The Private Sector Market for Diarrhea Treatment in Nigeria: Final Deliverable

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CLINTON HEALTH ACCESS INITIATIVE

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Abbreviations

ACT: Artemisinin Combination Therapy
AMFm: Affordable Medicines Facility: malaria
API: Active Pharmaceutical Ingredient
CHAI: Clinton Health Access Initiative
CME: Continuing Medical Education
EML: Essential Medicines List
FDS: Food and Drugs Service
GMP: Good Manufacturing Practices
HAI: Health Action International
MDG: Millennium Development Goal
MI: Micronutrients Initiative
NAFDAC: National Agency for Food and Drugs Administration and Control
NAPPMED: National Association of Proprietary Patent Medicine Dealers
NGO: Non-Governmental Organization
NYSC: National Youth Service Corps
ORS: Oral Rehydration Salts
ORT: Oral Rehydration Therapy
OTC: Over-The-Counter
PCN: Pharmacist's Council of Nigeria
PHC: Primary Health Center
POM: Prescription Only Medication
PPMV: Proprietary Patent Medicine Vendor
QA: Quality Assurance
SFH: Society for Family Health
UN: United Nations
UNICEF: United Nations Children's Fund
USAID: United States Agency for International Development
WHO: World Health Organization

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Executive Summary

Diarrheal diseases kill more than 200,000 under-five children each year in Nigeria, representing 19% of Nigeria's under-five deaths.[1] Treatment with Zinc and Oral Rehydration Salts (ORS) is recommended by the WHO, and has the potential to prevent more than 40% of these deaths. Reducing the mortality burden of diarrheal diseases in Nigeria by increasing access to Zinc and ORS treatment therefore represents a significant opportunity to make dramatic progress on MDG 4.

Nigeria's high diarrheal disease mortality persists in large part due to grossly inadequate access to appropriate treatment. Nationwide, only about 30% of children with diarrhea receive Oral Rehydration Therapy (ORT)[2] and less than 1% receives Zinc for the treatment of diarrhea.[3] The majority of diarrhea patients in Nigeria are treated with antibiotics. In response, the Government of Nigeria is currently developing a national scale-up plan for essential childhood medicines that includes appropriate treatments for childhood diarrhea. To successfully minimize diarrheal mortality, however, the private health-care delivery sector will have an important role to play as nearly 60%[*] of caregivers who seek treatment for diarrhea in Nigeria turn to the private sector.[4]

This assessment attempts to inform the development of a comprehensive scale-up plan for ORS and Zinc by identifying the main barriers to increasing accessibility and uptake of appropriate diarrhea treatments through Nigeria's private healthcare delivery sector. In particular, barriers to access and uptake were assessed at the levels of supply, distribution, and sale of treatments. Desk reviews of existing research were supplemented by analyses of population-based data and interviews with key informants in the diarrhea treatment and pharmaceutical sectors.

The healthcare sector in Nigeria is dominated by the private market, which accounts for 73.5% of the country's total expenditures on healthcare. Despite the prominent role that private sector channels play in enabling treatment access, barriers at all levels of this market hinder affordable and equitable access to drugs. Retail prices for medicines are prohibitively high for nearly half of the population, and range between 2 to 64 times the international reference prices in 2006, with wide variations across facilities and retailers.[5] The majority of private healthcare in Nigeria is delivered through Patent and Proprietary Medicine Vendors (PPMV), a retail channel with an estimated 150,000 formal and informal vendors across the country.[6,7,8] Though PPMVs are meant to only sell over-the-counter (OTC) drugs, most sell prescription-only medications (POM) as well.[9] The lack of regulatory enforcement, formal organization, and training of PPMVs, among other factors, has led to the proliferation of poor practices among this cadre.[10]

The diarrhea treatment market is no exception to these broader challenges and additionally, the market for ORS and Zinc remains an underdeveloped component of Nigeria's pharmaceutical industry, lacking investments from manufacturers to drive sales or competition to drive coverage and lower prices. There are currently fifteen locally manufactured and five imported ORS products registered in Nigeria, and only one imported product of the WHO-approved formulation for Zinc.[11] In comparison, 178 local manufacturers and importers have registered Metronidazole,[12] the most commonly used treatment for diarrhea.

This assessment identifies the key demand and supply barriers to scaling up ORS and Zinc in Nigeria.

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[*] 36% sought care in the private sector, as opposed to 25% in the public sector; 36% pursued home management and 3% chose traditional or other sources.

Demand-side barriers:

There are two major demand-side drivers for diarrhea treatment failure. First, care-seeking behavior for diarrheal diseases in Nigeria is low. Roughly 30%[13] to 42%[14] of caregivers seek treatment outside the home for diarrhea. This failure may be linked to caregiver perceptions of childhood diarrhea as a non-threatening condition: over 60% of cases receive no treatment.[15] Secondly, caregivers who do seek care tend to prefer inappropriate treatments. While caregiver awareness of ORS is moderate (>60%),[16] ORS is often perceived as weak or ineffective.[17] Caregiver awareness of Zinc for the treatment of childhood diarrhea, on the other hand, is low.[18] Caregivers seeking treatment at private sector primary providers [pharmacies or Proprietary Patent Medicine Vendors (PPMVs)] tend to request treatment with antibiotics:[19] almost half of all such diarrhea cases receive antibiotics, while ~25% receive ORS.[20,21]

Supply-side barriers:

There are significant availability and affordability barriers in the private sector market for ORS and Zinc. There is currently only one pediatric Zinc product available on the Nigerian market, and its dose and formulation* render it inferior for the treatment of diarrhea. ORS treatment courses, priced between USD0.63 and USD4.38[22] (driven by high manufacturing and distribution costs[23]), are too expensive for the majority of consumers. Furthermore, private sector suppliers see ORS and Zinc as low priority products due to perceived weak demand and poor profitability. Meanwhile, caregivers' preferred primary providers (drug shops and PPMVs) undermine potential demand by failing to recommend ORS and Zinc,[24] resulting from a lack of knowledge of these treatments and a desire to respond to customer preferences, among other considerations.

Shifting the market to increase the availability and affordability of ORS and Zinc in Nigeria will require a coordinated effort between private and public stakeholders. While the public sector has a critical role in stimulating national demand for ORS and Zinc through education and awareness programs, encouraging competitive private sector participation in this market will be crucial to ensure availability by reducing prices, and increase availability of the products. In tandem, efforts to reposition ORS and Zinc as attractive products, both clinically effective and profitable through high volumes and low margins, will be important to changing diarrhea management practices of caregivers and diarrhea prescribing practices of PPMVs. Interventions will need to identify and leverage centers of influence within the vast and diffuse private healthcare market in Nigeria. Moreover, these interventions will need to target the unregulated PPMV-level of the market, where the majority of Nigerians access drugs, to alter current ordering and dispensing habits. The introduction of a co-packaged product may be an attractive option to circumvent the challenges of poor regulation and product perception, since it can ensure that a greater percentage of caregivers have access to both products, and incite excitement for a "new treatment for diarrhea" among suppliers, retailers, and caregivers.

1. Context

In July of 2011, under the leadership of UNICEF and Ray Chambers, the UN Special Envoy for Malaria, a group of partners began developing a new global initiative to dramatically accelerate the scale-up of effective treatment for the three largest killers of children: diarrhea, malaria, and pneumonia. Improving access to malaria treatment and diagnosis has received significant, if still insufficient, attention and funding in recent years. In contrast, scale-up of diarrhea and pneumonia treatment has been largely

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* 10mg non-dispersible tablets

neglected for the past decade, resulting in less analysis on solutions to achieve large-scale access to these products. The initiative seeks to mobilize additional attention, resources, and concrete action to support 10 countries with the highest burdens of these diseases to design and implement ambitious programs to scale-up those treatments with the goal of achieving universal access by the end of 2015.

As one of these high-burden countries, the government of Nigeria, with assistance from the Clinton Health Access Initiative and other partners, is currently developing a scale-up plan to address these three childhood illnesses.

Currently, the majority of children in Nigeria seek and obtain treatment for all three diseases from the private sector, which requires different, more market-oriented interventions to ensure greater coverage of effective treatment.   This is particularly the case for ORS and Zinc, the WHO-recommended treatments for diarrhea, as both products are safe for over-the-counter use and therefore well- suited to distribution through the private sector. Thus, it is essential to gain a better understanding of private sector supply chains in order to ensure that these treatments reach the maximum number of children in need.

This report presents the findings of a rapid assessment of the private sector supply chain for ORS and Zinc in Nigeria; these findings will then be incorporated within the government's broader scale-up strategy. The aim of this analysis was to:

1. Understand the dynamics that govern the private sector market for diarrhea treatment, including ORS, Zinc, and key competing products;
2. Generate a data set to identify the supply and demand barriers to uptake of ORS and Zinc;
3. Utilize the data set to directly inform the ORS and Zinc scale-up strategy in Nigeria.

2. Methodology

This assessment synthesizes information on Nigeria's private-sector diarrhea treatment market, including potential and real drivers of demand and supply, in order to identify major barriers to the accessibility of appropriate diarrhea treatments. The assessment approached this task by analyzing and linking characteristics of the pharmaceutical supply chain in Nigeria and the behaviors of health providers, pharmaceutical retailers, and caregivers.

Pharmaceutical Supply Chain

Nigeria's pharmaceutical supply chain has been previously described in the World Health Organization's (WHO) *Baseline Assessment of the Nigerian Pharmaceutical Sector*, formative work for the Affordable Medicines Facility: Malaria (AMFm), the WHO's *Access to Medicines* reports, the *Nigeria Pharmaceutical Country Profile*, and Frost and Sullivan. Descriptions in this report draw on these previous efforts and supplement their findings with semi-structured interviews of key informants in the Nigerian pharmaceutical sector.

However, as NGOs in Nigeria play active roles in the Zn/ORS market by importing large volumes—usually after obtaining waivers for hefty import and customs duties[*]—many suppliers view them as competitors

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[*] Both UNICEF and Micronutrients Initiative, for instance, indicated that they had obtained waivers for duties on their ORS and Zinc imports, and have a combined import volume of nearly 200,000 treatment courses.

in this arena. As such, many major players in the private-sector pharmaceutical supply chain were reluctant to divulge proprietary and market information related to their diarrhea treatment products and this limited the range of key informants that were included in the current assessment (see the appendix for details on key informants).

Information on retail prices and cost components of pharmaceutical products in Nigeria obtained from key informants was validated by an informal retail availability assessment carried out by CHAI and the Society for Family Health (SFH). Using a convenience sample, ORS, metronidazole, and Zinc products were purchased from retail outlets in Abuja, Lagos, Port Harcourt, Kaduna, Sokoto, Yola, Ibadan, Calabar, Onitsha, and Enugu, and their prices recorded. While this methodology does not provide an exhaustive catalogue of the range of product pricing in Nigeria, it is sufficient to validate information provided by key informants regarding the variation of retail prices and the relative affordability of products. Moreover, relative pricing and cost components of pharmaceutical products in Nigeria have been previously described by Health Action International and the WHO.[25,26] Information from these reports constitutes an important input in this assessment.

Provider, Retailer, and Caregiver Behavior

Insights on provider, retailer, and caregiver behaviors were obtained from semi-structured interviews with key informants in the diarrhea treatment field and validated with findings from a targeted desk review of available literature on knowledge, attitudes, and practices *vis-à-vis* diarrhea treatment in Nigeria. Secondary analyses of data from the 2008 Nigerian Demographic and Health Survey previously performed by USAID and informal polls of Nigerian pediatricians and PHC staff using convenience samples were also incorporated to supplement key informant insights (see the appendix for details on key informants).

Finally, analysis of preliminary data from a baseline survey of diarrhea treatment practices in southern Nigeria performed by UNICEF was also used to inform findings on provider, retailer, and caregiver behaviors. This survey was conducted in eight local governments of four states, achieving a sample size of 5,473 caregivers and 268 providers and retailers (among which 198 were PPMVs). See appendix B-C for the survey methodology. This survey's use in the current assessment was limited, however, by inconsistencies in data collection arising from poor supervision. As a result, much of the information captured by this exercise pertaining to the availability and affordability of treatments was not analyzable at the time this report was prepared.

3. Diarrhea Treatment Private Sector Supply Chain

Overview of the Pharmaceutical Sector

The market for pharmaceuticals in Nigeria was valued at $580.0 million in 2007, and is expected to more than triple to $1,868.9 million by 2014 due to increased government and donor funding for healthcare, a growing middle class, and improved regulation. In 2007, generics composed 66.2% of pharmaceutical products sold and branded pharmaceuticals composed the remaining 33.8% of the market.[27]

The local manufacturing industry represented 25%-40% of the total pharmaceutical market in 2007, a share that is relatively stable. Growth in the local manufacturing industry is encouraged by the enforcement of import bans—prohibiting the importation of products for which local manufacturing capacity exists—and higher import duties charged on finished products than on raw materials.

Consequently, foreign manufacturers have established local manufacturing facilities within Nigeria. According to National Agency for Food and Drug Administration and Control (NAFDAC), 58.0% of local manufacturing facilities are indigenously owned and 5.0% are government owned (2007 figures).

Continued growth in the pharmaceutical industry is challenged by several regulatory and quality issues such as:

1. *Illegal market participants*: The pharmaceutical industry in Nigeria has been plagued by counterfeit and illegally imported pharmaceuticals. While NAFDAC has made strides in improving regulation and control of pharmaceuticals, this illegal market continues to exist. In 2006, the market for counterfeit pharmaceutical products was estimated to be worth $700M USD.[28]
2. *Time taken to register novel compounds with NAFDAC*: NAFDAC requires that all novel compounds undergo local clinical trials to demonstrate effectiveness within the local population, extending the time for the registration of a new product to 18 months.
3. *Import Delays*: Delays of up to two and a half months have been reported at ports of entry into Nigeria, attributed to insufficient infrastructural and personnel resources. These delays are a particular threat in a market where supply chains can rapidly become saturated with counterfeit products in the absence of genuine pharmaceuticals.

Overview of the Pharmaceutical Supply Chain

The pharmaceutical supply chain in Nigeria presents diverse routes for commodity flow from supplier to patient, with products moving from 567 suppliers to over 150,000 formal and informal retailers. The top of the in-country supply chain consists of Nigerian suppliers, which may be local manufacturing firms or importers of finished retail products. It is important to note, however, that no Nigerian manufacturer has the capacity to produce Active Pharmaceutical Ingredients (APIs) in-country. Nigerian manufacturers are therefore engaged primarily in the import, processing, and packing of APIs.

Once product has been delivered in-country, suppliers employ three main distribution strategies in order to reach regional and local markets.[29,30] Suppliers a) operate regional distribution systems on a hub-and-spoke model as either vertically integrated supply chains or under the operation of third-party logistics firms, b) enter into relationships with wholesalers and/or distributors who operate in different regions of the country and in turn sell to retailers or secondary wholesalers, or c) a combination of the two (see sections 6 and 7 for more details). Figure 1 illustrates the flow of pharmaceutical commodities in Nigeria's private sector supply chain.

As depicted in figure 1, the private supply chain terminates at a variety of retailers in both the formal and informal sector. Retailers supplied by the private sector include private health providers and pharmacies, formal and informal Proprietary and Patent Medicine Vendors (PPMVs), and public health facilities. Sales to public health facilities constitute a significant portion of supplier revenues in many cases.[31] However, private-sector retailers constitute the majority of sales volumes for the diarrhea treatment market (see sections 8 and 9 for more details).
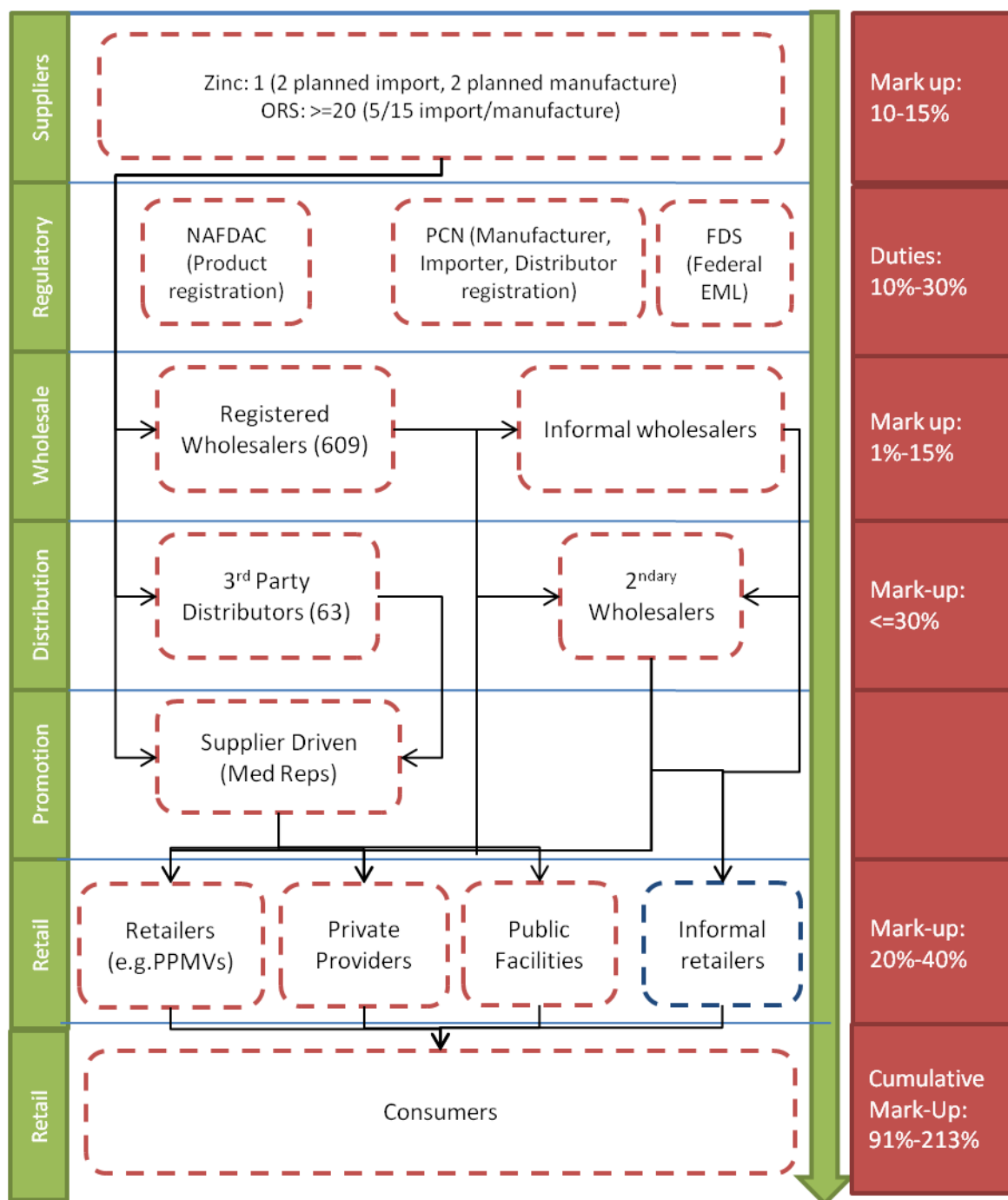
Figure 1: Schematic of the private-sector pharmaceutical supply chain in Nigeria. [Sources: PCN registration data; semi-structured interviews with suppliers; WHO/HAI: Medicine Prices in Nigeria, 2006; The Private Commercial Sector Distribution Chain for Antimalarial *Drugs in Nigeria: Findings from a Rapid Survey* (2009); FMoH, WHO: *Access to and Rational Use of Medicines at the Facility Level* (2010); Frost and Sullivan, *Distributor Analysis in Nigeria* (2011)]

Access to Medicines

The affordability of medicines constitutes a significant barrier to access in Nigeria. Only 54% of Nigerians are usually able to afford the medicines they need, and over 46% report that they have had to borrow money or sell possessions to pay for medicines.[32] This is due a confluence of poverty and price inflation in the pharmaceutical sector.

A 2006 assessment by WHO and Health Access International (HAI) found that retail prices for medicines in Nigeria ranged from 2 to 64 times international reference prices, with wide variations in prices observed across facilities and retailers in both the public and private sector likely influenced by a lack of price regulation. [33] According to the same report, generic medications are up to eight times as expensive in Nigeria as in other sub-Saharan African countries. [34]

Relatively high consumer costs are pervasive in both the public and private sectors, but consumer costs are highest in private health clinics. [35] While medicines purchased in public facilities have been found to be the most affordable in general, [36] medicines in private pharmacies are competitively priced with the public sector, and generic medicines in these retailers tend to be slightly less expensive than in public facilities. [37,38] Private clinics, on the other hand, were found to charge over 200% more than public facilities for the lowest generic price version of the medicines evaluated. [39]

The WHO/HAI report identifies high distribution costs, high production costs, and high tariffs as the main drivers of Nigeria's pharmaceutical price inflation. Port charges and clearing costs, for example, were estimated to contribute 13% of the final cost to the consumer, and retailer margins were estimated to contribute 23%. [40] Moreover, margins at all points in the supply chain were estimated to increase substantially as the landed cost of commodities decreased, suggesting that a lack of price regulation in the pharmaceutical sector contributes to both high variability and high consumer costs. Figure 2 shows the major cost components of medicines in Nigeria.
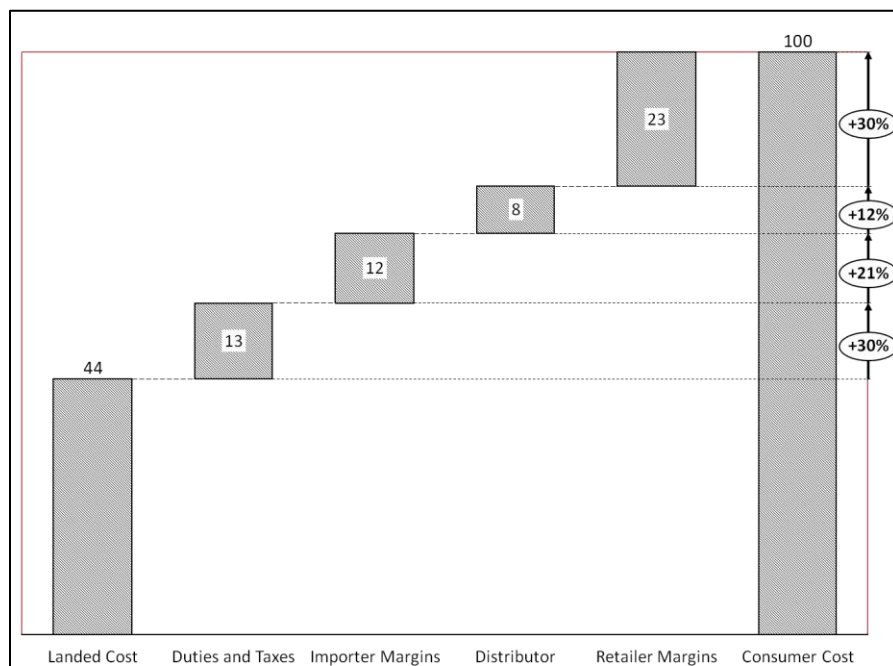
Figure 2: Estimated average % contribution of major pharmaceutical cost components to consumer cost [Adapted from WHO/HAI: Medicine Prices in Nigeria, 2006]

High and variable consumer costs were also observed in the context of the diarrhea treatment market. For instance, a treatment course of metronidazole tablets was observed to range from USD0.31 to USD2.50, and even more so for Zinc and ORS: ORS treatment courses were observed between USD0.63 and USD4.38 while Zinc treatment courses ranged from USD1.25 to USD3.13—rendering the appropriate treatment of Zn/ORS unaffordable for most Nigerians.

The availability of essential medicines in public sector facilities also constitutes a significant barrier to access and likely contributes to the observed preference for private sector providers in Nigeria. Availability of medicines is generally poor in the public sector: only about two thirds of public facilities stock a full range of essential medicines—with only about a third stocking ORS—and only half are able to fill more than 75% of patients' prescriptions. [41] Moreover, the average stock-out duration for public facilities is ninety days. [42]

Availability of drugs in the private sector, however, is higher and private pharmaceutical retailers have by far the greatest availability of medicines,[43] with over 90% stocking a full range of essential medicines,[44] while private clinics have the second-highest availability.

4. Regulatory Environment

Key Barriers

- Antibiotics are widely available as Over-the-Counter (OTC) medications through illegal sales at primary pharmaceutical retailers (e.g. PPMVs), despite their classification as prescription-only medications. The ubiquitous presence of antibiotics at all levels of the private sector challenges ORS and Zinc from gaining market share.
- The regulatory status of Zinc is currently unclear. While Ministry of Health officials will note that Zinc has Over-the-Counter status and can be sold legally by PPMVs, it does not appear on PCN's list of "Approved medicines for sale by PPMVs" except as a component of approved multivitamins. The ambiguous regulatory status of Zinc may limit the ambition of actors at the top of the supply chain—government, manufacturers or implementing partners—to push Zinc to the lowest level of access in the private sector.

Nigeria's Pharmaceutical Regulatory System

The National Agency for Food and Drug Administration and Control (NAFDAC):

NAFDAC regulates and controls the registration, importation, manufacturing, distribution, advertisement, and sale of food and drug products.

Over-the-Counter (OTC) drugs incur a one-time USD6,250 (NGN1,000,000) registration fee, while Prescription-Only Medicines (POM) incur a USD1,562 (NGN250,000) registration fee.[45] Fees for locally manufactured products are considerably lower (USD437 or NGN70,000 for pharmaceuticals in general).[46] NAFDAC also plays a limited quality assurance role by conducting batch quality assurance upon importation or production in-country.[47]

The process for registering a new product for importation generally takes three to nine months to complete, depending on whether or not it is fast-tracked.[48] The registration process involves the submission of product documentation by the manufacturer—including a certificate of GMP—and samples of the product for quality assurance.[49,50] As mentioned above, NAFDAC performs QA on all shipments of pharmaceuticals intended for Nigeria and has agents in China and India to facilitate this process before shipments embark.[51]

However, NAFDAC has limited resources and manpower to effectively regulate drug quality at the retail level in Nigeria. In one study done by Erhun *et al*, the majority of participants cited ineffective enforcement of existing laws as the major reason for counterfeit drugs, followed by inadequate laws and non-health professionals in the drug business.[52] In 2001, a study by NAFDAC found that almost 70% of pharmaceuticals on the market were not authorized, and only after massive campaigns to increase awareness, the figure came down to 20% in June 2004.[53,54]

Finally, prices in Nigeria's pharmaceutical sector are unregulated, leading to wide variation in wholesaler margins (typically 1%-10%, but up to 15% in the event of product shortage).

Pharmacist's Council of Nigeria (PCN):

The Pharmacist's Council of Nigeria is responsible for the regulation of pharmaceutical premises. This includes manufacturers, importers, distributors, and retailers (i.e. pharmacists and PPMVs).

Pharmaceutical manufacturers and importers are required to register with the PCN. The PCN sets and maintains regulations pertaining to the registration requirements for pharmaceutical premises.[55] PCN registration fees range from USD12 (NGN2,000) for PPMVs (USD6 or NGN1,000 for annual renewal) to USD125 (NGN200,000) for manufacturers with multiple product lines (USD 112 or NGN100,000 for annual renewal).[56]

Moreover, distributors of pharmaceutical products must list a superintendent pharmacist as a part of registration. Under this rule, a pharmacist may only be associated with one registered business. A rapid supply chain assessment points out that there are nearly 11,000 people per pharmacist in Nigeria, making the requirement for a single, dedicated pharmacist the "largest barrier for new entrants into the market."[57] PCN registration regulations were therefore found to limit the availability of high-quality, formal pharmaceutical establishments and contribute to the proliferation of informal pharmaceutical wholesalers. The scale of the informal wholesale market is not well quantified, but the assessment report indicates that informal wholesalers are likely to be a major source of products for PPMVs and other retailers.[58]

At the retail level, pharmacies and PPMVs must register with the PCN in order to operate legally. The PCN is charged with inspecting PPMVs and other pharmaceutical premises to ensure compliance with relevant regulations as a part of this oversight responsibility.[59] Unlike registered pharmacists,[*] the PCN does not institute any formal training requirement for the issuance of PPMV licenses. Rather, PPMVs must only attend a mandatory orientation.[60]

However, the PCN does maintain a list of medicines approved for sale by PPMVs. The medications on this list are generally OTC medications, but they may only be sold in pre-packaged doses and not dispensed from bulk stores.[61] Like the sale of prescription-only-medications, however, enforcement of this regulation is weak, and PPMVs often stock medications not found on the PCN's approved list.

The lack of formal training programs is a key challenge for the provision of quality health retail services through PPMVs. Unlike physicians, pharmacists, and other formal health providers in Nigeria—who obtain updated information about new treatments and guidelines through more rigorous formal CME requirements—PPMVs are often left with few formal channels for obtaining information about the proper use and administration of the medications they sell, despite being required to attend orientation sessions as a licensing requirement. This situation is discussed in more detail in section 8 below.

Nigerian Customs Authority:

The Nigerian Customs Authority plays a role in managing the importation of pharmaceuticals and collecting duties ranging from 5% for the simplest APIs to 20% for finished products intended for retail sale.[62] Clearance and inspection charges contribute an additional 5-10% to total importation costs. These

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[*] PCN instituted the Mandatory Continuing Professional Development program for pharmacists in 1998: http://www.pcnng.org/MCPD%20Programme.htm

duties can be waived, however, for products imported for humanitarian purposes and waivers are generally received by most NGOs engaged in the importation of ORS.

As mentioned in section 3 above, all Nigerian pharmaceutical manufacturers import their APIs, which leads to an increase in cost of at least 10% even before the in-country supplier mark-up. Costs related to the importation of pharmaceutical products in Nigeria can therefore constitute a significant portion of the final retail price and are estimated to contribute approximately 13% of the cost to consumers.[63]

Current Regulatory Status of Key Diarrhea Treatment Products

Antibiotics are currently classified as a Prescription-Only Medication (POM) by NAFDAC, which means they may not be dispensed or sold without a prescription. In addition, the PCN does not include them on its list of approved medications for PPMVs,[64] indicating that they are not eligible for retail sale even as pre-packaged doses. However, antibiotics are widely dispensed by both formal and informal retailers as OTC medications despite their POM classification.

While NAFDAC has conferred OTC status to ORS, and the PCN lists ORS as one of the approved medications for sale by PPMVs, Zinc's regulatory status is unclear. Key informants within the Ministry of Health have indicated that Zinc currently has OTC status, implying that it may be purchased from a registered pharmaceutical premise without a prescription. However, Zinc is not present on the PCN's approved medication list, implying that it is ineligible for sale as a patent medicine except as a component of a multivitamin or multimineral supplement—which the PCN lists as products eligible for sale at PPMVs.

Despite this regulatory uncertainty, however, key informants within the pharmaceutical industry and the Ministry of Health do not view Zinc's current regulatory status as a significant barrier to uptake in the private sector. For example, ACTs have a similarly opaque status—being classified as OTC by NAFDAC but also conspicuously absent from the PCN's PPMV-approved list—but are still widely available in PPMV shops.[65] However, a reclassification of Zinc's regulatory status may facilitate government-led interventions to generate demand for Zinc among retailers and consumers, and remove any uncertainty about the market potential of Zinc for the treatment of childhood diarrhea.

5. Supplier Landscape

Key Barriers

- Suppliers perceive consumer demand for ORS and Zinc products to be low, and subsequently do not prioritize these products for production or promotion. This lack of prioritization contributes to limited availability, marketing and price competition in private sector channels (see Figure 3).
- Comparatively higher production and distribution costs, combined with low demand, for ORS lead to low margins, rendering ORS an unattractive product within suppliers' portfolios.

Comparative Pricing of Major Diarrhea Treatments (USD)	
Zinc	1.25 to 3.13 for 10 tablets
ORS	0.63 to 4.38 for three-sachet course
Zinc & ORS	1.88 to 7.50 for combined course
Antibiotics	0.31 to 2.50 for tablets; 1.56 to 2.63 for suspensions

Pharmaceutical Suppliers in Nigeria

There are currently 159 pharmaceutical manufacturers and 408 pharmaceutical importers registered in Nigeria that make up the suppliers of health products in the country.[66] Pharmaceutical importers that are either subsidiaries of international pharmaceutical companies or locally owned and operated companies therefore form the backbone of the Nigerian pharmaceutical industry. These companies supply ready-made pharmaceutical products for distribution down the supply chain or bulk APIs for processing by local manufacturers.

Semi-structured interviews with Nigerian pharmaceutical suppliers indicate that, for the most part, the in-country representative conducts market research and decides which products to import based on the perceived demand generated by need or public sector market priming. In some cases, importers that also operate as distributors will decide to create a market by employing a "push marketing strategy" using its medical representative sales force.

Once a product is targeted, the Nigerian importer will initiate and lead the registration process, with inputs from the international manufacturer where required. In some cases international manufacturers will initiate the registration of its products to expand into a new market.

Market Characteristics of Diarrhea Treatment Products

Antibiotics:

Antibiotics are the largest competitors to ORS and Zinc as a treatment for diarrhea in Nigeria, with approximately 33% of childhood diarrhea cases being treated with an antibiotic as compared to about 25% being treated with ORS and less than 1% being treated with Zinc.[67] Metronidazole and Thalazole have been found to be the most common types of antibiotics used for diarrhea treatment. Manufacturer margins on these products—which retail at as low as USD0.31 per treatment course—range from 10%-50% while distributor margins were described as approximately 30% and retail margins as approximately 10%-50%.[*]

The wide ranges in margins are generally influenced by location, distribution systems, access to volume pricing, product availability and retailer/consumer demand. Moreover, supplier margins are affected by duties and other clearing costs because, as indicated above, these factors contribute an average of 13% to the final consumer cost of pharmaceuticals. Variability in margins appears in retail prices as well: observed retail prices[†] of metronidazole treatment courses in Nigeria range from USD0.31 to USD2.50 for tablets and USD1.56 to USD2.63 for suspensions.

Three major metronidazole manufacturers were interviewed in Nigeria with reported annual sales volumes of 360,000 to 2,000,000 units each. While these sales numbers do not represent the percent of metronidazole used for diarrhea treatment, they do illustrate the volumes required to achieve a profitable, high-volume, low-margin product. The market potential of these alternative diarrhea

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[*] Based on interviews with representatives from two of three identified metronidazole suppliers. The third declined to discuss any pricing information.
[†] Based on informal retail assessments performed by CHAI and SFH and described in Section 3: Methodology.

treatments is further illustrated by the volume of suppliers. For instance, there are over 178 metronidazole products registered for both import and manufacture in Nigeria.

Oral Rehydration Salts:

The local market for ORS is relatively diverse, comprising over fifteen locally-manufactured and five imported products.[68] Most of these products are unflavored powder sachets. Retail prices for a three-sachet course of ORS range from USD0.63 to USD4.38. According to key informants, supplier margins for ORS (5-12%) are not competitive with the major antibiotic products on the market. Low margins for ORS—even locally-manufactured products—on the Nigerian market likely stem from the following factors:

1. Local production of the raw materials used in ORS is low, leading to sourcing or importing the products at a high cost. For example, Nigeria imports over 90% of the sugar consumed in-country, and refined sugar imports attract duties of 35%.[69] As such, locally-produced ORS suffers from the same import-induced price-inflation as locally produced pharmaceuticals in general, and may do so to a higher degree if the manufacturer has chosen to import refined ingredients.
2. In-country production costs for ORS may actually be higher than those for other products (e.g. metronidazole) due to the absence of API production in Nigeria. One supplier interviewed described the manufacture of ORS to be more labor- and time-intensive than the production of antibiotic tablets from imported APIs due to the additional manufacturing steps for ORS—which are traditionally carried out by external manufacturers. These manufacturing processes are ostensibly more expensive to perform in Nigeria due to its high cost of doing business.[70]
3. Finally, shipping and distribution for ORS are relatively more expensive than for other pharmaceutical products. For example, one ORS supplier pointed out that a treatment dose (three sachets) of ORS constitutes a much greater shipping burden both in terms of weight and volume relative to a treatment dose (a ten-tablet card) of metronidazole. This discrepancy between ORS and metronidazole results in an increased per-unit distribution cost for the former.

Despite these challenges, two major suppliers of metronidazole have demonstrated interest in entering the ORS and Zinc markets.[71] This suggests that larger pharmaceutical suppliers in Nigeria could 1) perceive an ability to maintain higher margins in this market by leveraging economies of scale, 2) see an opportunity to produce incremental revenue by marketing ORS and Zinc products alongside metronidazole, or 3) perceive an impending increase in demand for Zinc and ORS products due to international interest and wish to position themselves to quickly capture the market.

Zinc:

In contrast to the diversity of the Nigerian market for ORS, the market for pediatric Zinc is undeveloped. There are only four Zinc products on the Nigerian market[72]. None of these products are dispersible, none are manufactured locally, and only one meets the WHO-recommended formulation for the treatment of childhood diarrhea.[*] Based on the market landscape for Zinc, it appears that most uptake of the product

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[*]Though this product is a 10mg, non-dispersible formulation and is therefore not the correct dosage. The remaining products appear to be marketed as adult nutritional supplements. WHO-recommended formulations include Zinc-Sulfate, Zinc-Gluconate, and Zinc-Acetate with 20mg Zinc content. Products on the Nigerian market include Zinc-Lactate, Zinc-Galactate and 10mg Zinc-Gluconate.

in Nigeria has been driven by NGO efforts: between 2010 and 2011, UNICEF and Micronutrient Initiative alone reportedly distributed nearly 200,000 ten-day courses of Zinc for pediatric diarrhea.[*]

However, despite a past sluggish market for Zinc, two manufacturers are currently registering dispersible Zinc sulfate tablets to produce in Nigeria and two importers are registering dispersible Zinc sulfate tablets to import to Nigeria. All four of these products are slated for introduction by the second quarter of 2012 and the timing of their decisions to enter the Zinc market in Nigeria suggests that international interest in Zinc scale-up may have played a role in signaling potential demand.

Manufacturer perceptions of diarrhea treatment market

Poor uptake of ORS and a perception of low consumer and retailer demand for ORS and Zinc in the private sector have led to an overall lack of supplier interest in these commodities. Suppliers cited this low demand as a major barrier to both entry and aggressive participation in this market. Although many suppliers relayed the frustration with NGOs distorting the market for ORS by distributing subsidized or free products,[73] several indicated that the public sector represented a significant portion of their diarrhea treatment sales, with figures ranging from about 7% to 40% to as high as 80% of sales.[74]

Despite the market challenges and fears, two major suppliers of metronidazole have demonstrated an interest in entering the ORS and Zinc market, suggesting that there is potential for the overall size and competitiveness of these markets to expand.[75]

6. Distributor/Wholesaler Landscape

Key Barriers

- Pharmaceutical commodities follow fragmented, convoluted distribution channels to a multitude of formal and informal retailers, limiting the influence of actors at the top of the chain on the bottom: supplier-driven promotion is cost-intensive, and price regulation is not feasible, resulting in significant variability.
- Inefficient penetration of rural markets, limiting availability and reducing affordability for the majority of Nigerians that live in rural areas.

Private-Sector Distribution Systems

Distribution of diarrhea treatment products down the private sector supply chain in Nigeria is congruent with that of antimalarials.[76] Pharmaceutical products flow through the supply chain to retail outlets through diverse and far-reaching distribution infrastructure, with suppliers sometimes utilizing up to 50 distributors to deliver to different regional markets.

Three main distribution strategies are used by Nigerian suppliers in varying combinations: 1) operating regional distribution systems on a hub-and-spoke model as a vertically integrated supply chain; 2) contracting a third-party logistics firm for distribution to regional or local depots and/or sales representatives; 3) entering into relationships with wholesalers and/or distributors who operate in

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[*] While this represents the majority of Zinc coverage in Nigeria (<1%), it pales in comparison to the estimated 50 million episodes of childhood diarrhea in the country every year.

different regions of the country and in turn sell to retailers or secondary wholesalers. The characteristics of these strategies are summarized below.

- *Vertically Integrated Distribution:* Suppliers operate a series of regional warehouses connected to a central warehouse for distribution to wholesalers, sales representatives, and larger retailers. Commodities may be distributed via proprietary delivery vehicles, waybills, and/or pickup by sales representatives and/or retailers from the central and local warehouses. Larger retailers may in turn act as secondary wholesalers to smaller retailers, and sales representatives make deliveries to retailers to fulfill the orders they generate.[77]

- *Wholesalers:* Private wholesale firms purchase directly from suppliers for distribution and sell to retailers in local and regional markets. According to AMFm formative research, such wholesalers may establish relationships with suppliers as "authorized distributors," often availing them of incentives such as volume discounts and lines of credit. Wholesalers may even function as regional warehouses for suppliers and have supplier sales representatives directly attached to them as a part of this role.[78]

- *Third-Party Contractors:* Suppliers contract to an independent firm specializing in the distribution of consumer and other goods through a propriety distribution system similar to that described for *Vertically Integrated Distribution.*[79]

Rural and Informal Distribution Systems

Weaknesses in Nigeria's transportation infrastructure have rendered large swaths of rural areas isolated and inaccessible. Most pharmaceutical distributors are therefore unable to reach rural areas efficiently and they remain under-served and under-supplied for all essential medicines.[80] As a result, informal distribution systems have formed which are described as being initiated through formal and informal PPMVs.[81]

For example, the National Association of Proprietary and Patent Medicine Dealers (NAPPMED) operates regional and local chapters which, in some rural areas, reportedly act as a platform for pooled procurement.[82] In this scenario, members of a local chapter pool orders and send a designee to an urban market to procure commodities from a pharmaceutical supplier or wholesaler and subsequently distribute them to PPMVs in their region. The costs of transportation are borne by the PPMVs and are likely passed on to consumers.

In some cases, suppliers have recognized the opportunity to capture demand in rural markets, and a few have achieved modest penetration through the use of conventional marketing and distribution infrastructure, including medical sales representatives or more innovative arrangements. For instance, one supplier indicated that they actively recruited National Youth Service Corps (NYSC) members posted to rural areas as sales representatives. NYSC members collect OTC pharmaceutical products from the suppliers' distribution system in adjacent urban areas and sell them to rural retailers on a consignment basis.

While these tactics help fill gaps, availability and affordability of key commodities in remote areas remain a challenge, particularly as actors at the central level have limited ability to influence what occurs several levels downstream. Given the difficulty of influencing ordering and retailing practices in such a diffuse market, co-packaging or bundling ORS and Zinc may be an important tactic to ensure that caregivers are receiving both recommended products at the lowest levels.

7. Sales and Marketing

Key Barriers

- Suppliers are not incentivized to promote low margin, low volume products like ORS and Zinc.

Most suppliers interviewed described undertaking promotional activities for their products, usually via routine sales channels such as networks of medical and/or sales representatives. Formative research for the AMFm project also identified the use of sales and medical representatives as a key supplier strategy for promotion, education and demand generation.

Interviews with suppliers and other key informants indicate that most major pharmaceutical suppliers in Nigeria employ brand recognition strategies as a key component of marketing activities. Brand recognition is often built through mass-media (i.e. television, radio, and print media) and other promotional tactics (such as advertisements on transit systems), forming the backbone of marketing for over-the-counter products. This is congruent with experience from the introduction of the AMFm program, in which some importers engaged in mass media marketing to promote their ACTs directly to caregivers.

For prescription-only products such as antibiotics, brand recognition is leveraged by medical and sales representatives to create demand among prescribers at health facilities and clinics. In addition to standard pharmaceutical detailing activities, clinical presentations to professional association events and support for continuing medical education programs serve as platforms for product promotion. Prescribers are generally targeted in these activities based on their perceived ability to influence treatment choices for these products.

Promotional decisions are generally made at the supplier level and are influenced by the forecasted profit potential of individual products. For instance, one interviewed ORS supplier indicated that product promotional budgets were drawn directly from the revenue of the product line itself, implying that higher-revenue products have larger promotional budgets. The relatively low profit potential of ORS and Zinc, compared to alternative diarrhea treatments such as antibiotics, likely makes it difficult for suppliers to allocate large promotional budgets to their ORS or Zinc products, limiting the use of standard promotional tactics employed for other OTC products.

8. Provider Behavior

Key Barriers

- As detailed in the following sections, the majority of caregivers seek care at PPMVs, where they commonly receive inappropriate treatment for diarrhea, due to several factors:
    - Many PPMVs are unaware of, and untrained on, the appropriate treatment for childhood diarrhea;
    - PPMVs do not have the opportunity to offer advice or recommend a better treatment because often, caregivers do not ask PPMVs for treatment based on patient symptoms;

- When a caregiver does offer the symptoms for which she/ he is seeking treatment, she/ he will often still demand a preferred treatment (typically antibiotics). The PPMV, facing competition from other shops, will provide the demanded treatment rather than risk losing a sale in trying to push an alternative;
- As mentioned, ORS and Zinc are not pushed down to retailers from the top of the chain, and PPMVs may be incentivized to sell sub-optimal treatments with higher margins (i.e. antibiotics) over demanding ORS and Zinc from upstream suppliers.
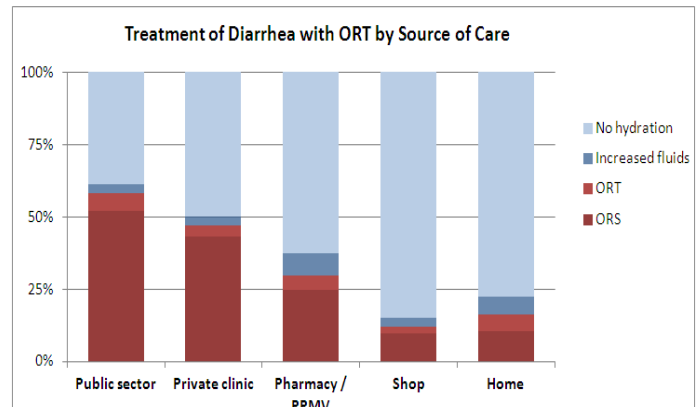
Patronage of Public and Private Providers

Figure 3: Proportion of children receiving ORT for diarrhea by source of care. (USAID, secondary analysis of NDHS 2008)

In general, specialized healthcare providers in Nigeria (e.g. pediatricians) display strong knowledge of appropriate treatments for childhood diarrhea: pediatricians polled in a targeted survey of teaching hospitals in Nigeria all indicated that they routinely prescribe Zinc[*] and ORS for the treatment of uncomplicated childhood diarrhea. Further, a study of private practitioners in Enugu found that all physicians interviewed believed in the efficacy of ORT for uncomplicated childhood diarrhea.[83] Moreover, the treatment of childhood diarrhea with ORT is higher at public (~60%) and private (~50%) clinics than at other channels of care (i.e. PPMVs, 27%; shops, 10%).[84]

Number of practitioners in Nigeria		
Practitioner	**Total**	**Per 10,000 people**
Physicians[85]	55,376	3.66
Pharmacists[86]	13,199	0.87
Nurses[87]	224,943	14.9
PPMVs[88,89,90†]	43,000 - 150,000	2.9-10

Table 1: Density of healthcare providers and retailers in

Unfortunately, patient access to specialized health professionals is low in Nigeria. There are fewer than four doctors and fifteen nurses for every 10,000 people in Nigeria,[91] and they are mostly concentrated in secondary and tertiary facilities. The public primary health-care system—which is intended to be the backbone of access to basic health services in Nigeria—consists of just under 20,000 facilities,[92] most of which are poorly resourced.[93,94] In contrast, PPMVs constitute the most numerous pharmaceutical retailer category.[95,96] There are between 43,000[97,98] and 150,000[99] PPMVs[‡] in Nigeria and in some Nigerian communities, over 46% of caregivers identify PPMVs as their first choice provider for the treatment of childhood illnesses.[100] In addition to being the primary source of care, PPMVs are also the primary source (up to 90% in some communities) of drugs used for the treatment of childhood diarrhea.[101]

Thus, while higher-level healthcare providers in both the public and private sector are more likely to have better knowledge and practices *vis-à-vis* appropriate treatments for childhood diarrhea, their relatively scarcity in Nigeria compared with pharmaceutical retailers means that they are seldom a first-line provider for the treatment of common childhood illnesses such as diarrhea.

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[*] However, most could not identify what the source of Zinc would be for their patients.
[†] Wide range accounts for estimates of informal (unlicensed) PPMVs.
[‡] Including formal and informal outlets. Estimates are based on calculations from SFH and interviews with NAPPMED representatives.

Retailer Behavior

Despite high patronage of PPMVs for the treatment of childhood diarrhea, studies in Nigeria indicate that PPMVs have inconsistent and often poor knowledge of diarrheal diseases and the appropriate treatment. A recent UNICEF assessment of diarrhea treatment in southern Nigeria found that less than 40% of PPMVs believe that the combination of ORS and Zinc is an effective treatment for childhood diarrhea.[102] In some communities, over a quarter of PPMVs do not know how to properly prepare ORS.[103] This lack of knowledge around ORS and Zinc points to low rates of PPMVs stocking and recommending ORS and Zinc as treatment for diarrhea.

Educating PPMVs on the appropriate treatment for children with diarrhea will be a critical component of changing the market for diarrhea treatment; however, there are currently no formal systems to disseminate new information to PPMVs. Recognizing this gap, some NGOs and pharmaceutical companies have started to implement PPMV training programs for specific diseases, and the National Association of Proprietary and Patent Medicine Dealers has expressed an interest in expanding these efforts.

However, a lack of awareness is not the only issue facing PPMVs; demand from caregivers also shapes retailer behavior. Evidence from studies in Enugu and Borno states indicate that although many pharmaceutical retailers expressed a preference for ORT, the majority routinely sold antibiotics as a treatment for diarrhea.[104,105] The discrepancy between stated treatment preferences and actual sales practices stems mostly from caregiver expectations and demands.[106,107] Caregivers may not provide a description of the child's symptoms or ask a PPMV for its recommendation - in such cases, PPMVs are not expected to provide advice; rather, the caregiver expects only a transactional interaction.

Due to intense competition among PPMVs, PPMVs tend to prioritize customer preferences. In a study covering 444 patent medicine shops in Oyo state, Brieger et. al. reported that nearly 80% of caregivers patronizing PPMVs request specific medications.[108] PPMVs ask for clarifications or a history from the customer in less than 19% of transactions,[109] and, importantly, PPMVs suggest medications to clients in only 30% of transactions, simply selling the requested medication 69% of the time.[110]

There are other incentives to consider that may keep PPMVs from recommending ORS and Zinc to caregivers seeking treatment for a child's diarrheal: chief among these is the profit potential of alternative treatments to ORS, like antibiotics.[111]

9. Caregiver Behavior

Key Barriers

- As detailed below, roughly one-third of caregivers do not seek care for childhood diarrhea outside the home, and many episodes of childhood diarrhea receive no treatment.
- Caregivers exhibit a preference for antibiotics as a treatment for childhood diarrhea as a result of 1) a lack of confidence in ORS—as demonstrated by the disconnect in caregiver knowledge and use, and 2) relatively high retail prices for both ORS and Zinc—and limited availability for Zinc—compared to antibiotics commonly used for the treatment of childhood diarrhea.
- The combined price of a treatment course of ORS and Zinc in Nigeria is beyond the range of affordability for most caregivers.

Care-Seeking Behavior and Treatment Preferences

Antibiotics are the most common treatment received for childhood diarrhea in Nigeria. Over 30%[112] of childhood diarrheas are treated with antibiotics, with some studies reporting antibiotic treatment rates of up to 54%.[113] At the same time, usage of ORS stands at just over 25%,[114] and Zinc coverage is less than 1%.[115] The tendency to treat childhood diarrhea with antibiotics likely stems from the preferences of caregivers themselves. For instance, a study of diarrhea management practices in Northwest Nigeria found that nearly a quarter of caregivers preferred antibiotics as a first-line treatment for diarrhea while only 6% said the same of ORS.[116]

Little in-depth study of the reasons for caregiver preferences has been done in Nigeria, but preferences for antibiotics in the treatment of childhood diarrhea are likely due to a combination of price and perceptions of efficacy. Preliminary data from a UNICEF assessment of diarrhea treatment practices in four states show that less than 7% of caregivers were aware of Zinc as a treatment for childhood diarrhea and less than 30% of caregivers believe that Zinc and ORS are an effective treatment for childhood diarrhea.[117]

Analysis of the caregiver-reported cost of treatment for childhood illnesses showed the median total treatment cost paid was about USD1.00, with most caregivers spending less than USD2.00.[118] While ORS retail prices observed by CHAI and SFH ranged from USD0.63 to USD4.38 for three sachets,[119] prices for metronidazole and other antibiotics commonly used in the treatment of childhood diarrhea were observed to range from USD0.31[120] to USD2.50[121] per ten-tablet sachet. Metronidazole is therefore competitively priced with ORS when viewed on a cost-per-treatment-course basis.

Furthermore, care-seeking behavior for childhood diarrhea varies by region in Nigeria—with more caregivers preferring home or no treatments in the north than in the south—but is generally low throughout the country.[122] Nationally, 36% of caregivers do not seek care for diarrhea outside the home,[123] and between 28.5%[124] and 45%[125] of children receive no treatment for their diarrhea. These low rates of care-seeking behavior for childhood diarrhea are in part due to individual and cultural misperceptions of diarrhea.

Observed Retail Price Ranges for Diarrhea Treatments in Nigeria

	Metronidazole (tablets)	Metronidazole (suspension)	ORS	Zinc	ORS + Zinc
High	$2.50	$2.63	$4.38	$3.13	$7.50
Low	$0.31	$1.56	$0.63	$1.25	$1.88
▲ Median	$1.41	$2.10	$2.51	$2.19	$4.69
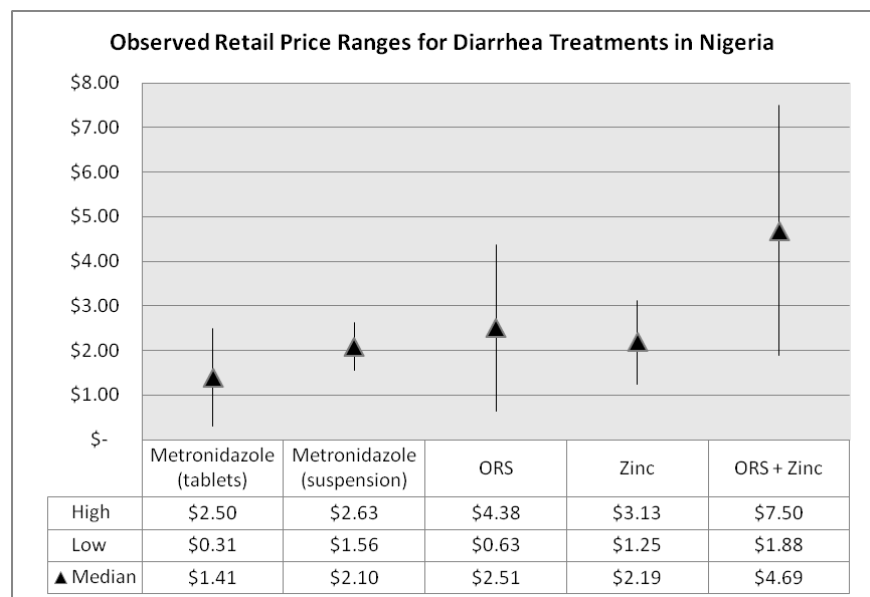
Figure 4: Observed retail prices for treatments courses of selected diarrheal treatments in Nigeria. (CHAI/SFH informal retail availability assessments.)

Several studies have shown that caregivers perceive several different types of diarrhea—which vary by severity and cause—and that their treatment decisions are based on which category of diarrhea they perceive their child as having.[126,127,128] Categorizations of diarrhea vary by community, but generally include conceptions of "normal" or watery diarrhea, dysentery, cholera, and less severe categories. For instance, teething is a commonly cited cause of diarrhea in Nigeria,[129,130,131] and caregivers perceiving

their child's diarrhea as being a result of teething are not likely to treat it as aggressively as categories perceived to be more serious.

Care for diarrhea outside the home is generally sought only when the child's condition does not improve, the caregiver perceives the child as being in danger, or a more severe form of diarrhea is suspected.[132] Moreover, decisions about where and how a child's diarrhea should be treated often involve community members other than the child's parents, such as relatives, neighbors, and prominent community members. As such, interventions seeking to change care-seeking behavior must target the entire community and not just mothers or parents.[133]

Caregivers who do seek care are often in direct control of the type of treatment received by their child. For instance, a study in Nnewi found that treatment for childhood illnesses was decided by the mother in 52% of cases. The study also found, however, that PPMV recommendations were the deciding factor in 29% of cases, while trained health professionals influenced only 13.8% of cases.[134] This finding is buttressed by those from Brieger et. al., as discussed in the previous section.[135] Thus interventions seeking to influence treatment decisions should focus on caregivers and their communities, as well as on primary pharmaceutical retailers such as PPMVs.

10. Supply Side Barriers

Key Barrier #1: Perception of Zinc and ORS as low demand, low-margin products leads to supply-side failure

Structured interviews with pharmaceutical suppliers in Nigeria indicate that ORS and Zinc are not priority products due to the perceived low demand from caregivers. This perception is a major contributor to the current lack of Zinc supply in the country and the stagnant ORS market—Zinc and ORS are not prioritized products in supplier portfolios and receive minimal marketing investment. Suppliers have indicated that better data on demand and insights into caregiver and provider perceptions of diarrhea treatments would aid entry into this market.

For example, two major suppliers have initiated registration of imported Zinc products and two companies are currently preparing to locally manufacture Zinc sulphate in large part due to the current international focus on the scale-up of ORS and Zinc for diarrhea treatment. Actualizing this perceived demand will be critical to increasing and sustaining the supply of Zinc/ORS in Nigeria and creating a more dynamic, competitive market to facilitate access.

Key Barrier #2: Limited use of appropriate diarrhea treatment among PPMVs—which represent a highly fragmented and difficult-to-target base

PPMVs are a major source of care for childhood diarrhea, but knowledge of appropriate treatments among these providers is low. In the case of diarrhea, less than 40% of children who receive care for diarrhea from these outlets receive ORS while nearly half receive antibiotics.[136] This lack of knowledge and mismanagement is a major barrier to appropriate treatment, especially as PPMVs are the most common source of diarrhea treatment for caregivers.

Moreover, while caregivers are likely to request antibiotics as a treatment for uncomplicated childhood diarrhea, many are also likely to seek treatment advice from retailers. PPMVs currently undermine

potential demand for Zinc and ORS when they fail to recommend appropriate treatments, thereby increasing the proportion of children that receive inappropriate treatments.

No formal structure or requirements for PPMV training exist in Nigeria. Moreover, the volume and distribution of pharmaceutical retailers in Nigeria make cost of direct promotion to small-scale pharmaceutical retailers prohibitive for many suppliers, preventing them from engaging in the large-scale detailing activities that form the foundation of promotional efforts and serve to educate primary providers on effective treatments for common illnesses. And a reputation of providing sub-standard pharmaceutical services to their clients makes some suppliers and wholesalers reticent to incorporate PPMVs into their formal distribution channels.[137]

Addressing the root causes of sub-standard care among PPMVs is therefore likely to be important not just in ensuring they recommend appropriate treatments to their clients, but also in better linking them to formal supply chains where higher-quality treatments are available.

Key Barrier #3: High production and distribution costs for locally-produced ORS leading to low margins and high consumer costs

While the root causes of relatively high ORS retail prices in Nigeria require further investigation, initial exploration indicates that high in-country production costs—due to high costs of doing business and limited local production of raw materials—may contribute considerably to comparatively higher consumer level prices. Moreover, anecdotal evidence from some suppliers indicate that the packaging and volume of an ORS treatment course leads to relatively high distribution per unit costs compared to other products, which affects supplier margins.

Increased demand for domestic ORS may improve the market landscape for ORS by encouraging competition and economies of scale among ORS producers, but additional analysis is needed to understand the scale and impact of high production and distribution costs in Nigeria. To this end, it will be important to work with existing and potential suppliers to better understand the cost components of ORS production in Nigeria, identify challenges to efficient production and distribution, and develop innovative solutions where necessary.

11. Demand Side Barriers

Key Barrier #1: Caregiver Preferences for Alternative Treatments

ORS is perceived as a weak and ineffective treatment for diarrhea and this perception is ascribed to a failure to properly market ORS.[*] Overall, demand for ORS is low compared to caregiver awareness.[138] This may be due do a perception of ORS as inefficacious,[139] the relative expensiveness of ORS compared to antibiotics, or both. At the same time, caregivers patronizing PPMVs are likely to request antibiotics as a treatment for uncomplicated childhood diarrhea.[140] Moreover, awareness of Zinc as a treatment for childhood diarrhea is low among caregivers. Perceptions of ORS as an ineffective diarrhea treatment—combined with an entrenched preference for alternative treatments and a lack of awareness of Zinc—

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[*] The hypothesis here is that ORS is currently marketed as a diarrhea treatment, but its role in the management of childhood diarrhea is not adequately explained to caregivers. As a result, caregivers do not understand that ORS is intended to treat dehydration, not the diarrhea itself. When caregivers subsequently try ORS and it fails to stop the diarrhea, they form the impression that it is an ineffective treatment.

constitutes a significant barrier to scaling-up Zn/ORS for the treatment of childhood diarrhea. Overall, understanding the root cause of caregivers' perceptions, including any regional differences in understanding and preferences, will be essential to designing effective behavior change efforts.

Key Barrier #2: Lack of Care-Seeking Behavior

Care-seeking behavior for diarrheal diseases in Nigeria is low. Only about 30%[141] to 42%[142] of caregivers seek treatment outside the home for diarrhea, which may be linked to caregiver perceptions of diarrhea as a common or non-threatening condition, a perceived lack of available care, an inability to afford care and/or treatment, or some combination of these factors. Whatever the reasons, treatments employed in the home management of childhood diarrhea are suboptimal: only about 15% of children treated at home receive ORS, while about 20% receive antibiotics and over 60% receive no treatment.[143]

The complex nature of care-seeking behavior in Nigeria renders this a particularly difficult barrier to address in a rapid and dramatic manner. Individual, community, and cultural perceptions exert significant influence over both the decision to seek care and the choice of treatment once care is sought. Within that context, it is important to note that any individual intervention is by no means a panacea and will likely affect the desired change only over time and in concert with other interventions.

12. Conclusion

This assessment provides an overview of the current market for diarrhea treatment in Nigeria, and in doing so, offers insight on the primary reasons for this market's failure to supply affordable, accessible ORS and Zinc. On the supply side, the perception of Zinc and ORS as low-demand, low margin products has limited investment from actors at the top of the chain to drive uptake of these commodities. With limited competition in the market or pull from buyers and sellers downstream, manufacturers and importers of Zinc and ORS have achieved low penetration and unappealing prices. On the demand side, low treatment-seeking for diarrhea and a preference for alternatives to Zinc and ORS, namely antibiotics, interrupt any demand-side pull to reshape the market.

As seen from the drivers of the current market breakdown, the desired shift will not occur easily or through the actions of one sector alone. In addition, further research and careful planning will be needed to develop and implement interventions that will have an effect on the market. Notably, because the majority of the population accesses treatment at the highly fragmented PPMV-level, efforts to change the availability, affordability, and uptake of ORS and Zinc among this diffuse stakeholder group will need to rely on interventions targeted at key influencers within the supply chain. In addition, changing entrenched behavior not to seek treatment or well-established preferences for antibiotics may require more innovative marketing and behavior change tactics than previously deployed.

While the public sector has a role in creating awareness and establishing credibility of ORS and Zinc as treatment for diarrhea, this assessment reinforces the centrality and great potential of the private sector, as well as the challenges within this market that need to be addressed to achieve national diarrhea treatment targets.

Appendix A: Methodology Details

List of key informants

- Stanley Chitekwe, UNICEF-Nigeria
- Martin Bell, Society for Family Health
- Nkiru Anonyuo, Society for Family Health
- Dr. Muyiwa Owolabi, Ahmadu Bello University
- Dr. Francis Aminu, Micronutrients Initiative
- Mr. Vincent Mama, National Association of Proprietary and Patent Medicine Dealers
- Bart van der Grinten, IDA Foundation Nigeria
- Evan Simpson, PATH
- John Quinley, United States Agency for International Development
- Pharm. Chovwe Oderhohwo-Emaniru, Emzor Pharmaceutical Industries Ltd
- Dr. Tony Ihenatu, Archy Pharmaceutical Ltd
- Wale Oyenuga, Cipla Evans
- Biola Adebayo, Fidson Healthcare Ltd
- Chukutem Chukuka, Nigerian German Chemicals
- Mayur Khakhar, Phillips Pharmaceuticals
- Ugo Okereke, May and Baker

Key informant interview guides

Interviews with key informants were semi-structured based on prepared questions relevant to a key informant's position. While key informants in the pharmaceutical industry were targeted for the collection of relatively similar information relating to particular market insights, key informants in the diarrhea treatment field were targeted for information specific to their position within the field. As such, prepared questions for pharmaceutical players followed standard format and content, while prepared questions for diarrhea treatment players varied according to the role of the informant. The interview guide for pharmaceutical suppliers is reproduced below:

a. What products are part of your diarrhea and pneumonia treatment portfolios? What do your antibiotic lines include?
  i. Do you manufacture any locally? (Which ones?)
  ii. What were your approximate annual sales volumes of each of these products last year? How has this changed over time?
  iii. What activities have influenced the uptake of your top selling product?
b. How many and which diarrhea treatments are registered in Nigeria? (Probe: ORS, Zn)
c. From which manufacturers do you import the largest volumes of products in your diarrhea treatment portfolio (including APIs)?
  i. What taxes are applied to your imported diarrhea treatments? Pneumonia treatments? APIs? Do they differ by product?
  ii. What other types of requirements apply to importing diarrhea treatments?
  iii. What challenges do you face importing to Nigeria?
d. Do you supply to the public sector? If yes, what % of your total diarrhea treatment business comes from the public sector? (PROBE: ORS, Zn, Amox)

    e. What percent of your total revenue does the diarrhea portfolio account for? Pneumonia?
        i. Are either a growth category for your company?
        ii. What marketing activities or incentive structures have you developed to support products in your diarrhea treatment portfolio? Pneumonia? (Probe: ORS, Zinc, Amox)
    f. Can you describe the structure of your supply chain? (i.e. Do you rely on wholesalers, 3rd party distributors, medical representatives, or other means to distribute your products? How is your supply chain structured to deliver to different states/regions?)
        i. Who are your top three wholesalers by volume?
        ii. Who are your top three distributors by volume?
        iii. What volumes of ORS, Zinc, amoxicillin, and other related diarrhea treatments and antibiotics do you sell to wholesalers?
        iv. Can you describe the extent of penetration your products have in rural markets? What strategies do you use to reach these markets?
    g. How much do you sell each product for in your diarrhea and pneumonia treatment portfolios? (Ask for representative products in each category or ranges. Probe for ORS, Zn, and Amox.)
        i. Do you have a recommended retail price for each product? If so, what is it?
        ii. What are your approximate margins on each product? What are the approximate margins of wholesalers, distributors, and retailers?
    h. Do you currently manufacture and/or import ORS, LO-ORS, or Zinc for diarrhea treatment? If no, why not?
        i. Do you have enough capacity to produce ORS and Zinc to meet the potential demand?
    i. If yes, are ORS and Zinc priority products for your company? Why or why not?
        i. What would have to change about the current ORS and Zinc market for you to actively produce and market the products?
    j. What factors do you think have contributed to ORS, Zn, and Amoxicillin not achieving significant uptake?
    k. At what level in your supply chain are decisions typically made about which products to stock and promote? (i.e. Push vs. Pull, Retailer-driven, Distributor-driven, etc) What are the main criteria that influence this decision?
        i. How are ORS, Zinc, and Amoxicillin perceived by your:
            1. Wholesalers:
            2. Distributers:
            3. Retailers:
            4. Providers:

Targeted Desk Review

A desk review of available literature on market characteristics and knowledge, attitudes, practices of providers, retailers, and caregivers was performed. Existing assessments were gathered from the WHO's access to medicines reports, HAI's online database, market research companies where available.

In addition, a broad PubMed search was carried out using the terms "Nigeria" and "Diarrhea" in order to identify studies with relevance to the aims of the current assessment. A total of 543 studies were returned by the search, and abstracts were selected for review based on study titles and summaries that suggested relevance to 1) provider, retailer, or caregiver behaviors in the management of childhood diarrhea and 2) the availability, affordability, and market prevalence of diarrheal treatments.

A total of 134 abstracts were reviewed against the same criteria described above, and full studies were reviewed only if their abstracts suggested the results were applicable to the current assessment. A total of 19 studies were identified with direct relevance to the aims of the current assessment.

Appendix B: Methodology for UNICEF Baseline Survey

Use of Zinc in the household management of childhood diarrhoea
METHODOLOGY FOR THE BASELINE SURVEYS

1. **HOUSEHOLD SURVEY**

The household baseline survey will be conducted at the selected LGAs to assess and document basic parameters including the prevalence of diarrhea, the proportion of diarrhea cases that accessed Zinc-ORS, the care-seeking behaviour of mothers with children having diarrhea and their home management practices of diarrhea.

WARDS: Administrative wards in the selected LGAs were listed alphabetically within each LGA and five wards were randomly selected from each selected LGA using the table of random numbers (appendix II). The selected ward per LGA per State is listed below:

STATES	ANAMBRA		IMO		OGUN		OYO	
LGAs (Intervention)	AYAMELUM (HH & PHC)	EKWUSIGO (HH, PMV & PC)	ONUIMO (HH, PMV & PC)	ORLU (HH & PHC)	ODEDA (HH & PHC)	REMO NORTH (HH, PMV & PC)	AFIJIO (HH, PMV & PC)	SURULERE (HH & PHC)
WARD 1	Omor 3	Orumba	Aboh Umuduru	Ihioma / Ebenese	Ilugun	Akaka	Akinmorin	Arolu
WARD 2	Omosi	Nza	Eziama	Ihiteowerre	Olodo	Isara 1	Awe 2	Bakaloye
WARD 3	Ifite 1	Uruokwe	Ofeahia Umuduru	Mgbee/ Umuokpara	Alabata	Iyankan	Fiditi 1	Iregba
WARD 4	Ifete 2	Ichi	Okwelle I	Okporo Ohaeke	Obete	Ode 1	Ilora 1	Iwofin
WARD 5	Omor 2	Ifite	Okwelle II	Okwuabala	Odeda	Ode 2	Ilora 3	Mayin

COMMUNITY: All the communities having eligible HH > 60 within the selected five wards per LGA will be listed alphabetically and given numbers and two communities (or segment of the community) per ward will be randomly selected from the listed communities in each selected ward using the table of random numbers.

HOUSEHOLD SAMPLING: The household unit will represent the smallest unit to be observed. A household will be defined as a family unit that feeds from the same pot and has a recognized head of authority. Only Households with 1-59 months old children will be sampled. Sixty households consisting of caregiver/U5 child pair will be selected for the survey per community, totaling 120 household per ward, 600 HH per LGA, 1200 HH per State and 4800 HH for the four states involved in the study.

This will involve visiting the selected communities. At each community, pay a courtesy call on the village head and ask questions from community people to locate the centre of the community. At the centre of the community, spin a bottle and identify the direction of the mouth. At the first household in this direction, seek informed consent of the caregiver and if given, interview this caregiver. If consent is not given, skip this household and continue to the next household, interviewing serially until you reach the end of the community. If the caregiver is absent, make a repeat visit to the HH. If the required number of sixty HHs has not been achieved, turn right and continue interviewing until the required number of 60 HHs are interviewed. In situation where there is no HH on the right, turn left and continues with the next HH. Where the whole community has been covered, and the required number of HHs has not been reached, that community should be rejected and the procedure repeated in the next contiguous community. In a compound with more than one HH, all the eligible HHs should be interviewed.

TRAINING
A one-day LGA level training will be conducted for about 20 interviewers per LGA from where 15 will be recruited for the survey. The morning (am) hours will be centered on some theory, methodology and the tools for data collection, while the afternoon (pm) will be used to simulate the survey procedure and hands-on exercise on the validated, pre tested semi structured questionnaires A (for HH) and B (for OICs).

During the training, each interviewer will be expected to conduct at least two interview sessions, one for HH questionnaire and the other for OICs questionnaire. Note that each of the questionnaires should be pre – numbered before the baseline survey begins (see appendix II). This should be done during the training.

2. OICS OF PPMVS AND GOVERNMENT, MISSION AND PRIVATE HOSPITAL SURVEY
The second baseline survey will be conducted in each selected LGA. It will focus on the professional OICs or assistant of PPMVs and that of government, mission and private hospitals through the PPMV associations/State PPMVL Committee in selected LGAs as well as the Nigerian Association of Patent and Proprietary Medicine Dealers.

At least 50% of all the registered PPMVs, government, mission and private hospitals in the selected LGAs will be sampled in the survey and be administered the questionnaire subject to a minimum of 25 or all of them if less than 25. The selected OICs should be distributed 50% PPMVs, 25% government hospital and 25% private/mission hospitals.

SURVEY COORDINATION
National Survey Coordinator = 1
State Coordinators = 4, 1 for each state. Should be member of the National Zinc Team
State Supervisors = 4, 1 for each state. Preferably, the SNO
LGA Supervisors = 32, 4 for each LGA, 8 per state. Preferably, the LGA NFP, IMCI, M & E officers, and Health Educators
Interviewers = 120, 15 per LGA, 3 per ward, covering 15 HH per day, for four days. 30 per state

APPENDIX I: OBJECTIVE OF THE TRAINING
To give the interviewers knowledge and skills involved in baseline data collection

APPENDIX II: NUMBERING OF THE HH QUESTIONNAIRE
The questionnaires in each LGA should be pre numbered from 001 – 600 thus:

WARD	COMMUNITY 1	COMMUNITY 2

1	001 – 060	061 – 120
2	121 – 180	181 – 240
3	241 – 300	301 – 360
4	361 – 420	421 – 480
5	481 - 540	541 - 600

Appendix C: UNICEF Baseline Survey Questionnaires

QUESTIONNAIRE FORM A

Household Zinc Supplementation Survey Form

USE OF ZINC IN THE HOUSEHOLD MANAGEMENT OF CHILDHOOD DIARRHOEA IN NIGERIA

BACKGROUND INFORMATION   Questionnaire No: _____

STATE _____   LGA_____   WARD_____   COMMUNITY_____

The educational level, Father: None ☐ Adult education ☐ Primary ☐ Secondary ☐ Tertiary ☐

The educational level, Mother: None ☐ Adult education ☐ Primary ☐ Secondary ☐ Tertiary ☐

Age of caregiver:_____

Interviewer's Name_____   Signature & Date_____

1. List of U5 children in the HH

S/No	Name	Sex Male = M, Female = F	Age (month)	The number of diarrhoea episodes in the last 1 month
1				
2				
3				
4				
5				

PART I: Knowledge, Attitude and key behavior of caregiver in relation to Zinc and diarrhoea management

1. When can you say your child has diarrhoea?* Correct ☐   Incorrect ☐   Don't Know ☐

2. What drugs do you give to children with diarrhoea at home? *Multiple response is allowed*
   Antibiotic ☐   Antidiarrhoeal ☐ Anti vomiting, ☐   LO-ORS/Zinc ☐
   Herbal preparation ☐   Others, specify _____

---

* Probe for the number of watery stools in 24 hours. Diarrhoea = Passage of three (3) or more watery stools in 24 hours.

3. Tell me all that you would do to manage your U5 child with diarrhoea at home? *Multiple response ie allowed.* (i) ORS/SSS ☐ (ii) continuous feeding/breastfeeding ☐
(iii) Zinc ☐ (iv) take child to health facilities if case worsens ☐
(iv) Others, specify _____

4. If Zinc tablet is mentioned in question 3 above, for how many days do you give Zinc to the child? _____

5. Tell me how to prepare ORS.*   Correct ☐   Incorrect ☐   Don't Know ☐

6. Tell me how to prepare Sugar Salt Solution (SSS).† Correct ☐ Incorrect ☐   Don't Know ☐

7. What is the source of water for your ORS/LO-ORS/SSS?

Well ☐   Tap ☐   Stream/River ☐   Borehole ☐ , Bottle ☐   Sacchet ☐   Others (specify) _____

8. Are you aware of the use of Zinc tablet in the treatment of diarrhoea?   Yes ☐   NO ☐

9. If yes to question 8 above, state source of information:

Radio/TV ☐ PHC/Govt. Hospital ☐ PPMV ☐ Friend/Neighbour ☐ Other specify_____

10. Do you believe Zinc + LO-ORS is an effective treatment for Diarrhoea in U5? Yes ☐   NO ☐

11. Will you recommend Zinc + LO-ORS to someone for treatment of diarrhoea in U5? Yes ☐   NO ☐

Part II: Social Mobilisation

12. Thinking back over the past 3 months, have you seen or heard any messages about treatment for diarrhoea?
Yes ☐   No ☐

13. If yes, where did you hear/see the message(s) about treatment for diarrhoea? *Multiple responses allowed*
Radio ☐   Television ☐   Education session/health talk ☐ church/mosque ☐
Community health worker ☐   Clinic nurse/doctor ☐   Neighbor/friend ☐
Newspaper ☐   Banner/poster/etc ☐   Others (specify) _____

14. What were the main messages that you heard/saw about diarrhoea treatment? *Multiple responses allowed*
Causative Agents ☐   Preventions ☐   Treatments with drugs ☐   Zinc ☐
ORS ☐   Others (Specify) _____

15. Have you ever heard any messages about Zinc + LO-ORS?   Yes ☐   No ☐

16. What was the main message that you heard/saw on Zinc + LO-ORS?

Prevent dehydration ☐   Reduce duration ☐   Reduce severity ☐
Prevent recurrence within 3 months ☐ Others (specify) _____

17. What types of activities are implemented to educate the population about the treatment of diarrhoea?

Community Mobilization ☐   Group Discussion/dialogue ☐   IEC Material use ☐ Others
(specify)_____

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* Dissolve one sachet of ORS in one litre (two 50cl or three 35cl coca cola bottles) of safe drinking water.
† Dissolve 5 cubes/10 level teaspoon (5ml) of sugar and 1 level teaspoon of salt in 1 litre (two 50cl or three 35cl coca cola bottles) of safe drinking water.

PART III: Diarrhoea Management and Associated Cost (to be completed by HH with diarrhoea child in the last one month)

18. When your child had diarrhoea in the last one month, did you go to anywhere for help? Yes ☐ No ☐

19. If yes, where did you go? PHC facility ☐ Govt. Hosp ☐ Private/Mission Hosp ☐ PPMV ☐
    Others (specify) _____

20. What were your reasons for choosing this facility?
    Price ☐ Easily accessible ☐ Quality of care ☐ Most knowledgeable source ☐
    Others, specify: _____

21. How many days after the diarrhoea began did you first seek advice? _____

22. What drugs were you given? Multiple responses allowed.
    Antibiotic ☐ Antidiarrhoeal ☐ Anti vomiting, ☐ ORS ☐ LO-ORS ☐ Zinc ☐
    Others, specify _____

23. What advice did you receive for treatment of diarrhoea? Multiple responses allowed.
    Give fluids ☐ Give more than usual amount of fluid ☐ Give more than usual to eat ☐
    Continue breastfeeding ☐ Take to clinic/hospital if condition worsens ☐
    Information on prevention of diarrhoea ☐ Other (specify)_____

24. Cost of drugs:

Drugs	Quantities	Costs
Antibiotic		
Antidiarrhoeal		
Anti vomiting		
ORS		
LO-ORS		
Zinc		
Intravenous fluids		
Others (specify) i. ii. iii.		

25. Cost of other services:

Services	Cost
Card	
Consultation	
Lab. Test	
Others (specify) i. ii. iii.	

26. What do you think of the price of Zinc?
    Not expensive ☐ Affordable ☐ Expensive ☐ Too expensive ☐
    No opinion ☐ Don't know ☐

27. What do you think of the price of LO-ORS?
Not expensive ☐ Affordable ☐ Expensive ☐ Too expensive ☐
No opinion ☐ Don't know ☐

28. What transport means did you use?

Bicycle ☐ Motorcycle ☐ Car/bus ☐ Boat/canoe ☐ By foot ☐

Others, specify: _____

29. How long does it take you to reach the treatment center (in minutes) by your means of transport? ____

30. How much does it cost to reach your treatment center using your specified mode of transport? ₦_____

31. How long (time in minutes) were you at the treatment centre? _____

32. If you were given Zinc, how many tablets did you use? _____

Supervisor Name _____ Signature & Date _____

QUESTIONNAIRE FORM A

Household Zinc Supplementation Survey Form

USE OF ZINC IN THE HOUSEHOLD MANAGEMENT OF CHILDHOOD DIARRHOEA IN NIGERIA

BACKGROUND INFORMATION   Questionnaire No: _____

STATE _____ LGA_____ WARD_____ COMMUNITY_____

The educational level, Father: None ☐ Adult education ☐ Primary ☐ Secondary ☐ Tertiary ☐

The educational level, Mother: None ☐ Adult education ☐ Primary ☐ Secondary ☐ Tertiary ☐

Age of caregiver:_____

Interviewer's Name_____   Signature & Date_____

1. List of U5 children in the HH

S/No	Name	Sex Male = M, Female = F	Age (month)	The number of diarrhoea episodes in the last 1 month
1				
2				
3				
4				
5				

PART I: Knowledge, Attitude and key behavior of caregiver in relation to Zinc and diarrhoea management

33. When can you say your child has diarrhoea?* Correct ☐   Incorrect ☐   Don't Know ☐

34. What drugs do you give to children with diarrhoea at home? *Multiple response is allowed*
    Antibiotic ☐   Antidiarrhoeal ☐   Anti vomiting, ☐   LO-ORS/Zinc ☐
    Herbal preparation ☐   Others, specify _____

35. Tell me all that you would do to manage your U5 child with diarrhoea at home? *Multiple response ie allowed.*   (i) ORS/SSS ☐   (ii) continuous feeding/breastfeeding ☐
    (iii) Zinc ☐   (iv) take child to health facilities if case worsens ☐
    (iv) Others, specify _____

36. If Zinc tablet is mentioned in question 3 above, for how many days do you give Zinc to the child? _____

37. Tell me how to prepare ORS.†   Correct ☐   Incorrect ☐   Don't Know ☐

38. Tell me how to prepare Sugar Salt Solution (SSS).‡ Correct ☐   Incorrect ☐   Don't Know ☐

39. What is the source of water for your ORS/LO-ORS/SSS?
    Well ☐   Tap ☐   Stream/River ☐   Borehole ☐, Bottle ☐   Sacchet ☐   Others (specify) _____

40. Are you aware of the use of Zinc tablet in the treatment of diarrhoea?   Yes ☐   NO ☐

41. If yes to question 8 above, state source of information:
    Radio/TV ☐ PHC/Govt. Hospital ☐ PPMV ☐ Friend/Neighbour ☐ Other specify_____

42. Do you believe Zinc + LO-ORS is an effective treatment for Diarrhoea in U5?   Yes ☐   NO ☐

43. Will you recommend Zinc + LO-ORS to someone for treatment of diarrhoea in U5? Yes ☐ NO ☐

Part II: Social Mobilisation

44. Thinking back over the past 3 months, have you seen or heard any messages about treatment for diarrhoea?
    Yes ☐   No ☐

45. If yes, where did you hear/see the message(s) about treatment for diarrhoea? *Multiple responses allowed*
    Radio ☐   Television ☐   Education session/health talk ☐ church/mosque ☐
    Community health worker ☐   Clinic nurse/doctor ☐   Neighbor/friend ☐
    Newspaper ☐   Banner/poster/etc ☐   Others (specify) _____

46. What were the main messages that you heard/saw about diarrhoea treatment? *Multiple responses allowed*
    Causative Agents ☐   Preventions ☐   Treatments with drugs ☐   Zinc ☐
    ORS ☐   Others (Specify) _____

47. Have you ever heard any messages about Zinc + LO-ORS?   Yes ☐   No ☐

---

* Probe for the number of watery stools in 24 hours. Diarrhoea = Passage of three (3) or more watery stools in 24 hours.
† Dissolve one sachet of ORS in one litre (two 50cl or three 35cl coca cola bottles) of safe drinking water.
‡ Dissolve 5 cubes/10 level teaspoon (5ml) of sugar and 1 level teaspoon of salt in 1 litre (two 50cl or three 35cl coca cola bottles) of safe drinking water.

48. What was the main message that you heard/saw on Zinc + LO-ORS?

Prevent dehydration ☐   Reduce duration ☐   Reduce severity ☐
Prevent recurrence within 3 months ☐ Others (specify) _____

49. What types of activities are implemented to educate the population about the treatment of diarrhoea?

Community Mobilization ☐   Group Discussion/dialogue ☐   IEC Material use ☐   Others
(specify)_____

PART III: Diarrhoea Management and Associated Cost (to be completed by HH with diarrhoea child in the last one month)

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50. When your child had diarrhoea in the last one month, did you go to anywhere for help? Yes ☐ No ☐

51. If yes, where did you go? PHC facility ☐ Govt. Hosp ☐   Private/Mission Hosp ☐   PPMV ☐

Others (specify) _____

52. What were your reasons for choosing this facility?

Price ☐   Easily accessible ☐   Quality of care ☐   Most knowledgeable source ☐

Others, specify: _____

53. How many days after the diarrhoea began did you first seek advice? _____

54. What drugs were you given? Multiple responses allowed.

Antibiotic ☐   Antidiarrhoeal ☐   Anti vomiting, ☐   ORS ☐   LO-ORS ☐   Zinc ☐

Others, specify _____

55. What advice did you receive for treatment of diarrhoea?   Multiple responses allowed.

Give fluids ☐   Give more than usual amount of fluid ☐   Give more than usual to eat ☐
Continue breastfeeding ☐   Take to clinic/hospital if condition worsens ☐
Information on prevention of diarrhoea ☐   Other (specify)_____

56. Cost of drugs:

Drugs	Quantities	Costs
Antibiotic		
Antidiarrhoeal		
Anti vomiting		
ORS		
LO-ORS		
Zinc		
Intravenous fluids		
Others (specify) iv. v. vi.		

57. Cost of other services:

Services	Cost
Card	
Consultation	
Lab. Test	

Others (specify) iv. v. vi.	

58. What do you think of the price of Zinc?
    Not expensive ☐ Affordable ☐ Expensive ☐ Too expensive ☐
    No opinion ☐ Don't know ☐

59. What do you think of the price of LO-ORS?
    Not expensive ☐ Affordable ☐ Expensive ☐ Too expensive ☐
    No opinion ☐ Don't know ☐

60. What transport means did you use?

    Bicycle ☐ Motorcycle ☐ Car/bus ☐ Boat/canoe ☐ By foot ☐

    Others, specify: _____

61. How long does it take you to reach the treatment center (in minutes) by your means of transport? ____

62. How much does it cost to reach your treatment center using your specified mode of transport? ₦_____

63. How long (time in minutes) were you at the treatment centre? _____

64. If you were given Zinc, how many tablets did you use? _____

Supervisor Name _____ Signature & Date _____

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[141] Multiple Indicator Cluster Survey (2007): 69.8% of children who had diarrhea in the two weeks preceding the survey received no treatment beyond home management.

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