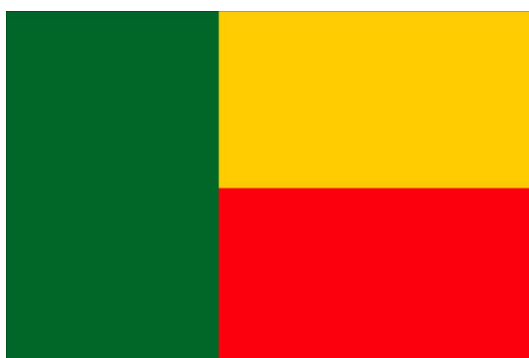




Outlet Survey Republic of Benin 2011 Survey Report



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General Definitions

Term	Definition
Adult Equivalent Treatment Dose (AETD)	An AETD is the number of milligrams (mg) of an antimalarial drug needed to treat a 60 kg adult.
Antimalarial	Any medicine recognized by the WHO for the treatment of malaria. Medicines used solely for the prevention of malaria were excluded from analysis in this report.
Antimalarial combination therapy	The simultaneous use of two or more drugs with different modes of action to treat malaria.
Artemisinin-based Combination Therapy (ACT)	An antimalarial that combines artemisinin or one of its derivatives with an antimalarial or antimalarials of a different class. Refer to Combination Therapy (below).
Artemisinin monotherapy	An antimalarial medicine that has a single active compound, where this active compound is artemisinin or one of its derivatives.
Artemisinin and its derivatives	Artemisinin is a plant extract used in the treatment of malaria. The most common derivatives of artemisinin used to treat malaria are artemether, artesunate, and dihydroartemisinin.
Booster Sample	A booster sample is an extra sample of units (in this case, outlets) of a type not adequately represented in the main survey, but which are of special interest. In this survey, public health facilities (PHFs) and pharmacies were targeted by a booster sample. The booster sample of public health facilities aimed to enumerate all PHFs in the <i>commune</i> in which a selected <i>arrondissement</i> fell. The booster sample of pharmacies aimed to enumerate all pharmacies in all <i>departments</i> of Benin (i.e. to conduct a full census of all registered pharmacies in the country).
Censused <i>arrondissement</i>	An <i>arrondissement</i> where field teams conducted a full census of all outlets with the potential to sell antimalarials.
Cluster	The primary sampling unit, or cluster, for the outlet survey. It is an administrative unit determined by the Ministry of Health (MOH) that host a population size of approximately 10,000 to 15,000 inhabitants. These units frequently are defined by geographical, health, or political boundaries, and are based around wards. In Benin, they were defined as <i>arrondissements</i> .
Combination therapy	The use of two or more classes of antimalarial drugs/molecules in the treatment of malaria that have independent modes of action.
Dosing/treatment regimen	The posology or timing and number of doses of an antimalarial used to treat malaria. This schedule often varies by patient weight.

Enumerated Outlets	Outlets that were visited by a member of one of the field teams and for which, at minimum, basic descriptive information was collected.
First-line treatment	The government recommended treatment for uncomplicated malaria. Benin's first-line treatment for malaria is artemether-lumefantrine (AL) 20mg/120mg.
Monotherapy	An antimalarial medicine that has a single mode of action. This may be a medicine with a single active compound or a synergistic combination of two compounds with related mechanisms of action.
Nationally registered ACTs	ACTs registered with a country's national drug regulatory authority and permitted for sale or distribution in-country. Each country determines its own criteria for placing a drug on its nationally registered listing.
Non-artemisinin therapy	An antimalarial treatment that does not contain artemisinin or any of its derivatives.
Outlet	Any point of sale or provision of a commodity to an individual. Outlets are not restricted to stationary points of sale and may include mobile units or individuals. Refer to the annex for a description of the outlet types visited for this survey.
Oral artemisinin monotherapy	Artemisinin or one of its derivatives in a dosage form with an oral route of administration. These include tablets, suspensions, and syrups and exclude suppositories and injections.
Rapid-Diagnostic Test (RDT) for malaria	A test used to confirm the presence of malaria parasites in a patient's bloodstream.
Screened	An outlet that was administered the screening questions (S2 and S3) of the outlet survey questionnaire (see Screening criteria).
Screening criteria	The set of requirements that must be satisfied before the full questionnaire is administered. In this survey an outlet met the screening criteria if (1) they had antimalarials in stock at the time of the survey visit (S2), or (2) they report having stocked them in the past three months (S3).
Second-line treatment	The government recommended second-line treatment for uncomplicated malaria. Benin's second-line treatment for malaria is quinine. Second-line treatment indicators include all dosage forms.
Treatment/dosing regimen	The posology or timing and number of doses of an antimalarial used to treat malaria. This schedule often varies by patient weight.

Classification of ACTs

Quality assured ACTs (QAACT) A quality-assured product must be WHO pre-qualified and/or authorized for marketing by a Stringent Drug Regulatory Authority. Products that have not yet been WHO pre-qualified or approved by a Stringent Drug Regulatory Authority must be evaluated and recommended for use by an independent panel of technical experts hosted by World Health Organisation’s Department for Essential Medicines and Pharmaceutical Policies (GFATM, 2010). Quality assured ACTs comply with the Quality Assurance Policy of the Global Fund to Fight AIDS, Tuberculosis and Malaria.
Brands included in this category and audited during data collection are:

Artefan 20mg/120mg (5-14kg; 35+kg)
Artemether + Lumefantrine 20mg/120mg (*Ipca Laboratories Ltd*)
Coartem 20mg/120mg (5-15kg; 15-25kg; 25-35kg; 35+kg)
Coartem Dispersible 20mg/120mg (5-15kg; 15-25kg)
Lumartem 20mg/120mg (5-15kg; 15-25kg; 25-35kg; 35+kg)
Artesunate + Amodiaquine 50/153mg (*Ipca Laboratories Ltd*)
Coarsucam (Nourrisson ; Petit Enfant ; Enfant ; Adulte)
Winthrop (Nourrisson ; Petit Enfant ; Enfant ; Adulte)

First-line quality assured ACTs (FAACT): Government recommended first-line treatments for uncomplicated malaria that appear on the WHO list of approved ACTs or the UNICEF procurement list.
Brands included in this category and audited during data collection are:

Artefan 20mg/120mg (5-14kg; 35+kg)
Artemether + Lumefantrine 20mg/120mg (*Ipca Laboratories Ltd*)
Coartem 20mg/120mg (5-15kg; 15-25kg; 25-35kg; 35+kg)
Coartem Dispersible 20mg/120mg (5-15kg; 15-25kg)
Lumartem 20mg/120mg (5-15kg; 15-25kg; 25-35kg; 35+kg)

Non first-line quality assured ACTs (NAACT): ACTs that are not the government’s recommended first-line treatment for uncomplicated malaria, but which do appear on the WHO list of approved ACTs or the UNICEF procurement list.
Brands included in this category and audited during data collection are:

Artesunate + Amodiaquine 50/153mg (*Ipca Laboratories Ltd*)
Coarsucam (Nourrisson; Petit Enfant; Enfant; Adulte)
Winthrop (Nourrisson; Petit Enfant; Enfant; Adulte)

Other ACTs

ACTs that appear on neither the WHO list of approved ACTs or the UNICEF procurement list. This includes all audited brands of ACTs not included in the other two ACT categories:

Alaxin-Plus	Darte-Q
Alaxin-SP	Darte-Q Pediatrique
Arco	Duo-Cotexcin Adult
Artecom	Fantem 20mg/120mg
Artecore	Fantem Suspension
Artedar (Pediatrique; Adulte)	Larimal FD 400 (Enfant; Adulte)
Artemether Lumefantrine	Laritem 20mg/120mg
(Tong-Mei Laboratoire)	Lonart
Artequin (Pediatrique; 300/375; 600/750)	Lonart Forte
Arthesis+ (Nourrisson; Petit Enfant; Enfant; Adulte)	Lufanter
Artiz	Lufanter Pediatrique
Artiz Forte	Lumart+
Artrim	Lumartem 80mg/480mg
Artrin	Lumartem Suppositoires
AsunateDenk Plus	Lumet Forte
Bimalaril 80/480	Lumiter
Bimalarial Suspension (Nourrisson; Enfant; Adolescent)	Malacur
Camoquin Plus (Pediatrique; Enfant; Adulte)	Malacur Suspension
Co-Arinate FDC (Enfant; Adulte)	P-Alaxin
Co-Artesiane Suspension	P-Alaxin Suspension
Cofantrine (Enfant; Adulte)	
Cofantrine Dispersible	
Cofantrine Suspension	
Colart	
Cospherunat	

Other ACT classifications

Nationally registered ACTs:

ACTs registered with a country's national drug regulatory authority and permitted for sale or distribution in-country. Each country determines its own criteria for placing a drug on its nationally registered listing. (See the appendices for a complete list of Benin's nationally registered ACTs). Brands included in this category and audited during data collection are*:

Alaxin-Plus	Camoquin Plus Enfants	Lonart
Alaxin-SP	Camoquin Plus Adultes	Lonart Forte
Arco	Co-Arinate FDC	Lufanter
Artecom	Co-Artesiane	Lumartem
Artecure	Coarsucam	Lumiter
Artedar	Coartem 20/120	Malacur
Artediam	Coartem Dispersible 20/120	P-Alaxin
Artefan 20/120	Cofantrine	Winthrop
Artefan 40/240	Darte-Q	
Artefan 80/480	Darte- Q Pediatrique	
AL (<i>Ipca</i>)	Duo-Cotecxin	
Artequin		
ASAQ (<i>Ipca</i>)		
AsunateDenk Plus		

* All strengths and formulations of a brand, unless specified

List of Abbreviations

--	No data was available
***	Undefined ratio as a non-zero value is being divided by a value of zero
ABMS	<i>Association Béninoise pour le Marketing Social</i> (PSI affiliate in Benin)
ACT	Artemisinin-based Combination Therapy
AETD	Adult Equivalent Treatment Dose
AL	Artemether-Lumefantrine
AMFm	Affordable Medicines Facility – malaria
ASAQ	Artesunate Amodiaquine
CAME	Central Medical Stores (<i>Centrale d’Achat des Médicaments Essentiels et des Consommables médicaux</i>)
CFA	<i>(Franc) de la Communauté financière d’Afrique</i>
CHW	Community Health Worker
CI	Confidence interval
CQ	Chloroquine
DHS	Demographic and Health Survey
DPM	<i>Direction des Pharmacies et du Médicament</i>
FAACT	First-line Quality Assured ACT
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GPS	Global Positioning System
IQR	Inter-Quartile Range
LLIN	Long Lasting Insecticidal Net
LSHTM	London School of Hygiene and Tropical Medicine
MOH	Ministry of Health
n/a	Not applicable: Indicates statistic cannot be calculated as the numerator is zero
NAACT	Non-first line quality Assured ACT
NGO	Non-governmental Organization
NMCP	National Malaria Control Program (<i>Programme National de Lutte contre le Paludisme, PNLP</i>)
PMI	President’s Malaria Initiative
PPS	Probability Proportional to Size
PSI	Population Services International
QAACT	Quality Assured ACT
RDT	Rapid Diagnostic Test
SP	Sulfadoxine-Pyrimethamine
UNICEF	United Nations Children’s Fund
WHO	World Health Organization

Executive Summary

Overview

The *ACTwatch* Outlet Survey, one of the *ACTwatch* project components, involves quantitative research at the outlet level in *ACTwatch* countries (Benin, Cambodia, the Democratic Republic of Congo [DRC], Madagascar, Nigeria, Uganda and Zambia). Other elements of *ACTwatch* include Household Surveys led by Population Services International (PSI) and Supply Chain Research led by the London School of Hygiene & Tropical Medicine (LSHTM). This report presents the results of a cross-sectional survey of outlets conducted in Benin from the 8th to the 30th of April 2011.

The objective of the outlet survey is to monitor levels and trends in the availability, price and volumes of antimalarials, and providers' perceptions and knowledge of antimalarial medicines at different outlets. Price and availability data on diagnostic testing services is also collected.

A nationally representative sample of all outlets with the potential to sell or provide antimalarials to a consumer was taken through a census approach in 19 clusters across Benin; clusters being defined as *Arrondissements*. Sampling was conducted using a one-stage probability proportion to size (PPS) cluster design, with the measure of size being the relative cluster population. Oversampling of public health facilities and registered pharmacies was conducted to ensure adequate representation of these outlet types in the survey.

The inclusion criteria for this study were outlets that stocked an antimalarial at the time of survey or had stocked antimalarials in the previous three months. An outlet is defined as any point of sale or provision of commodities for individuals. Outlets included in the survey are as follows: 1) public health facilities (national/referral/zone hospitals, health centres, village health units, dispensaries and *maternities*); 2) private-not-for-profit health facilities (mission and non-governmental organisation [NGO] health facilities); 3) private-for-profit health facilities (private clinics and hospitals); 4) registered pharmacies; 5) general retailers (stores, *boutiques*, and market stalls); 7) itinerant drug vendors (hawkers); and 8) community health workers (CHW). Refer to the appendices for definitions and numbers of each type of outlet included in the analysis.

Three questionnaire modules were administered to participating outlets: 1) a screening module, 2) an audit module (antimalarial audit sheets and RDT audit sheets), and 3) a provider module. For all outlets, trained interviewers administered the screening module to collect information on the outlet type and location, including the outlet's longitude and latitude, and information on availability of antimalarials. Among those outlets that stocked antimalarials at the time of survey, the audit module was administered. For each antimalarial, information was recorded on the brand and generic names, strength, expiry, amount sold in the last week and price to the consumer. Among outlets that stocked antimalarials at the time of interview or in the past three months, the interviewer collected information on provider demographics, knowledge, perceptions, and medicine storage conditions using the provider module. Where these outlets had RDTs available, information on RDT brand, manufacturer, price and number of tests sold in the last week was collected using the rapid diagnostic test audit module.

Several validation and data checking steps occurred during and after data collection. Double data entry was conducted using Microsoft Access (Microsoft Cooperation, Seattle, WA, USA). Data were analysed using Stata 11 (Stata Corp, College Station, TX).

More information on the study design is available at www.actwatch.info.

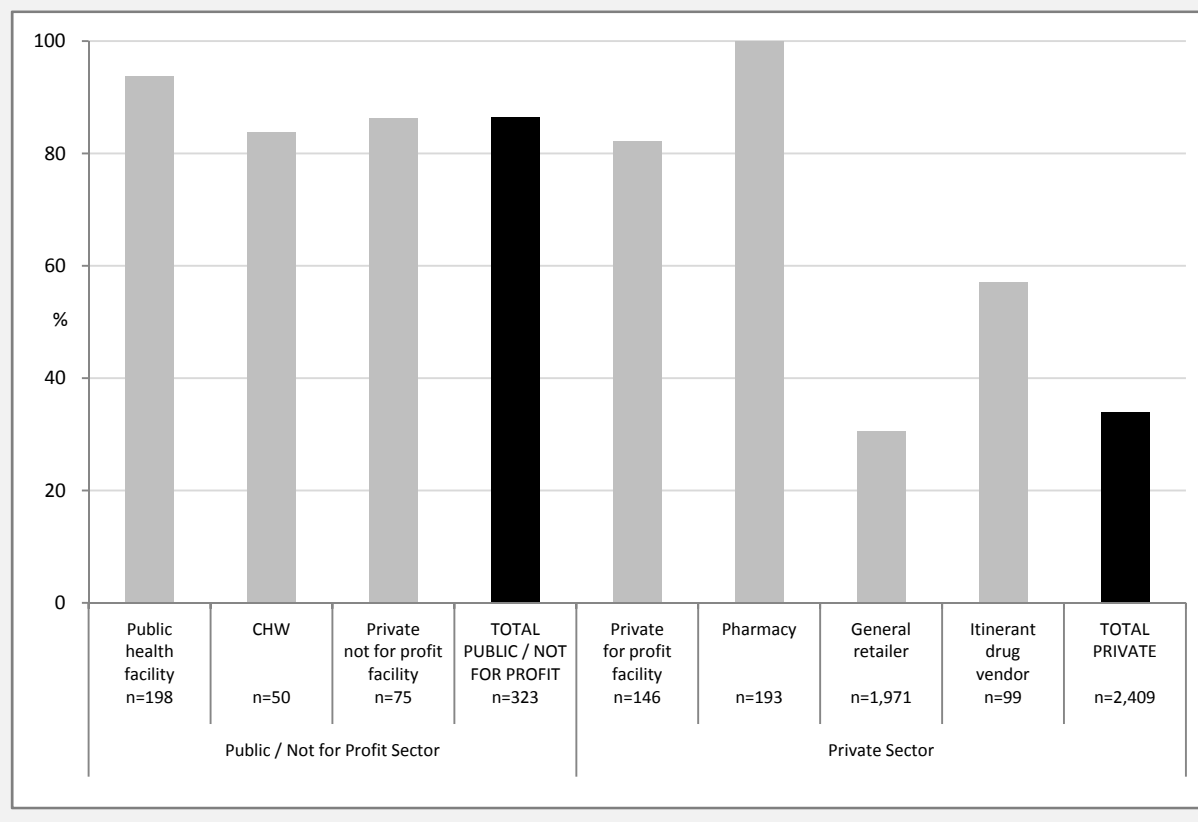
Key findings

Data collection ran from the 8th to 30th April, 2011. A total of 2,966 outlets were approached for inclusion in the study. 99 outlets were not screened for various reasons: 53 providers refused to participate in screening; 30 outlets were closed down permanently; in 9 outlets an eligible respondent was not available; and 7 outlets were not open at the time of the survey visit. Overall, 2,867 outlets agreed to participate in the *ACTwatch* outlet survey and were screened. Of the 1,519 outlets that met the screening criteria and were eligible for interview, 104 refused to continue and in 25 outlets an eligible respondent wasn't available or the time wasn't convenient for the full interview. 1,390 outlets completed interviews: 178 outlets reported having stocked antimalarials at any point in the three months prior to the interview and 1,212 outlet reported stocking antimalarials at the time of the interview.

AVAILABILITY OF ANY ANTIMALARIAL:

Antimalarials were available in over 80% of screened outlets, with the exception of general retailers (shops and markets stalls, [31%]) and itinerant drug vendors (57%) (Figure 1). On the day of interview, any antimalarial was available in 87% of outlets in the public/not for profit sector, including 94% of public health facilities (PHFs). In the private sector, 100% of pharmacies and 82% of private-for-profit health facilities stocked antimalarials on the day of interview. Due to the large numbers of general retailers in the private sector, in total only one-third (34%) of the private sector had any antimalarial available on the day of interview. There is a clear distinction in availability of any antimalarial between these *informal* outlets (general retailers and itinerant drug vendors) and *formal* private sector outlets.

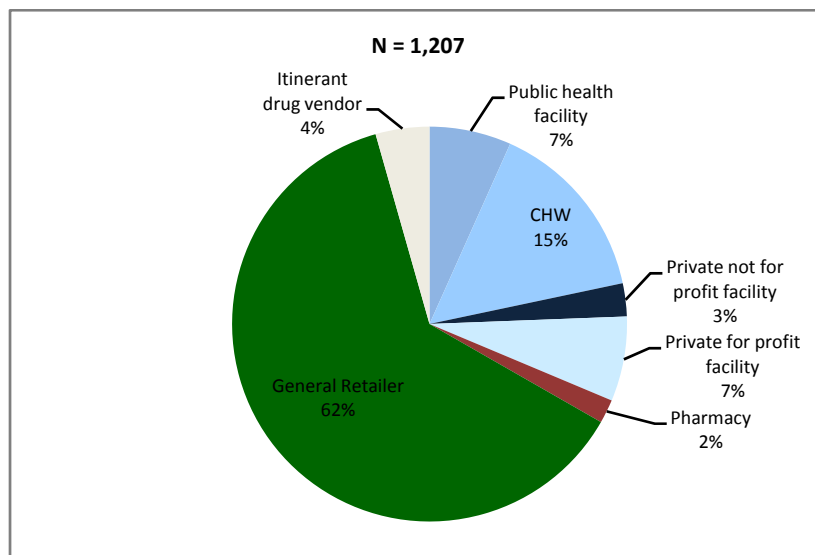
Figure 1. Availability of antimalarials by outlet type



OUTLET TYPES STOCKING ANTIMALARIALS:

Figure 2 shows the relative distribution of outlets that had at least one antimalarial in stock on the day of interview. General retailers were the most common type of outlet stocking antimalarials, followed by community health workers (CHWs). In total, the public/not for profit sector comprised one-quarter of outlets stocking antimalarials.

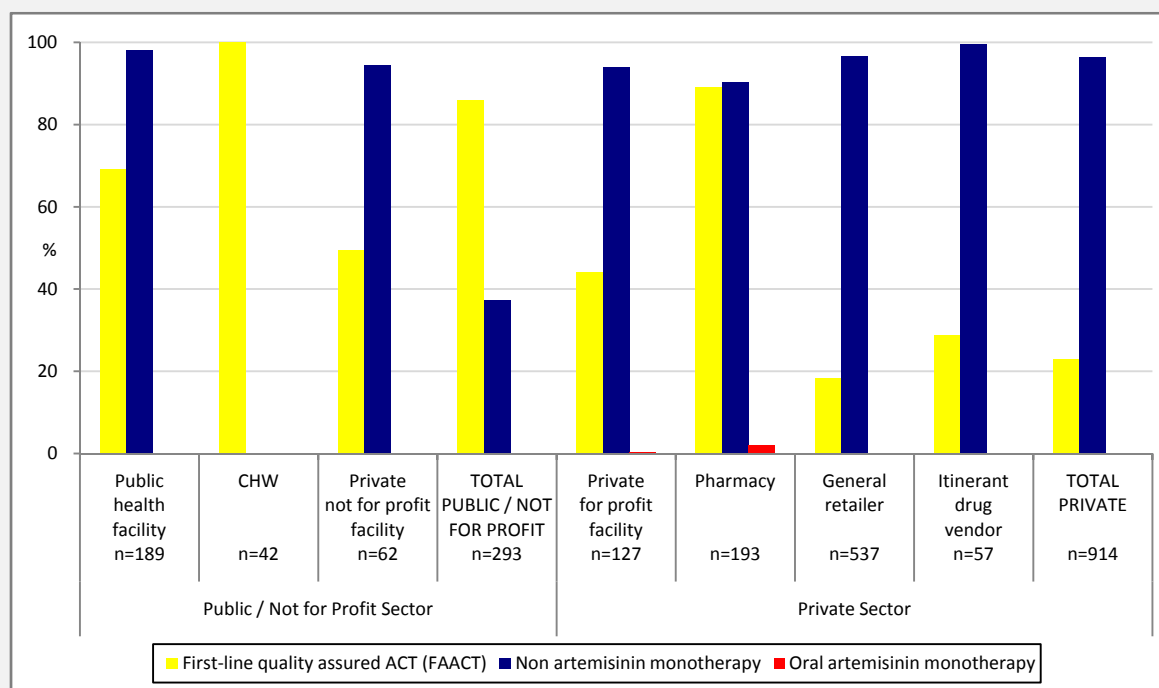
Figure 2. Relative distribution of outlet types stocking antimalarials



AVAILABILITY OF DIFFERENT CLASSES ANTIMALARIALS:

Among outlets stocking antimalarials on the day of interview there is a large difference between the availability of first-line quality assured ACT (FAACT) in the public/not for profit sector and the private sector (86% and 23% respectively, see figure 3). All CHWs (n=42) with antimalarials in stock had FAACT, while 70% of PHFs had FAACT in stock. Only 18% of general retailers stocked FAACTs. More than 90% of all outlets stocked non-artemisinin monotherapy, with the exception of CHWs who only had FAACT in stock. Outlets stocking oral artemisinin monotherapy were rare.

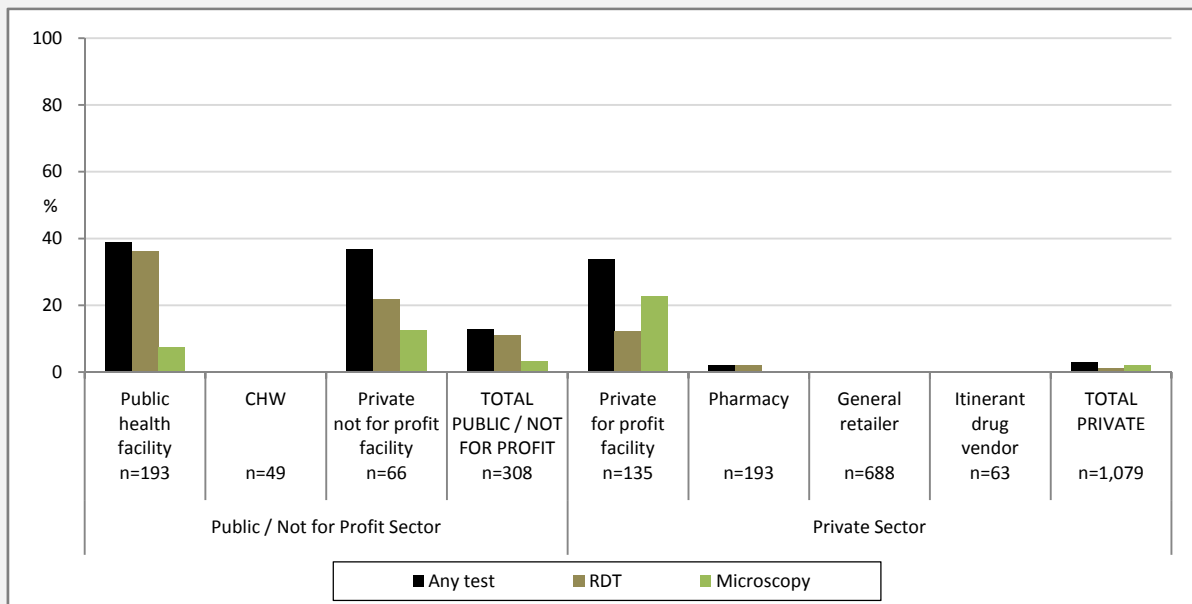
Figure 3. Availability of antimalarials, among outlets with at least one antimalarial in stock



AVAILABILITY OF DIAGNOSTIC BLOOD TESTING:

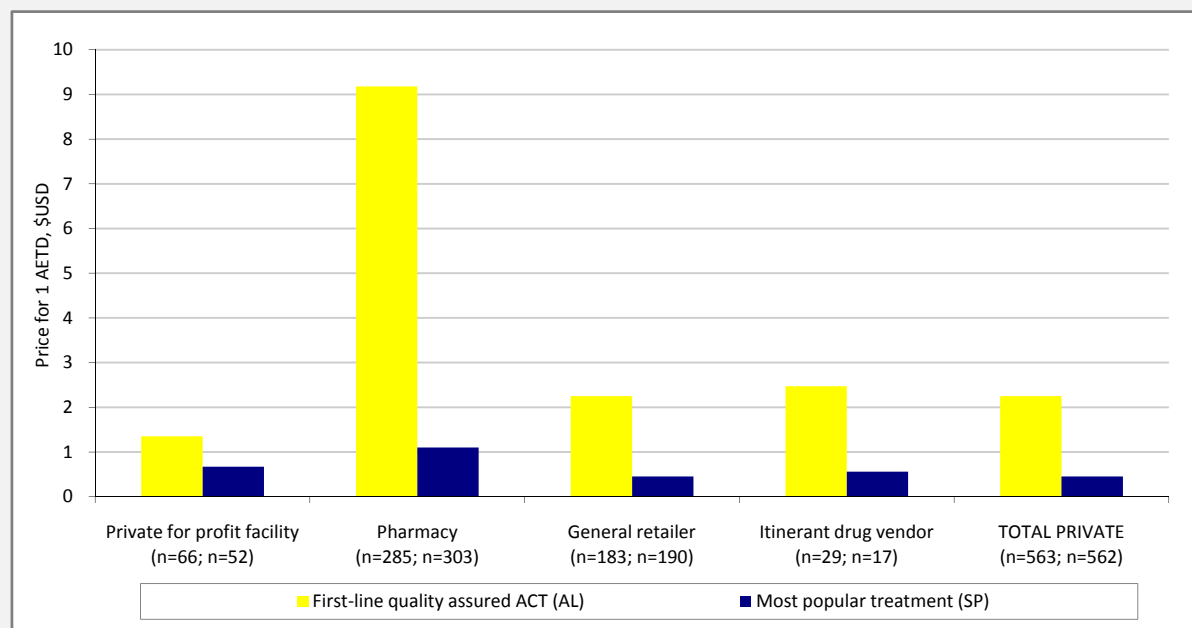
Among outlets stocking antimalarials in the past three months, availability of diagnostic blood testing facilities was low (figure 4). In the public/not for profit sector, RDTs were more common than microscopy; however, only 36% of PHFs had RDTs in stock and none of the 49 CHWs interviewed had RDTs available. Levels of any test availability were similar in private not-for-profit and private-for-profit health facilities (37% and 34%), but low in other private sector outlets (pharmacies 2%, and general retailers 0%).

Figure 4. Proportion of outlets with microscopic blood testing facilities and rapid diagnostic tests



PRICE OF ANTIMALARIALS: At the time of data collection no outlet type systematically provided FAACT free of charge; the median price of FAACT in PHFs was \$1.35 [n=311]. The median FAACT price in the private sector was \$2.25 [n=563], and pharmacies were substantially more expensive than other private outlets (\$9.18 [n=285], compared to \$2.25 [n=183] in general retailers). By comparison the median price of SP, a widely available non-artemisinin therapy, was 5 times less expensive than the median FAACT cost in the private sector (\$0.45 [n=562]).

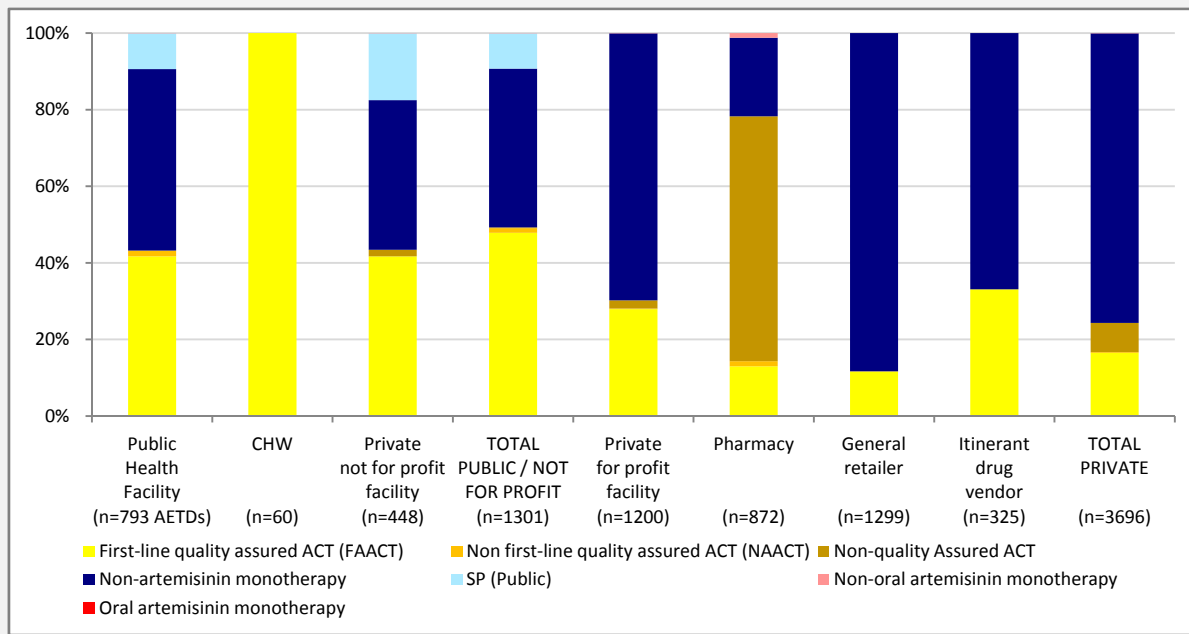
Figure 5. Median price of a tablet AETD antimalarial treatment in the private sector



VOLUMES OF ANTIMALARIALS SOLD/DISTRIBUTED:

Figure 6 presents the market share of different antimalarial classes sold/distributed in the 7 days before the survey, within each outlet type. Distribution of FAACT was more common in the public/not for profit sector than in the private sector (48% compared to 17%). 64% of recent antimalarial sales in pharmacies were non-quality assured ACTs, a category that includes non-tablet formulations. Whilst 12% of AETDs sold by general retailers were FAACTs, chloroquine comprised 45% of their market share, and SP comprised 34%.

Figure 6. Market share of AETDs sold/distributed in the past week (7 days), within outlet types



PROVIDER KNOWLEDGE:

Overall, 56% of providers interviewed were able to correctly state AL as the recommended first-line treatment for uncomplicated malaria in Benin. Knowledge was significantly higher in the public/not for profit sector compared to the private sector (93% vs. 45%). Knowledge of the correct dosing regimen for adults was generally higher than that for children, although 90% of CHWs could state the correct regimen for a child while fewer (55%) could state this correctly for an adult.

Figure 7. Provider knowledge of recommended first-line treatment and dosing regimens

