in the poorest group compared to the wealthiest group (**figure 5.5.2**).
- Sixty-nine percent of children U5 with fever, sought care (**figure 5.3.2**). Careseeking for children U5 with fever was evenly distributed between sexes (**figure 5.3.3**). Of those that sought care, 79% visited a pharmacy as their first point of care (**figure 5.3.4**). Average length of time between fever onset and seeking care was comparative to that of pregnant women with 1.8 days (**figure 5.3.2**).
- Eighty-two percent of children U5 with fever received drugs, a greater percentage than seen in pregnant women, however still only 19% took antimalarials (**figure 5.4.3**). Of those whose caregiver knew what drugs they had taken, the most commonly reported was paracetamol (**figure 5.4.4**). For antimalarials, the most commonly reported was chloroquine (15%); only 1% received an ACT, the recommended treatment for children U5 with uncomplicated malaria (1).

Prevention

- Fifty-eight percent of children U5 had slept under an ITN the previous night (**figure 5.4.5**). Furthermore, fewer children U5 in the poorest quintile slept under an ITN the night before compared to those in the wealthiest group by 24% (**figure 5.5.2**).

B. SUPPLY

Treatment

- The survey found limited availability of parasitological testing services amongst community-based care providers, particularly for pharmacies (**figure 7.1.1**). This correlates with the high percentage of stock-outs reported of rapid diagnostic tests (RDTs) amongst community-based care providers (**figure 7.2.1**). Given that pharmacies tended to be the first point of care in the communities surveyed (**figure 5.3.4**), this provides a potential explanation for the low level of parasitological testing observed amongst pregnant women and children U5 with fever in the two weeks preceding the survey. To note that during this period LGA district officials did report that rapid diagnostic tests (RDTs) and antimalarials had not been delivered in the LGA for 2 months as a result of the COVID-19 pandemic affecting the supplies to health facilities.
- Artemether-Lumefantrine is the primary artemisinin-based combination therapy (ACT) recommended in Nigeria, with Artesunate-Amodiaquine as an alternative (1). Stock-outs of Artemether-Lumefantrine were predominantly focused at the community-based care level (**figure 7.2.1**). However, there was a high percentage of stock-outs reported for all concentrations of Artesunate-Amodiaquine for nearly all service delivery levels. Stock-outs of pre-referral treatment and treatment for severe malaria treatment were high across healthcare levels I and II (**figure 7.2.2**). The stock-outs of antimalarials may explain the low levels of antimalarials reportedly taken amongst pregnant women and children U5 with fever in the communities surveyed. To note that 4th Edition of the National Guidelines for Diagnosis and Treatment of Malaria indicates that pre-referral treatment and severe malaria treatment is not provided as part of community-based care, however there were a few CHWs and pharmacies that reported offering these services (**figure 7.1.2**)(1).
- No surveyed service delivery staff correctly identified the overall appropriate management of a child U5 with severe malaria symptoms and a pregnant woman with uncomplicated malaria in hypothetical scenarios (clinical vignettes) (**figure 7.3.1** and **figure 7.3.2**). For the hypothetical scenario involving a child U5 with severe malaria, no service delivery sites correctly identified how to collect patient history, conduct a physical examination, and provide appropriate treatment – although the general hospital correctly identified the steps for patient history and physical examination, and appropriate treatment was correctly identified in 96% of pharmacies (**figure 7.3.1**). For the scenario involving uncomplicated malaria in a pregnant woman in her first trimester, no service delivery sites correctly identified the steps for all three areas of patient history, physical examination, and appropriate treatment (**figure 7.3.2**). In particular it should be noted that none of the service delivery staff surveyed correctly identified the appropriate treatment of uncomplicated malaria in a pregnant woman. Inappropriate case management of malaria amongst providers may also be a cause of low reporting of ACT use in the community, in addition to anti-malarial stock-outs.

- Despite all service delivery types scoring low for appropriate management in the clinical vignettes, nearly all service delivery types reported receiving a supportive supervision visit in the previous three months at time of survey. Level I and level II health facilities reported the most supervision, decreasing at community-based care level. However, the focus on malaria topics within supervision visits was limited for primary health clinics, CHWs, and pharmacies (**figure 7.4.3**). Of those that received a supervision only CHWs were dissatisfied with the supervision received (25%) (**figure 7.4.4**).

Prevention

- IPTp was predominantly reported as being delivered at level I and II health facilities in line with guidelines (**figure 7.1.3**) (1). However reported stock outs of SP at primary health clinics was high (89%) (**figure 7.2.3**).
- ITNs were generally available at level I and level II health facilities for distribution during the time of survey but were largely not being distributed through community-based care providers (**figure 7.1.3**), and no private sector pharmacies had ITNs in stock (**figure 7.2.3**).

9. REFERENCES

1. National Guidelines for Diagnosis and Treatment of Malaria. Fourth ed. Abuja, Nigeria: Federal Ministry of Health; 2020. p. 1-79.
2. Guidelines for the treatment of malaria. Third ed. Geneva: World Health Organization; 2015. p. 1-317.
3. World malaria report. Geneva: World Health Organization; 2019.

SuNMaP 2 Longitudinal Study
London School of Hygiene & Tropical Medicine
Keppel Street, London, WC1E 7HT, UK

www.lshtm.ac.uk/research/centres-projects-groups/sunmap2-longitudinal-study