ACTWATCH OUTLET SURVEY RESULTS

DEMOCRATIC REPUBLIC OF CONGO, KINSHASA AND KATANGA, 2015
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1.1 background
Overview of ACTwatch
ACTwatch has implemented 50 outlet surveys since 2008. Over 360,000 public- and private-sector outlets have been screened for the availability of antimalarials, and more than 50,000 outlets have been audited over the course of the project. ACTwatch has gathered information on branded and generic antimalarial medicine price and sales for over 400,000 antimalarial products.

ACTwatch is a multi-country research project implemented by Population Services International (PSI). Standardized tools and approaches are employed to provide comparable data across countries and over time. ACTwatch is designed to provide timely, relevant, and high-quality antimalarial and malaria diagnostic testing market intelligence, including information on artemisinin-based combination therapies (ACT), the most effective treatment for malaria. The project was launched in 2008 with funding from the Bill and Melinda Gates Foundation (BMGF) and is currently funded through 2016 by the BMGF, UNITAID, and the Department for International Development (DFID).

Research methods implemented include outlet and household surveys, supply chain studies, key informant interviews, and, in selected countries, a new module to document private-sector fever case management practices using observation and client exit interviews.

What are the project goals and objectives?

The goal of the ACTwatch project is to provide policymakers with actionable evidence to inform and monitor national and global policy, strategy, and funding decisions for improving malaria case management and elimination efforts.

The objectives include:

1) Generation of relevant, timely, and high-quality antimalarial market evidence;
2) Identification of strengths and gaps in the antimalarial market performance of the public and private sectors, and market readiness to adhere to national guidelines;
3) Dissemination of evidence at national, regional, and international levels; and
4) Reach policy-makers, donors, and implementers with timely evidence to inform policy, strategy, and funding decisions.

Why is ACTwatch relevant?

ACTwatch data provide timely and practical evidence for national malaria programs and their partners. The project monitors antimalarial markets in the context of policy shifts and investments in the scale-up of first-line ACT and blood testing using malaria rapid diagnostic tests (mRDT). This has included adaptation of project methods for the evaluation of the Affordable Medicines Facility-malaria (AMFm) pilot.

In the Greater Mekong Subregion (GMS), the evidence is also important to help inform malaria control strategies that have focused on the containment of artemisinin resistance and a more recent commitment to eliminate
malaria in the region by 2030. The emergence of malaria parasites resistant to artemisinin in the GMS is a serious threat to the recent gains and current ambition of elimination of *Plasmodium falciparum* in the region. As ACTwatch provides market intelligence regarding the performance of both the public and private sectors, as well as provider readiness to adhere to national treatment guidelines, this information will be critical to knowing where there are gaps and opportunities within the different sectors.

**What are the outlet surveys?**

Outlet surveys are the core component of the ACTwatch project. In the sub-Saharan Africa region, project countries include Benin, the Democratic Republic of Congo (DRC) (in Kinshasa and Katanga), Kenya, Madagascar, Nigeria, Tanzania, Uganda, and Zambia. In the Greater Mekong Subregion, outlet surveys have been implemented in Cambodia, Lao People’s Democratic Republic (PDR), Myanmar, and Thailand.

The 2015 Outlet Survey was the third round of ACTwatch outlet surveys conducted in DRC, with previous studies implemented in 2009 at a national level, and sub-national surveys in 2011 and 2013. This brief presents key trend lines for Kinshasa province (2009, 2011, 2013) and Katanga province (2011 and 2013). These surveys were designed to monitor key antimalarial market indicators at the national level and within urban and rural research domains. In 2015, 60 rural and 20 urban areas were selected in Katanga and 17 rural and 17 urban areas were selected in Kinshasa.
What questions are answered by the ACTwatch Outlet Survey?

What types of outlets in the public and private sectors are distributing antimalarials and providing malaria blood testing?

What types of antimalarials and mRDT are available and distributed by the public and private sectors?

What proportion of public and private sector antimalarial-stocking outlets are stocking: 1) quality-assured ACT; 2) non-quality assured ACT; and 3) malaria blood testing?

What is the antimalarial market share of quality-assured ACT relative to the market share for other types of antimalarials?

What is the consumer price for antimalarial medicines and malaria blood testing among private sector outlets?
1.2 background
Country Background
Malaria is a major cause of morbidity and mortality in the DRC, and the greatest burden of the disease falls on pregnant women and children under five. Despite some improvements in the last five years, at a national level, malaria accounts for an estimated 40% of outpatient visits and 19% of mortality of children under five, respectively.

DRC accounts for 11% of all cases of *Plasmodium falciparum* in sub-Saharan Africa. Malaria prevalence in the under five population was estimated to be between 22.6% and 30.8% in 2013/14, with only 29.2% of children with fevers treated with antimalarials.

In 2011, 9.4 million cases and almost 24,000 deaths due to malaria were reported in the DRC, making it the biggest cause of morbidity and mortality in the country. Around 97% of the population lives in areas of high and stable malaria transmission, while the remaining 3% live in highland areas in the east (Kivu and Katanga). The three malaria epidemiology zones in the DRC are equatorial, tropical, and highland. The most common parasite species in the DRC is *Plasmodium falciparum*, which is responsible for 95% of infections. Resistance to non-artemisinin antimalarial drugs was estimated to be between 29% and 80% for chloroquine, and up to 60% for sulfadoxine-pyrimethamine (SP) in 2001.

**Public health system**

Health services are financed by the government, bilateral, and multilateral donors, but up to 70% of operating costs are covered by fees charged to users. Financial barriers are one of the main reasons for low healthcare utilization. In a household study in Kinshasa, the incidence of catastrophic health expenditures was found to be between 46% and 81% for families seeking treatment for a child with severe malaria.

The public health system in the DRC is supported by faith-based networks (FBNs), which in addition to providing health care services, play a key role in the management or co-management of health zones. The Catholic Church is estimated to be present in half of health zones, fully supporting 27% and partially supporting 63% of facilities.

40% of the country’s health zones are co-managed by FBNs alongside the Ministry of Health.

**Private health system**

DRC’s private health sector is estimated to provide 60% of health care services used by the population, and extends to all areas of the country. It is divided into two categories: the non-profit private sector, which includes faith-based organizations (FBOs) and non-governmental organizations (NGOs), and the private for-profit sector, which includes private health facilities, pharmacies, and drug outlets. However, as noted above, FBNs are integrated into the public health system to a large extent, meaning the distinction between public and not-for-profit sectors is unclear. A large number of private and informal health structures are being created outside the health system, leading to the emergence of an uncoordinated, unregulated, and low-quality private for-profit sector.

The pharmaceutical sector in the DRC is largely unregulated: more than 3,000 types of medicines are available on the market, yet the Drugs, Pharmacy and Medicinal Plants Directorate has issued marketing authorizations for only 400. A considerable portion of the pharmaceutical retail sector in the DRC operates without a license—from the wholesaler to the pharmacy level—although recent policy shifts have aimed to increase the number of pharmacies authorised to dispense mRDTs and antimalarials. Additionally, private-sector pharmacies are now authorized to carry out mRDT prior to dispensing treatment for malaria. A national initiative, DEFEAT Malaria, also aims to reduce the costs of antimalarials and mRDTs in the private sector. The private sector has a wide range of inputs, largely insulating it from the supply chain challenges that have affected the public sector in the country.
In March 2005, the national malaria program adopted artesunate amodiaquine (ASAQ) as first-line treatment for uncomplicated malaria, and the program made oral quinine the recommended treatment for patients who failed to respond or had intolerance to ASAQ. Implementation of this new policy began in 2006, but scale-up has been slow, due to a number of challenges. These include difficulties tracking needs given the fragmented supply system and poor reporting of consumption data.

Guidelines supporting community-based treatment of uncomplicated malaria using ACTs were issued in the DRC in 2007.

In 2012, a forum of experts convened and recommended the use of artemether lumefantrine (AL) as an alternative first-line treatment to ASAQ. This group also suggested that parenteral artesunate be used for severe malaria. These recommendations were approved by the Ministry of Health, with a three-year period to transition to parenteral artesunate for the treatment of severe malaria.

In 2013, the national guidelines were revised to stipulate that pregnant women should receive the intermittent preventive therapy (IPTp) SP at every antenatal clinic visit after their first trimester.

According to national policy that has been in place since 2010 and in line with WHO recommendations, all patients with fever should be tested for malaria, either using microscopy or RDTs. Microscopy is expected to be the primary diagnostic procedure in hospitals and larger health centers, while RDTs are to be used in smaller health facilities and at the community level.

Oral artemisinin monotherapy was officially banned in the DRC in 2007.
1.3 background
Outlet Survey Methods
ACTwatch antimalarial market monitoring in DRC from 2009 to present has been implemented in the context of strategies designed to improve coverage of appropriate case management. This antimalarial market evidence monitored the health system readiness and performance for malaria case management in the context of recent strategies and investments to improve case management.

**How was sampling conducted?**

In 2009, a nationally represented survey was implemented in the DRC from August 10 to October 27, 2009. Data were retroactively analyzed to produce provincial estimates for Kinshasa. Provincially representative outlet surveys were conducted in Katanga and Kinshasa provinces between October December 2013 and 2015 respectively.

A representative sample of health areas was selected from urban and rural domains. Within selected clusters, a census of all outlets with the potential to sell or distribute antimalarials and/or provide malaria blood testing was completed. Additional health areas were selected for oversampling of government-supported public health facilities. A full census of pharmacies was conducted in Kinshasa and Katanga provinces. This booster sampling strategy was used to obtain a sufficient sample size for indicator estimates within these outlet types.

**What types of outlets are screened?**

Outlets were screened to determine eligibility. Outlets eligible for the survey met at least one of three criteria: 1) one or more antimalarials were in stock on the day of the survey; 2) one or more antimalarials were in stock in the three months preceding the survey; and/or 3) malaria blood testing (microscopy or mRDT) was available. Outlets that do not serve the general public (e.g. military facilities) were excluded from the study.

**How are the outlets identified?**

Among eligible outlets, service providers were interviewed and all antimalarials and mRDTs were audited. The audit collected information about each antimalarial and mRDT in stock (e.g. brand name, drug active ingredients and strengths, manufacturer, etc.) and retailer reports on consumer price and sale/distribution volumes for each product. A representative sample of outlets was identified within target study domains such that findings from the outlet survey provide estimates of antimalarial and mRDT availability, price, and relative market share across the entire market as well as within key market channels.

**How is information on antimalarials and malaria rapid diagnostic tests captured?**

A structured paper questionnaire was used to complete an audit of all antimalarials and mRDT as well as a provider interview. Key informant interviews were conducted with specific stakeholders to supplement information for the DRC background.

**How were data analyzed?**

All data cleaning and analysis was performed using Stata 13.1 (©StataCorp, College Station, TX). Data were weighted to account for variation in probability of outlet selection, and standard error calculation reflected clustering of outlets at health-area and health-zone levels. Standard indicators were constructed according to definitions applied across ACTwatch project countries.
MAP OF KATANGA AND KINSHASA STUDY PROVINCES
Differences in urban and rural areas

In calculating and comparing data between rural and urban sites, the ACTwatch project shows where the public and private sectors are weaker and stronger, and where provinces can target strategies to increase the availability of and access to malaria treatment.

The 2015 Outlet Survey compares 60 rural and 20 urban areas in Katanga and 17 rural and 17 urban areas in Kinshasa. All results are from 2015.

Urban and rural comparison data are shown where findings have significant changes or interesting indicators.

SELECTED CLUSTERS AND BOOSTER AREAS IN KINSHASA PROVINCE
RURAL AND URBAN HEALTH ZONES IN KATANGA PROVINCE
What types of outlets were included?

The study population is defined as all outlets with the potential to sell or distribute antimalarial medicines and/or provide malaria blood testing. The classification of different outlets was based on discussions with national stakeholders to determine appropriate categories of outlets to screen as part of the census approach.

Please note, CHWs were not visited during the 2009 and 2013 DRC outlet surveys but were screened for eligibility in 2015 to capture any recent efforts to equip CHWs with malaria testing and treatment. However, there were often 50 or less CHWs included in the study per category analyzed, so they are not included in most graphs. Full information about CHW findings can be found in the 2015 reference document.

Additionally, only eight pharmacies were screened in Katanga. Given the small sample size estimates for these facilities, they are not presented but are included in the denominator of total private sector.

| Public Health Facilities | (Referral) hospitals, (referral) health centers, health posts, and dispensaries. This category is comprised of government-managed facilities that provide medicines according to prescription. This category also includes any private not-for-profit or for-profit health facilities that are designated by the government as the public health facility for the health area and equipped with a minimum basic package of services and commodities. |
| Community Health Workers | These health workers are community-based volunteers equipped with antimalarial treatment to be provided free of charge. They may be equipped with malaria rapid diagnostic tests. CHWs are considered public-sector outlets. |
| Private Not-For-Profit Health Facilities | Private (referral) hospitals, (referral) health centers, health posts and laboratories, managed by charitable or religious organizations on a non-profit basis. |
| Private For-Profit Health Facilities | Private (referral) hospitals, (referral) health centers, health posts and laboratories, run on a for-profit basis. |
| Pharmacies | Pharmacies are licensed and regulated by the national medical authority (the 3eme Direction), and are staffed by pharmacists and qualified health practitioners. They sell all classes of medicine and are generally located in urban areas. |
| Drug Stores | Drug stores are smaller in size and scope than pharmacies. These facilities are not licensed by the national medical authority. They are sometimes owned or run by staff with primary health qualifications, such as nurses, but are most commonly owned by staff with no health qualification. They are ubiquitous in urban areas in the DRC. |
KLI

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ORDRE DES PHARMACIENS

PHARMACIEN
CNOP 240/85
Phciennne MATA BAKEMBA
Sampling flowchart for Kinshasa province in 2015

Notes for flowcharts:

* Identified as outlets with potential to sell or distribute antimalarials and/or provide malaria blood testing during the census or booster sampling.

** Administered questions to assess current or recent (previous 3 months) availability of antimalarials and malaria blood testing (microscopy or rapid diagnostic test).

*** Indicates total outlets included in the study and where a partial or complete interview was conducted with an outlet representative.
Sampling flowchart for Katanga province in 2015

A
Outlets enumerated*
[1,088]

- Outlets not screened [36]
  - Respondent not available [3]
  - Outlet closed at time of visit [6]
  - Outlet closed permanently [20]
  - Refused [7]

B
Outlets screened**
[1,052]

- Outlets that did not meet screening criteria [16]
- Outlets not interviewed [1]
- Outlet closed at time of visit [1]

C
Outlets that met screening criteria
[1,037]
1 = [993]
2 = [35]
3 = [9]

D
Outlets interviewed***
[1,036]
1 = [993]
2 = [34]
3 = [9]
2.1 results
Market Composition

Relative distribution of outlets stocking antimalarials

This section shows the relative distribution of outlets stocking antimalarials across the public- and private-sector. Results are shown for Kinshasa province in 2009, 2013, and 2015 and Katanga province in 2013 and 2015. All results are for outlets stocking at least one antimalarial.
How does market composition look over time?

The private sector constituted the majority of service delivery points for malaria treatment provision over time in both Katanga and Kinshasa. These figures show that in terms of absolute number of outlets where antimalarial medicines were available, most places were categorized as drug stores. According to the last survey round, drug stores comprised 58.5% of the antimalarial market composition in Katanga and 68.5% in Kinshasa. There were also few changes over time, though in Kinshasa, the antimalarial market composition was comprised of slightly more public health facility service delivery points in 2015 compared to 2009 (8.4% versus 1.3% respectively).

Observing results from the most recent survey round from Katanga, in 2015, one in four antimalarial service delivery points in Katanga were public-sector outlets, including public health facilities (19.6%), CHW (7.1%) and private not-for-profit facilities (1.9%). In contrast, only 8.4% of antimalarial-stocking outlets in Kinshasa were public-sector outlets, and antimalarial-stocking CHWs were very uncommon (1.3%).

Market composition across outlets

![Diagram showing market composition across outlets in Katanga 2015 and 2013](image-url)
How does market composition compare between urban and rural areas?

Drug stores were the most common type of antimalarial-stocking outlet in urban and rural areas of both provinces, and they accounted for over 70% of antimalarial-stocking outlets in urban areas in Kinshasa and Katanga. In rural areas in Kinshasa and Katanga, drug stores accounted for a smaller fraction but were still the most common antimalarial service delivery point, at 49% and 52%, respectively. The public sector accounted for a greater percentage of outlets with antimalarials in rural areas compared to urban areas. In Kinshasa, 30% of antimalarial-stocking outlets in rural areas were public sector compared with 11.4% in urban areas. Similarly in Katanga, more than one in three antimalarial-stocking outlets were public sector in rural areas compared with 11% in urban areas.

Market composition across rural and urban areas

- Public Health Facility
- Community Health Worker
- Private Not For-Profit Facility
- Private For-Profit Facility
- Pharmacy
- Drug Store
- General Retailer

Katanga Urban
N=458

- 72.6%
- 14.0%
- 2.2%
- 8.4%
- 2.8%

Katanga Rural
N=385

- 51.7%
- 25.1%
- 11.2%
- 10.5%
- 1.5%
Antimalarial market composition

### Kinshasa Urban

- **Public Health Facility**: 8.1%
- **Community Health Worker**: 3.3%
- **Private Not For-Profit Facility**: 16.9%
- **Private For-Profit Facility**: 0.5%
- **Pharmacy**: 71.2%
- **Drug Store**:
- **General Retailer**:

### Kinshasa Rural

- **Public Health Facility**: 10.7%
- **Community Health Worker**: 4.4%
- **Private Not For-Profit Facility**: 14.5%
- **Private For-Profit Facility**: 21.3%
- **Pharmacy**: 49.1%
- **Drug Store**:
- **General Retailer**:

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2.2 results
Antimalarial Availability

Availability of 1) any antimalarial among all screened outlets, and 2) different types of antimalarials, among outlets with antimalarials in stock

This section shows the availability of outlets stocking at least one antimalarial among all screened outlets and outlets stocking quality-assured artemisinin-based combination therapy (QA ACT) treatment, and outlets stocking non-quality assured ACT (non-QA ACT) among outlets stocking at least one antimalarial. It also shows the types of QA and non-QA ACT treatment that were audited.
Which outlets stock at least one antimalarial?

There was almost universal coverage of antimalarials in public health facilities in Kinshasa (98.5%) and Katanga (98%) in 2015. Availability of antimalarials among CHWs varied, with universal coverage in Katanga (98%), and lower availability in Kinshasa with one in three CHWs having an antimalarial in stock in 2015. In Kinshasa province antimalarial availability dropped from 100% to 73% in 2015 among private not-for-profit facilities.

The majority of private-sector outlets were stocking antimalarials in 2015 in Kinshasa (88%) and Katanga (91%), but there were notable gaps among private for-profit health facilities (63.4% and 72.1%, respectively). Availability of any antimalarial remained high across survey rounds in drug stores (>90%). In 2009 and 2013, thousands of retail outlets were included during each round but very few were stocking antimalarials. These outlets were subsequently not included in the 2015 survey. This also explains why there is a substantial increase in private-sector availability between 2013 and 2015 given general retailers were not included in the denominator.
Quality-assured ACT

QA ACTs are ACTs with World Health Organization pre-qualification from a manufacturer with “Good Manufacturing Practices” (GMP). QA ACTs include the following:

- Any ACT that appeared on the Global Fund’s indicative list of assured antimalarials prior to data collection
- Any ACTs that previously had C-status in an earlier Global Fund quality assurance policy

What is availability of QA ACT?

Availability of quality-assured ACT (QA ACT) among antimalarial-stocking public health facilities in 2015 was 87% in Kinshasa, as compared with 59% in 2013, and 92% in Katanga, as compared with 71% in 2013. QA ACT availability was much lower in the private sector, particularly in Kinshasa (22%), but relatively higher in Katanga (53%).
**What is availability of non-QA ACT?**

The availability of non-QA ACT increased over time in Kinshasa. Within the public sector, 2015 availability was 39% compared with 23% in 2013 and 20% in 2009. In the private sector, 2015 availability was 83% compared with 82% in 2013 and 61% in 2009. There was a notable increase among drug stores over time: 2009, 73%; 2013, 91%; and 2015, 91%. Availability of non-QA ACTs was generally lower in Katanga over time compared with Kinshasa, but was still 50% in 2015.

**What were types of quality-assured and non-quality assured ACT audited in 2015?**

QA ACT available in the public sector was primarily ASAQ in Katanga (98%). QA ACTs available in the private sector included both ASAQ and AL in Katanga (AL, 42%; ASAQ, 58%). Most non-QA ACTs audited in the public and private sector were tablet formulation, although suspensions accounted for 30% of non-QA ACTs in the public sector and 34% in the private sector.
Types of QA ACT and non-QA ACT audited among public- and private-sector outlets in Kinshasa province in 2015

Quality-assured Public Sector
N=562
- Artemether lumefantrine tablet: 98.8%
- Dihydroartemisinin piperaquine tablet: 1.2%

Quality-assured Private Sector
N=291
- Artemisinin napthoquine tablet: 53.4%
- Artesunate mefloquine tablet: 46.6%

Non-quality-assured Public Sector
N=390
- Artemisinin piperaquine tablet: 36.3%
- Dihydroartemisinin piperaquine tablet: 38.8%
- Dihydroartemisinin piperaquine trimethoprim tablet: 4.8%
- Artemether lumefantrine suspension: 5.1%
- Artesunate sulfadoxine pyrimethamine tablet: 4.3%

Non-quality-assured Private Sector
N=6,999
- Artemisinin piperaquine tablet: 34.6%
- Artesunate amodiaquine tablet: 32.4%
- Dihydroartemisinin piperaquine suspension: 2.9%
- Dihydroartemisinin piperaquine tablet: 7.4%
- Artesunate mefloquine tablet: 9.7%
- Dihydroartemisinin piperaquine SP tablet: 0.2%
- Artemether lumefantrine tablet: 0.4%

Legend:
- = Artemether lumefantrine tablet
- = Artemisinin napthoquine tablet
- = Artesunate amodiaquine tablet
- = Artesunate mefloquine tablet
- = Dihydroartemisinin piperaquine tablet
- = Dihydroartemisinin piperaquine trimethoprim tablet
- = Artemisinin piperaquine tablet
- = Artesunate sulfadoxine pyrimethamine tablet
- = Dihydroartemisinin piperaquine SP tablet
Types of QA ACT and non-QA ACT audited among public- and private-sector outlets in Katanga province in 2015

- **Artemether lumefantrine tablet**
- **Artemisinin napthoquine tablet**
- **Artesunate amodiaquine tablet**
- **Artesunate mefloquine tablet**
- **Dihydroartemisinin piperaquine tablet**
- **Dihydroartemisinin piperaquine trimethoprim tablet**
- **Artemether lumefantrine suspension**
- **Artemisinin piperaquine tablet**
- **Artesunate sulfadoxine pyrimethamine tablet**
- **Dihydroartemisinin piperaquine SP tablet**

Quality-assured Public Sector
- N=801
  - 98.4%
  - 1.6%

Quality-assured Private Sector
- N=706
  - 57.8%
  - 42.2%

Non-quality-assured Public Sector
- N=148
  - 48.4%
  - 28.4%
  - 10.4%
  - 5.5%
  - 3.5%
  - 0.5%
  - 1.6%

Non-quality-assured Private Sector
- N=1877
  - 44.5%
  - 30.6%
  - 7.2%
  - 7.3%
  - 1.8%
  - 3.7%
  - 1.5%
What is the availability of Sulfadoxine Pyrimethamine (SP)?

According to national policy, SP is used for intermittent preventive therapy in pregnancy (IPTp) and administered to all pregnant women during each ANC visit after the first trimester. In 2015, SP was available among fewer than half of antimalarial-stocking health facilities in Kinshasa, including public health facilities (46%), private not-for-profit facilities (43%), and private for-profit facilities (21%). In Katanga, SP availability among these facilities was 46%, 38%, and 35%, respectively. Data trends from Kinshasa suggest an increase in public health facility availability between 2013 (27%) and 2015 (46%), but a decrease among public health facilities in Katanga (2013, 58%; 2015, 46%). SP availability among antimalarial-stocking drug stores was high in Kinshasa (71%) and Katanga (63%) in 2015.
2.3 results
Malaria Diagnostic Availability

Availability of malaria diagnostics, among outlets with antimalarials in stock.

This section summarizes the availability of malaria blood testing among all outlets with at least one antimalarial in stock on the day of the survey or within the past three months.
Which outlets had malaria blood testing available?

The percentage of antimalarial-stocking public health facilities with malaria blood testing available (mRDT or microscopy) increased in Kinshasa from 83% in 2009 to 97% in 2015. In Katanga, testing availability was 76% in 2013 and 87% in 2015. Among private not-for-profit and for-profit facilities, more than 95% in Kinshasa had testing available in 2015. Availability was lower in Katanga for private for profit facilities (57%). Malaria blood testing was rarely available in drug stores in 2015 (Kinshasa 2%; Katanga 10%), and overall private-sector availability in 2015 was very low (Kinshasa, 22%; Katanga, 19%).
Which outlets had malaria microscopy available?

The percentage of antimalarial-stocking outlets with malaria microscopy available remained high over time among public health facilities (2009 83%; 2013 89%; 2015 89%) and private for-profit health facilities (2009, 85%; 2013, 89%; 2015, 89%) in Kinshasa. The availability of malaria microscopy in Katanga was much lower, including among public facilities (2013 45%; 2015 28%) and private for-profit health facilities (2013, 49%; 2015, 23%).

Outlets with malaria microscopy available in Kinshasa province

Outlets with malaria microscopy available in Katanga province
Which outlets had mRDT available?

mRDT availability increased among antimalarial-stocking outlets within most outlet types over time. This includes mRDT scale up in public health facilities within Kinshasa (2009, 4%; 2013, 29%; 2015, 69%) and Katanga (2013, 54%; 2015, 84%). In the private sector, availability increased among private for-profit facilities in Kinshasa (2009, 5%; 2013, 18%; 2015, 31%). Drug store availability remained very low in Kinshasa (1%) and Katanga (10%).
2.4 results
Antimalarial Market Share

Relative sale or distribution of antimalarials in the week preceding the survey

This section summarizes relative market volume (sale/distribution) of antimalarial of adult equivalent treatment doses.
Within the public sector in Kinshasa, QA ACT market share increased from 29% in 2009 to 52% in 2013 and then decreased to 33% in 2015. Within the private sector in Kinshasa, QA ACT market share remained low over time (2009, 2%; 2013, 3%; 2015, 2%). In the private sector in Kinshasa, oral artemisinin monotherapy accounted for 11% of the private-sector market share in 2009, but market share was nearly 0% in 2013 and 2015.

Within the public sector in Katanga, QA ACT market share increased from 49% in 2013 to 57% in 2015. QA ACT market share in the private sector remained low at 21% in 2013 and 22% in 2015.

### Defining antimalarial market share

Provider reports on the amount of the drug sold or distributed during the week preceding the survey were used to calculate market share for the following types of antimalarials: ACT, non-artemisinin therapy, oral artemisinin monotherapy and non-oral artemisinin monotherapy. The volume of each drug distributed is the number of ‘adult equivalent treatment doses’ (AETDs) that were reportedly sold/distributed during the week preceding the survey. Measures include all dosage forms (tablet and non-tablet).
Though a slight decline was observed over time, the private sector distributed the majority of antimalarials in Kinshasa (2009, 96%; 2013, 97%; 2015, 86%) and Katanga provinces (2013, 86%; 2015, 74%). The most commonly distributed antimalarials over time were non-artemisinin therapies, namely SP. In 2015, non-artemisinin therapy accounted for 46% market share in Kinshasa and 45% in Katanga. Though ACT market share remained stable between 2013 and 2015, QA ACT market share remained relatively low over time, and accounted for only 7% of the market share in Kinshasa in 2015 and 31% in Katanga.

Relative antimalarial market share by antimalarial class across the public and private sector in Kinshasa province

![Graph showing relative antimalarial market share by antimalarial class across the public and private sector in Kinshasa province.]

Relative antimalarial market share by antimalarial class across the public and private sector in Katanga province

![Graph showing relative antimalarial market share by antimalarial class across the public and private sector in Katanga province.]

What are differences in antimalarial market share by class and outlet type?

In 2015, the private sector accounted for 86% of the antimalarial distribution in Kinshasa. This market share was captured primarily by drug stores (80%).

In 2015, the private sector accounted for 74% of the antimalarial distribution in Katanga. This market share was captured primarily by drug stores (61%).
What are differences in antimalarial market share by urban and rural areas?

Private-sector antimalarial market share was higher in urban compared to rural areas in Kinshasa (88%, 75%) and Katanga (90%, 59%). In rural areas, QA ACT market share was 16% in Kinshasa and 47% in Katanga, as compared with lower QA ACT market share in urban areas of Kinshasa (5%) and Katanga (14%).

Non-quality assured ACT market share was higher in urban versus rural areas of Kinshasa (40%, 26%) and Katanga (37%, 6%).

Relative antimalarial market share by antimalarial class across urban/rural location in Kinshasa province

Relative antimalarial market share by antimalarial class across urban/rural location in Katanga province
2.5 results
Private-sector Price

Median price for malaria testing and treatment in the private sector

This section presents median private-sector price for mRDT and antimalarial AETD, or the amount of medicine needed to treat a 60-kg adult.
How did private-sector prices compare among treatments?

The 2015 private-sector median price for one AETD of QA ACT was 12 times more expensive than one AETD of SP in Kinshasa ($3.96 QA ACT; $0.34 SP). In Katanga, one AETD of QA ACT in 2015 ($1.20) was four times more expensive than SP ($0.30). QA ACT was more expensive than non-QA ACT in 2015 in Kinshasa ($3.96 versus $3.01), and QA ACT was less expensive than non-QA ACT in Katanga ($1.20 versus $3.44). While the price of QA ACT remained similar over time in Katanga, the 2015 price was three times higher than the 2013 price in Kinshasa.

Additionally, mRDT testing was the same price in private for-profit facilities and drug stores in Kinshasa and Katanga ($1.10) for both children and adults in 2015 U.S. dollars.
2.6 results
Provider Knowledge

Provider knowledge of first-line treatment for malaria

This section addresses provider knowledge about the first-line treatments for malaria: ASAQ and AL. Providers at outlets with at least one antimalarial in stock on the day of the survey or within the past three months were asked to cite the first-line treatment for malaria.
Do providers know the first-line treatment for uncomplicated malaria?

According to national policy in the DRC, first-line treatments for uncomplicated malaria are ASAQ and AL. Across nearly all outlet types, data trends suggest an increase in the percentage of providers who correctly stated a first-line treatment for uncomplicated malaria between 2013 and 2015. In 2015, knowledge was higher in the public sector than the private sector in both Kinshasa and Katanga provinces, but slight improvements were noted across both sectors.

Provider knowledge within public health facilities was higher in Katanga (83%) versus Kinshasa (65%); however, this reflected an increase in Kinshasa from 42% in 2013. Provider knowledge was lowest among drug stores in Kinshasa (14%) and Katanga (29%), where most antimalarials were distributed.

For comparability purposes, only data for 2013 and 2015 are shown as the first-line treatment (ASAQ and AL) was the same for those years, yet different in 2009.
Percentage of providers who correctly stated the first-line treatment for uncomplicated malaria in Katanga province.
discussion
Summary
The latest Outlet Survey shows a high readiness for the public sector to manage malaria cases. By 2015, ~90% of public health facilities in Kinshasa and Katanga had QA ACT in stock. This high QA ACT availability was an improvement over Kinshasa’s lower stock levels in 2009 and 2013. Additionally, the majority of QA ACT in the public sectors in Kinshasa and Katanga was ASAQ tablets—the first-line treatment for uncomplicated malaria. In terms of malaria diagnostic capacity, around 90% of public health facilities had malaria testing available (mRDT or microscopy), and this has increased substantially over time, driven mainly by increases in mRDT. The high degree of readiness for malaria case management among public health facilities in Kinshasa and Katanga was observed in both urban and rural areas.

However, lower readiness was observed in 2015 for IPTp given that less than half of the antimalarial-stocking public health facilities and private not-for-profit facilities had SP available. Maintaining a constant supply of SP in the public sector will be critical to ensure appropriate case management of pregnant women.

The private sector plays an important role in antimalarial distribution in Kinshasa and Katanga, with over 85% of antimalarials distributed by this channel in Kinshasa and 74% in Katanga in 2015. While the public sector had a slightly larger market share in rural versus urban areas, even in rural areas, most antimalarials were distributed by the private sector, suggesting the importance of continued engagement with this channel. Most antimalarials were distributed by drug stores in both provinces (80% in Kinshasa and 60% in Katanga) illustrating the importance of these private-sector outlets as a source of care. Continued engagement with these private-sector outlet types may be the most effective way to ensure adherence to national treatment guidelines in the private sector.

In 2009, more than 10% of the private-sector market share in Kinshasa was comprised of oral artemisinin monotherapy. By 2015, oral artemisinin monotherapy had disappeared from Kinshasa’s public and private sector, demonstrating the successful enforcement of the ban on this antimalarial medicine.

Availability of malaria blood testing was low in the private sector and had not increased over time. In 2015, around one in five private-sector outlets had malaria testing available (Kinshasa, 22%; Katanga, 19%), and this was most commonly present in private for-profit facilities. In drug stores, where most antimalarials are distributed, availability of testing was around 10% in Katanga and it was negligible in Kinshasa. Sub-optimal fever case management practices in the private sector will be important to further examine and address to ensure continued progress toward ensuring that all malaria cases are detected and treated according to national policy. Limited availability of malaria testing in the private sector is a likely barrier to increasing coverage of confirmatory testing prior to treatment given the high relative antimalarial market share for the private sector.
Strategies to increase access to diagnostic testing among drug stores will be an important means to promote confirmatory testing prior to treatment.

Other challenges to QA ACT uptake persist. These include the availability and use of SP for case management in the private sector. One in every four antimalarials distributed by the private sector in 2015 was SP. While SP should continue to account for a portion of the anti-malarial market share because SP is recommended for IPTp, the persistent substantial SP market share is cause for concern. Continued use of SP likely include management of fever/malaria in people of all ages given the widespread availability and distribution of products. The persistent high relative market share for SP in the private sector in both Kinshasa and Katanga suggests ongoing high demand for this medicine, despite discontinuation of its use for case management due to drug resistance. The relatively low price of SP relative to ACT is likely to be a contributing factor to ongoing availability and distribution. Low provider knowledge of the first-line treatment in the private sector may also explain why SP is commonly distributed.

Less than one third of the antimalarials distributed in DRC were QA ACT, and this was exceptionally low in Kinshasa where only 6% of the market share was comprised of QA ACT. A key change in the antimalarial market observed in Kinshasa and Katanga was the availability and distribution of ACT that was not quality-assured according to global manufacturing standards. Non-QA ACT was previously observed in baseline studies, but increases were observed over time across the private sector in both Kinshasa and Katanga, and across Kinshasa’s public sector. In 2015, non-QA ACT accounted for one-fifth of all antimalarial distribution in Katanga and almost 40% in Kinshasa, namely through the private sector. Kinshasa’s widespread distribution may in part be explained by very low availability of QA ACT relative to other antimalarials, as well as price differentials between QA ACT and non-QA ACT. Availability and use of these non-quality-assured treatments must be closely monitored given the threat that substandard combination therapies pose to artemisinin drug efficacy.
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WHAT IS ACTWATCH?
ACTwatch is a multi-country research project designed to provide timely, relevant, and high quality antimalarial market evidence. Launched in 2008 with funding from the Bill and Melinda Gates Foundation, it is currently implemented in 13 countries with additional funding from UNITAID and the DFID. Standardized tools and approaches are employed to provide comparable data across countries and over time.

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