ACTwatch

Evidence for Malaria Medicines Policy

A Qualitative Assessment of the Private Sector Antimalarial Distribution Chain in Nigeria, 2009

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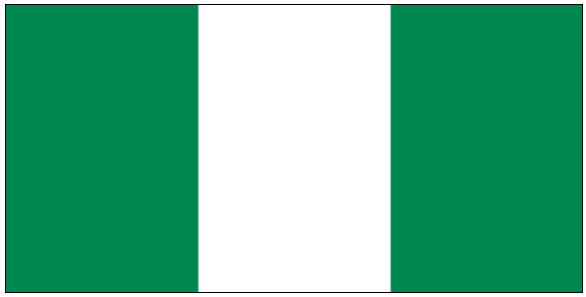

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Contents

Definitions

Antimalarial: Any medicine recognized by the WHO for the treatment of malaria. Medicines used solely for the prevention of malaria were excluded from analysis in this report.

Artemisinin and its derivatives: Artemisinin is a plant extract used in the treatment of malaria. The most common derivatives of artemisinin used to treat malaria are artemether, artesunate, and dihydroartemisinin.

Artemisinin monotherapy (AMT): An antimalarial medicine that has a single active compound, where this active compound is artemisinin or one of its derivatives.

Artemisinin-based Combination Therapy (ACT): An antimalarial that combines artemisinin or one of its derivatives with an antimalarial or antimalarials of a different class. See toocombination therapy.

Combination therapy: The use of two or more classes of antimalarial drugs/molecules in the treatment of malaria that have independent modes of action.

Distribution chain: The chain of businesses operating from the factory gate/port of entry down to the retail level. Also sometimes referred to as downstream value chain. In this report, the terms distribution chain and supply chain are used interchangeably. More specifically, the 'private commercial sector distribution chain' refers to any type of public or private wholesaler who served private commercial outlets, as well as private commercial wholesalers who served public sector or NGO outlets so that any transactions between public, NGO and private commercial sectors are noted.

First-line treatment: The government recommended treatment for uncomplicated malaria. Nigeria's first-line treatment for *Plasmodium falciparum* malaria is artemether-lumefantrine, 20mg/120mg, with artesunate-amodiaquine (4mg/10mg/kg) as an alternative first-line treatment.

Mark-up: The difference between the price at which a product is purchased, and that at which it is sold. Sometimes also referred to as margin. In this report, the terms mark-up and margin are used interchangeably. May be expressed in absolute or percent terms. Because it is common for wholesalers to vary their prices with the volumes they sell, minimum, mid-point and maximum mark-ups were calculated in this report using price data collected from interviewees. Key findings on price mark-ups at the wholesale level are reported using mid-point mark-up data. As maximum and minimum selling prices were not collected at the retail level, only one set of absolute and percent retail mark-ups is calculated.

> **Absolute mark-up**: The absolute mark-up is calculated as the difference between the selling price and the purchase price. In this report, absolute mark-ups are reported in US dollars.
>
> **Percent mark-up**: The percentage mark-up is calculated as the difference between the selling price and the purchase price, divided by the purchase price.

Monotherapy: An antimalarial medicine that has a single mode of action. This may be a medicine with a single active compound or a synergistic combination of two compounds with related mechanisms of action.

Non-artemisinin therapy (nAT): An antimalarial treatment that does not contain artemisinin or any of its derivatives.

Non-WHO-prequalified ACTs: ACTs that do not meet acceptable standards of quality, safety and efficacy as assessed by the WHO Prequalification of Medicines Programme, or have yet to be assessed as such. (See WHO-prequalified ACTs below)

Oral artemisinin monotherapy: Artemisinin or one of its derivatives in a dosage form with an oral route of administration. These include tablets, granules, suspensions, and syrups and exclude suppositories and injections.

Outlet: Any point of sale or provision of a commodity to an individual. Outlets are not restricted to stationary points of sale and may include mobile units or individuals.

Purchase price: The price paid by businesses (i.e. wholesalers or outlets) for their most recent purchase of an antimalarial product from their suppliers. This is different from selling price (see below). Prices are shown in US dollars.

Rapid-Diagnostic Test (RDT) for malaria: A simple test that does not require the use of microscopy used to confirm the presence of malaria parasites in a patient's bloodstream.

Selling price: The price paid by customers to purchase antimalarials. For outlets, these customers are patients or caretakers; for wholesalers, these customers are other businesses or health facilities.

Treatment/dosing regimen: The posology or timing and number of doses of an antimalarial used to treat malaria. This schedule often varies by patient weight.

WHO-prequalified ACTs: ACTs that meet acceptable standards of quality, safety and efficacy as assessed by the WHO Prequalification of Medicines Programme. This is a service provided by WHO to guide bulk medicine purchasing of international procurement agencies and countries for distribution in resource limited settings, often using funds for development aid (e.g. Global Fund grants). More details on the list of prequalified medicines and the prequalification process may be found on the WHO website at: http://www.who.int/mediacentre/factsheets/fs278/en/index.html.

Wholesalers: Businesses that supply other businesses, which may include retailers or other wholesalers. In this report, wholesalers are classified further into more specific categories defined by the type of businesses that they supply. As some wholesalers will supply different types of businesses (e.g. both retail outlets and other wholesalers), these categories are not mutually exclusive and such wholesalers may appear in multiple categories. These are defined below.

> **Terminal wholesalers:** Wholesalers that supply retail outlets *directly*.
>
> **Intermediate wholesalers**: Wholesalers that supply other wholesalers *directly*.
>
> **Primary or top wholesalers**: Wholesalers that import and/or receive supplies *directly* from manufacturers.

Abbreviations

ACT	artemisinin-based combination therapy
AETD	adult equivalent treatment dose
AL	artemether lumefantrine
AMFm	Affordable Medicine Facility - malaria
AMT	artemisinin monotherapy
ASAQ	artesunate-amodiaquine
ASMQ	artesunate and mefloquine
CMS	Central Medical Stores
CQ	chloroquine
DHA	dihydroartemisinin
DHA+PP	dihydroartemisinin and piperaquine
FMOH	Federal Ministry of Health, Nigeria
INT	intermediate level (wholesaler of supply chain)
IPT	intermittent preventive treatment of malaria
IQR	inter-quartile range
IRS	indoor residual spraying
ITN	insecticide treated net
LSHTM	London School of Hygiene & Tropical Medicine
MEC	mutually-exclusive category of wholesalers
MQ	mefloquine
NAFDAC	National Agency for Food and Drug Administration and Control
nAT	non-artemisinin therapy
NGN	Nigerian Naira
NGO	non-governmental organisation
NMCP	National Malaria Control Programme
OS	ACTwatch Outlet Survey
OTC	over-the-counter
PCN	Pharmacists Council of Nigeria
Pf	*Plasmodium falciparum*
PMG-MAN	Pharmaceutical Manufacturers Group of the Manufac. Assoc. of Nigeria
POM	prescription only medicine
PPS	probability proportional to size
PPMV	Proprietary Patent Medicines Vendor
PSI	Population Services International
RDT	rapid diagnostic test
RMM	role-model mothers
SFH	Society for Family Health, Nigeria
SP	sulphadoxine pyrimethamine
VAT	value added tax
WHO	World Health Organization
WS	wholesaler

Executive Summary

In Nigeria, as in many low-income countries, private commercial providers play an important role in the treatment of malaria. To design effective interventions for improved access to accurate diagnosis and effective malaria treatment, there is a need to understand retailers' behaviour and identify the factors that influence their stocking and pricing decisions. Private commercial retailers are the last link in a chain of manufacturers, importers and wholesalers, and their supply sources are likely to have an important influence on the price and quality of malaria treatment that consumers can access. However, there is limited rigorous evidence on the structure and operation of the distribution chain for antimalarial drugs that serves the retail sector.

The ACTwatch Supply Chain Study, one of the ACTwatch project components, aims to address this gap by conducting quantitative and qualitative studies on distribution chains for antimalarials in the ACTwatch countries (Nigeria, Cambodia, Benin, the Democratic Republic of Congo, Madagascar, Uganda and Zambia). This report presents the results from qualitative interviews with antimalarial drug wholesalers, retailers and other key stakeholders conducted in Nigeria between July and September 2009. A summary of the key findings isgiven below. To provide a complete description of the supply chain for antimalarial drugs in Nigeria, this report should be read in conjunction with the report on the results of the quantitativesupply chain survey also conducted as part of this study [1], available at www.actwatch.info.

- The market for antimalarials constitutes an important segment of the overall private commercial pharmaceutical sector in Nigeria. For many wholesalers and retailers, antimalarial sales were viewed as key revenue generators and important components of their product portfolios.
- Alongside the more conventional types of private sector pharmaceutical traders, such as registered importers, wholesalers and pharmacies, specialised market vendors operating within traditional open-air markets were regarded as important actors in the wholesale and retail of antimalarials.
- ACTs were generally recognised as effective treatments and many wholesalers chose to stock them; but their high price relative to other antimalarials and problems with availability constrained demand for these products. As such, many older, less expensive antimalarials, such as chloroquine and SP remained very popular, which is a key factor behind the stocking decisions of both wholesalers and retailers. Although many were aware of Rapid Diagnostic Tests (RDTs), they were not demanded by customers and were therefore not commonly stocked.
- Because the sale of antimalarials was viewed as a lucrative endeavour, the wholesale and retail markets for these products werevery competitive, as demonstrated by a number of characteristics. Stocking decisions were overwhelmingly driven by demand, rather than by other product attributes such as quality and reputation; firms were decidedly price-takers (i.e. were obliged to charge the market price), rather than price-setters; and businesses commonly employed a diverse range of marketing and distribution strategies to maintain and expand their market shares.
- The potential for profit, along with a perceived lack of adequate regulatory oversight, was a key factor sustaining the parallel market for antimalarial medicines, which is largely composed of businesses operating in traditional open-air markets that engage in either wholesaling or retailing activities without possessing the necessary license to do so. As a result, the distinction between retailer and wholesaler was not always clear. Issues with regulatory compliance and enforcement also led many to have

concerns about the prevalence of counterfeit and substandard antimalarials that could potentially put consumers at risk.

- There were several organisational features of private sector distribution chain for antimalarials in Nigeria that reflect its specialisation and sophistication. The use of vertically integrated distribution infrastructure and third-party logistics service providers was common among manufacturers and importers to achieve wide geographic coverage of their products. This was enhanced through the pervasive use of sales representatives deployed for both product marketing as well as for order taking and delivery. Authorised distributorship arrangements between top-level suppliers and wholesalers, which use a variety of incentives to increase product volume flowing through the distribution chain, were also a prominent feature of distribution practices.
- Specialised trade associations were also a common feature of the private sector distribution chain in Nigeria. These associations performed a number of different functions, which sometimesincluded a mechanism for collective representation or quasi-self-regulation, but also served as a valued source of industry-specific information and training. As such, many wholesalers and retailers chose to be members of these trade associations.

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1. Introduction & Objectives

In Nigeria, as in many low-income countries, private commercial providers play an important role in the treatment of malaria. To design effective interventions for improved access to accurate diagnosis and effective malaria treatment, there is a need to understand retailers' behaviour and identify the factors that influence their stocking and pricing decisions. Private commercial retailers are the last link in a chain of manufacturers, importers and wholesalers, and their supply sources are likely to have an important influence on the price and quality of malaria treatment that consumers can access. However, there is limited rigorous evidence on the structure and operation of the distribution chain for antimalarial drugs that serves the retail sector.

This study aims to address this gap and constitutes an integral part of the ACTwatch project, a multi-country programme of research being conducted in Nigeria, Benin, Cambodia, the Democratic Republic of Congo Madagascar, Uganda and Zambia. The overall goal of ACTwatch is to generate and disseminate evidence to policy makers on artemisinin-based combination therapy (ACT) availability and price in order to inform the development of policies designed to increase rates of access to effective malaria treatment. Along with the Supply Chain Study, the ACTwatch project also includes Outlet and Household Surveys led by PSI and the Society for Family Health (SFH) in Nigeria.

The objective of the Supply Chain component of ACTwatch is to document and analyse the supply chain for antimalarials and rapid diagnostic tests (RDTs) for malaria using quantitative (structured survey) and qualitative (in-depth interviews) methods for studying providers operating at each level of the chain. This report presents the results from qualitative interviews with antimalarial drug wholesalers and other related key stakeholders conducted in Nigeria between July and September 2009. In order to provide a complete description of the supply chain for antimalarial drugs, this report should be read in conjunction with the report on the results of the quantitativesupply chain survey also conducted as part of this study[1], available at www.actwatch.info.

2. Country Background

Economic Profile

Nigeria is Africa's most populous countryand the eighth largest in the world with an estimated population of 155.2 million. [2] Located in West Africa, it is bordered by Niger in the north, Benin to the west, and Cameroon and Chad in the east. It is made up of six geopolitical zones, 36 states (plus the Federal Capital Territory of Abuja), and 774 Local Government Authorities (LGAs).State governments have substantial autonomy and exercise considerable authority over the allocation and utilization of their resources, limiting the influence of the federal government over state and local government affairs.[3]Since gaining independence from Britain in 1960, Nigeria has become one of the largest oil producing countries in the world and the national economy is dependent on the petroleum industry, which generated 85% of government revenue and over 90% of export earnings in 2006. [4] Driven mainly by rising oil prices, GDP growth since 2008 has been relatively strong ranging from 6 to 8.4%, and in 2010, GDP per capita was US$ 1222, categorising the country as a lower middle income country according to the World Bank.[5]However, Nigeria's oil wealth has not been well distributed throughout the population, and large income inequality persists. For example, despite generating over one-fifth of the national GDP in 2006, the petroleum industry

only employed a small fraction of the national labour force, while agriculture, in comparison, employed nearly 70% of the population and accounted for around 40% of GDP[4]. In 2010, more than two-thirds of Nigerians were living on less than $1.25 per day (adjusted for purchasing power parity). [5]

To address these issues, in 2004 Nigeria launched its National and State Economic Empowerment and Development Strategies (NEEDS and SEEDS) for growth and poverty reduction based on 3 pillars: (i) empowering people and improving social service delivery; (ii) improving the private sector and focusing on non-oil growth; and (iii) changing the way government works and improving governance. This was followed in 2007 by President Yar'Adua's 7-point agenda focussing on power and energy; food security and agriculture; wealth creation and employment, mass transportation, land reforms; security; qualitative and functional education and pursuance of the rule of law.[4] While some progress has been made since 2004, particularly in the areas of economic stability, procurementand financial sector reform, much remains to be done. For example, from 2009 to 2010, Nigeria's ranking in the World Bank's ease of doing business report decreased from 134th to 137th out of a list of 183 countries [5], and it was ranked 134th out of 178 countries in Transparency International's Corruption Perception Index in 2010. [6] Nigeria has some of the worst social indicators: in 2009, life expectancy at birth was 51 years, nearly 1 out of every 6 children died under the age of 5, and only 61% of the adult population was literate. [5]

Pharmaceutical Sector

The pharmaceutical sector in Nigeria is regulated by two government agencies: the National Agency for Food and Drug Administration and Control (NAFDAC) is responsible for regulating the importation, export, manufacture, advertisement, distribution, sale and use of drugs, cosmetics, medical devices, bottled water and chemicals, and undertakes activities to ensure the quality and safety of such products, including registration and inspection of imported, exported and manufactured products [7]; while the Pharmacists Council of Nigeria (PCN)regulates the practice of pharmacy in all regards, including training and registering of pharmacists and pharmacy technicians, and the inspection and monitoring of premises where pharmaceutical activities, such as dispensing, wholesaling and retailing, take place. [8] The PCN issues different licenses for the manufacturing, importing, wholesaling (for authorised distributors and wholesalers) and retailing of pharmaceuticals; and in order to obtain each of these licenses, the business must be registered with the Corporate Affairs Commission anda registered pharmacist must be attached to the business as the superintendent pharmacist, or as an owner in the case of retail pharmacies. [8] Drug shops that are only permitted to sell a limited range of over-the-counter medicines (OTCs), known as Proprietary Patent Medicine Vendors (PPMVs), must also obtain a license from the PCN in order to operate; however, PPMVs are not required to have a pharmacist attached to the business.

Regulatory capacity is limited in Nigeria, and as such, prescription only medicines are sometimes sold over-the-counter without a prescription. [9] It is also widely recognised that while only authorised to stock OTC medicines, PPMVs usually stock all types of drugs, diagnose, prescribe, dispense and even administer injections. [10] Drug counterfeits also pose a significant challenge to regulation of the sector and patient safety. [11] Lastly, the prices of medicines are not regulated in Nigeria. [9]

Although the range of licensed retail outlets is limited to pharmacies and PPMVs, the 2009 ACTwatch Outlet Survey revealed that patients may access antimalarials through a diverse range of private sector outlet types. The most common private outlet type stocking antimalarials was found to be PPMVs (81%), followed by general retailers (9%), then private for-profit health facilities (3%). Registered pharmacies were the least

common formal source of antimalarials in the private sector at 1%, and itinerant medicine vendors accounted for another 1%. The remaining outlets were in the public and not-for-profit sector, with health facilities in these sectors accounting for around 4% of all outlets stocking antimalarials, and community health workers another 1%. [12]This reflects the large overall role that the private sector plays in providing health services: For example, in the period 1999-2001, although only 2% of tertiary hospitals were private, 72% of secondary and 35% of primary health facilities were private. A household survey carried out by the Federal Ministry of Health (FMOH) found that 56% of respondents who were ill in the previous two weeks purchased drugs from a private seller compared to 35% who obtained drugs from a public health facility. [3]

In the public sector, pharmaceutical procurement and distribution in Nigeria is both centralised and decentralised depending on the disease area. Most medicines are procured and stored by individual health care institutions, while medication for HIV, malaria and tuberculosis are centrally procured and distributed from the federal Central Medical Store (CMS). [9] Each state also has its own CMS, and procures and stores pharmaceuticals for their public facilities. [10]

Malaria Epidemiology and Control Strategies

Nigeria's geographic location creates a suitable climate for malaria transmission throughout the entire country, apart from the mountainous areas located in Plateau State. There are five ecological strata from South to North (mangrove swamps, rainforest, Guinea-, Sudan- and Sahel-savannah) where the duration of thetransmission season decreases from perennial in most of the South to 3 months or less inthe border region with Chad. [3]The dominant malaria parasite species is *Plasmodiumfalciparum* (*Pf*).It is estimated that approximately 30% of the population live inareas of high to very high transmission intensity and 67% inthe moderate transmission zone and that a total of 70-110 million clinical cases of malaria occur each year. In 2009, the number of deaths due to malaria was estimated to be around 300 000 among children under 5 years of age and malaria was responsible for 11% of all maternal deaths. [3]Malaria prevention activities to date have focussed on integrated vector management targeting children and mothers, with a strong emphasis on improving ITN coverage.

National Treatment Policy

In 2004, artemether-lumefantrine (AL) 20mg/120mg was adoptedto replace chloroquine as the first-line treatment for uncomplicated malaria by the National Malaria Control Program (NMCP), and artesunate+amodiaquine (ASAQ) was included at a later date as an alternative.According to the treatment policy, severe malaria is to be treated at tertiary health facilities while 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 artemisinin monotherapy (AMT) has been banned in Nigeria since 2006[13], although it is still widely available. [12]

The treatment policy includes parasitological confirmation for suspected cases of malaria where facilities exist, with the exception of children under-five who should be treated based on clinical diagnosis. Parasitological confirmation is not required as a pre-condition for initiating treatment for those with suspected severe malaria. The treatment policy acknowledges that laboratory facilities are not available at primary level and that they may not be available even at secondary level. The policy states that use of RDTs is desirable where microscopy does not exist; however, RDTs are not widely available. [14] For example, the 2009 ACTwatch Outlet Survey found that although diagnostic testing was available at 27.5% of public health facilities, 86.1% of private not-for profit health facilities and 37.0% of private for-profit health facilities, this

consisted of mostly microscopy, and that the availability of any diagnostic tests in other types of outlets, such as pharmacies and drug stores, was less than 3%. [12]

Antimalarial Treatment Distribution and Delivery

As noted above, patients access treatment for malaria through the public sector and a diverse range of private sector outlets. According to policy, ACTs should be provided free of charge via the public sector and non-profit health facilities, including community health extension workers (CHEW) associated with public health facilities. [9]Prior to the introduction of national scale ACT subsidies under AMFm in 2010, another subsidy programme run by SFH and funded by the Global Fund had made paediatricdoses of ASAQ available since 2008 through private sector health facilities, pharmacies and PPMVs in 18 of the 36 states and the Federal Capital Territory. These products, with brand names Arsuamoon and Larimal,were sold for a wholesale purchase price of 5 NGN (US$ 0.03) per treatment with an approved retail price set at 30 NGN (US$ 0.20). To ensure that the target retail price was achieved and also to minimise leakage of the subsidised product outside of programme areas and target retail outlet types, SFH chose to bypass private sector wholesalers and distributed these subsidised products directlyto target outlets in the participating states from their own warehouses and only in limited quantities (e.g. PPMVs were permitted to purchase 2 packages from SFH per transaction). Subsidised ASAQ was also distributed through several civil society partners (Africare Nigeria, Errand Express, Planned Parenthood Federation of Nigeria) strategically selected by SFH in order to improve coverage in underserved rural areas.

In 2007, a total of 17.5 million doses of ACTs (AL and ASAQ) were distributed in the public and NGO sectors or sold in the private sector at subsidised prices through SFH. While this represents notable progress compared to 2006 when less than half of this volume was distributed, it still only providedtreatment for about 25% of the estimated number of malaria cases. [3] In 2005, 0.1% of under-5 children were promptly treated with ACT [3], and by 2010, this figure had increased to 3.2% [15]-- both well below the coverage target of 80%. As such, considerable effort has been made to improve access to treatment at community level as part of the broader aim to improve overall case management. This has included pilot studies on home management of malaria fever and on the use of role-model mothers, and the World Bank Malaria Control Booster Project that focuses not only on improving access to prevention, treatment and RDTs in the public sector in 7 states, but also improving procurement and logistics, monitoring and evaluation, and coordinationacross programmes and jurisdictions. [16]However, as in many other developing countries, care for a large proportion of febrile children in Nigeria is first sought from the private sector. The ACTwatch Household Survey conducted in 2009 found that 45.5% of such care was initially sought from private providers at health facilities (7.1%), pharmacies or PPMVs (27.1%). [17]

3. Methods

3.1. Scope of the supply chain survey

The Supply Chain Study was conducted amongst wholesalers who operated in the private commercial distribution chain that served the antimalarial drug retailers described in the ACTwatch Outlet Survey report. [12] The term 'private commercial sector distribution chain' refers to any type of supplier (e.g. public or private) who served private commercial outlets as well as private suppliers who served public and NGO outlets, and the focus of the study is on suppliers who operate from the point where commodities leave the factory gate or port of entry down to those directly supplying retailers. Overall, the study consisted of two

components: (i) a cross-sectional structured survey that collected data on the structure of the private commercial sector supply chain for antimalarial drugs, wholesaler characteristics and business practices, wholesale outlet licensing and inspection, wholesaler knowledge, qualifications and training; and wholesale availability, purchase prices and mark-ups for antimalarials and rapid diagnostic tests, and (ii) qualitative interviews with a subset of wholesalers and retailers included in the structured survey, and other key stakeholders relevant to the operation of the private commercial sector distribution chain for antimalarials and RDTs. The report presents the results from the second component. The methods and results from (i) the structured survey of wholesalers are described in a separate report [1]that can be found on the ACTwatch website at www.actwatch.info.

3.2. Sampling & data collection procedures

3.2.1. Key Informant Interviews (KIIs)

These interviews were conducted with important public and private sector stakeholders situated at the top of the supply chain, such as government officials involved in the delivery and funding of health care, and in the regulation of drugs and business; the most significant antimalarial importers and wholesalers; and representatives of organizations such as associations of wholesale pharmacists or pharmaceutical manufacturers. Key informants in the country were identified through a comprehensive review of relevant documents and through consultation with actors familiar with the country's supply chain.

Using a semi-structured interview guide, the participant was asked questions about the overall antimalarial and RDT supply chains for the country, and their own role in these; broad estimates of the number of suppliers at each level; and their perceptions of key factors affecting supply and the effectiveness of regulation. Interviews were conducted by a member of the research team and notes were taken by a trained research assistant.

3.2.2. In-Depth Interviews (IDIs)

In-depth interviews (IDIs) were conducted within a sub-set of antimalarial providers sampled as part of the structured supply chain survey and the ACTwatch Outlet Survey. The IDI method was chosen to facilitate collection of data on complex issues, subjective perceptions and opinions of staff, and the exploration of sensitive commercial and regulatory issues, which are not readily addressed using quantitative methods. To ensure inclusion of a diverse mix of businesses, respondents were purposively sampled from a range of commercial hubs across the country, from various trading environments (e.g. inside and outside of traditional markets), across various settings (e.g. urban, rural, accessible, remote) andacross various levels of the supply chain, from retail level to the top of the supply chain. Wholesalers were then classified into three different categories for analysis: (i) primary wholesalers at the top of the supply chain (i.e. importers or those who are supplied directly by manufacturers); (ii) intermediate wholesalers (i.e. wholesalers that supply other wholesalers); and (iii) terminal wholesalers (i.e. wholesalers that supply retailers). For the retailers and terminal wholesalers, participants were further classified according to location: (i) remote, (ii) moderately accessible, and (iii) accessible. Retailers were also selected to ensure some variation in outlet type (e.g. registered pharmacy, PPMV, private clinic).

Interviews were conducted with the person in the business most informed about antimalarial trade by a member of the research team and notes were taken by a trained research assistant. Using a semi-structured interview guide, the participant was asked questions about key aspects of market structure (e.g.

horizontal/vertical integration); key aspects of provider conduct (e.g. transport of drugs, credit, source and cost of capital, marketing techniques, vertical restraints, how prices are set, competition and collusion, how stocking and supplier choices are made, perceptions of the appropriateness of regulations and the enforcement capacity of authorities); cost structure; and the role of antimalarials in their portfolio (i.e. how do they compare to other product groups in terms of mark-up and share of sales values).

3.2.3. Data collection procedures

Both types of interviews used an information sheet and a consent form. All data collection tools were provided in English, piloted by trained data collectors, and further revisions were made to adapt the tools to the specificities of the Nigerian context. Before each interview, the researcher provided the information sheet, stated their name, the institutions involved, aims of the study, nature of questions to be asked and length of the interview. Each respondent was given the opportunity to ask questions at any time before, during and after the interview, and received the contact details of the local research coordinator. Interviewers then invited respondents to participate in the study and obtained written consent, or where this was not possible, oral consent was obtained and witnessed by a member of the research team. Interviewers emphasized that individual information was confidential and that no information would be passed on to regulatory authorities or competitors.Information from KIIs and IDIs was supplemented by review of relevant documents on antimalarial regulation and policy.

3.3. Data analysis

3.3.1. Interviews conducted

In total,9 key informant and 30in-depth interviews were conductedin Nigeria(Table 3.1).

Table 3.1: Number of in-depth interviews across distribution chain levels

Business type/Distribution chain level	Number of interviews
Retailer*	4
Terminal-level wholesaler	10
Intermediate-level wholesaler	10
Primary or top-level wholesaler	6
Total	30

*Retailers in this category included a private clinic, a registered pharmacy and two PPMVs located in relatively remote areas. Other registered pharmacies and PPMVs operating in moderately accessibly and accessible areas were also interviewed, but were included among terminal- and intermediate-level wholesaler categories because these businesses were also known to wholesale.

3.3.2. Analytical approach

One or two team members read all interview notes to identify the main themes or experiences identified by respondents. An initial coding structure was developed based on the research questions and existing literature, which was then applied to interview notes and revised as analysis proceeded. All interviews for a given country were coded by a single member of the research team, but to ensure consistency of codes applied by different team members across different countries, co-coding exercises were conducted at the beginning of the coding process where two researchers independently coded a minimum of 5 interview

transcripts which were then compared. Any discrepancies were discussed and agreed between coders. Coding and analysis was conducted using NVIVO software.

4. Results

4.1. Market Structure

During the interviews, wholesaler and retailer respondents were asked a range of questions about the general structure of the distribution chain for antimalarials. Specific topics included the range of products, sellers and buyers at different levels of the chain; barriers to entering the pharmaceutical market; competition; and integration within the chain, such as vertical integration (i.e. where a single enterprise operates related businesses at different levels of the distribution chain, as in the case of a domestic manufacturer supplying wholesalers operated by the same owner) and horizontal integration (i.e. where a single enterprise operates more than one similar business at the same level of the distribution chain, as in the case of a retail chain).

4.1.1. Range of sellers and buyers

- Important regional wholesale drug markets in Nigeria are located in and around Lagos, Onitsha, Kano, Aba and Ibadan, although pharmaceutical wholesale businesses are a common feature in all parts of the country.In 2008, there were 616 businesses licensed wholesale pharmaceuticals, and 286 registered drug importers in Nigeria; however, there was insufficient data to determine how many of these businesses were importing antimalarials.
- Pharmaceutical manufacturing in Nigeria is relatively well-developed and in 2008 there were 140 licensed drug manufacturers. Domestic manufacturers may also import medicines when they do not possess the necessary capacity to produce them (e.g. injectables) or repackage imported products to suit the local market. The headquarters of drug manufacturers are located throughout the country, but are particularly concentrated in the major commercial centres near Lagos, Ibadan, and Ilorin. Among the local manufacturers, over 100 of these were licensed to produce an antimalarial medication in 2008, and of these, 10 were licensed to produce an ACT, although none are WHO-prequalified. Several multinational pharmaceutical manufacturers had local subsidiaries that import their antimalarial products (e.g. Ipca Laboratories Ltd [India], Sanofi-Aventis [Morocco], Novartis [China, USA]), while other foreign manufacturers may deal with one or more local importers.
- Importers commonly act as sole agents for products manufactured outside of Nigeria, a tendency supported by the stringent product registration requirements (i.e. foreign manufacturers must be certified by NAFDAC prior to supplying drugs for import which can be a lengthy process), the amount of time that it takes to develop a relationship with the supplier, and the amount of investment that goes into developing the local market for the imported product. Duties are generally imposed on imported pharmaceuticals; however there are exceptions for medication for HIV, malaria and tuberculosis. [9]
- In terms of wholesaler coverage, some wholesalers focused much of their business within the state where they were located with some customers located in adjacent states, while others chose to actively seek out customers from a wide range of states and in different regions of the country(see section 4.2.5on restocking and delivery practices).
- Customer types mentioned by wholesaler and retailer respondents varied by supply chain level. For wholesalers operating at the top of the chain, customers ranged from other wholesalers to hospitals and

government agencies; one top-level wholesaler also mentioned retail pharmacies as customers (ID 28). Customers mentioned by intermediate wholesalerswere mainly retailers such as pharmacies and different types of health facilities, including private and public hospitals and clinics;other wholesalers were also frequently mentioned at this level,whilea few intermediate wholesalers mentioned that PPMVswere customers. Among terminal-level wholesalers,customer types mentioned were mainly pharmacies, private clinics and PPMVs. Several respondents at this level also mentionedhospitals, other wholesalers and public sector health facilities. Customer types reported by retailers were mainly patients from the local community.

- Traditional open-air markets were noted by many respondents as important centres for antimalarial wholesaling and retailing. Businesses operating in these markets are typically specialised in the trade ofpharmaceuticals and related medical/health products. Many of these businesses were believed to beregistered PPMVs whose licences permit the retail of a limited number of over-the-counter medicines, but that also engaged in wholesaling. Several respondents suggested that these types of wholesalers are often the preferred suppliers of smaller, less specialised customers, such as general retailers and rural outlets. See sections 4.1.2and 4.5.5forfurther discussion of market-based antimalarial wholesalers and retailers.
- In terms of purchasing antimalarialsdirectly from manufacturers and importers, most intermediate wholesalers indicated that they were supplied by local manufacturers, importers or both, while only a few terminal wholesalers reported these as a major source of supply. Some terminal wholesalers described purchasing from top-level suppliers through their sales representatives (see section 4.2.5on restocking and delivery practices). Retailers, on the other hand, describedsome of the difficulties in buying directly from importers. For example, one retail respondent described not having sufficient cash flow to place ordersof sufficient size and value as that demanded by importers(ID 11).
- Many smaller wholesalers described their aspirations to enter into 'authorised distributorship' agreements with their supplier (typically domestic manufacturers or importers). These non-exclusive agreements may only give these wholesalers the right to purchase directly from the manufacturer or importer; but more attractively, these agreements often allow wholesalers access to preferred pricing, discounts, credit facilities, and promotions. In order to qualify for this preferred status, wholesale businesses may have to demonstrate a certain ability to reach and maintain specified sales targets, an ability to regularly settle accounts, and a capacity for storage and distribution. Authorised distributors may also act as regional depots for suppliers who often attach to them sales representatives who detail prescribers to generate prescriptions/demand. Under some agreements, orders that arise from these marketing activities will then be picked from the wholesaler's inventories, thus contributing to their overall sales. Several respondents felt that, when implemented well, this status may help to protect the market share of participating wholesalers by giving them an advantage over non-participating competitors. However, one wholesaler said that the benefits from these agreements may differ across suppliers if, for example, suppliers award this status to too many competing wholesalers or if benefits are extended to competitors beyond the pool of authorised distributors (ID 5). Another respondent indicated that many wholesalers find it difficult to qualify for this preferred status, and revealed that one strategy to circumvent these barriers was for competing wholesalers to pool their purchases to ensure that one of them might qualify (ID 28). See section 4.2.6 for more discussion on cooperation among businesses.

4.1.2. Competition

- When respondents were asked about their competitors,many intermediate-level respondents operating within traditional open-air marketsindicated that every other drug seller in the same marketis considered a competitor. Among terminal wholesalers, responses on competition were heterogeneous and differed somewhat by location. Respondents generally agreed that there were many businesses selling antimalarials. Some of those operating in large cities or towns, or near main roads described facing a great deal of competition, while others in similar locations did not. Terminal wholesalers operating in more remote locations expressed less concern about competitors.Similarly, retailers indicated that they did not face considerable competition, even when respondents acknowledged that the number of potential competitors was relatively high. For example, despite noting more than 25 other antimalarial retailers operating in the same village, one retailer in a remote area of the country did not feel that competitors threatened his business (ID 13).
- Most respondents operating outside of traditional open-air markets considered pharmaceutical businesses operating within those markets to be important competitors as prices there tended to be lower, which was perceived as attractive to many potential customers.
- A few respondents also considered non-governmental and faith-based organisations engaged in the free provision of antimalarials to pregnant women and children to be competitors. In addition to free treatment, these organisations also distributed bednets and conducted awareness generating workshops (e.g. on the Roll Back Malaria Initiative) (see section 4.6 for discussion on competition from the public sector).
- Regarding product-level competition, many respondents felt that the growing number of low-priced products imported from China and India were increasing competition in the private pharmaceutical sector as these products may be cheaper than locally produced drugs.

4.1.3. Range of products

- When respondents were asked about which antimalarial products they typically have in stock, both wholesalers and retailers mentioned different types of antimalarials (e.g. ACTs, AMTs and non-artemisinin therapies [nATs]). Respondents at retail and wholesale levels of the distribution chain mentioned stocking nATssuch as SP, quinine, chloroquine,and AMTs, such as artesunate and dihydroartemisinin; and while many wholesalers also mentioned having an ACT in stock, very few retailers did so.
- A similar pattern was evident when respondents were asked about which antimalarial products were being sold in relatively large volumes (only wholesalers were asked these questions). 'Fast-moving' products mentioned by wholesalers included ACTs, AMTs and nATs and were identified using either brand or generic names. 'Fast moving' ACTs were mainly described using brand names, with the brands Coartem and Lonart (both AL) the most commonly mentioned. Artesunate was the only 'fast-moving' AMT mentioned, while 'fast moving' nATs were described using a mixture of brand and generic names, with the most common being Fansidar (SP). A few wholesalers also noted that sales of ACTs had begun to exceed those of SP.

4.2. Provider Conduct

Respondents at both wholesale and retail levels were asked questions related to a diverse range of business practices. Topics included choice of supplier, product selection, price-setting, restocking practices, cooperation among businesses, sources of capital, and others. Under price-setting, respondents were specifically asked to discuss mark-ups and factors that may cause price variation, such as second degree

price discrimination (i.e. discounts based on volume) and third degree price discrimination (i.e. price varies by attributes such as location or by customer segment).

4.2.1. Factors influencing choice of supplier and product

- Regarding choice of supplier, the variety of products stocked by the supplier and whether a supplier carried productsin high demand were two of the most commonly mentioned factors. Other factors included the existence of business and personal relationships with suppliers;prices offered by different suppliers;whether suppliers offered promotional items or discounts; whether the supplier was registered with NAFDAC; and the supplier's proximity to their own business.
- The choice of which products to stock appeared to be overwhelmingly determined by demand. If a product was considered to be 'fast moving', respondents at all levels of the distribution chain were willing to stock it. Other considerations when choosing a product included its reputation, quality, the likelihood and level of profit to be made from selling the product, and whether the product could be sold at a price acceptable and attractive to customers. The relatively high price of ACTs was cited as a reason why these antimalarials were not more popular. While sales representatives from suppliers were acknowledged by respondents as sources of information about new products, promotions, etc., respondents did not perceive them to have influence over the choice of products to stock.

4.2.2. Factors affecting availability

- In general, issues with antimalarial availability were mentioned by many wholesalers; however, retailers did not raiseavailability problems.
- Most intermediate wholesalers reported experiencing shortages or stock-outs, particularly with respect to ACTs and the various brands of AL, Coartem in particular. One respondent described waiting for more than a month for new ACT stock (not Coartem) to arrive (ID 8). Respondents attributed these availability issues to factors affecting different stages of the distribution chain.At the manufacturing and import stages, respondents cited problems in availability of the active pharmaceutical ingredients to manufacture ACTs, importation (e.g. clearance of consignments), and exchange rate volatility leading to spikes in prices of foreign goods. Causes of stock-outs related to the transport of goods within Nigeria included fuel shortages, supplier difficulty in maintaining vehicles used for delivery, and issues with the couriers contracted to deliver orders. At the consumer level, high demand for antimalarials served to compound these issues at higher levels of the chain leading to more frequent and longer periods of stock-outs.Only a few intermediate wholesalers statednot having problems obtaining ACTs, although they did concede that their suppliers were sometimes out of stock. Terminal wholesalers described similar problems with availability and specifically highlighted the scarcity of Coartem. At this level, delivery times for orders varied between one to three months. Responsesfrom top-level wholesalers were mixed: some reported not having any problems with availability, while others attributed previous availability problems to the abrupt change in treatment policy to ACT; persistent problems were mainly attributedto import and logistics issues.
- Many respondents indicated that stock-outs were detrimental to their business and described some of their coping strategies. One strategy common among intermediate and terminal wholesalers was to maintain a varied product portfolio. For terminal wholesalers, this was important to attract and retain customers; while for intermediate wholesalers, this strategy allowed them to recommend an alternative product in case of stock-out or recommend other wholesalers who could supply the product.

4.2.3. Price setting

Determinants of price

- The most commonly mentioned factor affecting the price of antimalarials was competition, with many commenting that one 'cannot charge more than the market can bear' or similar. Many wholesalers indicated that they regularly monitored medicine prices among their competitors, which was sometimes conducted by the sales representatives employed by larger wholesalers operating at higher levels of the distribution chain.
- Purchase price was another commonly mentioned determinant of selling price, which many wholesalers operating at the top of the distribution chain described as being strongly influenced by exchange rate fluctuations. Relatively high purchase price was also cited by respondents as one reason why ACTs were not more widely sold. To achieve lower purchase prices, one wholesaler described how businesses sometimes cooperated by poolingorders for a single supplier to qualify forvolume discounts or to purchase at preferred prices through a pool member who is a supplier's authorised distributor (ID 28).
- Product scarcity was also considered a factor that could augment bothpurchase prices and mark-ups.
- Respondents also indicated that a number of different operating costs affected their selling prices. Both retailers and wholesalersspecifically highlightedtransportation costs. In addition, top-level wholesalers mentioned costs associated with drug importation (e.g. clearance charges, product registration costs) and manufacturing (e.g. raw materials) as important determinants of price. When these wholesalers did not pay for these costs separately, respondents at this level indicated that changes in these costs were reflected in the purchase prices of their suppliers. One retail respondent also added costs associated with taxes, rent and utilities as another important factor affecting her selling prices (ID 11). See section 4.3.2 for further details on cost structure.
- Recommended retail prices (RRPs) were not a common feature of the antimalarial market. Even when prompted, no respondent at retailor terminal wholesale level mentioned the use of RRPs. Among top-level wholesalers, one respondent said that selling prices are suggested by theirsupplier; but that these recommendationswere not necessarily adhered to as selling priceswere ultimately determined by'market forces' (ID28). Similarly, a few intermediate-level wholesalers reported that a fixed price or mark-up wasprescribed to them by some suppliers, but they were allowed some flexibility to adjust prices to prevailing market conditions(ID4) (see section 4.2.4 on vertical restraints).

Determinants of mark-ups

- Nearly all respondents described mark-ups in terms of percentages, and only one used currency units to describe mark-ups (ID 21).
- The range of percentage mark-ups applied varied somewhat by distribution chain level: retailers reported mark-ups between 10% and 40%; among terminal wholesalers, mark-ups ranged between 1% and 30%, with most falling between 5% and 10%; mark-ups among intermediate wholesalers ranged from 1% to 35%; and between 2.5% and 12% for top-level wholesalers, although most were between 7% and 10%.
- Respondents also gave a number of reasons explaining variation and changes in mark-ups. At all levels of the chain, respondents described having to adjust their mark-ups to at least match their competitors'

prices for the same or similar products. One retail respondent described how product scarcity (e.g. within a particular market) could substantially drive up applied mark-ups (ID11), while another retailer indicated that products being sold in higher volumes attracted lower mark-ups (ID 13). Conversely, a terminal-level wholesaler indicated that lower mark-ups of 5% to 6% were applied to slower moving products, while other products with stable demand, such as Coartem, attracted the maximum mark-up of 10% (ID 22).Among top-level wholesalers, changes in the exchange rate were said to affect mark-ups.

Price discrimination and variation

- Most respondents at all levels of the chain indicated that increased market competition and demand were the key reasons why they would lower their price for a given product; however, no respondent stated that they would sell below cost price.
- Second degree price discrimination, where selling price varied according to the size of the purchase (e.g. value or volume discounts), was very common at all levels of the distribution chain.
- Third degree price discrimination, where selling price varied according to specific customer attributes, was also mentioned at all levels of the chain. For example, in some cases only wholesalers in 'authorised distributorship' agreements with suppliers were able to access preferred pricing, discounts and promotions; and retailers mentioned that lower prices for a given product could be offered to 'poorer' customers.
- Supplier-customer relations may also cause price variation. Retailers mentioned that some customers negotiate final prices, and wholesalers described the practice of awarding discounts in order to build or maintain customer relationships. One wholesaler also described accessing lower purchase prices when paying for orders in cash, rather than with supplier credit (ID 23).
- A number of wholesalers said that many suppliers were not willing to buy back expired unsold stock, which forced wholesalers to reduce mark-ups and prices if the expiration date was approaching.

4.2.4. Vertical restraints

- Although most respondents stated that their suppliers did not place any types of restrictions or conditions on the sale of their products, a few did describe vertical restraints.
- The most frequently mentioned type of vertical restraint related to product pricing, although there was some variation in how strictly these pricing restrictions were applied. For example, several intermediate wholesalers stated that suppliers provide pricing guidelines, such as recommended selling prices, and price floors and ceilings. One intermediate wholesaler said that these pricing guidelines were reasonable as they were not so high as to decrease demand (ID 2); however, another intermediate-level wholesaler operating within a traditional market believed that such pricing guidelines are not regularly adhered to, particularly in market settings, due to the intense competition that sometimes forced him to sell below the recommended price (ID 9). One wholesaler operating at the top of the distribution chain (e.g. an importer/manufacturer) explained how they set the wholesale and retail selling prices for their product and include compliance to their pricing regime as a condition of authorised distributorship agreements with wholesalers (ID 30).

4.2.5. Restocking and delivery practices

Order frequency and quantification

- Top-level wholesalers reported placing orders with foreign suppliers between twice per month to 3-6 times per year. Among intermediate wholesalers, order frequency varied from as often as twice per month to only when stock had run out; however,most respondents at this level reported that they would

order new stock around once per month. Order frequency for terminal wholesalers was higher, and ranged from once per quarter to once a week; although several respondents indicated that frequency varied by product and orders were placed as often as necessary. For retailers, order frequency was also high, with all respondents reporting several orders per week.

- For most intermediate and terminal wholesalers, quantification of orders was largely based on previous sales and the amount of cash available to purchase new stock. Some intermediate wholesalers indicated having access to small amounts of credit with suppliers of a limited duration (e.g. 30 days), which affected how much new stock could be purchased; while other wholesalers at this level also mentioned taking into account the changing seasonal intensity of malaria, trends in prescribing habits, levels of remaining stock and their expiration dates when deciding how much new stock to purchase.

Distribution and lead times

- When placing orders, several intermediate wholesalers described how sales representatives sent by suppliers would both take and deliver orders. Most wholesalers at this level reported having their orders delivered to them by their suppliers; however, a few described having to collect orders themselves, particularly when suppliers were experiencing delays or problems making deliveries. The most common way of placing orders among terminal wholesalers was bytelephone or email. As at intermediate level, both terminal wholesalers and retailers reported that most orders were delivered by their suppliers.
- For some, whether a supplier delivered to customers appeared to depend on distance, with suppliers being more likely to deliver if the customer was located relatively nearby in order to contain transport costs.
- Larger suppliers, however, have exploited different distribution strategies to increase their geographic coverage. In one model, suppliers distribute through a series of depots specifically engaged in the warehousing and distribution of consumer products that may be owned by a single enterprise (e.g. a drug manufacturer or importer, constituting a vertically integrated supply chain) or more commonly, owned and operated by separate private enterprises that specialise in logistics offering warehousing and distribution as a service for a wide range of products, including drugs (e.g. MDS Logistics[1]). Large suppliers typically had one central warehouse where manufactured goods or received consignments were stored prior to distributing to regional depots. For those using a third party logistics company, transportation from port to central depot to regional depot may be included in the contracted service. Both the central and regional depots are often used as warehouses from whichtheir sales representatives who detail in the region may pick and fill orders that they themselves generate. In other cases, wholesale customers may come to the depot to collect orders that they have placed by telephone. Authorised distributors may also act as regional depots for suppliers who often attach sales/marketing representatives that detail prescribers to generate prescriptions/demand. Under some agreements, orders that arise from these marketing activities will then be picked from the wholesaler's inventories, thus contributing to their overall sales (see also section 4.1.1 on range of sellers and buyers).
- Other services reported for businesses located further afieldincluded courier services, transportation services and way billing[2]. In such cases customers were the ones to pay for the delivery.

[1] MDS Logistics is the largest third party logistics company in Nigeria providing logistics and ancillary services to manufacturers, wholesale distributors and importers. They maintain a network of 47 distribution centers in 31 states of Nigeria and over 200 warehouses.

[2] In this common method of delivery, orders placed by customers typically in person or by telephone are packed by the supplier and transported via mass transit operators (e.g. bus lines) to regional transport hubs, such as bus or taxi parks in commercial centres, from where the customer will then retrieve their packaged order. The cost of this delivery is typically borne by the customer who

- Distribution practices from wholesale to retail level varied. Some wholesalers focused much of their business within the state where they are located with some customers located in adjacent states, while others chose to actively seek out customers from a wide range of states. Many wholesalers stated that their preference was to serve retail outlet customers directly on their premises, but many also delivered using a variety of means (their own vehicles, way billing and courier services), and sometimes employed sales representatives themselves to take and deliver orders.
- Once orders had been placed, intermediate wholesalers reported that delivery times ranged fromtwo days to 1-2 weeks, and even up to two months. Terminal wholesalers reported that deliveries could arrive within 24 hours of placing orders, but could take as long as two weeks for those located further afield (ID 23).Because retailers order several times per week, deliveries were also as frequent.

4.2.6. Cooperation among businesses

- Most respondents stated that they were members of associations. In most cases, these were trade associations organised by activity (e.g. importers, patent medicine vendors), jurisdiction (e.g. specific market or town, or national level), and in some cases by profession (e.g. pharmacists, medical doctors). Some of the associations specifically named by respondents were the Nigerian Association of Patent and Proprietary Medicine Dealers(NAPMED), the Association of Pharmaceutical Importers of Nigeria (APIN), the Association of Nigerian Representatives of Overseas Pharmaceutical Manufacturers (NIROPHARM), the Pharmacist Council of Nigeria (PCN), and the Nigerian Medical Association (NMA).
- For those belonging to trade associations, respondents said that a key benefit of membership was the assistance provided in understanding and complying with regulatory requirements and also in dealing with the regulatory authorities. Several respondents, particularly those operating within traditional markets, mentioned how these trade associations provided training and guidance on the identification and reporting of counterfeit products.
- Intermediate wholesalers operating outside of a large traditional market where pharmaceutical wholesaling took place explained that such a trade association did not exist for their type of business in their area as it was an intensely competitive environment and they did not perceive any benefit of forming or joining one (ID 9 & 10). A SFH detailer working the area revealed during a personal communication that a trade association did exist for those traders operating inside the market, mainly as a vehicle for collective representation and to protect members from what was perceived as excessive regulatory intervention (e.g. markets raids searching for unlicensed businesses).
- Another way in which businesses cooperated was to provide supplies to competitors on an ad hoc basis in case of stock-outs. This was done to ensure that a supplier is able to provide a customer with all of the products sought to avoid the customer having to purchase from multiple suppliers.
- Competing wholesalers also cooperated by pooling orders to access benefits available only to authorised distributors (see sections 4.1.1 on the range of sellers and buyers, and 4.2.3 on price setting for additional discussion on authorised distributorships).

4.2.7. Sources of capital

- For most respondents, the purchase of new stock was financed either through available cash or credit provided by the supplier. In many cases, respondents mentioned using both.

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pays the fee to the transport operator upon retrieval of the package; however, some suppliers do offer this as delivery method as a service included in the price of the purchased goods.

- When credit facilities were provided by the supplier, terms ranged from 14 days to 2 months, with 14-21 days being the most commonly mentioned duration. Some respondents also stated that the credit terms provided depended on purchase volumes, with larger volumes generally attracting longer terms.
- Only one respondent reported using a bank loan to finance inventory (ID 30). One importerdescribed bank loansasdifficult to obtain, particularly for start-up businesses. This caused problems because foreign suppliers often required advance payments for large consignments (ID 25).
- One respondent suggested that to encourage the sale of ACTs and improve access to treatment, the government should help make bank loans more accessible, for example, by promoting collateral-free loan products and lower interest rates (ID 18).

4.3. Sales Revenue and Expenses

Respondents were asked questions about sales revenue, and the costs of starting and operating a pharmaceutical business, including taxes and tariffs, to examine potential cost drivers. Considering the sensitivity of these topics, many respondents preferred to speak in general terms rather than give specific figures. For start-up costs, respondents were asked to estimate how much they would need to spend today if they were to set up another similar business. Where detailed, these costs are reported in both the local currency and US dollars[3].

4.3.1. Revenue from antimalarial sales and fluctuations in sales

- In general, pharmaceutical wholesalers indicated that sales of antimalarials constitute a considerable proportion of their overall sales. Intermediate wholesalers indicated that antimalarial sales comprised between 5% and 40% of total monthly sales, and between 10% and 60% for terminal wholesalers. Top-level wholesalers reported antimalarials to constitute between 5% and 60% of their total sales.
- Most respondents, regardless of supply chain level, reported fluctuations in antimalarial demand, which in turn affected the share attributed to antimalarials out of their overall monthly sales.
- The most commonly mentioned cause of such fluctuationwas the seasonality of malaria transmission, which peaks during the rainy season; however, others mentioned that stock-outs and product scarcity when demand for antimalarials is high can lead to price speculation, which also causes fluctuations in revenue.Another wholesaler operating in the north of the country reported that revenues from antimalarials tend to dip during periods of religious fasting, as many adherents leave the city to return home (ID 3).
- Only two respondents (one wholesaler and one retailer) stated that demand for antimalarials was high all year round (ID 14&19).

4.3.2. Cost structure

- Respondents were asked about their typical expenditure ona number of recurrent expenses, including rent, electricity, inventory, water, telephone, regular and casual employment salaries, stationary, marketing, fuel (e.g. to operate generators), fees to NAFDAC or associations (e.g. PCN, NAPMED), insurance, transportation (e.g. vehicles for deliveries) and security. While many respondents were willing to share this information, some of the data collected from individual wholesalers was incomplete or

[3]The average exchange rate during the data collection period (18 July to 8 September 2009) was 154.892 Nigeria Naira (NGN) to US$1 (www.oanda.com).

vague (e.g. 'it fluctuates'), while other respondents, typically top-level wholesalers, were more reluctant to share this information.

- Across all levels of the distribution chain, expenditure tended to be highest for rent, inventory and salaries of regular employees. Following these, expenditure on telephones and transportation also tended to be relatively high at all levels of the chain. Expenditure on electricity was also notably high among both intermediate and terminal wholesalers.
- Importers reported having to pay for most of the expenses associated with the import of pharmaceuticals, including freight, insurance, clearance, and NAFDAC product registration charges; however, one respondent indicated that some of these costs (e.g. freight and insurance) are incorporated by some foreign suppliers into product purchase prices (ID 26).
- While most respondents stated that they paid their own staff, there were several wholesalers and importers that had sales staff from suppliers embedded within their own workforce who typically focussed on activities promoting the suppliers' products. Sometimes referred to as 'sales representatives', these embedded employees were being paid by the supplier, rather than by the wholesaler, and were sometimes provided with vehicles by the supplier.

4.3.3. Tax structure

- In addition to the recurring expenses described above, respondents also mentioned several different kinds of taxes that were regularly paid, including corporation, local government, state government, and in some instances market tax. Several respondents also mentioned having to deduct the income tax liability at source for employeesalaries (i.e. the 'pay as you earn' or PAYE system).
- For incorporated businesses, corporation taxes tended to be higher than other types of taxes mentioned. However, there was considerable inconsistency in the types of taxes paid across respondents, and some at both wholesale and retail levelsstated that they did not pay any taxes at all.
- A few importers also mentioned the tariffs on imported pharmaceutical products, which were as high as 20% to import unfinished pharmaceutical goods (ID29).

4.3.4. Start-up costs

- Respondents were asked to estimate the initial costs required to set up a similar business in four broad categories, including furniture and fittings, initial stock, equipment and vehicles. Retailers and wholesalers operating at the top of the chain were morereluctant to estimate these expenses; and those respondents that did mainly reported costs in the local currency.
- For terminal and intermediate wholesalers, the largest start-up costs were for the initial purchase of stock, which ranged between NGN 1.5 and 100 million (US$ 9,684-645,611).This was followed by vehicles (between NGN 200,000 and several million, or US$ 1,291-tens of thousands), furniture and fittings (between NGN 150,000 and several million, or US$ 968-tens of thousands), and equipment (NGN 34,000 and several million, or US$ 220-tens of thousands).
- One retailer operating in a remote area described that, in order to start up a similar business in the same location, the first cost consideration would be to register with the trade association and obtain their approval for the shop's location. This type of registration, however, did not have a fixed fee and could be paid with goods, such as beer and cola nuts (ID 14).

4.4. Non-Regulatory Interventions

Non-regulatory intervention is a general term used to describe activities designed to influence provider conduct and business practices within the pharmaceutical distribution chain that do not involve regulatory action. These activities may be driven by actors in the public, private, parastatal or civil society sectors, and may include training of providers, information dissemination, marketing, demand generation, etc.

4.4.1. Provision of information

- Sales representatives from different suppliers were the most common source of information on antimalarials mentioned by respondents. In addition to taking and delivering orders (see section 4.2.5on restocking practices), respondents described how sales representative provide them with useful market intelligence, such as on new products, what products are in demand, product affordability, and potential target market segments. While this information is provided mainly during visits to businesses, one respondent also described how sales representatives come to association meetings (ID 21).
- Several other respondents mentioned the role of organisation and association meetings as a source of information, particularly for information on counterfeit drugs.
- Other sources of information on antimalarials mentioned by respondents included product information leaflets included within product packaging, newspapers (e.g. the industry specific Pharmanews), articles in academic publications, and the internet.
- Several respondents mentioned seminars and product launches as sources of information on new drugs.
- Very few respondents mentioned government agenciesas important sources of information on antimalarials.

4.4.2. Creating Demand

- Several respondents considered some of the activities of sales representatives as an effective means of generating end-user demand. They described how sales representatives would visit health facilities and promote the particular antimalarials directly to prescribers either during one-on-one sessions or during seminars organised in larger facilities, such as hospitals. One respondent also stated that representatives have sales targets that they are required to meet as a condition of their employment (ID 30).
- Provision of information was also used to influence end-user choices. Oneretailerdescribed having great influence on customer product choice, recommending what antimalarial to purchase (ID 13). Another importer described using billboards, not only as a marketing tool, but also as a meansof disseminating information about their antimalarial products to consumers (ID 25).
- From the supplier perspective,several respondents described how suppliers incentivise purchasing in larger volumes through various promotions, such as free gifts, discounts or additional product for purchasing in certain quantities.

4.4.3. Suggestions for non-regulatory interventions

Improving access in rural areas

- Several respondents suggested that in order to better reach remote rural areas,wholesalerscould be incentivised by their suppliers to distribute more widely, for example, by being assigned a territory where they have exclusive distribution rights to assure market share, by being provided with support for staff and vehicles to take orders and make deliveries, or by providingfree or subsidised fuel for sales representatives to travel to remote areas.

- Another suggestion made by respondents was to increase the public sector presence in rural areas by establishing and equipping new health facilities.

Improving use of ACTs

- Many respondents suggested that more advocacywas needed to improve the use of ACTs. Awareness around the benefits of the recommended first-line antimalarial and where quality ACTs may be purchased in the community could be improved by promotion through radio, engaging community leaders and speaking at churches.
- Improving awareness of ACTs among drug vendors and enabling them to sell more ACTs by making their prices more affordable was also mentioned.
- The relatively high price of ACTs was singled out as a key factor limiting their more widespread use in rural areas. Several respondents reinforced that in the case of a subsidy for ACTs (such as the AMFm), the recommended retail pricesmust be clearly and indelibly printed on the packaging to avoid price gouging, but also that this recommended price should allow for a sufficient mark-up to ensure that private businesses selling the product remain viable.
- A few wholesalers also suggested that suppliers could provide more incentives to sell ACTs in greater volumes to help improve their availability for end-users. Among others, suggestions included cash incentives, help with costs associated with logistics and staff, guaranteed territory for distribution, preferential pricing for selected distributors, and as described by one respondent, anything that would help to create 'conditions that would make someone want to do the job and make [it feel] worthwhile' (ID 7).

4.5. Regulation

Wholesalers and retailers were asked to discuss their opinions on the regulation of the pharmaceutical sector. Specific topics discussed related to business licensing, product registration, bans on particular products or practices, inspections, over-the-counter medications, the black market, counterfeits, sub-standard products, and suggestions to improve regulation of the sector.

4.5.1. General perception of regulation

- Most respondents acknowledged that there were problems both with regulatory compliance and enforcement. Nevertheless, many respondents were generally satisfied by the current levels of regulation, stating that without it, the private pharmaceutical sector would become much more disorderly and ungovernable.
- Respondents generally felt that the regulations issued by the PCN pertaining to their particular business types were reasonable and fairly easy to comply with, and feared the consequences of non-compliance (e.g. fines, closures, arrests). As a reflection, one importer believed that the improving regulatory conditions were encouraging more businesses to enter the private pharmaceutical market (ID 27).
- Despite this, many expressed concern about the capacity of PCN to fully enforce these regulations, which created opportunities for businesses to lapse in compliance. When asked whether respondents believed businesses complied with the regulations, opinions differed with some stating that businesses were actually eager to comply, and others feeling rather pessimistic. Several respondents also felt that some businesses regularly circumvented regulations through corruption and bribery of inspectors.
- Respondents discussed many specific issues related to regulation, which are summarised in the following sub-sections.

4.5.2. Importation

- One respondent felt that the fees charged by NAFDAC in order to import were too high (ID 5), while another criticised the overly bureaucratic import process where more than 15 signatureswere required to obtain the necessary approvals (ID 15).

4.5.3. Inspections of premises

- Across respondents, some reported being inspected by PCN and others by NAFDAC, and the typical number of visits ranged from one to three times per year. Respondents generally felt that the number of these visits was insufficient to improve levels of regulatory compliance among businesses; however, one retailer who had previously been cited for regulatory deficiencyfelt that the number of visits from regulators was too high (ID 12).
- Among the wide range of points considered during inspections and discussed by respondents, including auditing for unregistered products and possession of fire extinguishers, respondents in Kano raised several points regarding storage. Respondents in this large commercial hub in the North of the country described how, despite PCN providing wholesalers and retailers with information about good storage practices (ID 7), many wholesaler warehouses still did not entirely comply (e.g. inadequate ventilation) (ID 4), and the storage facilities of unregistered wholesalers and retailers (i.e. many PPMVs) were not being inspected by the PCN, which has consequences for the quality assurance of the productsthey sell (ID 5).

4.5.4. Licenses

- Several respondents were critical of the amount of time that the PCN took to issue and renew both wholesale and retail pharmaceutical licenses.
- The number of unregistered vendors, including those businesses engaging in activities for which they do not have the most appropriate license (e.g. wholesalers that retail, and vice versa), was also a common concern among respondents.
- Related to this, a number of retail pharmacy respondents were particularly dismissive of unregistered vendors and felt that registered pharmacies needed to be promoted for a number of reasons. One respondent felt that regulatory requirements for pharmacies far outstrippedthose required of other retailertypes, believing the latter to be ‘under-regulated’ (ID 5). Several others believed that, given the regulatory requirements and the training of pharmacists, registered pharmacies were the only type of retailer that could reliably ensure the completion of the quality assurance chain and provide ethical and quality pharmaceutical services to patients. As such, another respondent suggested campaigns to raise consumer awareness of the benefits of purchasing drugs from registered retailers over other types of retail outlets (ID 2).
- While some respondents felt that PPMVs were useful and particularly necessary to improve access to antimalarials in rural areas, respondents emphasised the need to ensure that PPMVs were registered.
- In addition to securing a license to operate from the PCN, one retailer also described how it was necessary in their location to also obtain approval from the local pharmaceutical retailers’ trade association on the location of the shop (ID 14).

4.5.5. Unlicensed businesses and black/parallel market

- Unlicensed pharmaceutical wholesaling and retailing was a concern for many respondents, particularly as they believed that these types of unlicensed businesses were more likely to escape regulatory oversight and also sell counterfeit, substandard and unregistered products. Unlicensed retailing examples cited by respondents included unregistered PPMVs, non-traditional medicine outlets such as supermarkets and hawkers/mobile vendors that operate at transport hubs, and wholesalers that retail without possessing the necessary license (ID 5); while the dominant example of unlicensed wholesaling was of market traders who both retail and wholesale that are commonly found in the central markets of cities and towns. Respondents suggested that many of these market traders are registered with the PCN as PPMVs, but operate beyond the scope of their regulated activities. A number of wholesalers considered these market traders to be important competitors in the antimalarial wholesale market, and particularly attractive for smaller retail outlet customers because of the lower prices offered and convenience (i.e. customers can find all the products they are looking for in one place and select the vendors offering the best prices). However, a few indicated that such unlicensed trading did not affect their business as their customers were conscious of purchasing genuine, quality drugs and were aware of where to find them.
- One respondent believed that sales targets set by pharmaceutical manufacturers, importers and wholesalers themselves for their sales representatives were an important factor contributing to the number of retailers selling products for which they do not have the appropriate licence by compelling sales representatives to find new customers (ID 8); while another lamented how wholesalers often knowingly sell directly to unlicensed vendors (ID 23).
- It was also widely accepted that a proportion of the total inventory across the entire private sector (i.e. both formal and informal) consists of smuggled genuine products (or 'parallel imports'), counterfeits, and also drugs leaked from the public sector.
- A few respondents described how the PCN and NAFDAC had recently increased activities to suppress unlicensed wholesaling and retailing by closing shops, confiscating product and imposing fines, and some suggested that this type of enforcement needed to be done more regularly (ID 22).

4.5.6. Counterfeit and substandard drugs

- This was a frequently discussed topic among respondents at all levels of the distribution chain.
- In general, many felt that any product that was in demand and profitable to sell was a target for counterfeiting, and that profit maximisation was the prime motivating factor for businesses to sell counterfeit products.
- Many respondents believed that antimalarials were being actively counterfeited and sold at lower prices compared to their genuine counterparts.
- To combat the presence of fake, substandard or unregistered products, many felt that improving regulatory compliance would be the most important intervention, but that this is becoming increasingly difficult due to the growing number of wholesalers and retailers in the private pharmaceutical sector.
- Many also emphasised that it would be more effective to prevent the entry of counterfeits into the market by better monitoring points of entry (e.g. inspection at ports), rather than by surveying businesses for counterfeits already on the market.
- One respondent stated that sales representatives were important sources of information on counterfeitand substandard drugs circulating in the market(ID 3). Trade associations, such as the National Association of Patent Medicine Vendors, performed a similar function.

- Another respondent described how businesses in the same traditional market had formed a 'self-regulation taskforce' that scanned the products being sold by pharmaceutical vendors (e.g. PPMVs in that market) for counterfeit drugs, and informedthe regulatory authority when such products were encountered (ID24).
- When asked about the possibility of importers expanding their businesses to include repackaging activities, one respondent was against the idea as he felt that allowing thispractice would create more opportunities to produce counterfeit products (ID 28).

4.5.7. Suggestions for regulatory interventions

- To address what many believed to be low levels of regulatory compliance among both wholesalers and retailers, respondents generally recommended that enforcement activities should be more frequent, preferably unannounced, and that penalties be more stringent.
- To help businesses better comply with regulations, several respondents suggested that regulators provide training, develop some type of targeted awareness campaign, and also disseminate transparent guidelines on the application of regulations to ensure that regulations are enforced equally and fairly.
- To control price fluctuations, a few wholesale respondents suggested that it may be useful to introduce some form of price regulation in the pharmaceutical market, without specifying how this could be done.
- Other wholesalers suggested that the standards for the storage of pharmaceuticals needed to be better enforced, given that they believed many wholesalers fall short in this regard, which has consequences for maintaining drug quality.
- Related to this, several wholesalers felt that to better ensure drug quality overall, quality assurance mechanisms all along the distribution chain needed to be strengthened and better integrated from the point of entry (e.g. improved quality testing of foreign products at ports and better control at 'porous' border crossings), to an improved system of product tracing from importers all the way down to retailers.Given the perceived high prevalence of unlicensed vendors, several respondents believed that such a system would require more rigorous implementation of the business licensing regime and could only work with businesses staffed by registered health professionals, such as pharmacists, because accountability could only be assured through recognised businesses and professionals.
- Another point raised by several respondents related to the duplication of regulatory functions between NAFDAC and the PCN, where responsibility for regulatory control was clear and distinct for some areas (e.g. professional regulation, product registration), but notalways for others (e.g. monitoring and controlling for counterfeit and substandard products). Several respondents felt that such confusions led to inefficiencies in regulatory control and should be resolved.

4.6. Public-Private Links andPublic Sector Issues

- Respondents acknowledged the role that government plays in influencing consumer demand by promoting certain antimalarials recommended in treatment guidelines and discouraging the use of other drugs. However, several respondents criticised the change in government treatment policy to ACTs saying that private sector businesses were not provided with sufficient notice in order to adequately prepare for increased demand for ACTs. One importer also described how their foreign ACT supplier also did not have sufficient stock to fill their orders, leading to long lead times and potential loss of market share (ID 29).

- One respondent also recognised the vital service that local governments and primary health facilities provide by improving access to antimalarials in rural areas (ID 8). As such, this respondent did not view the public sector as an important competitor, particularly as he believed the volume of antimalarials distributed through the private sector to be many times greater. A manufacturer/importer, however, believed that the programmes providing antimalarials free of charge to children and pregnant women through the public sector was having a noticeable impacton antimalarial sales (ID 27).

4.7. RDTs

Similar to antimalarials, wholesaler and retailer respondents were asked a broad range of questions related to RDTs. Topics included the general supply chain structure for RDTs, price setting, product availability, regulation of RDTs, and interventions or suggestions to improve access and use of RDTs. However, because RDTs were rarely encountered among private sector wholesalers and retailers, very few respondents discussed these topics.

- Many respondents were aware of RDTs; however, some had never seen them, a few terminal wholesaler respondents had never heard of them, and only one top-level wholesale respondent was selling them at the time of interview. This respondent explained that RDTs were not being widely used in Nigeria and only one company was marketing them at the time (ID 28). This respondent also indicated that the private commercial sector distribution chain for RDTs was likely to be similar to that for antimalarials.

5. Summary of Key Findings

Viewed alongside the findings from the quantitative survey of the private commercial distribution chain for antimalarials in Nigeria (see[1] atwww.actwatch.info), this study has produced new insight into the perceptions and practices of private sector antimalarial wholesalers and retailers in Nigeria.

- The market for antimalarials constitutes an important segment of the overall private commercial pharmaceutical sector in Nigeria. For many wholesalers and retailers, antimalarial sales were viewed as key revenue generators and important components of their product portfolios.
- Alongside the more conventional types of private sector pharmaceutical traders, such as registered importers, wholesalers and pharmacies, specialised market vendors operating within traditional open-air markets were regarded as important actors in the wholesale and retail of antimalarials.
- ACTs were generally recognised as effective treatments and many wholesalers chose to stock them; but their high price relative to other antimalarials and problems with availabilityconstrained their demand. As such, many older, less expensive antimalarials, such as chloroquine and SP remained very popular, which is a key factor behind the stocking decisions of both wholesalers and retailers. Although many were aware of RDTs, they were not demanded by customers and were therefore not commonly stocked.
- Because the sale of antimalarials wasviewed as a lucrative endeavour, the wholesale and retail markets for these products werevery competitive, as demonstrated by a number of characteristics. Stocking decisions were overwhelmingly driven by demand, rather than by other product attributes such as quality and reputation; firms were decidedly price-takers (i.e. were obliged to charge the market price),

rather than price-setters; and businesses commonly employed a diverse range of marketing and distribution strategies to maintain and expand their market shares.

- The potential for profit, along with a perceived lack of adequate regulatory oversight,was also a key factor sustaining the parallel market for antimalarial medicines, which is largely composed of businesses operating in traditional open-air markets that engage in either wholesaling or retailing activities without possessing the necessary license to do so. As a result, the distinction between retailer and wholesaler was not always clear. Issues with regulatory compliance and enforcement also led many to have concerns about the prevalence of counterfeit and substandard antimalarials that could potentially put consumers at risk.
- There were several organisational features of private sector distribution chain for antimalarials in Nigeria that reflect its specialisation and sophistication. The use of vertically integrated distribution infrastructure and third-party logistics service providers was common among manufacturers and importers to achieve wide geographic coverage of their products. This was enhanced through the pervasive use of sales representatives deployed, not only for product marketing purposes, but also for order taking and delivery. Authorised distributorship arrangements between top-level suppliers and wholesalers, which use a variety of incentives to increase product volume flowing through the distribution chain, were also a prominent feature of distribution practices.
- Specialised trade associations were also a common feature of the private sector distribution chain in Nigeria. These associations performed a number of different functions, which may include a mechanism for collective representation or quasi-self-regulation, but also served as a valued source of industry-specific information and training. As such, many wholesalers and retailers chose to be members of these trade associations.

When interpreting the findings of this study, there are a number of issues that need to be considered. First is that the sample selected for interview was purposefully chosen to capture the widest possible range of opinions and experiences of antimalarial wholesalers and retailers, rather than to be statistically representative of the entire study population. In order to protect the confidentiality of respondents and due to the sensitivity of the topics being discussed, interviews were documented using a note taker, rather than recorded. While this may have helped to improve the reliability of the data by allowing respondents to be more at ease, some of the richness and detail of the discourse is likely to have been lost. Some responses are also likely to be affected by social desirability bias, with respondents answering in a way that they think will meet the approval of the interviewer. Finally, data for this study were collected in 2009 and changes to the market since then are likely to have occurred, especially due to the introduction of the AMFm in late 2010.

6. References

1. Palafox B, Patouillard E, Tougher S, Goodman C, Hanson K, Arogundade ED, O'Connell K and the ACTwatch Study group. (2012) *ACTwatch 2009 Supply Chain Survey Results, Nigeria*. Nairobi: ACTwatch project, Population Services International.
2. CIA. (2011) *The World Factbook: Nigeria*. Accessed 19 September 2011; Available from: https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html.
3. FMOH (2009). *Malaria Strategic Plan 2009-2013: A Road Map for Malaria Control in Nigeria*. Abuja: Federal Ministry of Health, National Malaria Control Programme.
4. Foreign & Commonwealth Office. (2011) *Nigeria - Country Information*. Accessed 4 August 2011; Available from: http://www.fco.gov.uk/en/travel-and-living-abroad/travel-advice-by-country/country-profile/sub-saharan-africa/nigeria?profile=all.
5. World Bank. (2011) *World Development Indicators Online*. Accessed 20 August 2011; Available from: http://ddp-ext.worldbank.org/ext/DDPQQ/member.do?method=getMembers&userid=1&queryId=6.
6. Transparency International. (2011) *Corruption Perception Index 2010*. Accessed 7 August 2011; Available from: http://www.transparency.org/policy_research/surveys_indices/cpi/2010/results.
7. NAFDAC. (2002-2009) *National Agency for Food and Drug Administration and Control: Safeguarding the health of the nation*. Accessed 8 August 2011; Available from: http://www.nafdacnigeria.org/.
8. PCN. (2011) *Pharmacists Council of Nigeria*. Accessed 8 August 2011; Available from: http://www.pcnng.org/.
9. FMOH. (2011) *Nigeria Pharmaceutical Country Profile*. Abuja: Federal Ministry of Health in collaboration with the World Health Organization.
10. FMOH. (2010) *Access to and rational use of medicines at the facility level*. Abuja: Federal Ministry of Health.
11. Erhun W, Babalola O and Erhun M. (2001) "Drug Regulation and Control in Nigeria: The Challenge of Counterfeit Drugs." *Journal of Health & Population in Developing Countries* 4(2): 23-34.
12. ACTwatch Group. (2009) *Outlet Survey Report (Baseline), Republic of Nigeria*: Population Services International.
13. WHO. (2008) *World Malaria Report 2008. WHO/HTM/GMP/2008.*
14. FMOH. (2005) *National antimalarial treatment policy*. Abuja: National Malaria and Vector Control Division, Federal Ministry of Health.
15. NPC, NMCP and Macro MDI. (2011) *Nigeria Malaria Indicator Survey 2010: Preliminary Report*. Abuja: National Population Commission, National Malaria Control Programme, MEASURE DHS/ICF Macro.
16. World Bank. (2011) *Malaria Control Booster Project - Nigeria*. Accessed 25 August 2011; Available from: http://web.worldbank.org/external/projects/main?pagePK=64312881&piPK=64302848&theSitePK=40941&Projectid=P097921.
17. Littrell M, Gatakaa H, Evance I, Poyer S, Njogu J, Solomon T, Munroe E, Chapman S, Goodman C, Hanson K, Zinsou C, Akulayi L, Raharinjatovo J, Arogundade E, Buyungo P, Mpasela F, Adjibabi CB, Agbango JA, Ramarosandratana BF, Coker B, Rubahika D, Hamainza B, Shewchuk T, Chavasse D and O'Connell KA. (2011) "Monitoring fever treatment behaviour and equitable access to effective medicines in the context of initiatives to improve ACT access: baseline results and implications for programming in six African countries." *Malar J* 10: 327.