



ACTWATCH LITE BENIN 2023

Survey of the private sector market for antimalarial drugs and malaria rapid diagnostic tests (RDTs) in Benin 2023



December 5, 2023



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ACRONYMS

ABMed	Agence Béninoise du Médicament et des autres produits de santé (Benin Drug and Health Products Agency)
ABMS	Association Béninoise pour le Marketing Social (Beninese Association for Social Marketing)
AL	Artemether lumefantrine
AMFm	Affordable Medicines Facility - malaria
ASAQ	Artesunate amodiaquine
CQ	Chloroquine
ACT	Artemisinin-based combination therapy
DHAPPQ	Dihydroartemisinie-piperiquine
DHS	Demographic and Health Survey
GF / FM	Global Fund / Fonds Mondial
GPS	Global Positioning System
LSHTM	London School of Hygiene and Tropical Medicine
LLIN	Long-lasting insecticidal net
WHO	World Health Organization
NGO	Non-governmental organization
POS	Point of sale
PMI	President's Malaria Initiative
NMCP	National Malaria Control Program
PPS	Probability proportional to size
PSI	Population Services International
SP	Sulfadoxine-Pyrimethamine
RDT	Rapid diagnostic test

DEFINITIONS

Antimalarial	Drugs used for the short-term treatment and prevention of malaria. Medicines used solely for the prevention of malaria have been excluded from the analysis of key indicators in this report.
Artemisinin monotherapy	An antimalarial drug with a single active compound, where the active compound is artemisinin or one of its derivatives.
Artemisinin and its derivatives	Artemisinin is a plant extract or synthetic plant extract used in the treatment of malaria. The most common artemisinin derivatives used to treat malaria are artemether, artesunate and dihydroartemisinin.
Oral artemisinin monotherapy	Artemisinin or one of its derivatives administered orally. These include tablets, suspensions and syrups, but exclude suppositories and injections.
Prequalified artemisinin-based combination therapies (ACTs)	Pre-qualified ACTs comply with the WHO quality assurance policy. A pre-qualified ACT is any ACT that was on the WHO indicative list prior to data collection (see : https://extranet.who.int/prequal/medicines/prequalified/finished-pharmaceutical-products) or previously had C status in a previous Global Fund quality assurance policy. An antimalarial product that is not WHO prequalified does not necessarily mean that it is not of good quality.
ACTs registered nationwide	ACTs registered with ABMed (Agence Béninoise du Médicaments et des autres produits de santé), Benin's national pharmaceutical regulatory authority) and authorized for sale or distribution in Benin. Each country determines its own criteria for including a drug on its national list.
Adult equivalent treatment dose (AETD)	An AETD is the dosage (total number in milligrams (mg)) of an antimalarial drug needed to treat a 60 kg adult (see Annex 8: AETD (ADULT EQUIVALENT TREATMENT DOSE)).
Booster sample	A "booster" sample was selected by extending the primary sampling unit to a higher administrative unit for sampling certain types of outlets. This extension provided a larger sample size for specific outlets. For this survey, a "booster" sample was selected for pharmacies and pharmaceutical depots. The administrative unit for these types of outlets was extended beyond the arrondissement to the commune. See Annex 3 for a detailed description of sampling methods.
Cluster	The primary sampling unit, or cluster, for the exit survey. This is an administrative unit determined by the Ministry of Health, with a population of around 10,000 to 15,000. In Benin, the cluster was defined by the arrondissement.
Census group	A district where field teams carried out a complete census of all outlets likely to sell anti-malarial drugs.
Monotherapy	An antimalarial drug with a single mode of action. It may be a drug with a single active compound, or a synergistic combination of two compounds with related mechanisms of action.
Point of sale (POS)	Any point of service or point of sale for goods. Points of sale are not limited to fixed outlets and can include mobile units or individuals.
Retail outlets eligible for the study	Outlets received a full questionnaire if they met at least one of the following three inclusion criteria: (1) had one or more antimalarials in stock at the time of the survey; or (2) had one or more antimalarials in stock during the previous three months; or (3) provided blood tests for malaria diagnosis (microscopy

	or rapid tests) without having antimalarials in stock. Outlets providing services to specific populations (e.g. the army and military clinics) were excluded from the study.
Dosage/therapeutic regimen	The dosage or administration time and number of doses of an antimalarial drug used to treat malaria. This schedule often varies according to the patient's weight.
Prequalified RDT	Prequalified RDTs are RDTs that comply with WHO quality assurance policy. A pre-qualified RDT is one that was on the WHO indicative list prior to data collection (see here)
Artemisinin-based combination therapy (ACT)	An antimalarial drug that combines artemisinin or one of its derivatives with one or more antimalarial drugs from a different class.
First-line treatment	The government has recommended treatment for uncomplicated malaria. The treatment options in Benin for uncomplicated malaria are lumefantrine artemether and pyronaridine artesunate.
Severe malaria treatment	The WHO recommends intravenous or intramuscular artesunate as first-line treatment in the management of severe <i>P. falciparum</i> malaria. If artesunate is not available, artemether should be used in preference to quinine to treat severe malaria. Rectal artesunate is suitable for pre-referral treatment of children under 6 years of age.
Non-artemisinin treatment	An antimalarial drug that does not contain artemisinin or one of its derivatives.
Sales outlet types	
Faith-based / private not-for-profit healthcare facilities	Faith-based hospitals or clinics run by qualified health professionals registered with the Ministry of Health. A service fee is usually charged.
Private for-profit healthcare facilities	Private hospitals, clinics and diagnostic laboratories operated by healthcare professionals trained and registered with the Ministry of Health. Medical consultations, diagnosis and treatment are provided at cost price.
Pharmacies (Approved pharmacies)	Pharmacies are authorized and regulated by ABMed to dispense health products on prescription and by advice at a commercial rate. They are managed by pharmacists and qualified healthcare professionals, and are generally located in urban areas.
Pharmaceutical depots	These establishments are located mainly in rural areas with no access to pharmacies. They are licensed and regulated by ABMed, and are linked to local pharmacies where they obtain their supplies of essential medicines.
General retailers	Grocery stores, stores, mini-markets, kiosks and market stalls selling fast-moving consumer goods.
Itinerant vendors	Mobile vendors generally operate in urban markets. They are not registered with any national regulatory authority.
Wholesalers	ACTwatch Lite has identified a number of officially registered importer-wholesalers. These are large organizations whose official mandate is to import and supply pharmaceutical products to Benin. These wholesalers are likely to have a main office in a major city and branches elsewhere in the country.

Other suppliers	Outlets other than importer-wholesalers have played a role in the supply of antimalarials in Benin. These were either identified by other outlets as their source of supply, or identified themselves during the outlet survey as suppliers to other types of outlets. These outlets were often pharmacies supplying private non-profit or for-profit health establishments.
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INTRODUCTION

This report is a detailed presentation of the ACTwatch Lite 2023 survey in Benin. This is the first ACTwatch Lite series, but follows on from previous ACTwatch surveys conducted in 2008, 2009, 2011, 2014 and 2016 in Benin.

ACTwatch Lite is a pilot research project implemented by the non-governmental organization Population Services International (PSI). The project builds on previous ACTwatch tools and methodologies and aims to create a WHO-approved toolkit available for measuring private sector malaria markets.

The ACTwatch Lite 2023 study in Benin was implemented against a backdrop of changes in Benin's healthcare system and national policy, and with the aim of understanding the state of its antimalarial medicines and malaria diagnostics markets seven years after the last similar national study carried out in 2016.

Notable changes likely to have affected the Benin market for private-sector malaria treatment and testing during this period include:

1. The implementation of the international operation Pangea IX initiated by the International Criminal Police Organization (ICPO-Interpol) to combat pharmaceutical crime and launched by Benin in February 2017,
2. The reorganization of pharmaceutical activities in the Republic of Benin under Law N°2021-3 of February 01, 2021, stipulating that the opening and operation of any industrial pharmaceutical establishment is subject to obtaining a license issued by the Ministry of Health.
3. Establishment of a national map of pharmaceutical depots and programming of areas for the creation of said depots in accordance with Ministerial Order N°0124/MS/DC/SGM/CJ/ABRP/SA/116SGG22 of December 27, 2022.

In Benin, the distribution of medicines takes place within the context of a liberal market economy and is governed by several laws and regulations governing the production, import and distribution of medicines. Marketing authorization is issued by the *Agence Béninoise du Médicament et des autres produits de santé* (ABMed). This authorization is acquired following an approval process conducted by ABMed. An antimalarial drug's marketing authorization is not necessarily conditional on obtaining World Health Organization (WHO) prequalification. The price of anti-malarial drugs and the profit margins of those involved in wholesale and retail distribution are regulated by the Beninese government through ABMed at the time of application for marketing authorization or its renewal. Wholesale drug distribution in the private sector is mainly managed by private wholesale distributors for dispensing pharmacies and large public hospital pharmacies. However, the latter can also obtain supplies from the *Société Béninoise pour l'Approvisionnement en Produits de Santé* (SOBAPS), under well-defined conditions controlled by ABMed. However, SOBAPS is not authorized to supply antimalarial drugs to dispensing pharmacies.

The distribution of subsidized antimalarial drugs is supervised by the National Malaria Control Program (NMCP), with distribution support from SOBAPS. These antimalarial drugs, mainly artemisinin-based combination therapies (ACTs), most of which are WHO prequalified, are almost exclusively reserved for use in public health facilities. Exceptionally, however, some private establishments may have access to these subsidized ACTs, with the authorization of the NMCP and under very specific conditions.

This document presents the results of the ACTwatch Lite study conducted in Benin in 2023.

STUDY METHODS AND DATA COLLECTION

ACTwatch Lite is a cross-sectional market survey of retail and wholesale sellers and importers in the supply chain, assessing a set of core indicators (availability, price and market share of antimalarial products) in three countries (Benin, Cameroon and Nigeria). In Benin, training and data collection for the study took place from June 12 to July 19, 2023. A more complete description of the study design and methodology is presented in annexes 3 and 4. A representative sample of urban and rural districts was taken with probability of selection proportional to population size.

In the selected clusters, a census of all eligible outlets likely to sell or distribute antimalarials and/or provide malaria blood tests was carried out. During data collection, information on the most common wholesale

purchasing sources of retail outlet providers was used to generate a real-time sampling frame for the selection of wholesalers for the study. Supply chain data were supported by semi-structured interviews with importers of antimalarials and rapid diagnostic tests (RDTs) at the top of the national supply chain. Digital questionnaires were used, with a database of pre-registered basic antimalarial products, comprehensive internal logic checks and mandatory indicators to reduce data collection time and minimize data entry errors. Remote data quality control and data processing ensured that data was cleansed in real time, considerably reducing the time needed to generate key market performance indicators in a decision-ready format.

A note on the results in this report :

We have provided multi-year comparisons for some key indicators. These are based on data reported in previous ACTwatch studies. See psi.org/actwatch-lite for more information on the methods and results of previous studies.

This document is a comprehensive reference for the 2023 study. Please refer to the appendices for more information on the background, design, implementation and data analysis of the study.

Gray text for data appearing in report tables indicates that the estimate provided has been derived from a small sample. Specifically, gray text is used to indicate point estimates derived from an N of fewer than 50 and median prices derived from an N of fewer than five.

Figure 1: Map of study sites

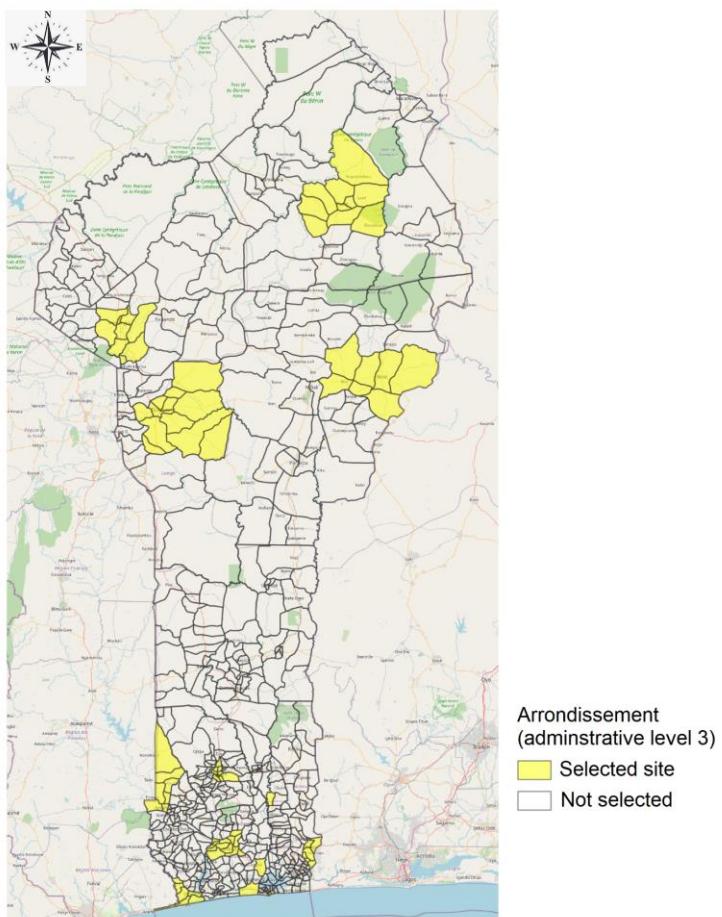
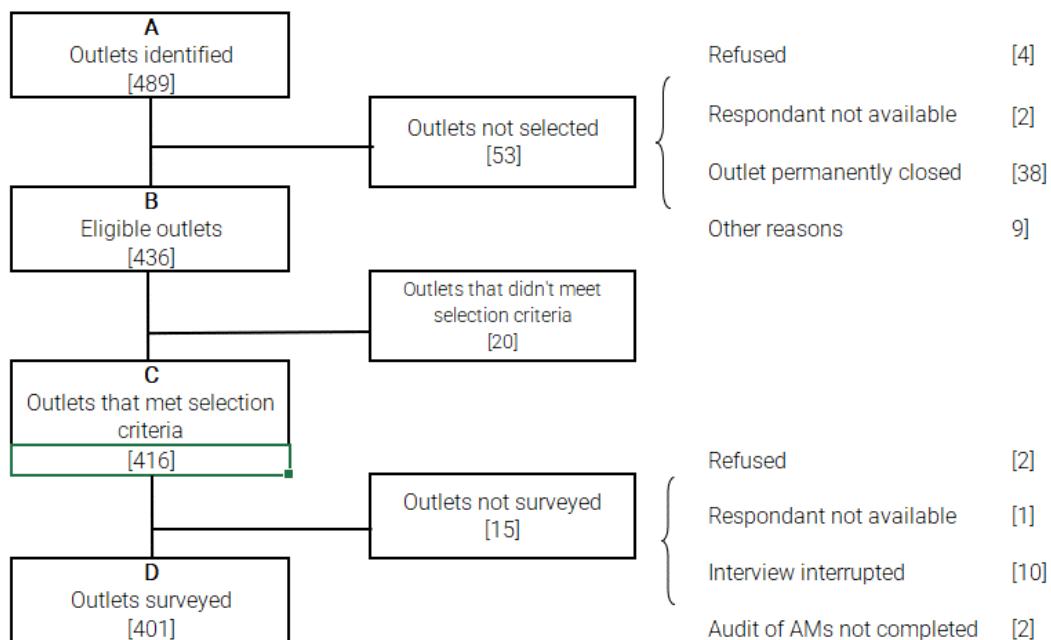


Figure 2: Survey flow chart



*Identified as outlets likely to sell or distribute antimalarials and/or perform malaria blood tests during census or recall sampling.

Questions were asked to assess the current or recent availability (previous 3 months) of antimalarial drugs and blood tests for malaria (microscopy or rapid diagnostic test). * A partial or complete interview was carried out with a sales representative.

KEY RESULTS

Table S1 Main results

	Retail								Suppliers		
	Formal				General retailer	Informal		Retail Outlet Total	Wholesalers	Other supplier	Suppliers ^A Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutical depot	Formal Total		Itinerant vendor	Informal Total				
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Percentage of outlets surveyed * stocking	N=25	N=211	N=145	N=381	N=34	N=18	N=52	N=433	N=4	N=65	N=69
Any malaria-related blood test	91.3 (74.0, 97.5)	88.4 (81.4, 93.0)	1.2 (0.2, 5.6)	54.9 (48.4, 61.3)	1.6 (0.2, 11.2)	0.0 -	1.2 (0.2, 7.8)	47.4 (40.7, 54.1)	0.0 -	5.4 (1.9, 14.5)	5.1 (1.8, 13.7)
At least one antimalarial available on the day of the survey	94.0 (74.5, 98.8)	80.4 (74.4, 85.3)	99.7 (98.2, 99.9)	88.9 (85.4, 91.6)	51.9 (21.6, 80.8)	95.4 (72.9, 99.4)	63.3 (29.4, 87.7)	85.3 (76.9, 91.0)	62.6 (16.2, 93.5)	100.0 -	97.8 (87.1, 99.6)
At least one ACT-type antimalarial drug	82.2 (54.8, 94.6)	55.3 (44.5, 65.6)	98.6 (94.9, 99.6)	74.0 (67.1, 79.9)	24.6 (7.5, 56.5)	41.8 (13.0, 77.5)	29.1 (11.0, 57.7)	67.7 (59.4, 75.0)	62.6 (16.2, 93.5)	97.5 (87.3, 99.5)	95.4 (85.4, 98.6)
At least one nationally approved ACT antimalarial drug#	81.4 (54.4, 94.1)	49.1 (38.0, 60.2)	97.5 (93.9, 99.0)	70.2 (63.1, 76.5)	0.0 -	20.2 (6.9, 46.4)	5.3 (1.2, 20.1)	61.1 (53.2, 68.4)	62.6 (16.2, 93.5)	97.5 (87.3, 99.5)	95.4 (85.4, 98.6)
At least one WHO-prequalified ACT antimalarial drug ^Y	71.7 (49.4, 86.8)	48.5 (36.4, 60.7)	95.7 (90.9, 98.0)	68.5 (60.8, 75.3)	12.0 (3.2, 35.9)	35.2 (11.7, 69.0)	18.1 (6.6, 40.9)	61.4 (52.9, 69.2)	62.6 (16.2, 93.5)	95.8 (86.3, 98.8)	93.8 (84.1, 97.7)
Sulfadoxine pyrimethamine	20.6 (8.0, 43.7)	11.1 (7.1, 16.9)	77.0 (68.7, 83.6)	37.3 (32.0, 42.9)	33.9 (13.7, 62.3)	7.7 (1.7, 28.6)	27.0 (13.6, 46.4)	35.8 (29.9, 42.2)	27.8 (4.1, 77.5)	78.8 (68.6, 86.3)	75.7 (65.3, 83.8)
At least one treatment for severe malaria	65.8 (45.6, 81.6)	49.4 (41.0, 57.9)	86.0 (79.2, 90.8)	64.8 (58.7, 70.3)	1.6 (0.2, 11.2)	0.0 -	1.2 (0.2, 7.8)	55.8 (48.6, 62.8)	42.6 (9.6, 83.8)	93.2 (80.0, 97.9)	90.2 (78.8, 95.8)
Percentage of outlets with at least one antimalarial on the day of the survey stocking**:	N=24	N=167	N=143	N=334	N=21	N=17	N=38	N=372	N=3	N=65	N=68
Any malaria-related blood test	87.9 (63.1, 96.8)	91.4 (84.4, 95.4)	1.2 (0.2, 5.6)	46.8 (41.0, 52.7)	3.2 (0.6, 16.1)	0.0 -	1.9 (0.3, 10.5)	41.5 (36.7, 46.5)	0.0 -	5.4 (1.9, 14.5)	5.2 (1.8, 14.0)
At least one ACT-type antimalarial drug	87.5 (67.4, 95.9)	68.7 (56.4, 78.9)	98.9 (94.4, 99.8)	83.3 (76.6, 88.3)	47.3 (25.0, 70.8)	43.8 (13.6, 79.5)	45.9 (25.2, 68.1)	79.4 (73.6, 84.1)	100.0 -	97.5 (87.3, 99.5)	97.6 (87.7, 99.6)
At least one nationally approved ACT antimalarial drug#	86.6 (66.5, 95.4)	61.2 (48.4, 72.6)	97.9 (94.0, 99.3)	79.1 (72.1, 84.7)	0.0 -	21.2 (7.3, 47.9)	8.4 (2.4, 25.3)	71.7 (65.5, 77.1)	100.0 -	97.5 (87.3, 99.5)	97.6 (87.7, 99.6)
At least one WHO-prequalified ACT antimalarial drug ^Y	76.3 (58.0, 88.3)	60.3 (45.7, 73.2)	96.0 (91.1, 98.3)	77.0 (69.2, 83.4)	23.2 (9.2, 47.4)	36.9 (12.3, 70.9)	28.6 (14.4, 48.9)	72.0 (64.6, 78.3)	100.0 -	95.8 (86.3, 98.8)	95.9 (86.8, 98.8)
Sulfadoxine pyrimethamine	21.9 (8.6, 45.4)	13.8 (8.9, 20.9)	77.2 (68.9, 83.8)	41.9 (36.1, 48.0)	65.3 (45.7, 80.7)	8.1 (1.8, 30.1)	42.6 (26.3, 60.7)	42.0 (36.0, 48.3)	44.4 (7.9, 88.1)	78.8 (68.6, 86.3)	77.5 (67.1, 85.3)
At least one treatment for severe malaria	70.0	61.4	86.2	72.9	3.2	0.0	1.9	65.5	68.1	93.2	92.3

	Retail								Suppliers		
	Formal				General retailer	Informal		Retail Outlet Total	Wholesalers		Suppliers ^A Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutical depot	Formal Total		Itinerant vendor	Informal Total		Wholesalers	Other supplier	
	%	%	%	%	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)
	(47.6, 85.7)	(50.8, 71.1)	(79.4, 91.1)	(66.1, 78.7)	(0.6, 16.1)	-	(0.3, 10.5)	(59.2, 71.2)	(18.7, 95.2)	(80.0, 97.9)	(80.5, 97.2)
Market share, by type of outlet	%	%	%	%	%	%	%	%			
WHO-prequalified ACT market share Ψ	1.8	6.2	19.0	27.0	0.2	0.1	0.3	27.3	-	-	-
Price in FCFA	Median	Median	Median	Median	Median	Median	Median	Median	Median	Median	Median
	[IQR] (N)	[IQR] (N)	[IQR] (N)	[IQR] (N)	[IQR] (N)	[IQR] (N)	[IQR] (N)	[IQR] (N)	[IQR] (N)	[IQR] (N)	[IQR] (N)
1 WHO-prequalified adult ACT AETD Ψ	600.00 FCFA [600.00-800.00] (47)	666.67 FCFA [600.00-1000.00] (198)	2407.50 FCFA [2280.00-2920.00] (1,735)	2335.00 FCFA [1810.00-2880.00] (1,980)	1000.00 FCFA [1000.00-1000.00] (4)	800.00 FCFA [800.00-800.00] (9)	800.00 FCFA [800.00-1000.00] (13)	2335.00 FCFA [1751.25-2880.00] (1,993)	-	-	-
1 Adult SP AETD	1.50 FCFA (1)	500.00 FCFA [500.00] (11)	490.00 FCFA [400.00-500.00] (292)	490.00 FCFA [400.00-500.00] (304)	300.00 FCFA [250.00-500.00] (13)	450.00 FCFA [250.00-450.00] (2)	300.00 FCFA [250.00-450.00] (15)	480.00 FCFA [385.00-500.00] (319)	-	-	-
Pre-packaged (WHO pre-qualified) pediatric AL γ	40.29 FCFA [40.29-40.29] (10)	46.33 FCFA [40.29-100.72] (46)	166.18 FCFA [146.04-279.99] (282)	165.18 FCFA [138.41-271.94] (338)	-	-	-	165.18 FCFA [138.41-271.94] (338)			

Abbreviations: RDT = rapid diagnostic test; ACT = artemisinin-based combination therapy.

* The denominator includes 13 outlets who met the selection criteria for an interview, but did not complete the full interview (i.e. were not interviewed or only completed a partial interview).

*** Retail outlets stocking antimalarials had at least one antimalarial in stock on the day of the survey, which was verified by the presence of at least one antimalarial recorded on the audit sheet.

^A the "suppliers" category includes wholesalers who supply only to retail outlets, and "other suppliers", who are retail outlets that supply both other retail outlets and the public.

β other ACTs included: AL, DHAPPQ, Arterolane-PPQ, ASSP and include ASMQ, AS-pyronaridine, DHA-PPQ-Trim

+ At the time of the 2023 ACTwatch Lite study in Benin, AL and ARPPQ were first-line treatments for uncomplicated malaria.

Ψ Prequalified ACTs are products that appear on the 2023 WHO prequalified list.

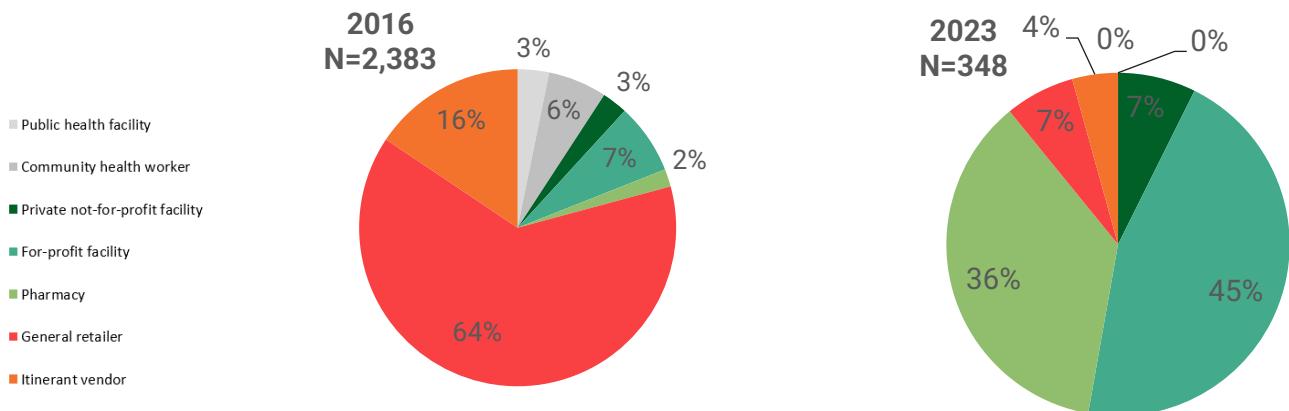
Nationally approved ACTs are those on the 2023 list of approved antimalarials in Benin

\checkmark Other non-artemisinin therapies i.e. other than SP, quinine and chloroquine

\forall At the time of the 2023 ACTwatch Lite study in Benin, injectable artesunate was the first-line treatment for severe malaria.

Figure 3 Market composition: Breakdown by outlet type, 2016 vs.2023

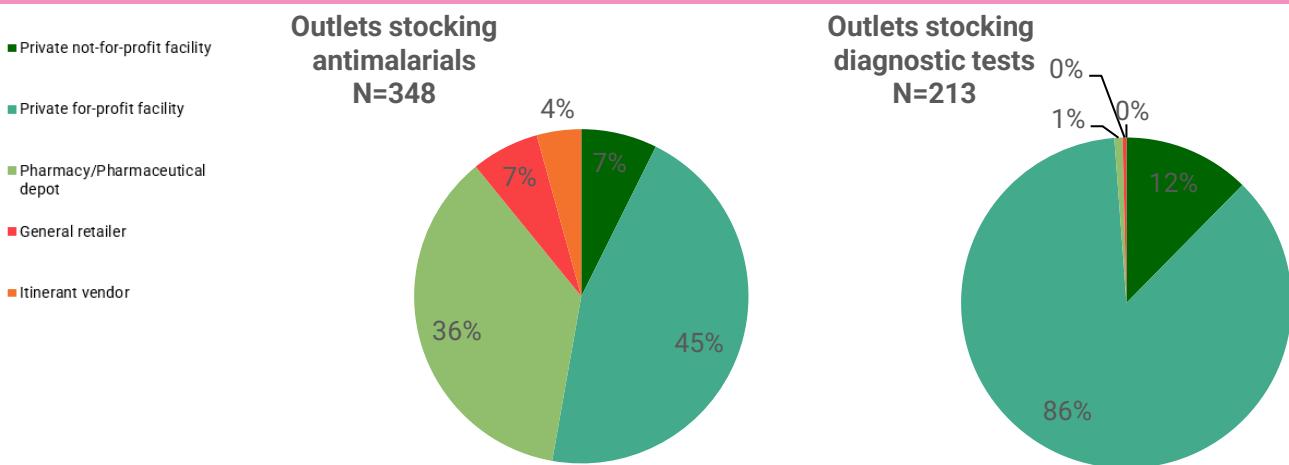
Among all retail outlets with at least one antimalarial in stock



The private sector accounted for over 90% of antimalarial drug retail outlets in 2016, while in 2023, the study included only the private sector. In 2016, the informal private sector accounted for a significant share of the total market of 80%, however by 2023 it represented just 11%. Private for-profit health centers and pharmacies were the most common types of antimalarial drug retail outlets in the 2023 survey, accounting for 45% and 36% of the market, respectively.

Figure 4 Market composition: distribution of outlet types, 2023

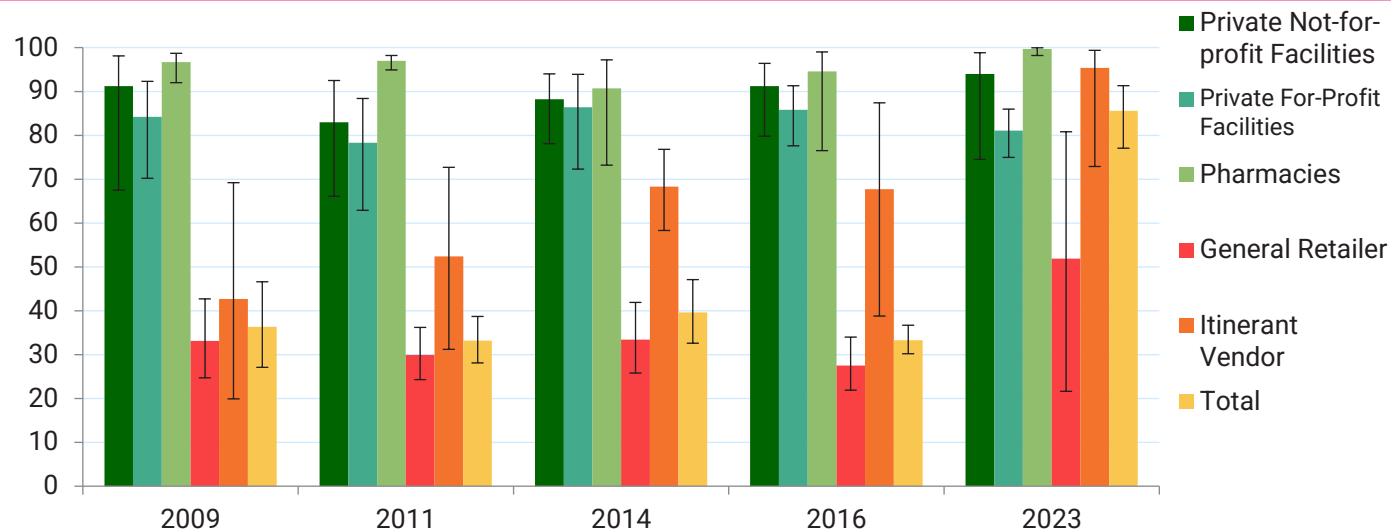
Among all outlets stocking at least one antimalarial drug or stocking at least one diagnostic test



In 2023, most outlets stocking anti-malarial drugs came from the formal private sector, 81% being private for-profit facilities or pharmacies, with the informal sector accounting for just 11% of outlets. As for outlets stocking malaria diagnostic tests (rapid tests and microscopy), almost all (99%) came from the formal sector (86% were private for-profit facilities and 12% non-profit facilities).

Figure 5 Percentage of private-sector outlets with at least one antimalarial in stock on the day of the survey, 2009-2023

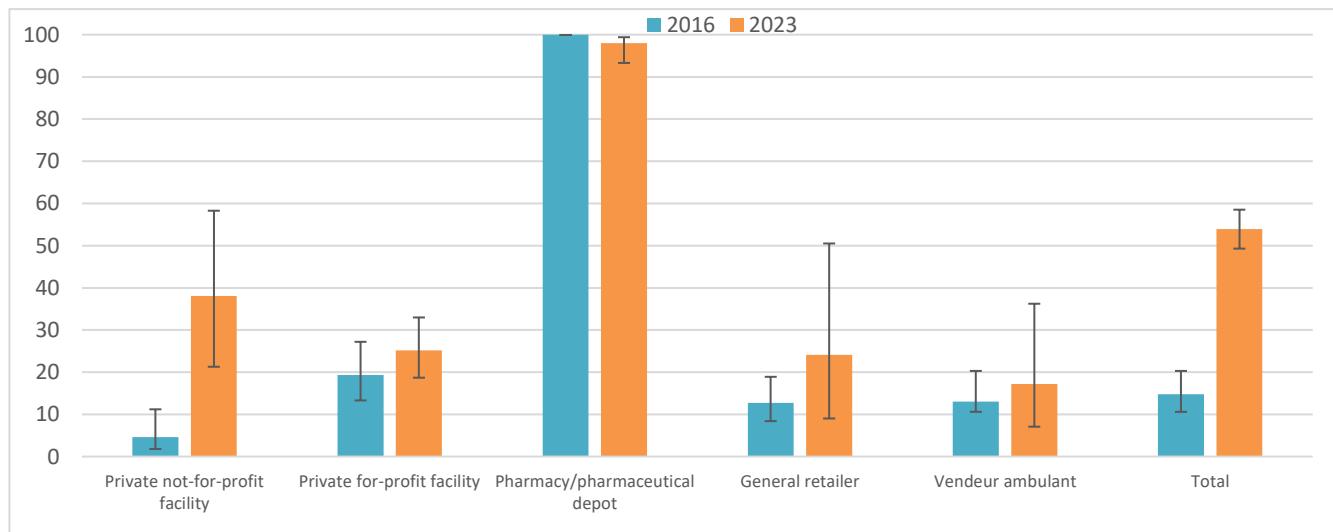
Among all the outlets audited, across survey rounds



Between 2009 and 2023, there was little change in the availability of antimalarial drugs in stock at all outlets in the formal private sector (not-for-profit facilities, for-profit facilities and pharmacies). In 2023, over 99% of pharmacies visited had at least one antimalarial in stock. The apparent increase in the availability of antimalarials in the informal private sector (general retailers and itinerant vendors) is explained by the sharp reduction in the number of informal outlets in 2023 compared with previous years. These results are therefore likely not comparable for the informal sector. The overall increase in total availability between 2016 and 2023 is also due to this change in market composition.

Figure 6 Percentage of antimalarial retail outlets with ACTs in stock on the day of the survey, 2016 vs. 2023

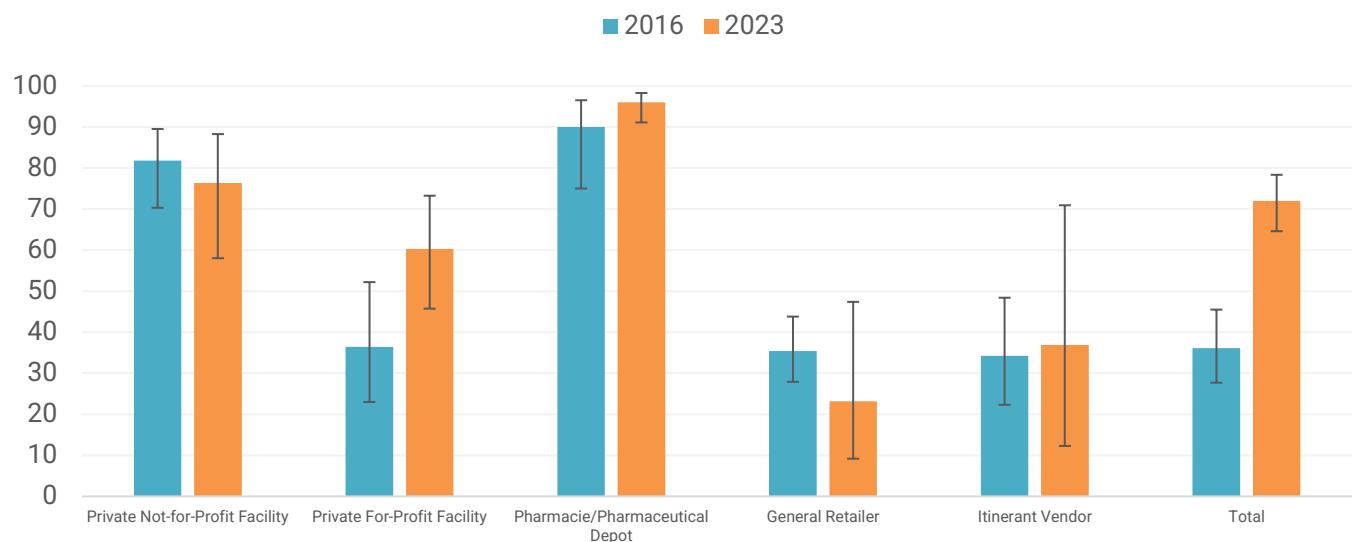
Among all outlets selling antimalarial drugs, across survey rounds



Availability of any artemisinin-based combination therapy (ACT) in all outlets stocking at least one antimalarial on the day of the study increased from 47% to 69% in private for-profit facilities between 2016 and 2023. Availability of ACTs was high in pharmacies (99% in 2023). Less than half of informal outlets had ACTs available in 2016 and 2023. Total availability in all private sector outlets increased from 41% to 79%, but this difference is mainly due to changes in market composition, with significant reductions in the number of informal sector outlets.

Figure 7 Percentage of antimalarial outlets with WHO-prequalified ACTs in stock on the day of the survey, 2016-2023

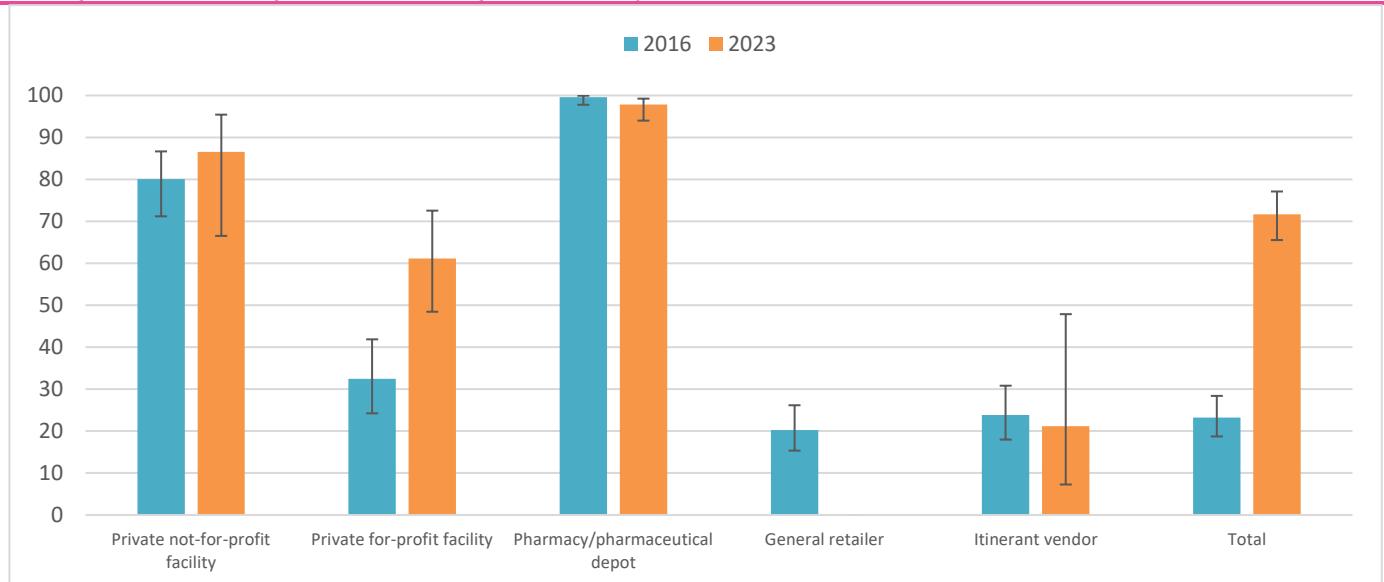
Among all outlets selling antimalarial drugs, across survey rounds



In 2023, the availability of quality-assured (i.e. WHO prequalified) artemisinin-based combination therapies (ACTs) was 76%, 60% and 96% in non-profit, for-profit and pharmacy outlets, respectively. These products were less often available in informal sector outlets, at 23% and 37% in general retailers and itinerant vendors, respectively. Overall, availability of WHO-prequalified ACT in the private sector increased, doubling (from 36% to 72%) across all outlets between 2016 and 2023. This can likely be explained by changes in market composition (a much reduced informal sector) and increased availability in for-profit facilities and pharmacies over the study period.

Figure 8 Percentage of antimalarial drug outlets stocking nationally approved ACTs on survey day 2016-2023

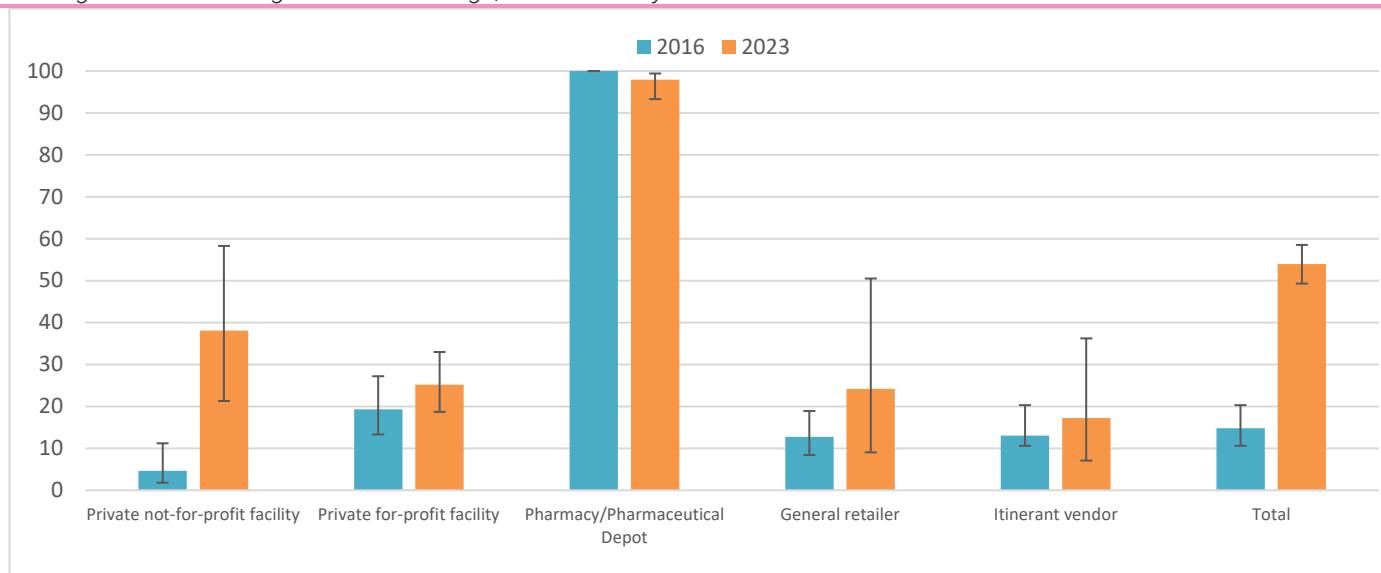
Among all outlets selling anti-malarial drugs, at all survey sites



The availability of a nationally-approved ACTs increased in Benin's private sector between 2016 and 2023, with the biggest increase in private for-profit facilities (from 32% to 61%). The availability of these drugs remained stable in pharmacies over the same period (100% and 98% in 2016 and 2023, respectively). No general retailers had any nationally-approved ACTs in stock on the day of the survey in 2023.

Figure 9 Percentage of antimalarial retail outlets with non-WHO-prequalified ACTs in stock on the day of the survey 2016-2023

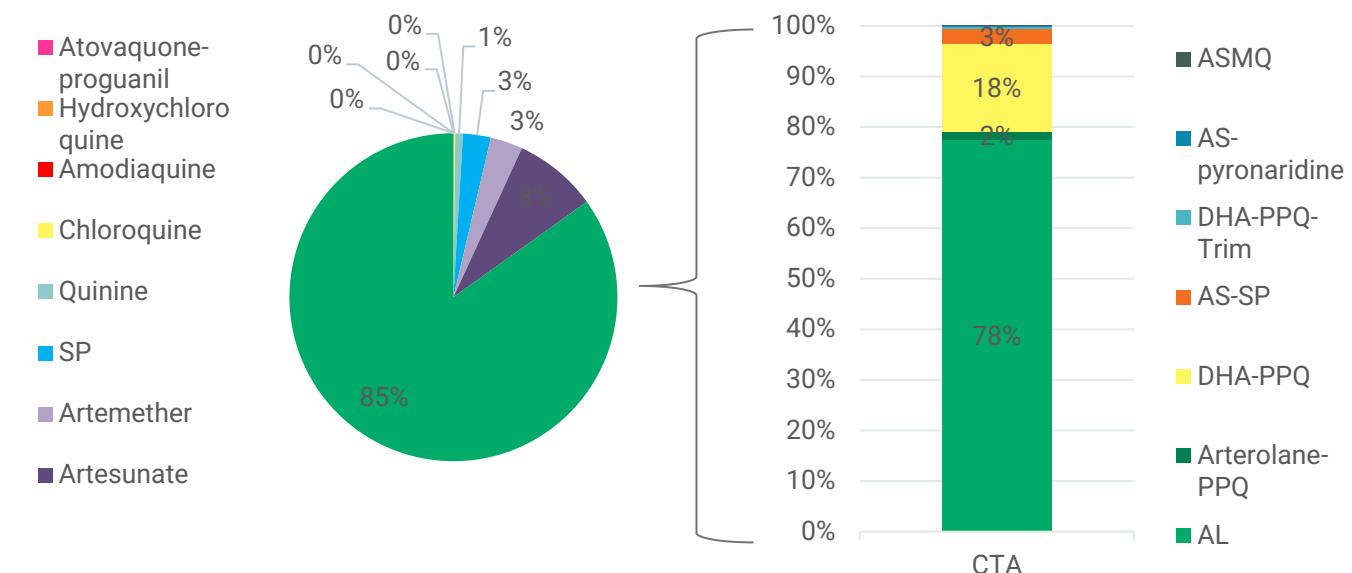
Among all outlets selling antimalarial drugs, across survey rounds



Non-prequalified ACTs are ACTs that do not appear on the WHO prequalification list. Availability of these products increased in Benin's private sector between 2016 and 2023 in all types of outlets except pharmacies, where availability changed little, from 100% to 98%. In the private sector as a whole, the availability of non-prequalified ACTs rose from 15% to 54%. In non-profit private establishments, their availability rose from 5% to 38% between 2016 and 2023.

Figure 10 Types of antimalarial drugs audited in private-sector outlets, 2023

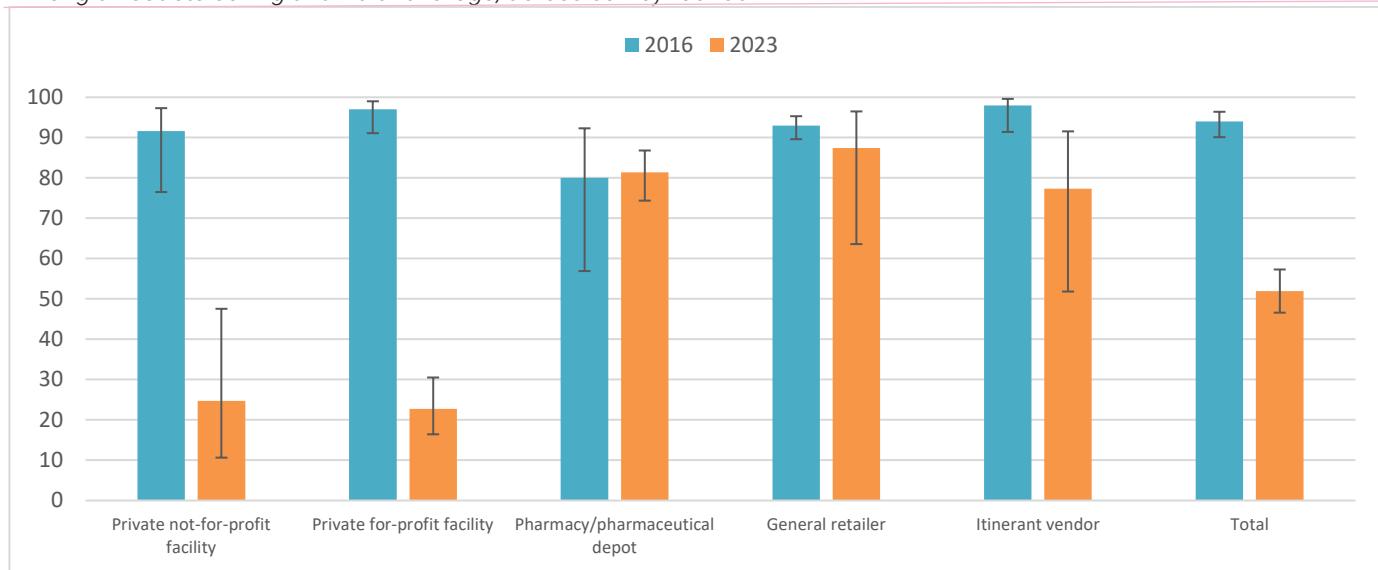
Of all ACT drugs audited, in the sector as a whole



ACTs accounted for 85% of all antimalarial drugs audited in the private sector in 2023 (N= 13,346). Other antimalarials included artesunate (8%), artemether (3%), sulfadoxine-pyrimethamine, SP (3%), quinine (1%) while chloroquine, amodiaquine, hydroxychloroquine, and atovaquone were <1%. Of all the ACTs audited, artemether-lumefantrine, AL was the most common (77%), followed by dihydroartemisinin piperaquine, DHAPPQ (18%). Other ACTs audited included Artesunate + sulfadoxine-pyrimethamine, ASSP (3%) and arterolane piperaquine (2%). At the time of the ACTwatch Lite 2023 study, AL and arterolane- piperaquine were the first-line treatments for uncomplicated malaria in Benin.

Figure 11 Percentage of antimalarial outlets with non-artemisinic antimalarials in stock on the day of the survey, 2016 vs.2023

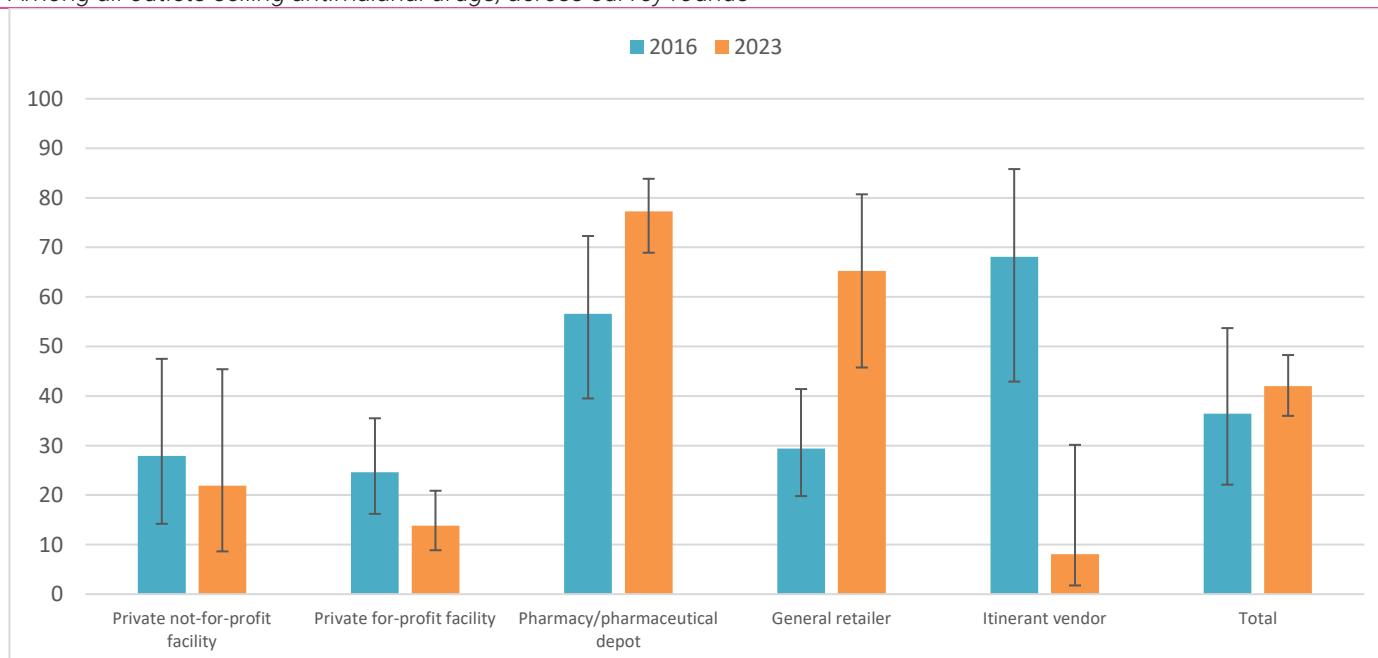
Among all outlets selling antimalarial drugs, across survey rounds



Availability of non-artemisinin therapies (such as SP and quinine) declined overall between 2016 and 2023. The most significant declines were in not-for-profit and for-profit facilities, where the availability of these products fell from 92% to 25% and 97% to 23%, respectively. Little change was observed in pharmacies/pharmacy depots over the same period, with just over 80% having these products in stock during both survey cycles.

Figure 12 Percentage of antimalarial retail outlets with SP in stock on the day of the survey, 2016 vs. 2023

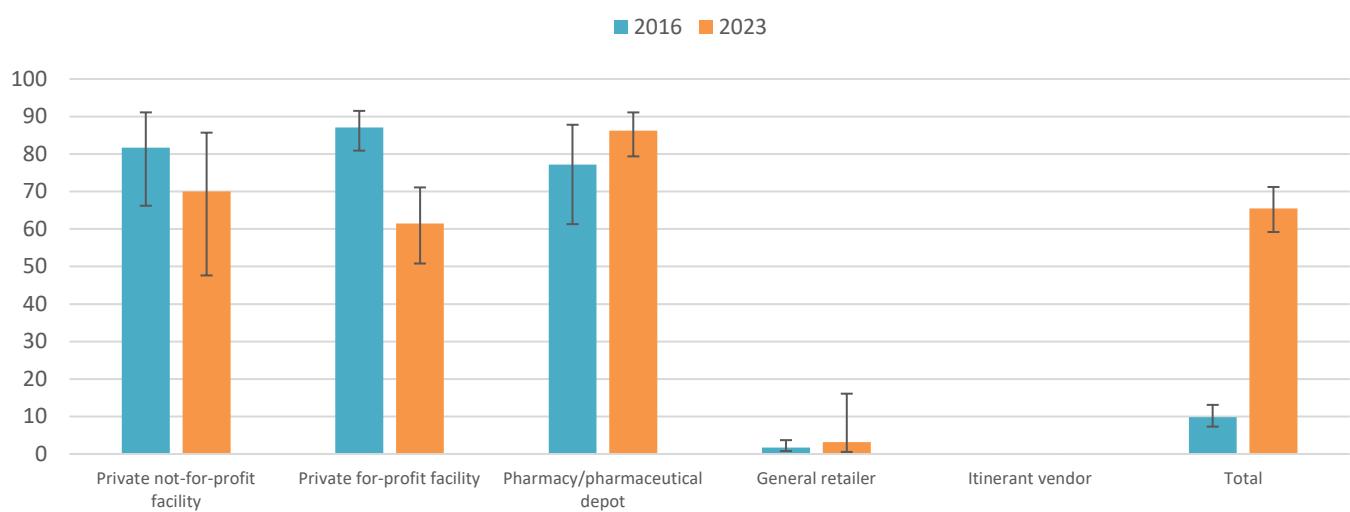
Among all outlets selling antimalarial drugs, across survey rounds



SP is indicated for the chemoprevention of seasonal and perennial malaria (SMC/PMC). Availability of SP remained fairly stable between 2016 and 2023 in the private sector as a whole among outlets with at least one antimalarial in stock, although there were variations according to outlet type. Availability in pharmacies rose from 57% to 77%, while there were slight decreases in private non-profit and for-profit outlets, where availability was 22% and 14% respectively in 2023.

Figure 13 Percentage of antimalarial outlets with severe malaria treatment in stock on survey day 2016 vs.2023

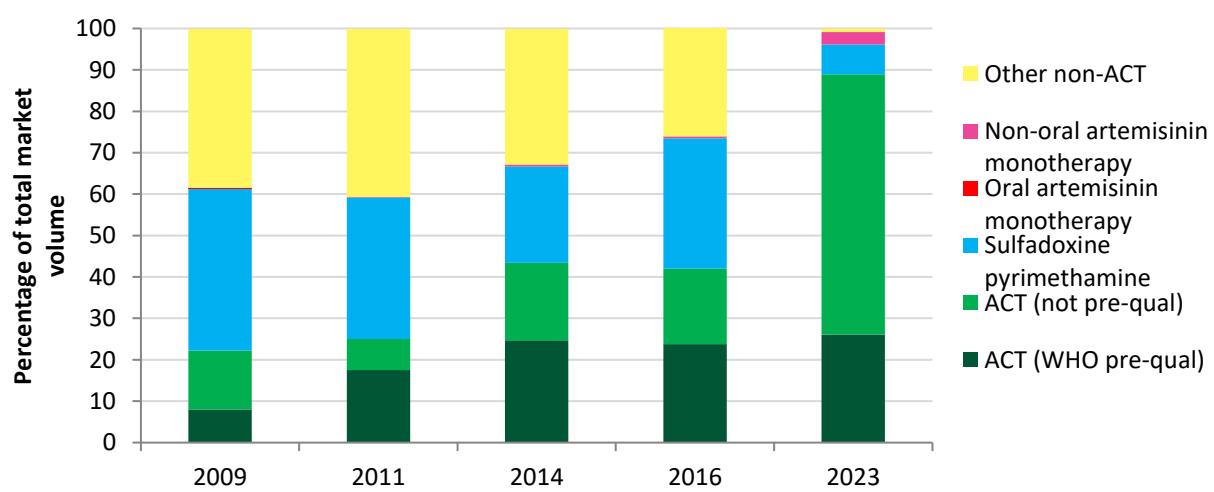
Among all outlets selling antimalarial drugs, across survey rounds



Injectable artesunate was the first-line treatment for severe malaria at the time of the ACTwatch Lite 2023 Benin study, with injectable artemether and quinine indicated as second-line and rectal artesunate as a pre-reference treatment for severe malaria. In all, 65% of private-sector retail outlets offered these products in 2023. Availability of any treatment for severe malaria decreased in for-profit and not-for-profit facilities and increased in pharmacies between 2016 and 2023. The strong increase in availability in the private sector as a whole is due to changes in the composition of the market, with substantial reductions in the number of informal sector outlets in 2023 no longer driving the total percentage down.

Figure 14 Market share of antimalarial drugs, 2009-2023

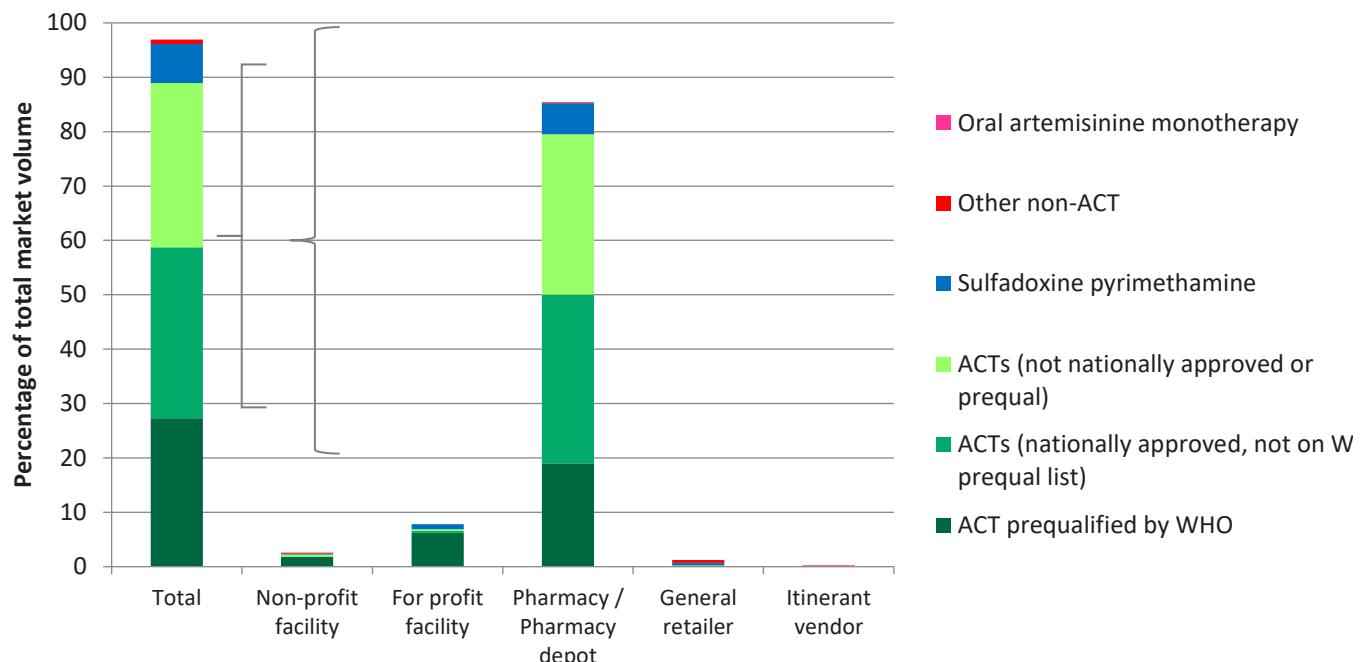
Relative market volume (sales/distribution) of anti-malarial AETDs, by type of anti-malarial and by sector, across survey rounds



The percentage of private-sector market share represented by ACTs has increased over time, with the biggest increase between 2016 and 2023. By 2023, ACTs accounted for 89% of the total private sector market. The market share represented by WHO-prequalified ACTs has also increased each year. By 2023, they accounted for 26% of the total private sector market. SP lost market share between 2016 and 2023, dropping from 32% to 7% of the market, while the market share of non-oral artemisinin-based monotherapies increased. No oral artemisinin-based monotherapies were found in the 2023 study.

Figure 15 Market share of antimalarial drugs, 2023

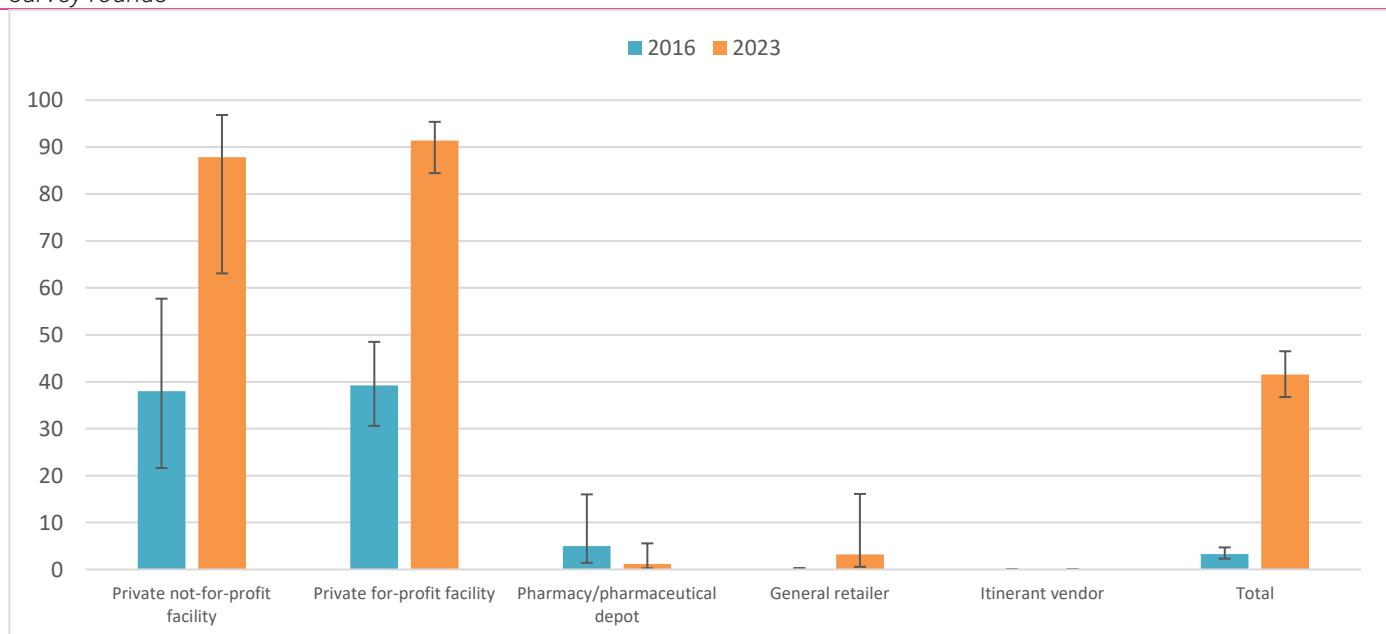
Relative market volume (sales/distribution) of antimalarial AETDs, by antimalarial class and type of outlet



By 2023, 88% of all private-sector distribution of antimalarials was via pharmacies, while for-profit outlets accounted for 9%, non-profit outlets for 3% and the informal sector (general retailers and itinerant vendors combined) for 1% of market share.

Figure 16 Percentage of outlets stocking antimalarials and offering malaria blood tests, 2016 vs. 2023

Among all outlets with at least one antimalarial in stock on the day of the survey or in the last three months, across survey rounds

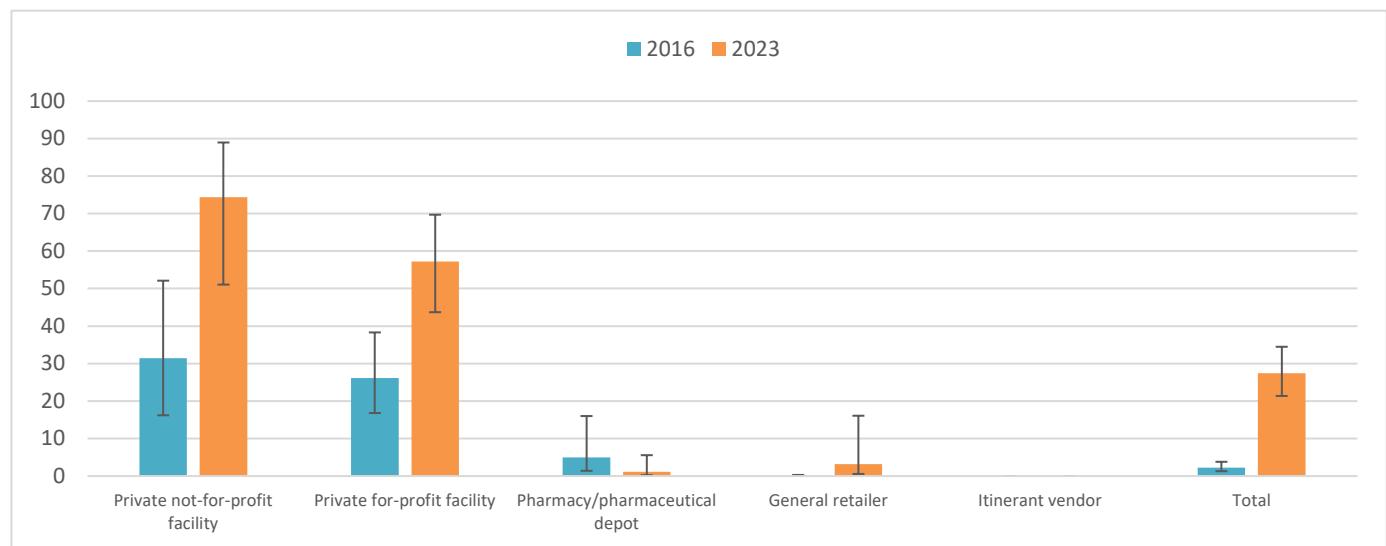


The availability of malaria diagnostic tests (microscopy or rapid diagnostic tests [RDTs]) at antimalarial stocking points increased in the private sector, from 3% to 42% between 2016 and 2023, partly due to changes in market composition

with the decline of the informal sector. The highest levels of availability were in not-for-profit (88%) and for-profit (91%) facilities. Availability was very low in pharmacies (1%).

Figure 17 Percentage of outlets stocking antimalarials and having RDTs for malaria, 2016 vs.2023

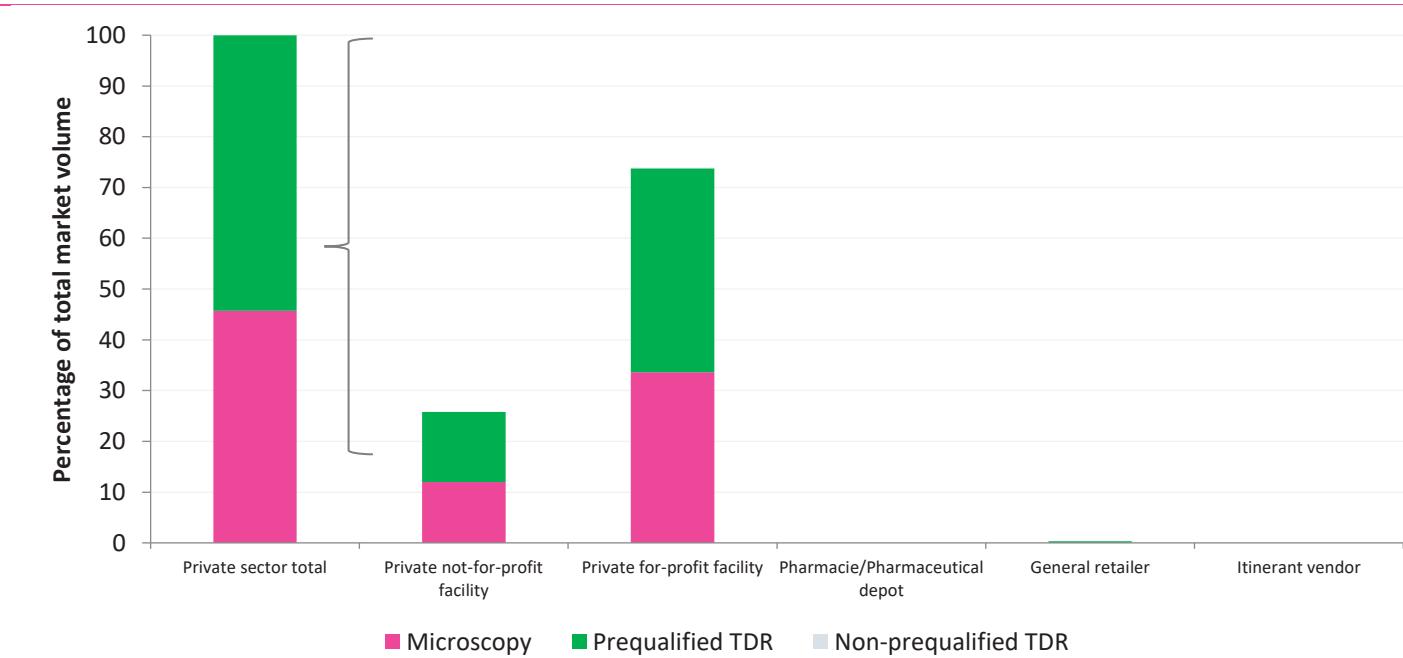
Among all retail outlets with at least one antimalarial in stock on the day of the survey or in the last three months, across survey rounds



Around one in four private facilities had a malaria rapid diagnostic test (RDT) on the day of the study in 2023. RDT availability increased in private not-for-profit (from 31% to 74%) and for-profit (from 26% to 57%) facilities, but decreased in pharmacies (from 5% to 1%) between 2016 and 2023.

Figure 18 Market share of blood tests for malaria, 2023

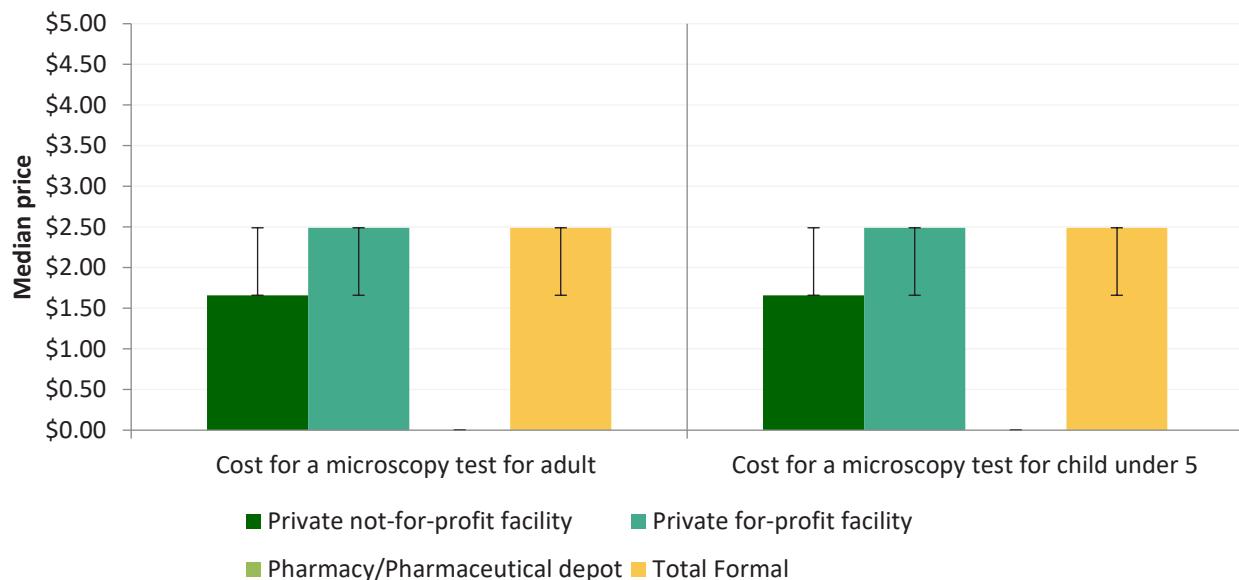
Relative market volume (sales/distribution) of blood tests for malaria by RDT and microscopy, by type of test and outlet



In the private sector, in 2023, microscopy and RDTs will have similar market shares. Most malaria diagnostics are performed in for-profit facilities, which account for almost three-quarters (74%) of the private sector diagnostics market. Not-for-profit facilities account for the remaining 26% of the private diagnostics market.

Figure 19 Reported cost of malaria microscopy tests, 2023

Among all retail outlets performing microscopy tests

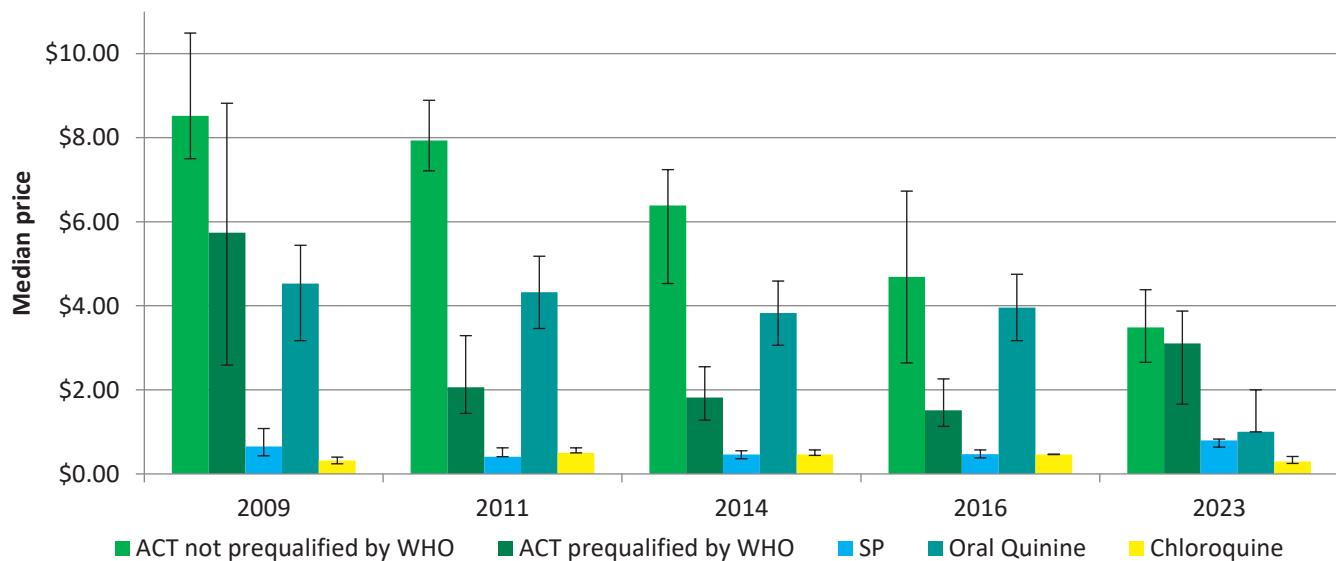


All prices are expressed in USD to allow comparison with previous studies and between countries. FCFA/USD exchange rates for this analysis were calculated using the average value for each study period. For 2023, the rate was 606.804 (OANDA, 2023).

Microscopy tests (the thick drop or blood smear) were only carried out in private not-for-profit and for-profit outlets (not in pharmacies or informal outlets). The median price of a malaria microscopy test was 1.66 USD (**503.65 FCFA**) in not-for-profit outlets and 2.49 USD (**1510.94 FCFA**) in for-profit outlets for both adults and children.

Figure 20 Median price for equivalent doses of adult antimalarial treatment (AETD) in the private sector, 2009-2023

Among all tablet formulations of ACT without quality assurance (non-WHO prequalified ACT), ACT with quality assurance (WHO prequalified ACT), sulfadoxine-pyrimethamine (SP), oral quinine and chloroquine available in the private sector, across survey rounds, in 2009 US dollars to account for inflation.

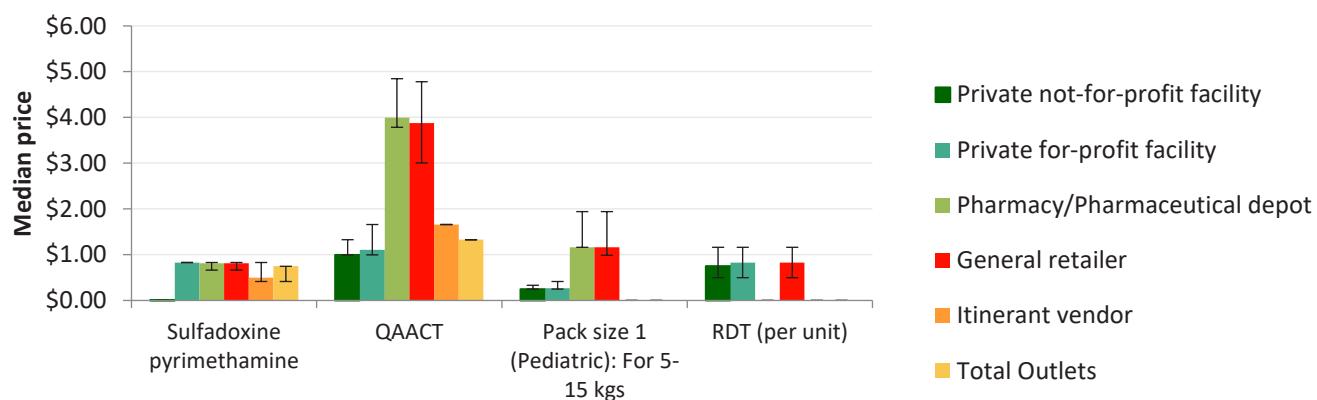


All prices are expressed in USD to allow comparison with previous studies and between countries. FCFA/USD exchange rates for this analysis were calculated using the average value for each study period. For 2009, the rate was 456.617. For 2023, the rate was 606.804 (OANDA, 2023). These values were weighted against the 2009 values.

The median price per AETD in the private sector for non-WHO prequalified ACTs has been steadily decreasing over time. The price of prequalified ACTs (i.e. ACTs on the WHO prequalified list) increased between 2016 and 2023, from \$1.51 (**689.49 FCFA**) to \$3.10 (**1415.51 FCFA**) (prices in 2009 US dollars).

Figure 21 Median private-sector price of antimalarials (standardized AETD), 2023

Among all tablet formulations of SP, QA (prequalified) ACT and PP pediatric QA AL (treatment for a 2-year-old child), available in the private sector, by type of outlet, in 2023 US dollars



All prices are expressed in USD to allow comparison with previous studies and between countries. FCFA/USD exchange rates for this analysis were calculated using the average value for each study period. For 2023, the rate was 606.804 (OANDA, 2023).

The median price of a AETD from a pre-qualified ACT varied between outlet types, with pharmacy prices higher than other private sector outlets (\$4.00 (**2427.22 FCFA**)), \$1.00 (**606.80 FCFA**) and \$1.11 (**673.55 FCFA**) in pharmacies, non-profit and for-profit outlets, respectively). The price of SP was much more similar across outlet types and cheaper than ACTs, at around \$0.80 (**485.44 FCFA**) per AETD. A pre-packaged pediatric dose of prequalified ACT had a median price of \$1.16 (**703.89 FCFA**) in pharmacies, versus \$0.25 (**151.70 FCFA**) in non-profit and for-profit outlets. The median price of a mRDT was \$0.83 (**503.65 FCFA**) in the private sector as a whole.

Figure 22 Availability of main antimalarial products, rural and urban areas

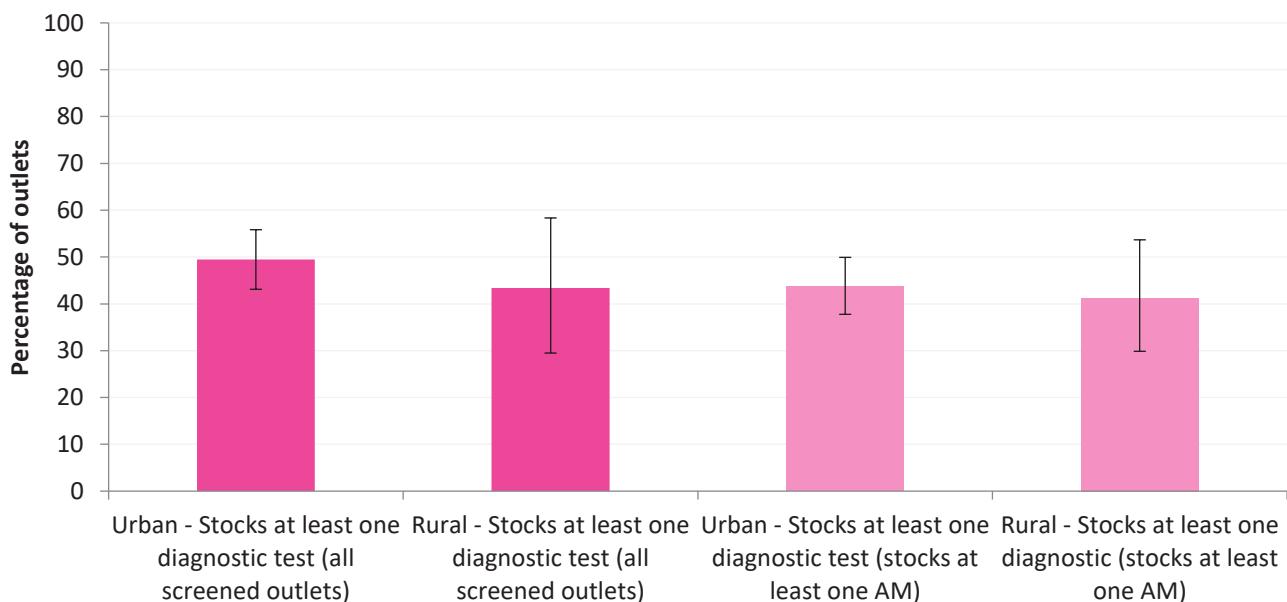
Among all eligible outlets



The ACTwatch Lite 2023 study did not aim to make in-depth comparisons between urban and rural areas. However, overall, the availability of key antimalarial drugs was lower in rural than in urban areas. Among eligible outlets located in urban areas, 89% had an antimalarial in stock on the day of the survey, compared with 78% of rural outlets. The greatest difference was in the availability of treatment for severe malaria, with 66% in urban areas and 34% in rural areas.

Figure 23 Availability of malaria diagnostics by type of outlet, rural and urban areas

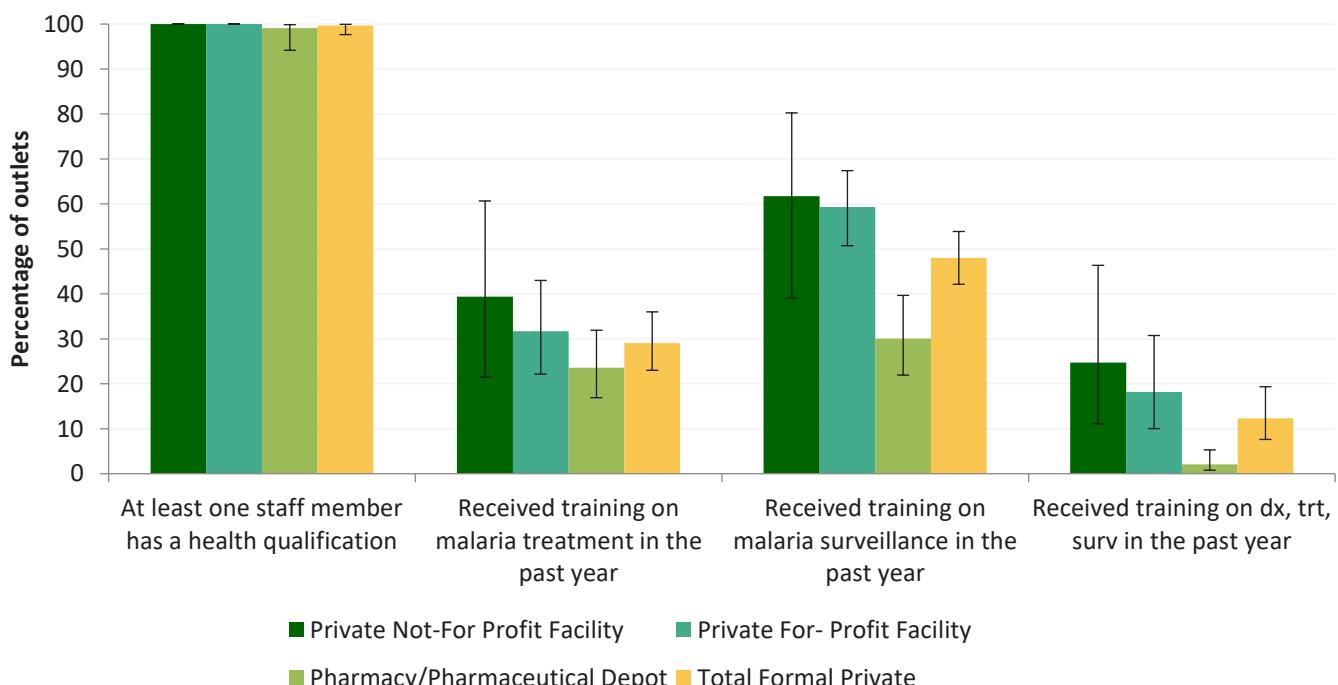
Among all eligible outlets



The availability of malaria diagnostics (microscopy and/or RDT) did not vary significantly between outlets in urban and rural areas. Of all outlets screened, 49% and 43% had diagnostics available in urban and rural areas, respectively.

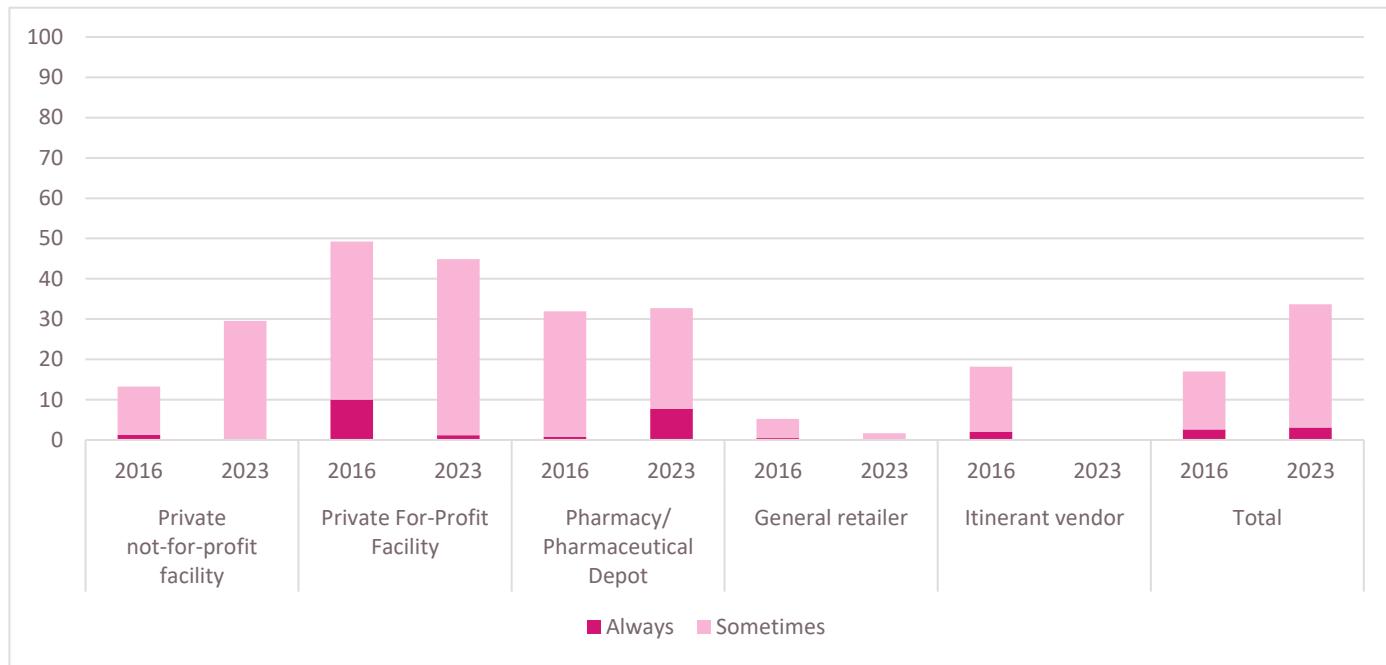
Figure 24 Malaria-related qualifications and training received by outlet staff

Among all eligible outlets



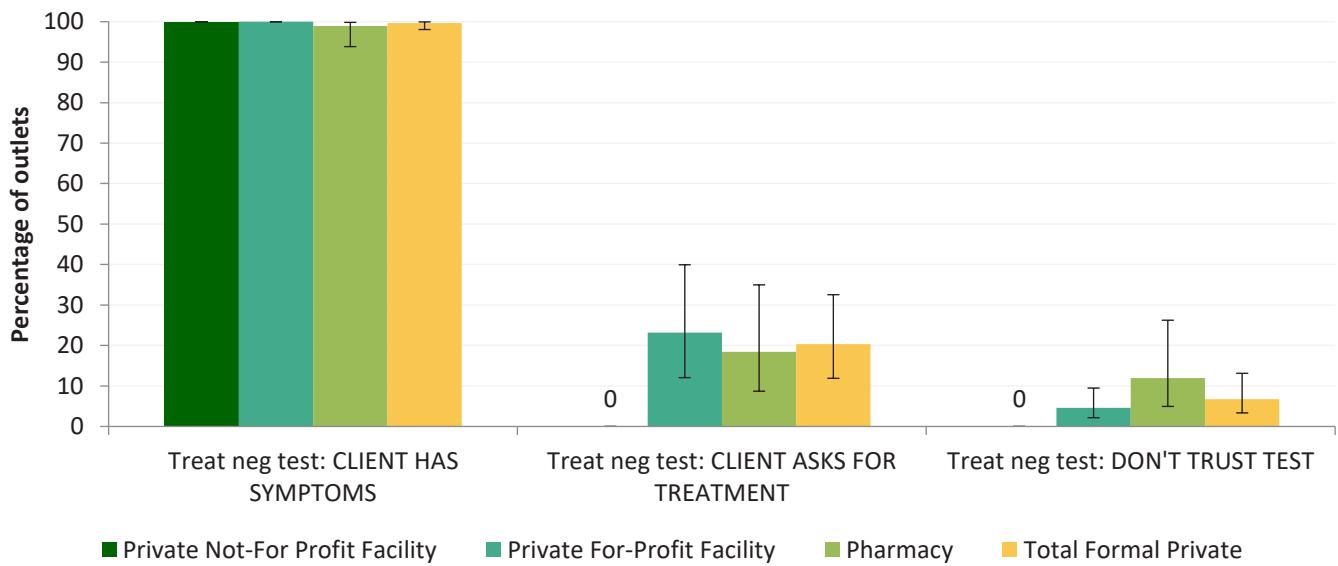
In the formal private sector in 2023, almost all outlets had at least one staff member with a health qualification. Less than a third (29%) of outlets had a staff member who had received training in malaria treatment in the year prior to the study, around half (48%) had received training in malaria surveillance in the previous year, but only 12% had received both.

Figure 25 Provider would recommend antimalarial medication to a client with a negative malaria blood test, by year and POS type



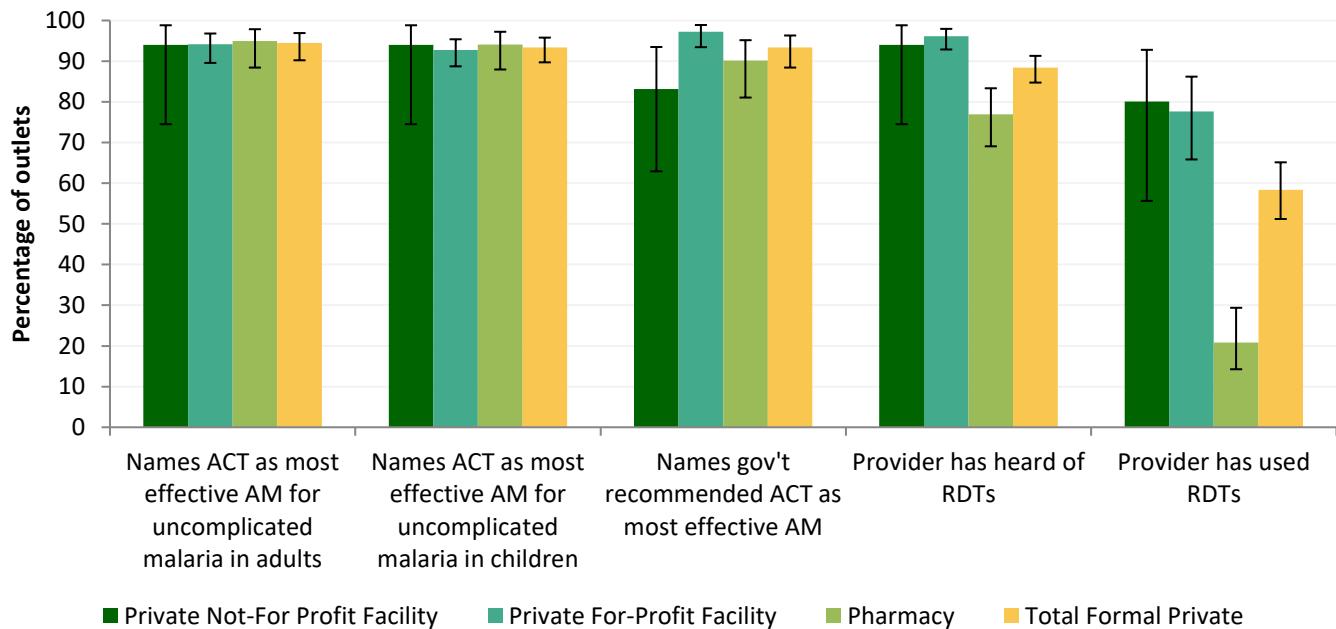
Around a third (34%) of private-sector providers said they would sometimes or always recommend antimalarial treatment following a negative malaria test result in 2023, representing an increase from 17% in 2016. In 2023, there was some variation by outlet type, where 30%, 39% and 25% of providers in for-profit and not-for-profit facilities and pharmacies said they would sometimes recommend treatment despite a negative test, respectively.

Figure 26 Circumstances invoked for antimalarial treatment of a customer with a negative test:



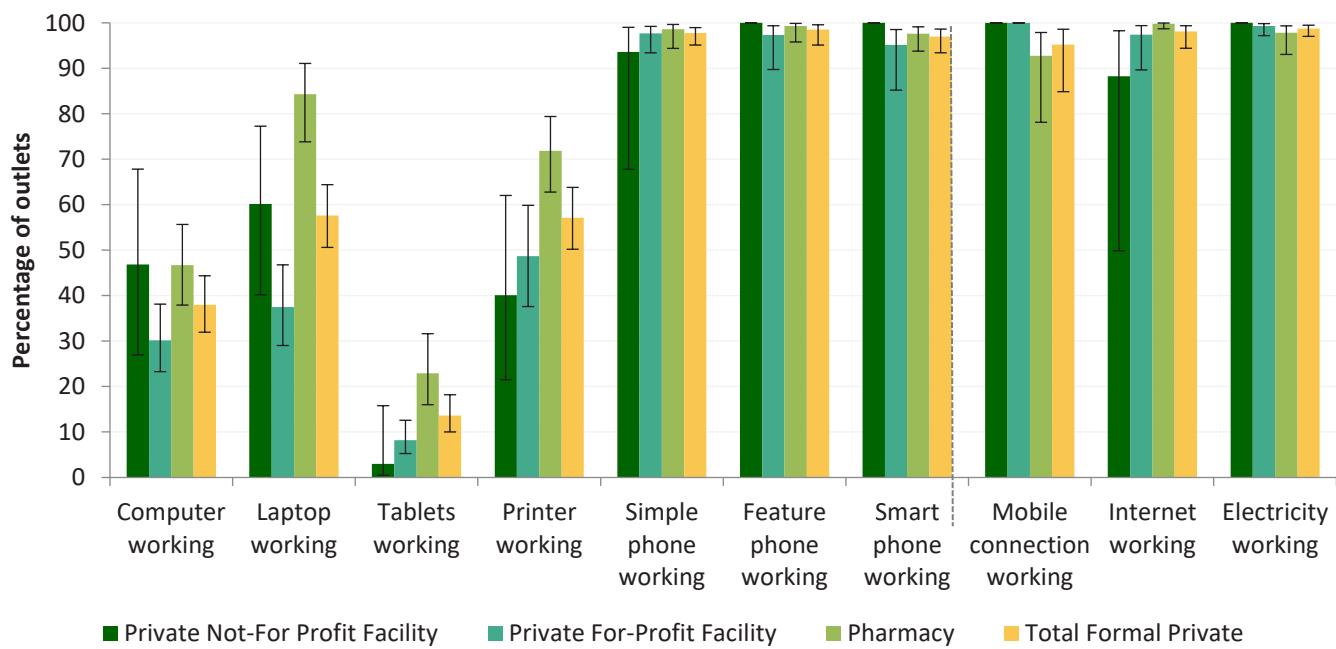
In 2023, in all types of formal outlets, the presentation of malaria symptoms was the reason given for treating malaria despite a negative test result by almost all providers who said they would provide treatment despite a negative test (100% in for-profit and not-for-profit facilities, 99% in pharmacies). In addition, around one in five providers in the private sector said they would provide antimalarials despite a negative test result due to customer requests, while lack of confidence in test results was reported by very few providers (7% of the total).

Figure 27 Knowledge of malaria treatment and screening



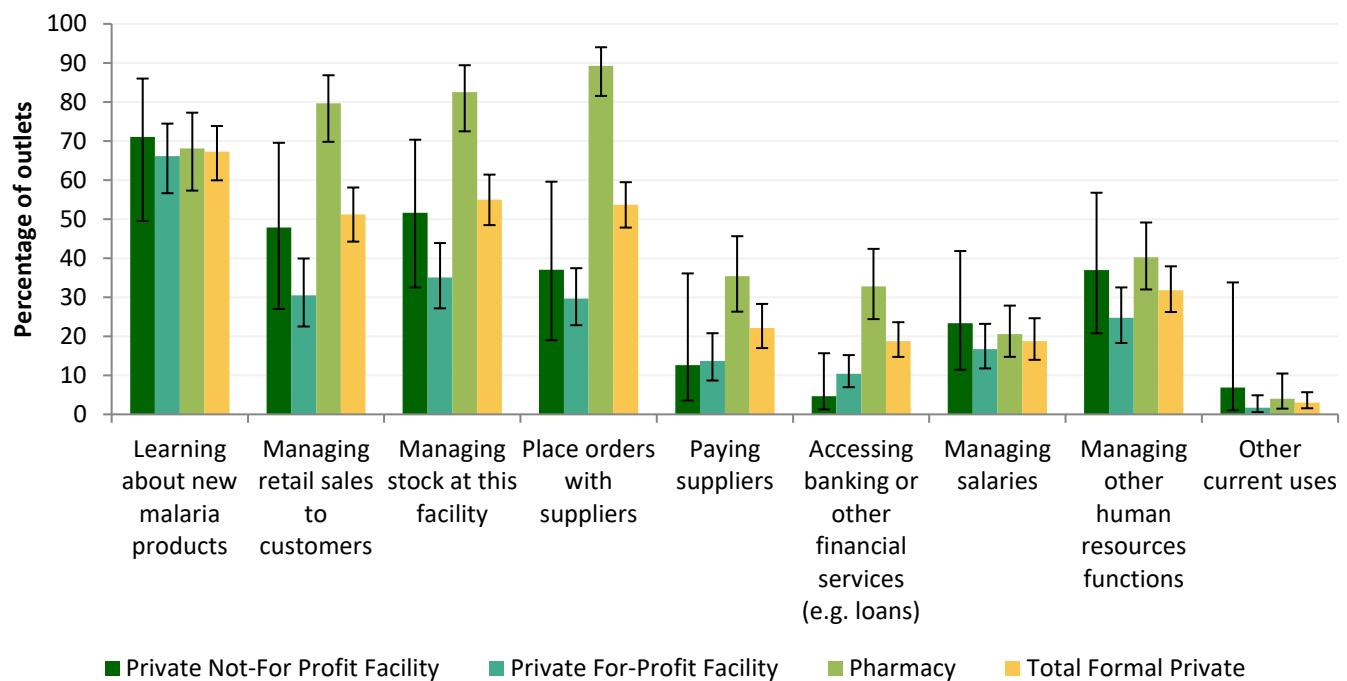
By 2023, in all types of formal private-sector outlets, the majority of providers reported that ACTs were the most effective treatment for uncomplicated malaria in adults (95%) and children (93%). Similarly, ACTs on the national registration list were identified as the most effective treatment by 93% of all providers. Over three-quarters of providers (88%) had heard of malaria RDTs, but only one in five pharmacy providers (21%) had ever used one.

Figure 28 Proportion of outlets with access to operational technology



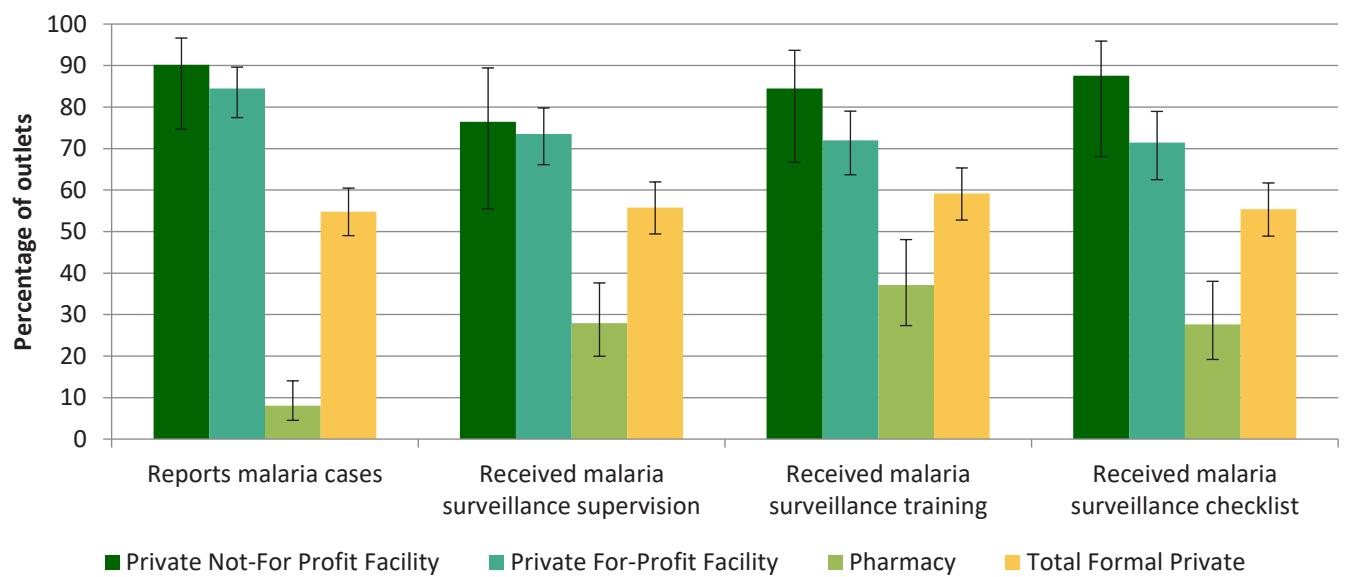
The availability of digital and electronic equipment was an important element in the private sector's ability to integrate with digital malaria surveillance systems. Over 95% of all outlets had access to a cell phone, Internet and electricity in 2023, but fewer reported having access to a computer (38%), laptop (58%) or tablet (14%).

Figure 29 % of outlets currently using digital technology to...



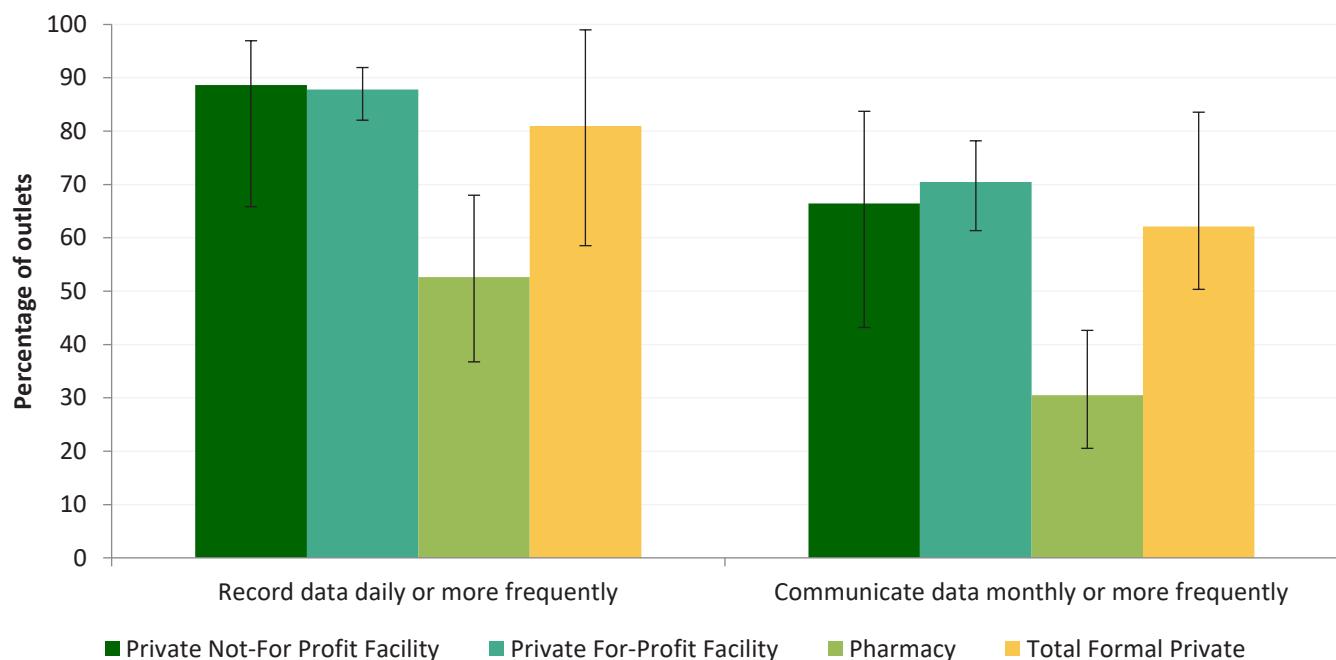
More than two-thirds (67%) of all outlets reported using digital technology to obtain information on new antimalarials. The percentage of pharmacies reporting the use of digital tools to manage sales (80%), inventory (83%) and orders (89%) was higher than that of not-for-profit facilities (48%, 52% and 37%) and for-profit facilities (31%, 35%, 30%), respectively. The use of digital technology for paying suppliers, online banking and managing payroll and other HR functions was lower than the other indicators across all outlet types (22%, 19%, 18% and 32%, respectively).

Figure 30 Participation in malaria surveillance in retail outlets, by type of outlet



Higher levels of participation in malaria surveillance systems were reported among respondents in private not-for-profit and for-profit facilities compared to those in pharmacies for all indicators. 90% of not-for-profit providers reported recording malaria cases in the surveillance system, compared with 8% in pharmacies. Similarly, respondents in pharmacies reported lower levels of supervision (28%) and training (37%) in malaria surveillance than those in not-for-profit facilities (76% and 85%, respectively).

Figure 31 Malaria surveillance, recording and reporting frequency



The frequency of reporting and notification of malaria cases varied according to outlet type in 2023. Nearly 90% of private not-for-profit (89%) and for-profit (88%) outlets, but only around half of pharmacies (53%) reported reporting malaria cases at least daily. Reporting malaria cases into the system at least once a month was reported by 66% and 70% of non-profit and for-profit facilities, but only by 30% of reporting pharmacies, respectively.

Malaria surveillance registration forms

Among respondents in all outlets reporting malaria case registration in 2023, the majority (93%) used form B1, and fewer than one in five reported using any of the other form types.

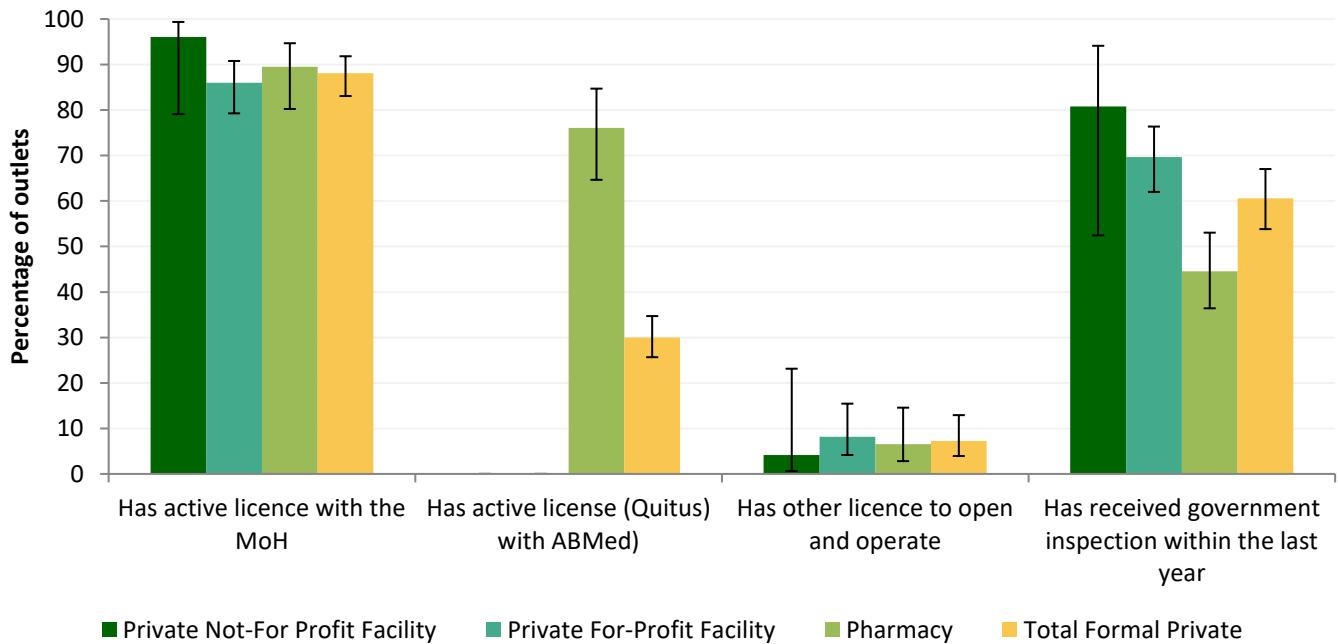
Malaria surveillance reporting forms

Among respondents from all outlets participating in the malaria surveillance system in 2023, three-quarters (75%) used B5a1 reports, 72% reported to the NMCP, while less than one in five said they used another type of report.

Reports to the following information systems

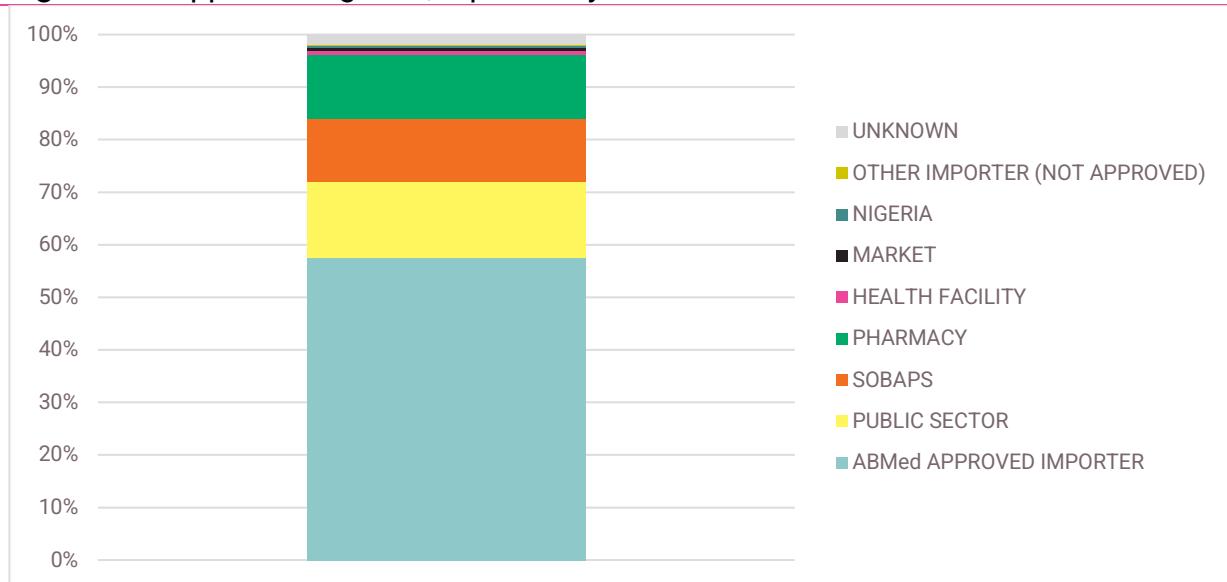
The type of information system used reported by respondents varied according to outlet type: 45% of respondents in pharmacies notified that they reported to the national health information and management system (SNIGS), while 76% and 33% of respondents in non-profit establishments said they reported to the integrated system for collecting and publishing statistics (SIRP) and the logistics information and management system (SIGL) respectively.

Figure 32 Point-of-sale licenses and inspections, by type of outlet



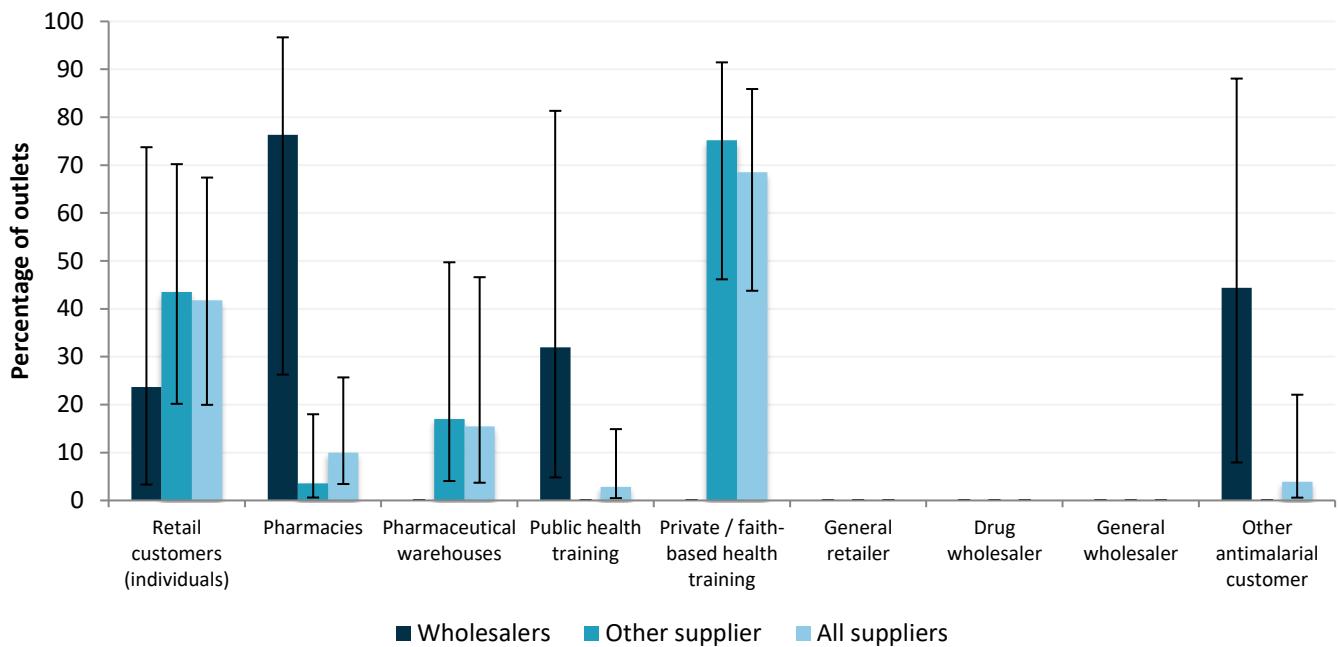
In 2023, more than four out of five respondents in formal private-sector outlets said they had an operating license from the Ministry of Health, while 76% of pharmacies said they had an active ABMed license. 81% of not-for-profit outlets reported a government inspection in the previous year, a higher figure than in for-profit outlets and pharmacies (70% and 45%, respectively).

Figure 33 Supplier categories, reported by outlets



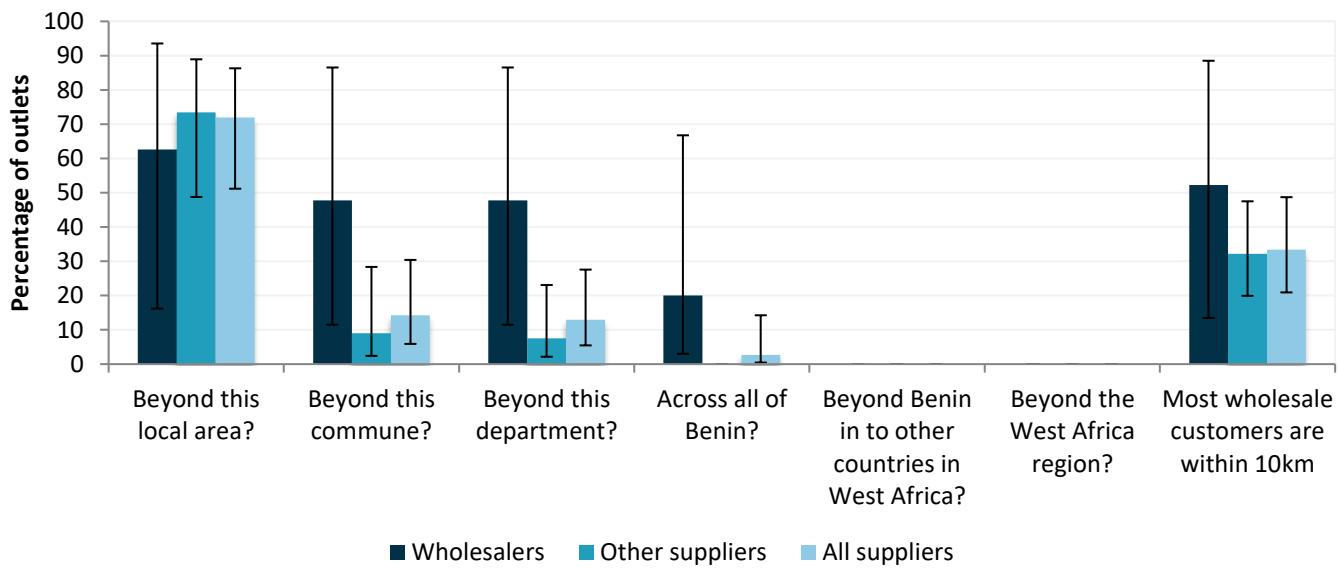
Outlets were asked to provide information on their main suppliers of antimalarial products. From 333 outlets, 767 supplier names, locations and business practices were collected. Of these supplier data, 57% of the names provided were importers/distributors from the ABMed list of approved importers/wholesalers. A further 26% came from government distribution channels (12% SOBAPS, 14% zonal depot distributors) and 12% were pharmacies.

Figure 34 Suppliers reported by suppliers: Percentage of suppliers with the following types of outlets as customers for antimalarials



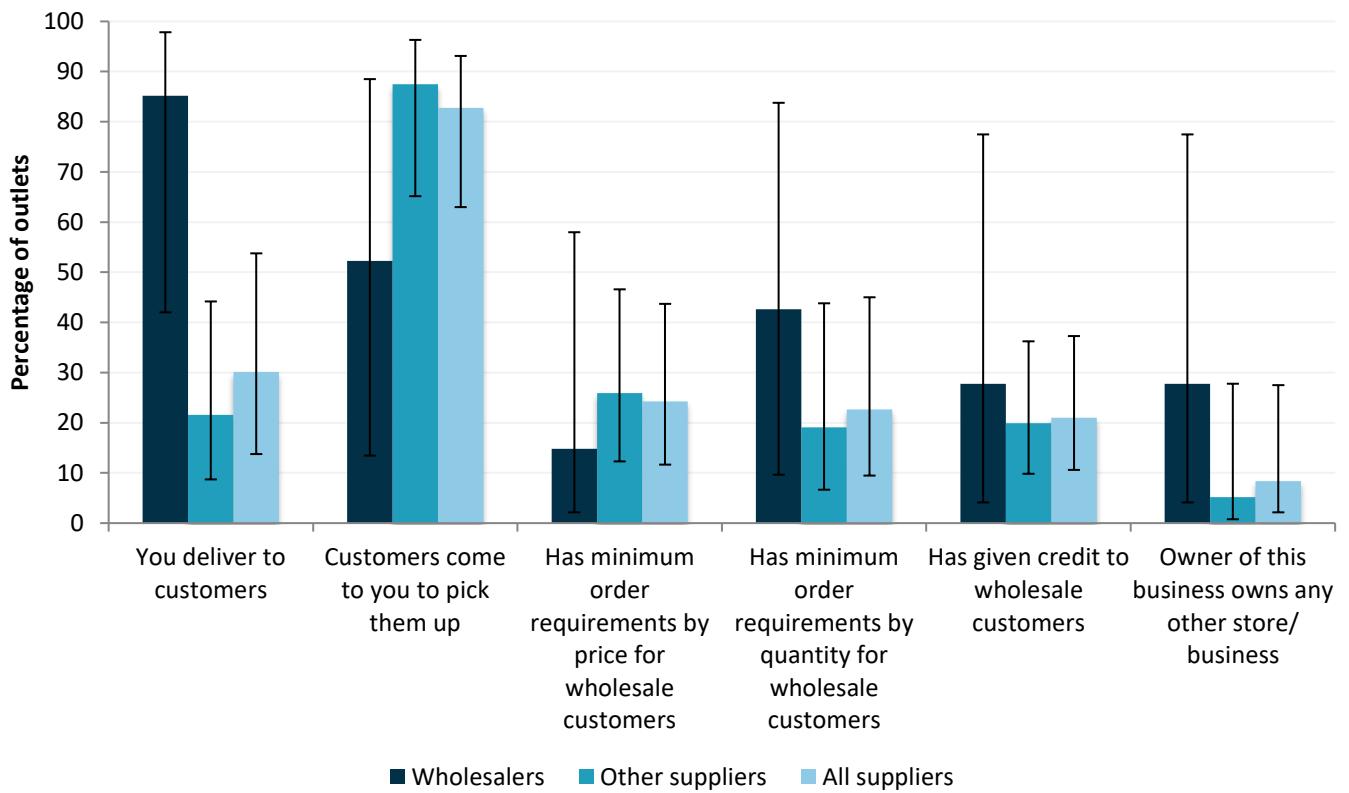
Outlets that reported wholesaling antimalarial products to other outlets were asked a series of questions about the types of customers and other outlets their company supplied with antimalarials. Among the 4 officially recognized wholesalers, the type of customer most frequently identified was pharmacies, public health facilities, individual customers and "others". Among the other antimalarial suppliers interviewed, most identified private for-profit or non-profit establishments, as well as individual customers.

Figure 35 Suppliers declared by suppliers: Percentage of suppliers whose customers are located in:



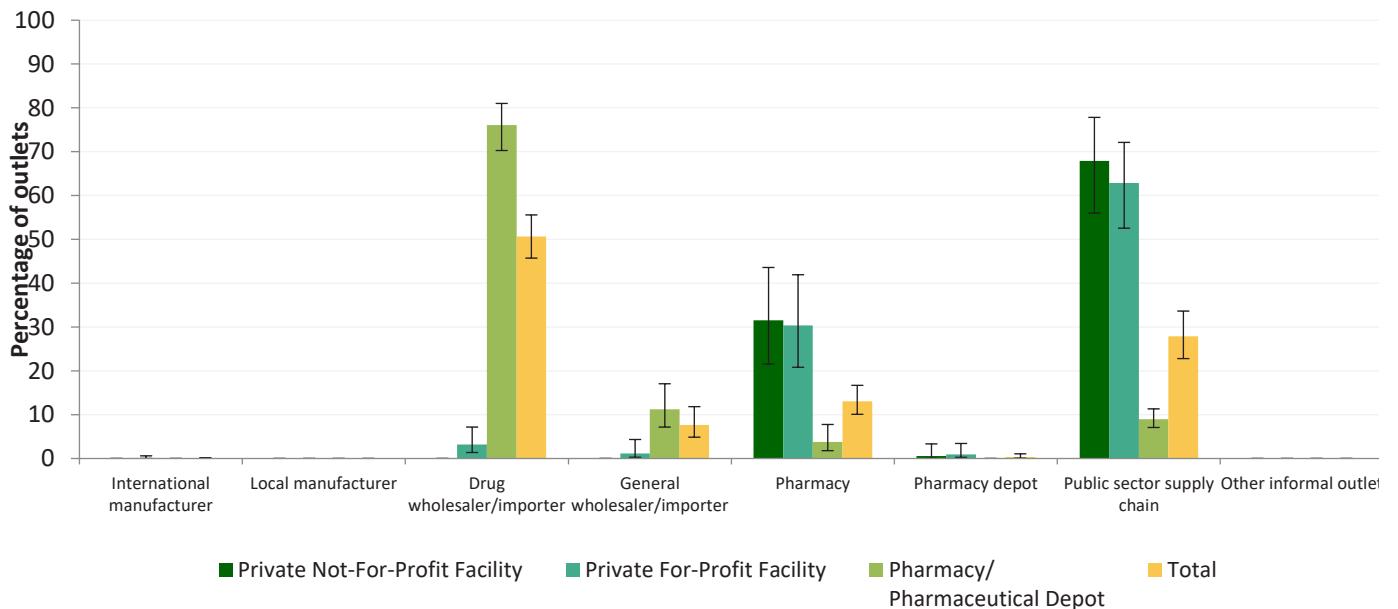
Among both the four official wholesalers and the other antimalarial suppliers interviewed, most said they had customers in their own region. The four official wholesalers also commonly reported having customers in a wider geographical area, either beyond their commune or outside their department, but not beyond Benin.

Figure 36 Suppliers declared by suppliers: Percentage of suppliers with the following business practices



The four official wholesalers surveyed offered delivery to customers more frequently than other antimalarial suppliers. Less than a third of suppliers of all types reported offering credit to their customers at the point of sale. The four main wholesalers more often declared minimum order volumes than other suppliers.

Figure 37 Suppliers declared by customers: type of suppliers used by retail outlets

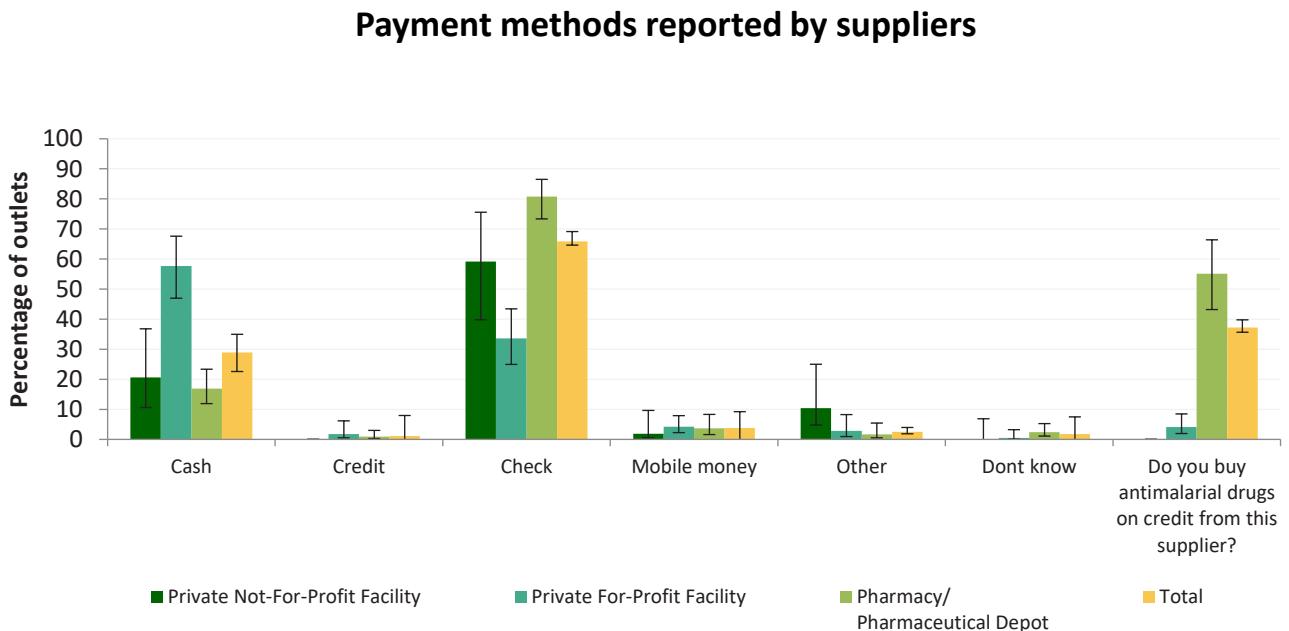


We asked respondents in formal private-sector outlets to list the types of supplier they used for antimalarials. 76% of pharmacies reported using official wholesalers/importers. Private not-for-profit (68%) and for-profit (63%) facilities reported obtaining their antimalarials via the public sector supply chain. However, almost a third of both not-for-profit (32%) and for-profit (30%) facilities reported that their suppliers were pharmacies.

Figure 38a/b Suppliers reported by customers: Percentage of suppliers with the following business practices.

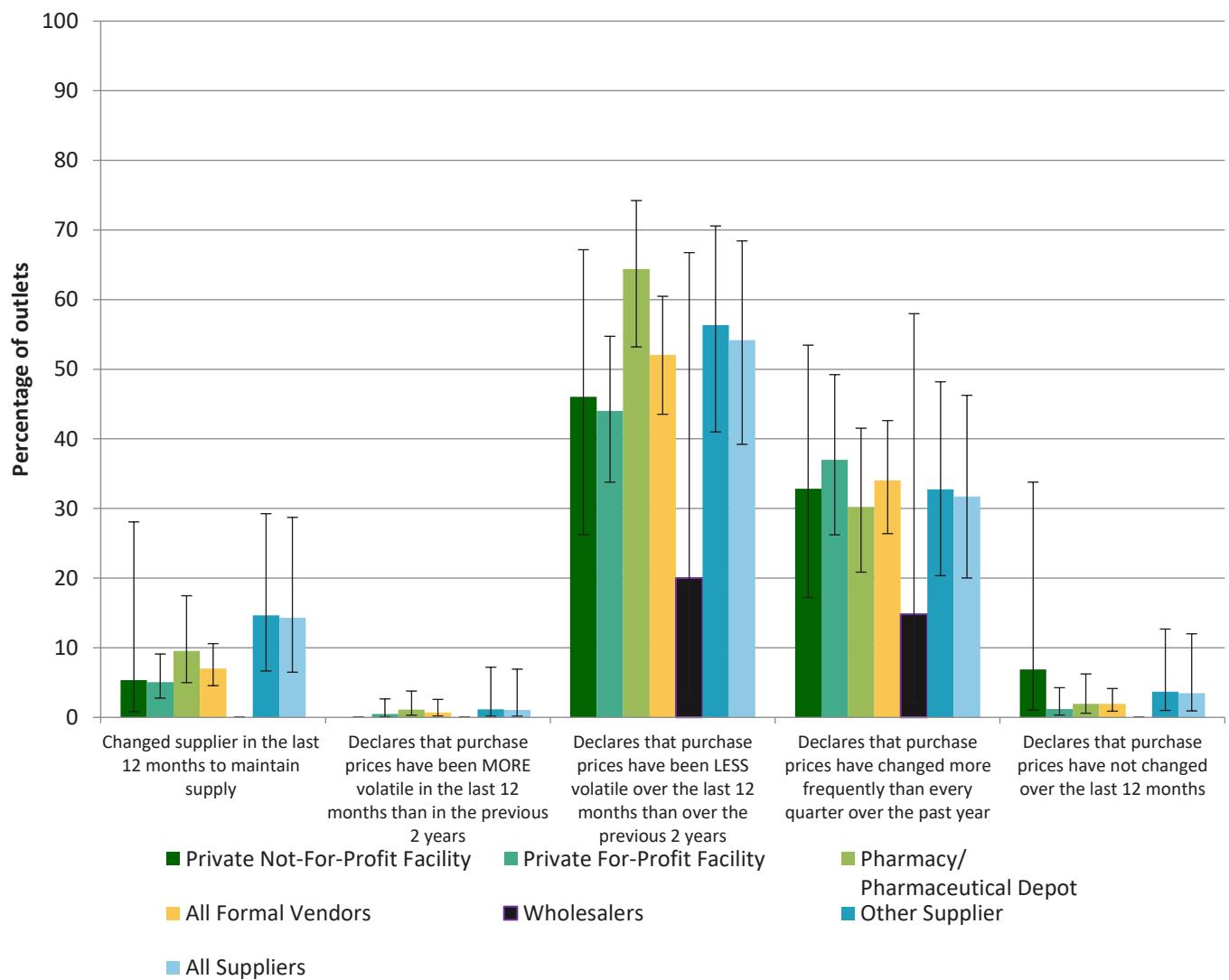


87% of pharmacies said that the anti-malarial drugs they purchased were delivered to them, while 93% of non-profit and 89% of for-profit establishments said they collected their products from their suppliers.



Formal sector outlets were the most likely to report paying their suppliers in cash or by cheque. Very few (4%) reported using mobile money.

Figure 39 Suppliers reported by customers: market volatility



Around half (52%) of formal private sector outlets reported that prices had been less volatile over the previous 12 months than in the 2 years prior to that period, but a third (34%) reported that prices had changed at least once per quarter of the previous year. Fewer than one in ten respondents, regardless of the type of customer-facing outlet, said they had changed supplier in the previous 12 months.

SECTION A: AVAILABILITY, PRICE, MARKET SHARE

Table 1 Availability of antimalarials at all surveyed outlets *, by outlet type

Percentage of outlets interviewed* stocking :	Type of outlet								Supplier^		
	Formal			Informal				Wholesaler	Other supplier	Suppliers Total	
	Private not-for-profit facility (%) N=25	Private for-profit facility (%) N=210	Pharmacy/ Pharmaceutical depot. (%) N=145	Formal Total (%) N=380	General retailer (%) N=34	Itinerant vendor (%) N=18	Informal Total (%) N=52	Retail Total (%) N=432	Wholesaler (%) N=4	Other supplier (%) N=65	Suppliers Total (%) N=69
Any anti-malarial medication at the time of the survey visit	94.0 (74.5, 98.8)	81.1 (75.0, 86.0)	99.7 (98.2, 99.9)	89.3 (85.8, 91.9)	51.9 (21.6, 80.8)	95.4 (72.9, 99.4)	63.3 (29.4, 87.7)	85.6 (77.1, 91.3)	62.6 (16.2, 93.5)	100.0 -	97.8 (87.1, 99.6)
Any ACT	82.2 (54.8, 94.6)	55.7 (45.1, 65.8)	98.6 (94.9, 99.6)	74.3 (67.7, 80.0)	24.6 (7.5, 56.5)	41.8 (13.0, 77.5)	29.1 (11.0, 57.7)	67.9 (59.7, 75.2)	62.6 (16.2, 93.5)	97.5 (87.3, 99.5)	95.4 (85.4, 98.6)
Artemether lumefantrine ⁺	82.2 (54.8, 94.6)	55.7 (45.1, 65.8)	98.6 (94.9, 99.6)	74.3 (67.7, 80.0)	24.6 (7.5, 56.5)	41.8 (13.0, 77.5)	29.1 (11.0, 57.7)	67.9 (59.7, 75.2)	62.6 (16.2, 93.5)	97.5 (87.3, 99.5)	95.4 (85.4, 98.6)
Dihydroartemisinin piperaquine	4.7 (0.7, 25.5)	2.1 (0.9, 4.8)	87.7 (79.5, 92.9)	35.5 (31.0, 40.3)	0.0 -	0.0 -	0.0 -	30.5 (25.5, 36.0)	42.6 (9.6, 83.8)	93.5 (84.4, 97.4)	90.4 (81.0, 95.4)
Arterolane piperaquine ⁺	0.0 -	0.2 (0.0, 1.4)	54.1 (45.0, 62.9)	21.1 (17.1, 25.7)	0.0 -	0.0 -	0.0 -	18.1 (14.2, 22.8)	27.8 (4.1, 77.5)	61.8 (47.3, 74.5)	59.8 (45.0, 73.0)
Artesunate SP	0.0 -	0.0 -	82.1 (74.1, 88.0)	31.9 (27.6, 36.5)	0.0 -	0.0 -	0.0 -	27.3 (22.7, 32.6)	62.6 (16.2, 93.5)	84.9 (76.4, 90.7)	83.5 (75.1, 89.5)
Other ACT ^β	0.0 -	0.0 -	31.2 (22.2, 41.9)	12.1 (8.7, 16.6)	0.0 -	0.0 -	0.0 -	10.4 (7.4, 14.5)	0.0 -	37.1 (23.6, 53.0)	34.9 (22.0, 50.5)
WHO prequalified ACTs ^γ	71.7 (49.4, 86.8)	48.9 (36.9, 61.0)	95.7 (90.9, 98.0)	68.8 (61.2, 75.5)	12.0 (3.2, 35.9)	35.2 (11.7, 69.0)	18.1 (6.6, 40.9)	61.6 (53.1, 69.5)	62.6 (16.2, 93.5)	95.8 (86.3, 98.8)	93.8 (84.1, 97.7)
Nationally approved ACTs [#]	81.4 (54.4, 94.1)	49.6 (38.7, 60.6)	97.5 (93.9, 99.0)	70.6 (63.6, 76.7)	0.0 -	20.2 (6.9, 46.4)	5.3 (1.2, 20.1)	61.4 (53.5, 68.7)	62.6 (16.2, 93.5)	97.5 (87.3, 99.5)	95.4 (85.4, 98.6)
Other ACT not nationally approved or WHO prequalified	12.5 (4.6, 29.7)	7.8 (4.6, 13.0)	94.7 (87.1, 98.0)	41.9 (37.3, 46.7)	12.5 (3.3, 37.6)	6.6 (2.3, 17.5)	11.0 (3.7, 28.2)	37.5 (31.7, 43.8)	62.6 (16.2, 93.5)	95.2 (86.5, 98.4)	93.2 (83.9, 97.3)
Any non-artemisinin therapy	23.2 (9.8, 45.7)	18.4 (13.3, 24.9)	81.1 (74.2, 86.5)	43.1 (37.8, 48.6)	45.3 (20.4, 72.8)	73.8 (50.0, 88.8)	52.8 (27.8, 76.5)	44.5 (38.8, 50.3)	42.6 (9.6, 83.8)	83.3 (73.8, 89.9)	80.9 (70.9, 88.1)
Sulfadoxine pyrimethamine	20.6 (8.0, 43.7)	11.2 (7.2, 17.0)	77.0 (68.7, 83.6)	37.4 (32.1, 43.1)	33.9 (13.7, 62.3)	7.7 (1.7, 28.6)	27.0 (13.6, 46.4)	36.0 (30.0, 42.3)	27.8 (4.1, 77.5)	78.8 (68.6, 86.3)	75.7 (65.3, 83.8)
Oral quinine	2.7 (0.4, 15.9)	1.2 (0.2, 5.5)	17.4 (10.8, 26.7)	7.6 (4.8, 11.8)	13.6 (4.2, 36.2)	26.9 (14.7, 44.0)	17.1 (7.1, 35.7)	8.9 (6.3, 12.5)	0.0 -	9.6 (3.8, 22.6)	9.1 (3.5, 21.4)
Chloroquine	0.0 -	0.0 -	2.4 (0.4, 14.1)	0.9 (0.1, 5.9)	14.5 (8.9, 22.9)	49.0 (34.3, 63.8)	23.6 (15.6, 34.1)	4.1 (2.3, 7.3)	0.0 -	5.3 (0.8, 27.4)	5.0 (0.8, 26.0)
Other non-artemisinin therapies [↓]	0.0 -	0.0 -	1.8 (0.7, 4.4)	0.7 (0.3, 1.7)	0.0 -	4.6 (0.7, 25.4)	1.2 (0.2, 8.3)	0.8 (0.3, 1.7)	0.0 -	1.2 (0.4, 3.3)	1.1 (0.4, 3.1)

Table 1 Availability of antimalarials at all surveyed outlets *, by outlet type

Percentage of outlets interviewed* stocking :	Type of outlet								Supplier^		
	Formal			Informal				Retail Total	Wholesaler	Other supplier	Suppliers Total
	Private not-for-profit facility % (95% CI) N=25	Private for-profit facility % (95% CI) N=210	Pharmacy/ Pharmaceutical depot. % (95% CI) N=145	Formal Total % (95% CI) N=380	General retailer % (95% CI) N=34	Itinerant vendor % (95% CI) N=18	Informal Total % (95% CI) N=52				
Oral artemisinin monotherapy	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -
Non-oral artemisinin monotherapy	63.1 (43.7, 79.1)	47.2 (39.0, 55.5)	84.9 (77.3, 90.2)	63.0 (57.1, 68.5)	1.6 (0.2, 11.2)	0.0 -	1.2 (0.2, 7.8)	54.3 (47.3, 61.0)	42.6 (9.6, 83.8)	93.2 (80.0, 97.9)	90.2 (78.8, 95.8)
Any treatment for severe malaria	65.8 (45.6, 81.6)	49.8 (41.1, 58.5)	86.0 (79.2, 90.8)	65.0 (58.9, 70.8)	1.6 (0.2, 11.2)	0.0 -	1.2 (0.2, 7.8)	56.0 (48.6, 63.2)	42.6 (9.6, 83.8)	93.2 (80.0, 97.9)	90.2 (78.8, 95.8)
Rectal artesunate	0.0 -	1.0 (0.1, 6.1)	17.2 (10.4, 27.1)	7.2 (4.6, 11.0)	0.0 -	0.0 -	0.0 -	6.2 (3.9, 9.5)	0.0 -	21.3 (10.4, 38.5)	20.0 (9.8, 36.6)
Artemether IV/IM	28.6 (14.4, 48.9)	17.3 (12.5, 23.4)	73.1 (64.7, 80.1)	39.8 (35.3, 44.4)	0.0 -	0.0 -	0.0 -	34.2 (29.6, 39.0)	42.6 (9.6, 83.8)	82.5 (69.4, 90.8)	80.2 (67.5, 88.7)
Artesunate IV/IM ^v	54.9 (35.9, 72.6)	36.9 (29.8, 44.5)	79.2 (70.7, 85.7)	54.7 (49.0, 60.2)	1.6 (0.2, 11.2)	0.0 -	1.2 (0.2, 7.8)	47.1 (40.2, 54.1)	42.6 (9.6, 83.8)	86.4 (73.8, 93.4)	83.7 (72.3, 91.1)
Quinine IV/IM	5.3 (1.4, 18.1)	6.8 (4.0, 11.3)	18.2 (12.5, 25.6)	11.1 (8.3, 14.7)	1.6 (0.2, 11.2)	0.0 -	1.2 (0.2, 7.8)	9.7 (7.1, 13.1)	14.8 (2.2, 58.0)	15.3 (8.2, 26.6)	15.2 (8.6, 25.6)

* The denominator includes 13 outlets that met the selection criteria for a full interview, but did not carry out the full interview (i.e. were not interviewed or only carried out a partial interview).

[^] The "suppliers" category includes wholesalers (who supply only outlets) and "other suppliers" (which are outlets that supply both other outlets and the public).

^β other ACTs include : AL, DHAPPQ, Arterolane-PPQ, ASSP and include ASMQ, AS-pyronaridine, DHA-PPQ-Trim

+ At the time of the 2023 ACTwatch Lite study in Benin, AL and ARPPQ were first-line treatments for uncomplicated malaria.

Ψ Prequalified ACT are products that appear on the WHO prequalified list.

The ACTs approved at national level are those on the Benin approval list.

↓ Other non-artemisinin therapies - other than SP, quinine and chloroquine

"In the ACTwatch Lite 2023 study in Benin, injectable artesunate was the first-line treatment for severe malaria.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 2 Availability of antimalarials in surveyed outlets stocking at least one antimalarial*, by outlet type

	Type of outlet								Supplier^		
	Formal				Informal				Retail Total	Suppliers	
	Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutic al depot	Formal Total	General retailer	Itinerant vendor	Informal Total	Wholesaler	Other supplier	Total	
Percentage of outlets interviewed* stocking at least one antimalarial : N=24	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI) N=334	% (95% CI) N=21	% (95% CI) N=17	% (95% CI) N=38	% (95% CI) N=372	% (95% CI) N=3	% (95% CI) N=65	% (95% CI) N=68
Any anti-malarial medication at the time of the survey visit	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Any ACT	87.5 (67.4, 95.9)	68.7 (56.4, 78.9)	98.9 (94.4, 99.8)	83.3 (76.6, 88.3)	47.3 (25.0, 70.8)	43.8 (13.6, 79.5)	45.9 (25.2, 68.1)	79.4 (73.6, 84.1)	100.0	97.5 (87.3, 99.5)	97.6 (87.7, 99.6)
Artemether lumefantrine*	87.5 (67.4, 95.9)	68.7 (56.4, 78.9)	98.9 (94.4, 99.8)	83.3 (76.6, 88.3)	47.3 (25.0, 70.8)	43.8 (13.6, 79.5)	45.9 (25.2, 68.1)	79.4 (73.6, 84.1)	100.0	97.5 (87.3, 99.5)	97.6 (87.7, 99.6)
Dihydroartemisinin piperaquine	5.0 (0.8, 26.7)	2.6 (1.1, 6.0)	87.9 (79.7, 93.1)	39.8 (34.5, 45.3)	0.0	0.0	0.0	35.6 (30.5, 41.1)	68.1 (18.7, 95.2)	93.5 (84.4, 97.4)	92.5 (83.9, 96.7)
Arterolane piperaquine*	0.0 -	0.3 (0.1, 1.7)	54.2 (45.1, 63.1)	23.6 (19.1, 28.9)	0.0	0.0	0.0	21.2 (16.9, 26.3)	44.4 (7.9, 88.1)	61.8 (47.3, 74.5)	61.1 (46.7, 73.9)
Artesunate SP	0.0 -	0.0 -	82.3 (74.3, 88.2)	35.7 (30.7, 41.0)	0.0	0.0	0.0	31.9 (27.1, 37.2)	100.0 -	84.9 (76.4, 90.7)	85.4 (77.1, 91.1)
Other ACT ^	0.0 -	0.0 -	31.3 (22.2, 42.1)	13.6 (9.7, 18.7)	0.0	0.0	0.0	12.1 (8.7, 16.8)	0.0 -	37.1 (23.6, 53.0)	35.7 (22.6, 51.3)
WHO prequalified ACTs ^	76.3 (58.0, 88.3)	60.3 (45.7, 73.2)	96.0 (91.1, 98.3)	77.0 (69.2, 83.4)	23.2 (9.2, 47.4)	36.9 (12.3, 70.9)	28.6 (14.4, 48.9)	72.0 (64.6, 78.3)	100.0 -	95.8 (86.3, 98.8)	95.9 (86.8, 98.8)
Nationally approved ACTs ^	86.6 (66.5, 95.4)	61.2 (48.4, 72.6)	97.9 (94.0, 99.3)	79.1 (72.1, 84.7)	0.0 -	21.2 (7.3, 47.9)	8.4 (2.4, 25.3)	71.7 (65.5, 77.1)	100.0 -	97.5 (87.3, 99.5)	97.6 (87.7, 99.6)
Other ATC not nationally approved or WHO prequalified	13.3 (5.0, 31.0)	9.6 (5.6, 16.1)	95.1 (87.2, 98.2)	46.9 (41.4, 52.5)	24.1 (9.0, 50.5)	6.9 (2.4, 18.2)	17.3 (7.5, 35.0)	43.8 (38.1, 49.7)	100.0 -	95.2 (86.5, 98.4)	95.4 (87.0, 98.5)
Any non-artemisinin therapy	24.7 (10.6, 47.5)	22.7 (16.4, 30.5)	81.4 (74.4, 86.8)	48.3 (42.5, 54.1)	87.4 (63.6, 96.5)	77.3 (51.8, 91.5)	83.4 (66.9, 92.6)	52.0 (46.6, 57.3)	68.1 (18.7, 95.2)	83.3 (73.8, 89.9)	82.8 (72.9, 89.6)
Sulfadoxine pyrimethamine	21.9 (8.6, 45.4)	13.8 (8.9, 20.9)	77.2 (68.9, 83.8)	41.9 (36.1, 48.0)	65.3 (45.7, 80.7)	8.1 (1.8, 30.1)	42.6 (26.3, 60.7)	42.0 (36.0, 48.3)	44.4 (7.9, 88.1)	78.8 (68.6, 86.3)	77.5 (67.1, 85.3)
Oral quinine	2.8 (0.4, 16.7)	1.5 (0.3, 6.7)	17.4 (10.9, 26.8)	8.5 (5.4, 13.1)	26.2 (12.9, 45.9)	28.2 (15.8, 45.2)	27.0 (16.9, 40.1)	10.4 (7.5, 14.3)	0.0 -	9.6 (3.8, 22.6)	9.3 (3.6, 21.8)
Chloroquine	0.0 -	0.0 -	2.4 (0.4, 14.2)	1.0 (0.2, 6.6)	28.0 (10.3, 56.9)	51.3 (35.9, 66.5)	37.3 (23.1, 53.9)	4.8 (2.6, 8.8)	0.0 -	5.3 (0.8, 27.4)	5.1 (0.8, 26.5)
Other non-artemisinin therapies √	0.0 -	0.0 -	1.8 (0.7, 4.4)	0.8 (0.3, 1.9)	0.0 -	4.8 (0.7, 26.5)	1.9 (0.3, 11.6)	0.9 (0.4, 2.0)	0.0 -	1.2 (0.4, 3.3)	1.1 (0.4, 3.2)
Oral artemisinin monotherapy	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -
Non-oral artemisinin monotherapy	67.2 (45.6, 83.3)	58.2 (48.2, 67.6)	85.1 (77.4, 90.6)	70.6 (64.2, 76.2)	3.2 (0.6, 16.1)	0.0 -	1.9 (0.3, 10.5)	63.4 (57.7, 68.7)	68.1 (18.7, 95.2)	93.2 (80.0, 97.9)	92.3 (80.5, 97.2)

Table 2 Availability of antimalarials in surveyed outlets stocking at least one antimalarial*, by outlet type

	Type of outlet							Supplier^			
	Formal				Informal			Retail Total	Suppliers		
	Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutic al depot	Formal Total	General retailer	Itinerant vendor	Informal Total		Total	Suppliers Total	
Any treatment for severe malaria	70.0 (47.6, 85.7)	61.4 (50.8, 71.1)	86.2 (79.4, 91.1)	72.9 (66.1, 78.7)	3.2 (0.6, 16.1)	0.0 -	1.9 (0.3, 10.5)	65.5 (59.2, 71.2)	68.1 (18.7, 95.2)	93.2 (80.0, 97.9)	92.3 (80.5, 97.2)
Rectal artesunate	0.0 -	1.2 (0.2, 7.5)	17.2 (10.4, 27.2)	8.0 (5.2, 12.3)	0.0 -	0.0 -	0.0 -	7.2 (4.7, 10.8)	0.0 -	21.3 (10.4, 38.5)	20.5 (10.0, 37.2)
Artemether IV/IM	30.4 (15.7, 50.8)	21.3 (15.8, 28.2)	73.3 (64.8, 80.4)	44.6 (40.1, 49.2)	0.0 -	0.0 -	0.0 -	39.9 (35.8, 44.2)	68.1 (18.7, 95.2)	82.5 (69.4, 90.8)	82.0 (69.0, 90.3)
Artesunate IV/IM ^v	58.4 (37.3, 76.8)	45.5 (36.7, 54.6)	79.4 (70.9, 86.0)	61.2 (54.8, 67.3)	3.2 (0.6, 16.1)	0.0 -	1.9 (0.3, 10.5)	55.0 (48.9, 61.0)	68.1 (18.7, 95.2)	86.4 (73.8, 93.4)	85.7 (74.0, 92.6)
Quinine IV/IM	5.7 (1.5, 19.0)	8.4 (5.0, 13.9)	18.2 (12.5, 25.7)	12.4 (9.3, 16.4)	3.2 (0.6, 16.1)	0.0 -	1.9 (0.3, 10.5)	11.3 (8.4, 15.1)	23.7 (3.3, 73.7)	15.3 (8.2, 26.6)	15.6 (8.6, 26.5)

* Retail outlets stocking antimalarials had at least one antimalarial in stock on the day of the survey, which was verified by the presence of at least one antimalarial recorded on the audit sheet. The denominator includes 12 outlets that met the selection criteria for a full interview, but did not carry out the full interview (i.e. were not interviewed or only carried out a partial interview).

[^] The "suppliers" category includes wholesalers (who supply only outlets) and "other suppliers" (which are outlets that supply both other outlets and the public).

β other ACTs included: AL, DHAPPQ, Arterolane-PPQ, ASSP and include ASMQ, AS-pyronaridine, DHA-PPQ-Trim

+ At the time of the 2023 ACTwatch Lite study in Benin, AL and ARPPQ were first-line treatments for uncomplicated malaria.

Ψ Prequalified ACTs are products that appear on the 2023 WHO prequalified list.

Nationally approved ACTs are those on the 2023 list of approved antimalarials in Benin

√ Other non-artemisinin therapies i.e. other than SP, quinine and chloroquine

Δ At the time of the 2023 ACTwatch Lite study in Benin, injectable artesunate was the first-line treatment for severe malaria.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 3 Availability of malaria blood tests in surveyed retail outlets, by type of outlet

	Type of outlet								Supplier^		
	Formal				Informal				Wholesale distributor	Other supplier	Suppliers Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	Retail Total			
Percentage of controlled outlets with*:	% (95% CI) N=25	% (95% CI) N=210	% (95% CI) N=145	% (95% CI) N=380	% (95% CI) N=34	% (95% CI) N=18	% (95% CI) N=52	% (95% CI) N=432	% (95% CI) N=4	% (95% CI) N=65	% (95% CI) N=69
Any malaria blood test	91.3 (74.0, 97.5)	89.1 (82.4, 93.5)	1.2 (0.2, 5.6)	55.2 (48.7, 61.4)	1.6 (0.2, 11.2)	0.0 -	1.2 (0.2, 7.8)	47.5 (40.9, 54.2)	0.0 -	5.4 (1.9, 14.5)	5.1 (1.8, 13.7)
Percentage of antimalarial drug retail outlets with**:	% (95% CI) N=20	% (95% CI) N=136	% (95% CI) N=143	% (95% CI) N=299	% (95% CI) N=21	% (95% CI) N=17	% (95% CI) N=38	% (95% CI) N=337	% (95% CI) N=3	% (95% CI) N=65	% (95% CI) N=68
Any malaria blood test	87.9 (63.1, 96.8)	91.4 (84.4, 95.4)	1.2 (0.2, 5.6)	46.8 (41.0, 52.7)	3.2 (0.6, 16.1)	0.0 -	1.9 (0.3, 10.5)	41.5 (36.7, 46.5)	0.0 -	5.4 (1.9, 14.5)	5.2 (1.8, 14.0)
mRDT	74.3 (51.1, 89.0)	57.2 (43.7, 69.7)	1.2 (0.2, 5.6)	30.8 (23.7, 39.0)	3.2 (0.6, 16.1)	0.0 -	1.9 (0.3, 10.5)	27.4 (21.4, 34.5)	0.0 -	5.4 (1.9, 14.5)	5.2 (1.8, 14.0)
Prequalified mRDT^	74.3 (51.1, 89.0)	56.5 (43.0, 69.2)	1.2 (0.2, 5.6)	30.5 (23.4, 38.7)	3.2 (0.6, 16.1)	0.0 -	1.9 (0.3, 10.5)	27.2 (21.0, 34.3)	0.0 -	5.4 (1.9, 14.5)	5.2 (1.8, 14.0)
Microscopy	47.7 (25.8, 70.6)	55.8 (44.6, 66.4)	0.0 -	27.8 (22.2, 34.2)	0.0 -	0.0 -	0.0 -	24.6 (19.6, 30.3)	0.0 -	1.7 (0.3, 10.1)	1.6 (0.3, 9.8)

* Availability of blood tests in all eligible outlets. The denominator includes 13 outlets that met the selection criteria for a full interview, but did not carry out the full interview (i.e. were not interviewed or only carried out a partial interview).

** Availability of blood tests is reported among outlets that had antimalarials in stock on the day of the study or had stocked them in the previous three months.

^ The "suppliers" category includes wholesalers (who supply only retail outlets) and "other suppliers" (who supply other outlets and retail consumers).

^ Prequalified mRDTs products on the WHO list of prequalified in vitro diagnostic products (2023).

Source: ACTwatch Lite survey, BENIN, 2023.

Table 4 Distribution of outlet types surveyed

Distribution of outlet types, among outlets with at least 1 antimalarial or malaria blood testing available on the day of the survey	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	General retailer	Itinerant vendor	All private outlets
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Anti-malarial* drugs						
N=348 private retail outlets	7.4 (5.2, 10.3)	45.4 (40.7, 50.3)	36.3 (30.5, 42.6)	6.6 (4.1, 10.5)	4.3 (2.1, 8.7)	100.0 -
Blood test for malaria** (in French)						
N= 213 private retail outlets	12.4 (8.9, 17.0)	86.5 (81.3, 90.4)	0.8 (0.1, 4.5)	0.4 (0.1, 2.3)	- -	100.0 -

* Retail outlets with at least one antimalarial in stock on the day of the survey, verified by the presence of at least one antimalarial recorded in the antimalarial audit form.

** Retail outlets offering malaria blood tests on the day of the survey, verified by the presence of at least one RDT recorded in the RDT audit form and/or the reported availability of a malaria microscopy.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 5 Purchase price in FCFA of antimalarial tablets (standardized AETD) in surveyed retail outlets, by type of outlet

	Type of outlet							Retail Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	
Median price of a AETD* tablet:	Median FCFA [IQR]	Median FCFA [IQR]	Median FCFA [IQR]	Median FCFA [IQR]	Median FCFA [IQR]	Median FCFA [IQR]	Median FCFA [IQR]	Median FCFA [IQR] (N of antimalarials)
(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)
Any ACT	600.00 FCFA [600.00-800.00] (57)	800.00 FCFA [600.00-1000.00] (249)	2570.00 FCFA [2150.00-3400.00] (8,896)	2500.00 FCFA [2045.00-3385.00] (9,202)	1000.00 FCFA [1000.00-1000.00] (10)	800.00 FCFA [800.00-1400.00] (12)	1000.00 FCFA [800.00-1000.00] (22)	2500.00 FCFA [2045.00-3385.00] (9,224)
Artemether lumefantrine	600.00 FCFA [600.00-800.00] (56)	800.00 FCFA [600.00-1000.00] (242)	2350.00 FCFA [1985.00-2920.00] (6,569)	2335.00 FCFA [1950.00-2920.00] (6,867)	1000.00 FCFA [1000.00-1000.00] (10)	800.00 FCFA [800.00-1400.00] (12)	1000.00 FCFA [800.00-1000.00] (22)	2335.00 FCFA [1950.00-2920.00] (6,889)
Dihydroartemisinin piperazine	6300.00 FCFA (1)	3450.00 FCFA [2625.00-6900.00] (6)	3035.00 FCFA [2407.50-3855.00] (1,799)	3035.00 FCFA [2407.50-3855.00] (1,806)	-	-	-	3035.00 FCFA [2407.50-3855.00] (1,806)
Arterolane piperazine	-	2580.00 FCFA (1)	3860.00 FCFA [2580.00-3893.33] (188)	3860.00 FCFA [2580.00-3893.33] (189)	-	-	-	3860.00 FCFA [2580.00-3893.33] (189)
Artesunate SP	-	-	3505.00 FCFA [2510.00-4090.00] (290)	3505.00 FCFA [2510.00-4090.00] (290)	-	-	-	3505.00 FCFA [2510.00-4090.00] (290)
Other ACT	-	-	4085.00 FCFA [3425.00-4085.00] (50)	4085.00 FCFA [3425.00-4085.00] (50)	-	-	-	4085.00 FCFA [3425.00-4085.00] (50)
Nationally approved ACT	600.00 FCFA [600.00-800.00] (43)	800.00 FCFA [600.00-1000.00] (203)	2415.00 FCFA [1985.00-3040.00] (4,357)	2335.00 FCFA [1975.00-2920.00] (4,603)	-	800.00 FCFA [800.00-1400.00] (5)	800.00 FCFA [800.00-1400.00] (5)	2335.00 FCFA [1950.00-2920.00] (4,608)
WHO pre-qualified ACT	600.00 FCFA [600.00-800.00] (47)	666.67 FCFA [600.00-1000.00] (198)	2407.50 FCFA [2280.00-2920.00] (1,735)	2335.00 FCFA [1810.00-2880.00] (1,980)	1000.00 FCFA [1000.00-1000.00] (4)	800.00 FCFA [800.00-1000.00] (9)	800.00 FCFA [800.00-1000.00] (13)	2335.00 FCFA [1751.25-2880.00] (1,993)
Non-prequalified ACT	2000.00 FCFA [1800.00-6300.00] (10)	2105.00 FCFA [1550.00-3400.00] (51)	2570.00 FCFA [2100.00-3426.67] (7,161)	2570.00 FCFA [2045.00-3426.67] (7,222)	1000.00 FCFA [1000.00-1000.00] (6)	1400.00 FCFA [1400.00-1600.00] (3)	1000.00 FCFA [1000.00-1600.00] (9)	2570.00 FCFA [2045.00-3426.67] (7,231)
Non-ART	1.50 FCFA [1.50-1734.67] (2)	500.00 FCFA [500.00-650.00] (14)	490.00 FCFA [445.00-1025.00] (320)	490.00 FCFA [445.00-1025.00] (336)	375.00 FCFA [250.00-1734.67] (27)	500.00 FCFA [262.50-625.00] (15)	375.00 FCFA [250.00-625.00] (42)	490.00 FCFA [385.00-1025.00] (378)
Sulfadoxine pyrimethamine	1.50 FCFA (1)	500.00 FCFA [500.00-500.00] (11)	490.00 FCFA [400.00-500.00] (292)	490.00 FCFA [400.00-500.00] (304)	300.00 FCFA [250.00-500.00] (13)	450.00 FCFA [250.00-450.00] (2)	300.00 FCFA [250.00-450.00] (15)	480.00 FCFA [385.00-500.00] (319)
Quinine	1734.67 FCFA (1)	2520.10 FCFA [2520.10-2520.10] (3)	3780.15 FCFA [3157.09-4953.44] (18)	3192.12 FCFA [3157.09-4953.44] (22)	2602.00 FCFA [2100.08-5782.22] (8)	1734.67 FCFA [1734.67-2602.00] (12)	2520.10 FCFA [1734.67-2602.00] (12)	3192.12 FCFA [2602.00-4158.16] (34)
Chloroquine	-	-	3500.00 FCFA (1)	3500.00 FCFA (1)	375.00 FCFA [250.00-375.00] (6)	500.00 FCFA [375.00-500.00] (8)	375.00 FCFA [262.50-500.00] (14)	375.00 FCFA [375.00-625.00] (15)

* AETD - Adult Equivalent Treatment Dose - is the number of milligrams needed to treat a 60 kg adult (see Annex 8: AETDs).

Information provided by the respondent on the price of a specific quantity of antimalarial (for example, price per tablet or price per pack) has been converted into a price by AETD.

The pricing data in this table is derived from the audited products for which pricing information was provided. The number of antimalarial products audited for which price information was missing is as follows: 152 any ACT tablets; 115 AL tablets; 31 DHAPPQ tablets; 1 ARPPQ tablet; 5 ASSP tablets; 0 other ACT tablets; 77 nationally approved tablets; 21 QAACT tablets; 131X non-QAACT tablets; 19 non-ACT tablets; 19 SP tablets; 0 quinine tablets; 0 chloroquine tablets.

Source: ACTwatch Lite survey, BENIN, 2023

Table 6 Purchase price in FCFA francs for tablet ACTs and malaria RDTs at surveyed outlets, by outlet type

	Type of outlet							
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Informal Itinerant vendor	Informal outlet Total	Retail Total
Median price of pre-packaged therapy* :	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)
Artemether lumefantrine WHO prequalified								
Pack size 1 (pediatric): For 5-15 kgs	150.00 FCFA [150.00-200.00] (13)	160.00 FCFA [150.00-250.00] (52)	700.00 FCFA [700.00-1170.00] (337)	700.00 FCFA [595.00-1170.00] (402)	-	-	-	700.00 FCFA [595.00-1170.00] (402)
Packaging size 2 (child): For 15-25 kgs	-	1,500.00 FCFA [1500.00-1500.00] (2)	1,460.00 FCFA [1460.00-1460.00] (126)	1,460.00 FCFA [1460.00-1460.00] (128)	-	-	-	1,460.00 FCFA [1460.00-1460.00] (128)
Size 3 package (Teenager): For 25-35 kgs	-	-	2,160.00 FCFA [2160.00-2160.00] (96)	2,160.00 FCFA [2160.00-2160.00] (96)	-	-	-	2,160.00 FCFA [2160.00-2160.00] (96)
Size 4 package (adult): For ≥ 35 kgs	1,700.00 FCFA [1700.00-1700.00] (2)	2,450.00 FCFA [2000.00-2450.00] (8)	2,335.00 FCFA [2160.00-2335.00] (485)	2,335.00 FCFA [2160.00-2335.00] (495)	-	-	-	2,335.00 FCFA [2160.00-2335.00] (495)
Artemether lumefantrine not WHO prequalified								
Pack size 1 (pediatric): For 5-15 kgs	17,000.00 FCFA (1)	1,330.00 FCFA [920.00-1550.00] (11)	1,330.00 FCFA [740.00-1868.00] (1,776)	1,330.00 FCFA [740.00-1870.00] (1,788)	-	-	-	1,330.00 FCFA [740.00-1870.00] (1,788)
Packaging size 2 (child): For 15-25 kgs	-	2,330.00 FCFA (1)	2,100.00 FCFA [1285.00-2225.00] (527)	2,100.00 FCFA [1285.00-2225.00] (528)	-	-	-	2,100.00 FCFA [1285.00-2225.00] (528)
Size 3 package (Teenager): For 25-35 kgs	-	3,005.00 FCFA [2570.00-3005.00] (2)	2,570.00 FCFA [2570.00-2570.00] (104)	2,570.00 FCFA [2570.00-2570.00] (106)	-	-	-	2,570.00 FCFA [2570.00-2570.00] (106)
Size 4 package (adult): For ≥ 35 kgs	1,800.00 FCFA [1660.00-1950.00] (5)	2,000.00 FCFA [1500.00-2500.00] (18)	2,230.00 FCFA [1985.00-2590.00] (2,379)	2,230.00 FCFA [1985.00-2575.00] (2,402)	1,000.00 FCFA (1)	-	1,000.00 FCFA (1)	2,230.00 FCFA [1985.00-2575.00] (2,403)
mRDT								
mRDT (per unit)	450.00 FCFA [300.00-700.00] (52)	500.00 FCFA [300.00-700.00] (196)	-	500.00 FCFA [300.00-700.00] (248)	-	-	-	500.00 FCFA [300.00-700.00] (248)

* Prices of prepackaged ACT products as declared by respondents.

Pricing data in this table was obtained from audited products for which pricing information was provided. The number of anti-malarial products audited for which price information was not provided is as follows:

For quality-assured products, 2 pediatrics, 0 children, 1 adolescent and 8 adults had no price information; For non-quality-assured products, 30 pediatrics, 9 children, 1 adolescent and 45 adults had no price information; and 128 RDTs.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 7 Median percent price increase for antimalarials (standardized AETD) in outlets surveyed, by type of outlet

Median profit margin# per AETD* tablet :	Type of outlet						Retail Total	
	Formal			Informal			Retail Total	
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	
Median % [IQR] (N of antimalarials)	Median % [IQR] (N of antimalarials)	Median % [IQR] (N of antimalarials)	Median % [IQR] (N of antimalarials)	Median % [IQR] (N of antimalarials)	Median % [IQR] (N of antimalarials)	Median % [IQR] (N of antimalarials)	Median % [IQR] (N of antimalarials)	
Any ACT	36% [0.36-0.36] (39)	36% [0.25-0.67] (203)	31% [0.30-0.31] (7,567)	31% [0.30-0.31] (7,809)	30% [0.20-0.33] (10)	56% [0.33-0.60] (11)	33% [0.25-0.60] (21)	31% [0.30-0.31] (7,830)
Artemether lumefantrine	36% [0.36-0.36] (38)	36% [0.25-0.67] (197)	31% [0.30-0.31] (5,572)	31% [0.30-0.31] (5,807)	30% [0.20-0.33] (10)	56% [0.33-0.60] (11)	33% [0.25-0.60] (21)	31% [0.30-0.31] (5,828)
Dihydroartemisinin piperaquine	30% (1)	21% [0.06-0.36] (6)	31% [0.30-0.31] (1,555)	31% [0.30-0.31] (1,562)	-	-	-	31% [0.30-0.31] (1,562)
Arterolane piperaquine	-	-	30% [0.30-0.31] (156)	30% [0.30-0.31] (156)	-	-	-	30% [0.30-0.31] (156)
Artesunate SP	-	-	31% [0.30-0.31] (243)	31% [0.30-0.31] (243)	-	-	-	31% [0.30-0.31] (243)
Other ACT	-	-	30% [0.30-0.31] (41)	30% [0.30-0.31] (41)	-	-	-	30% [0.30-0.31] (41)
Nationally approved ACT	36% [0.36-0.36] (27)	36% [0.25-0.67] (166)	31% [0.30-0.31] (3,714)	31% [0.30-0.31] (3,907)	-	56% [0.40-0.60] (5)	56% [0.40-0.60] (5)	31% [0.30-0.31] (3,912)
WHO pre-qualified ACT	36% [0.36-0.36] (33)	36% [0.27-0.67] (162)	31% [0.30-0.31] (1,469)	31% [0.30-0.31] (1,664)	30% [0.30-0.67] (4)	50% [0.33-0.60] (9)	40% [0.30-0.67] (13)	31% [0.30-0.31] (1,677)
Non-prequalified ACT	30% [0.30-0.30] (6)	25% [0.07-0.32] (41)	31% [0.30-0.31] (6,098)	31% [0.30-0.31] (6,145)	20% [0.18-0.20] (6)	58% [0.56-0.60] (2)	20% [0.18-0.60] (8)	31% [0.30-0.31] (6,153)
Non-ART	67% (1)	30% [0.25-0.63] (10)	31% [0.30-0.31] (261)	31% [0.30-0.32] (272)	33% [0.25-0.50] (27)	67% [0.50-0.74] (12)	43% [0.25-0.67] (39)	31% [0.30-0.32] (311)
Sulfphadoxine pyrimethamine	67% (1)	43% [0.20-0.63] (8)	31% [0.30-0.31] (237)	31% [0.30-0.32] (246)	33% [0.30-0.67] (13)	67% [0.30-0.67] (1)	36% [0.30-0.67] (14)	31% [0.30-0.32] (260)
Quinine	-	28% [0.25-0.30] (2)	30% [0.30-0.37] (15)	30% [0.30-0.37] (17)	25% [0.18-0.33] (8)	25% [0.20-0.67] (3)	25% [0.20-0.33] (11)	30% [0.20-0.36] (28)
Chloroquine	-	-	-	-	50% [0.50-0.80] (6)	74% [0.67-0.82] (7)	67% [0.50-0.80] (13)	67% [0.50-0.80] (13)

* AETD - Adult Equivalent Treatment Dose - is the number of milligrams needed to treat a 60 kg adult (see Annex 9: AETD).

Information provided by the respondent on the price of a specific quantity of antimalarial (for example, price per tablet or price per pack) has been converted into a price by AETD.

Percentage profit margins are calculated as the percentage difference between the reported wholesale purchase price and the retail selling price for each product. Only products with non-missing wholesale and retail prices were included. The number of products missing at least one of these prices was as follows: 1,598 ACT tablets; 1,178 AL tablets; 325 DHAPPQ tablets; 34 ARPPQ tablets; 52 ASSP tablets; 9 other ACT tablets; 773 nationally approved tablets; 337 QAACT tablets; 1,261 non-QAACT tablets; 86 non-ART tablets; 78 SP tablets; 6 quinine tablets; 2 chloroquine tablets. The median percentage difference is shown here.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 8 Median percent price increase for pre-packaged ACTs and mRDTs in outlets surveyed, by outlet type

	Type of outlet								Retail Total
	Formal				Informal				
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	Retail Total	
Median profit margin* for pre-packaged therapies :	Median % [IQR] (N of antimalarials)								
WHO pre-qualified aArtemether lumefantrine									
Pack size 1 (pediatric): For 5-15 kgs	36% [0.36-0.36] (10)	36% [0.25-0.67] (44)	31% [0.30-0.31] (279)	31% [0.30-0.33] (333)	-	-	-	-	31% [0.30-0.33] (333)
Packaging size 2 (child): For 15-25 kgs	-	25% [0.25-0.25] (2)	31% [0.30-0.31] (111)	31% [0.30-0.31] (113)	-	-	-	-	31% [0.30-0.31] (113)
Size 3 package (Teenager): For 25-35 kgs	-	-	31% [0.30-0.31] (87)	31% [0.30-0.31] (87)	-	-	-	-	31% [0.30-0.31] (87)
Size 4 package (adult): For \geq 35 kgs	-	9% [0.07-0.60] (6)	31% [0.30-0.31] (416)	31% [0.30-0.31] (422)	-	-	-	-	31% [0.30-0.31] (422)
Non-prequalified artemether lumefantrine									
Pack size 1 (pediatric): For 5-15 kgs	-	32% [0.25-0.42] (7)	31% [0.30-0.31] (1,497)	31% [0.30-0.31] (1,504)	-	-	-	-	31% [0.30-0.31] (1,504)
Pack size 2 (child): For 15-25 kgs	-	15% (1)	31% [0.30-0.31] (442)	31% [0.30-0.31] (443)	-	-	-	-	31% [0.30-0.31] (443)
Size 3 package (Teenager): For 25-35 kgs	-	9% [0.09-0.17] (2)	31% [0.30-0.31] (90)	31% [0.30-0.31] (92)	-	-	-	-	31% [0.30-0.31] (92)
Size 4 package (adult): For \geq 35 kgs	30% [0.16-0.30] (4)	25% [0.08-0.30] (13)	31% [0.30-0.31] (2,019)	31% [0.30-0.31] (2,036)	20% (1)	-	20% (1)	-	31% [0.30-0.31] (2,037)
mRDT									
mRDT (per unit)	36% [0.30-0.36] (42)	36% [0.18-0.52] (205)	-	36% [0.20-0.50] (247)	-	-	-	-	36% [0.20-0.50] (247)

Percentage profit margins are calculated as the percentage unit price difference between the reported wholesale purchase price and the retail selling price for each product. Only products with non-missing wholesale and retail prices were included. The number of products for which at least one of these prices was missing was as follows: For WHO prequalified LAs, 71 pediatric, 15 children, 10 adolescents and 81 adults had no price information; For non-quality-assured LAs, 314 pediatric, 94 children, 15 adolescents and 413 adults had no price information; and 128 RDTs. The median percentage difference is shown here.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 9 Absolute profit margins for antimalarial (standardized AETD) in surveyed outlets, by outlet type

	Type of outlet							Retail Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	
Median profit margin per AETD* :	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)
Any ACT	161.15 FCFA [161.15-302.15] (40)	191.36 FCFA [161.15-478.41] (210)	597.76 FCFA [491.00-814.80] (7,665)	591.21 FCFA [475.39-813.80] (7,915)	232.66 FCFA [167.86-302.15] (10)	302.15 FCFA [201.43-402.87] (11)	232.66 FCFA [201.43-402.87] (21)	591.21 FCFA [475.39-813.80] (7,936)
Artemether lumefantrine	161.15 FCFA [161.15-246.76] (39)	188.84 FCFA [161.15-452.11] (204)	559.99 FCFA [467.33-696.96] (5,646)	554.95 FCFA [448.86-694.95] (5,889)	232.66 FCFA [167.86-302.15] (10)	302.15 FCFA [201.43-402.87] (11)	232.66 FCFA [201.43-402.87] (21)	554.95 FCFA [446.18-694.95] (5,910)
Dihydroartemisinin piperaquine	1,465.44 FCFA (1)	619.41 FCFA [151.08-1208.61] (6)	720.13 FCFA [554.95-939.31] (1,575)	720.13 FCFA [554.95-939.31] (1,582)	-	-	-	720.13 FCFA [554.95-939.31] (1,582)
Arterolane piperaquine	-	-	905.11 FCFA [612.36-958.83] (156)	905.11 FCFA [612.36-958.83] (156)	-	-	-	905.11 FCFA [612.36-958.83] (156)
Artesunate SP	-	-	814.80 FCFA [596.25-950.77] (246)	814.80 FCFA [596.25-950.77] (246)	-	-	-	814.80 FCFA [596.25-950.77] (246)
Other ACT	-	-	949.76 FCFA [694.95-969.91] (42)	949.76 FCFA [694.95-969.91] (42)	-	-	-	949.76 FCFA [694.95-969.91] (42)
ACT recorded at national level	161.15 FCFA [161.15-189.35] (28)	201.43 FCFA [161.15-496.87] (173)	564.02 FCFA [465.82-725.16] (3,761)	554.95 FCFA [446.18-709.05] (3,962)	-	302.15 FCFA [302.15-402.87] (5)	302.15 FCFA [302.15-402.87] (5)	554.95 FCFA [445.17-709.05] (3,967)
WHO pre-qualified ACT	161.15 FCFA [161.15-161.15] (33)	173.23 FCFA [161.15-402.87] (168)	564.02 FCFA [528.77-694.95] (1,484)	554.95 FCFA [435.10-683.53] (1,685)	232.66 FCFA [232.66-402.87] (4)	201.43 FCFA [201.43-302.15] (9)	232.66 FCFA [201.43-352.51] (13)	554.95 FCFA [435.10-683.53] (1,698)
Unqualified ACT	453.23 FCFA [246.76-483.44] (7)	352.51 FCFA [100.72-557.97] (42)	602.29 FCFA [478.91-815.14] (6,181)	600.27 FCFA [478.16-815.14] (6,230)	167.86 FCFA [167.86-302.15] (6)	553.94 FCFA [503.59-604.30] (2)	302.15 FCFA [167.86-402.87] (8)	599.77 FCFA [478.16-815.14] (6,238)
Non-ART	0.60 FCFA (1)	151.08 FCFA [69.49-507.63] (10)	114.82 FCFA [93.67-238.20] (265)	114.82 FCFA [93.67-238.20] (276)	125.90 FCFA [70.00-167.86] (27)	214.02 FCFA [161.15-251.79] (12)	151.08 FCFA [87.36-238.36] (39)	116.23 FCFA [93.67-238.30] (315)
Sulfadoxine pyrimethamine	0.60 FCFA (1)	151.08 FCFA [50.36-251.79] (8)	108.77 FCFA [93.67-123.88] (241)	108.77 FCFA [93.67-123.88] (250)	100.72 FCFA [58.16-151.08] (13)	100.72 FCFA [67.14-151.08] (14)	100.72 FCFA [100.72-123.88] (264)	106.76 FCFA [93.67-123.88] (264)
Quinine	-	616.78 FCFA [507.63-725.92] (2)	1,153.09 FCFA [726.80-1229.45] (15)	1,153.09 FCFA [726.80-1229.45] (17)	524.13 FCFA [317.27-1269.09] (8)	524.13 FCFA [423.03-698.84] (3)	524.13 FCFA [423.03-698.84] (11)	751.26 FCFA [524.13-1229.45] (28)
Chloroquine	-	-	-	-	125.90 FCFA [75.54-167.86] (6)	214.02 FCFA [161.15-226.61] (7)	161.15 FCFA [125.90-214.02] (13)	161.15 FCFA [125.90-214.02] (13)

* AETD - Adult Equivalent Treatment Dose - is the number of milligrams needed to treat a 60 kg adult (see Annex 8: AETDs).

Information provided by the respondent on the price of a specific quantity of antimalarial (for example, price per tablet or price per pack) has been converted into a price by AETD.

Profit margins are calculated as the unit price difference between the reported wholesale purchase price and the retail selling price for each product by AETD. Only products with non-missing wholesale and retail prices were included. The number of products for which at least one of these prices was missing was as follows: 1,492 any ACT tablets; 1,096 AL tablets; 305 DHAPPQ tablets; 34 ARPPQ tablets; 49 ASSP tablets; 8 other ACT tablets; 718 nationally approved tablets; 316 QAACT tablets; 1,176 non-QAACT tablets; 82 non-ART tablets; 74 SP tablets; 6 quinine tablets; 2 chloroquine tablets.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 10 Absolute profit margins on tablet ACT and mRDTs in surveyed outlets, by outlet type

	Type of outlet								Retail Total	
	Formal				Informal					
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total			
Median profit margin for pre-packaged therapy:	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)	Median FCFA [IQR] (N of antimalarials)				
WHO prequalified artemether lumefantrine										
Pack size 1 (pediatric): For 5-15 kgs	40.29 FCFA [40.29-40.29] (10)	46.33 FCFA [40.29-100.72] (46)	166.18 FCFA [146.04-279.99] (282)	165.18 FCFA [138.41-271.94] (338)	-	-	-	-	165.18 FCFA [138.41-271.94] (338)	
Pack size 2 (child): For 15-25 kgs	-	302.15 FCFA [302.15-302.15] (2)	347.47 FCFA [339.42-347.47] (113)	347.47 FCFA [339.42-347.47] (115)	-	-	-	-	347.47 FCFA [339.42-347.47] (115)	
Size 3 package (Teenager): For 25-35 kgs	-	-	512.65 FCFA [502.08-513.66] (87)	512.65 FCFA [502.08-513.66] (87)	-	-	-	-	512.65 FCFA [502.08-513.66] (87)	
non-prequalified artemether lumefantrine										
Size 4 package (adult): For ≥35 kgs	-	201.43 FCFA [151.08-755.38] (6)	542.87 FCFA [502.58-553.94] (419)	542.87 FCFA [502.18-553.94] (425)	-	-	-	-	542.87 FCFA [502.18-553.94] (425)	
Pack size 1 (pediatric): For 5-15 kgs	-	201.43 FCFA [105.75-288.05] (8)	315.25 FCFA [174.24-435.60] (1,518)	315.25 FCFA [174.24-435.60] (1,526)	-	-	-	-	315.25 FCFA [174.24-435.60] (1,526)	
Packaging size 2 (child): For 15-25 kgs	-	302.15 FCFA (1)	488.48 FCFA [306.18-518.69] (453)	488.48 FCFA [306.18-518.69] (454)	-	-	-	-	488.48 FCFA [306.18-518.69] (454)	
Size 3 package (Teenager): For 25-35 kgs	-	251.79 FCFA [251.79-372.65] (2)	611.35 FCFA [598.26-611.35] (90)	611.35 FCFA [597.76-611.35] (92)	-	-	-	-	611.35 FCFA [597.76-611.35] (92)	
Size 4 package (adult): For ≥35 kgs	453.23 FCFA [246.76-453.23] (4)	348.48 FCFA [100.72-397.83] (13)	528.77 FCFA [465.31-624.45] (2,039)	528.77 FCFA [464.31-624.25] (2,056)	167.86 FCFA (1)	-	167.86 FCFA (1)	-	528.77 FCFA [464.31-624.25] (2,057)	
RDT										
mRDT (per unit)	80.57 FCFA [40.29-161.15] (43)	100.72 FCFA [40.29-251.79] (219)	-	100.72 FCFA [40.29-241.72] (262)	-	-	-	-	100.72 FCFA [40.29-241.72] (262)	

Profit margins are calculated as the unit price difference between the declared wholesale purchase price and the retail selling price for each product, per prepackaged product. Only products with non-missing wholesale and retail prices were included. The number of products for which at least one of these prices was missing was as follows: For quality-assured LA: 66 pediatric, 13 pediatric, 10 adolescent and 78 adult; For non-quality-assured LA: 292 pediatric, 83 pediatric, 15 adolescent and 393 adult; and 113 RDT.

Source: ACTwatch Lite survey, BENIN, 2023

Table 11 Median number of antimalarial AETDs and RDTs sold in the week preceding the survey, in all outlets interviewed, by outlet type

	Type of outlet							Retail Total (N of retail outlets)
	Formal			Informal				
	Private not-for-profit facility (N of retail outlets)	Private for-profit facility (N of retail outlets)	Pharmacy/ Pharmaceutical depot (N of retail outlets)	Formal outlet Total Median [IQR] (N of retail outlets)	General retailer Median [IQR] (N of retail outlets)	Itinerant vendor Median [IQR] (N of retail outlets)	Informal outlet Total Median [IQR] (N of retail outlets)	
Median number sold among all PdV checked	Median [IQR] (N of retail outlets)	Median [IQR] (N of retail outlets)	Median [IQR] (N of retail outlets)	Median [IQR] (N of retail outlets)	Median [IQR] (N of retail outlets)	Median [IQR] (N of retail outlets)	Median [IQR] (N of retail outlets)	Median [IQR] (N of retail outlets)
1. Any ACT	4.0 [1.00-10.00] (55)	3.5 [1.25-7.50] (237)	1.0 [0.00-3.00] (8,554)	1.0 [0.00-3.00] (8,846)	5.0 [3.00-5.00] (10)	3.0 [2.50-5.00] (11)	4.0 [2.50-5.00] (21)	1.0 [0.00-3.00] (8,867)
Artemether lumefantrine	4.0 [1.00-10.00] (54)	3.8 [1.50-7.50] (231)	1.0 [0.00-3.00] (6,298)	1.0 [0.00-3.00] (6,583)	5.0 [3.00-5.00] (10)	3.0 [2.50-5.00] (11)	4.0 [2.50-5.00] (21)	1.0 [0.00-3.00] (6,604)
Dihydroartemisinin piperaquine	1.67 (1)	0.0 [0.00-1.33] (6)	1.0 [0.00-2.00] (1,746)	1.0 [0.00-2.00] (1,753)	-	-	-	1.0 [0.00-2.00] (1,753)
Artesunate SP	-	-	2.0 [1.00-5.00] (280)	2.0 [1.00-5.00] (280)	-	-	-	2.0 [1.00-5.00] (280)
Arterolane piperaquine	-	-	0.5 [0.00-1.50] (180)	0.5 [0.00-1.50] (180)	-	-	-	0.5 [0.00-1.50] (180)
Other ACT	-	-	0.0 [0.00-1.00] (50)	0.0 [0.00-1.00] (50)	-	-	-	0.0 [0.00-1.00] (50)
Nationally approved ACT	4.0 [1.00-14.00] (41)	3.8 [1.50-7.50] (194)	1.0 [0.00-3.00] (4,168)	1.5 [0.00-3.00] (4,403)	-	2.5 [2.50-3.00] (5)	2.5 [2.50-3.00] (5)	1.5 [0.00-3.00] (4,408)
WHO pre-qualified ACT	4.0 [1.00-10.00] (46)	3.8 [1.50-7.50] (190)	2.0 [0.50-4.00] (1,659)	2.0 [0.50-4.50] (1,895)	5.0 [5.00-12.00] (4)	3.0 [3.00-5.00] (9)	5.0 [3.00-5.00] (13)	2.0 [0.50-4.50] (1,908)
Front-line ACT	4.0 [1.00-10.00] (54)	3.8 [1.50-7.50] (231)	1.0 [0.00-3.00] (6,314)	1.0 [0.00-3.00] (6,599)	5.0 [3.00-5.00] (10)	3.0 [2.50-5.00] (11)	4.0 [2.50-5.00] (21)	1.0 [0.00-3.00] (6,620)
Non-prequalified ACT	1.7 [1.00-5.00] (9)	3.0 [1.00-5.00] (47)	1.0 [0.00-3.00] (6,895)	1.0 [0.00-3.00] (6,951)	3.0 [2.00-4.00] (6)	1.3 [0.00-2.50] (2)	2.5 [1.50-4.00] (8)	1.0 [0.00-3.00] (6,959)
2. Any non-artemisinin therapy	16.0 [7.00-16.00] (4)	6.0 [4.29-10.00] (27)	2.0 [0.52-6.00] (306)	3.0 [0.80-7.00] (337)	2.0 [1.00-8.00] (27)	5.8 [2.40-6.00] (14)	3.0 [1.19-7.33] (41)	3.0 [1.00-7.00] (378)
Sulfadoxine pyrimethamine	16.0 [7.00-16.00] (3)	8.0 [5.00-10.00] (24)	3.0 [1.00-7.00] (280)	3.0 [1.00-8.00] (307)	8.0 [3.00-8.00] (13)	10 [8.00-10.00] (2)	8.0 [3.00-10.00] (15)	3.0 [1.00-8.00] (322)
Oral quinine	79.3 (1)	4.3 [4.29-4.29] (3)	0.7 [0.00-1.44] (17)	0.7 [0.00-1.73] (21)	0.9 [0.48-1.19] (8)	4.8 [0.38-5.76] (3)	1.2 [0.48-1.27] (11)	0.9 [0.17-1.73] (32)
Quinine IV/IM	-	-	-	-	-	-	-	-
3. Oral artemisinin monotherapy	-	-	-	-	-	-	-	-
4. Non-oral artemisinin monotherapy	-	0 (1)	0.0 [0.00-0.25] (66)	0.0 [0.00-0.25] (67)	-	-	-	0.0 [0.00-0.25] (67)
Artesunate IV/IM	-	-	-	-	-	-	-	-

Table 11 Median number of antimalarial AETDs and RDTs sold in the week preceding the survey, in all outlets interviewed, by outlet type

	Type of outlet							Retail Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	
Artemether IV/IM	-	-	-	-	-	-	-	-
Rectal artesunate	-	0	0.0	0.0	-	-	-	0.0
		(1)	[0.00-0.31] (38)	[0.00-0.31] (39)				[0.00-0.31] (39)
Any antimalarial drug	4.0 [1.00-14.00] (59)	3.8 [1.50-7.50] (265)	1.0 [0.00-3.00] (8,926)	1.0 [0.00-3.00] (9,250)	3.0 [1.20-8.00] (37)	4.0 [2.40-6.00] (25)	3.0 [1.33-6.00] (62)	1.0 [0.00-3.00] (9,312)
RDT	5.3 [1.50-16.00] (69)	5.0 [2.25-12.00] (295)	-	5.0 [2.00-14.00] (364)	25.0 (1)	-	25.0 (1)	5.0 [2.00-14.00] (365)

* AETD - Adult Equivalent Treatment Dose - is the number of milligrams needed to treat a 60 kg adult (see Annex 8: AETDs).

Information provided by the respondent on the price of a specific quantity of antimalarial (for example, price per tablet or price per pack) has been converted into a price by AETD.

Profit margins are calculated as the unit price difference between the reported wholesale purchase price and the retail selling price for each product by AETD. Only products with non-missing wholesale and retail prices were included. The number of products for which at least one of these prices was missing was as follows: 457 all antimalarials; 439 all ACT tablets; 308 AL tablets; 109 DHAPPQ tablets; 10 ARPPQ tablets; 12 ASSP tablets; 0 other ACT tablets; 216 nationally approved tablets; 89 QAACT tablets; 350 non-QAACT tablets; 17 non-ACT tablets; 12 SP tablets; 2 oral quinine; 0 injectable quinine; and 10 mRDTs.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 12 Median number of antimalarial AETDs and RDTs sold in the week preceding the survey in retail outlets*, by outlet type

	Type of outlet							Retail Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	
Median number of sales in outlets with any sales:	Median [IQR] (N of retail outlets)							
1. Any ACT	4.0 [1.00-10.00] (55)	3.5 [1.25-7.50] (237)	1.0 [0.00-3.00] (8,554)	1.0 [0.00-3.00] (8,846)	5.0 [3.00-5.00] (10)	3.0 [2.50-5.00] (11)	4.0 [2.50-5.00] (21)	1.0 [0.00-3.00] (8,867)
Artemether lumefantrine	4.0 [1.00-10.00] (54)	3.8 [1.50-7.50] (231)	1.0 [0.00-3.00] (6,298)	1.0 [0.00-3.00] (6,583)	5.0 [3.00-5.00] (10)	3.0 [2.50-5.00] (11)	4.0 [2.50-5.00] (21)	1.0 [0.00-3.00] (6,604)
Dihydroartemisinin piperaquine	1.67 (1)	0.0 [0.00-1.33] (6)	1.0 [0.00-2.00] (1,746)	1.0 [0.00-2.00] (1,753)	-	-	-	1.0 [0.00-2.00] (1,753)
Artesunate SP	-	-	2.0 [1.00-5.00] (280)	2.0 [1.00-5.00] (280)	-	-	-	2.0 [1.00-5.00] (280)
Arterolane piperaquine	-	-	0.5 [0.00-1.50] (180)	0.5 [0.00-1.50] (180)	-	-	-	0.5 [0.00-1.50] (180)
Other ACT	-	-	0.0 [0.00-1.00] (50)	0.0 [0.00-1.00] (50)	-	-	-	0.0 [0.00-1.00] (50)
Nationally approved ACT	4.0 [1.00-14.00] (41)	3.8 [1.50-7.50] (194)	1.0 [0.00-3.00] (4,168)	1.5 [0.00-3.00] (4,403)	-	2.5 [2.50-3.00] (5)	2.5 [2.50-3.00] (5)	1.5 [0.00-3.00] (4,408)
WHO pre-qualified ACT	4.0 [1.00-10.00] (46)	3.8 [1.50-7.50] (190)	2.0 [0.50-4.00] (1,659)	2.0 [0.50-4.50] (1,895)	5.0 [5.00-12.00] (4)	3.0 [3.00-5.00] (9)	5.0 [3.00-5.00] (13)	2.0 [0.50-4.50] (1,908)
Front-line ACT	4.0 [1.00-10.00] (54)	3.8 [1.50-7.50] (231)	1.0 [0.00-3.00] (6,314)	1.0 [0.00-3.00] (6,599)	5.0 [3.00-5.00] (10)	3.0 [2.50-5.00] (11)	4.0 [2.50-5.00] (21)	1.0 [0.00-3.00] (6,620)
Non-prequalified ACT	1.7 [1.00-5.00] (9)	3.0 [1.00-5.00] (47)	1.0 [0.00-3.00] (6,895)	1.0 [0.00-3.00] (6,951)	3.0 [2.00-4.00] (6)	1.3 [0.00-2.50] (2)	2.5 [1.50-4.00] (8)	1.0 [0.00-3.00] (6,959)
2. Any non-artemisinin therapy	16 [7.00-16.00] (4)	6.0 [4.29-10.00] (27)	2.0 [0.52-6.00] (306)	3.0 [0.80-7.00] (337)	2.0 [1.00-8.00] (27)	5.8 [2.40-6.00] (14)	3.0 [1.19-7.33] (41)	3.0 [1.00-7.00] (378)
Sulfadoxine pyrimethamine	16 [7.00-16.00] (3)	8.0 [5.00-10.00] (24)	3.0 [1.00-7.00] (280)	3.0 [1.00-8.00] (307)	8.0 [3.00-8.00] (13)	10 [8.00-10.00] (2)	8.0 [3.00-10.00] (15)	3.0 [1.00-8.00] (322)
Oral quinine	79.3 (1)	4.3 [4.29-4.29] (3)	0.7 [0.00-1.44] (17)	0.7 [0.00-1.73] (21)	0.9 [0.48-1.19] (8)	4.8 [0.38-5.76] (3)	1.2 [0.48-1.27] (11)	0.9 [0.17-1.73] (32)
Quinine IV/IM	-	-	-	-	-	-	-	-
3. Oral artemisinin monotherapy	-	-	-	-	-	-	-	-
	0	0	0	0	-	-	-	0

Table 12 Median number of antimalarial AETDs and RDTs sold in the week preceding the survey in retail outlets*, by outlet type

	Type of outlet							Retail Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	
4. Non-oral artemisinin monotherapy								
Artesunate IV/IM	-	(1)	[0.00-0.25] (66)	[0.00-0.25] (67)	-	-	-	[0.00-0.25] (67)
Artemether IV/IM	-	-	-	-	-	-	-	-
Rectal artesunate	-	0 (1)	0 [0.00-0.31] (38)	0 [0.00-0.31] (39)	-	-	-	0 [0.00-0.31] (39)
Any antimalarial drug	4 [1.00-14.00] (59)	3.75 [1.50-7.50] (265)	1 [0.00-3.00] (8,926)	1 [0.00-3.00] (9,250)	3 [1.20-8.00] (37)	4 [2.40-6.00] (25)	3 [1.33-6.00] (62)	1 [0.00-3.00] (9,312)
RDT	4 [1.00-10.00] (52)	3.75 [1.50-7.50] (202)	-	3.75 [1.50-8.00] (254)	-	-	-	3.75 [1.50-8.00] (254)

* AETD - Adult Equivalent Treatment Dose - is the number of milligrams needed to treat a 60 kg adult (see Annex 8: AETDs).

Information provided by the respondent on the price of a specific quantity of antimalarial (for example, price per tablet or price per pack) has been converted into a price by AETD.

Profit margins are calculated as the unit price difference between the reported wholesale purchase price and the retail selling price for each product by AETD. Only products with non-missing wholesale and retail prices were included.

The number of products missing at least one of these prices was as follows: 457 all antimalarials; 308 AL tablets; 109 DHAPPQ tablets; 10 ARPPQ tablets; 12 ASSP tablets; 0 other ACT tablets; 216 nationally approved tablets; 89 QAACT tablets; 350 non-QAACT tablets; 17 non-ACT tablets; 12 SP tablets; 2 oral quinine; 0 injectable quinine; and 10 RDTs.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 13 Market share of antimalarial drugs - total private sector (retail) market

Distribution of antimalarial AETDs sold or distributed during the previous week, by type of outlet and by product type*.

	Type of outlet								Retail Total	
	Formal			Informal						
	Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total			
	%	%	%	%	%	%	%	%	%	
1. Any ACT	2.1	6.9	79.5	88.6	0.2	0.1	0.4	89.0		
Artemether lumefantrine	2.1	6.8	64.6	73.6	0.2	0.1	0.4	74.0		
Dihydroartemisinin piperaquine	0.0	0.1	10.0	10.1	0.0	0.0	0.0	10.1		
Artesunate SP	0.0	0.0	3.8	3.8	0.0	0.0	0.0	3.8		
Arterolane piperaquine	0.0	0.0	0.7	0.7	0.0	0.0	0.0	0.7		
Other ACT ^β	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.3		
ACT prequalified by WHO	1.8	6.2	19.0	27.0	0.2	0.1	0.3	27.3		
Additional nationally approved ACTs (not WHO prequalified) #	0.1	0.4	31.0	31.4	0.0	0.0	0.0	31.4		
ACT that is not WHO prequalified or nationally approved	0.3	0.3	29.5	30.1	0.1	0.0	0.1	30.2		
Front-line ACT+	2.1	6.8	64.8	73.8	0.2	0.1	0.4	74.2		
2. Non-artemisinin therapy √	0.4	0.9	5.9	7.3	0.5	0.3	0.8	8.0		
Sulfadoxine pyrimethamine	0.2	0.9	5.7	6.8	0.4	0.0	0.5	7.2		
Oral quinine	0.3	0.0	0.1	0.4	0.0	0.0	0.1	0.5		
Quinine injection	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1		
3. Oral artemisinin monotherapy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
4. Non-oral artemisinin monotherapy	0.3	0.7	2.1	3.0	0.0	0.0	0.0	3.0		
Artesunate injection	0.2	0.5	1.4	2.2	0.0	0.0	0.0	2.2		
Artemether Injection	0.1	0.1	0.6	0.8	0.0	0.0	0.0	0.8		
Rectal artesunate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Any antimalarial drug	2.9	8.5	87.5	98.8	0.8	0.4	1.2	100.0		

* Retail outlets stocking antimalarials had at least one antimalarial in stock on the day of the survey, which was verified by the presence of at least one antimalarial recorded on the audit sheet. The denominator includes 12 outlets that met the selection criteria for a full interview, but did not carry out the full interview (i.e. were not interviewed or only carried out a partial interview).

β other ACTs included: AL, DHAPPQ, Arterolane-PPQ, ASSP and include ASMQ, AS-pyronaridine, DHA-PPQ-Trim

+ At the time of the 2023 ACTwatch Lite study in Benin, AL and ARPPQ were first-line treatments for uncomplicated malaria.

Ψ Prequalified ACTs are products that appear on the 2023 WHO prequalified list.

Nationally approved ACTs are those on the 2023 list of approved antimalarials in Benin

√ Other non-artemisinin therapies i.e. other than SP, quinine and chloroquine

Source: ACTwatch Lite survey, BENIN, 2023.

Table 14 Market share of antimalarials, by type of outlet

Distribution of antimalarial AETDs sold or distributed during the previous week, by type of outlet and by product type*.

	Type of outlet							
	Formal			Informal				
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	Retail Total
	%	%	%	%	%	%	%	%
1. Any ACT	74.3	81.4	90.9	89.6	31.3	37.2	33.3	89.0
Artemether lumefantrine	73.9	80.8	73.9	74.5	31.3	37.2	33.3	74.0
Dihydroartemisinin piperaquine	0.3	0.6	11.5	10.2	0.0	0.0	0.0	10.1
Artesunate SP	0.0	0.0	4.3	3.8	0.0	0.0	0.0	3.8
Arterolane piperaquine	0.0	0.0	0.8	0.7	0.0	0.0	0.0	0.7
Other ACT	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.3
WHO pre-qualified ACT ψ	62.8	73.1	21.8	27.4	21.0	34.9	25.7	27.3
Additional ACTs approved at national level (not WHO prequalified) #	2.4	4.8	35.4	31.8	0.0	2.3	0.8	31.4
ACT that is not WHO prequalified or nationally approved	9.1	3.5	33.8	30.4	10.3	0.0	6.8	30.2
Front-line ACT+ ⁺	73.9	80.8	74.1	74.7	31.3	37.2	33.3	74.2
2. Non-artemisinin therapy \checkmark	15.6	10.9	6.7	7.4	68.2	62.8	66.4	8.0
Sulfadoxine pyrimethamine	6.8	10.3	6.5	6.8	52.4	12.3	38.7	7.2
Oral quinine	8.8	0.4	0.2	0.4	3.7	9.4	5.7	0.5
Quinine injection	0.0	0.2	0.0	0.1	0.1	0.0	0.1	0.1
3. Oral artemisinin monotherapy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. Non-oral artemisinin monotherapy	10.1	7.7	2.4	3.0	0.5	0.0	0.3	3.0
Artesunate injection	7.3	6.4	1.7	2.2	0.5	0.0	0.3	2.2
Artemether Injection	2.8	1.3	0.7	0.8	0.0	0.0	0.0	0.8
Rectal artesunate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Any antimalarial drug	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Retail outlets stocking antimalarials had at least one antimalarial in stock on the day of the survey, which was verified by the presence of at least one antimalarial recorded on the audit sheet. The denominator includes 12 outlets that met the selection criteria for a full interview, but did not carry out the full interview (i.e. were not interviewed or only carried out a partial interview).

β other ACTs included: AL, DHAPPQ, Arterolane-PPQ, ASSP and include ASMQ, AS-pyronaridine, DHA-PPQ-Trim

+ At the time of the 2023 ACTwatch Lite study in Benin, AL and ARPPQ were first-line treatments for uncomplicated malaria.

ψ Prequalified ACTs are products that appear on the 2023 WHO prequalified list.

Nationally approved ACTs are those on the 2023 list of approved antimalarials in Benin

\checkmark Other non-artemisinin therapies i.e. other than SP, quinine and chloroquine

Table 15 Market share of blood tests for malaria

Distribution of malaria blood tests performed or sold in the previous week in each type of outlet, by type of test*.	Retail level								Retail Total	
	Formal			Informal						
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total			
	%	%	%	%	%	%	%	%	%	
1. Microscopy	12.0	33.6	0.0	45.7	0.0	0.0	0.0	45.7		
2. RDT	13.8	40.2	0.0	54.0	0.3	0.0	0.3	54.3		
mRDT prequalified Ψ	13.8	40.1	0.0	53.9	0.3	0.0	0.3	54.2		
Abbott Diagnostics	13.8	36.2	0.0	50.0	0.3	0.0	0.3	50.3		
ARKRAY Healthcare	0.0	1.2	0.0	1.2	0.0	0.0	0.0	1.2		
Advy Chemical	0.0	2.5	0.0	2.5	0.0	0.0	0.0	2.5		
Other manufacturer	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1		
mRDT manufacturer unknown	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.2		
3. Any diagnosis	25.8	73.8	0.0	99.7	0.3	0.0	0.3	100.0		

* 5292 blood tests for malaria were carried out in the last seven days.

** Sum of lines - market share for the type of drug specified for blood tests.

*** Sum of columns - market share for specified outlet type.

Ψ Prequalified RDTs are products that appear on the WHO prequalified list.

A total of 294 malaria screening blood tests were audited. Of these, 0 audited tests were not included in the market share calculations due to incomplete or inconsistent information.

Table 16 Market share of malaria blood tests by type of outlet

Distribution of malaria blood tests performed or sold in the previous week in each type of outlet, by type of test*.	Retail level								Retail Total	
	Formal			Informal						
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total			
	%	%	%	%	%	%	%	%	%	
1. Microscopy	46.6	45.5	0.0	45.8	0.0	0.0	0.0	0.0	45.7	
2. RDT	53.4	54.5	0.0	54.2	100.0	0.0	100.0	100.0	54.3	
mRDT prequalified Ψ	53.4	54.2	0.0	54.0	100.0	0.0	100.0	100.0	54.2	
Abbott Diagnostics	53.4	49.0	0.0	50.1	100.0	0.0	100.0	100.0	50.3	
ARKRAY Healthcare	0.0	1.7	0.0	1.3	0.0	0.0	0.0	0.0	1.2	
Advy Chemical	0.0	3.4	0.0	2.5	0.0	0.0	0.0	0.0	2.5	
Other manufacturer	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	
mRDT manufacturer unknown	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.2	
3. Any diagnosis	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	100.0	

* 5292 blood tests for malaria have been carried out in the last seven days.

The sum of the categories in each column is 100%.

Ψ Prequalified RDTs are products that appear on the WHO prequalified list.

A total of 294 malaria screening blood tests were audited. Of these, 0 audited tests were not included in the market share calculations due to incomplete or inconsistent information.

SECTION B: URBAN / RURAL

Table 17 Availability of antimalarials at surveyed outlets in 2023, by urban/rural area

		Type of outlet								Type of supplier		
		Formal			Informal				Retail Total	Wholesalers		Suppliers Total
		Private not-for-profit facility	Private for-profit facility	Pharmacy/pharmaceutical depot	Formal Total	General retailer	Itinerant vendor	Informal Total		% (95% CI)	% (95% CI)	% (95% CI)
Percentage of outlets* stocking :		Urban N=16	Urban N=165	Urban N=124	Urban N=305	Urban N=13	Urban N=14	Urban N= 27	Urban N=332	Urban N = 4	Urban N = 57	Urban N = 61
		Rural N=9	Rural N=45	Rural N=21	Rural N=75	Rural N=21	Rural N=4	Rural N = 25	Rural N=100	Rural N = 0	Rural N = 8	Rural N = 8
Any anti-malarial medication at the time of the survey visit	Urban	90.3 (63.9, 98.0)	81.3 (74.9, 86.4)	99.6 (97.6, 99.9)	89.3 (85.9, 92.0)	81.6 (39.2, 96.8)	94.3 (67.1, 99.3)	88.2 (61.3, 97.3)	89.2 (85.5, 92.1)	62.6 (16.2, 93.5)	100.0	97.3 (84.7, 99.6)
	Rural	100.0	80.4 (64.3, 90.4)	100.0	89.1 (79.0, 94.7)	41.1 (15.3, 72.8)	100.0	45.9 (17.0, 77.9)	77.8 (53.9, 91.3)	-	100.0	100.0
Any ACT	Urban	77.8 (40.0, 94.9)	49.3 (36.7, 62.0)	98.1 (93.4, 99.5)	71.0 (63.2, 77.6)	56.9 (26.1, 83.1)	45.6 (11.8, 84.1)	51.0 (23.3, 78.1)	69.3 (63.1, 74.8)	62.6 (16.2, 93.5)	96.9 (84.8, 99.4)	94.4 (82.7, 98.3)
	Rural	89.2 (52.4, 98.4)	72.2 (55.8, 84.2)	100.0	83.4 (72.1, 90.7)	12.8 (2.4, 47.0)	25.0 (6.7, 60.9)	13.8 (3.0, 45.2)	65.1 (42.9, 82.2)	-	100.0	100.0
Artemether lumefantrine*	Urban	77.8 (40.0, 94.9)	49.3 (36.7, 62.0)	98.1 (93.4, 99.5)	71.0 (63.2, 77.6)	56.9 (26.1, 83.1)	45.6 (11.8, 84.1)	51.0 (23.3, 78.1)	69.3 (63.1, 74.8)	62.6 (16.2, 93.5)	96.9 (84.8, 99.4)	94.4 (82.7, 98.3)
	Rural	89.2 (52.4, 98.4)	72.2 (55.8, 84.2)	100.0	83.4 (72.1, 90.7)	12.8 (2.4, 47.0)	25.0 (6.7, 60.9)	13.8 (3.0, 45.2)	65.1 (42.9, 82.2)	-	100.0	-
Dihydroartemisinin piperaquine	Urban	7.7 (1.1, 37.6)	2.2 (0.9, 5.2)	95.2 (90.4, 97.7)	40.3 (35.1, 45.9)	0.0	0.0	0.0	36.9 (31.5, 42.6)	42.6 (9.6, 83.8)	94.8 (83.6, 98.5)	91.0 (80.1, 96.2)
	Rural	0.0 -	2.1 (0.3, 12.8)	63.3 (42.8, 79.9)	22.6 (14.9, 32.6)	0.0	0.0	0.0	16.6 (9.6, 27.2)	-	87.8 (59.8, 97.2)	87.8 (59.8, 97.2)
Arterolane maleate piperaquine (ARPPQ)	Urban	0.0	0.3	59.3	24.3 (10.0, 30.0)	0.0	0.0	0.0	22.2 (17.0, 30.0)	27.8	59.5	57.2
	Rural	0.0 -	0.0 -	37.1 (21.2, 56.3)	12.6 (6.8, 21.9)	0.0	0.0	0.0	9.2 (4.5, 18.0)	-	72.1 (39.4, 91.1)	72.1 (39.4, 91.1)
Artesunate + Sulfadoxine-pyrimethamine (ASSP)	Urban	0.0 -	0.0 -	89.1 (82.8, 93.2)	36.2 (31.1, 41.7)	0.0	0.0	0.0	33.1 (27.9, 38.8)	62.6 (16.2, 93.5)	84.2 (75.1, 90.4)	82.6 (73.6, 89.0)
	Rurality	0.0 -	0.0 -	59.5 (39.5, 76.7)	20.1 (12.7, 30.3)	0.0	0.0	0.0	14.8 (8.2, 25.3)	-	87.8 (59.8, 97.2)	87.8 (59.8, 97.2)
Other ACT ^b	Urban	0.0 -	0.0 -	36.3 (25.4, 48.8)	14.8 (10.2, 20.8)	0.0	0.0	0.0	13.5 (9.3, 19.1)	0.0	43.4 (28.0, 60.1)	40.2 (25.6, 56.9)
	Rural	0.0 -	0.0 -	14.8 (5.4, 34.4)	5.0 (2.1, 11.4)	0.0	0.0	0.0	3.7 (1.5, 8.9)	-	9.5 (1.3, 45.0)	9.5 (1.3, 45.0)
Nationally approved ACT [#]	Urban	60.8 (33.8, 82.5)	43.0 (28.8, 58.6)	98.1 (93.4, 99.5)	66.6 (57.6, 74.5)	19.1 (5.3, 50.1)	37.5 (10.4, 75.6)	28.7 (11.5, 55.4)	63.3 (55.3, 70.7)	62.6 (16.2, 93.5)	94.8 (83.6, 98.5)	92.5 (81.1, 97.2)
	Rural	89.2	63.9	87.9	74.7	9.4	25.0	10.7	57.9	-	100.0	100.0

Table 17 Availability of antimalarials at surveyed outlets in 2023, by urban/rural area

		Type of outlet							Type of supplier			
		Formal			Informal			Retail Total	Wholesalers		Suppliers Total	
		Private not-for-profit facility	Private for-profit facility	Pharmacy/pharmaceutical depot	Formal Total	General retailer	Itinerant vendor	Informal Total	Other supplier	(95% CI)		
		% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	(95% CI)	% (95% CI)	
Percentage of outlets* stocking :		Urban N=16	Urban N=165	Urban N=124	Urban N=305	Urban N=13	Urban N=14	Urban N= 27	Urban N=332	Urban N = 4	Urban N = 57	Urban N = 61
		Rural N=9	Rural N=45	Rural N=21	Rural N=75	Rural N=21	Rural N=4	Rural N = 25	Rural N=100	Rural N = 0	Rural N = 8	Rural N = 8
		(52.4, 98.4)	(46.2, 78.5)	(69.7, 95.8)	(61.5, 84.6)	(1.5, 41.4)	(6.7, 60.9)	(2.1, 39.8)	(38.2, 75.3)	-	-	-
WHO pre-qualified WHO pre-qualified ACT [¶]	Urban	76.5 (39.6, 94.2)	43.7 (30.9, 57.2)	98.1 (93.4, 99.5)	67.9 (59.8, 75.0)	0.0 -	19.1 (4.9, 52.1)	10.0 (2.2, 35.1)	63.0 (56.3, 69.1)	62.6 (16.2, 93.5)	96.9 (84.8, 99.4)	94.4 (82.7, 98.3)
	Rurality	89.2 (52.4, 98.4)	64.9 (47.2, 79.3)	95.6 (84.2, 98.9)	77.9 (65.6, 86.7)	0.0 -	25.0 (6.7, 60.9)	2.1 (0.2, 15.8)	57.9 (38.6, 75.1)	-	100.0	100.0
Other ACT not nationally approved or WHO prequalified	Urban	20.4 (7.5, 44.8)	7.3 (3.7, 13.8)	98.1 (93.4, 99.5)	45.1 (40.0, 50.3)	37.7 (11.8, 73.3)	8.1 (3.0, 20.3)	22.3 (8.9, 45.8)	43.1 (37.4, 49.1)	62.6 (16.2, 93.5)	96.9 (84.8, 99.4)	94.4 (82.7, 98.3)
	Rural	0.0 -	9.0 (3.6, 21.0)	83.8 (61.5, 94.4)	33.4 (24.0, 44.2)	3.4 (0.4, 25.5)	0.0 -	3.1 (0.3, 22.8)	25.4 (15.8, 38.1)	-	87.8 (59.8, 97.2)	87.8 (59.8, 97.2)
Any non-artemisinin therapy	Urban	15.5 (3.7, 46.5)	21.3 (15.4, 28.7)	80.0 (72.6, 85.9)	44.8 (38.9, 50.9)	70.0 (33.2, 91.7)	73.5 (45.1, 90.3)	71.8 (49.8, 86.8)	47.1 (41.2, 53.1)	42.6 (9.6, 83.8)	85.9 (76.1, 92.1)	82.8 (72.1, 89.9)
	Rural	35.6 (11.8, 69.5)	11.0 (3.6, 28.8)	84.5 (66.2, 93.8)	38.5 (27.2, 51.1)	36.3 (14.9, 65.1)	75.0 (39.1, 93.3)	39.5 (16.5, 68.4)	38.8 (27.5, 51.4)	-	72.1 (39.4, 91.1)	72.1 (39.4, 91.1)
Sulfadoxine-pyrimethamine	Urban	15.5 (3.7, 46.5)	11.3 (7.2, 17.2)	75.3 (66.2, 82.6)	37.6 (31.7, 43.8)	57.7 (29.1, 81.9)	9.4 (1.9, 35.6)	32.5 (15.5, 55.9)	37.2 (30.7, 44.1)	27.8 (4.1, 77.5)	80.3 (69.7, 87.8)	76.5 (65.5, 84.8)
	Rural	28.6 (7.7, 65.8)	11.0 (3.6, 28.8)	82.3 (62.1, 93.0)	37.0 (25.8, 49.9)	25.2 (8.3, 55.5)	0.0 -	23.1 (8.4, 49.5)	33.3 (21.8, 47.2)	-	72.1 (39.4, 91.1)	72.1 (39.4, 91.1)
Oral quinine	Urban	0.0 -	1.7 (0.3, 7.6)	10.7 (6.2, 17.8)	5.2 (3.1, 8.6)	35.1 (17.7, 57.7)	27.3 (15.0, 44.6)	31.1 (20.8, 43.6)	7.4 (5.4, 10.2)	0.0 -	7.0 (2.4, 18.6)	6.5 (2.2, 17.4)
	Rural	6.9 (1.0, 35.8)	0.0 -	39.1 (21.4, 60.2)	14.0 (7.0, 25.9)	5.7 (0.9, 29.0)	25.0 (3.1, 77.8)	7.3 (1.5, 29.3)	12.2 (6.1, 22.9)	-	21.3 (3.8, 64.9)	21.3 (3.8, 64.9)
Chloroquine	Urban	0.0 -	0.0 -	3.1 (0.5, 18.0)	1.3 (0.2, 8.0)	12.4 (2.4, 44.7)	48.7 (32.5, 65.2)	31.3 (18.2, 48.3)	3.8 (1.8, 8.1)	0.0 -	6.5 (1.0, 32.2)	6.0 (0.9, 30.3)
	Rural	0.0 -	0.0 -	0.0 -	0.0 -	15.3 (10.0, 22.7)	50.0 (20.8, 79.2)	18.2 (12.2, 26.2)	4.8 (2.1, 10.8)	-	0.0 -	0.0 -
Other non-artemisinin therapies √	Urban	0.0 -	0.0 -	1.7 (0.6, 4.5)	0.7 (0.3, 1.8)	0.0 -	0.0 -	0.0 -	0.6 (0.2, 1.6)	0.0 -	1.4 (0.5, 4.1)	1.3 (0.4, 3.8)
	Rural	0.0 -	0.0 -	2.2 (0.3, 13.2)	0.7 (0.1, 4.6)	0.0 -	25.0 (6.7, 60.9)	2.1 (0.2, 15.8)	1.1 (0.3, 4.0)	-	0.0 -	0.0 -
Oral artemisinin monotherapy	Urban	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -
	Rural	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	-	0.0 -	0.0 -
Non-oral artemisinin monotherapy	Urban	71.8 (48.9, 87.1)	55.6 (47.0, 63.8)	86.4 (78.3, 91.8)	69.1 (63.6, 74.2)	6.2 (1.3, 25.2)	0.0 -	3.0 (0.5, 14.9)	63.5 (58.0, 68.6)	42.6 (9.6, 83.8)	93.1 (76.4, 98.2)	89.4 (76.1, 95.7)

Table 17 Availability of antimalarials at surveyed outlets in 2023, by urban/rural area

	Type of outlet								Type of supplier			
	Formal			Informal				Retail Total	Wholesalers		Suppliers Total	
	Private not-for-profit facility	Private for-profit facility	Pharmacy/pharmaceutical depot	Formal Total	General retailer	Itinerant vendor	Informal Total		Wholesalers	Other supplier		
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	
Percentage of outlets* stocking :												
	Urban N=16	Urban N=165	Urban N=124	Urban N=305	Urban N=13	Urban N=14	Urban N=27	Urban N=332	Urban N = 4	Urban N = 57	Urban N = 61	
	Rural N=9	Rural N=45	Rural N=21	Rural N=75	Rural N=21	Rural N=4	Rural N = 25	Rural N=100	Rural N = 0	Rural N = 8	Rural N = 8	
	49.4 (20.5, 78.7)	25.6 (14.4, 41.3)	80.0 (58.9, 91.7)	46.5 (34.7, 58.8)	0.0	0.0	0.0	34.3 (23.3, 47.2)	-	93.9 (66.6, 99.2)	93.9 (66.6, 99.2)	
Any treatment for severe malaria	Urban	76.1 (51.7, 90.5)	59.2 (50.2, 67.7)	87.8 (81.4, 92.3)	71.9 (66.1, 77.1)	6.2 (1.3, 25.2)	0.0	3.0 (0.5, 14.9)	66.1 (60.1, 71.6)	42.6 (9.6, 83.8)	93.1 (76.4, 98.2)	89.4 (76.1, 95.7)
	Rural	49.4 (20.5, 78.7)	25.6 (14.4, 41.3)	80.0 (58.9, 91.7)	46.5 (34.7, 58.8)	0.0	0.0	0.0	34.3 (23.3, 47.2)	-	93.9 (66.6, 99.2)	93.9 (66.6, 99.2)
Rectal artesunate	Urban	0.0	0.0	20.0 (11.7, 32.1)	8.1 (5.1, 12.9)	0.0	0.0	0.0	7.5 (4.7, 11.6)	0.0	24.0 (11.2, 43.9)	22.2 (10.4, 41.3)
	Rural	0.0	3.4 (0.5, 19.7)	8.0 (2.0, 27.3)	4.6 (1.5, 13.1)	0.0	0.0	0.0	3.4 (1.1, 10.0)	-	9.5 (1.3, 45.0)	9.5 (1.3, 45.0)
Artemether IV/IM	Urban	19.9 (7.0, 45.0)	19.1 (13.6, 26.2)	73.5 (64.0, 81.2)	41.3 (36.5, 46.3)	0.0	0.0	0.0	37.8 (33.3, 42.5)	42.6 (9.6, 83.8)	82.7 (67.3, 91.8)	79.8 (65.4, 89.2)
	Rural	42.5 (16.1, 74.0)	12.6 (5.4, 26.6)	71.8 (52.7, 85.3)	35.8 (26.0, 46.9)	0.0	0.0	0.0	26.4 (17.7, 37.4)	-	81.7 (52.1, 94.8)	81.7 (52.1, 94.8)
Artesunate IV/IM ^v	Urban	62.7 (39.2, 81.4)	46.2 (38.8, 53.8)	84.4 (76.5, 90.1)	62.8 (57.4, 67.9)	6.2 (1.3, 25.2)	0.0	3.0 (0.5, 14.9)	57.7 (52.0, 63.2)	42.6 (9.6, 83.8)	89.5 (76.5, 95.7)	86.1 (74.7, 92.9)
	Rural	42.5 (16.1, 74.0)	13.0 (5.9, 26.4)	62.3 (40.9, 79.7)	32.8 (23.5, 43.7)	0.0	0.0	0.0	24.2 (15.0, 36.5)	-	72.6 (33.2, 93.4)	72.6 (33.2, 93.4)
Quinine IV/IM	Urban	4.3 (0.7, 23.1)	9.5 (5.7, 15.3)	15.4 (11.0, 21.2)	11.6 (8.8, 15.1)	6.2 (1.3, 25.2)	0.0	3.0 (0.5, 14.9)	10.8 (8.0, 14.5)	14.8 (2.2, 58.0)	18.7 (10.2, 31.9)	18.5 (10.5, 30.4)
	Rural	6.9 (1.0, 35.8)	0.0	26.9 (10.7, 53.1)	9.9 (4.3, 21.0)	0.0	0.0	0.0	7.3 (3.0, 16.4)	-	0.0	0.0

* The denominator includes 13 outlets that met the selection criteria for a full interview, but did not carry out the full interview (i.e. were not interviewed or only carried out a partial interview).

[^] The "suppliers" category includes wholesalers (who supply only outlets) and "other suppliers" (which are outlets that supply both other outlets and the public).

β other ACTs include : AL, DHAPPQ, Arterolane-PPQ, ASSP and include ASMQ, AS-pyronaridine, DHA-PPQ-Trim

+ At the time of the 2023 ACTwatch Lite study in Benin, AL and ARPPQ were first-line treatments for uncomplicated malaria.

Ψ Prequalified ACT are products that appear on the WHO prequalified list.

The ACTs approved at national level are those on the Benin approval list.

√ Other non-artemisinin therapies - other than SP, quinine and chloroquine

^vIn the ACTwatch Lite 2023 study in Benin, injectable artesunate was the first-line treatment for severe malaria.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 18 Availability of antimalarials in outlets stocking at least one antimalarial, by type of outlet and urban/rural area

	Type of outlet								Suppliers			
	Formal			Informal				Retail Total	Wholesalers	Other supplier	Suppliers Total	
	Private not-for-profit facility	Private for-profit facility	Pharmacy/pharmaceutical depot	Formal Total	General retailer	Itinerant vendor	Informal outlet Total					
Percentage of outlets* stocking:	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	Urban N=268	Urban N=11	Urban N=13	Urban N=24	
	Urban N=15	Urban N=131	Urban N=122	Urban N=268	Urban N=11	Urban N=13	Urban N=24		Urban N=292	Urban N=3	Urban N=60	
Any anti-malarial medication at the time of the survey visit	Rural N=9	Rural N=36	Rural N=21	Rural N=66	Rural N=10	Rural N=4	Rural N=14	Rural N=80	Rural N=0	Rural N=8	Rural N=8	
	Urban	100.0 -	100.0 -	100.0 -	100.0 -	100.0 -	100.0 -		100.0 -	100.0 -	100.0 -	
Any ACT	Urban	86.2 (57.5, 96.7)	60.6 (45.4, 74.0)	98.5 (92.9, 99.7)	79.5 (71.3, 85.8)	69.7 (32.8, 91.6)	48.3 (12.2, 86.3)	57.8 (26.6, 83.8)	77.6 (70.8, 83.3)	100.0 -	96.9 (84.8, 99.4)	97.0 (85.4, 99.5)
	Rural	89.2 (52.4, 98.4)	89.7 (76.3, 95.9)	100.0 -	93.6 (86.1, 97.2)	31.1 (9.8, 65.4)	25.0 (6.7, 60.9)	30.0 (11.2, 59.4)	83.7 (72.9, 90.7)	-	100.0 -	100.0 -
Artemether lumefantrine ⁺	Urban	86.2 (57.5, 96.7)	60.6 (45.4, 74.0)	98.5 (92.9, 99.7)	79.5 (71.3, 85.8)	69.7 (32.8, 91.6)	48.3 (12.2, 86.3)	57.8 (26.6, 83.8)	77.6 (70.8, 83.3)	100.0 -	96.9 (84.8, 99.4)	97.0 (85.4, 99.5)
	Rural	89.2 (52.4, 98.4)	89.7 (76.3, 95.9)	100.0 -	93.6 (86.1, 97.2)	31.1 (9.8, 65.4)	25.0 (6.7, 60.9)	30.0 (11.2, 59.4)	83.7 (72.9, 90.7)	-	100.0 -	100.0 -
Dihydroartemisinin piperaquine	Urban	8.5 (1.3, 40.1)	2.7 (1.1, 6.4)	95.6 (90.7, 98.0)	45.2 (39.0, 51.5)	0.0 -	0.0 -	0.0 -	41.4 (35.0, 48.1)	68.1 (18.7, 95.2)	94.8 (83.6, 98.5)	93.5 (83.5, 97.7)
	Rural	0.0 -	2.6 (0.4, 15.6)	63.3 (42.8, 79.9)	25.3 (16.7, 36.5)	0.0 -	0.0 -	0.0 -	21.4 (13.8, 31.5)	-	87.8 (59.8, 97.2)	87.8 (59.8, 97.2)
Arterolane maleate piperaquine (ARPPQ)	Urban	0.0 -	0.4 (0.1, 2.3)	59.6 (48.9, 69.4)	27.2 (21.4, 33.9)	0.0 -	0.0 -	0.0 -	24.9 (19.2, 31.7)	44.4 (7.9, 88.1)	59.5 (43.4, 73.8)	58.8 (42.9, 73.0)
	Rural	0.0 -	0.0 -	37.1 (21.2, 56.3)	14.1 (7.6, 24.7)	0.0 -	0.0 -	0.0 -	11.9 (6.3, 21.4)	-	72.1 (39.4, 91.1)	72.1 (39.4, 91.1)
Artesunate + Sulfadoxine-pyrimethamine (ASSP)	Urban	0.0 -	0.0 -	89.4 (83.1, 93.6)	40.5 (34.5, 46.9)	0.0 -	0.0 -	0.0 -	37.1 (31.0, 43.7)	100.0 -	84.2 (75.1, 90.4)	84.9 (76.0, 91.0)
	Rurality	0.0 -	0.0 -	59.5 (39.5, 76.7)	22.6 (14.2, 33.9)	0.0 -	0.0 -	0.0 -	19.1 (11.7, 29.4)	-	87.8 (59.8, 97.2)	87.8 (59.8, 97.2)
Other ACT ^β	Urban	0.0 -	0.0 -	36.4 (25.4, 49.1)	16.5 (11.5, 23.2)	0.0 -	0.0 -	0.0 -	15.1 (10.4, 21.5)	0.0 -	43.4 (28.0, 60.1)	41.4 (26.6, 57.8)
	Rural	0.0 -	0.0 -	14.8 (5.4, 34.4)	5.6 (2.3, 13.0)	0.0 -	0.0 -	0.0 -	4.7 (2.0, 11.0)	-	9.5 (1.3, 45.0)	9.5 (1.3, 45.0)
Nationally approved ACT [#]	Urban	67.4 (44.0, 84.4)	52.9 (35.2, 70.0)	98.5 (92.9, 99.7)	74.5 (64.7, 82.4)	23.5 (6.7, 56.7)	39.7 (11.0, 77.9)	32.5 (13.5, 59.8)	71.0 (61.8, 78.8)	100.0 -	94.8 (83.6, 98.5)	95.0 (84.3, 98.6)
	Rural	89.2 (52.4, 98.4)	79.4 (64.0, 89.4)	87.9 (69.7, 95.8)	83.8 (73.7, 90.6)	23.0 (5.8, 59.0)	25.0 (6.7, 60.9)	23.3 (7.5, 53.3)	74.4 (62.5, 83.6)	-	100.0 -	100.0 -
WHO pre-qualified ACT [¶]	Urban	84.7 (56.2, 96.0)	53.7 (38.3, 68.4)	98.5 (92.9, 99.7)	76.0 (67.5, 82.8)	0.0 -	20.2 (5.2, 53.8)	11.3 (2.6, 37.7)	70.6 (63.2, 77.0)	100.0 -	96.9 (84.8, 99.4)	97.0 (85.4, 99.5)

Table 18 Availability of antimalarials in outlets stocking at least one antimalarial, by type of outlet and urban/rural area

	Type of outlet								Suppliers		
	Formal				Informal				Wholesalers	Other supplier	Suppliers Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/pharmaceutical depot	Formal Total	General retailer	Itinerant vendor	Informal outlet Total	Retail Total			
Percentage of outlets* stocking:	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	Wholesalers	Other supplier	Suppliers Total
	Urban N=15	Urban N=131	Urban N=122	Urban N=268	Urban N=11	Urban N=13	Urban N=24	Urban N=292	Urban N = 3	Urban N = 57	Urban N = 60
	Rural N=9	Rural N=36	Rural N=21	Rural N=66	Rural N=10	Rural N=4	Rural N = 14	Rural N=80	Rural N = 0	Rural N = 8	Rural N = 8
Other ACT not nationally approved or WHO prequalified	Rural	89.2 (52.4, 98.4)	80.7 (65.0, 90.4)	95.6 (84.2, 98.9)	87.4 (78.5, 92.9)	0.0 -	25.0 (6.7, 60.9)	4.5 (0.7, 24.1)	74.5 (63.4, 83.1)	-	100.0 -
	Urban	22.6 (8.7, 47.3)	9.0 (4.6, 16.8)	98.5 (92.9, 99.7)	50.4 (44.4, 56.4)	46.2 (14.1, 81.9)	8.6 (3.2, 21.3)	25.3 (10.1, 50.5)	48.3 (41.5, 55.2)	100.0 -	96.9 (84.8, 99.4)
	Rural	0.0 -	11.2 (4.1, 26.9)	83.8 (61.5, 94.4)	37.4 (26.3, 50.0)	8.2 (1.1, 40.5)	0.0 -	6.7 (1.0, 34.7)	32.7 (23.1, 43.9)	-	87.8 (59.8, 97.2)
Any non-artemisinin therapy	Urban	17.2 (4.3, 49.2)	26.2 (18.8, 35.2)	80.4 (72.8, 86.2)	50.2 (43.7, 56.7)	85.9 (48.8, 97.5)	77.9 (46.4, 93.5)	81.4 (58.8, 93.1)	52.8 (46.7, 58.8)	68.1 (18.7, 95.2)	85.9 (76.1, 92.1)
	Rural	35.6 (11.8, 69.5)	13.6 (4.6, 34.2)	84.5 (66.2, 93.8)	43.2 (30.9, 56.4)	88.5 (50.1, 98.3)	75.0 (39.1, 93.3)	86.1 (57.1, 96.6)	49.9 (38.7, 61.0)	-	72.1 (39.4, 91.1)
	Urban	17.2 (4.3, 49.2)	13.9 (8.7, 21.4)	75.6 (66.5, 82.9)	42.1 (35.6, 48.9)	70.7 (40.8, 89.4)	10.0 (2.0, 37.9)	36.9 (17.1, 62.3)	41.6 (34.7, 49.0)	44.4 (7.9, 88.1)	80.3 (69.7, 87.8)
Sulfadoxine-pyrimethamine	Rural	28.6 (7.7, 65.8)	13.6 (4.6, 34.2)	82.3 (62.1, 93.0)	41.5 (29.2, 55.0)	61.3 (35.9, 81.8)	0.0 -	50.3 (27.9, 72.6)	42.9 (31.6, 55.0)	-	72.1 (39.4, 91.1)
	Urban	0.0 -	2.0 (0.4, 9.2)	10.7 (6.2, 17.9)	5.8 (3.5, 9.6)	43.0 (24.6, 63.6)	29.0 (16.6, 45.6)	35.2 (25.1, 46.8)	8.3 (6.0, 11.4)	0.0 -	7.0 (2.4, 18.6)
	Rural	6.9 (1.0, 35.8)	0.0 -	39.1 (21.4, 60.2)	15.7 (8.0, 28.4)	14.0 (3.2, 44.2)	25.0 (3.1, 77.8)	16.0 (5.0, 40.6)	15.7 (8.7, 26.7)	-	21.3 (3.8, 64.9)
Oral quinine	Urban	0.0 -	0.0 -	3.1 (0.5, 18.1)	1.4 (0.2, 8.9)	15.1 (3.1, 49.5)	51.7 (34.2, 68.7)	35.5 (21.6, 52.3)	4.3 (2.0, 9.0)	0.0 -	6.5 (1.0, 32.2)
	Rural	6.9 -	0.0 -	39.1 (21.4, 60.2)	15.7 (8.0, 28.4)	14.0 (3.2, 44.2)	25.0 (3.1, 77.8)	16.0 (5.0, 40.6)	15.7 (8.7, 26.7)	-	0.0 -
	Urban	0.0 -	0.0 -	3.1 (0.5, 18.1)	1.4 (0.2, 8.9)	15.1 (3.1, 49.5)	51.7 (34.2, 68.7)	35.5 (21.6, 52.3)	4.3 (2.0, 9.0)	0.0 -	6.5 (1.0, 32.2)
Chloroquine	Rural	0.0 -	0.0 -	0.0 -	0.0 -	37.3 (10.8, 74.6)	50.0 (20.8, 79.2)	39.6 (15.6, 70.0)	6.2 (2.1, 16.7)	-	0.0 -
	Urban	0.0 -	0.0 -	1.7 (0.6, 4.5)	0.8 (0.3, 2.0)	0.0 -	0.0 -	0.0 -	0.7 (0.3, 1.8)	0.0 -	1.4 (0.5, 4.1)
	Rural	0.0 -	0.0 -	2.2 (0.3, 13.2)	0.8 (0.1, 5.2)	0.0 -	25.0 (6.7, 60.9)	4.5 (0.7, 24.1)	1.4 (0.4, 5.0)	-	0.0 -
Other non-artemisinin therapies ✓	Urban	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -
	Rural	0.0 -	0.0 -	2.2 (0.3, 13.2)	0.8 (0.1, 5.2)	0.0 -	25.0 (6.7, 60.9)	4.5 (0.7, 24.1)	1.4 (0.4, 5.0)	-	0.0 -
	Urban	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -
Oral artemisinin monotherapy	Rural	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -	0.0 -
	Urban	79.5 (52.9, 93.1)	68.3 (58.6, 76.7)	86.7 (78.3, 92.2)	77.4 (72.3, 81.8)	7.6 (1.7, 28.1)	0.0 -	3.4 (0.6, 16.5)	71.2 (65.9, 75.9)	68.1 (18.7, 95.2)	93.1 (76.4, 98.2)
	Rural	49.4 (20.5, 78.7)	31.8 (17.6, 50.5)	80.0 (58.9, 91.7)	52.2 (38.4, 65.7)	0.0 -	0.0 -	0.0 -	44.1 (33.4, 55.4)	-	93.9 (66.6, 99.2)
Non-oral artemisinin monotherapy	Urban	79.5 (52.9, 93.1)	68.3 (58.6, 76.7)	86.7 (78.3, 92.2)	77.4 (72.3, 81.8)	7.6 (1.7, 28.1)	0.0 -	3.4 (0.6, 16.5)	71.2 (65.9, 75.9)	68.1 (18.7, 95.2)	93.1 (76.4, 98.2)
	Rural	49.4 (20.5, 78.7)	31.8 (17.6, 50.5)	80.0 (58.9, 91.7)	52.2 (38.4, 65.7)	0.0 -	0.0 -	0.0 -	44.1 (33.4, 55.4)	-	93.9 (66.6, 99.2)

Table 18 Availability of antimalarials in outlets stocking at least one antimalarial, by type of outlet and urban/rural area

	Type of outlet								Suppliers			
	Formal			Informal			Retail Total	Suppliers		Suppliers Total		
	Private not-for-profit facility	Private for-profit facility	Pharmacy/pharmaceutical depot	Formal Total	General retailer	Itinerant vendor		Wholesalers	Other supplier			
Percentage of outlets* stocking:	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)		
	Urban N=15	Urban N=131	Urban N=122	Urban N=268	Urban N=11	Urban N=13	Urban N=24	Urban N=3	Urban N=57	Urban N=60		
Rural N=9	Rural N=36	Rural N=21	Rural N=66	Rural N=10	Rural N=4	Rural N=14	Rural N=80	Rural N=0	Rural N=8	Rural N=8		
Any treatment for severe malaria	84.3 (55.6, 95.9)	72.8 (62.6, 81.1)	88.2 (81.5, 92.7)	80.5 (75.2, 85.0)	7.6 (1.7, 28.1)	0.0 -	3.4 (0.6, 16.5)	74.1 (68.0, 79.3)	68.1 (18.7, 95.2)	93.1 (76.4, 98.2)	91.9 (77.8, 97.4)	
Rectal artesunate	Urban	49.4 (20.5, 78.7)	31.8 (17.6, 50.5)	80.0 (58.9, 91.7)	52.2 (38.4, 65.7)	0.0 -	0.0 -	44.1 (33.4, 55.4)	- -	93.9 (66.6, 99.2)	93.9 (66.6, 99.2)	
Artemether IV/IM	Urban	0.0 -	0.0 -	20.1 (11.8, 32.2)	9.1 (5.7, 14.2)	0.0 -	0.0 -	8.4 (5.4, 12.7)	0.0 -	24.0 (11.2, 43.9)	22.8 (10.7, 42.2)	
Artesunate IV/IM ^v	Rural	0.0 -	4.3 (0.6, 23.7)	8.0 (2.0, 27.3)	5.2 (1.7, 14.7)	0.0 -	0.0 -	4.4 (1.4, 12.4)	- -	9.5 (1.3, 45.0)	9.5 (1.3, 45.0)	
Quinine IV/IM	Urban	22.1 (8.2, 47.4)	23.5 (17.4, 31.0)	73.8 (64.1, 81.6)	46.2 (41.8, 50.7)	0.0 -	0.0 -	42.3 (38.0, 46.8)	68.1 (18.7, 95.2)	82.7 (67.3, 91.8)	82.1 (67.1, 91.1)	
	Rural	42.5 (16.1, 74.0)	15.7 (6.8, 32.3)	71.8 (52.7, 85.3)	40.2 (29.0, 52.4)	0.0 -	0.0 -	33.9 (24.7, 44.5)	- -	81.7 (52.1, 94.8)	81.7 (52.1, 94.8)	
	Urban	69.4 (41.4, 87.9)	56.8 (47.8, 65.4)	84.8 (76.6, 90.5)	70.3 (64.7, 75.3)	7.6 (1.7, 28.1)	0.0 -	3.4 (0.6, 16.5)	64.7 (58.5, 70.4)	68.1 (18.7, 95.2)	89.5 (76.5, 95.7)	88.5 (76.8, 94.7)
	Rural	42.5 (16.1, 74.0)	16.2 (7.1, 32.7)	62.3 (40.9, 79.7)	36.8 (26.0, 49.1)	0.0 -	0.0 -	31.1 (22.0, 41.9)	- -	72.6 (33.2, 93.4)	72.6 (33.2, 93.4)	
	Urban	4.8 (0.8, 24.8)	11.7 (7.1, 18.7)	15.5 (11.1, 21.3)	13.0 (9.9, 16.8)	7.6 (1.7, 28.1)	0.0 -	3.4 (0.6, 16.5)	12.2 (9.0, 16.2)	23.7 (3.3, 73.7)	18.7 (10.2, 31.9)	19.0 (10.6, 31.7)
	Rural	6.9 (1.0, 35.8)	0.0 -	26.9 (10.7, 53.1)	11.1 (4.8, 23.5)	0.0 -	0.0 -	0.0 (4.1, 19.9)	- -	0.0 -	0.0 -	

* Retail outlets stocking antimalarials had at least one antimalarial in stock on the day of the survey, which was verified by the presence of at least one antimalarial recorded on the audit sheet. The denominator includes 12 outlets that met the selection criteria for a full interview, but did not carry out the full interview (i.e. were not interviewed or only carried out a partial interview).

^v The "suppliers" category includes wholesalers (who supply only outlets) and "other suppliers" (which are outlets that supply both other outlets and the public).

β other ACTs include : AL, DHAPPQ, Arterolane-PPQ, ASSP and include ASMQ, AS-pyronaridine, DHA-PPQ-Trim

+ At the time of the 2023 ACTwatch Lite study in Benin, AL and ARPPQ were first-line treatments for uncomplicated malaria.

Ψ Prequalified ACT are products that appear on the WHO prequalified list.

The ACTs approved at national level are those on the Benin approval list.

√ Other non-artemisinin therapies - other than SP, quinine and chloroquine

▀ Iv tηe ACTwatch Lite 2023 study in Benin, injectable artesunate was the first-line treatment for severe malaria.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 19 Availability of diagnostics at surveyed retail outlets (urban/rural)

	Type of outlet								Suppliers ^A			
	Formal			Informal				POS Total	Wholesalers	Other supplier	Suppliers Total	
	Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total					
Percentage of outlets* stocking :	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	Urban N = 16	Urban N = 4	Urban N = 57	Urban N = 61	
	Urban N=16	Urban N=165	Urban N=124	Urban N=305	Urban N=13	Urban N=14	Urban N= 27		Urban N = 4	Urban N = 57	Urban N = 61	
All types of diagnostics	Rural N=9	Rural N=45	Rural N=21	Rural N=75	Rural N=21	Rural N=4	Rural N = 25	Rural N=100	Rural N = 0	Rural N = 8	Rural N = 8	
	Urban	85.9 (62.3, 95.7)	90.0 (81.2, 95.0)	1.5 (0.3, 6.9)	53.8 (46.1, 61.3)	6.2 (1.3, 25.2)	0.0	3.0 (0.5, 14.9)	49.5 (43.1, 55.8)	0.0	5.2 (1.5, 16.4)	4.8 (1.4, 15.4)
	Rural	100.0 -	86.9 (74.6, 93.7)	0.0 -	58.9 (46.6, 70.1)	0.0	0.0	0.0 (29.5, 58.3)	43.4	-	6.1 (0.8, 33.4)	6.1 (0.8, 33.4)
	Urban	77.0 (55.5, 90.0)	49.6 (35.3, 63.9)	1.5 (0.3, 6.9)	31.8 (22.5, 42.8)	6.2 (1.3, 25.2)	0.0	3.0 (0.5, 14.9)	29.3 (21.0, 39.3)	0.0	5.2 (1.5, 16.4)	4.8 (1.4, 15.4)
RDT	Rural	89.2 (52.4, 98.4)	74.4 (57.6, 86.2)	0.0 -	50.8 (38.6, 62.9)	0.0	0.0	0.0 (25.3, 51.4)	37.4	-	6.1 (0.8, 33.4)	6.1 (0.8, 33.4)
	Urban	77.0 (55.5, 90.0)	48.6 (34.1, 63.4)	1.5 (0.3, 6.9)	31.3 (21.9, 42.5)	6.2 (1.3, 25.2)	0.0	3.0 (0.5, 14.9)	28.9 (20.4, 39.1)	0.0	5.2 (1.5, 16.4)	4.8 (1.4, 15.4)
WHO prequalified TOR	Rural	89.2 (52.4, 98.4)	74.4 (57.6, 86.2)	0.0 -	50.8 (38.6, 62.9)	0.0	0.0	0.0 (25.3, 51.4)	37.4	-	6.1 (0.8, 33.4)	6.1 (0.8, 33.4)
	Urban	58.3 (35.3, 78.2)	63.6 (51.9, 73.8)	0.0 -	37.4 (30.6, 44.7)	0.0	0.0	0.0 (28.2, 40.8)	34.2	0.0	2.1 (0.3, 12.3)	1.9 (0.3, 11.5)
Microscopy tests	Rural	28.6 (7.7, 65.8)	31.5 (18.5, 48.2)	0.0 -	20.5 (12.2, 32.5)	0.0	0.0	0.0 (8.1, 26.3)	15.1	-	0.0	0.0

* Availability of blood tests in all eligible outlets. The denominator includes 13 outlets that met the selection criteria for a full interview, but did not carry out the full interview (i.e. were not interviewed or only carried out a partial interview).

** Availability of blood tests is reported among outlets that had antimalarials in stock on the day of the study or had stocked them in the previous three months.

^A The "suppliers" category includes wholesalers (who supply only retail outlets) and "other suppliers" (who supply other outlets and retail consumers).

¶ Malaria rapid tests on the WHO list of prequalified in vitro diagnostic products (2023).

Source: ACTwatch Lite survey, BENIN, 2023.

Table 20 Availability of diagnostics at retail outlets stocking antimalarials (urban/rural)

		Type of outlet								Suppliers^		
		Formal			Informal			POS Total	Wholesale distributor		Suppliers Total	
		Private not-for-profit facility	Private for-profit facility	Pharmacy/Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor		% (95% CI)	% (95% CI)		
		% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	(95% CI)	(95% CI)	(95% CI)	
Percentage of outlets* stocking :		Urban N=13	Urban N=106	Urban N=122	Urban N=241	Urban N=11	Urban N=13	Urban N= 24	Urban N=265	Urban N = 3	Urban N = 57	Urban N = 60
Any type of diagnosis	Urban	80.3 (46.5, 95.0)	92.0 (83.4, 96.3)	1.5 (0.3, 7.0)	44.8 (38.3, 51.6)	7.6 (1.7, 28.1)	0.0 -	3.4 (0.6, 16.5)	40.9 (35.8, 46.3)	0.0 -	5.2 (1.5, 16.4)	5.0 (1.4, 15.7)
	Rural	100.0 -	89.9 (73.9, 96.6)	0.0 -	52.0 (39.5, 64.3)	0.0 -	0.0 -	0.0 -	43.0 (32.3, 54.4)	- -	6.1 (0.8, 33.4)	6.1 (0.8, 33.4)
	Urban	67.8 (37.4, 88.1)	46.5 (30.9, 62.8)	1.5 (0.3, 7.0)	24.6 (16.8, 34.6)	7.6 (1.7, 28.1)	0.0 -	3.4 (0.6, 16.5)	22.6 (15.8, 31.3)	0.0 -	5.2 (1.5, 16.4)	5.0 (1.4, 15.7)
RDT	Rural	84.8 (41.5, 97.8)	83.7 (68.7, 92.3)	0.0 -	47.6 (36.2, 59.3)	0.0 -	0.0 -	0.0 -	39.4 (29.7, 49.9)	- -	6.1 (0.8, 33.4)	6.1 (0.8, 33.4)
	Urban	67.8 (37.4, 88.1)	45.5 (30.0, 62.0)	1.5 (0.3, 7.0)	24.2 (16.4, 34.2)	7.6 (1.7, 28.1)	0.0 -	3.4 (0.6, 16.5)	22.2 (15.4, 31.1)	0.0 -	5.2 (1.5, 16.4)	5.0 (1.4, 15.7)
Prequalified mRDT ¶	Rural	84.8 (41.5, 97.8)	83.7 (68.7, 92.3)	0.0 -	47.6 (36.2, 59.3)	0.0 -	0.0 -	0.0 -	39.4 (29.7, 49.9)	- -	6.1 (0.8, 33.4)	6.1 (0.8, 33.4)
	Urban	52.4 (24.4, 78.9)	67.3 (55.5, 77.2)	0.0 -	31.9 (25.6, 38.9)	0.0 -	0.0 -	0.0 -	28.9 (23.3, 35.2)	0.0 -	2.1 (0.3, 12.3)	2.0 (0.3, 11.7)
Microscopy tests	Rural	40.3 (11.7, 77.4)	27.6 (13.2, 48.8)	0.0 -	16.9 (8.9, 29.7)	0.0 -	0.0 -	0.0 -	14.0 (7.3, 24.9)	- -	0.0 -	0.0 -

* Availability of blood tests in all eligible outlets. The denominator includes 13 outlets that met the selection criteria for a full interview, but did not carry out the full interview (i.e. were not interviewed or only carried out a partial interview).

** Availability of blood tests is reported among outlets that had antimalarials in stock on the day of the study or had stocked them in the previous three months.

^ The "suppliers" category includes wholesalers (who supply only retail outlets) and "other suppliers" (who supply other outlets and retail consumers).

¶ Malaria rapid tests on the WHO list of prequalified in vitro diagnostic products (2023).

Source: ACTwatch Lite survey, BENIN, 2023.

SECTION C: SUPPLIERS

Table 21 Sales outlet characteristics, by outlet type

	Type of outlet				Supplier^	
	Formal		Pharmacy/ Pharmaceutical depot	Formal outlet Total		
	Private not-for-profit facility % (95% CI) N=25	Private for-profit facility % (95% CI) N=205				
Percentage of outlets with at least one member of staff who:						
Has a qualification in the healthcare field	100.0 - (95% CI) N=25	100.0 - (95% CI) N=205	99.1 (94.2, 99.9)	99.6 (97.7, 99.9)	100.0 - (95% CI) N=65	
Received training on malaria case management in the past year	39.4 (21.5, 60.7)	31.7 (22.1, 43.0)	23.6 (16.9, 31.9)	29.1 (23.0, 36.0)	22.3 (13.6, 34.4)	
Received training on malaria surveillance in the past year	61.7 (39.0, 80.2)	59.3 (50.7, 67.4)	30.1 (21.9, 39.7)	48.0 (42.1, 53.9)	32.7 (23.4, 43.7)	
Received training on case management AND surveillance in the past year	24.7 (11.1, 46.3)	18.2 (10.0, 30.7)	2.0 (0.8, 5.3)	12.3 (7.6, 19.3)	0.0 -	
Median [IQR]	Median [IQR] (N)	Median [IQR] (N)	Median [IQR] (N)	Median [IQR] (N)	Median [IQR] (N)	
Median [IQR] of the number of years the respondent has worked in this outlet	5.0 [2.00-10.00] (2)	3.0 [1.00-6.00] (31)	6.0 [2.00-13.00] (19)	3.0 [1.00-10.00] (52)	5.0 [3.00-10.00] (8)	
Median number [IQR] of employees in the outlet	- -	6.0 [4.00-13.00] (2)	10.0 [7.00-14.00] (8)	8.0 [5.00-14.00] (10)	11.0 (1)	
Percentage of providers with access to :						
Any cell phone	100.0 - (95% CI) N=25	96.8 (94.1, 98.3)	98.2 (93.2, 99.5)	97.6 (95.6, 98.7)	100.0 - (95% CI) N=65	
Any smartphone	13.4 (4.7, 32.7)	10.4 (6.4, 16.6)	11.5 (6.5, 19.4)	11.1 (7.6, 15.9)	15.4 (8.5, 26.1)	
Internet connection (last month)	86.6 (67.3, 95.3)	85.9 (79.6, 90.6)	85.4 (77.5, 90.9)	85.8 (80.3, 89.9)	83.3 (72.5, 90.4)	
Wi-Fi	25.0 (11.3, 46.6)	14.2 (9.4, 20.8)	39.0 (30.8, 47.9)	24.8 (20.0, 30.3)	39.5 (28.2, 52.1)	
Mobile money	92.1 (62.5, 98.8)	89.5 (81.3, 94.4)	92.3 (84.9, 96.2)	90.8 (86.1, 94.1)	89.4 (73.4, 96.3)	
Laptop, desktop or tablet computer	52.1 (29.5, 73.8)	52.4 (42.7, 61.9)	82.0 (71.4, 89.3)	64.1 (57.1, 70.5)	96.4 (89.7, 98.8)	
Regular Internet and electricity connections	52.0 (32.9, 70.6)	67.5 (58.0, 75.7)	89.2 (79.5, 94.6)	74.9 (67.7, 81.0)	91.7 (80.5, 96.7)	
Use digital technology for sales, inventory, orders or supplier payments	65.6 (43.5, 82.6)	47.9 (39.0, 57.0)	94.4 (86.1, 97.9)	67.6 (61.1, 73.5)	99.6 (98.0, 99.9)	

Provider questions were administered to one staff member working in each outlet eligible for an interview (current/recent antimalarial-stocking outlets or outlets providing malaria blood testing in the formal private sector. Interviews were not conducted with providers at informal outlets)

[^] the "suppliers" category includes wholesalers, who only supply outlets, and "other suppliers" which are outlets who supply both other outlets as well as the public

Numbers of providers (N) in this table are the total number of providers eligible for table indicators. No provider interviews were missing information on provider characteristics and technology access.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 22 Provider case management knowledge and practices, by outlet type

	Type of outlet				Supplier ^A Supplier Total (95% CI) N=69	
	Formal		Pharmacy/ Pharmaceutical depot (95% CI) N=145	Formal outlet Total (95% CI) N=380		
	Private not-for-profit facility (95% CI) N=25	Private for-profit facility (95% CI) N=210				
Percentage of retail outlets where the respondent :						
Correctly identified the most effective antimalarial drug for a child	94.0 (74.5, 98.8)	94.2 (89.6, 96.8)	94.9 (88.4, 97.9)	94.4 (90.2, 96.9)	94.2 (84.9, 97.9)	
Correctly identified the most effective antimalarial drug for an adult.	94.0 (74.5, 98.8)	92.7 (88.7, 95.4)	94.1 (88.0, 97.2)	93.4 (89.7, 95.8)	91.4 (82.8, 96.0)	
Correctly identified the government-recommended first-line treatment for uncomplicated malaria.	83.2 (62.9, 93.5)	97.3 (93.4, 98.9)	90.2 (81.1, 95.2)	93.4 (88.4, 96.3)	89.6 (78.1, 95.4)	
Has heard of RDTs for malaria	94.0 (74.5, 98.8)	96.1 (92.9, 97.9)	77.0 (69.1, 83.3)	88.4 (84.7, 91.3)	80.8 (68.2, 89.2)	
Has used an RDT	80.1 (55.7, 92.8)	77.6 (65.8, 86.2)	20.8 (14.3, 29.4)	58.3 (51.2, 65.1)	36.7 (23.5, 52.2)	
Respondents who would recommend an antimalarial to a customer with a negative blood test for malaria:	N=25	N=210	N=145	N=380	N=69	
The service provider ALWAYS treats customers who test negative with an antimalarial.	-	1.2 (0.4, 3.6)	7.7 (2.9, 19.1)	3.6 (1.5, 8.4)	6.0 (1.3, 24.4)	
The service provider SOMETIMES treats customers who test negative with an antimalarial drug.	29.6 (14.7, 50.6)	43.6 (37.1, 50.4)	25.0 (18.6, 32.8)	35.4 (29.3, 41.9)	27.3 (16.7, 41.3)	
Circumstances when the respondent would recommend an antimalarial to a customer with a negative test* :	N=7	N=99	N=47	N=153	N=24	
Customer show signs and symptoms of malaria.	100.0	100.0	99.0 (93.8, 99.8)	99.7 (98.1, 99.9)	97.9 (88.3, 99.6)	
Customer requests antimalarial treatment.	-	23.2 (12.1, 39.9)	18.5 (8.7, 35.0)	20.3 (11.9, 32.6)	18.9 (7.9, 38.7)	
Provider does not trust the test result.	-	4.6 (2.2, 9.5)	12.0 (5.0, 26.3)	6.7 (3.3, 13.1)	12.4 (3.6, 35.1)	

A provider interview was conducted with the senior most staff at outlets eligible for the study (outlets stocking antimalarials or offering malaria blood tests in the formal private sector, current or recent). Interviews were not conducted with providers of informal outlets).

^A The "suppliers" category includes wholesalers (who supply only retail outlets) and "other suppliers" (who supply other outlets and retail consumers).

The numbers of providers (N) in this table correspond to the total number of eligible providers for the indicators in the table. No provider interview lacked information on malaria treatment knowledge and practices.

At the time of ACTwatch Benin's 2016 point-of-sale survey, artemether-lumefantrine was the first-line treatment for uncomplicated malaria in adults and children aged two.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 23 Provider digital capability and attitudes to potential use , by outlet type

	Type of outlet			Supplier^	
	Formal	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total
	%	(95% CI)	%	(95% CI)	%
Percentage of retail outlets :		N=25	N=205	N=144	N=374
Where the following was available within the last 30 days:					
Electricity	100.0	99.3 (97.2, 99.8)	97.8 (93.1, 99.3)	98.8 (97.0, 99.5)	96.5 (86.0, 99.2)
Voice and SMS connection on the cell phone	100.0	100.0 -	92.8 (78.1, 97.9)	95.2 (84.9, 98.6)	100.0 -
Internet connection (data or WiFi)	88.2 (49.8, 98.3)	97.4 (89.6, 99.4)	99.8 (98.7, 100.0)	98.1 (94.4, 99.4)	99.6 (97.5, 99.9)
With equipment available if needed within the last 30 days :					
Computer	46.9 (26.9, 67.8)	30.2 (23.3, 38.1)	46.7 (37.9, 55.7)	38.0 (32.0, 44.4)	54.2 (40.5, 67.2)
Laptop computer	60.2 (40.2, 77.3)	37.5 (29.0, 46.8)	84.3 (73.8, 91.1)	57.7 (50.6, 64.4)	94.4 (86.7, 97.7)
Tablet	3.0 (0.5, 15.8)	8.2 (5.3, 12.6)	22.9 (16.0, 31.6)	13.6 (10.0, 18.2)	28.2 (15.8, 45.1)
Printer	40.1 (21.5, 62.0)	48.7 (37.6, 59.9)	71.8 (62.8, 79.4)	57.1 (50.2, 63.8)	82.9 (73.0, 89.6)
Basic telephone (no internet connection)	93.6 (67.8, 99.0)	97.7 (93.4, 99.2)	98.6 (94.4, 99.6)	97.7 (95.1, 99.0)	100.0 -
Function phone (limited, basic internet connection)	100.0 -	97.4 (89.7, 99.4)	99.3 (95.8, 99.9)	98.5 (95.1, 99.6)	98.6 (92.4, 99.8)
Smartphone phone	100.0 -	95.1 (85.2, 98.5)	97.6 (93.8, 99.1)	97.0 (93.4, 98.6)	99.2 (95.6, 99.9)
Current use of digital technology for business services:					
Point-of-sale inventory management	51.7 (32.5, 70.3)	35.0 (27.1, 43.9)	82.5 (72.5, 89.4)	55.0 (48.5, 61.4)	87.3 (77.2, 93.3)
Place orders with suppliers	37.0 (19.0, 59.6)	29.6 (22.8, 37.4)	89.3 (81.5, 94.0)	53.7 (47.8, 59.5)	94.1 (84.1, 97.9)
Retail sales	47.9 (27.0, 69.5)	30.5 (22.5, 39.9)	79.6 (69.8, 86.8)	51.2 (44.2, 58.1)	92.2 (83.1, 96.6)
Access to banking or other financial services	4.6 (1.3, 15.6)	10.4 (7.0, 15.2)	32.8 (24.4, 42.4)	18.8 (14.7, 23.6)	54.3 (40.9, 67.0)
Payroll management	23.3	16.7	20.5	18.7	23.3

	(11.4, 41.8)	(11.8, 23.2)	(14.7, 27.8)	(14.0, 24.6)	(14.0, 36.1)
Management of other human resources functions	37.0 (20.8, 56.8)	24.7 (18.3, 32.5)	40.3 (32.0, 49.1)	31.8 (26.2, 37.9)	50.3 (36.7, 63.8)
Paying suppliers	12.6 (3.6, 36.1)	13.6 (8.7, 20.8)	35.4 (26.3, 45.6)	22.1 (17.0, 28.3)	43.9 (31.0, 57.6)
Find out about new anti-malaria products	71.0 (49.5, 86.0)	66.1 (56.6, 74.5)	68.1 (57.3, 77.3)	67.3 (59.9, 73.9)	85.9 (71.4, 93.7)
Interested in using digital technology for business services over the next two years:					
Point-of-sale inventory management	77.9 (48.6, 93.0)	74.7 (65.7, 81.9)	86.1 (64.9, 95.4)	76.7 (68.2, 83.4)	72.4 (38.3, 93.2)
Place orders with suppliers	58.1 (34.4, 78.6)	69.8 (60.5, 77.7)	78.5 (50.2, 93.0)	69.4 (60.5, 77.0)	51.3 (11.1, 89.8)
Retail sales	43.7 (20.4, 70.2)	64.6 (54.5, 73.6)	75.4 (49.3, 90.6)	64.7 (55.8, 72.7)	81.0 (39.6, 96.5)
Access to banking or other financial services	39.5 (21.2, 61.2)	46.1 (37.2, 55.2)	55.4 (44.2, 66.1)	48.5 (41.7, 55.4)	56.5 (34.6, 76.1)
Payroll management	34.3 (16.0, 59.0)	50.8 (41.3, 60.3)	52.1 (40.5, 63.5)	50.1 (42.8, 57.5)	51.3 (38.4, 68.8)
Management of other human resources functions	48.5 (25.9, 71.7)	48.8 (39.6, 58.0)	61.7 (48.8, 73.2)	53.2 (44.9, 61.4)	69.1 (48.6, 84.1)
Paying suppliers	33.9 (17.4, 55.6)	54.3 (46.6, 61.9)	44.9 (32.7, 57.9)	49.5 (42.7, 56.3)	37.1 (19.8, 58.6)
Find out about new anti-malaria products	47.7 (17.5, 79.7)	70.3 (58.3, 80.0)	80.0 (64.0, 90.0)	72.5 (61.9, 81.1)	63.3 (24.0, 90.4)

A provider interview was conducted with the senior most staff at outlets eligible for the study (outlets stocking antimalarials or offering malaria blood tests in the formal private sector, current or recent). Interviews were not conducted with providers of informal outlets.

[^]The "suppliers" category includes wholesalers (who supply only retail outlets) and "other suppliers" (who supply other outlets and retail consumers).

The numbers of providers (N) in this table correspond to the total number of providers eligible for the indicators in the table. None of the provider interviews lacked information on access to and use of technology at the point of sale.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 24 Provider participation in malaria surveillance, by type of outlet

	Type of outlet				Suppliers^ Total	
	Formal		Pharmacy/ Pharmaceutical depot	Formal outlet Total		
	Private not-for-profit facility	Private for-profit facility				
Percentage of outlets that:	% (95% CI) N=25	% (95% CI) N=205	% (95% CI) N=144	% (95% CI) N=380	% (95% CI) N=65	
Report malaria data to the health system	90.2 (74.7, 96.6)	84.5 (77.5, 89.6)	8.1 (4.5, 14.0)	54.8 (49.0, 60.5)	10.7 (4.6, 22.9)	
Received a supervisory visit for malaria reporting in the last year	76.4 (55.5, 89.4)	73.5 (66.1, 79.8)	27.9 (20.0, 37.6)	55.8 (49.4, 61.9)	32.0 (22.2, 43.5)	
Received training in malaria reporting in the last two years	84.5 (66.7, 93.7)	72.0 (63.7, 79.0)	37.1 (27.3, 48.1)	59.2 (52.8, 65.3)	39.9 (27.0, 54.5)	
Have job-aids or other resources to facilitate malaria reporting	87.6 (68.1, 95.9)	71.4 (62.5, 79.0)	27.6 (19.2, 38.0)	55.4 (48.9, 61.7)	25.9 (15.8, 39.4)	
Percentage of outlets who received a malaria supervision visit that:	% (95% CI) N=20	% (95% CI) N=150	% (95% CI) N=41	% (95% CI) N=211	% (95% CI) N=19	
Received written feedback from the supervisor during or after the last visit	88.7 (65.8, 97.0)	87.8 (82.1, 91.9)	52.6 (36.7, 68.0)	81.0 (74.4, 86.2)	62.7 (40.3, 80.8)	
Discussed or took corrective action based on the data.	66.4 (43.2, 83.7)	70.5 (61.4, 78.2)	30.5 (20.5, 42.6)	62.1 (55.2, 68.7)	19.8 (8.0, 41.2)	
Median number [IQR] of visits in the last 12 months	3 [2.00-3.00] (3)	2 [2.00-3.00] (31)	1 [1.00-2.00] (22)	2 [1.00-3.00] (56)	1 [1.00-2.00] (10)	
Percentage of outlets who report malaria data that:	% (95% CI) N=22	% (95% CI) N=170	% (95% CI) N=11	% (95% CI) N=203	% (95% CI) N=6	
Record data daily or more frequently	33.1 (16.6, 55.2)	49.5 (37.3, 61.7)	20.9 (7.3, 47.0)	45.8 (35.3, 56.6)	33.5 (14.3, 60.3)	
Report data monthly or more frequently	100.0 -	100.0 -	59.2 (33.7, 80.5)	97.6 (95.0, 98.9)	65.2 (39.6, 84.2)	
Percentage of outlets that report that use the following tools to RECORD cases:						
Curative care register (B1)	94.8 (72.3, 99.2)	98.1 (95.3, 99.2)	13.8 (2.9, 45.7)	92.8 (88.0, 95.7)	49.4 (26.0, 73.0)	
REMECOM (LMIS)	35.9 (18.1, 58.6)	16.6 (10.8, 24.6)	0.0 -	18.1 (12.0, 26.4)	0.0 -	
Laboratory register	27.3 (11.7, 51.5)	16.7 (11.1, 24.4)	2.0 (0.3, 12.5)	17.2 (11.4, 25.1)	0.0 -	

Table 24 Provider participation in malaria surveillance, by type of outlet

	Type of outlet			Formal outlet Total	Suppliers^ Total		
	Formal						
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot				
Parasitology register	15.2 (4.2, 42.5)	3.3 (1.5, 7.1)	13.8 (2.9, 45.7)	5.4 (3.0, 9.8)	22.9 (6.8, 54.5)		
IMCI Registry	24.8 (10.1, 49.2)	13.0 (7.5, 21.7)	0.0 -	13.8 (7.7, 23.3)	0.0 -		
SMI (C5)	14.3 (4.0, 39.8)	10.4 (5.9, 17.6)	0.0 -	10.3 (6.1, 16.7)	0.0 -		
Stock sheet	42.8 (23.2, 65.0)	13.2 (8.4, 20.1)	14.3 (3.1, 46.4)	17.0 (11.2, 24.8)	0.0 -		
Don't know	0.0 -	0.0 -	25.1 (8.6, 54.5)	1.5 (0.6, 3.4)	0.0 -		
Other	0.0 -	3.1 (0.8, 11.1)	44.8 (31.9, 58.5)	5.1 (2.4, 10.7)	50.6 (27.0, 74.0)		
Percentage of outlets that report that use the following tools to REPORT cases							
Report B5a1	77.5 (53.6, 91.2)	80.2 (72.3, 86.3)	0.0 -	75.2 (66.3, 82.4)	15.9 (2.2, 61.8)		
Report C7	32.5 (14.9, 57.0)	6.1 (3.3, 11.1)	0.0 -	9.1 (5.1, 15.8)	10.6 (1.4, 50.1)		
Report B5b	8.2 (2.0, 27.7)	7.3 (3.9, 13.2)	0.0 -	7.0 (4.1, 11.8)	0.0 -		
Report C6	27.3 (11.7, 51.5)	21.8 (15.0, 30.7)	0.0 -	21.3 (14.8, 29.5)	0.0 -		
A7 report	31.9 (15.2, 55.2)	17.9 (11.1, 27.5)	0.0 -	18.6 (11.6, 28.4)	0.0 -		
NMCP1 report	75.7 (51.8, 90.0)	76.4 (66.2, 84.3)	9.5 (1.4, 44.4)	72.5 (62.7, 80.4)	31.7 (7.1, 73.7)		
Shuttle consultation form	0.0 -	0.7 (0.1, 4.2)	0.0 -	0.6 (0.1, 3.4)	0.0 -		
Hospitalization shuttle form	0.0 -	0.7 (0.1, 4.2)	0.0 -	0.6 (0.1, 3.4)	0.0 -		
DHIS2 follow-up	0.0 -	3.2 (1.1, 8.8)	0.0 -	2.6 (0.9, 7.1)	0.0 -		
COM3 report	0.0 -	0.7 (0.1, 4.2)	14.3 (3.1, 46.4)	1.4 (0.4, 4.6)	0.0 -		
Notebook or loose-leaf	0.0 -	1.0 (0.2, 5.5)	14.3 (3.1, 46.4)	1.6 (0.5, 5.0)	0.0 -		
Don't know	7.6 (1.2, 36.4)	2.3 (0.8, 6.7)	13.8 (2.9, 45.7)	3.7 (1.6, 8.2)	22.9 (6.8, 54.5)		

Table 24 Provider participation in malaria surveillance, by type of outlet

	Type of outlet			Formal outlet Total	Suppliers ^A Total		
	Formal						
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot				
Other	0.0 -	1.6 (0.4, 6.4)	27.1 (9.5, 56.7)	2.9 (1.3, 6.2)	0.0 -		
SNIGS: National Health Information and Management System	27.4 (13.2, 48.3)	45.2 (34.5, 56.3)	13.8 (2.9, 45.7)	41.1 (31.1, 51.9)	22.9 (6.8, 54.5)		
SIRP (NMCP1) : Routine Malaria Information System	75.9 (54.0, 89.4)	67.5 (56.9, 76.5)	0.0 -	64.6 (55.5, 72.7)	15.9 (2.2, 61.8)		
SIGL (A7) : Logistics Management Information System	33.4 (15.8, 57.3)	6.9 (3.0, 15.1)	9.5 (1.4, 44.4)	10.3 (5.1, 19.8)	15.9 (2.2, 61.8)		
Don't know	3.0 (0.4, 17.4)	11.7 (7.2, 18.5)	35.5 (16.4, 60.7)	12.0 (7.9, 17.7)	33.5 (14.3, 60.3)		
Other	0.0 -	0.3 (0.1, 1.5)	0.0 -	0.2 (0.0, 1.3)	0.0 -		

A provider interview was conducted with the senior most staff at outlets eligible for the study (outlets stocking antimalarials or offering malaria blood tests in the formal private sector, current or recent). Interviews were not conducted with providers of informal outlets.

^A The "suppliers" category includes wholesalers (who supply only retail outlets) and "other suppliers" (who supply other outlets and retail consumers).

The numbers of suppliers (N) in this table correspond to the total number of suppliers eligible for the indicators in the table. No information was missing during interviews with suppliers.

Source: ACTwatch Lite survey, BENIN, 2023.

Table 25 Availability and price of point-of-sale diagnostics

	Type of outlet			
	Formal		Pharmacy/ Pharmaceutical depot	Formal outlet Total % (95% CI) N=219
	Private not-for-profit facility % (95% CI) N=24	Private for-profit facility % (95% CI) N=193		
Percent of outlets that do malaria blood testing that have :				
Disposable gloves	100.0	100.0	100.0	100.0
Equipped with sharps container	100.0	99.1 (94.5, 99.9)	100.0	99.3 (95.2, 99.9)
Microscopic malaria screening available	49.9 (29.7, 70.1)	59.7 (48.6, 69.9)	0.0	57.7 (48.5, 66.4)
RDT disposal	86.9 (69.9, 95.0)	62.3 (50.3, 72.9)	59.0 (10.0, 94.9)	65.3 (54.8, 74.4)
Median [IQR]	Median [IQR] (N)	Median [IQR] (N)	Median [IQR] (N)	Median [IQR] (N)
Number tested by microscopy within the last 7 days	36 [20.00-80.00] (12)	10 [5.00-20.00] (130)	-	10 [5.00-21.00] (142)
Cost of a microscopy test for an adult	\$1.66 [1.66-2.49] (12)	\$2.49 [1.66-2.49] (129)	-	\$2.49 [1.66-2.49] (141)
Cost of a microscopy test for a child under 5 years of age	\$1.66 [1.66-2.49] (12)	\$2.49 [1.66-2.49] (129)	-	\$2.49 [1.66-2.49] (141)

A provider interview was conducted with the senior most staff at outlets eligible for the study (outlets stocking antimalarials or offering malaria blood tests in the formal private sector, current or recent). Interviews were not conducted with providers of informal outlets.

The numbers of suppliers (N) in this table correspond to the total number of suppliers eligible for the indicators in the table. No information was missing during interviews with suppliers.

Table 26 Outlet licenses by type of outlet

Percentage of outlets that:	Type of outlet				Suppliers ^ Total (95% CI) N=65	
	Formal		Pharmacy/ Pharmaceutical depot (95% CI) N=144	Formal outlet Total (95% CI) N=380		
	Private not-for-profit facility (95% CI) N=25	Private for-profit facility (95% CI) N=205				
Have an active license with the Ministry of Health	96.0 (79.1, 99.4)	86.0 (79.3, 90.8)	89.5 (80.2, 94.7)	88.1 (83.1, 91.8)	89.8 (79.0, 95.3)	
Have an active license (Quitus) with ABMed	0.0 -	0.0 -	76.1 (64.7, 84.7)	30.0 (25.7, 34.7)	74.2 (60.2, 84.5)	
Has another type of opening and operating license	4.2 (0.6, 23.1)	8.2 (4.2, 15.4)	6.6 (2.8, 14.6)	7.2 (3.9, 12.9)	5.0 (2.0, 12.3)	
Has been subject to government inspection in the past year	80.8 (52.4, 94.1)	69.7 (62.0, 76.4)	44.6 (36.4, 53.0)	60.6 (53.8, 67.0)	52.4 (40.2, 64.4)	

A provider interview was conducted with the senior most staff at outlets eligible for the study (outlets stocking antimalarials or offering malaria blood tests in the formal private sector, current or recent). Interviews were not conducted with providers of informal outlets.

[^] The "suppliers" category includes wholesalers (who supply only retail outlets) and "other suppliers" (who supply other outlets and retail consumers). Wholesalers and "other suppliers" were asked to describe their own customers and business practices.

The number of suppliers (N) in this table corresponds to the total number of suppliers eligible for the indicators in the table. No supplier interview was missing information.

Source: ACTwatch Lite survey, BENIN, 2023.

SECTION D: SUPPLY CHAIN

Table 27 Characteristics and business practices of terminal wholesalers (as declared by wholesalers)

	Suppliers^		
	Wholesalers	Other supplier	All suppliers
Percentage of wholesalers with the following types of outlets as customers for antimalarials:	% (95% CI) N=4	% (95% CI) N=65	% (95% CI) N=69
Individuals (retail)	23.7 (3.3, 73.7)	43.6 (20.2, 70.2)	41.8 (20.0, 67.4)
Pharmacies	76.3 (26.3, 96.7)	3.5 (0.6, 18.0)	10.0 (3.4, 25.7)
Pharmaceutical depot	-	17.0 (4.1, 49.7)	15.5 (3.7, 46.6)
Private non-profit facilities	31.9 (4.8, 81.3)	-	2.8 (0.5, 14.9)
Private for-profit facilities	-	75.2 (46.2, 91.5)	68.5 (43.8, 85.9)
General retailers	-	-	-
Other drug wholesalers	-	-	-
Other general wholesalers	-	-	-
Other anti-malarial customer	44.4 (7.9, 88.1)	-	3.9 (0.6, 22.1)
Median number [IQR] of unique customers served in the last 7 days	1 (1)	1 [1.00-3.00] (6)	1 [1.00-3.00] (7)
Percentage of wholesalers who state that most of their customers are less than 10 km from their point of sale	52.2 (13.5, 88.5)	32.2 (19.9, 47.5)	33.4 (20.9, 48.7)
Percentage of wholesalers with customers outside their locality	47.8 (11.5, 86.5)	9.0 (2.4, 28.4)	14.2 (5.9, 30.4)
Percentage of wholesalers with customers outside of Benin	20.0 (3.0, 66.8)	-	2.7 (0.5, 14.2)
Percentage of wholesalers with the following sales practices :			
Minimum order requirements based on price	14.8 (2.2, 58.0)	25.9 (12.3, 46.6)	24.2 (11.7, 43.7)
Minimum order requirements based on quantity	42.6 (9.6, 83.8)	19.1 (6.7, 43.8)	22.6 (9.5, 45.0)

Deliver products to customers	85.2 (42.0, 97.8)	21.6 (8.7, 44.2)	30.1 (13.8, 53.8)
Allow customers to pick up products at the point of sale	52.2 (13.5, 88.5)	87.5 (65.2, 96.3)	82.8 (63.0, 93.1)
Provide credit to customers (within the past three months)	27.8 (4.1, 77.5)	19.9 (9.8, 36.2)	21.0 (10.6, 37.3)
Median [IQR] of credit terms offered over the last three months (number of days)	- -	- -	- -
Percentage of wholesalers owning other businesses and type of business			
The owner of this business owns another store/business	27.8 (4.1, 77.5)	5.2 (0.8, 27.8)	8.4 (2.1, 27.5)
Drug wholesaler/distributor/importer	- -	- -	- -
Wholesaler/distributor/general importer	100.0 -	- -	46.8 (5.7, 92.7)
Wholesale and retail pharmacy	- -	- -	- -
General wholesale and retail store	100.0 -	- -	46.8 (5.7, 92.7)
Pharmacy / Pharmaceutical depot	- -	100.0 -	53.2 (7.3, 94.3)
Other type of company	- -	- -	- -

A provider interview was conducted with the senior most staff at outlets eligible for the study (outlets stocking antimalarials or offering malaria blood tests in the formal private sector, current or recent). Interviews were not conducted with providers of informal outlets.

[^]The "suppliers" category includes wholesalers (who supply only retail outlets) and "other suppliers" (who supply other outlets and retail consumers). Wholesalers and "other suppliers" were asked to describe their own customers and business practices.

The number of suppliers (N) in this table corresponds to the total number of suppliers eligible for the indicators in the table. No supplier interview was missing information.

Table 28 Customer-reported characteristics of antimalarial suppliers

	Formal				Suppliers		
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	Wholesalers	Other supplier	Suppliers Total
	Median US\$ [IQR] (N)	Median US\$ [IQR] (N)	Median US\$ [IQR] (N)	Median US\$ [IQR] (N)	Median US\$ [IQR] (N)	Median US\$ [IQR] (N)	Median US\$ [IQR] (N)
Median number [IQR] of antimalarial suppliers used in the last 3 months	1 [1.00-2.00] (13)	1 [1.00-2.00] (126)	4 [3.00-4.00] (8)	2 [1.00-4.00] (147)	-	\$4.00 [4.00-5.00] (3)	\$4.00 [4.00-5.00] (3)
Customers' perception of the wholesale price of their best-selling antimalarial product :	% (95% CI) N=25	% (95% CI) N=210	% (95% CI) N=145	% (95% CI) N=380	% (95% CI) N=4	% (95% CI) N=65	% (95% CI) N=69
Percentage of customers switching supplier in the last 12 months to maintain supply of top-selling antimalarial product	5.3 (0.8, 28.1)	5.1 (2.8, 9.1)	9.5 (5.0, 17.5)	7.0 (4.6, 10.6)	-	14.7 (6.7, 29.3)	14.3 (6.5, 28.7)
Percentage of customers reporting that purchase prices have changed more often than every quarter over the past 12 months*	0.0	0.5	1.1	0.7	0.0	1.1	1.1
Percentage of customers who say purchase prices have not changed over the past 12 months	46.0 (26.2, 67.2)	44.0 (33.8, 54.7)	64.4 (53.2, 74.2)	52.1 (43.5, 60.5)	20.0 (3.0, 66.8)	56.4 (41.0, 70.6)	54.2 (39.2, 68.4)
Percentage of customers who say purchase prices have been LESS volatile over the past 12 months than over the previous 2 years	32.8 (17.2, 53.5)	37.0 (26.2, 49.2)	30.2 (20.9, 41.5)	34.0 (26.4, 42.6)	14.8 (2.2, 58.0)	32.8 (20.3, 48.2)	31.7 (20.0, 46.3)
Percentage of customers who say that purchase prices have been MORE volatile over the past 12 months than over the previous 2 years	6.9 (1.1, 33.8)	1.2 (0.3, 4.3)	2.0 (0.6, 6.2)	1.9 (0.9, 4.1)	-	3.7 (1.0, 12.7)	3.5 (0.9, 12.0)
Percentage of respondents able to give details of their main suppliers :	100.0	94.5	94.9	95.1	57.4	93.7	93.0
Type of suppliers reported:	-	(89.6, 97.2)	(89.6, 97.5)	(91.5, 97.2)	(9.0, 94.9)	(85.9, 97.4)	(85.3, 96.8)
International manufacturer	-	0.1 (0.0, 0.6)	-	0.0 (0.0, 0.2)	-	-	-
Local manufacturer	-	-	-	-	-	-	-
Drug wholesaler/importer	-	3.2 (1.4, 7.2)	76.1 (70.3, 81.0)	50.7 (45.7, 55.6)	-	-	-
Wholesaler/general importer	-	1.1 (0.3, 4.3)	11.2 (7.2, 17.1)	7.7 (4.9, 11.8)	-	-	-
Pharmacy	31.5 (21.6, 43.6)	30.3 (20.8, 41.9)	3.8 (1.8, 7.8)	13.0 (10.1, 16.7)	-	-	-
Drug depot	0.6 (0.1, 3.3)	1.0 (0.3, 3.4)	-	0.3 (0.1, 1.1)	-	-	-
Public sector supply chain	67.9 (56.0, 77.8)	62.9 (52.6, 72.1)	9.0 (7.1, 11.3)	27.9 (22.8, 33.6)	-	-	-
Other informal retail outlets	-	-	-	-	-	-	-
Customer/supplier relations	-	-	-	-	-	-	-

Table 28 Customer-reported characteristics of antimalarial suppliers

	Formal				Suppliers		
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	Wholesalers	Other supplier	Suppliers Total
Percentage of suppliers who deliver products to buyers	7.2 (2.0, 22.8)	9.1 (4.4, 18.1)	87.0 (82.1, 90.8)	60.0 (53.6, 66.0)	-	-	-
Percentage of suppliers requesting removal by the supplier	92.8 (77.2, 98.0)	89.2 (80.3, 94.3)	10.5 (6.9, 15.6)	37.9 (31.6, 44.7)	-	-	-
Percentage of suppliers offering both situations	-	1.7 (0.6, 4.6)	2.1 (0.5, 7.8)	1.9 (0.7, 5.2)	-	-	-
Types of payment offered by suppliers							
Cash	20.6 (9.4, 39.6)	57.6 (47.0, 67.6)	16.9 (11.9, 23.4)	28.9 (24.0, 34.4)	-	-	-
Credit	-	1.8 (0.5, 6.2)	0.9 (0.3, 3.0)	1.1 (0.5, 2.6)	-	-	-
Check	59.1 (39.3, 76.4)	33.6 (24.9, 43.4)	80.8 (73.3, 86.5)	65.8 (59.6, 71.6)	-	-	-
Mobile money	1.8 (0.3, 11.3)	4.3 (2.3, 7.9)	3.7 (1.6, 8.3)	3.8 (2.2, 6.3)	-	-	-
Other	10.4 (3.4, 27.5)	2.9 (0.9, 8.3)	1.7 (0.5, 5.5)	2.5 (1.2, 5.1)	-	-	-
Don't know	-	0.5 (0.1, 3.2)	2.4 (1.1, 5.3)	1.8 (0.8, 3.6)	-	-	-
Percentage of suppliers offering credit to buyers	-	4.1 (2.0, 8.5)	55.1 (43.2, 66.4)	37.2 (29.2, 46.0)	-	-	-

A provider interview was conducted with the senior most staff at outlets eligible for the study (outlets stocking antimalarials or offering malaria blood tests in the formal private sector, current or recent). Interviews were not conducted with providers of informal outlets.

^a The "suppliers" category includes wholesalers (who supply only retail outlets) and "other suppliers" (who supply other outlets and retail consumers). Wholesalers and "other suppliers" were asked to describe their own customers and business practices.

The number of suppliers (N) in this table corresponds to the total number of suppliers eligible for the indicators in the table. No supplier interview was missing information.

ANNEXES

ANNEX 1: PROJECT OVERVIEW

ACTwatch Lite has been designed to provide relevant, high-quality data on the private market for antimalarial drugs. The aim of this data is to inform and improve the policies and strategies of national and international malaria control programs, and to guide their policy, strategy and funding decisions to improve malaria case management.

Over the past two decades, numerous investments and interventions at regional and international level have positively influenced the private sector market in malaria-endemic countries, particularly in sub-Saharan Africa. Among the direct interventions that have impacted this private sector, the most illustrative was the Affordable Medicines Facility-malaria (AMFm) initiative launched in 2010 and extended as a private sector co-payment mechanism by the Global Fund until 2017. Despite the positive results of these interventions, the adoption of policy and action at national level to involve the private health sector market in malaria case management has not progressed enormously since the AMFm era. One of the main factors limiting progress in this sector is the lack of up-to-date, robust data on malaria case management, including inputs, in the private market sector. These data can be used by public health stakeholders and policy-makers at national level to support the design of appropriate interventions.

Between 2007 and 2016, the ACTwatch project collaborated with Ministries of Health in 13 African and Southeast Asian countries to conduct over 50 malaria market surveys. These surveys provided nationally representative data on the availability, price and market share of antimalarial products in the public and private health sectors. In collaboration with the World Health Organization (WHO) and with funding from the Bill & Melinda Gates Foundation, PSI is implementing a new market survey in 2023 on antimalarial drugs and diagnostic tests in the private sector in Benin, Cameroon and Nigeria (ACTwatch Lite). This study will provide a WHO-approved toolkit which, combined with appropriate advocacy, will catalyze support for the adoption of ACTwatch Lite methods in other countries.

Successful implementation of ACTwatch Lite will provide national malaria programs and their partners with an up-to-date understanding of national malaria private sector markets, with which to 1) understand the drivers of market performance and target areas and channels of intervention; 2) inform national and sub-national decision-making; 3) contribute to the development of Global Fund concept notes and other funding opportunities.

ANNEX 2: NATIONAL CONTEXT

Benin is a stable, democratic country in the West African sub-region. It is bordered by Niger to the northeast, Burkina Faso to the northwest, Nigeria to the east and Togo to the west. Benin's climate varies from region to region. The south has high humidity, with alternating dry seasons from November to March and mid-July to mid-September, and rainy seasons from April to mid-July and mid-September to October. The northern and central regions have a tropical climate, with a dry season from November to April and a rainy season from June to September. Administratively, Benin is divided into 12 departments, 77 communes and 546 arrondissements (Government of Benin, 2023).

In 2023, Benin's population was estimated at 14.2 million, with an estimated demographic growth rate of 3.31%. The population is mainly concentrated in the south around the cities of the Atlantic coast, with lower concentrations in the north. Life expectancy at birth is estimated at 62.6 years (Central Intelligence Agency, 2023). The total fertility rate in 2023 was 5.93 children per woman, and the infant mortality rate was 54.33 per 1,000 live births. In 2019, around 40% of the population lives below the poverty line.

Health care system

Benin's current universal healthcare system, Assurance pour le Renforcement du Capital Humain-Assurance Maladies (ARCH-AM), was launched in 2019. By December 2022, 867,944 Beninese from the poorest strata were enrolled in ARCH-AM, with the state subsidizing up to 100% of coverage for this population (World Health Organization, 2023). The U.S. President's Malaria Initiative estimates in its Malaria Operational Plan for Fiscal Year 2023 (MOP 2023) that, at the time of publication, approximately one million Beninese are covered by ARCH-AM. Prior to the implementation of ARCH-AM, the national health insurance scheme consisted of a user fee policy, which had negative effects on accessibility to health services for low-income people (WHO, 2023). ARCH-AM is still being rolled out and extended, and the number of people covered by the new system is set to increase.

Malaria risk and burden

Compared with the early 2000s, Benin has made substantial progress in the fight against malaria. However, the number of cases has risen steadily since 2014, from 4.1 million in 2015 to 4.7 million in 2020 (President's Malaria Initiative, 2023). The increase in the number of cases can be explained in part by improved data reporting systems. Malaria-related deaths in Benin remained relatively constant over the 2017-2020 period, rising from 2,182 in 2017 to 2,336 in 2020. In 2023, the most affected departments in Benin are Alibori, Atacora, Donga, Ouémé, Mono and Zou (PMI, 2023).

In Benin, malaria control programs face several major challenges, including insecticide resistance for vector control interventions, the quality of fever case management and appropriate referrals, frequent rotations of healthcare providers, low antenatal care uptake and frequent stock-outs of sulfadoxine-pyrimethamine at health facilities.

Current interventions

The Global Fund and PMI ensure that ITNs are widely distributed through mass campaigns organized every three years. PMI strives to continue the distribution of ITNs through antenatal care and the Expanded Program on Immunization (EPI) throughout Benin. The strategic malaria control plan of the National Malaria Control Program (NMCP) includes intermittent preventive treatment during pregnancy (IPTp), chemoprevention of seasonal malaria, diagnosis and treatment of malaria through routine health services, distribution of insecticide-treated bed nets, indoor residual spraying (IRS) and larval source management (LSM).

Efforts have been made to improve pregnant women's access to insecticide-treated nets and doses of IPTp at their first antenatal care visit. However, although antenatal care visit (ANC) attendance and IPTp receipt have increased since 2016, a gap between ANC attendance and IPTp receipt persists. The reasons for this discrepancy may be due to socio-cultural factors, husbands' level of education, patients' age, concealment of pregnancy and the nature of the pregnancy (PMI, 2023).

Severe malaria case management activities at national level include training pediatric emergency department and departmental staff in triage, assessment and emergency treatment, support for the use of injectable artesunate as first-line treatment for severe malaria (ACT follow-up), as well as the implementation of rectal artesunate for pre-referral treatment (PMI, 2023).

The use of perennial malaria chemoprevention (PMC) in infants is currently being implemented by PSI through Project Plus, a project supported by Unitaid. Under the Benin model, children will have more frequent interactions with the health system and receive a minimum of eight SP treatments, in line with the Ministry of Health's child immunization schedule. Other interventions for malaria incidence in children under five include chemoprevention of seasonal malaria, which began implementation in two districts in 2019 and expanded to 17 districts in 2021 (PMI, 2023).

Funding and major initiatives to improve malaria case management

Several international governmental and non-governmental organizations are supporting Benin in its fight against malaria, including the Bill & Melinda Gates Foundation, PMI, Unitaid, USAID, UNICEF, WHO and the Global Fund.

Target 3.3 of the WHO's Sustainable Development Goal (SDG) describes its technical strategy for combating malaria between 2016 and 2030: 1) reduce the incidence of malaria cases by at least 90% by 2030; 2) reduce malaria mortality rates by at least 90% by 2030; 3) eliminate malaria in at least 35 countries by 2030; and 4) prevent a resurgence of malaria in all malaria-free countries (WHO, 2023).

ANNEX 3: SURVEY METHODS

Population design and study

ACTwatch Lite is a cross-sectional survey of retail outlets. The study population is defined as all outlets likely to sell or distribute antimalarial drugs and/or provide blood tests for malaria. In Benin, this includes the following types of outlets: faith-based/private non-profit health facilities, private for-profit health facilities, pharmacies, pharmaceutical depots, general retailers, itinerant vendors, and wholesalers.

Eligibility criteria

Outlets were eligible for the study if they met at least one of the three study criteria: 1) one or more antimalarials in stock on the day of the survey; 2) antimalarials reportedly stocked during the three months prior to the survey; and/or 3) performs blood tests for malaria (microscopy or RDT).

Sampling

The study will adapt the geographic cluster sampling approach used by ACTwatch and other market surveys⁷. The primary sampling approach used in market research is to sample a set of administrative units (geographic clusters) with a corresponding population of approximately 10,000 to 15,000. The appropriate administrative unit in Benin for this desired population size is the arrondissement. There are 546 arrondissements in Benin, grouped into 77 communes.

Sampling will be driven by the selection of urban clusters (arrondissements). Rural arrondissements will be linked to selected urban arrondissements by geographic proximity, to minimize fieldwork time and travel costs.

Prior to sampling, all arrondissements in Benin will be classified into one of the following three groups:

1. Arrondissements in the four largest cities of Benin (communes with special status: Cotonou, Abomey-Calavi, Porto-Novo and Parakou). These cities are also communes in which all arrondissements are classified as urban.
2. All other urban arrondissements
3. All rural arrondissements

From a list of all urban arrondissements, stratified by classifications 1 and 2 above, a given number of urban arrondissements will be selected with a probability proportional to the population size.

- For each selected urban arrondissement in group 1 (Cotonou, Abomey-Calavi, Porto-Novo or Parakou) fieldwork will occur at the arrondissement level:

For each selected urban arrondissement in group 2 fieldwork will occur at the commune level (the next administrative level above the arrondissement).

Sample size

A series of calculations was performed to identify the minimum sample size required to estimate key market indicators with a precision of 10 percentage-points at the national level and within urban and rural areas. Given the time that has elapsed since the 2016 ACTwatch survey and the known changes in antimalarial markets in general and the private sector market in Benin in particular, the sample size estimates for the 2023 survey did not use the 2016 indicator estimates. Instead, key indicator values were assumed to be 50% to maximize the sample size estimate. A precision of 10 percentage points in one survey round corresponds to the ability to detect a minimum change of 20 percentage points over two surveys, assuming that the sample size for the second survey is at least as large as the first. This is relevant given that one of the purposes of the 2023 market

study is to serve as a baseline for evaluating any future private sector intervention in the market. The following formula and assumptions were used to estimate the number of outlets required:

$$n = \text{deff} \times \frac{[Z_{1-\alpha}^2 \times P(1 - P)]}{d^2} \times \text{CPF}$$

with:

n = desired sample size (by urban/rural area and by type of outlet)

P = assumed population proportion value, equal to 0.5.

$Z_{1-\alpha}$ = the standard normal deviate value for an α type I error (two-sided), equal to 1.96

d = the desired absolute precision of the estimate (half the width of the desired confidence interval), equal to 0.1.

deff = the design effect in case of multi-stage cluster sample design, equal to 2.

FPC = finite population correction, a correction applied to the sample size calculation when the size of the universe of is known (or assumed to be less than a given value) and the sample represents more than 5% of the universe. In this study, FPC is applied to sample size estimates for private for-profit health facilities, pharmacies, and pharmaceutical depots.

To convert the desired outlet sample size into a required number of clusters, we considered the sample distribution conducted in the 2016 ACTwatch study. In 2016, the study identified 15 urban and 15 rural arrondissements. A total of 6,895 outlets were identified, of which 2,610 outlets were included in the study and interviewed. Data from the 2016 study sample categorized by the 2023 sampling approach is presented in the table below. This data was used to estimate the sample requirements for the 2023 study.

Sample data from the 2016 Benin survey.

	Value
Number of urban clusters in a municipality with 1+ selected urban clusters (median)	1
Number of rural clusters in a commune with 1+ selected urban clusters (median)	5
Percentage of selected urban clusters making up urban group 1 (urban commune)	40%
Number of eligible study points per selected cluster (average)	
Private healthcare facilities	17.9
Faith-based healthcare facilities	5.0
Pharmacies	6.9
Pharmaceutical depots	0
General and mobile drug retailers*	29.7
Urban Group 1	Urban Group 2
6.1	3.9
1.6	1.2
1.7	0
0	1
11.9	5.9
Rural	

* The average number of informal vendors per group in 2016 was 148.7 in urban group 1, 59.7 in urban group 2 and 29.5 in rural groups. Given the increased crackdown on informal medicine sellers in recent years, the informal private medicine sector is much less visible than in the past. We conservatively estimate that the number of suppliers present and willing to participate is 80% lower than in 2016.

The number of clusters corresponding to the retail outlet sample requirements was estimated using data from the 2016 ACTwatch outlet survey (above). A sample size of 15 urban clusters, supplemented by additional pharmacies and pharmacy depots, will yield the indicative numbers of outlets surveyed in the table below (assuming that the proportion of retail outlets eligible for interview in 2023 is no lower than in 2016). Prior to drawing the sample, it is estimated that these 15 urban clusters will be linked to, on average, 45 rural clusters also included in the study. These sample sizes will be sufficient to estimate the market indicators (as proportions) with at least the absolute level of precision shown in the table.

Given the relatively small number of registered pharmacies and pharmacy depots located in each arrondissement, and to avoid drawing too many clusters in which all outlets must be censused, the study will

increase the sample for these outlet types. An increased sample size will ensure that the study has the power to make robust estimates at the outlet level for these outlet types.

Expected number of points of sale surveyed and lowest expected accuracy, ACTwatch Lite Benin 2023						
	Urban		Rural		Total	
Output type	Number of outlets surveyed	Lowest absolute accuracy	Number of outlets surveyed	Lowest absolute accuracy	Number of outlets surveyed	Lowest absolute accuracy
Private for-profit healthcare facilities	162	0,10*	175	0,08*	337	0,06*
Faith-based healthcare facilities ¹	44	0.21	54	0.19	100	0.14
Pharmacies	120	0.10	0	-	120	0.10
Pharmaceutical depots	0	-	50	0,17*	50	0,17*
Total (formal)	325	0.08	279	0.09	604	0.06
General retailers and mobile drug sellers (informal)	285	0.09	265	0.09	550	0.06

¹ Faith-based facilities are included in the study on an exploratory basis, and their target number is not set according to the achievement of a given precision, as is the case for private healthcare facilities and pharmacies.

* Including a finite population correction that assumes a total of 500 private health facilities in urban areas, 300 private health facilities in rural areas and 150 pharmaceutical depots. These figures are based on data extracted from DHIS2 for private health facilities reporting to NHIS according to the 2021 Health Statistics Directory and the list of registered pharmacies and pharmaceutical depots available on the ABMed website.

Collecting data

The field team, including interviewers, supervisors, and quality controllers received training that included classroom training on the study overview, questionnaire, and on conducting malaria audits and RDTs. This was followed by a field exercise. Fieldworker training and data collection took place from June 12 to July 19, 2023.

Two structured questionnaires were developed, one for retail outlets and the other for wholesalers, adapting ACTwatch's previous point-of-sale and supply chain questionnaires. The digital questionnaires were programmed into an Open Data Kit (ODK) and administered by SurveyCTO software on Android devices. During fieldwork, a series of screening questions were asked at outlets to determine survey eligibility. Retail outlets were targeted first, followed by wholesale outlets. The retail outlet questionnaire collected information on wholesale sources of supply to facilitate sampling of wholesale outlets.

After obtaining informed consent (confirmed in the questionnaire), an audit of all available antimalarial drugs and RDTs was carried out. The questionnaire was programmed so that common products could be searched instead of manually entering product details (brand name, active ingredients, etc.) for all products.. Interviewers collected point-of-sale and product-specific information, such as sales over the last 7 days, retail price and wholesale price. Following the audit, the supplier was asked a series of questions about business characteristics and practices, staff training and qualifications, participation in national malaria surveillance and data reporting, digital capability and attitudes to potential digital market services (e.g. consultancy and information services, inventory management services, business management services, financial services). Geographical coordinates were captured for each outlet in the official sector. Both the retail and wholesale questionnaires covered the above topics. The wholesale questionnaire also collected information on commercial and distribution practices, including selling price for a range of different sales volumes, credit terms for buying and selling, and commercial activities carried out by the supplier, including distribution services offered to buyers and their costs.

Data cleaning and analysis

All data cleaning and analysis was carried out using Stata 15 (©StataCorp, College Station, TX). Sampling weights were applied to account for variations in the probability of selection (see Annex 4), and the standard

error estimate took account of clustering at borough and commune level. Indicator definitions are given in Annex 8.

Protecting human subjects

The ACTwatch Lite Benin 2023 protocol received ethical approval from the Comité National d'Ethique Pour la Recherche en Santé, the Conseil National de la Statistique (CNS) and the PSI Research Ethics Committee. Interviews with suppliers and product audits were carried out only after a standard informed consent form had been administered and the provider had consented to participate in the study. Providers were given the opportunity to terminate the interview at any time during the study. Standard measures were used to maintain provider confidentiality and anonymity.

Sampling weight

Sampling weights were applied for the analysis of the Benin 2023 survey data to account for variations in selection probability resulting from the sampling design:

- 1) One-stage cluster sampling: arrondissements were selected from sampling frames in each area with probability proportional to size. In each arrondissement, a census of all outlets likely to sell or distribute antimalarials and/or provide malaria blood tests was carried out.
- 2) Booster sample: The geographical area for the retail census was extended to the commune level for pharmacies and drugstores. All pharmacies and drugstores in the communes in which the selected arrondissements were located were included in the study.

The sampling weights applied during the analysis are the inverse of the selection probability:

$$W_i = \frac{1}{a \times \frac{M_\alpha}{\sum M_\alpha}}$$

Where:

M_α =	Estimated cluster (population size)
$\sum M_\alpha$ =	Sum of estimated cluster sizes (population size) across the stratum
a =	Number of selected clusters in the stratum

Sampling weights are calculated at cluster level and applied to all outlets in a given cluster, regardless of outlet type.

Market share was calculated using complete census data at the arrondissement level only (i.e., the booster sample was not included in the market share calculation). Borough sampling weights were created using the sampling weight formula (W_i), where:

M_α =	Estimated size of borough population
$\sum M_\alpha$ =	Sum of estimated borough population size in total stratum
a =	Number of selected districts in stratum

Arrondissement sampling weights were applied to all other indicators in the report for all outlet types, with the exception of public health facilities, pharmacies and drugstores. Since these outlet types were included in the sample by means of a commune-wide census, the weights applied to these outlet types for all indicators other than market share were calculated using the sampling weight formula (W_i), where:

M_α =	Estimate of the size of the commune population
$\sum M_\alpha$ =	Sum of estimated commune population size across stratum
a =	Number of selected communes in stratum

A sampling frame with population size was used to select the sample because there are no precise estimates of the total number of outlets per geographic or administrative unit that might be eligible for a survey of drug outlets. The main assumption used in the use of population figures for sampling and weighting is that the distribution of outlets and/or the distribution of drugs transiting through the outlets of a given group is correlated with the size of the population.

Finite population correction

A Finite Population Correction (FPC) was applied to the study estimates to account for the high proportion of arrondissements and communes selected in the study without replacement. The FPC affects the standard errors of the estimates, but not the point estimates themselves.

ANNEX 4: SAMPLE CLUSTERS

Table of study clusters:

Municipality	Borough
Abomey-Calavi	Akassato Godomey
Allada	Allada Agbanou Ahouannonzoun Attogon Avakpa Ayous Hinvi Lissegazoun Lon-Agonmey Sekou Togoudo Tokpa-Avagoudo
Aplahoue	Aplahoue Atom Aزو Dekpo Godohou Kissamey Lonkly
Bohicon	Bohicon Ii Agongointo Avogbana Bohicon I Gnidjazoun Lissezoun Ouassaho Passagon Saclo Sodohome
Cotonou	4th district 11th Arrondissement
Djougou	Djougou Ii Barei Barienou Belle Bougou Djougou I Djougou Iii Kolokonde Onklou Patargo Pelebina Serou
Grand-Popo	Grand-Popo Adjaha Agoue Avloh Djanglanmey Gbehoue Sazoue
Ifangni	Ko-Koumolou Banigbe Daagbe

	Ifangni
	Lagbe
	Tchaada
Kandi	Kandi li
	Angaradebou
	Bensekou
	Donwari
	Kandi I
	Kandi Iii
	Kassakou
	Saah
	Sam
	Sonsoro
Natitingou	Natitingou (1,2,3)
	Kpotopounga
	Perma
	Peporiyahou
	Kouaba
	Tchoumi-Tchoumi
	Kouandata i
Nikki	Nikki
	Biro
	Gnonkourakali
	Ouenou
	Serekale
	Suya
	Tasso
Parakou	3rd Arrondissement
Porto-Novo	2nd Arrondissement

ANNEX 5: SAMPLE OVERVIEW

Retail outlets visited by department							
Department	Private not-for-profit facility	Private for-profit facility	Pharmacy/pharmaceutical depot	General retailer	Itinerant vendor	Wholesalers	TOTAL
Alibori	3	16	4	0	0	0	23
Atacora	3	9	4	0	0	0	16
Atlantic	5	98	48	2	0	1	154
Borgou	3	27	21	0	0	1	52
Couffo	2	9	4	0	0	0	15
Donga	6	24	7	1	0	0	38
Coast	2	21	29	0	0	1	53
Mono	0	3	5	1	0	0	9
Oueme	1	11	12	0	0	0	24
Tray	1	11	2	0	0	0	14
Zou	1	28	11	0	0	1	41
Geographical information not collected	0	0	0	32	18	0	50
TOTAL	27	257	147	36	18	4	489

ANNEX 6: QUESTIONNAIRE

Questionnaires were developed in French and can be found in the Annexes of the original French language version of this report.

ANNEX 7: DEFINITIONS OF KEY INDICATORS

Table 1: Availability of antimalarials among all outlets surveyed

Table 1 shows the proportion of all outlets counted that had antimalarials in stock at the time of the survey visit. The availability of antimalarials is reported for all outlets, as well as for the different types of outlet. Availability is reported for all antimalarial drugs, as well as for specific types of antimalarial drugs.

Numerator	Number of outlets with an antimalarial drug in stock at the time of the survey visit, confirmed by the presence of at least one antimalarial drug (defined as a drug containing antimalarial components) recorded in the antimalarial verification section.
Denominator	Number of outlets visited and screened.
Calculation	Numerator divided by denominator.
Handling missing values	All screened outlets will contribute to the denominator. This includes outlets that were eligible for an interview (including a malaria check), but: 1) were not interviewed; or 2) the interview was only partially completed.
Notes and considerations	Given the partial completion or non-completion of interviews among eligible outlets, and the inclusion of these outlets in the denominator, these availability indicators can be considered as conservative estimates of antimalarial availability.

Table 2: Availability of antimalarial drugs among retail outlets stocking at least one antimalarial drug

Table 2 shows the proportion of outlets who had any antimalarial in stock on the day of survey with specific antimalarials in stock at the time of the survey visit. The availability of antimalarials is reported for all outlets, as well as for the different types of outlet. Availability is reported for all anti-malarial drugs as well as for specific types of anti-malarial drugs.

Numerator	Number of outlets with an antimalarial drug in stock at the time of the survey visit, confirmed by the presence of at least one antimalarial drug (defined as a drug containing antimalarial components) recorded in the antimalarial verification section.
Denominator	Number of outlets with at least 1 antimalarial in stock (confirmed by audit).
Calculation	Numerator divided by denominator.
Handling missing values	All outlets with at least one antimalarial recorded in the antimalarial audit sheet will contribute to the denominator. This includes outlets where the interview was not fully completed (partial interview).
Notes and considerations	Given the partial completion of interviews with outlets stocking anti-malarial drugs, and the inclusion of these outlets in the denominator, these availability indicators can be considered as conservative estimates of anti-malarial drug availability.

Table 3: Availability of malaria blood tests at anti-malarial stocking points

Table 6 shows the proportion of antimalarial vendors who had antimalarial blood tests available. Test availability is reported for all outlets, as well as for each type of outlet. Availability is reported for all blood tests, as well as for specific types of tests: microscopy and rapid diagnostic tests (RDTs), including prequalified RDTs.

Numerator	Number of outlets with blood malaria screening available (all, microscopy, RDT, prequalified RDT).
Denominator	Part 1: Number of eligible retail outlets Part 2: Number of retail outlets with antimalarials in stock at the time of the survey visit, or which had stocked antimalarials in the previous three months.
Calculation	Numerator divided by denominator.
Handling missing values	<ul style="list-style-type: none"> Antimalarial stocking points for which information on the availability of microscopy and RDTs is lacking are excluded from the malaria screening indicators. The number of such outlets is indicated in a footnote. Outlets offering partial information on the availability of blood tests (microscopy or RDT information) are included in the denominator of the "any available blood test" indicator. The number of such outlets is indicated in a footnote. The mRDT and microscopy availability indicators respectively exclude outlets for which information on availability is missing (i.e. outlets lacking information on microscopy availability are excluded from the microscopy indicator).

Table 4: Composition of the anti-malarial drugs market

Table 3 shows the distribution of outlet types among outlets with at least one antimalarial in stock on the day of the survey.

Numerator	By type of outlet, the number of outlets with an antimalarial in stock at the time of the survey visit, confirmed by the presence of at least one antimalarial (defined as a drug containing antimalarial components) recorded in the antimalarial verification section.
Denominator	Total number of outlets with an antimalarial drug in stock at the time of the survey visit, confirmed by the presence of at least one antimalarial drug (defined as a drug containing antimalarial ingredients) recorded in the antimalarial verification section.
Calculation	Numerator for each catch type divided by the denominator.
Handling missing values	All outlets with at least one anti-malarial registered in the anti-malarial audit sheet will contribute to the indicator. This includes outlets where the interview has not been fully completed (partial interview).
Notes and considerations	Market composition is calculated among outlets located in the representative cluster sample and excludes the booster sample.

Table 5: Prices of antimalarial drugs

Table 5a shows the median price of an adult equivalent treatment dose (AETD, see Annex 8) for selected types of antimalarial tablets for all output types. The interquartile range (IQR) is provided as a measure of dispersion.

Calculation	Median price of antimalarial AETD (see Annex 11) in US dollars with inter-quartile range (25th and 75th percentiles).
Handling missing values	Anti-malarials for which price information is missing are excluded from the median price calculation.
Notes and considerations	The price in US dollars is calculated on the basis of exchange rates available from www.oanda.com using the historical exchange rates tool. The average exchange rate over the entire data collection period is used to convert the local currency entered at the time of data collection into US dollars.

Table 6: Prices of antimalarial drugs

Table 6 shows the median price of pre-packaged ACT AQ therapies: pediatric appropriate for a 10 kg child (2 years), child (15-25 kg), adolescent (25-35 kg) and adult appropriate for a 60 kg adult. The interquartile range (IQR) is provided as a measure of dispersion.

Calculation	Median price of pre-packaged treatment in US dollars with inter-quartile range (25th and 75th percentiles).
Handling missing values	Anti-malarials for which price information is missing are excluded from the median price calculation.
Notes and considerations	The price in US dollars is calculated on the basis of exchange rates available from www.oanda.com using the historical exchange rates tool. The average exchange rate over the entire data collection period is used to convert the local currency entered at the time of data collection into US dollars.

Tables 7 and 8: Profit margins

Table 7 shows the median percentage profit per AETD, while Table 8 shows the median percentage profit for prepackaged antimalarial tablet formulation types for all outlet types. The interquartile range (IQR) is provided as a measure of dispersion.

Calculation	The profit percentage is calculated for each antimalarial by dividing the difference between the retail price and the wholesale price by the wholesale price. The median is then indicated for each type of antimalarial in each type of outlet.
Handling missing values	Antimalarials for which information on retail or wholesale purchase prices is missing are excluded from the median price calculation. Antimalarials for which profits have been negative are excluded from this calculation.
Notes and considerations	The price in US dollars is calculated on the basis of exchange rates available from www.oanda.com using the historical exchange rates tool. The average exchange rate over the entire data collection period is used to convert the local currency entered at the time of data collection into US dollars.

Tables 9 and 10: Profit margins

Table 9 shows the median absolute benefit values per AETD, while Table 10 shows the median absolute benefit for prepackaged tablet antimalarial types for all outlet types. The interquartile range (IQR) is provided as a measure of dispersion.

Calculation	Absolute profit is calculated for each antimalarial by calculating the difference between the retail price and the wholesale price. The median is then indicated for each type of antimalarial in each type of outlet.
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Handling missing values	Antimalarials for which information on retail or wholesale purchase prices is missing are excluded from the median price calculation. Antimalarials with a negative difference are excluded from this calculation.
Notes and considerations	The price in US dollars is calculated on the basis of exchange rates available from www.oanda.com using the historical exchange rates tool. The average exchange rate over the entire data collection period is used to convert the local currency entered at the time of data collection into US dollars.

Table 11: Median sales volumes

Table 11 shows the median number of certain types of antimalarial tablet formulations and mRDTs sold in the previous week for all outlet types. The interquartile range (IQR) is provided as a measure of dispersion.

Calculation	AETD sales volumes by product type are calculated, and the median is then reported by type of antimalarial in each type of outlet.
Handling missing values	Anti-malarial drugs for which information on sales volume is lacking are excluded from this calculation.

Table 12: Median sales volumes among outlets with sales

Table 12 shows the median number of certain types of antimalarial tablet formulations and mRDTs sold in the previous week across all outlet types for outlets reporting sales. The interquartile range (IQR) is provided as a measure of dispersion.

Calculation	AETD sales volumes by product type are calculated, and the median is then reported by antimalarial type in each outlet type if the outlet's overall sales volume in the previous week was greater than zero.
Handling missing values	Anti-malarial drugs for which information on sales volume is lacking are excluded from this calculation.

Table 13: Market share of antimalarial drugs

Antimalarial market share is the quantity of adult treatment equivalent doses (AETDs) reported to have been sold/distributed in the previous week, by outlet type and antimalarial drug type, as a percentage of all AETDs sold/distributed in the previous week. Expressed as a percentage, market share is the quantity of a specific antimalarial sold/distributed by a specific type of outlet relative to the total antimalarial market (all types of antimalarial sold/distributed by all types of outlet). Totals are shown by type of antimalarial drug and type of outlet. For all anti-malarial drug types and outlet types, the percentages in the overall table add up to 100% (the total market).

Numerator	Number of AETDs sold/distributed for a specific antimalarial drug category and outlet type.
Denominator	Total number of AETDs sold/distributed.
Calculation	Numerator divided by denominator.
Handling missing values	AETD sold/distributed is calculated among audited drugs with complete and consistent information. Antimalarials with incomplete or inconsistent information among the key variables that define AETD sold/distributed (active ingredients, concentration, formulation, pack size, quantity sold/distributed) are excluded from the calculation.

Notes and considerations	See Annex 8 for a description of the AETD calculation.
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Table 14: Market share of antimalarials by type of outlet

Antimalarial market share for all outlet types is the quantity of adult treatment equivalent doses (AEDs) reportedly sold/distributed in the previous week by antimalarial type in each outlet type, as a percentage of all AEDs sold/distributed in the previous week in the specified outlet type. Expressed as a percentage, the outlet type's market share is the quantity of a specific antimalarial sold/distributed relative to the entire antimalarial market segment for the specified outlet type (all antimalarial types sold/distributed by the specific outlet type). Totals are reported by anti-malarial drug type for each outlet type. For all anti-malarial drug types in each outlet type, the sum of the percentages is 100%.

Numerator	Number of AEDs sold/distributed for a specific category of antimalarial drugs in the type of outlet specified.
Denominator	Total number of AED sold/distributed in the specific outlet type.
Calculation	Numerator divided by denominator.
Handling missing values	AEDs sold/distributed are calculated among audited drugs with complete and consistent information. Antimalarials with incomplete or inconsistent information among the key variables that define AED sold/distributed (active ingredients, concentration, formulation, pack size, quantity sold/distributed) are excluded from the calculation.
Notes and considerations	See Annex 8 for a description of the AED calculation.

Table 15: Market share of malaria screening blood tests

Malaria blood test market share is the number of malaria blood tests reportedly sold or distributed in the previous week by outlet type and malaria blood test type (RDT, microscopy) as a percentage of all malaria blood tests sold/distributed in the previous week. Expressed as a percentage, market share is the number of a specific type of malaria blood test sold by a specific type of outlet relative to the total malaria blood test market (all malaria blood tests sold / distributed by all types of outlet). Totals are shown by test type and by outlet type. For all malaria blood test types and outlet types, the percentages in the overall table add up to 100% (the total market).

Numerator	Number of malaria blood tests sold/distributed for a specific type of blood test (RDT, microscopy) and type of output.
Denominator	Total number of malaria blood tests sold/distributed.
Calculation	Numerator divided by denominator.
Handling missing values	Malaria blood tests sold/distributed are calculated between RDTs and microscopy services verified with complete and consistent information. RDTs and microscopy services with incomplete or inconsistent information on the quantity sold/distributed) are excluded from the calculation.

Notes and considerations	Records and/or recalls of microscopy tests versus malaria RDTs may differ within a given outlet, introducing an unquantifiable bias into the estimate of the total number of tests performed.
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Table 16: Market share of malaria blood tests by type of outlet

Market share of malaria blood tests by outlet type is the number of malaria blood tests that would have been sold or distributed in the previous week by blood test type in each outlet type, as a percentage of all blood tests sold / distributed in the previous week in the specified outlet type. Expressed as a percentage, the outlet type's market share is the quantity of a specific malaria blood test sold / distributed relative to the entire blood test market segment for the specified outlet type (all malaria tests sold / distributed by the specific outlet type). Totals are reported by test type for each outlet type. For all malaria blood test types in each outlet type, percentages total 100%.

The market share of each mRDT manufacturer is also reported by outlet type. Within each outlet type, the number of mRDTs sold or distributed for a given manufacturer relative to all mRDTs distributed in that outlet type is expressed as a percentage. Totals for mRDT market share in all manufacturer sums at 100% in each outlet type.

Numerator	Number of malaria blood tests sold/distributed for a specific type of blood test (RDT, microscopy) or number of malaria RDTs sold/distributed for a specific manufacturer, in the type of outlet specified.
Denominator	Total number of malaria blood tests / RDTs sold / distributed in the specific outlet type.
Calculation	Numerator divided by denominator.
Handling missing values	Malaria blood tests sold/distributed are calculated between RDTs and microscopy services verified with complete and consistent information. RDTs and microscopy services with incomplete or inconsistent information on the quantity sold/distributed) are excluded from the calculation.
Notes and considerations	Records and/or recalls of microscopy tests versus malaria RDTs may differ within a given outlet, introducing an unquantifiable bias into the estimate of the total number of tests performed.

ANNEX 8: AETD (ADULT EQUIVALENT TREATMENT DOSE)

Definition

Antimalarial drugs are manufactured from a variety of active pharmaceutical ingredients, dosage forms, strengths and pack sizes. ACTwatch uses the adult treatment equivalent dose (AETD) as the standard unit for pricing and sales/distribution analyses. An AETD is defined as the number of milligrams (mg) of an antimalarial drug required to treat an adult weighing 60 kilograms (kg). For each generic antimalarial drug, the AETD is defined as the number of mg recommended in the WHO guidelines for the treatment of uncomplicated malaria in areas of low drug resistance. Where the WHO treatment guidelines do not cover a specific generic, AETD is defined on the basis of peer-reviewed research or the treatment recommended by the product manufacturer for a 60 kg adult. **The table below provides definitions of AETD used in this report.**

While it is recognized that the use of AETDs can oversimplify and ignore many of the complexities of drug consumption and utilization, this analytical approach has been chosen because it standardizes drug dosages across drug types and across countries (which can sometimes vary), thus enabling comparisons on prices and volumes calculated on the basis of an AETD.

Additional considerations:

- When combination therapies consist of two or more active antimalarial ingredients packaged together (co-formulated or co-blistered), the concentration of a single main ingredient is issued. Artemisinin derivative is used as the main ingredient for ACT AETD calculations.
- Co-cloned combinations are generally assumed to be a 1:1 ratio of tablets, unless otherwise specified during fieldwork or on manufacturers' websites.
- Sulfamethoxypyrazine-pyrimethamine is assumed to deliver the same full adult dose as sulfadoxine-pyrimethamine.

Calculation

Information collected on the drug concentration and unit size indicated on the product packaging was used to calculate the total quantity of each active ingredient found in the package. The number of AETDs in a unit was calculated.¹ The number of AETDs in a monotherapy is calculated by dividing the total amount of active ingredient in the unit by the AETD (i.e. the total number of mg required to treat a 60 kg adult). The number of AETDs for combination therapy is calculated by dividing the total quantity of active ingredient used as the basis for the AETD by the AETD.

Definition: Adult Equivalent Treatment Dosage (AETD)

Antimalarial Generic [Ingredient used for the dose in mg of AETD].	Dose used to calculate 1 AETD (mg required to treat a 60 kg adult)	Source
Amodiaquine	1800mg	WHO model form, 2008
Artemether	960mg	WHO use of antimalarial drugs, 2001 Note: this includes a recommended loading dose of 4 mg / kg on the first day, followed by a six-day course of 2 mg / kg once daily.
Artemether-Lumefantrine [Artemether]	480mg	WHO malaria treatment guidelines 3rd edition, 2015
Artemisinin-Naphthoquine	2400mg	WHO use of antimalarial drugs, 2001

¹ The unit depends on the dosage form of the drug. The unit for antimalarials in tablet, suppository or granule form is the pack. The unit for injectable antimalarials is the ampoule. The unit for anti-malarial syrups and suspensions is the bottle.

[Artemisinin]

Artemisinin - Piperaquine [Artemisinin]	504mg	Thanh NX, Trung TN, Phong NC et al. 2012. Efficacy and tolerability of artemisinin-piperaquine (Artequick®) versus artesunate-amodiaquine (Coarsucam™) for the treatment of uncomplicated Plasmodium falciparum malaria in south-central Vietnam. Malaria Journal, 11 :217.
Arterolane- Piperaquine [Arterolane]	450mg	Patil C, Katare S, Baig M, Doifode S. Fixed-dose combination of arterolane and piperaquine: a new perspective in antimalarial treatment. Ann Med Health Sci Res. 2014 Jul; 4(4):466-71. doi: 10.4103/2141-9248.139270
Artesunate	960mg	WHO use of antimalarial drugs, 2001 Note: this includes a recommended loading dose of 4 mg / kg on the first day, followed by a six-day course of 2 mg / kg once daily.
Artesunate-Amodiaquine [Artesunate]	600mg	WHO malaria treatment guidelines 3rd edition, 2015
Artesunate-Mefloquine [Artesunate]	600mg	WHO malaria treatment guidelines 3rd edition, 2015
Artesunate- Sulfadoxine-Pyrimethamine [Artesunate]	600mg	WHO malaria treatment guidelines 3rd edition, 2015
Atovaquone-Proguanil [Atovaquone]	3000mg	WHO malaria treatment guidelines 3rd edition, 2015
Chloroquine	1500mg	WHO malaria treatment guidelines 3rd edition, 2015
Dihydroartemisinin-piperaquine [Dihydroartemisinin].	360mg	WHO malaria treatment guidelines 3rd edition, 2015 Note: AETD under the new 2015 guidelines is now 480 mg, whereas 360 mg was indicated in the previous guidelines. Product availability for prepackaged adult DHA PPQ in 2015 was still most often 360 mg administered over a 3-day cycle on a total of 9 tablets (40/320).
Dihydroartemisinin-Piperazine-Trimethoprim [Dihydroartemisinin].	256mg	Manufacturer's guidelines (Artecxin - Medicare Pharma; Artescom - Ctonghe)
Dihydroartemisinin-sulfadoxine-pyrimethamine [Dihydroartemisinin].	360mg	Manufacturer's guidelines (Dalasin - Adams Pharma)
Hydroxychloroquine	2000mg	Manufacturer's guidelines (Plaquenil - Sanofi Aventis)
Mefloquine	1000mg	WHO model form, 2008
Quinine	10408mg	WHO model form, 2008
Sulfadoxine-pyrimethamine	1500mg	WHO model form, 2008

ANNEX 9: VOLUME OF ANTIMALARIAL DRUGS DISTRIBUTED

Distribution of antimalarial AETDs sold or distributed during the previous week, by type of outlet and by product type	Formal			Informal		Retail Total
	Private not-for-profit facility AETD (95% CI)	Private for-profit facility AETD (95% CI)	Pharmacy/ Pharmaceutical depot AETD (95% CI)	General retailer AETD (95% CI)	Itinerant vendor AETD (95% CI)	
1. Any ACT	2256.6 (939.9, 3573.2)	7287.9 (4912.2, 9663.5)	83999.6 (62270.3, 105728.9)	252.9 (98.3, 407.5)	156.2 -	93953.2 (70377.6, 117528.8)
Artemether lumefantrine	2246.6 (927.4, 3565.8)	7233.8 (4856.2, 9611.4)	68276.9 (51274.8, 85279.0)	252.9 (98.3, 407.5)	156.2 -	78166.4 (59482.8, 96850.0)
Dihydroartemisinin piperaquine	10 - (0.0, 233.6)	54.1 (6976.5, 14238.1)	10607.3 -	0 -	0 -	10671.4 (7028.0, 14314.8)
Artesunate SP	0 - -	0 - (2702.1, 5309.3)	4005.7 -	0 -	0 -	4005.7 (2702.1, 5309.3)
Arterolane piperaquine	0 - -	0 - (348.3, 1178.8)	763.6 -	0 -	0 -	763.6 (348.3, 1178.8)
Other ACT	0 - -	0 - (33.3, 659.0)	346.1 -	0 -	0 -	346.1 (33.3, 659.0)
WHO pre-qualified ACT	1657.3 - (39114.4, 8250.5)	6081 (14057.7, 25053.9)	19555.8 -	169.8 (0.0, 350.8)	129.8 -	27593.8 (20963.0, 34224.6)
Additional nationally approved ACTs (not WHO prequalified)	1854 (594.8, 3113.2)	6432.3 (4271.2, 8593.4)	45657.5 (34201.6, 57113.4)	0 -	54.9 -	53998.7 (41383.7, 66613.7)
ACT that is not WHO prequalified or nationally approved	599.2 (0.0, 1263.3)	1206.9 (850.7, 1563.1)	64443.8 (47720.2, 81167.4)	83.1 (13.1, 153.0)	26.4 -	66359.4 (48839.2, 83879.7)
Front-line ACT	2246.6 (927.4, 3565.8)	7233.8 (4856.2, 9611.4)	68452.2 (51442.2, 85462.2)	252.9 (98.3, 407.5)	156.2 -	78341.7 (59654.9, 97028.5)
2. Non-artemisinin therapy	475.1 (0.0, 1139.1)	976.9 (493.0, 1460.7)	6224.5 (3883.4, 8565.5)	552.1 -	264.1 (100.5, 427.7)	8492.7 (5808.6, 11176.7)
Sulfadoxine pyrimethamine	207 (0.0, 634.2)	924.6 (470.1, 1379.0)	6000.4 (3671.4, 8329.4)	424 -	51.8 -	7607.7 (5004.8, 10210.7)
Oral quinine	268.1 - -	37.9 - (53.6, 255.8)	154.7 -	30.1 -	39.5 -	530.3 (0.0, 1083.9)
Quinine injection	0 - -	14.4 (5.8, 23.0)	42.4 (12.3, 72.4)	1 -	0 -	57.8 (29.9, 85.7)
3. Oral artemisinin monotherapy	0 - -	0 - -	0 - -	0 -	0 -	0 -
4. Non-oral artemisinin monotherapy	306.5 (94.0, 519.0)	688.1 (424.6, 951.6)	2177 (1552.9, 2801.2)	4.1 -	0 -	3175.8 (2362.8, 3988.7)
Artesunate injection	220.7 (75.3, 366.1)	574.8 (328.7, 820.8)	1525.6 (1047.8, 2003.4)	4.1 -	0 -	2325.2 (1685.5, 2964.9)
Artemether Injection	85.8 (0.0, 182.7)	113.3 (74.7, 152.0)	606.1 (211.2, 1001.1)	0 -	0 -	805.2 (408.0, 1202.5)
Rectal artesunate	0 - -	0 - (6.3, 44.5)	25.4 -	0 -	0 -	25.4 (5.9, 44.9)
Any antimalarial drug	3038.2 (1262.0, 4814.4)	8952.8 (6206.2, 11699.4)	92401.1 (68616.9, 116185.4)	809.2 (533.7, 1084.6)	420.3 (79.8, 760.8)	105621.6 (79244.1, 131999.2)

ANNEX 10: VOLUME OF DIAGNOSTICS DISTRIBUTED

Breakdown of diagnostics sold or distributed during the previous week, by type of outlet and by type of product	Formal			Informal		Retail Total N distributed (95% CI)
	Private not-for-profit facility N distributed (95% CI)	Private for-profit facility N distributed (95% CI)	Pharmacy/ Pharmaceutical depot N distributed (95% CI)	General retailer	Itinerant vendor	
1. Microscopy	2957.8 (1123.1, 4792.6)	8268.3 (5261.4, 11275.2)	0	0	0	11226.1 (7385.3, 15067.0)
2. RDT	3393.4 -	9885.1 (6767.5, 13002.8)	0	84.6	0	13363.1 (9140.2, 17586.0)
WHO Prequalified RDT	3393.4 -	9848 (6729.5, 12966.5)	0	84.6	0	13326 (9102.8, 17549.1)
Abbott Diagnostics RDT	3393.4 -	8895.1 (5929.3, 11860.9)	0	84.6	0	12373.1 (8280.9, 16465.2)
ARKRAY Healthcare RDT	0 -	307.3 (0.0, 681.3)	0	0	0	307.3 (0.0, 681.3)
Advy Chemical RDT	0 -	612.3 (0.0, 1693.5)	0	0	0	612.3 (0.0, 1693.5)
RDT from other manufacturer	0 -	33.3 -	0	0	0	33.3 -
RDT with unknown manufacturer	0 -	37.1 (0.0, 300.0)	0	0	0	37.1 (0.0, 300.0)
Any diagnosis	6351.2 (3467.8, 9234.7)	18153.4 (13612.4, 22694.4)	0	84.6	0	24589.2 (18087.9, 31090.6)

ANNEX 11: FIGURES AND TABLES IN USD

Table X29 Purchase price in USD of antimalarials (standardized AETD) in surveyed outlets, by type of outlet

	Type of outlet							Retail Total	
	Formal			Informal					
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total		
Median price of a AETD* tablet :	Median US\$ [IQR] (N of antimalarials)								
Any ACT	\$1.00 [1.00-1.33] (57)	\$1.33 [1.00-1.66] (249)	\$4.27 [3.57-5.64] (8,896)	\$4.15 [3.39-5.62] (9,202)	\$1.66 [1.66-1.66] (10 F)	\$1.33 [1.33-2.32] (12 F)	\$1.66 [1.33-1.66] (22)	\$4.15 [3.39-5.62] (9,224 F)	
Artemether lumefantrine	\$1.00 [1.00-1.33] (56)	\$1.33 [1.00-1.66] (242)	\$3.90 [3.29-4.85] (6,569)	\$3.88 [3.24-4.85] (6,867)	\$1.66 [1.66-1.66] (10 F)	\$1.33 [1.33-2.32] (12 F)	\$1.66 [1.33-1.66] (22)	\$3.88 [3.24-4.85] (6,889 F)	
Dihydroartemisinin piperazine	\$10.46 (1)	\$5.73 [4.36-11.45] (6)	\$5.04 [4.00-6.40] (1,799)	\$5.04 [4.00-6.40] (1,806)	-	-	-	\$5.04 [4.00-6.40] (1,806 F)	
Arterolane piperaquine	-	\$4.28 (1)	\$6.41 [4.28-6.46] (188)	\$6.41 [4.28-6.46] (189)	-	-	-	\$6.41 F	
Artesunate SP	-	-	\$5.82 [4.17-6.79] (290)	\$5.82 [4.17-6.79] (290)	-	-	-	\$5.82 [4.17-6.79] (290 F)	
-	-	-	\$6.78 [5.68-6.78] (50)	\$6.78 [5.68-6.78] (50)	-	-	-	\$6.78 [5.68-6.78] (50 F)	
Other ACT	-	-	[5.68-6.78] (50)	[5.68-6.78] (50)	-	-	-	[5.68-6.78] (50 F)	
Nationally approved ACT	\$1.00 [1.00-1.33] (43)	\$1.33 [1.00-1.66] (203)	\$4.01 [3.29-5.05] (4,357)	\$3.88 [3.28-4.85] (4,603)	-	\$1.33 [1.33-2.32] (5 F)	\$1.33 [1.33-2.32] (5 F)	\$3.88 [3.24-4.85] (4,608 F)	
WHO pre-qualified ACT	\$1.00 [1.00-1.33] (47)	\$1.11 [1.00-1.66] (198)	\$4.00 [3.78-4.85] (1,735)	\$3.88 [3.00-4.78] (1,980)	\$1.66 [1.66-1.66] (4)	\$1.33 [1.33-1.33] (9 F)	\$1.33 [1.33-1.66] (13 F)	\$3.88 [2.91-4.78] (1,993 F)	
Non-prequalified ACT	\$3.32 [2.99-10.46] (10)	\$3.49 [2.57-5.64] (51)	\$4.27 [3.49-5.69] (7,161)	\$4.27 [3.39-5.69] (7,222)	\$1.66 [1.66-1.66] (6 F)	\$2.32 [2.32-2.66] (3 F)	\$1.66 [1.66-2.66] (9 F)	\$4.27 [3.39-5.69] (7,231 F)	
Non-ART	\$0.00 [0.00-2.88] (2)	\$0.83 [0.83-1.08] (14)	\$0.81 [0.74-1.70] (320)	\$0.81 [0.74-1.70] (336)	\$0.62 [0.41-2.88] (27 F)	\$0.83 [0.44-1.04] (15 F)	\$0.62 [0.41-1.04] (42 F)	\$0.81 [0.64-1.70] (378 F)	
Sulfadoxine pyrimethamine	\$0.00 (1)	\$0.83 [0.83-0.83] (11)	\$0.81 [0.66-0.83] (292)	\$0.81 [0.66-0.83] (304)	\$0.50 [0.41-0.83] (13 F)	\$0.75 [0.41-0.75] (2 F)	\$0.50 [0.41-0.75] (15 F)	\$0.80 [0.64-0.83] (319 F)	
Quinine	\$2.88 (1)	\$4.18 [4.18-4.18] (3)	\$6.27 [5.24-8.22] (18)	\$5.30 [5.24-8.22] (22)	\$4.32 [3.49-9.60] (8 F)	\$2.88 [0.04-4.18] (4 F)	\$4.18 [2.88-4.32] (12 F)	\$5.30 [4.32-6.90] (34 F)	
Chloroquine	-	-	\$5.81 (1)	\$5.81 (1)	\$0.62 [0.41-0.62] (6 F)	\$0.83 [0.62-0.83] (8 F)	\$0.62 [0.44-0.83] (14 F)	\$0.62 [0.62-1.04] (15 F)	

* AETD - Adult Equivalent Treatment Dose - is the number of milligrams needed to treat a 60 kg adult (see Annex 8: AETDs).

Information provided by the respondent on the price of a specific quantity of antimalarial (for example, price per tablet or price per pack) has been converted into a price by AETD.

The pricing data in this table is derived from the audited products for which pricing information was provided. The number of antimalarial products audited for which price information was missing is as follows: 152 any ACT tablets; 115 AL tablets; 31 DHAPQ tablets; 1 ARPPQ tablet; 5 ASSP tablets; 0 other ACT tablets; 77 nationally approved tablets; 21 QAACT tablets; 131X non-QAACT tablets; 19 non-ART tablets; 19 SP tablets; 0 quinine tablets; 0 chloroquine tablets.

All prices are expressed in USD to allow comparison with previous studies and between countries. FCFA/USD exchange rates for this analysis were calculated using the average value for each study period. For 2023, the rate was 606.804 (OANDA, 2023).

Table X30 Purchase price in USD of pre-packaged ACTs and mRDTs at surveyed outlets, by outlet type

	Type of outlet							Retail Total	
	Formal			Informal					
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total		
Median price of pre-packaged therapy* :	Median US\$ [IQR] (N of antimalarials)								
WHO pre-qualified artemether lumefantrine									
Pack size 1 (paediatric): For 5-15 kgs	\$0.25 [0.25-0.33] (13)	\$0.27 [0.25-0.41] (52)	\$1.16 [1.16-1.94] (337)	\$1.16 [0.99-1.94] (402)	-	-	-	\$1.16 [0.99-1.94] (402)	
Pack size 2 (child): For 15-25 kgs	-	\$2.49 [2.49-2.49] (2)	\$2.42 [2.42-2.42] (126)	\$2.42 [2.42-2.42] (128)	-	-	-	\$2.42 [2.42-2.42] (128)	
Size 3 package (Teenager): For 25-35 kgs	-	-	\$3.59 [3.59-3.59] (96)	\$3.59 [3.59-3.59] (96)	-	-	-	\$3.59 [3.59-3.59] (96)	
Size 4 package (adult): For ≥ 35 kgs	\$2.82 [2.82-2.82] (2)	\$4.07 [3.32-4.07] (8)	\$3.88 [3.59-3.88] (485)	\$3.88 [3.59-3.88] (495)	-	-	-	\$3.88 [3.59-3.88] (495)	
Non-qualified artemether lumefantrine									
Pack size 1 (paediatric): For 5-15 kgs	\$28.22 (1)	\$2.21 [1.53-2.57] (11)	\$2.21 [1.23-3.10] (1,776)	\$2.21 [1.23-3.10] (1,788)	-	-	-	\$2.21 [1.23-3.10] (1,788)	
Pack size 2 (child): For 15-25 kgs	-	\$3.87 (1)	\$3.49 [2.13-3.69] (527)	\$3.49 [2.13-3.69] (528)	-	-	-	\$3.49 [2.13-3.69] (528)	
Size 3 package (Teenager): For 25-35 kgs	-	\$4.99 [4.27-4.99] (2)	\$4.27 [4.27-4.27] (104)	\$4.27 [4.27-4.27] (106)	-	-	-	\$4.27 [4.27-4.27] (106)	
Size 4 package (adult): For ≥ 35 kgs	\$2.99 [2.76-3.24] (5)	\$3.32 [2.49-4.15] (18)	\$3.70 [3.29-4.30] (2,379)	\$3.70 [3.29-4.27] (2,402)	\$1.66 (1)	-	\$1.66 (1)	\$3.70 [3.29-4.27] (2,403)	
RDT									
mRDT (per unit)	\$0.75 [0.50-1.16] (52)	\$0.83 [0.50-1.16] (196)	-	\$0.83 [0.50-1.16] (248)	-	-	-	\$0.83 [0.50-1.16] (248)	

* Prices of prepackaged ACT products as declared by respondents.

The pricing data in this table was obtained from audited products for which pricing information was provided. The number of anti-malarial products audited for which price information was not provided is as follows:

For quality-assured products, 2 pediatrics, 0 children, 1 adolescent and 8 adults had no price information; For non-quality-assured products, 30 pediatrics, 9 children, 1 adolescent and 45 adults had no price information; and 128 RDTs.

All prices are expressed in USD to allow comparison with previous studies and between countries. FCFA/USD exchange rates for this analysis were calculated using the average value for each study period. For 2023, the rate was 606.804 (OANDA, 2023).

Source: ACTwatch Lite survey, BENIN, 2023.

Table X31 Absolute profit margins on antimalarial tablets (standardized) in surveyed outlets, by type of outlet

	Type of outlet							
	Formal			Informal				Retail Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	
Median profit margin per AETD* :	Median US\$ [IQR]	Median US\$ [IQR]	Median US\$ [IQR]	Median US\$ [IQR]	Median US\$ [IQR]	Median US\$ [IQR]	Median US\$ [IQR]	Median US\$ [IQR]
	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)	(N of antimalarials)
Any ACT	\$0.27 [0.27-0.50] (40)	\$0.32 [0.27-0.79] (210)	\$0.99 [0.81-1.34] (7,665)	\$0.97 [0.78-1.34] (7,915)	\$0.38 [0.28-0.50] (10)	\$0.50 [0.33-0.66] (11)	\$0.38 [0.33-0.66] (21)	\$0.97 [0.78-1.34] (7,936)
Artemether lumefantrine	\$0.27 [0.27-0.41] (39)	\$0.31 [0.27-0.75] (204)	\$0.92 [0.77-1.15] (5,646)	\$0.91 [0.74-1.15] (5,889)	\$0.38 [0.28-0.50] (10)	\$0.50 [0.33-0.66] (11)	\$0.38 [0.33-0.66] (21)	\$0.91 [0.74-1.15] (5,910)
Dihydroartemisinin piperaquine	\$2.42 (1)	\$1.02 [0.25-1.99] (6)	\$1.19 [0.91-1.55] (1,575)	\$1.19 [0.91-1.55] (1,582)	-	-	-	\$1.19 [0.91-1.55] (1,582)
Arterolane piperaquine	-	-	\$1.49 [1.01-1.58] (156)	\$1.49 [1.01-1.58] (156)	-	-	-	\$1.49 [1.01-1.58] (156)
Artesunate SP	-	-	\$1.34 [0.98-1.57] (246)	\$1.34 [0.98-1.57] (246)	-	-	-	\$1.34 [0.98-1.57] (246)
Other ACT	-	-	\$1.57 [1.15-1.60] (42)	\$1.57 [1.15-1.60] (42)	-	-	-	\$1.57 [1.15-1.60] (42)
Nationally approved ACTs	\$0.27 [0.27-0.31] (28)	\$0.33 [0.27-0.82] (173)	\$0.93 [0.77-1.20] (3,761)	\$0.91 [0.74-1.17] (3,962)	-	\$0.50 [0.50-0.66] (5)	\$0.50 [0.50-0.66] (5)	\$0.91 [0.73-1.17] (3,967)
WHO pre-qualified ACT	\$0.27 [0.27-0.27] (33)	\$0.29 [0.27-0.66] (168)	\$0.93 [0.87-1.15] (1,484)	\$0.91 [0.72-1.13] (1,685)	\$0.38 [0.38-0.66] (4)	\$0.33 [0.33-0.50] (9)	\$0.38 [0.33-0.58] (13)	\$0.91 [0.72-1.13] (1,698)
ACT that is not WHO pre-qualified or nationally approved	\$0.75 [0.41-0.80] (7)	\$0.58 [0.17-0.92] (42)	\$0.99 [0.79-1.34] (6,181)	\$0.99 [0.79-1.34] (6,230)	\$0.28 [0.28-0.50] (6)	\$0.91 [0.83-1.00] (2)	\$0.50 [0.28-0.66] (8)	\$0.99 [0.79-1.34] (6,238)
Non-ART	\$0.00 (1)	\$0.25 [0.11-0.84] (10)	\$0.19 [0.15-0.39] (265)	\$0.19 [0.15-0.39] (276)	\$0.21 [0.12-0.28] (27)	\$0.35 [0.27-0.41] (12)	\$0.25 [0.14-0.39] (39)	\$0.19 [0.15-0.39] (315)
Sulfadoxine pyrimethamine	\$0.00 (1)	\$0.25 [0.08-0.41] (8)	\$0.18 [0.15-0.20] (241)	\$0.18 [0.15-0.20] (250)	\$0.17 [0.10-0.25] (13)	\$0.17 (1)	\$0.17 [0.11-0.25] (14)	\$0.18 [0.15-0.20] (264)
Quinine	-	\$1.02 [0.84-1.20] (2)	\$1.90 [1.20-2.03] (15)	\$1.90 [1.20-2.03] (17)	\$0.86 [0.52-2.09] (8)	\$0.86 [0.70-1.15] (3)	\$0.86 [0.70-1.15] (11)	\$1.24 [0.86-2.03] (28)
Chloroquine	-	-	-	-	\$0.21 [0.12-0.28] (6)	\$0.35 [0.27-0.37] (7)	\$0.27 [0.21-0.35] (13)	\$0.27 [0.21-0.35] (13)

* AETD - Adult Equivalent Treatment Dose - is the number of milligrams needed to treat a 60 kg adult (see Annex 8: AETDs).

Information provided by the respondent on the price of a specific quantity of antimalarial (for example, price per tablet or price per pack) has been converted into a price by AETD.

Profit margins are calculated as the unit price difference between the declared wholesale purchase price and the retail selling price for each product per AETD. Only products with non-missing wholesale and retail prices were included. The number of products for which at least one of these prices was missing was as follows: 1,492 any ACT tablets; 1,096 AL tablets; 305 DHAPPQ tablets; 34 ARPPQ tablets; 49 ASSP tablets; 8 other ACT tablets; 718 nationally approved tablets; 316 QAACT tablets; 1,176 non-QAACT tablets; 82 non-ACT tablets; 74 SP tablets; 6 quinine tablets; 2 chloroquine tablets.

All prices are expressed in USD to allow comparison with previous studies and between countries. FCFA/USD exchange rates for this analysis were calculated using the average value for each study period. For 2023, the rate was 606.804 (OANDA, 2023).

Table X32 Absolute price mark-ups on prepackaged ACTsand mRDT in surveyed outlets, by outlet type

	Type of outlet							
	Formal				Informal			Retail Total
	Private not-for-profit facility	Private for-profit facility	Pharmacy/ Pharmaceutical depot	Formal outlet Total	General retailer	Itinerant vendor	Informal outlet Total	
Median profit margin for pre-packaged therapy :	Median US\$ [IQR] (N of antimalarials)							
Prequalified artemether lumefantrine								
Pack size 1 (paediatric): For 5-15 kgs	\$0.07 [0.07-0.07] (10)	\$0.08 [0.07-0.17] (46)	\$0.27 [0.24-0.46] (282)	\$0.27 [0.23-0.45] (338)	-	-	-	\$0.27 [0.23-0.45] (338)
Pack size 2 (child): For 15-25 kgs	-	\$0.50 [0.50-0.50] (2)	\$0.57 [0.56-0.57] (113)	\$0.57 [0.56-0.57] (115)	-	-	-	\$0.57 [0.56-0.57] (115)
Size 3 package (Teenager): For 25-35 kgs	-	-	\$0.84 [0.83-0.85] (87)	\$0.84 [0.83-0.85] (87)	-	-	-	\$0.84 [0.83-0.85] (87)
Non-prequalified artemether lumefantrine								
Size 4 package (adult): For ≥ 35 kgs	-	\$0.33 [0.25-1.24] (6)	\$0.89 [0.83-0.91] (419)	\$0.89 [0.83-0.91] (425)	-	-	-	\$0.89 [0.83-0.91] (425)
Pack size 1 (paediatric): For 5-15 kgs	-	\$0.33 [0.17-0.47] (8)	\$0.52 [0.29-0.72] (1,518)	\$0.52 [0.29-0.72] (1,526)	-	-	-	\$0.52 [0.29-0.72] (1,526)
Pack size 2 (child): For 15-25 kgs	-	\$0.50 (1)	\$0.81 [0.50-0.85] (453)	\$0.81 [0.50-0.85] (454)	-	-	-	\$0.81 [0.50-0.85] (454)
Size 3 package (Teenager): For 25-35 kgs	-	\$0.41 [0.41-0.61] (2)	\$1.01 [0.99-1.01] (90)	\$1.01 [0.99-1.01] (92)	-	-	-	\$1.01 [0.99-1.01] (92)
Size 4 package (adult): For ≥ 35 kgs	\$0.75 [0.41-0.75] (4)	\$0.57 [0.17-0.66] (13)	\$0.87 [0.77-1.03] (2,039)	\$0.87 [0.77-1.03] (2,056)	\$0.28 (1)	-	\$0.28 (1)	\$0.87 [0.77-1.03] (2,057)
RDT								
mRDT (per unit)	\$0.13 [0.07-0.27] (43)	\$0.17 [0.07-0.41] (219)	-	\$0.17 [0.07-0.40] (262)	-	-	-	\$0.17 [0.07-0.40] (262)

Profit margins are calculated as the unit price difference between the declared wholesale purchase price and the retail selling price for each product, per prepackaged product. Only products with non-missing wholesale and retail prices were included. The number of products for which at least one of these prices was missing was as follows: For quality-assured LA: 66 pediatric, 13 pediatric, 10 adolescent and 78 adult; For non-quality-assured LA: 292 pediatric, 83 pediatric, 15 adolescent and 393 adult; and 113 RDT.

All prices are expressed in USD to allow comparison with previous studies and between countries. FCFA/USD exchange rates for this analysis were calculated using the average value for each study period. For 2023, the rate was 606.804 (OANDA, 2023).

Source: ACTwatch Lite survey, BENIN, 2023