Outlet Survey Report (Baseline)
Federal Republic of Nigeria
12/08

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Acknowledgements

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A technical review of the outlet survey study design was provided by the following *ACTwatch* partners, *ACTwatch* Advisory Committee members and other stakeholders:

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<td>Paediatrician &amp; Senior Lecturer, LSHTM</td>
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Definitions

**Antimalarial combination therapy** – The simultaneous use of two or more drugs with different modes of action to treat malaria.

**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, artemesate, and dihydroartemisinin.

**Artemisinin-based Combination Therapy (ACT)** – A combination of artemisinin or one of its derivatives with a partner drug. The partner drug is an antimalarial(s) of a different class.

**First-line treatment** – The government recommended treatment for uncomplicated malaria. Nigeria’s first-line treatment for malaria is artemether-lumefantrine, 20mg/120mg. (See Appendix B for adult and child dosing regimens.)

**Monotherapy** – Antimalarial treatment with a single medicine: either a single active compound or a synergistic combination of two compounds with related mechanisms of action, such as sulfadoxine-pyrimethamine.

**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 Appendix B for a complete list of Nigeria’s nationally registered ACTs.)

**Non-artemisinin therapy** – An antimalarial treatment that does not contain artemisinin or any of its derivatives.

**Non-WHO/Nationally registered ACTs** – ACTs that neither appear on the WHO list of ACTs approved for procurement nor are registered with a given country’s national drug regulatory authority.

**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.

**Second-line treatment** – The government recommended second-line treatment for uncomplicated malaria. Nigeria’s second-line treatment for malaria is quinine. Second-line treatment indicators include all dosage forms.

**WHO approved ACTs** – ACTs that appear on the WHO list of antimalarials approved for procurement.

Legend for tables –

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
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<td>No data was available</td>
</tr>
<tr>
<td>n/a</td>
<td>Not applicable: Indicates ratios cannot be calculated as the numerator is zero</td>
</tr>
<tr>
<td>***</td>
<td>Undefined ratio as a non-zero value is being divided by a value of zero</td>
</tr>
<tr>
<td>AM</td>
<td>Antimalarial</td>
</tr>
<tr>
<td>AL</td>
<td>Artemether-Lumefantrine</td>
</tr>
<tr>
<td>ACT</td>
<td>Artemisinin-based Combination Therapy</td>
</tr>
<tr>
<td>SP</td>
<td>Sulfadoxine-Pyrimethamine</td>
</tr>
</tbody>
</table>
Key Indicator Descriptions

Acceptable storage conditions for medicines – An outlet is considered to have acceptable storage conditions for medicines if it is in compliance with all the following three standards: (1) medicines are stored in a dry area; (2) medicines are protected from direct sunlight; and (3) medicines are not kept on the floor.

Availability of antimalarials – The proportion of outlets in which an antimalarial medicine was found on the day of the survey, based on an audit conducted by the interviewer. For indicators of availability, all outlets surveyed are included in the denominator.

Credit to consumers – An outlet is considered to provide credit to consumers based on response of the provider. Providers in public health facilities were not asked this question.

Disruption in stock – An outlet is considered to have a disruption in stock where any drug is reported to have been out of stock in the three months prior to interview, or where a drug is not in stock at the time of the visit but was stocked at some point in the previous three months.

Expired stock – Indicators of expired stock are based upon the expiry information from one sample of each drug audited in an outlet; a full examination of all packages in stock was not conducted.


Microscopic blood or rapid diagnostic testing – An outlet is considered to have microscopic or rapid diagnostic blood testing based on provider response. Functionality of the diagnostic test was not observed by the interviewer.

Most popular antimalarial – The antimalarial with the largest volume of full adult courses sold or distributed in the past week.

Price – Prices are calculated in terms of purchases required for a full-course treatment. Only adult tablet formulations are included these calculations. Prices are shown in US dollars. The average exchange rate during the data collection period (2nd to 17th December 2008) was 130.70 Nigerian Naira (NGN) to US$1 (www.oanda.com).

Statistical significance – Mood’s median test is used to compare medians and chi-square tests are used to compare proportions between categories. P values are based on the standard type 1 error rate of 0.05, divided by the number of comparisons, to determine a type 1 error rate that is no more likely to produce a false positive across multiple tests than a single test with a p<0.05.

Volumes – Volumes are calculated in terms of purchases required for a full-course treatment. Only adult tablet formulations are included.
Executive Summary

Background:

The outlet survey is one of the ACTwatch research components. The objective 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.

This report presents indicators on availability, price, volumes, affordability in outlets and provider knowledge of antimalarials. National trends are presented first, followed by indicators presented across outlet categories, geographical areas and urbanisation.

Methods:

A nationally representative sample of all outlets that could sell or provide antimalarials to a consumer was taken through a census approach in 76 sub-districts across four geographic strata in Nigeria. Sampling was conducted using a one-stage probability proportional to size (PPS) cluster design, with the measure of size being the relative sub-district population.

Outlet inclusion criteria for this study included outlets which stocked an antimalarial at the time of survey or 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 (university and general hospitals, health centres, and community health extension workers); 2) Part One pharmacies (pharmacies registered by the Pharmacy Council of Nigeria and National Drug Authority and regulated by the National Agency for Food and Drug Administration and Control); 3) drug stores (Proprietary Patent Medicine Vendors [PPMVs]); and 4) private health facilities (private clinics) [see Appendix A for definitions and numbers of each type of outlet].

Among outlets, three questionnaires were administered: 1) Screening Questionnaire 2) Audit sheet and 3) Provider Questionnaire. For all outlets, trained interviewers administered the screening questionnaire to collect information on the outlet type; 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 sheet 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, and perceptions. Interviewers observed outlet licensing and storage conditions of medicines using the provider questionnaire.

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 was analysed using SPSS 17.0 (SPSS Inc., Chigaco, IL, USA).

Results:

Data were collected from 2nd to 17th December 2008. A total of 607 outlets were sampled. 24 providers refused to be interviewed; 13 outlets were permanently closed; 50 outlets were closed at the time of the visits (up to three visits before exclusion); and in 52 outlets, providers were not available for interview at the time of data collection. These outlets were excluded from the analysis. Overall, 468 providers agreed to participate in the ACTwatch outlet survey. Of these, all 468 outlets stocked antimalarials at any point in the three months prior to the interview, and 444 outlets stocked antimalarials at the time of the interview.
**AVAILABILITY OF ANTIMALARIALS:** The census of outlets found that 94.9% had antimalarials in stock. 16.7% of outlets stocked the recommended first-line treatment for uncomplicated malaria, artemether-lumefantrine (AL), 20mg/120mg. Less than one-third of public health facilities (30.0%) stocked the first-line treatment, compared to almost three-quarters (73.7%) of Part One pharmacies. The proportion of outlets stocking WHO-approved ACTs were similar to those stocking the first-line treatment. Across all outlet types, non-artemisinin therapies, such as chloroquine and SP, were more commonly stocked than the first-line treatment: 92.5% of all outlets surveyed had non-artemisinin therapies in stock. Oral artemisinin monotherapies were available at nearly half (47.0%) of outlets, including more than one-quarter (26.7%) of public health facilities.

![Figure 1. Availability of Antimalarials by Outlet Type](image)

**AVAILABILITY OF DIAGNOSTIC BLOOD TESTING:** Of outlets stocking antimalarials in the last three months, 9.8% offered diagnostic testing services of some kind. 9.1% of outlets had microscopic blood testing while 4.8% offered rapid diagnostic tests (RDTs). Diagnostic testing was available at 45.9% of public health facilities and at 32.6% of private health facilities, mostly through microscopy. Availability of diagnostic tests in Part One pharmacies and drug stores was very low (<1%).

![Figure 2. Proportion of Outlets with Microscopic Blood Testing Facilities & Rapid Diagnostic Tests](image)
**PRICE OF ANTIMALARIALS:** In public health facilities in Nigeria, the first-line treatment is mostly available free of cost. Among all outlets that sold ACTs for a price, the median price of the first-line treatment was $6.12. In comparison, the median price of the most popular antimalarial, SP, was $0.54, less than one-tenth the price of AL. Similarly, WHO approved and nationally registered ACTs were over 10 times more expensive than SP. The first-line treatment was also around 2.5 times more expensive than the international reference price for AL 20mg/120mg of $2.12. More than half of all outlets (59.3%) offered credit to consumers for the purchase of antimalarials.

![Figure 3. Median Price of a Full Adult Course Antimalarial Treatment](image)

**VOLUMES OF ANTIMALARIALS SOLD/DISTRIBUTED:** The most frequently sold or distributed class of antimalarials was non-artemisinin therapies (84.5%), the majority of which were distributed by drug stores. Overall, only 6.4% of all AM distribution was ACTs, and the first-line treatment accounted for only 2.1% of total AM distribution. Across all outlet types, oral artemisinin monotherapies accounted for larger relative volumes than the first-line treatment; in total oral artemisinin monotherapies comprised 9.1% of total AM distribution.

The public sector accounted for only 5% of AM distribution in Nigeria. The private sector dominated the market, with Part One pharmacies and drug stores distributing nearly 90% of all antimalarials.
PROVIDER KNOWLEDGE: Overall, 17.0% of providers were able to correctly state that AL is the recommended first-line treatment for uncomplicated malaria in Nigeria. Knowledge was highest among providers at public health facilities, however less than half (43.5%) were able to correctly identify the first-line treatment. Knowledge at drug stores – the outlets responsible for over 60% of AM distribution – was only 10.2%.

Among those providers who knew AL was the recommended first-line treatment for uncomplicated malaria, 74.7% were able to correctly state the dosing regimen of AL for an adult; 72.9% were able to correctly state the dosing regimen for a two-year old child. Similar levels of knowledge were found at public and private health facilities, while knowledge of first-line dosing regimens was lowest among drug store providers.
Country Background

Nigeria is located in Western Africa, bordering the Gulf of Guinea and sharing a border with Benin, Cameroon, Chad and Niger. It is the most populous nation in Africa with 149.2 million (2009 estimates) inhabitants of which approximately 48% live in urban areas. Seventy percent of the population lives below the poverty line (2007 estimates) and the per capita gross domestic product is $2,300 (2008 estimates). One in five children die before reaching their fifth birthday with malaria as one of the leading causes of death. It is estimated that 300,000 children die from malaria each year.

Epidemiology and Malaria Control Strategies

Malaria is characterized by a stable, perennial transmission in all parts of Nigeria with a seasonal difference most striking in the northern part of the country. Malaria is endemic throughout most of Nigeria with approximately 97% of the population at risk of infection. Current estimates are that 110 million cases of malaria occur annually in Nigeria accounting for 63% of all outpatient clinic visits and 30% of all hospital admissions. The predominant parasite species is *P. falciparum*, which accounts for about 98% of malaria cases in Nigeria.

National Treatment Policy

In 2005 Nigeria adopted artemether-lumefantrine (AL) as the first line treatment for uncomplicated malaria for both public and private health facilities. Artesunate + amodiaquine (ASAQ) was included at a later date as an alternative where AL is not available. The policy states that ACTs are to be given to children under five free of charge through the public sector and the health facilities of non-profit organizations. According to the treatment policy, severe malaria is to be treated at tertiary health facilities whilst lower level health facilities may provide pre-referral treatment with artesunate suppositories. The approved treatment for severe malaria is quinine, artesunate or artemether injection. Oral artemesinin monotherapy has been banned in Nigeria since 2006.

The treatment policy includes parasitological confirmation for suspected cases of malaria with the exception of children-under-five who should be treated on a clinical basis. Parasitological confirmation is not required as a pre-condition for initiating treatment for those with suspected severe malaria. Although the treatment policy indicates that laboratory facilities are not available at lower level health facilities, and RDTs are not yet available nationwide.

Antimalarial Treatment Distribution and Delivery

Patients access treatment for malaria through the public and a diverse range of private sectors outlets. ACTs are to be provided free of charge via the public sector and non-profit organizations’ facilities including health facilities (hospitals, health centres) and community-based Community Health Worker/Extension Worker (CHEW) associated with the public health facilities. In seven states, Kano, Jigawa, Gombe, Bauchi, Akwa Ibom, Rivers, and Anambra, the World Bank Booster Project is supporting a pilot scheme commenced in 2008 using RDTs in the public sector. All three levels of government, the Federal, State and Local Government Areas (LGA), have responsibilities for the provision of health care. The 37 States and 774 LGA’s are responsible for all financial aspects of Secondary Health Care (SHC) and Primary Health Care (PHC) departments whilst the Federal government is responsible for policy. The co-ordination of activities is generally poor with service provision differing by state.

As in many other developing countries, a large proportion of febrile children in Nigeria are thought to receive their first treatment from formal and informal private sector practitioners including pharmacists, doctors, nurses and

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6 Nigeria is comprised of 36 states and the Federal Capital Territory (FCT), Abuja. In this report, FCT is considered a 37th state.
7 Health System Research Centre, UK Department for International Development.
midwives, as well as unqualified practitioners such as drug vendors, village doctors and traditional healers. Several studies have shown that treatment was most frequently sought from a type of drug vendor called proprietary patent medicine vendors (PPMVs) accounting for roughly one half of the sources of treatment in rural Nigeria, and for 36% of the cases in urban areas. The informal market is believed to play a very significant role in the distribution and delivery of antimalarials in Nigeria. A donor-supported subsidy has made ASAQ available since 2008 through private sector retailers in 18 states with an approved retail price of 30 Naira ($0.20 USD).

Malaria Financing
Through Round 4 of the Global Fund to fight AIDS, Tuberculosis and Malaria, subsidized child doses of ASAQ (Arsuamoon and Larimal) have been made available since 2008 via the private sector in eighteen of Nigeria’s 37 states. The subsidy includes the following private sector outlets: hospitals, pharmacy shops and PPMVs. Retailers in these 18 states may purchase the subsidized drug for 5 Naira ($0.03 USD) per treatment with an approved retail price set at 30 Naira ($0.20 USD).

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## Results

### Study-wide Trends

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<tbody>
<tr>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proportion of outlets that had:</strong></td>
<td>N=468 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antimalarials in stock at the time of survey visit</td>
<td>94.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First-line treatment (AL)</td>
<td>16.7</td>
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<tr>
<td>WHO approved ACT</td>
<td>22.4</td>
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<td>Nationally registered ACT</td>
<td>26.9</td>
<td></td>
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<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>25.0</td>
<td></td>
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</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>92.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Chloroquine</td>
<td>82.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sulfadoxine-Pyrimethamine (SP)</td>
<td>76.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Second-line treatment (Quinine)</td>
<td>11.5</td>
<td></td>
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<tr>
<td>Artemisinin monotherapy</td>
<td>48.3</td>
<td></td>
<td></td>
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<tr>
<td>• Oral artemisinin monotherapy</td>
<td>47.0</td>
<td></td>
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</tr>
<tr>
<td>A WHO approved or nationally registered ACT as the most distributed antimalarial, by volume of sales/distribution in the past week</td>
<td>0.8</td>
<td>N=467</td>
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<tr>
<td>No disruption in stock in the past three months</td>
<td>26.3</td>
<td>N=106 17</td>
<td></td>
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<tr>
<td>No disruption in stock of first-line treatment in the past three months</td>
<td>47.2</td>
<td>N=413</td>
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<td>Expired stock of any antimalarial</td>
<td>4.8</td>
<td>N=77</td>
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<td>Expired stock of first-line treatment (AL)</td>
<td>0.0</td>
<td>N=429</td>
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<tr>
<td>Acceptable storage conditions for medicines</td>
<td>92.3</td>
<td>N=460</td>
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<tr>
<td>Microscopic blood testing facilities</td>
<td>9.1</td>
<td>N=461</td>
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<tr>
<td>Rapid diagnostic tests</td>
<td>4.8</td>
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16 Denominators vary for indicators due to skip patterns, small numbers of refused questions, or missing data. Fluctuations in denominators for reasons other than skip patterns range from 0 – 19.2%.

17 Denominators are among providers that had the first-line treatment in stock at any point in the last three months.
## Price of Antimalarials

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<tr>
<td>Proportion of first-line ACTs distributed free of cost (by volumes of adult treatments)</td>
<td>0.0</td>
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</table>

### Median price of a full course of an adult treatment of:

<table>
<thead>
<tr>
<th></th>
<th>Median price (N of AMs)</th>
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</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>$6.12$^{100}</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>$7.65$^{150}</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>$5.74$^{111}</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>$4.97$^{111}</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>$0.54$^{113}</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>$3.12$^{131}</td>
</tr>
<tr>
<td>Sulfadoxine-Pyrimethamine (SP), the ‘most popular’ antimalarial treatment in Nigeria.</td>
<td>$0.54$^{1,002}</td>
</tr>
</tbody>
</table>

### Median price of a full course of an adult treatment of ACT relative to sulfadoxine-pyrimethamine (SP), the ‘most popular’ antimalarial treatment in Nigeria:

<table>
<thead>
<tr>
<th></th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>11.3</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>14.2</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>10.6</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>9.2</td>
</tr>
</tbody>
</table>

### Median price of a full course of an adult treatment of ACT relative to the minimum legal daily wage ($2.20):

<table>
<thead>
<tr>
<th></th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>2.8</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>3.5</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>2.6</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>2.3</td>
</tr>
</tbody>
</table>

### Median price of a full course adult first-line treatment relative to the international reference price ($2.12)

<table>
<thead>
<tr>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of outlets that offer credit to consumers for antimalarials</td>
<td>59.3</td>
</tr>
</tbody>
</table>

---

18 A total of 3,808 antimalarials were found in 444 outlets. Of these, 2,024 antimalarials are included in the pricing analysis. Free antimalarials were found in 14.4% of outlets with antimalarials, and 130 of the total 3,716 antimalarials for which price information was recorded were available for free.
## Volumes of Antimalarials Sold/Distributed

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volumes of full course adult treatments (sold or distributed in the past week):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of full course adult treatments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of outlets that stocked each category of AM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean per outlet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First-line treatment (AL)</td>
<td>384</td>
<td>78</td>
<td>4.9</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>210</td>
<td>105</td>
<td>2</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>553</td>
<td>126</td>
<td>4.4</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>634</td>
<td>117</td>
<td>5.4</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>15,654</td>
<td>433</td>
<td>36.2</td>
</tr>
<tr>
<td>- Chloroquine</td>
<td>5,622</td>
<td>385</td>
<td>14.4</td>
</tr>
<tr>
<td>- Sulfadoxine-Pyrimethamine (SP)</td>
<td>9,694</td>
<td>357</td>
<td>27.2</td>
</tr>
<tr>
<td>Second-line treatment (Quinine)</td>
<td>31</td>
<td>54</td>
<td>0.6</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>1,707</td>
<td>220</td>
<td>7.8</td>
</tr>
</tbody>
</table>

### Each antimalarial category as a proportion of the total volume of all antimalarials sold or distributed in the past week:

<table>
<thead>
<tr>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>2.1</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>1.1</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>3.0</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>3.4</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>84.4</td>
</tr>
<tr>
<td>- Chloroquine</td>
<td>30.3</td>
</tr>
<tr>
<td>- Sulfadoxine-Pyrimethamine (SP)</td>
<td>52.3</td>
</tr>
<tr>
<td>- Second-line treatment (Quinine)</td>
<td>0.2</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>9.2</td>
</tr>
</tbody>
</table>

---

19 There were a total of 18,548 full adult course treatments of antimalarials sold or distributed in the past one week. This was the denominator used to calculate the proportion of each indicator.

20 Percentages total more than 100% in each column because ACTs that are WHO approved, nationally registered, and the first-line treatment are not mutually exclusive.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proportion of providers that:</strong></td>
<td>N=452</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correctly state the recommended first-line treatment for uncomplicated malaria</td>
<td>17.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correctly state the dosing regimen of the first-line treatment for an adult</td>
<td>74.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correctly state the dosing regimen of the first-line treatment for a two year old</td>
<td>72.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can list at least one health danger sign in a child that requires referral to a public health facility:</td>
<td>69.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Convulsions</td>
<td>32.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Vomiting</td>
<td>37.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Unable to drink/breastfeed</td>
<td>5.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Excessive sleep/difficult to wake up</td>
<td>5.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Unconscious/coma</td>
<td>15.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree with the statement, “Most customers request an antimalarial by brand name or generic name.”</td>
<td>49.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree with the statement, “I decide which antimalarial medicine most customers receive.”</td>
<td>69.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

21 Questions on dosing regimens were only administered to those providers that correctly stated the recommended first-line treatment for uncomplicated malaria.
**Comparisons by Outlet Type**

In this section, availability, price, volumes and provider knowledge is compared across outlet type. A small number of outlets (N=20) are missing the identifying outlet classification information and therefore, throughout this section, the figures presented by outlet type do not add up to the national total.

### Availability of Antimalarials

<table>
<thead>
<tr>
<th></th>
<th>Public Health Facility</th>
<th>Part One Pharmacy</th>
<th>Drug Store</th>
<th>Private Health Facility</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of outlets that had:</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Antimalarials in stock at the time of survey visit</td>
<td>N=60</td>
<td>N=38</td>
<td>N=305</td>
<td>N=45</td>
<td>N=468</td>
</tr>
<tr>
<td>First-line treatment (AL)</td>
<td>90.0\textsuperscript{a}</td>
<td>97.4\textsuperscript{a}</td>
<td>96.4\textsuperscript{a}</td>
<td>93.3\textsuperscript{a}</td>
<td>94.9</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>35.0\textsuperscript{a}</td>
<td>65.8\textsuperscript{b}</td>
<td>15.1\textsuperscript{c}</td>
<td>22.2\textsuperscript{bc}</td>
<td>22.4</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>38.3\textsuperscript{a}</td>
<td>78.9\textsuperscript{a}</td>
<td>19.0\textsuperscript{a}</td>
<td>24.4\textsuperscript{ac}</td>
<td>26.9</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>18.3\textsuperscript{a}</td>
<td>84.2\textsuperscript{b}</td>
<td>19.0\textsuperscript{a}</td>
<td>28.9\textsuperscript{a}</td>
<td>25.0</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>73.3\textsuperscript{a}</td>
<td>97.4\textsuperscript{b}</td>
<td>96.4\textsuperscript{b}</td>
<td>91.1\textsuperscript{ab}</td>
<td>92.5</td>
</tr>
<tr>
<td>• Chloroquine</td>
<td>51.7\textsuperscript{a}</td>
<td>81.6\textsuperscript{b}</td>
<td>91.1\textsuperscript{b}</td>
<td>64.4\textsuperscript{ab}</td>
<td>82.3</td>
</tr>
<tr>
<td>• Sulfadoxine-Pyrimethamine</td>
<td>48.3\textsuperscript{a}</td>
<td>94.7\textsuperscript{b}</td>
<td>83.0\textsuperscript{b}</td>
<td>53.8\textsuperscript{b}</td>
<td>76.3</td>
</tr>
<tr>
<td>• Second-line treatment (Quinine)</td>
<td>16.7\textsuperscript{b}</td>
<td>28.9\textsuperscript{c}</td>
<td>6.2\textsuperscript{c}</td>
<td>31.1\textsuperscript{c}</td>
<td>15.5</td>
</tr>
<tr>
<td>• Quinine injection</td>
<td>15.0\textsuperscript{a}</td>
<td>13.2\textsuperscript{a}</td>
<td>0.7\textsuperscript{a}</td>
<td>24.4\textsuperscript{c}</td>
<td>5.8</td>
</tr>
<tr>
<td>Artemisinin monotherapy</td>
<td>33.3\textsuperscript{a}</td>
<td>92.1\textsuperscript{b}</td>
<td>47.9\textsuperscript{b}</td>
<td>37.8\textsuperscript{b}</td>
<td>48.3</td>
</tr>
<tr>
<td>• Oral artesiminin monotherapy</td>
<td>26.7\textsuperscript{a}</td>
<td>92.1\textsuperscript{b}</td>
<td>47.9\textsuperscript{b}</td>
<td>37.8\textsuperscript{b}</td>
<td>47.0</td>
</tr>
<tr>
<td>• Injectable/suppository artesiminin monotherapy</td>
<td>11.7\textsuperscript{a}</td>
<td>36.8\textsuperscript{b}</td>
<td>1.0\textsuperscript{a}</td>
<td>11.1\textsuperscript{a}</td>
<td>6.4</td>
</tr>
</tbody>
</table>

### Statistical significance

22 Statistical difference is labeled with a superscript, a, b, or c (p<0.0083). Proportions or medians with the same letter in their superscripts do not differ significantly from one another according to a chi-square or a Mood’s median test, respectively, with a type 1 error rate of 0.0083. The significance level of p<0.0083 is used to account for the number of pair-wise tests being conducted. With four outlet types, 6 pair-wise comparisons are needed to test each type against the other three. If the standard p-value of 0.05 was used in each comparison, the probability of a false positive would increase from 5% to 26.5%. The standard type 1 error rate of 0.05 is thus divided by 6 (0.05 / 6 = 0.0083), the number of comparisons, to determine a type 1 error rate that is no more likely to produce a false positive across 6 tests than a single test with a p<0.05.
<table>
<thead>
<tr>
<th>Availability of Antimalarials and Diagnostic Tests</th>
<th>Public Health Facility</th>
<th>Part One Pharmacy</th>
<th>Drug Store</th>
<th>Private Health Facility</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of outlets that had:</td>
<td>N=52</td>
<td>N=36</td>
<td>N=269</td>
<td>N=40</td>
<td>N=413</td>
</tr>
<tr>
<td>Expired stock of any antimalarial</td>
<td>3.8\textsuperscript{a}</td>
<td>11.1\textsuperscript{a}</td>
<td>4.8\textsuperscript{a}</td>
<td>2.5\textsuperscript{a}</td>
<td>4.8</td>
</tr>
<tr>
<td>Expired stock of first-line treatment (AL)</td>
<td>0.0\textsuperscript{a}</td>
<td>0.0\textsuperscript{a}</td>
<td>0.0\textsuperscript{a}</td>
<td>0.0\textsuperscript{a}</td>
<td>0.0</td>
</tr>
<tr>
<td>Expired stock of non-artemisinin therapy</td>
<td>4.7\textsuperscript{a}</td>
<td>5.9\textsuperscript{a}</td>
<td>4.1\textsuperscript{a}</td>
<td>2.6\textsuperscript{a}</td>
<td>4.0</td>
</tr>
<tr>
<td>Expired stock of artemisinin monotherapy</td>
<td>0.0\textsuperscript{a}</td>
<td>5.7\textsuperscript{a}</td>
<td>0.7\textsuperscript{a}</td>
<td>0.0\textsuperscript{a}</td>
<td>1.3</td>
</tr>
<tr>
<td>Acceptable storage conditions for medicines</td>
<td>86.7\textsuperscript{a}</td>
<td>83.8\textsuperscript{a}</td>
<td>95.1\textsuperscript{a}</td>
<td>93.3\textsuperscript{a}</td>
<td>92.3</td>
</tr>
<tr>
<td>Microscopic blood testing facilities</td>
<td>42.6\textsuperscript{a}</td>
<td>0.0\textsuperscript{b}</td>
<td>0.7\textsuperscript{a}</td>
<td>30.4\textsuperscript{a}</td>
<td>9.1</td>
</tr>
<tr>
<td>Rapid diagnostic tests</td>
<td>26.2\textsuperscript{a}</td>
<td>0.0\textsuperscript{bc}</td>
<td>0.3\textsuperscript{b}</td>
<td>10.9\textsuperscript{bc}</td>
<td>4.8</td>
</tr>
</tbody>
</table>
### Price of Antimalarials

<table>
<thead>
<tr>
<th>Distribution of free drugs:</th>
<th>Public Health Facility</th>
<th>Part One Pharmacy</th>
<th>Drug Store</th>
<th>Private Health Facility</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of first-line ACTs distributed free of cost (by volumes of adult treatments)</td>
<td>100.0(^{23})</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median price of a full course of an adult treatment of:</th>
<th>Median (N of AMs)</th>
<th>Median (N of AMs)</th>
<th>Median (N of AMs)</th>
<th>Median (N of AMs)</th>
<th>Median (N of AMs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>$2.18(^{23})(^{24})</td>
<td>$2.27(^{23})</td>
<td>$5.36(^{23})</td>
<td>$6.12(^{23})</td>
<td>$6.12(^{23})</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>$0.00(^{23})(^{24})</td>
<td>$0.03(^{23})</td>
<td>$1.42(^{23})</td>
<td>$2.34(^{23})</td>
<td>$2.34(^{23})</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>$0.00(^{23})(^{24})</td>
<td>$0.00(^{23})</td>
<td>$0.00(^{23})</td>
<td>$0.00(^{23})</td>
<td>$0.00(^{23})</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>$0.00(^{23})(^{24})</td>
<td>$0.00(^{23})</td>
<td>$0.00(^{23})</td>
<td>$0.00(^{23})</td>
<td>$0.00(^{23})</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>$0.08(^{23})</td>
<td>$0.08(^{23})</td>
<td>$0.54(^{23})</td>
<td>$0.38(^{23})</td>
<td>$0.38(^{23})</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>$3.21(^{23})</td>
<td>$3.57(^{23})</td>
<td>$2.68(^{23})</td>
<td>$2.01(^{23})</td>
<td>$3.12(^{23})</td>
</tr>
<tr>
<td>Sulfadoxine-Pyrimethamine (SP), the ‘most popular’ antimalarial treatment in Nigeria.</td>
<td>$0.07(^{23})</td>
<td>$0.77(^{23})</td>
<td>$0.54(^{23})</td>
<td>$0.38(^{23})</td>
<td>$0.54(^{23})</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median price of a full course of an adult treatment of ACT relative to sulfadoxine-pyrimethamine (SP), the ‘most popular’ antimalarial treatment in Nigeria:</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>31.1</td>
<td>8.1</td>
<td>9.9</td>
<td>16.1</td>
<td>11.3</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>n/a</td>
<td>10.4</td>
<td>14.2</td>
<td>3.5</td>
<td>14.2</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>n/a</td>
<td>7.9</td>
<td>8.5</td>
<td>n/a</td>
<td>10.6</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>n/a</td>
<td>7.2</td>
<td>8.5</td>
<td>16.1</td>
<td>9.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median price of a full course of an adult treatment of ACT relative to the minimum legal daily wage ($2.20):</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>1.0</td>
<td>2.9</td>
<td>2.4</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>n/a</td>
<td>3.7</td>
<td>3.5</td>
<td>0.6</td>
<td>3.5</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>n/a</td>
<td>2.8</td>
<td>2.1</td>
<td>n/a</td>
<td>2.6</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>n/a</td>
<td>2.5</td>
<td>2.1</td>
<td>2.8</td>
<td>2.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median price of a full course adult first-line treatment relative to the international reference price ($2.12)</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>1.0</td>
<td>3.0</td>
<td>2.5</td>
<td>2.9</td>
<td>2.9</td>
</tr>
</tbody>
</table>

| Proportion of outlets that offer credit to consumers for antimalarials | -- | 38.2\(^a\) | 62.7\(^b\) | 55.3\(^ab\) | 59.3 |

---

\(^{23}\) No first-line adult treatments were distributed in public health facilities. This indicator is based on the proportion of first-line child treatments distributed free of cost.

\(^{24}\) Median price based on child first-line courses (N=16). Pricing for adult first-line treatment was only available in 2 cases within public health facilities: the prices recorded were $0.00 and $4.36, for a full course of adult treatment.
### Volumes of Antimalarials Sold/Distributed

#### Volumes of full course adult treatments sold or distributed in the past week:

<table>
<thead>
<tr>
<th></th>
<th>Public Health Facility</th>
<th>Part One Pharmacy</th>
<th>Drug Store</th>
<th>Private Health Facility</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total number of full course adult treatments</td>
<td>Number of outlets that stocked each category of AM</td>
<td>Total number of full course adult treatments</td>
<td>Number of outlets that stocked each category of AM</td>
<td>Total number of full course adult treatments</td>
</tr>
<tr>
<td>First-line treatment (AL)</td>
<td>0</td>
<td>18</td>
<td>327</td>
<td>28</td>
<td>33</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>0</td>
<td>21</td>
<td>195</td>
<td>25</td>
<td>14</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>20</td>
<td>23</td>
<td>470</td>
<td>30</td>
<td>47</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>10</td>
<td>11</td>
<td>419</td>
<td>32</td>
<td>147</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>819</td>
<td>44</td>
<td>3,491</td>
<td>37</td>
<td>10,441</td>
</tr>
<tr>
<td>• Chloroquine</td>
<td>272</td>
<td>60</td>
<td>402</td>
<td>38</td>
<td>4,765</td>
</tr>
<tr>
<td>• Sulfadoxine-Pyrimethamine (SP)</td>
<td>539</td>
<td>29</td>
<td>2,884</td>
<td>36</td>
<td>5,608</td>
</tr>
<tr>
<td>• Second-line treatment (Quinine)</td>
<td>0</td>
<td>10</td>
<td>25</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>61</td>
<td>16</td>
<td>645</td>
<td>35</td>
<td>767</td>
</tr>
</tbody>
</table>

#### Each antimalarial category as a proportion of the total volume of all antimalarials sold or distributed in the past week:

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>0.0</td>
<td>6.5</td>
<td>0.3</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>WHO approved ACT</td>
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<td>3.9</td>
<td>0.1</td>
<td>0.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>2.2</td>
<td>9.4</td>
<td>0.4</td>
<td>1.4</td>
<td>3.0</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>1.1</td>
<td>8.3</td>
<td>1.3</td>
<td>4.5</td>
<td>3.4</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>89.9</td>
<td>69.5</td>
<td>91.6</td>
<td>76.4</td>
<td>84.4</td>
</tr>
<tr>
<td>• Chloroquine</td>
<td>29.9</td>
<td>8.0</td>
<td>41.8</td>
<td>14.4</td>
<td>30.3</td>
</tr>
<tr>
<td>• Sulfadoxine-Pyrimethamine (SP)</td>
<td>59.2</td>
<td>57.4</td>
<td>49.2</td>
<td>53.3</td>
<td>52.3</td>
</tr>
<tr>
<td>• Second-line treatment (Quinine)</td>
<td>0.0</td>
<td>0.5</td>
<td>0.0</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>6.7</td>
<td>12.8</td>
<td>6.7</td>
<td>20.7</td>
<td>9.2</td>
</tr>
</tbody>
</table>

---

25 Percentages total more than 100% in each column because ACTs that are WHO approved, nationally registered, and the first-line treatment are not mutually exclusive.
<table>
<thead>
<tr>
<th>Provider Knowledge and Perceptions</th>
<th>Public Health Facility</th>
<th>Part One Pharmacy</th>
<th>Drug Store</th>
<th>Private Health Facility</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td><strong>Proportion of providers that:</strong></td>
<td>N=62</td>
<td>N=36</td>
<td>N=295</td>
<td>N=45</td>
<td>N=452</td>
</tr>
<tr>
<td>Correctly state the recommended first-line treatment for uncomplicated malaria</td>
<td>43.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>25.0&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>10.2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>20.0&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>17.0</td>
</tr>
<tr>
<td>Correctly state the dosing regimen of the first-line treatment for an adult&lt;sup&gt;26&lt;/sup&gt;</td>
<td>84.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>100.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>53.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>88.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>74.7</td>
</tr>
<tr>
<td>Correctly state the dosing regimen of the first-line treatment for a two year old</td>
<td>87.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>75.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>58.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>87.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>72.9</td>
</tr>
<tr>
<td>Can list at least one health danger sign in a child that requires referral to a public health facility:</td>
<td>--</td>
<td>64.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>69.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>73.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>69.7</td>
</tr>
<tr>
<td>• Convulsions</td>
<td>--</td>
<td>25.6&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>30.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>50.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>32.0</td>
</tr>
<tr>
<td>• Vomiting</td>
<td>--</td>
<td>33.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>38.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>26.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>37.2</td>
</tr>
<tr>
<td>• Unable to drink/breastfeed</td>
<td>--</td>
<td>5.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>8.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.7</td>
</tr>
<tr>
<td>• Excessive sleep/difficult to wake up</td>
<td>--</td>
<td>5.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.2</td>
</tr>
<tr>
<td>• Unconscious/coma</td>
<td>--</td>
<td>12.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>14.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>23.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>15.0</td>
</tr>
<tr>
<td>Agree with the statement, “Most customers request an antimalarial by brand name or generic name.”</td>
<td>6.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>67.6&lt;sup&gt;b&lt;/sup&gt;</td>
<td>60.1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>49.0</td>
</tr>
<tr>
<td>Agree with the statement, “I decide which antimalarial medicine most customers receive.”</td>
<td>82.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>59.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>65.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>79.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>69.2</td>
</tr>
</tbody>
</table>

<sup>26</sup> Questions on dosing regimens were only administered to those providers that correctly stated the recommended first-line treatment for uncomplicated malaria.
## Comparisons by Stratum

### Availability of Antimalarials

<table>
<thead>
<tr>
<th>Proportion of outlets that had:</th>
<th>Lower North</th>
<th>South East</th>
<th>Upper North</th>
<th>South West</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimalarials in stock at the time of survey visit</td>
<td>97.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>93.9&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>88.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>97.8&lt;sup&gt;b&lt;/sup&gt;</td>
<td>94.9</td>
</tr>
<tr>
<td>First-line treatment (AL)</td>
<td>13.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>22.1&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>16.7</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>19.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>32.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>16.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>20.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>22.4</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>22.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>37.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>23.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>24.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>26.9</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>28.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>25.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>20.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>25.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>25.0</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>96.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>90.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>87.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>94.1&lt;sup&gt;b&lt;/sup&gt;</td>
<td>92.5</td>
</tr>
<tr>
<td>Artemisinin monotherapy</td>
<td>53.0&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>54.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>35.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>46.3&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>48.3</td>
</tr>
<tr>
<td>• Oral artemisinin monotherapy</td>
<td>50.0&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>53.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>34.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>46.3&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>47.0</td>
</tr>
<tr>
<td>A WHO approved or nationally registered ACT as the most distributed antimalarial, by volumes of sales/distribution in the past week</td>
<td>0.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.8</td>
</tr>
<tr>
<td>No disruption in stock in the previous three months</td>
<td>22.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>43.5&lt;sup&gt;b&lt;/sup&gt;</td>
<td>14.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>23.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>26.3</td>
</tr>
<tr>
<td>No disruption in first-line treatment stock in the previous three months</td>
<td>42.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>42.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>46.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>55.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>47.2</td>
</tr>
<tr>
<td>Expired stock of any antimalarial</td>
<td>8.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.8</td>
</tr>
<tr>
<td>Acceptable storage conditions for medicines</td>
<td>100.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>90.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>90.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>88.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>92.3</td>
</tr>
<tr>
<td>Microscopic blood testing facilities</td>
<td>18.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>8.0&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>8.2&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.5&lt;sup&gt;b&lt;/sup&gt;</td>
<td>9.1</td>
</tr>
<tr>
<td>Rapid diagnostic tests</td>
<td>7.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.8</td>
</tr>
</tbody>
</table>

<sup>27</sup> Statistical difference is labeled with a superscript, a, b, or c (p<0.0083). Proportions or medians with the same letter in their superscripts do not differ significantly from one another according to a chi-square or a Mood’s median test, respectively, with a type 1 error rate of 0.0083. The significance level of p<0.0083 is used to account for the number of pair-wise tests being conducted. With four outlet types, 6 pair-wise comparisons are needed to test each type against the other three. If the standard p-value of 0.05 was used in each comparison, the probability of a false positive would increase from 5% to 26.5%. The standard type 1 error rate of 0.05 is thus divided by 6 (0.05 / 6 = 0.0083), the number of comparisons, to determine a type 1 error rate that is no more likely to produce a false positive across 6 tests than a single test with a p=0.05.
### Price of Antimalarials

<table>
<thead>
<tr>
<th>Distribution of free drugs:</th>
<th>Lower North</th>
<th>South East</th>
<th>Upper North</th>
<th>South West</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of first-line ACTs distributed free of cost (by volumes of adult treatments)</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Median price of a full course of an adult treatment:</td>
<td>Median (N of AMs)</td>
<td>Median (N of AMs)</td>
<td>Median (N of AMs)</td>
<td>Median (N of AMs)</td>
<td>Median (N of AMs)</td>
</tr>
<tr>
<td>First-line treatment (AL)</td>
<td>$6.89&lt;sup&gt;a&lt;/sup&gt;(122)</td>
<td>$7.65&lt;sup&gt;ab&lt;/sup&gt;(17)</td>
<td>$5.78&lt;sup&gt;ab&lt;/sup&gt;(14)</td>
<td>$5.74&lt;sup&gt;b&lt;/sup&gt;(27)</td>
<td>$6.12&lt;sup&gt;b&lt;/sup&gt;(80)</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>$7.65&lt;sup&gt;a&lt;/sup&gt;(18)</td>
<td>$8.89&lt;sup&gt;a&lt;/sup&gt;(17)</td>
<td>$7.35&lt;sup&gt;ab&lt;/sup&gt;(14)</td>
<td>$7.65&lt;sup&gt;a&lt;/sup&gt;(17)</td>
<td>$7.65&lt;sup&gt;a&lt;/sup&gt;(18)</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>$5.97&lt;sup&gt;a&lt;/sup&gt;(33)</td>
<td>$6.12&lt;sup&gt;a&lt;/sup&gt;(39)</td>
<td>$4.59&lt;sup&gt;a&lt;/sup&gt;(24)</td>
<td>$4.95&lt;sup&gt;a&lt;/sup&gt;(26)</td>
<td>$5.74&lt;sup&gt;a&lt;/sup&gt;(111)</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>$4.78&lt;sup&gt;a&lt;/sup&gt;(56)</td>
<td>$5.74&lt;sup&gt;a&lt;/sup&gt;(39)</td>
<td>$5.16&lt;sup&gt;a&lt;/sup&gt;(24)</td>
<td>$4.95&lt;sup&gt;a&lt;/sup&gt;(24)</td>
<td>$4.97&lt;sup&gt;a&lt;/sup&gt;(111)</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>$0.61&lt;sup&gt;a&lt;/sup&gt;(234)</td>
<td>$0.61&lt;sup&gt;a&lt;/sup&gt;(401)</td>
<td>$0.38&lt;sup&gt;bc&lt;/sup&gt;(233)</td>
<td>$0.54&lt;sup&gt;bc&lt;/sup&gt;(292)</td>
<td>$0.54&lt;sup&gt;a&lt;/sup&gt;(1,389)</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>$3.12&lt;sup&gt;a&lt;/sup&gt;(95)</td>
<td>$3.57&lt;sup&gt;a&lt;/sup&gt;(97)</td>
<td>$3.12&lt;sup&gt;a&lt;/sup&gt;(95)</td>
<td>$2.68&lt;sup&gt;a&lt;/sup&gt;(92)</td>
<td>$3.12&lt;sup&gt;a&lt;/sup&gt;(95)</td>
</tr>
<tr>
<td>Sulfadoxine-Pyrimethamine (SP), the ‘most popular’ antimalarial treatment in Nigeria.</td>
<td>$0.61&lt;sup&gt;a&lt;/sup&gt;(243)</td>
<td>$0.61&lt;sup&gt;ab&lt;/sup&gt;(314)</td>
<td>$0.46&lt;sup&gt;bc&lt;/sup&gt;(152)</td>
<td>$0.54&lt;sup&gt;bc&lt;/sup&gt;(292)</td>
<td>$0.54&lt;sup&gt;a&lt;/sup&gt;(1,001)</td>
</tr>
</tbody>
</table>

#### Median price of a full course of an adult treatment of ACT relative to sulfadoxine-pyrimethamine (SP), the ‘most popular’ antimalarial treatment in Nigeria:

<table>
<thead>
<tr>
<th>Ratios</th>
<th>First-line treatment (AL)</th>
<th>WHO approved ACT</th>
<th>Nationally registered ACT</th>
<th>Non-WHO/nationally registered ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=105</td>
<td>11.3</td>
<td>12.5</td>
<td>12.6</td>
<td>10.6</td>
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<tr>
<td>N=86</td>
<td>12.5</td>
<td>14.6</td>
<td>16.0</td>
<td>14.2</td>
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<td>9.8</td>
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<td>10.6</td>
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<tr>
<td>N=115</td>
<td>7.8</td>
<td>9.4</td>
<td>11.2</td>
<td>8.5</td>
</tr>
<tr>
<td>N=378</td>
<td></td>
<td></td>
<td></td>
<td>9.2</td>
</tr>
</tbody>
</table>

#### Median price of a full course of an adult treatment of ACT relative to the minimum legal daily wage in Nigeria ($2.20):

<table>
<thead>
<tr>
<th>Ratios</th>
<th>First-line treatment (AL)</th>
<th>WHO approved ACT</th>
<th>Nationally registered ACT</th>
<th>Non-WHO/nationally registered ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=105</td>
<td>3.1</td>
<td>3.5</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>N=86</td>
<td>3.5</td>
<td>4.0</td>
<td>3.3</td>
<td>3.5</td>
</tr>
<tr>
<td>N=72</td>
<td>2.7</td>
<td>2.8</td>
<td>2.1</td>
<td>2.3</td>
</tr>
<tr>
<td>N=115</td>
<td>2.2</td>
<td>2.6</td>
<td>2.3</td>
<td>2.1</td>
</tr>
<tr>
<td>N=378</td>
<td></td>
<td></td>
<td></td>
<td>2.3</td>
</tr>
</tbody>
</table>

#### Median price of a full course adult first-line treatment relative to the international reference price ($2.12):

<table>
<thead>
<tr>
<th>Ratios</th>
<th>First-line treatment (AL)</th>
<th>WHO approved ACT</th>
<th>Nationally registered ACT</th>
<th>Non-WHO/nationally registered ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=105</td>
<td>3.3</td>
<td>3.6</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>N=86</td>
<td>3.6</td>
<td>3.6</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>N=72</td>
<td>53.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>74.4&lt;sup&gt;b&lt;/sup&gt;</td>
<td>63.9&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>50.4&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>N=378</td>
<td></td>
<td></td>
<td></td>
<td>59.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proportion of outlets that offer credit to consumers for antimalarials</th>
<th>Lower North</th>
<th>South East</th>
<th>Upper North</th>
<th>South West</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
</tbody>
</table>
### Volumes of Antimalarials Sold/Distributed

<table>
<thead>
<tr>
<th>Volumes of full course adult treatments (sold or distributed in the past week) of:</th>
<th>Lower North</th>
<th>South East</th>
<th>Upper North</th>
<th>South West</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total number of full course adult treatments</strong></td>
<td>78</td>
<td>110</td>
<td>144</td>
<td>52</td>
<td>384</td>
</tr>
<tr>
<td><strong>Number of outlets that stocked each category of AM</strong></td>
<td>18</td>
<td>22</td>
<td>8</td>
<td>30</td>
<td>553</td>
</tr>
<tr>
<td><strong>Number of full course adult treatments</strong></td>
<td>41</td>
<td>83</td>
<td>73</td>
<td>14</td>
<td>210</td>
</tr>
<tr>
<td><strong>Number of outlets that stocked each category of AM</strong></td>
<td>91</td>
<td>164</td>
<td>262</td>
<td>36</td>
<td>553</td>
</tr>
<tr>
<td><strong>Number of full course adult treatments</strong></td>
<td>37</td>
<td>43</td>
<td>20</td>
<td>33</td>
<td>210</td>
</tr>
<tr>
<td><strong>Number of outlets that stocked each category of AM</strong></td>
<td>152</td>
<td>133</td>
<td>271</td>
<td>78</td>
<td>634</td>
</tr>
<tr>
<td><strong>Number of full course adult treatments</strong></td>
<td>127</td>
<td>104</td>
<td>4,537</td>
<td>2,164</td>
<td>15,654</td>
</tr>
<tr>
<td><strong>Number of outlets that stocked each category of AM</strong></td>
<td>4,984</td>
<td>3,969</td>
<td>274</td>
<td>63</td>
<td>17,077</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Each antimalarial category as a proportion of the total volume of all antimalarials sold or distributed in the past week:</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>1.4</td>
<td>2.3</td>
<td>2.6</td>
<td>2.0</td>
<td>2.1</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>0.7</td>
<td>1.7</td>
<td>1.3</td>
<td>0.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>1.6</td>
<td>3.4</td>
<td>4.8</td>
<td>1.4</td>
<td>3.0</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>2.7</td>
<td>2.7</td>
<td>5.0</td>
<td>3.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>87.6</td>
<td>81.6</td>
<td>83.4</td>
<td>84.8</td>
<td>84.4</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>8.2</td>
<td>12.3</td>
<td>6.8</td>
<td>10.7</td>
<td>9.2</td>
</tr>
</tbody>
</table>

---

28 Percentages total more than 100% in each column because ACTs that are WHO approved, nationally registered, and the first-line treatment are not mutually exclusive.
### Provider Knowledge and Perceptions

<table>
<thead>
<tr>
<th></th>
<th>Lower North</th>
<th>South East</th>
<th>Upper North</th>
<th>South West</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of providers that:</td>
<td>N=126</td>
<td>N=110</td>
<td>N=84</td>
<td>N=132</td>
<td>N=452</td>
</tr>
<tr>
<td>Correctly state the recommended first-line treatment for uncomplicated malaria</td>
<td>7.1a</td>
<td>30.0b</td>
<td>11.9sc</td>
<td>18.9bc</td>
<td>17.0</td>
</tr>
<tr>
<td></td>
<td>N=8</td>
<td>N=33</td>
<td>N=10</td>
<td>N=24</td>
<td>N=75</td>
</tr>
<tr>
<td>Correctly state the dosing regimen of the first-line treatment for an adult</td>
<td>75.0a</td>
<td>90.9a</td>
<td>60.0a</td>
<td>58.3a</td>
<td>74.7</td>
</tr>
<tr>
<td></td>
<td>N=8</td>
<td>N=33</td>
<td>N=9</td>
<td>N=20</td>
<td>N=70</td>
</tr>
<tr>
<td>Correctly state the dosing regimen of the first-line treatment for a two year old</td>
<td>75.0ab</td>
<td>90.9a</td>
<td>55.6ab</td>
<td>50.0b</td>
<td>72.9</td>
</tr>
<tr>
<td>Can list at least one health danger sign in a child that requires referral to a public health facility:</td>
<td>62.2a</td>
<td>80.2bc</td>
<td>73.3bc</td>
<td>66.1ab</td>
<td>69.7</td>
</tr>
<tr>
<td>• Convulsions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22.5a</td>
<td>36.5a</td>
<td>34.7a</td>
<td>35.5a</td>
<td>32.0</td>
</tr>
<tr>
<td>• Vomiting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35.1a</td>
<td>45.8a</td>
<td>41.3a</td>
<td>29.8a</td>
<td>37.2</td>
</tr>
<tr>
<td>• Unable to drink/breastfeed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.5a</td>
<td>6.3a</td>
<td>2.7a</td>
<td>8.1a</td>
<td>5.7</td>
</tr>
<tr>
<td>• Excessive sleep/difficult to wake up</td>
<td>3.6a</td>
<td>6.3a</td>
<td>8.0a</td>
<td>4.0a</td>
<td>5.2</td>
</tr>
<tr>
<td>• Unconscious/coma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.7a</td>
<td>18.8a</td>
<td>14.7a</td>
<td>15.3a</td>
<td>15.0</td>
</tr>
<tr>
<td>Agree with the statement, “Most customers request an antimalarial by brand name or generic name.”</td>
<td>30.5a</td>
<td>60.9b</td>
<td>20.2a</td>
<td>75.6b</td>
<td>49.0</td>
</tr>
<tr>
<td>Agree with the statement, “I decide which antimalarial medicine most customers receive.”</td>
<td>76.6a</td>
<td>76.4a</td>
<td>28.6b</td>
<td>81.8a</td>
<td>69.2</td>
</tr>
</tbody>
</table>

Questions on dosing regimens were only administered to those providers that correctly stated the recommended first-line treatment for uncomplicated malaria.
### Comparisons by Urban vs. Rural Areas

#### Availability of Antimalarials

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proportion of outlets that had:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antimalarials in stock at the time of survey visit</td>
<td>97.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>92.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>94.9</td>
</tr>
<tr>
<td>First-line treatment (AL)</td>
<td>23.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.3&lt;sup&gt;b&lt;/sup&gt;</td>
<td>16.7</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>28.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>15.5&lt;sup&gt;b&lt;/sup&gt;</td>
<td>22.4</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>34.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>26.9</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>35.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>14.2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>25.0</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>94.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>90.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>92.5</td>
</tr>
<tr>
<td>Artemisinin monotherapy</td>
<td>57.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>38.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>48.3</td>
</tr>
<tr>
<td>• Oral artemisinin monotherapy</td>
<td>55.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>37.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>47.0</td>
</tr>
<tr>
<td>A WHO approved or nationally registered ACT as the most distributed antimalarial, by volumes of sales/distribution in the past week</td>
<td>1.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.8</td>
</tr>
<tr>
<td>No disruption in stock in the previous three months</td>
<td>25.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>27.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>26.3</td>
</tr>
<tr>
<td>No disruption in first-line treatment stock in the previous three months</td>
<td>48.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>44.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>47.2</td>
</tr>
<tr>
<td>Expired stock of any antimalarial</td>
<td>4.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.8</td>
</tr>
<tr>
<td>Acceptable storage conditions for medicines</td>
<td>89.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>95.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>92.3</td>
</tr>
<tr>
<td>Microscopic blood testing facilities</td>
<td>6.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>12.2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>9.1</td>
</tr>
<tr>
<td>Rapid diagnostic tests</td>
<td>3.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.8</td>
</tr>
</tbody>
</table>

<sup>30</sup> Statistical difference is labeled with a superscript, a or b (p<0.05). Proportions or medians that are both labeled with the superscript ‘a’ do not differ significantly from one another according to a chi-square or a Mood’s median test, respectively, with a type 1 error rate of 0.05.
### Price of Antimalarials

<table>
<thead>
<tr>
<th>Distribution of free drugs:</th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of first-line ACTs distributed free of cost (by volume of adult treatments)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median price of a full course of an adult treatment of:</th>
<th>Median (N of AMs)</th>
<th>Median (N of AMs)</th>
<th>Median (N of AMs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>$6.12^a(64)</td>
<td>$6.01^a(16)</td>
<td>$6.12^b(80)</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>$8.03^a(38)</td>
<td>$6.89^a(12)</td>
<td>$7.65^b(65)</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>$5.74^a(87)</td>
<td>$5.30^a(24)</td>
<td>$5.74^b(111)</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>$5.36^a(64)</td>
<td>$4.59^b(34)</td>
<td>$4.97^b(191)</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>$0.61^a(64)</td>
<td>$0.46^b(485)</td>
<td>$0.54^b(1,389)</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>$3.12^a(277)</td>
<td>$2.68^b(84)</td>
<td>$3.12^b(1,001)</td>
</tr>
<tr>
<td>Sulfadoxine-Pyrimethamine (SP), the ‘most popular’ antimalarial treatment in Nigeria.</td>
<td>$0.57^a(674)</td>
<td>$0.54^a(127)</td>
<td>$0.54^b(1,001)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median price of a full course of an adult treatment of ACT relative to sulfadoxine-pyrimethamine (SP), the ‘most popular’ antimalarial treatment in Nigeria:</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>10.7</td>
<td>11.1</td>
<td>11.3</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>14.1</td>
<td>12.8</td>
<td>14.2</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>10.1</td>
<td>9.8</td>
<td>10.6</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>9.4</td>
<td>8.5</td>
<td>9.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median price of a full course of an adult treatment of ACT relative to the minimum legal daily wage in Nigeria ($2.20):</th>
<th>Ratio</th>
<th>Ratio</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-line treatment (AL)</td>
<td>2.8</td>
<td>2.7</td>
<td>2.8</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>3.7</td>
<td>3.1</td>
<td>3.5</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>2.6</td>
<td>2.4</td>
<td>2.6</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>2.4</td>
<td>2.1</td>
<td>2.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median price of a full course adult first-line treatment relative to the international reference price ($2.12)</th>
<th>%</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.9</td>
<td>2.8</td>
<td>2.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proportion of outlets that offer credit to consumers for antimalarials</th>
<th>%</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>49.8^a</td>
<td>70.5^a</td>
<td>59.3</td>
</tr>
</tbody>
</table>
### Volumes of Antimalarials Sold/Distributed

<table>
<thead>
<tr>
<th>Volumes of full course adult treatments (sold or distributed in the past week) of:</th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total number of full course adult treatments</td>
<td>Number of outlets that stocked each category of AM</td>
<td>Total number of full course adult treatments</td>
</tr>
<tr>
<td><strong>First-line treatment (AL)</strong></td>
<td>309</td>
<td>57</td>
<td>75</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>146</td>
<td>70</td>
<td>64</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>432</td>
<td>83</td>
<td>121</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>515</td>
<td>85</td>
<td>119</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>8,067</td>
<td>229</td>
<td>7,587</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>958</td>
<td>135</td>
<td>750</td>
</tr>
<tr>
<td><strong>Each antimalarial category as a proportion of the total volume of all antimalarials sold or distributed in the past week:</strong></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>First-line treatment (AL)</td>
<td>3.1</td>
<td>0.9</td>
<td>2.1</td>
</tr>
<tr>
<td>WHO approved ACT</td>
<td>1.5</td>
<td>0.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Nationally registered ACT</td>
<td>4.3</td>
<td>1.4</td>
<td>3.0</td>
</tr>
<tr>
<td>Non-WHO/nationally registered ACT</td>
<td>5.2</td>
<td>1.4</td>
<td>3.4</td>
</tr>
<tr>
<td>Non-artemisinin therapy</td>
<td>80.9</td>
<td>88.5</td>
<td>84.4</td>
</tr>
<tr>
<td>Oral artemisinin monotherapy</td>
<td>9.6</td>
<td>8.7</td>
<td>9.2</td>
</tr>
</tbody>
</table>

---

31 Percentages total more than 100% in each column because ACTs that are WHO approved, nationally registered, and the first-line treatment are not mutually exclusive.
## Provider Knowledge and Perceptions

<table>
<thead>
<tr>
<th>Provider Knowledge and Perceptions</th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Proportion of providers that:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correctly state the recommended first-line treatment for uncomplicated malaria 19.4a 14.5a 17.0</td>
<td>N=232</td>
<td>N=220</td>
<td>N=452</td>
</tr>
<tr>
<td>Correctly state the dosing regimen of the first-line treatment for an adult 32 76.7a 71.9a 74.7</td>
<td>N=43</td>
<td>N=32</td>
<td>N=75</td>
</tr>
<tr>
<td>Correctly state the dosing regimen of the first-line treatment for a two year old 66.7a 80.6a 72.9</td>
<td>N=39</td>
<td>N=31</td>
<td>N=70</td>
</tr>
<tr>
<td>Can list at least one health danger sign in a child that requires referral to a public health facility:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Convulsions</td>
<td>N=232</td>
<td>N=221</td>
<td>N=453</td>
</tr>
<tr>
<td>• Vomiting</td>
<td>33.2a</td>
<td>30.6a</td>
<td>32.0</td>
</tr>
<tr>
<td>• Unable to drink/breastfeed</td>
<td>38.6a</td>
<td>35.5a</td>
<td>37.2</td>
</tr>
<tr>
<td>• Excessive sleep/difficult to wake up</td>
<td>4.9a</td>
<td>6.6a</td>
<td>5.7</td>
</tr>
<tr>
<td>• Unconscious/coma</td>
<td>15.7a</td>
<td>14.2a</td>
<td>15.0</td>
</tr>
<tr>
<td>Agree with the statement, “Most customers request an antimalarial by brand name or generic name.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree with the statement, “I decide which antimalarial medicine most customers receive.”</td>
<td>N=233</td>
<td>N=221</td>
<td>N=454</td>
</tr>
<tr>
<td></td>
<td>60.8a</td>
<td>36.7b</td>
<td>49.0</td>
</tr>
<tr>
<td></td>
<td>73.0a</td>
<td>65.2a</td>
<td>69.2</td>
</tr>
</tbody>
</table>

---

32 Questions on dosing regimens were only administered to those providers that correctly stated the recommended first-line treatment for uncomplicated malaria.
### Staff and Outlet Characteristics

<table>
<thead>
<tr>
<th>Proportion of outlets:</th>
<th>Study-wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>with a staff member that has completed primary school education</td>
<td>N=453</td>
</tr>
<tr>
<td>with a staff member that has completed secondary school education</td>
<td>N=453</td>
</tr>
<tr>
<td>that have received government or NGO training within the past two years</td>
<td>N=432</td>
</tr>
<tr>
<td>that have staff with a health related qualification</td>
<td>N=445</td>
</tr>
<tr>
<td>that store medicines in dry areas</td>
<td>N=431</td>
</tr>
<tr>
<td>that store medicines out of direct sunlight</td>
<td>N=429</td>
</tr>
<tr>
<td>that do not keep medicines on the floor</td>
<td>N=429</td>
</tr>
<tr>
<td>that report having a pharmacy, clinic, NGO or missionary license ³³</td>
<td>N=379</td>
</tr>
<tr>
<td>where a license was observed by the interviewer</td>
<td>N=373</td>
</tr>
</tbody>
</table>

³³ Questions regarding licensing were not asked in public health facilities.
### Appendix A: Nigeria Outlet Type Descriptions

<table>
<thead>
<tr>
<th>Outlet Types</th>
<th>N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health Facilities</td>
<td>62</td>
<td>These tertiary level public health facilities are designated as referral hospitals. They have specialized clinics with qualified personnel, such as doctors and nurses; pharmacy section(s); dispensary unit(s); and also serve as centres for training medical personnel. The staff typically includes doctors, nurses, community health extension workers, and some support staff. This level of public health facility is generally managed and controlled by the federal government; however there are some that fall under the domain of the state government. Some teaching hospitals are privately owned and the distinction between government-owned and private-owned facilities has made during the survey.</td>
</tr>
<tr>
<td>University teaching hospitals/Federal medical centres</td>
<td>1</td>
<td>These tertiary level public health facilities are designated as referral hospitals. They have specialized clinics with qualified personnel, such as doctors and nurses; pharmacy section(s); dispensary unit(s); and also serve as centres for training medical personnel. The staff typically includes doctors, nurses, community health extension workers, and some support staff. This level of public health facility is generally managed and controlled by the federal government; however there are some that fall under the domain of the state government. Some teaching hospitals are privately owned and the distinction between government-owned and private-owned facilities has made during the survey.</td>
</tr>
<tr>
<td>General hospital</td>
<td>11</td>
<td>These secondary public health facilities are managed and controlled by state governments. They have a number of wards for admitting patients, pharmacy section(s), dispensary unit(s), an ambulance, and a few residential houses for staff on emergency duties. The staff typically includes doctors, nurses, community health extension workers and some support staff.</td>
</tr>
<tr>
<td>Health centre</td>
<td>49</td>
<td>These primary health facilities are managed and operated at the local government area level. They are the smallest of all government-owned health facilities and offer fewer services than those found at tertiary and secondary level facilities. Health centres are located in both urban and rural settings, but are located closer to the village/community level. They are usually manned by one or two nurses with some community health extension workers and a few auxiliary staff; however, some are operated by doctors, while others have doctors that periodically visit to make major decisions or run specialist clinics.</td>
</tr>
<tr>
<td>Community Health Extension Worker</td>
<td>1</td>
<td>This cadre of trained health workers is found mostly at the primary health care level and provides services directly to the communities in which they work. While most of them are attached to government facilities, some of them operate at privately owned outlets, such as PPMVs, or from their residential homes.</td>
</tr>
<tr>
<td>Part One Pharmacy</td>
<td>39</td>
<td>These are registered by the Pharmacy Council of Nigeria (PCN) and are authorized to sell all classes of medicines, including prescription medicines. They usually employ nurses and intern pharmacists. Part One pharmacies are highly regulated by the National Agency for Food and Drug Administration and Control (NAFDAC). They are privately owned, either by registered pharmacists or individuals who employ the services of a registered pharmacist. In Nigeria, Part One pharmacies are overwhelmingly located in urban areas in commercial zones.</td>
</tr>
<tr>
<td>Part One pharmacy</td>
<td>39</td>
<td>These are registered by the Pharmacy Council of Nigeria (PCN) and are authorized to sell all classes of medicines, including prescription medicines. They usually employ nurses and intern pharmacists. Part One pharmacies are highly regulated by the National Agency for Food and Drug Administration and Control (NAFDAC). They are privately owned, either by registered pharmacists or individuals who employ the services of a registered pharmacist. In Nigeria, Part One pharmacies are overwhelmingly located in urban areas in commercial zones.</td>
</tr>
<tr>
<td>Outlet Type</td>
<td>Count</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Propriety Patent Medicine Vendors/Drug Store</td>
<td>307</td>
<td>These are small to medium sized outlets, equivalent to 'drug shops' in other countries. PPMVs may be registered by the Directorate of Pharmaceutical Services (DPS), but the majority of them are not registered. They are legally allowed to sell over the counter (OTC) medicines, however a number of them also illegally stock prescription medicines. (In 2006, NAFDAC de-classified ACTs from prescription-only to OTC; hence ACTs are legally available at PPMVs.) Some operate without a license, especially at the village level or remote areas. PPMVs are ubiquitous across Nigeria and, given the lack of Part One pharmacies in rural and community level settings, serve as accessible medicine outlets for consumers. The staffs are usually not trained in any health service delivery area. A small proportion of PPMVs are owned by nurses or other health workers, such as community health extension workers.</td>
</tr>
<tr>
<td>Private Health Facilities</td>
<td>46</td>
<td>These are non-governmental health facilities. Just as with public health facilities, private hospitals and clinics are classified in terms of their capacity— tertiary, secondary, or primary. For this study, all three levels have been grouped into one category. Hence, they can range from offering comprehensive health services to being limited in scope. Likewise, staff range in qualification and size. There is usually a dispensing section, but in some cases, the doctors may dispense medications themselves.</td>
</tr>
<tr>
<td>Other Outlets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supermarkets</td>
<td>14</td>
<td>Private businesses that sell fast moving consumer goods, food and provisions.</td>
</tr>
<tr>
<td>Role Model Mothers</td>
<td>1</td>
<td>These are women who are selected by their communities to serve on a volunteer basis as community distributors of ACTs, specifically Coartem®. Although the Role Model Mother (RMM) program has not been officially adopted by the public health system, they have been trained by either the public or private sector on the home management of malaria, and are able to refer cases to health facilities and dispense Coartem®.</td>
</tr>
</tbody>
</table>
Appendix B: First-line ACT and Registered ACTs

**Government recommended first-line treatment for uncomplicated malaria**

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Strength</th>
<th>Dosage Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artemether/Lumefantrine</td>
<td>20mg/120mg</td>
<td>Tablet</td>
</tr>
</tbody>
</table>

**Recommended treatment regimen for the government recommended first-line treatment for uncomplicated malaria**

<table>
<thead>
<tr>
<th>Age or weight group / kg</th>
<th># Tablets, Day 1</th>
<th># Tablets, Day 2</th>
<th># Tablets, Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months-3 yrs/5-14 kg</td>
<td>1 tablet morning and 1 evening</td>
<td>1 tablet morning and 1 evening</td>
<td>1 tablet morning and 1 evening</td>
</tr>
<tr>
<td>4-8 yrs/15-24 kg</td>
<td>2 tablets morning and 2 evening</td>
<td>2 tablets morning and 2 evening</td>
<td>2 tablets morning and 2 evening</td>
</tr>
<tr>
<td>9-14 yrs/25-34 kg</td>
<td>3 tablets morning and 3 evening</td>
<td>3 tablets morning and 3 evening</td>
<td>3 tablets morning and 3 evening</td>
</tr>
<tr>
<td>15 yrs-above/35 kg-above</td>
<td>4 tablets morning and 4 evening</td>
<td>4 tablets morning and 4 evening</td>
<td>4 tablets morning and 4 evening</td>
</tr>
</tbody>
</table>

**Complete list of nationally registered ACTs as of July 2006**

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Strength</th>
<th>Dosage Form</th>
<th>Brand Name</th>
<th>Manufacturer</th>
<th>Country of Manufacture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amodiaquine/Dihydroartemisinii</td>
<td>135mg/60mg</td>
<td>Tablet</td>
<td>Amsosinin</td>
<td>Adams Pharm</td>
<td>China</td>
</tr>
<tr>
<td>Amodiaquine/Dihydroartemisinii</td>
<td>270mg/120mg</td>
<td>Tablet Adult</td>
<td>Amsosinin</td>
<td>Adams Pharm</td>
<td>China</td>
</tr>
<tr>
<td>Artemether/Lumefantrine</td>
<td>15mg/90mg</td>
<td>Powder</td>
<td>Co-Artesiante</td>
<td>MPF BV</td>
<td>Netherlands</td>
</tr>
<tr>
<td>Artemether/Lumefantrine</td>
<td>20mg/120mg</td>
<td>Tablet Child</td>
<td>Coartem</td>
<td>Novartis</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Artemether/Lumefantrine</td>
<td>20mg/120mg</td>
<td>Tablet Adult</td>
<td>Coartem</td>
<td>Novartis</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Artemether/Lumefantrine</td>
<td>40mg/240mg</td>
<td>Tablet</td>
<td>Tamether</td>
<td>Jiangsu Yixing</td>
<td>China</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/153mg</td>
<td>Tablet</td>
<td>Arscum (under 7 years)</td>
<td>Sanofi</td>
<td>Morocco</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/153mg</td>
<td>Tablet</td>
<td>Arscum (7-13 years)</td>
<td>Sanofi</td>
<td>Morocco</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/153mg</td>
<td>Tablet</td>
<td>Arscum (After 13 years)</td>
<td>Sanofi</td>
<td>Morocco</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/153.1mg</td>
<td>Tablet</td>
<td>Arsuamoon</td>
<td>Guilin</td>
<td>China</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/153.1mg</td>
<td>Tablet</td>
<td>Larimal (Child Kit)</td>
<td>Ipca Pharma</td>
<td>India</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/153.1mg</td>
<td>Tablet</td>
<td>Larimal (Kid Kit)</td>
<td>Ipca Pharma</td>
<td>India</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/153.1mg</td>
<td>Tablet</td>
<td>Larimal (Adult)</td>
<td>Ipca Pharma</td>
<td>India</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/200mg</td>
<td>Tablet Child</td>
<td>DART</td>
<td>Swipha</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/200mg</td>
<td>Tablet Adult</td>
<td>DART</td>
<td>Swipha</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>50mg/200mg</td>
<td>Tablet</td>
<td>Quinsunat</td>
<td>Mekophar Chem Pharm</td>
<td>Vietnam</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine</td>
<td>100mg/200mg</td>
<td>Tablet</td>
<td>Camosunate plus</td>
<td>Adams Pharma</td>
<td>China</td>
</tr>
<tr>
<td>Generic Name</td>
<td>Strength</td>
<td>Dosage Form</td>
<td>Brand Name</td>
<td>Manufacturer</td>
<td>Country of Manufacture</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>----------</td>
<td>-------------</td>
<td>------------</td>
<td>--------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine 100mg/300mg Tablet</td>
<td></td>
<td></td>
<td>Gsunate Kit</td>
<td>GVS-India/ Greenlife-Nigeria</td>
<td>India</td>
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<tr>
<td>Artesunate/Amodiaquine 100mg/400mg Tablet</td>
<td></td>
<td></td>
<td>Malact</td>
<td>May and Baker</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine Unknown</td>
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<td>Suspension</td>
<td>Camosunate</td>
<td>Adams Pharma</td>
<td>China</td>
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<tr>
<td>Artesunate/Amodiaquine Unknown</td>
<td></td>
<td>Tablet</td>
<td>Amodarte</td>
<td>Medicamen Biotech</td>
<td>India</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine Unknown</td>
<td></td>
<td>Tablet</td>
<td>Efonrex</td>
<td>Bond Chemicals</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine Unknown Tablet Adult</td>
<td></td>
<td></td>
<td>Farinax</td>
<td>Swipha</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine Tablet Adult</td>
<td></td>
<td>Tablet Child</td>
<td>Artequin</td>
<td>Mepha</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine 100mg/125mg Tablet</td>
<td></td>
<td></td>
<td>Amodarte</td>
<td>Biotech India</td>
<td></td>
</tr>
<tr>
<td>Artesunate/Amodiaquine 100mg/125mg Tablet</td>
<td></td>
<td></td>
<td>Amodarte</td>
<td>Bond Chemicals</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Artesunate/Amodiaquine 100mg/125mg Tablet</td>
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<td></td>
<td>Amodarte</td>
<td>Swipha</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Artesunate/Mefloquine 100mg/125mg Tablet</td>
<td></td>
<td></td>
<td>Child</td>
<td>Mepha</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Artesunate/Mefloquine 100mg/125mg Tablet</td>
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<td></td>
<td>Amdin</td>
<td>Mekophar Chem Pharm</td>
<td>Vietnam</td>
</tr>
<tr>
<td>Artesunate/Mefloquine 100mg/125mg Tablet</td>
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<td></td>
<td>Amdin</td>
<td>Vaphicar Pharm</td>
<td>India</td>
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<td>Artesunate/Mefloquine 100mg/125mg Tablet</td>
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<td></td>
<td>Amdin</td>
<td>Mepha</td>
<td>Switzerland</td>
</tr>
<tr>
<td>Artesunate/Sulphadoxine/Pyrimethamine 50mg/</td>
<td></td>
<td>Tablet</td>
<td>Artescope</td>
<td>Guilin</td>
<td>China</td>
</tr>
<tr>
<td>Artesunate/Sulphadoxine/Pyrimethamine 100mg/</td>
<td></td>
<td>Tablet</td>
<td>Malosunate</td>
<td>Adams Pharma</td>
<td>China</td>
</tr>
<tr>
<td>Artesunate/Sulphadoxine/Pyrimethamine 200mg/</td>
<td></td>
<td>Tablet</td>
<td>Co-arinate</td>
<td>Dafra</td>
<td>Brussels</td>
</tr>
<tr>
<td>Artesunate/Sulphadoxine/Pyrimethamine 200mg/</td>
<td></td>
<td>Tablet</td>
<td>Farenax</td>
<td>Swipha</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Artesunate/Sulphadoxine/Pyrimethamine 30mg/</td>
<td></td>
<td>Tablet</td>
<td>Waipa</td>
<td>Kunimed Pharmachem</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Artesunate/Sulphadoxine/Pyrimethamine 40mg/</td>
<td></td>
<td>Capsules</td>
<td>Combimal</td>
<td>Kunming Pharma</td>
<td>China</td>
</tr>
<tr>
<td>Artesunate/Sulphadoxine/Pyrimethamine 40mg/</td>
<td></td>
<td>Granules</td>
<td>Combimal</td>
<td>Adams Pharm</td>
<td>China</td>
</tr>
<tr>
<td>Artesunate/Sulphadoxine/Pyrimethamine 32mg/</td>
<td></td>
<td>Table</td>
<td>Artecom</td>
<td>TONGHE PHARM</td>
<td>China</td>
</tr>
<tr>
<td>Dihydroartemisinin/Piperaquine Phosphate 30mg/25mg Tablet</td>
<td></td>
<td></td>
<td>Farenax</td>
<td>Swipha</td>
<td>Nigeria</td>
</tr>
<tr>
<td>Dihydroartemisinin/Piperaquine Phosphate 40mg/320mg Capsules</td>
<td></td>
<td></td>
<td>Combimal</td>
<td>Kunming Pharma</td>
<td>China</td>
</tr>
<tr>
<td>Dihydroartemisinin/Piperaquine Phosphate 40mg/320mg Granules</td>
<td></td>
<td></td>
<td>Combimal</td>
<td>Adams Pharm</td>
<td>China</td>
</tr>
<tr>
<td>Dihydroartemisinin/Piperaquine Phosphate 32mg/320mg/90mg</td>
<td></td>
<td></td>
<td>Artecom</td>
<td>TONGHE PHARM</td>
<td>China</td>
</tr>
<tr>
<td>Dihydroartemisinin/Piperaquine Phosphate/Trimethoprim 32mg/320mg/90mg</td>
<td></td>
<td></td>
<td>Axcin</td>
<td>Jiangsu Yixing</td>
<td>China</td>
</tr>
</tbody>
</table>