

# Medicine Prices In Nigeria

PRICES PEOPLE PAY FOR MEDICINES



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## Acronyms

|         |   |
|---------|---|
| ART     | Antiretroviral Therapy  |
| ARV     | Antiretroviral  |
| CIF     | Cost, Insurance, Freight  |
| CMS     | Central Medical Stores  |
| DRF     | Drug Revolving Fund   |
| EDL     | Essential Drugs List  |
| FCT     | Federal Capital Territory   |
| GDP     | Gross Domestic Product  |
| HAI     | Health Action International   |
| IB      | Innovator Brand   |
| LGA     | Local Government Area   |
| LPG     | Lowest Priced Generic   |
| MDGs    | Millennium Development Goals  |
| MPR     | Median Price Ratio  |
| MSG     | Most Sold Generic   |
| MSH     | Management Sciences for Health  |
| MUP     | Manufacturer's Unit Price   |
| NAFDAC  | National Agency for Food and Drug Administration and Control                    |
| NGO     | Non Governmental Organisation   |
| NHIS    | National Health Insurance Scheme  |
| NMA     | Nigerian Medical Association  |
| PCN     | Pharmacists Council of Nigeria  |
| PMG-MAN | Pharmaceutical Manufacturing Group of the Manufacturers' Association of Nigeria |
| PSN     | Pharmaceutical Society of Nigeria   |
| SMUP    | Sector Median Unit Price  |
| STG     | Standard Treatment Guidelines   |
| US      | United States   |
| USD     | United States Dollar  |
| WHO     | World Health Organisation   |

## **Foreword**

Nigeria was one of the eight African countries selected to conduct National Medicines Price Survey in 2004 in order to determine the prices people pay for their medicines. The exercise was sponsored by the World Health Organization (WHO) and Health Action International (HAI) following observations that the cost of medicines has been rising faster than overall consumer prices in a number of countries worldwide. The prices of medicines are generally high and are unaffordable for large sectors of the global population making access to essential medicines very difficult.

The situation in Nigeria is not different and this portends a lot of difficulties for us in the health sector in our determination to provide effective healthcare delivery services in line with the objectives of the Millennium Development Goals (MDGs). The availability, affordability and accessibility of essential medicines to the populace irrespective of their income status is critical to the success of our healthcare delivery services. It is for this reason that the Federal Ministry of Health gave its full support to the conduct of the National Medicines Price Survey.

The report of this survey is quite revealing and has confirmed the general concerns being expressed on the high prices of medicines offered to our teeming population. The fact that medicines cost as much as two to sixty four times the prices in the International Market is a cause for great concern. It is apparent that a number of factors are responsible for the observed trend. There is certainly the urgent need to address these factors which include poor drug procurement procedures in the public sector and the high mark-ups by drug importers.

It is indeed gratifying that this survey is coming at a time the government itself is carrying out comprehensive reform programmes aimed at encouraging development in all sectors of the economy. My Ministry will take appropriate action to address the high prices of medicines towards making them available, affordable and accessible. The government will consider the recommendations made in this report by taking appropriate action to develop a National Medicines Pricing Policy. In addition government will review the current medicines procurement system with a view to re-organising it in favour of bulk procurement.

The support of WHO in the planning and execution of this survey is commendable. The Ministry looks forward to continued collaboration with the WHO and other stakeholders in ensuring that the problems of high prices of medicines are adequately addressed. The role and place of medicines in the success of our healthcare delivery services is so crucial that all hands must be on deck to ensure sanity in the importation, manufacture, sale, distribution and use of medicines in Nigeria.



**Professor Eyitayo Lambo**  
Honourable Minister of Health

**March 2006**

# EXECUTIVE SUMMARY

## Introduction

In order to ascertain the prices of medicines in Nigeria, a survey was undertaken by the Federal Ministry of Health in collaboration with the World Health Organisation and Health Action International in 2004 using an international standardised methodology. A total of 129 medicine outlets in public and private health clinics as well as private pharmacies were randomly sampled from six states representing the six geopolitical zones in the country. The prices of a basket of 34 prescription medicines were measured. Three State Central Medical Stores and one NGO procurement facility were also assessed in terms of prices at which they procure key medicines.

## Results

### *Patient prices*

- Patients pay between 2 to 64 times international reference prices for medicines in various facilities in the public and private sectors of Nigeria.
- Prices in the public sector were almost identical with those in the private pharmacies
- Private health clinics were shown to charge up to 184% more than the public health facilities and 193% more than private retail pharmacies.
- Innovator brands were found to cost between 2 to 7 times the lowest priced generic equivalents.
- There was wide variability of prices of the same medicines between facilities, sectors and different types of the same product.

### *Procurement Prices*

- Prices range from 2 to 38 times international prices in the three functional state central medical stores surveyed.
- In the NGO facility, prices were up to 20 times less than those of the state central medical stores.

### *Availability*

- Generic medicines were generally more available in all outlets.
- The availability of the basket of 34 medicines was low in all sectors but moreso in the public and private health clinics.

### *Affordability*

- Medicines are unaffordable to the majority of <sup>1</sup>Nigerians (90.2%) who live below the income level of US\$ 2 a day as well as the government worker that earns a minimum wage of US\$1.4 per day.
- <sup>2</sup>Affordability was largely dependent on choice of therapeutic class, product or sector from which the medicine was purchased. For example:
  - A worker would pay 0.7 days' wages to treat an infection with amoxicillin but would pay an additional 18.8 days' wages when using ceftriaxone injection to treat the same infection.

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<sup>1</sup> 2004 World Development indicators

<sup>2</sup> Affordability of medicines was measured in relation to the number of days the lowest paid unskilled government worker would need to work to procure a course of treatment for 10 conditions.

- The worker would spend 1.4 days' wages to pay for the lowest priced generic atenolol to treat hypertension but would require 10.2 days' wages to pay for innovator brand atenolol. This means IB atenolol costs 7.3 times more than the LPG.
- Likewise, amitriptyline obtained from a private health clinic could cost a patient up to 650% more than when it is obtained from either a public health facility or a private pharmacy.

### ***Component of medicine prices***

- o Government tariffs and taxes as well as mark-up for distribution account for a significant proportion of what patients pay for medicines.
- o Mark-ups by the distributor or retailer were found to be up to 900% of the manufacturers' price.

### ***International comparison***

- Medicine procurement in public facilities is as much as five times more expensive in Nigeria than in 7 other countries while NGO procurement was least expensive when compared to the same countries.
- While innovator branded medicines compared well with prices in other countries, generic medicines were up to 825% more expensive in Nigeria than in other 7 countries
- In both public facilities and private pharmacies, Nigeria incorporates the least mark-up when compared to the 7 other countries.

### **Recommendations**

Medicine prices are important because most Nigerians purchase their medicines out of pocket. Thus, high medicine prices would constitute a major barrier to access to health care. To reduce medicines cost, the following are recommended.

### ***Procurement policy***

- o There is need to review procurement policy of the country. Considering the size and complexity of Nigeria, it will be rational to conduct further studies on best procurement method that would be effective with consideration of methods that have worked in similar developing countries. Policy options include:
  - National tendering with decentralised contracting and purchasing
  - Procurement agency with responsibility for national procurement of medicines
  - Competitive tendering with price transparency
  - Pooled procurement with national buyers
  - Providing incentives and capacity building in rational procurement
  - Parallel importation of single source products and price negotiations
  - Making medicine price information widely available

### ***Selection***

- o Since selection of medicines is key to affordability and can be a major hindrance to access to medicines, a standard treatment guideline needs to be developed for the country to guide rational selection of cost effective medicines for most diseases.
- o Generic policy needs to be institutionalised in the country
- o To encourage the selection, procurement, promotion, prescribing and dispensing of generic medicines, a generic policy needs to be institutionalised in the country. As

such, acceptance of generic products by professionals and patients needs to be promoted. Quality assurance mechanisms such as prequalification of generic manufacturers need to be instituted to provide confidence in generic products

### ***Affordability***

- A pricing policy which aims to reduce the high prices and wide disparity between prices should be developed for the country.
- The heavy tax burden on the pharmaceutical sector should be reviewed. Multiple taxation by local, state and federal governments as well as high tariffs on raw materials, packaging materials and other ancillary materials used to manufacture medicines which adversely affect the cost of medicines need to be reviewed. Essential medicines for priority diseases should be defined and exempted from all forms of taxation.
- To enhance the affordability of medicines, it is recommended that the medicine regulatory authority NAFDAC should be empowered to consider medicine prices before issuing marketing authorisation to importers and manufacturers

### **Further research**

Since the pharmaceutical sector in Nigeria is complex and has various actors who have benefited from its disorganised nature for decades, it is important to carefully analyse the situation before solutions are proffered. Therefore further studies need to be undertaken to ascertain the following:

- Determinants of prices of medicines in all sectors
- Reasons for poor availability of medicines in the country
- Actual prices patients pay using exit interviews or household surveys to measure discrepancies between the prices recorded by private clinics and actual prices patients pay
- Comprehensive stakeholder analysis to determine acceptable and workable policy interventions in the country.

The reviewed National Drug Policy has already incorporated many of the recommendations to improve the pricing of medicines. Thus, sustained and coordinated implementation of the policy would lead to an improvement in prices patients pay for medicines.

## **INTRODUCTION AND BACKGROUND:**

International treaties and governments all over the world recognize health care as a fundamental human right. In order to improve health by tackling socioeconomic determinants of health, 189 heads of state in 2000 endorsed the Millennium Development Goals (MDGs): “To reduce poverty and hunger and to tackle ill health, gender inequality, lack of education, lack of access to clean water and environmental degradation”.<sup>3</sup> The MDGs were “Framed as a compact, which recognizes the contribution that developed countries can make through trade, development assistance, debt relief, access to essential medicines and technology transfer”.<sup>4</sup> Therefore, without access to essential medicines, this fundamental right as well as the United Nation’s Millennium Development Goals cannot be realized.

The World Medicines Situation 2004<sup>5</sup> estimates that about half the people in Africa do not have regular access to essential medicines. A Baseline Assessment<sup>6</sup> of the Nigerian Pharmaceutical Sector in 2002 showed that only 46% of the key medicines were available in public health facilities and 23% of the average weekly expenditure of respondents went into the treatment of an episode of illness in a member of their household. These figures show poor access to essential medicines although the exact scale has not been accurately estimated.

Medicine financing in Nigeria is generally out of pocket as the National Health Insurance Scheme (NHIS) is still in the pilot stage, yet 70.2% of Nigerians live below poverty line of less than 1 USD a day.<sup>7</sup> Therefore issues concerning prices of medicines are key to improving access to essential medicines in Nigeria.

The objective of this survey is to document and compare the availability and prices of a chosen set of medicines in different parts of the health sector as well as in the different sections of the country, and to compare them with other countries with the aim of assessing the availability and affordability of the medicines.

The goal is to understand how prices vary in different sectors, different types of facilities, and different sections of the country and also to explore determinants of medicine prices in the country. The ultimate use would be made of information in order to explore appropriate policies that would help in reducing prices such that access to medicines would be enhanced.

Specifically, the survey seeks to generate the following information:

- i. public and private sector medicine prices
- ii. the availability of the medicines
- iii. the affordability of the medicines
- iv. the components of medicine prices

It is expected that the survey would provide:

- baseline information that can be used to assess effectiveness of policies relating to pricing of medicines.
- information on medicine prices for purposes of negotiations, differential and equity pricing and
- advocacy tools for NGOs, health professionals, and consumers while negotiating for equity and affordability of essential medicines.

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<sup>3</sup> WHO and the Millennium Development Goals, WORLD HEALTH ORGANISATION

<sup>4</sup> *ibid*

<sup>5</sup> The World Medicines Situation by WHO/EDM/PAR/2004.5

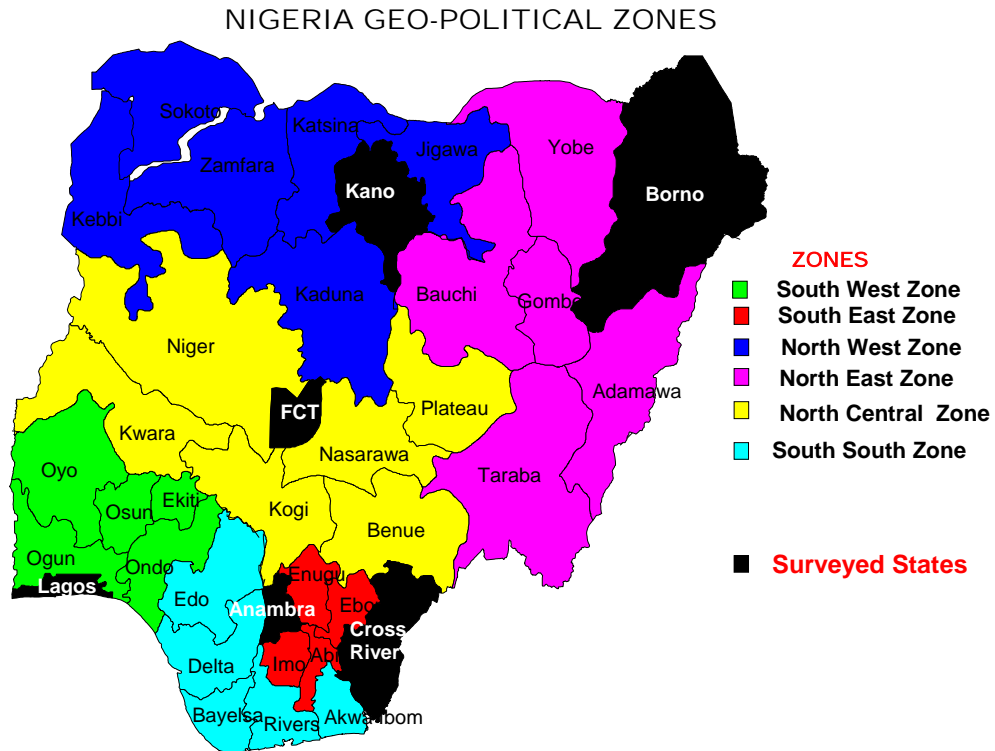
<sup>6</sup> Baseline Assessment of the Pharmaceutical Sector 2002, published by The Federal Ministry of Health in collaboration with the World Health Organization

<sup>7</sup> 2004 World Development Indicators

**Country Data:**

Nigeria is located on the West Coast of Africa, and has a landmass of 923, 678 square kilometres, and a population density of 128 per square kilometre.

The country is divided into six geo-political zones, 36 states and a Federal Capital Territory. The states are further divided into 774 Local Government Areas (LGAs).



## <sup>8</sup>Socio-economic indicators

|   |             |
|---|-------------|
| Total population  | 120,911,000 |
| GDP per capita (US\$)   | 915         |
| Annual growth of the GDP (US\$)   | 3.5         |
| Life expectancy at birth m/f (years)  | 48.0/49.6   |
| Total expenditure on health as a percentage of the GDP (2001)                                   | 3.4         |
| General government expenditure on health as a percentage of total expenditure on health (2001)  | 23.2        |
| Private expenditure on health as a percentage of total expenditure on health (2001)             | 76.8        |
| General government expenditure on health as a percentage of total government expenditure (2001) | 1.9         |
| External resources for health as a percentage of total expenditure on health                    | 7.1         |
| Social security expenditure as a percentage of general government expenditure on health (2001)  | 0           |
| Out of pocket expenditure on health as a percentage of private expenditure on health (2001)     | 100         |
| Private prepaid plans as a percentage of private expenditure on health                          | 0           |
| Per capita expenditure on health in US\$ (2000)   | 20          |
| <sup>9</sup> Population below 1 US\$ per day (1997)   | 70.2        |
| Population below 2 US\$ per day (1997)  | 90.8        |
| Percentage of population using private sector health provision                                  | 65          |

### National Medicines Situation Relevant to Prices

#### *Policies*

Nigeria's first National Medicines Policy was first published in 1990. This policy has gone through its first revision. Nigeria also has an Essential Drugs list (EDL) to guide procurement in the public sector; it was last reviewed in 2003. There is, however, no policy or incentive to encourage generic prescription or substitution although the reviewed National Medicines Policy makes provisions for this. Public sector procurement is meant to be limited to the EDL.

Procurement policies vary from state to state. Although each state of the federation has a medical store, most of them no longer procure medicines as they have ceded this duty to the health facilities who then produce medicines for their respective use. There is no policy which mandates the purchase of locally produced medicines.

#### *Dispensing*

The spread of the more than 11,000 pharmacists registered in 2003 is uneven. Registration of the premises by a pharmacist is a prerequisite to its being granted operating license. In the private sector, there are no chain pharmacies. All pharmacies are independent.

The dispensing of medicines in the public sector varies with the type of facility. In dispensaries and primary health care facilities, medicines are prescribed and dispensed by the nursing personnel or the community health extension worker who oversees the facility. However, in larger facilities (comprehensive health centres, secondary and tertiary health facilities) there is a clear separation between prescribing and dispensing functions. In such facilities, there are separate areas manned by pharmacists or dispensing assistants depending on the size of the facility.

Due to weakness in the public health system, Nigerians patronise private health care clinics. In a recent survey<sup>10</sup>, only 38% of households reported to have used the public health sector when faced with illness in a member of the household. Medicine sellers, private health clinics, and pharmacies were the main care providers and medicines were also obtained in these establishments after consultation. This underscores the importance of the private sector in

<sup>8</sup> The World Health Report 2004

<sup>9</sup> 2004 World Development indicators

<sup>10</sup> Baseline Assessment of the Nigerian Pharmaceutical Sector, 2002 published by Federal Ministry of Health in collaboration with the World Health Organization

medicine pricing. Dispensing doctors are well established in Nigeria as it is estimated that well over 90% of private clinics dispense medicines in their health facilities.

### ***Medicine Financing.***

Data on the pharmaceutical sector is generally not available and as such total expenditure on medicines, total private medicine expenditure, total value of international medicine aid/donations, and estimate and value of imported medicines cannot be accurately ascertained.

An assessment of ARV use in health facilities in Nigeria in 2003 showed that 95% of patients purchased their ARVs out of pocket.<sup>11</sup> On the average, (23%) of weekly household expenditure was spent on one episode of illness not requiring hospitalisation in a household member.<sup>10</sup> Of those who did not procure their medicines after consultation, financial reasons and non availability were mainly cited.

There is a National Medicine Regulatory authority that registers medicines in the country. There is no difference in fees paid for the registration of innovator brand and generic medicines. However, to register an imported medicine, one would pay as much as four times the cost for registering one produced locally.

Pricing of medicines are not regulated and prices are not part of market authorization/registration. There is no pricing regulation which defines maximum or minimum profit margins for both wholesale and retail medicines and patients do not pay professional fees such as dispensing fees to pharmacies.

The piloting of the National Health Insurance Scheme (NHIS) commenced in May 29, 2005, hence, the type of medicine exemptions for categories of patients and the percentage of the population covered, are yet to be defined. Meanwhile, payment for medicines is out of pocket for almost all patients at all the health care levels. However, different states have various funding policies in which a few have payment exemptions for children and pregnant women and others have free malaria treatment. Tuberculosis and family planning medicines are free throughout the country.

### ***Rational use of medicines***

Studies continue to indicate a propensity for polypharmacy in Nigeria. For example, the last national survey of the pharmaceutical sector showed that the average number of medicines per prescription was 4.7<sup>12</sup>. More than 90% of medicines in prescriptions were listed on the Essential Medicines List. Appropriateness of dispensing was also very low as only 2% of diarrhoea prescriptions, 10% of acute respiratory tract infection and 21% of prescriptions for mild to moderate pneumonia were adjudged correctly prescribed.

### ***Access to medicines***

The baseline survey also showed that there was generally low availability of key medicines in health facilities. Only about 46% of a basket of key medicines were found in facilities. The respondents to the household survey indicated purchasing medicines in public health facilities (38%), medicine stores (23%), private clinics (16%) and private pharmacies (7%). Thus, the private sector is more utilised than the public sector which may be traced to the poor availability of medicines in public health facilities.

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<sup>11</sup> Situation of Antiretroviral Drug Use In Nigeria by FMOH in collaboration with WHO, November 2003

<sup>12</sup> Baseline Assessment of the Nigerian Pharmaceutical Sector, 2002 published by Federal Ministry of Health in collaboration with the World Health Organization

## **METHODOLOGY:**

### **Overview of the Survey:**

This study is based on a methodology developed by the World Health Organization (WHO) and Health Action International (HAI), which uses a short list of medicines to compare the prices of medicines in different health sectors. This methodology has been designed to standardise the collection, analysis and interpretation of medicine price data.

#### 2.1.1. Survey Planning and Preparation:

##### ***Gathering baseline information on the national pharmaceutical sector***

Baseline information on the national pharmaceutical sector as it relates to pricing of medicines was gathered using a structured questionnaire (annex 1). Information gathered included the following:

- Existing medicine policies including availability and details of pricing policy
- Public procurement practices
- Medicine distribution including central procurement, sales and dispensing in public and private sectors
- Medicine financing including insurance, risk-sharing and prepayment schemes

The questionnaire was administered to the Department of Food and Drug Services of the Federal Ministry of Health, the National Agency for Food and Drug Administration and Control (NAFDAC), the Pharmacists' Council of Nigeria (PCN) and the Pharmaceutical Manufacturing group of the Manufacturing Association of Nigeria (PMG-MAN)

##### ***Selection of list of medicines***

An Advisory committee made up of key stakeholders in the pharmaceutical sector was assembled to make decisions regarding medicines to include in the core and supplementary list of medicines. Members were drawn from the departments of Food and Drug Services, Public Health and Hospital Services of the Federal Ministry of Health, the National Agency for Food and Drug Administration and Control (NAFDAC), the Pharmaceutical Society of Nigeria (PSN), the Nigerian Medical Association (NMA), the Pharmacists' Council of Nigeria (PCN), and the Pharmaceutical Manufacturing Group of the Manufacturers Association of Nigeria (PMG-MAN).

In order to make the survey manageable and comparable between countries, a short "core" list of 30 medicines (annex 2) was selected as the basis for data collection and analysis for any country undertaking the study. For each medicine, the core list contains one dosage form, one strength, one recommended pack size, and three products (the innovator brand (IB), the most sold generic equivalent (MSG) and lowest priced generic (LPG) equivalent).

Prior to the meeting of the advisory group, a pre-survey was conducted to help the committee make informed decisions on the choice of medicines in the core and supplementary lists. A structured form (annex 3a) was produced and administered to the largest importers of medicines in the country to obtain data on the two most sold generic equivalents of relevant innovator brands of the selected medicines. A second form (annex 3b) was also administered to determine the medicines to be included in the supplementary list. The most important pharmacological groups were chosen and the medicines in the EDL for the treatment of the conditions were listed. The importers/wholesalers were told to rank the listed medicines in terms of the three most sold medicines in each category. The results were collated and used to determine the medicines to be included in the list.

### ***Medicines List:***

A total of 34 medicines were included in both the core and supplementary lists. The core list has 26 medicines while the supplementary list has 8.<sup>13</sup> The following medicines were included in the supplementary list as an outcome of the deliberations in the Advisory Committee meeting:

1. Amoxicillin capsule 500mg;
2. Ampicillin/Cloxacillin capsule (500mg);
3. Cimetidine tablet 200mg;
4. Diclofenac Sodium tablet 100mg
5. Dihydroartemisinin tablet 60mg.
6. Fluconazole tablet 50mg
7. Ketoprofen tablet 200mg
8. Clotrimazole cream 1%

Out of these, ampicillin/cloxacillin 500mg, diclofenac sodium 100mg, dihydroartemisinin 60mg, fluconazole 50mg, ketoprofen 200mg do not have international reference prices but were retained in the supplementary list, because of their importance and the opportunity afforded by the study to obtain in-country data for their availability and pricing.

### ***Sampling of facilities***

- **Procurement Prices:** Medicine prices were collected from state medical stores and one NGO facility.
- **Public Sector:** Prices patients pay in government health facilities (tertiary and secondary) were collected. The primary health centres were not included in this study because they are not authorised to stock prescription medicines which was the focus of the survey.
- **Private sector:** Prices patients pay in private retail pharmacies.
- **Other sector:** Prices patients pay in private clinics also known as ‘dispensing doctors’.

To define the sample frame, directories of health facilities were obtained from the Planning, Research and Statistics of the Federal Ministry of Health (public and clinics), FCT branch of the Nigerian Medical Association (private health clinics in the FCT) and the Pharmaceutical Council of Nigeria (registered private pharmacies).

Using a multistage systematic random sampling technique and internet generated random numbers, one state was selected in each of the six geo-political zones in the country. In the six randomly selected states, the state capital was chosen and the largest health facility which was usually either a tertiary or secondary health facility was first sampled. Six local government areas which have private pharmacies were also identified and sampled. In anticipation of non-functioning facilities and other unforeseen problems in the field, four extra facilities of each type were sampled and data collectors were requested to seek approval before collecting data from the reserve facilities. In view of the methodology employed in sampling the facilities included in the study, the result can be generalized to the whole country.

Data collectors were also sent to the State Central Medical Stores in each of the states sampled from the six geo-political zones. The procurement list for 2004 was requested from the NGO facility from which unit costs were calculated and entered into the workbook.

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<sup>13</sup> *Losartan*, and *Lovastatin* were removed from the list as they are not in the Nigeria Essential Medicines List. *Diclofenac* tab 25 mg and *fluconazole* 200 mg are not locally available and were therefore deleted from the list.

### ***Location of survey:***

The following locations were included in the survey.

| <b>Zone</b>   | <b>State</b> | <b>Local Government Areas (LGAs)</b>  |
|---------------|--------------|---|
| North Central | FCT          | Abuja Municipal Area Council, Abaji Area Council, Gwarimpa, Kuje, Bwari and Gwagwalada                                  |
| North East    | Borno        | Maiduguri metropolitan, Biu, Hawul, Kwaya-Kusar, Magumeri, Shani and Jere   |
| North West    | Kano         | Tarauni, Nasarawa, Fegge, Wudil, Kura, Tudun Wada, Kano municipal and Takai   |
| South East    | Anambra      | Awka North, Awka South, Nnewi South, Nnewi North, Dunukofia, Ogbaru, Onitsha North,                                     |
| South South   | Cross River  | Calabar municipal, Akamkpa, Obubra, Ugep Yakurr, Ogoja, Yala, Calabar South, Ikom, Obudu,                               |
| South West    | Lagos        | Epe, Ajeromi, Badagry, Lagos Island, Lagos Mainland, Ikorodu, Epe, Ajeromi, Surulere, Eti-Osa, Apapa, and Oshodi-Isolo. |

### ***Training of the data collectors and Pre-testing of survey Instruments.***

Twelve pharmacists were trained in data collection using the finalized medicine list during a three-day workshop. To pretest the data collection tools, the pharmacists were divided into three groups and each group tested the tools in all the three sectors to be surveyed i.e. public health facilities, private pharmacy outlet and private health clinics. All the facilities were situated in the Federal Capital Territory of Nigeria.

Subsequently, experiences were shared and appropriate corrections were effected on the tools which were then produced for the actual survey. Realising the difficulties that may be encountered in private health clinics, advocacy tips were also discussed to increase the probability of success in the survey.

### ***Collecting data on the prices and availability of medicines in the chosen health facilities and pharmacies***

The twelve pharmacists, were then distributed in pairs to each of the six zones in the country to collect medicine prices in the identified sectors between September 6 – 16, 2004. Letters of endorsement were sent to the State Ministries of Health of the sampled states two weeks before the survey. The data collectors were also given letters of introduction as well as copies of the letters of endorsement already sent to the states. The letters assured the states of the anonymity of any information provided for the survey.

In their letters, the states were requested to facilitate the work of the data collectors in terms of introduction to the private health clinics and private pharmacies.

### ***Identifying the components of medicine prices***

In conjunction with Pharmaceutical Manufacturing Group of the Manufacturers' Association of Nigeria (PMG-MAN) and the Pharmaceutical Society of Nigeria (PSN), the relevant manufacturers and wholesalers were contacted to gather information on components of medicines prices.

### ***Data entry and analysis***

The calculations entered by the data collectors were reviewed and entered into the WHO/HAI 2003 workbooks prepared for the study. Double entry of all data was done to improve on the accuracy of entered data. Extreme values were cross checked to ensure that they did not represent errors in data entry or calculation. Data for artesunate was excluded from the analysis as the medicine was donated to the government.

The following data analyses were made:

1. Within-sector analysis of data from a single sector. This includes:
  - The median medicine price levels in relation to international standard prices
  - Variations in price across medicine procurements or medicine outlets
  - Comparisons between innovator brand and generic equivalents products
  - Product availability in medicine outlets
2. Cross-sector comparisons in which overall medicine availability and prices were compared between the different sectors both for individual medicines
3. Treatment affordability using standard regimens for key health problems expressed in terms of number of days of wages of the lowest paid government worker required to pay for the cost of treatment.
4. Price composition which includes:
  - Comparison between final patient prices to ex-factory prices for a set of medicines in different sectors
  - Examining the different charges and mark-ups that contribute to the final price.
5. International comparison between a specific sector both for individual medicines and MPR across medicines

### ***Reference Prices***

Standard international reference prices were used to facilitate comparison of prices between sectors and across countries. The Management Sciences for Health (MSH) 2003 prices were used. They are international not-for-profit/tender prices listed in the International Medicine Price Indicator Guide published by MSH.

### ***Making international price comparisons***

Results of surveys from seven other countries (Ethiopia, Ghana, Kenya, South Africa, Tanzania, Uganda and Zimbabwe) were used to make relevant comparisons with the country information.

## FINDINGS:

### Definitions

#### Median price ratio (MPR)

The MPR is a ratio of the local price to an international reference price (converted into the same currency). The reference price serves as an external standard for evaluating local prices. The MPR results in this survey are based on reference prices taken from the 2003 Management Sciences for Health (MSH) International Drug Price Indicator Guide (<http://erc.msh.org/>). The MSH Guide pools together information from recent price lists of large, non-profit generic medicine suppliers.

#### Medians

As averages can be skewed by outlying values, median values are generally used (unless otherwise stated) throughout the presentation of results and discussion as a better representation of the midpoint value.

#### Affordability

Affordability is the cost of treatment in relation to people's income. In this survey, the daily wage of the lowest paid unskilled government worker is used for the comparison. Medicines which are unaffordable to this worker will be much less affordable for the significant proportion of the population that have an income less than this worker.

#### Minimum data points for analysis

Four data points for patient prices and one data point for procurement prices are the minimum number of data points that are necessary for the analysis to be performed by the workbook. If there are less data points that are less than this, then no calculation of MPR is performed. Availability is however calculated for all medicines irrespective of the number of outlets stocking each medicine

### PROCUREMENT PRICES

Of the six state central medical stores surveyed only three were functional and procurement prices were obtained from them. In addition, a major NGO which procures medicines for member institutions in Nigeria was also surveyed in order to compare procurement prices between the public and non-profit sectors.

**Table 1: Median Price Ratios (MPR) for procurement prices for a basket of 18 LPG medicines in three state medical stores (public sector) and one NGO (private not-for-profit)**

| Sector             | Procurement price |               |               |
|--------------------|-------------------|---------------|---------------|
|                    | MPR               | 25 percentile | 75 percentile |
| Public (state CMS) | 3.29              | 1.91          | 5.96          |
| NGO                | 0.65              | 0.52          | 0.68          |

The data in annex 4a shows that while the state central medical stores procured some innovator brand medicines the majority of their stock was generic medicines. However, the NGO

procurement facilities only stocked generic medicines. Thus, comparison of procurement is only possible with LPG medicines.

The median price ratio for procurement for the basket of medicines for matched pairs of medicines was 3.29 in the state medical store in contrast to 0.65 in the NGO store. Thus public CMS procurement is about 500% higher than the NGO procurement. It can also be seen that half of the prices in the basket of medicines were 2 to 6 times the international reference prices while most of the prices in the NGO facility were less than the international reference prices. This shows that while procurement prices at the NGO facility were quite low, those of the public sector were generally high.

**Table 2: Median price ratios of medicines in the public sector procurement**

| Medicines                 | MPR   |       | RATIO IB:LPG (MPR) |
|---------------------------|-------|-------|--------------------|
|                           | IB    | LPG   |                    |
| Aciclovir                 |       | 6.21  |                    |
| Amitriptyline             |       | 1.58  |                    |
| Amoxicillin               |       | 3.06  |                    |
| Amoxicillin (2)           |       | 1.51  |                    |
| Atenolol                  |       | 11.26 |                    |
| Captopril                 |       | 4.13  |                    |
| Carbamazepine             |       | 1.74  |                    |
| Cimetidine                |       | 3.52  |                    |
| Ciprofloxacin             | 28.37 | 7.09  | 400%               |
| Clotrimazole              |       | 1.90  |                    |
| Co-trimoxazole suspension |       | 2.01  |                    |
| Diazepam                  |       | 1.93  |                    |
| Glibenclamide             |       | 17.36 |                    |
| Hydrochlorothiazide       |       | 19.18 |                    |
| Metformin                 | 4.01  | 0.76  | 530%               |
| Nifedipine Retard         |       | 5.22  |                    |
| Ranitidine                | 1.03  | 4.53  | 440%               |
| Sulfadoxine-pyrimethamine |       | 2.15  |                    |

Examining the MPRs in Table 2 for medicine procurement in the public sector, one can observe that the lowest priced generic equivalents of amitriptyline, amoxicillin 500mg, carbamazepine, clotrimazole, co-trimoxazole suspension, diazepam, metformin and ranitidine which were 2 and below could be considered procured at reasonable prices. However all the other medicines were procured up to 28 times the international price and therefore, were considered too expensive.

The result also shows procurement prices vary between the innovator brands and lowest priced generic equivalents and between facilities. The pricing is so arbitrary that the cost of an innovator brand of ranitidine in one facility was less than the generic equivalent in another. Also the innovator brand of metformin was procured as much as five and half times the generic equivalent.

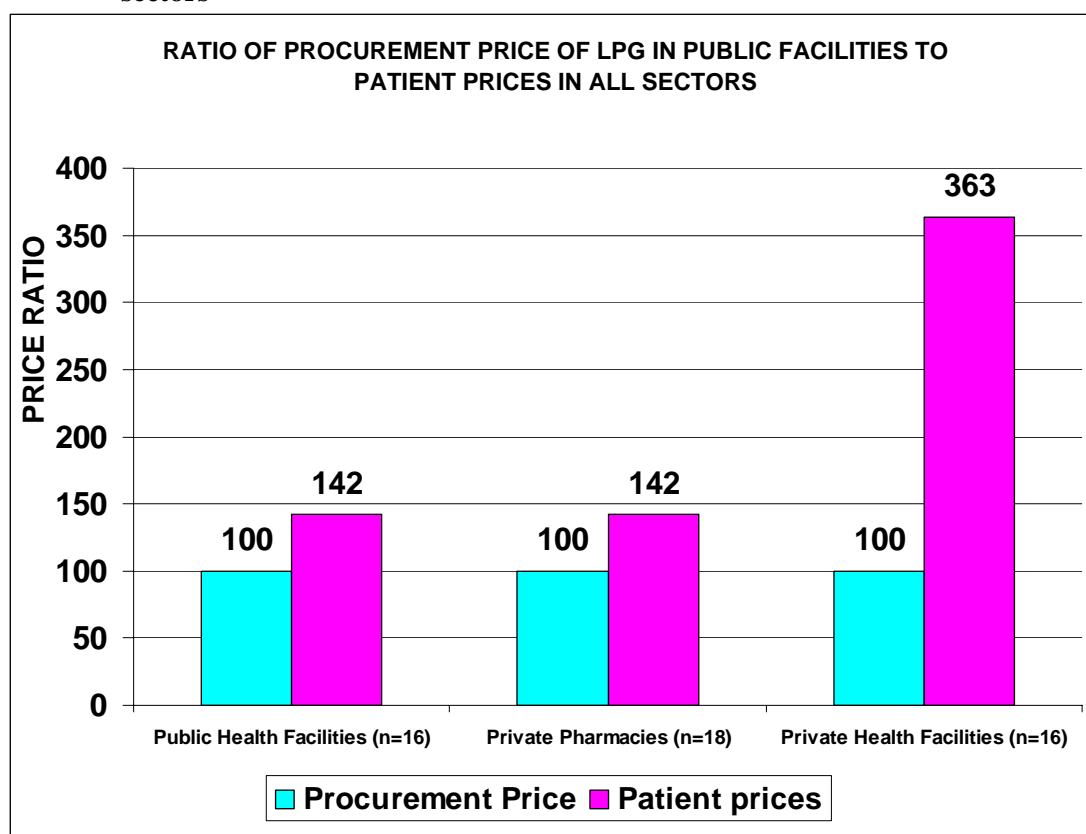
Availability of medicines was also low in both the private not-for-profit and public sectors.

**Table 3: Comparative analysis of MPR of medicines found both in the State CMS facilities and the NGO procurement facility**

| Medicine            | MPR           |      |                   |
|---------------------|---------------|------|-------------------|
|                     | Public Sector | NGO  | Ratio Public: NGO |
| Amitriptyline       | 1.58          | 0.52 | 300%              |
| Amoxicillin         | 3.06          | 0.94 | 330%              |
| Carbamazepine       | 1.74          | 0.65 | 270%              |
| Cimetidine          | 3.52          | 0.60 | 590%              |
| Diazepam            | 1.93          | 0.43 | 450%              |
| Glibenclamide       | 17.36         | 1.02 | 1710%             |
| Hydrochlorothiazide | 19.18         | 0.68 | 2820%             |
| Nifedipine Retard   | 5.22          | 0.65 | 800%              |

Examining the individual medicines that were available in both facilities, except for glibenclamide that was procured at about the same cost as the international reference price, the NGO prices were all less than international prices as shown in Table 3. Also the public sector procures 300% to 2800% times more expensively than in the NGO facility and the cost of lowest priced generic equivalent were consistently lower in the NGO sector than in the public sector.

**Chart 1: Ratio of Procurement prices of LPG in public facilities to patient prices in all sectors**



The above chart compares procurement prices in the state medical stores with the prices patients pay in all the sectors for lowest priced generic equivalents of medicines. It is based on the assumption that all sectors procure their medicines from the medical stores. Results show that the public health facilities sell generic medicines to patients identically (42% mark-up). However, the private health clinics mark-up the procurement prices in the state medical stores by up to 263%.

## PRICES PATIENTS PAY IN PRIVATE PHARMACIES

**Table 4: Comparison of private pharmacies innovator brand and lowest priced generic equivalent**

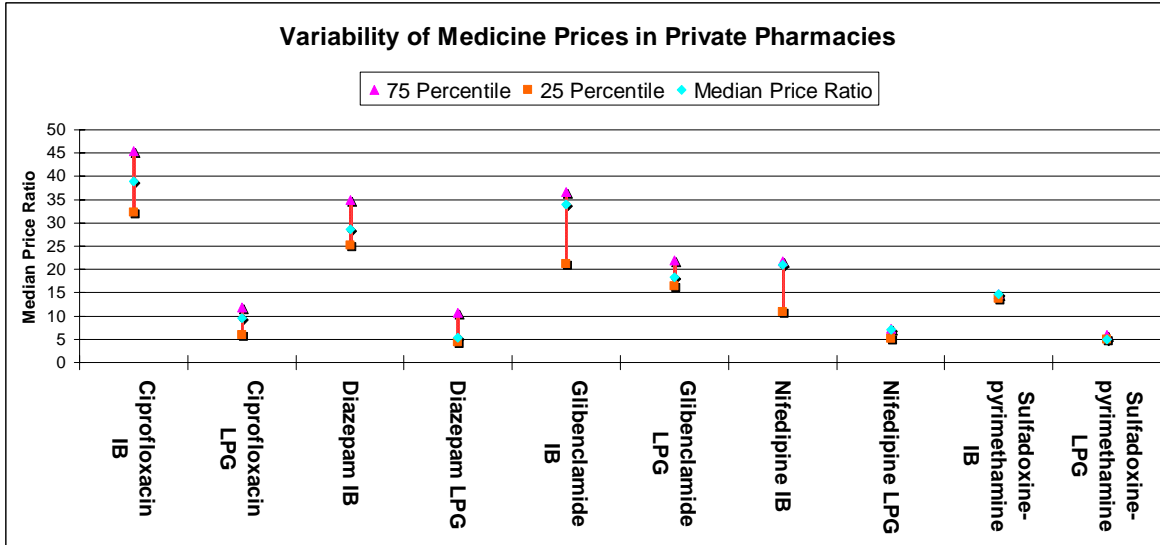
| Medicine                  | MPR  |      | Ratio IB: LPG |
|---------------------------|------|------|---------------|
|                           | IB   | LPG  |               |
| Aciclovir                 | -    | 4.2  | -             |
| Amitriptyline             | -    | 4.5  | -             |
| Amoxicillin               | 6.6  | 2.4  | 300%          |
| Amoxicillin (2)           | 6.1  | 2.0  | 300%          |
| Atenolol                  | 50.5 | 7.1  | 700%          |
| Captopril                 |      | 3.1  | -             |
| Carbamazepine             | 11.3 | 1.9  | 600%          |
| Ceftriaxone injection     | 6.8  | 3.8  | 200%          |
| Cimetidine                | 15.0 | 5.9  | 300%          |
| Ciprofloxacin             | 39.0 | 9.5  | 400%          |
| Clotrimazole              | 5.2  | 2.9  | 200%          |
| Co-trimoxazole suspension | 8.4  | 3.3  | 300%          |
| Diazepam                  | 28.6 | 5.4  | 500%          |
| Fluphenazine injection    |      | 3.9  | -             |
| Glibenclamide             | 33.9 | 18.3 | 200%          |
| Hydrochlorothiazide       |      | 43.0 |               |
| Metformin                 | 5.7  | 3.3  | 200%          |
| Nifedipine Retard         | 20.9 | 7.0  | 300%          |
| Omeprazole                | 14.5 | 3.0  | 500%          |
| Phenytoin                 | 21.2 | 10.6 | 200%          |
| Ranitidine                | 18.1 | 6.0  | 300%          |
| Salbutamol inhaler        | 2.3  |      | -             |
| Sulfadoxine-pyrimethamine | 14.6 | 4.9  | 300%          |

Examining individual prices in Table 4 it was found that most of the innovator brands range between 2 to 4 times the price of lowest priced generic equivalents with the highest (atenolol) being about 700% more expensive than the lowest priced generic equivalent.

The MPRs vary from 1.89 for the lowest priced generic version of carbamazepine to 50.53 of innovator brand atenolol. Other high MPRs were found for innovator brands of ciprofloxacin (39.01), diazepam (28.64), and lowest priced generic equivalent of hydrochlorothiazide (42.96). Low MPRs were also observed for innovator brand of salbutamol inhaler (2.33), lowest priced generic equivalent of amoxicillin (2.4) and lowest priced generic equivalent of omeprazole (3.01).

Atenolol has the largest innovator brand premium as the innovator brand costs 7 times the lowest priced generic equivalent. Other medicines with high innovator brand premiums include carbamazepine, diazepam, omeprazole and sulfadoxine/pyrimethamine suspension as the innovator brands cost at least 5 times the lowest priced generic equivalents.

**Chart 2: Variability of Medicine Prices in Private Pharmacies**



The MPRs of some products shown in chart 2 indicate that the prices of innovator brands show greater variation across facilities than the lowest priced generic equivalents. The difference between the MPR for the lowest priced generic equivalent and innovator brand was significant for the illustrated products confirming the very high innovator brand premium for ciprofloxacin, and diazepam. Prices for sulfadoxine/pyrimethamine (innovator brand and lowest priced generic equivalent) and lowest priced generic equivalent of nifedipine retard seem to be uniform throughout the private pharmacies.

**Table 5: Comparison of medicine prices in all sectors**

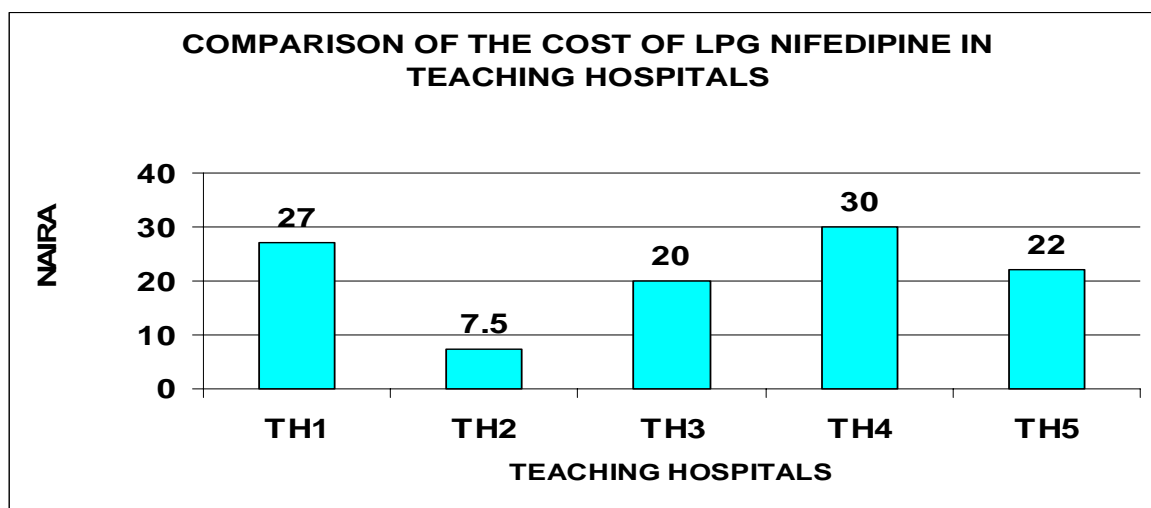
| Ratio                                  | IB   | MSG  | LPG  |
|--|------|------|------|
| Private pharmacies : Public facilities | 114% | 113% | 110% |
| Private clinics: Public facilities     | 140% | 284% | 226% |
| Private clinics: Private pharmacies    | 131% | 224% | 193% |

Overall, prices paid in public health facilities are nearly identical to those paid in private pharmacies for all the types of medicines. The prices charged by the private clinics are higher than the private pharmacies and the public health facilities. For example, overall prices for most sold generic equivalents were up to 184% more expensive in the private health clinics than in the public facilities. The variation in cost of innovator brands is less than the variation for generic medicines. Also, the variation of prices in private clinics is greater than in private pharmacies.

***Exploring variability of prices using MSG version***

Since the most sold generic version of a product is a specifically identified version of a medicine, it can be used and to compare and demonstrate the variability of prices of the same medicine across sectors and facilities in the same sector.

**Chart 3: Comparison of the cost of LPG Nifedipine in Teaching Hospitals**



We explored the cost of Nifecard® by Lek which is the most sold generic version of Nifedipine retard and the results in different teaching hospitals surveyed are shown in chart 3 above.

The prices of Nifecard® vary from 7.5 naira per tablet in one teaching hospital to 30 naira in another one. Thus the same medicine can cost up to 400% more from one teaching hospital to another.

**Table 6: Variability of the price of the same medicine across facilities in the public sector**

| MSG                                  | Minimum price per tab in naira | Maximum price per tab in naira | Ratio Min to Max |
|--------------------------------------|--------------------------------|--------------------------------|------------------|
| Atenolol                             | 7.5                            | 10                             | 133%             |
| Ceftriaxone                          | 1120                           | 1850                           | 165%             |
| Cimetidine                           | 7                              | 20                             | 286%             |
| Diazepam (Diazepam by Viatbiotics)   | 0.35                           | 5                              | 1429%            |
| Glibenclamide (Glanil® by NGC)       | 5                              | 15                             | 300%             |
| Metformin (Diabetmin by Hovid)       | 5                              | 20                             | 400%             |
| Nifedipine retard (Nifecard® by Lek) | 13                             | 30                             | 231%             |
| Omeprazole (Meprasil® by Fidson)     | 57.14                          | 105                            | 184%             |
| Ranitidine (Peptard® by Neimeth)     | 7                              | 100                            | 1429%            |

Table 6 shows the variability of prices across facilities in the public sector. A person can procure the same medicine made by the same manufacturer as much as between 133% to 1429% more depending on the facility visited in the country. Diazepam and ranitidine show the greatest variability in price between facilities while atenolol was the least variable.

**Table 7: Comparison of the cost of the same medicine across sectors**

| Most sold generic version          | Minimum prices per tablet |                    |                 | Maximum prices per tablet |                    |                 |
|------------------------------------|---------------------------|--------------------|-----------------|---------------------------|--------------------|-----------------|
|                                    | Public Facilities         | Private Pharmacies | Private Clinics | Public Facilities         | Private Pharmacies | Private Clinics |
| Diazepam (Diazepam by Viatbiotics) | 0.35                      | 1                  | 2               | 5                         | 5                  | 50              |
| Glibenclamide (Glanil by NGC)      | 5                         | 7                  | 12              | 15                        | 15                 | 40              |
| Metformin (Diabetmin by Hovid)     | 5                         | 6                  | 6               | 20                        | 15                 | 40              |
| Nifedipine (Nifecard by Lek)       | 13                        | 15                 | 20              | 30                        | 35                 | 105             |
| Omeprazole (Meprasil by Fidson)    | 57.14                     | 35.71              | 42.86           | 105                       | 100                | 300             |

The results in table 7 show that the difference in prices charged by health facilities on the same medicine is appreciable. For example, the most sold generic diazepam was obtained at the lowest price in public health facilities but cost as much as 143 times in private clinics. Also, the lowest price for Meprasil® was obtained in private pharmacies but cost about 840% higher in private clinics. The minimum and maximum prices for Meprasil® were more expensive in public facilities than in private pharmacies,

All the prices were higher in private clinics but there is no pattern in the pricing of the same medicines in public facilities and private pharmacies. While some are higher in public facilities, others are higher in private pharmacies. Overall, the prices of the same medicines are not so different in public facilities and private pharmacies, but show a large difference when compared with the cost in private clinics.

### *Medicine Availability*

**Table 8: Number of medicines found in more than 4<sup>14</sup> facilities in all sectors**

| Product             | Public Health facilities |            | Private pharmacy outlets |            | Clinics |            |
|---------------------|--------------------------|------------|--------------------------|------------|---------|------------|
|                     | Number                   | % of total | Number                   | % of total | Number  | % of total |
| Innovator brand     | 7                        | 21%        | 18                       | 53%        | 6       | 18%        |
| LP Generic versions | 19                       | 56%        | 22                       | 65%        | 18      | 53%        |

Table 8 shows the number of products (innovator brands and lowest priced generic products) found in at least four facilities<sup>15</sup> in the different sectors surveyed. Availability in all sectors is generally low. Highest availability of both innovator brand and generic products were in private pharmacy outlets. Just about half of the generic products were found in both public and private health clinics and about one quarter of the innovator brands were found in the same facilities.

**Table 9: Overall Percent Availability of Medicines on List in Public health facilities**

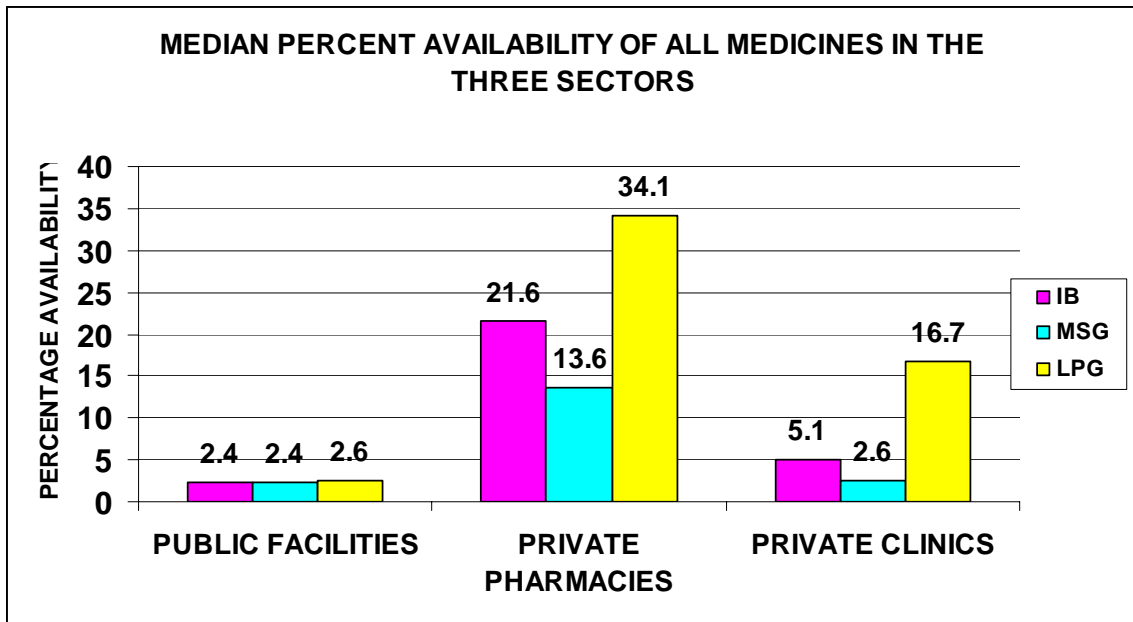
| Availability               | IB   | MSG   | LPG   |
|----------------------------|------|-------|-------|
| Median availability        | 2.4% | 2.4%  | 22.6% |
| 25 percentile availability | 0.0% | 0.0%  | 5.4%  |
| 75 percentile availability | 8.9% | 11.3% | 45.2% |

Of the 34 medicines for which prices were sought, the median availability for lowest priced generic equivalents was 22.6% with half of the generic medicines found in 5.4% to 45.2% of the private pharmacy outlets (table 9). In contrast, innovator brands were hardly available. More than one quarter of the innovator brands were not available in any of the outlets (i.e. 25 percentile is 0.00).

<sup>14</sup> A minimum of four prices is required to be included in analysis of patient prices

<sup>15</sup> *ibid*

**Chart 4: Median Percent availability of all medicines in the three sectors**



Availability for all the 34 surveyed medicines was generally low in all the sectors (chart 4). It is clear that all the sectors showed a preference for the lowest priced generic equivalents. The availability of innovator brands in all sectors was low.

It seems that the private pharmacies had more products than private health clinics. The public and private health clinics stocked almost entirely lowest priced generic equivalent products while the private pharmacies had a mix of all products. Availability of all products was lowest in private health clinics.

**Chart 5: Availability of anti-infectives in public facilities**

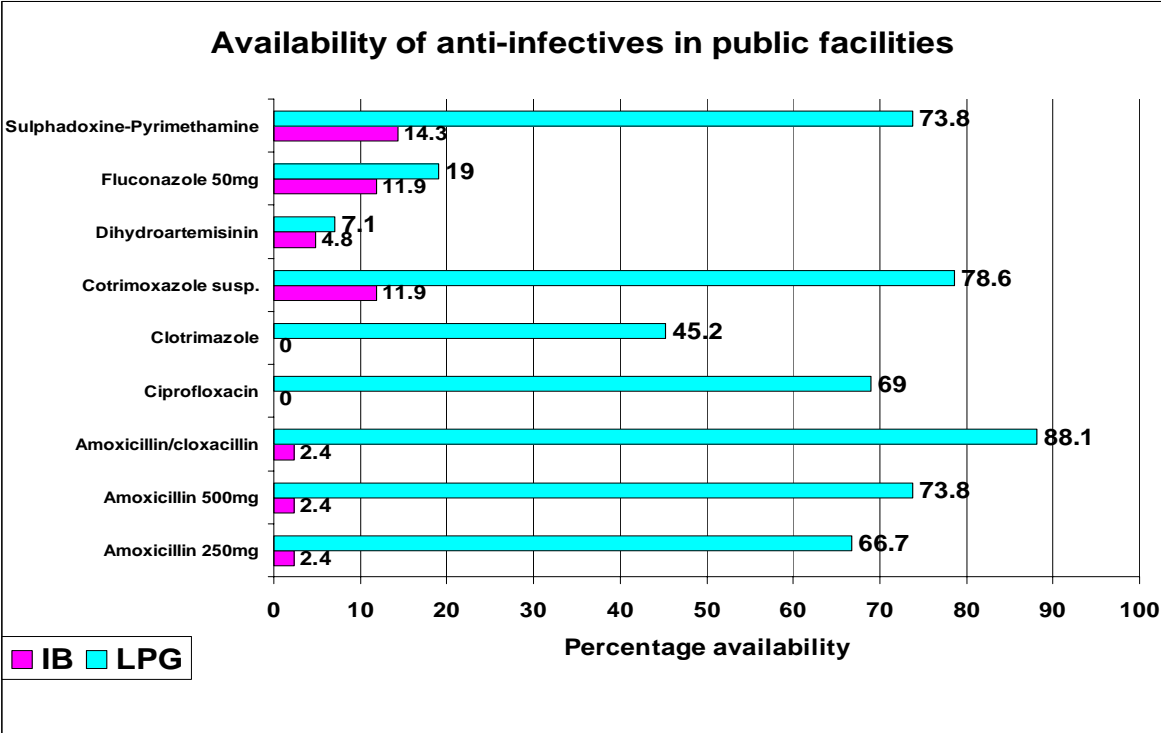
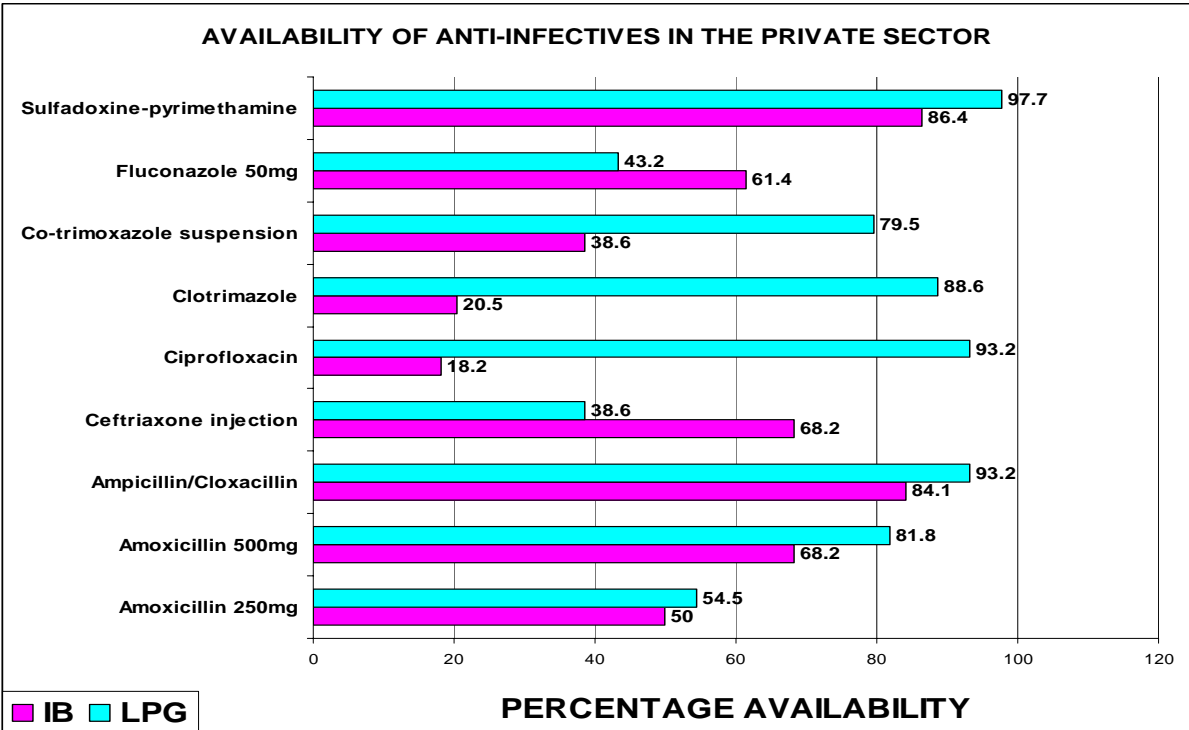


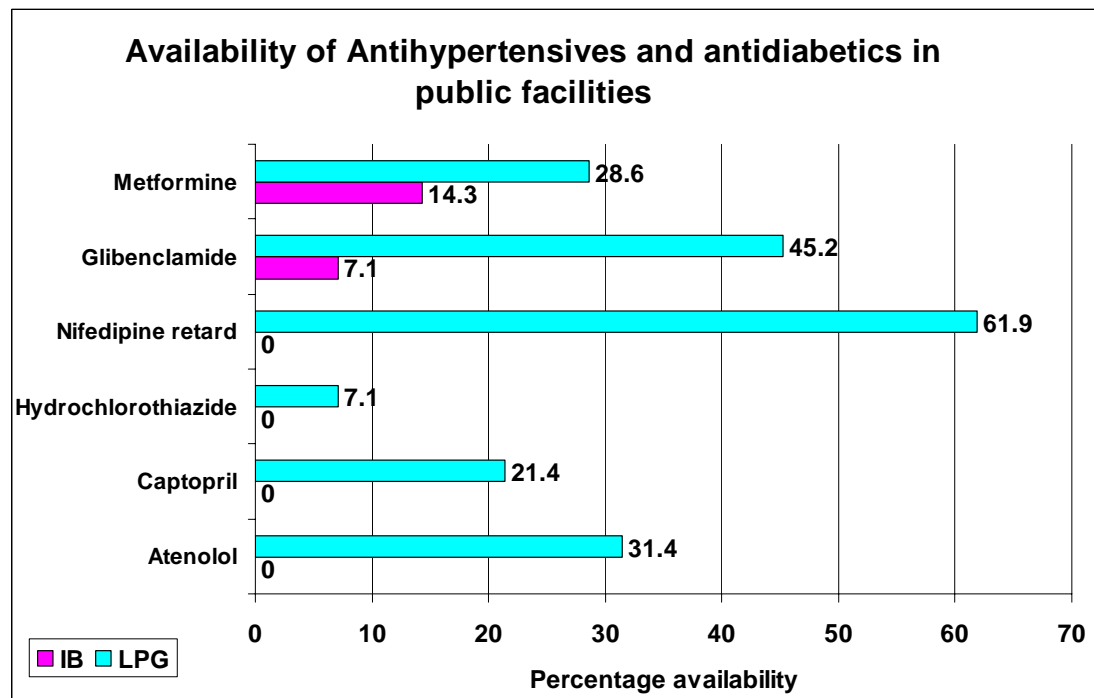
Chart 5 shows that apart from fluconazole and dihydroartemisinin the generic equivalents were much more readily available than the IBs. The chart also shows that while the availability of antifungals and artemisinin antimalarial was low, the other anti-infectives showed very high availability.

**Chart 6: Availability of anti-infectives in the private sector**

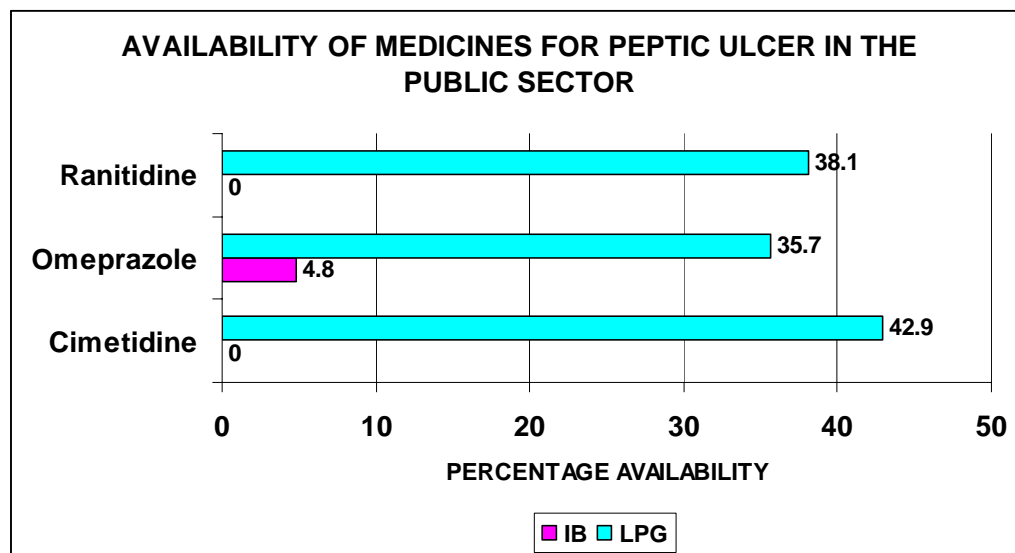


Considering chart 6 which shows availability of anti-infectives in private pharmacies, the innovator brands of fluconazole and ceftriaxone were more available than the generic versions of the same medicines. Generally, innovator brands were found in similar proportions as the generic versions except for clotrimazole pessaries, ciprofloxacin tablets, and cotrimoxazole suspension of where the generic versions were predominant. Availability of all anti-infectives was greater in private pharmacies than in public facilities.

**Chart 7: Availability of anti-hypertensives and anti-diabetics in public facilities**

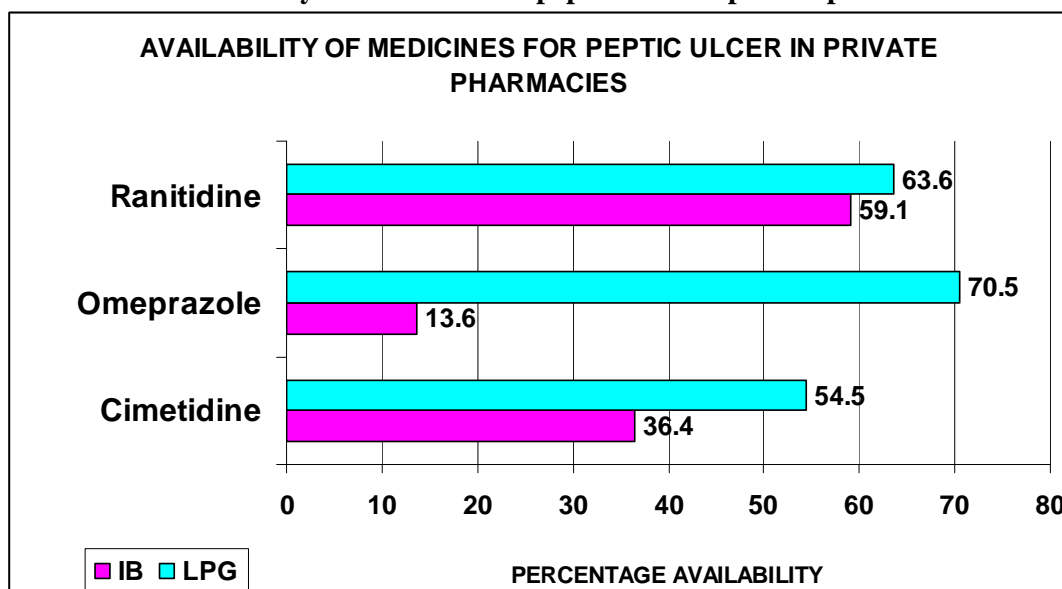


**Chart 8: Availability of medicines for peptic ulcer in the public sector**



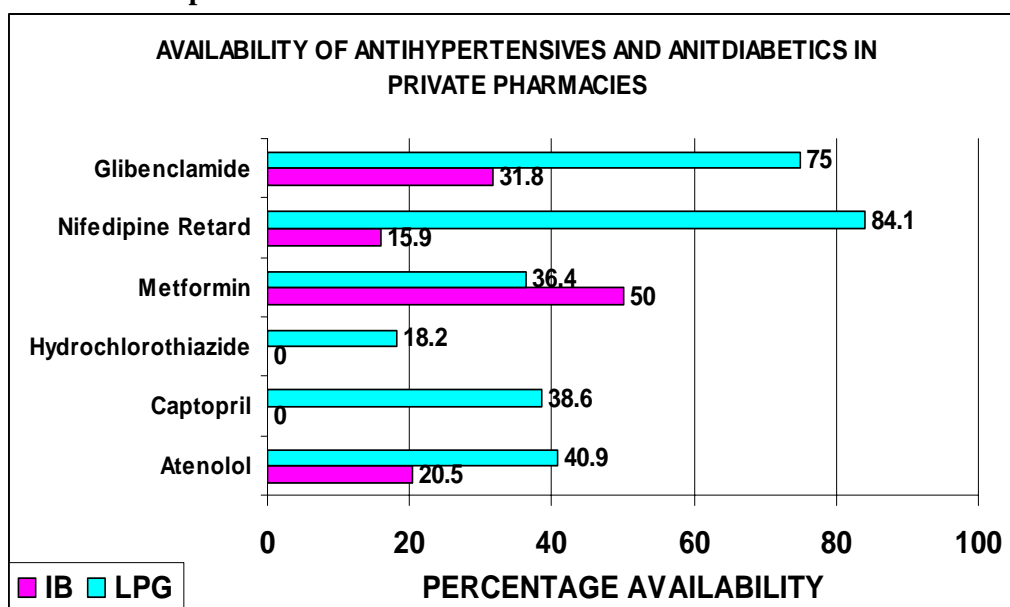
Just like other medicines, generic medicines were more likely to be stocked in the public sector than innovator brands. Availability of this class of medicine was quite low in the public sector as only less than half the facilities stocked them.

**Chart 9: Availability of medicines for peptic ulcer in private pharmacies**



In private pharmacies, availability of medicines for peptic ulcer was much greater when compared to public facilities. Except for omeprazole, the private pharmacies stocked both innovator brands and the generic versions of ulcer medicines.

**Chart 10: Availability of anti-hypertensives and anti-diabetics in private pharmacies**



Examining the details of availability in annex 4b the summaries show that innovator brand captopril was not found in any outlet surveyed. Beclomethasone was found only in 3 outlets, fluoxetine in 1 outlet and fluphenazine injections in very few outlets. Only the innovator brands of salbutamol inhaler and ketoprofen were available in the private pharmacies surveyed.

### *Medicine Affordability*

**Table 10: Cost of treatment of some conditions**

| Treatment  | Type of medicine      | Number of days' wages of lowest paid unskilled government worker |                    |                 |
|--|-----------------------|--|--------------------|-----------------|
|  |                       | Public facilities  | Private pharmacies | Private clinics |
| Diabetes:<br>Glibenclamide 5mg X<br>2 X 30 days        | Innovator brand       | -  | 6.1                |                 |
|  | Most sold generic     | 4.1  | 3.9                | 5.9             |
|  | Lowest priced generic | 3.3  | 3.3                | 4.9             |
| Hypertension:<br>Atenolol 50mg X 1 X<br>30 days        | Innovator brand       |  | 10.2               |                 |
|  | Most sold generic     | 1.3  | 1.5                |                 |
|  | Lowest priced generic | 1.6  | 1.4                | 4.4             |
| Gonorrhoea:<br>Ciprofloxacin 500mg<br>X 1 X 1 day      | Innovator brand       |  | 0.9                |                 |
|  | Most sold generic     |  | 0.3                |                 |
|  | Lowest priced generic | 0.3  | 0.2                | 0.4             |
| Depression:<br>amitriptyline 25mg X<br>3 X 30 days     | Innovator brand       |  |                    |                 |
|  | Most sold generic     |  |                    |                 |
|  | Lowest priced generic | 1.5  | 2.2                | 9.8             |
| Peptic ulcer:<br>Ranitidine 150mg tab<br>X 2 X 30 days | Innovator brand       |  | 19.6               |                 |
|  | Most sold generic     | 6.5  | 7.4                |                 |
|  | Lowest priced generic | 6.5  | 6.5                | 18.0            |

The table shows affordability of treatment of some selected conditions chosen on the basis of therapeutic importance and availability in the three sectors surveyed. To measure affordability, the cost of therapy for important conditions is compared with the daily wage of the lowest paid government worker in the states which is ₦5,500 (naira) per month.

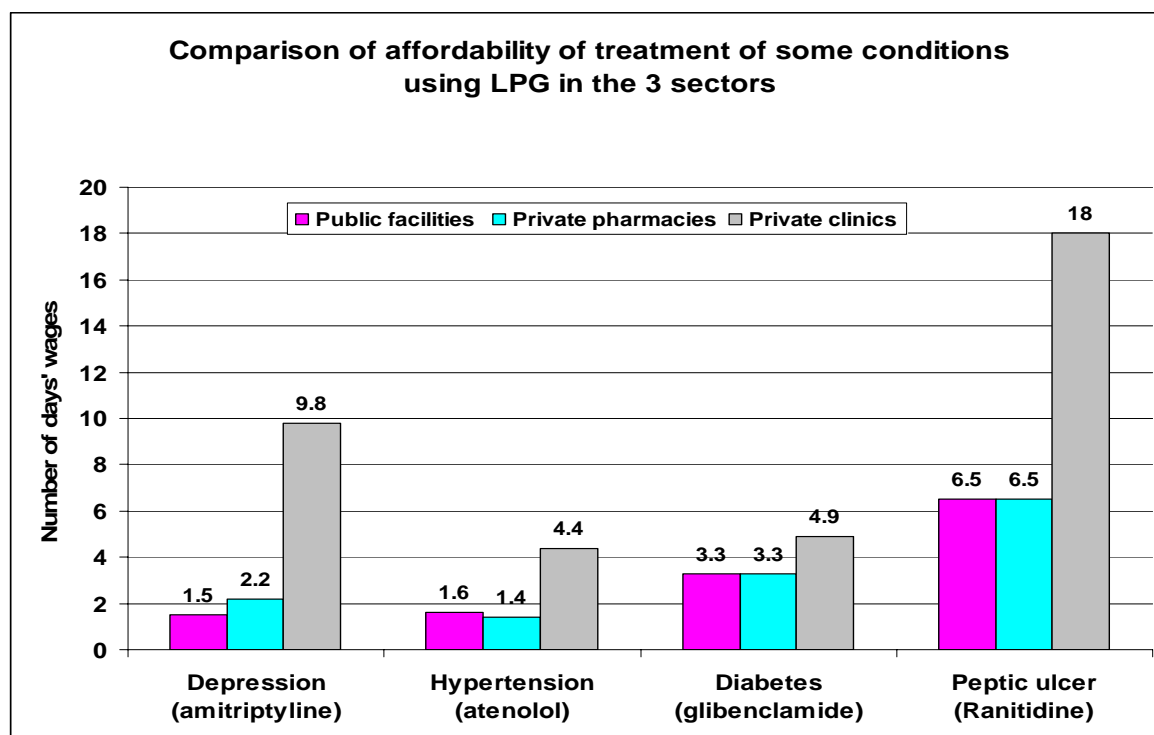
As would be expected, innovator brands are more expensive for all treatments than the most sold generic or the lowest priced generic version. Also, the selected medicines for the specific conditions are less affordable in the private clinics than in both public facilities and private pharmacies. Regardless of the condition being considered, the difference in affordability was minimal between the public facilities and the private pharmacies.

While treatment of gonorrhoea was the most affordable in all the sectors as it takes less than a day's wage to treat (table 10), the treatment of ulcer with ranitidine was the least affordable requiring 19.6 days' wages for the full course of treatment (one month) when purchased from the private pharmacy.

Generic amitriptyline is 6.5 times more affordable in public health facilities than in private health clinics. Treatment with generic atenolol is about 720% less expensive than the innovator brand of the same product for a month's course of therapy. This means that a worker would need to work additional 8.8 days to be able to afford the innovator brand of the same medicine.

## AFFORDABILITY OF CHRONIC CONDITIONS

Chart 11: Comparison of affordability of treatment of some conditions using LPG



Affordability of medicines to treat chronic illnesses shows very little difference in both the public health facilities and the private pharmacies while there is a huge difference in affordability in the private health clinics except for glibenclamide. Medicines can be deemed affordable when lowest priced generic equivalents are used to manage chronic conditions for hypertension, depression and diabetes while management of peptic ulcer with ranitidine might pose a challenge to the poorest families due to high cost of the IB and the generic versions.

Table 11: The effect of choice of therapeutic group to treat same diagnosis

| Condition    | Choice of medicine  | Number of days' wages | Ratio of cost in comparison with the lowest priced product |
|--------------|---------------------|-----------------------|--|
| Infection    | Amoxicillin         | 0.6                   | 100%   |
|              | Ciprofloxacin       | 1.5                   | 250%   |
|              | Ceftriaxone         | 21.3                  | 3550%  |
| Hypertension | Atenolol            | 1.4                   | 100%   |
|              | Hydrochlorothiazide | 3.3                   | 240%   |
|              | Captopril           | 5.3                   | 380%   |
| Gonorrhoea   | Ciprofloxacin       | 0.2                   | 100%   |
|              | Ceftriaxone         | 1.8                   | 900%   |
| Diabetes     | Metformin           | 2.8                   | 100%   |
|              | Glibenclamide       | 3.3                   | 120%   |
| Peptic ulcer | Ranitidine          | 6.5                   | 100%   |
|              | Omeprazole          | 25.7                  | 400%   |

The effect of choice of therapeutic groups within the diagnosis of a condition on the affordability of treatment was measured in Table 11.

Prescribing patterns show increased use of third generation cephalosporins to treat infections in both private and public health facilities.<sup>16</sup> We therefore measured the effect of this prescribing habit by comparing the cost of the use of amoxicillin and ceftriaxone using the full course to treat an infection. While a worker would pay 0.6 days' wages to procure a full course of treatment with lowest priced generic amoxicillin from the public sector, he would need 1.5 days' wages using ciprofloxacin and 21.3 days' wages (almost one month's wages) using the lowest priced generic ceftriaxone bought from the same sector. This represents 2.5 (ciprofloxacin) and 35.5 times (ceftriaxone) the cost of using amoxicillin.

While treatment of diabetes with either glibenclamide or metformin is not greatly affected by the choice of medicine, treatment of infection using ceftriaxone is greatly affected as previously demonstrated. Also treatment of gonorrhoea costs 9 times more with ceftriaxone than with ciprofloxacin.

**Table 12: The cost of monthly treatment of a hypothetical family with 3 chronic conditions**

| Condition            | Medicine                            | Number of days' wages  |                 |
|----------------------|-------------------------------------|------------------------|-----------------|
|                      |                                     | Public health facility | Private clinics |
| Hypertension (adult) | LPG atenolol                        | 6.5                    | 18.0            |
| Peptic ulcer (adult) | LPG ranitidine                      | 3.6                    | 6.0             |
| Asthma (child)       | IB salbutamol inhaler <sup>17</sup> | 1.4                    | 4.4             |
| <b>Total</b>         |                                     | <b>11.5</b>            | <b>28.4</b>     |

Considering a family with chronic conditions shown in Table 12. The family would spend almost two weeks salary if they received their medication from public health facilities and a whole month's salary if they were treated in private clinics.

<sup>16</sup> Personal communications with Prof. Ambrose Isah, Professor of Clinical Pharmacology, University of Benin, Edo State, Nigeria

<sup>17</sup> There is no available generic salbutamol

## Cumulative Mark-up

**Table 13: Example of a cumulative mark-up by sector**

| Select Medicine Name 2             | Medicine Strength | Dosage Form | Sector                      | Item                                | Brand     | Most Sold | Lowest Price |
|------------------------------------|-------------------|-------------|-----------------------------|-------------------------------------|-----------|-----------|--------------|
| Ceftriaxone injection              | 1 g/vial          | gram        | Public Procurement          | Manufacturer pack price             | 1970.000  | 1000.000  | 630.000      |
|                                    |                   |             |                             | Manufacturer pack size (# of units) | 1         | 1         | 1            |
|                                    |                   |             |                             | Manufacturer unit price (MUP)       | 1970.0000 | 1000.0000 | 630.0000     |
|                                    |                   |             |                             | Ratio: MUP to reference unit price  | 5.79      | 2.94      | 1.85         |
|                                    |                   |             |                             | Sector median unit price (SMUP)     |           |           |              |
|                                    |                   |             | % mark-up: SMUP over MUP    |                                     |           |           |              |
|                                    |                   |             | Public Patient Charge       | Manufacturer pack price             | 1970.000  | 1000.000  | 630.000      |
|                                    |                   |             |                             | Manufacturer pack size (# of units) | 1         | 1         | 1            |
|                                    |                   |             |                             | Manufacturer unit price (MUP)       | 1970.0000 | 1000.0000 | 630.0000     |
|                                    |                   |             |                             | Ratio: MUP to reference unit price  | 5.79      | 2.94      | 1.85         |
|                                    |                   |             |                             | Sector median unit price (SMUP)     | 2500.0000 | 1400.0000 | 1190.0000    |
|                                    |                   |             | % mark-up: SMUP over MUP    | 26.9%                               | 40.0%     | 88.9%     |              |
|                                    |                   |             | Private Retail Price        | Manufacturer pack price             | 1970.000  | 1000.000  | 630.000      |
|                                    |                   |             |                             | Manufacturer pack size (# of units) | 1         | 1         | 1            |
|                                    |                   |             |                             | Manufacturer unit price (MUP)       | 1970.0000 | 1000.0000 | 630.0000     |
|                                    |                   |             |                             | Ratio: MUP to reference unit price  | 5.79      | 2.94      | 1.85         |
|                                    |                   |             |                             | Sector median unit price (SMUP)     | 2300.0000 | 1290.0000 | 1300.0000    |
|                                    |                   |             | % mark-up: SMUP over MUP    | 16.8%                               | 29.0%     | 106.3%    |              |
|                                    |                   |             | Other Sector Patient Charge | Manufacturer pack price             | 1970.000  | 1000.000  | 630.000      |
|                                    |                   |             |                             | Manufacturer pack size (# of units) | 1         | 1         | 1            |
| Manufacturer unit price (MUP)      | 1970.0000         | 1000.0000   |                             | 630.0000                            |           |           |              |
| Ratio: MUP to reference unit price | 5.79              | 2.94        |                             | 1.85                                |           |           |              |
| Sector median unit price (SMUP)    | 2950.0000         |             |                             | 2000.0000                           |           |           |              |
| % mark-up: SMUP over MUP           | 49.7%             |             | 217.5%                      |                                     |           |           |              |

The cumulative mark-up analysis shown in table 13 allows the comparison of the sector median unit price, which is the final unit price of the medicine in each sector, with the manufacturer's unit price. This ratio expresses the cumulative mark-up of the medicine between initial purchase from the manufacturer and sale to the patient.

It is assumed that the procurement cost of medicines is the same in all the sectors since procurement is largely facility based. This means that the public and private sector operators would procure their medicines from the same wholesaler.

Results show the following:

- Mark-up is high in all sectors
- Private health clinics have the highest mark-up both for innovator brands and lowest priced generic equivalents.
- Mark-ups in the various sectors increase as the cost of medicine decreases. For example, the mark-up for lowest priced generic equivalents of ceftriaxone is a lot more (106.3%) than the mark-up for innovator brand of the same medicine (16.8) representing 6.2 times the mark-up.

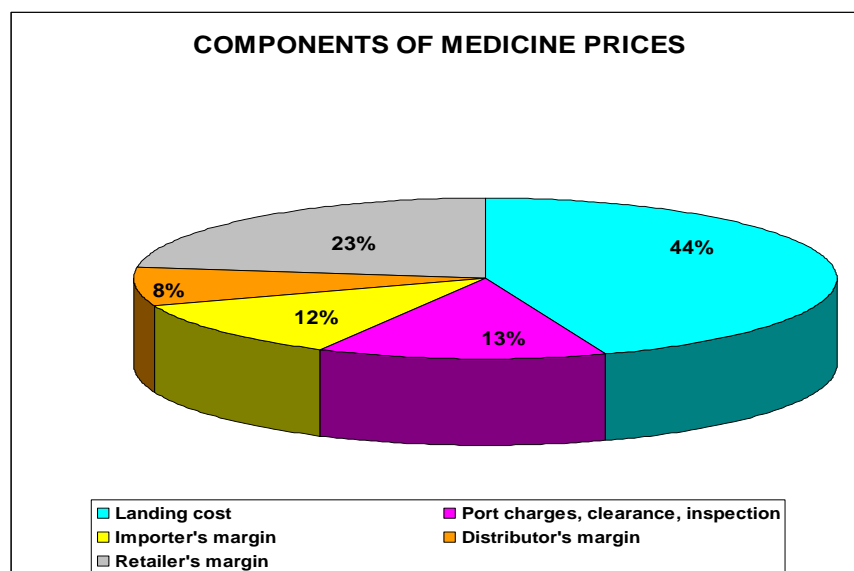
## Price Components

**Table 14: Example of Price components in the Private sector**

| Example 1: Medicine Name  | Medicine Strength | Dosage Form | Target Pack Size | Dispensed Quantity | Type of Charge                       | Charge Basis | Amount of Charge | Price of Dispensed Quantity | Cumulative % Mark-up |
|---------------------------|-------------------|-------------|------------------|--------------------|--------------------------------------|--------------|------------------|-----------------------------|----------------------|
| Co-trimoxazole suspension | 8+40 mg/ml        | millilitre  | 70               | 50                 | Cost, insurance, freight (CIF) price | NA           | NA               | 51.71                       | 0.00%                |
|                           |                   |             |                  |                    | Port charges, clearance, inspection  | percent      | 30%              | 67.22                       | 30.00%               |
|                           |                   |             |                  |                    | Importer's margin                    | percent      | 20%              | 80.67                       | 56.00%               |
|                           |                   |             |                  |                    | Distributor's margin                 | percent      | 10%              | 88.73                       | 71.60%               |
|                           |                   |             |                  |                    | Retailers' margin                    | percent      | 30%              | 115.35                      | 123.08%              |
|                           |                   |             |                  |                    |                                      |              |                  |                             |                      |
|                           |                   |             |                  |                    |                                      |              |                  |                             |                      |

The mark-up-structure was exemplified by analyzing four typical medicines (see annex 4c). Table 14 is one of the examples. The cost of imported medicines usually come as 'the landed cost' and this includes the cost of clearing at the port, as well as the various taxes and tariffs paid to the government. The charges are non discriminatory and the same percentage is charged for all medicines. Table 14 shows that the government taxes and tariffs as well as distribution of medicines cost at least 123% of the landing cost.

**Chart 12: Components of medicine prices in all sectors**



Analysis of the components of medicine prices using cotrimoxazole as an example shows that the landing cost is less than half of what the patient eventually pays. The rest is spread out over government tariffs and cost of distribution. It is therefore evident that government taxes, tariffs and distribution costs constitute a large chunk of costs that patients pay for medicines as illustrated by the cotrimoxazole pricing structure.

## *National prices in an International Perspective*

**Table 15: Comparison of Procurement and Patient prices in all sectors**

|   | Number of countries | 25th percentile | 75th percentile | median | Nigerian Median | Ratio |
|---|---------------------|-----------------|-----------------|--------|-----------------|-------|
| Public procurement median MPR LPG       | 8                   | 0.65            | 1.16            | 0.86   | 4.13            | 480%  |
| Public sector patient median MPR LPG    | 6                   | 1.25            | 2.78            | 2.11   | 3.54            | 168%  |
| NGO procurement median MPR LPG          | 4                   | 0.79            | 0.93            | 0.85   | 0.65            | 76%   |
| Private pharmacy patient median MPR LPG | 8                   | 3.04            | 4.41            | 3.56   | 5.12            | 144%  |
| Private pharmacy patient median MPR IB  | 8                   | 14.35           | 17.73           | 16.39  | 14.63           | 89%   |

Public procurement prices in the Nigerian public sector are extremely high – about 5 times the cost in 7 other countries and well above the 75 quartile. On the other hand, NGO prices in Nigeria were less expensive than NGO procurement in three other countries. While public sector procurement in Nigeria was the highest of the eight countries, the Nigerian NGO procurement was the lowest.

The difference in public sector prices to patients was not as pronounced as the procurement prices as they were about one and half times more expensive than the median price in the 8 countries. And just like the procurement prices, patient prices were above the 75% quartile.

The prices patients paid for generic medicines in private pharmacies were similar to public sector prices. Likewise, these prices were higher than the prices in the seven other countries by about the same factor of one and half. However, innovator brand products in private pharmacies were less expensive in Nigeria than in the seven other countries being used in the comparison. Judging from interquartile ranges, the prices of innovator brand products in private pharmacies in Nigeria were less expensive than in only two countries.

**Table 16: RATIO OF MEDIAN PRICE RATIOS IN PUBLIC SECTOR AND PRIVATE PHARMACIES**

|   | Median | 25 <sup>th</sup> percentile | 75 <sup>th</sup> percentile | Nigeria |
|---|--------|-----------------------------|-----------------------------|---------|
| Ratio public patient: public procurement LPG *      | 2.04   | 1.8                         | 2.99                        | 1.24    |
| Ratio private pharmacy patient: public patient LPG* | 1.82   | 1.48                        | 1.91                        | 1.18    |
|   |        |                             |                             |         |

The ratio of procurement to patient prices shows that Nigeria incorporates a lower mark-up on the retail prices of medicines than the other countries both in the public health facilities and the private pharmacies.

**Chart 13: Comparison of Median Price Ratios of innovator brand medicines in private pharmacies in 8 countries**

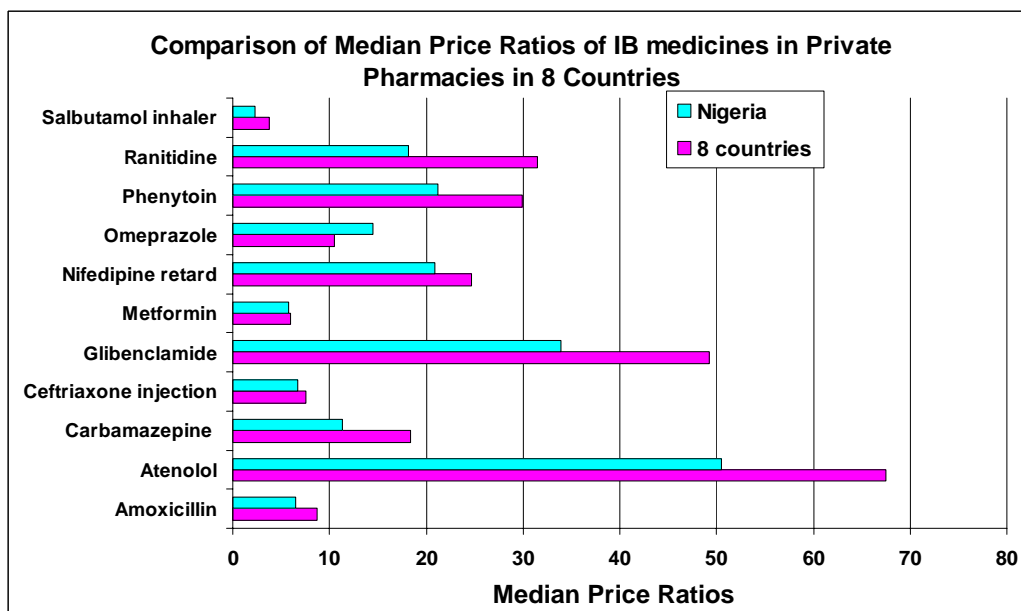
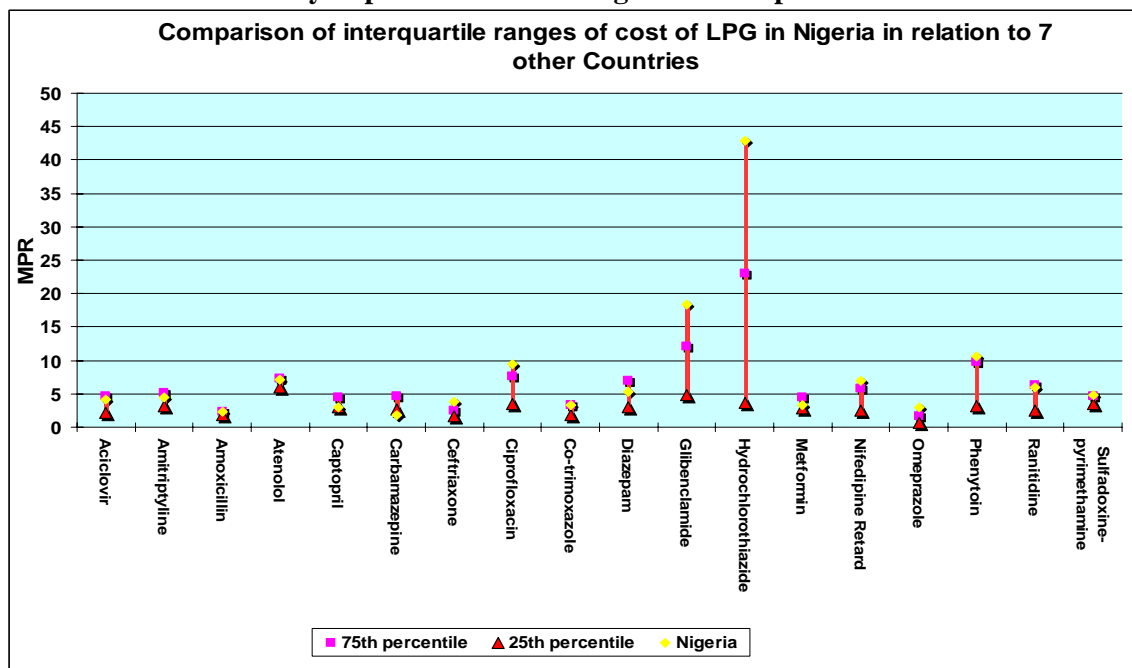


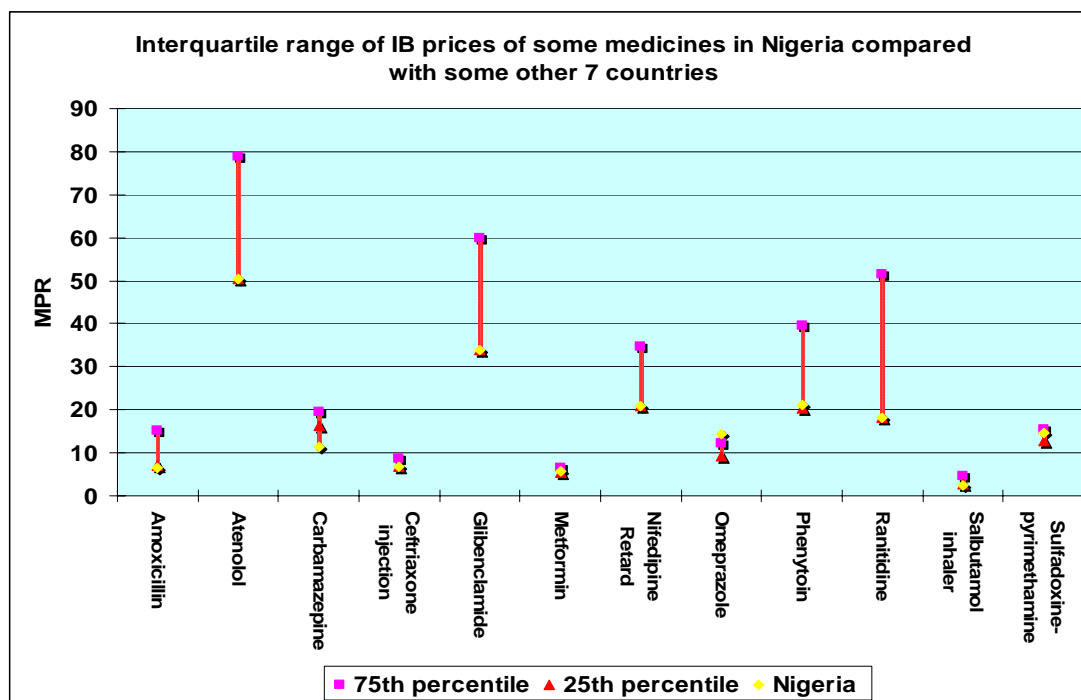
Chart 13 shows that apart from omeprazole and sulphadoxine-pyrimethamine which cost more in Nigeria, all other innovator brand products were less expensive in private pharmacies in Nigeria than in the other seven countries. The price of ranitidine is about half the price that obtains in seven other countries.

**Chart 14: Variability of prices of LPG in Nigeria as compared with 7 other countries**



Apart from hydrochlorothiazide and glibenclamide, there was very little variability in LPG prices. It is noteworthy that the prices of most generic medicines in Nigeria were above the 75% quartile. In contrast, the majority of innovator brands were priced less expensively in Nigeria than in the other countries under comparison.

**Chart15 : Variability of IB medicines in Nigeria as compared with other 7 countries**



**Table 17: AFFORDABILITY -private retail pharmacy- IB**

| Condition                   | Medicine                  | # days lowest paid government worker |         | Ratio |
|-----------------------------|---------------------------|--------------------------------------|---------|-------|
|                             |                           | Median                               | Nigeria |       |
| Diabetes                    | Glibenclamide             | 7.20                                 | 6.1     | 85%   |
| Hypertension                | Atenolol                  | 9.20                                 | 10.2    | 111%  |
| adult respiratory infection | Amoxicillin               | 1.50                                 | 1.7     | 113%  |
| Asthma                      | Salbutamol                | 4.45                                 | 3.3     | 74%   |
| peptic ulcer                | Ranitidine                | 19.60                                | 19.6    | 100%  |
| peptic ulcer                | Omeprazole                | 44.45                                | 57.7    | 130%  |
| Malaria                     | Sulfadoxine-pyrimethamine | 0.80                                 | 0.8     | 100%  |

**Table 18: AFFORDABILITY -private retail pharmacy- LPG**

| Condition                   | Medicine                  | # days lowest paid government worker |         | Ratio |
|-----------------------------|---------------------------|--------------------------------------|---------|-------|
|                             |                           | Median                               | Nigeria |       |
| Diabetes                    | Glibenclamide             | 1.3                                  | 3.3     | 264%  |
| Hypertension                | hydrochlorothiazide       | 0.4                                  | 3.3     | 825%  |
| Hypertension                | Atenolol                  | 1.3                                  | 1.4     | 112%  |
| Adult respiratory infection | Amoxicillin               | 0.4                                  | 0.6     | 150%  |
| Paed. respiratory infection | Cotrimoxazole             | 0.5                                  | 0.6     | 133%  |
| Gonorrhoea                  | Ciprofloxacin             | 0.1                                  | 0.2     | 200%  |
| Depression                  | Amitriptyline             | 1.9                                  | 2.2     | 119%  |
| Peptic ulcer                | Ranitidine                | 3.3                                  | 6.5     | 197%  |
| Peptic ulcer                | Omeprazole                | 3.3                                  | 12.0    | 364%  |
| Malaria                     | Sulfadoxine-pyrimethamine | 0.3                                  | 0.3     | 100%  |

Tables 17 and 18 show that with the exception of sulphadoxine-pyrimethamine where the affordability is the same, all other generic medicines were more affordable in other countries than in Nigeria. The medicines with the greatest disparity in affordability are hydrochlorothiazide, omeprazole, glibenclamide, ciprofloxacin and ranitidine which are 2 to 8 times less affordable in Nigerian retail pharmacies than in other countries. The trend is similar with innovator brand products except that glibenclamide and salbutamol inhaler was more affordable in Nigeria than in the other countries.

## **DISCUSSIONS:**

### ***Pricing***

Procurement prices were very high in state medical stores and very low at the NGO procurement facility. High procurement costs at state medical stores is an indication of inefficient procurement at the state stores in contrast to the NGO procurement which compares favorably with international procurement. For example, innovator brand atenolol costs as much as 50 times more than the international prices.

Although price mark-ups in Nigeria, in both the public sector and private pharmacies are lower than in the other seven countries compared, it seems likely that the high prices of medicines must be related to prices fixed by importers and manufacturers. This premise is strengthened by the fact that the NGO facility which has the lowest medicine prices imports its own medicines and is also subject to the payment of taxes and tariffs. On the other hand, the public sector and private pharmacies procure in-country from importers and manufacturers. In addition, the high cost of manufacturing in Nigeria might also be driving up the cost of local production of pharmaceuticals.

A more detailed study of determinants of medicine prices would be necessary in order to pin point the causes of high prices of medicines in Nigeria. Studying the cause of the large variability between prices as well as the gap between the minimum and maximum costs of products would provide an insight to what options to take to improve pricing in the country. Ultimately, a pricing policy which would have the objective of minimizing variability and excessive profit making and improve access to medicines especially for the poor and marginalized populations may need to be developed for the country.

In Nigeria, public sector prices are almost identical to private retail pharmacy prices. This is different from what obtains in most countries where private retail prices are much higher. This may be due to several causes such as the procurement methods and excessive mark-ups in public health facilities. Pooling procurement, using competitive tendering, price information and price negotiations are all well known means of ensuring affordable pricing. However, in most public sector, procurement is decentralized to the facility level making it impossible for the earlier mentioned strategies to be employed.

Another reason may be the fact that most facilities run revolving drug funds (DRF) schemes. The DRF managers run the scheme as a purely profit making venture. They include mark-ups to ensure that funds are not decapitalised and to ensure provision for depreciation due to inflation.

As is expected, generic medicines are more affordable than the innovator brand equivalents. The generic versions were more readily available in all the sectors than the innovator brands. This

shows an acceptance of generic medicines in the country although there is no legislation requiring generic prescribing or substitution.

Nevertheless, in private health clinics, the generic equivalents were priced at twice the cost found in either the public health facilities or the private pharmacies. This means that although private health clinics mainly procure generic medicines, they do not allow their patients to enjoy the benefits of generic prices. Generic medicines in this sector are priced almost like innovator brands. This shows that generic medicines are not necessarily the lowest priced medicines but are purchased to ensure wider profit margins.

The combination of prescribing and dispensing roles by private health clinics has been shown to result in increased medicine prices. This is confirmed by this survey in which the cost of medicines sold by the private clinics is up to 193% of cost in the public health facilities or in private pharmacies. This survey is likely to have underestimated the real prices of medicines that patients pay. An exit or surrogate patient survey may give a better indication of pricing in that sector. Despite the suspected underestimation of the prices patients pay to dispensing doctors, the cost of medicines in that sector is quite high. Pricing is not usually well defined and depends on such criteria as absence or presence of injection or infusion, number of medicines prescribed, perception of ability to pay, the practice, the type of neighbourhood etc. Thus, pricing is dependent on other factors than the traditional ones usually considered. Further studies may need to be undertaken to understand issues involved in pricing in private clinics.

### ***Availability***

The survey showed low availability of the basket of medicines surveyed in both the public and private health clinics. This is consistent with the results of a previous survey carried out in 2002 which shows 46% availability of key medicines<sup>18</sup> in the public sector. The medicines in both baskets of medicines are all part of the Nigerian Essential Drugs List. In-depth studies are needed to determine factors affecting availability of medicines.

It is important to note that salbutamol inhaler was available only as the innovator brand product. Given the scale of medicine counterfeiting in the county and the lifesaving nature in cases of asthma attack, it is possible that only the innovator brands are trusted and used at all levels.

ARVs were not available in the private pharmacies. This is not surprising as most of the sampled facilities were not ART centres which are designated by the government who also procures ARVs. A few of the centres were sampled in the study hence the low availability.

### ***Affordability***

Affordability was also calculated in terms of the government worker who earns less than US\$1.50 per day. Few Nigerians are government employees earning this minimum wage. Indeed 70.2% of Nigerians earn below US\$1.00 per day and the vast majority, 90.8 earn less than 2 US\$ per day. While affordability was measured in terms of only a single medicine, it is important to note that this is far from the reality. Studies show that the average number of medicines per prescription in Nigeria is 4.7.<sup>19</sup> Therefore, most conditions are treated with more medicines than calculated by this survey; as the real cost would be an aggregate of the cost of the individual medicines including the equipment used to deliver the medicines. It is also probable that more

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<sup>18</sup> Baseline Assessment of the Nigerian Pharmaceutical Sector, 2002, published by the Federal Ministry of Health in collaboration with the World Health Organization.

<sup>19</sup> Baseline Assessment of the Pharmaceutical Sector 2002, published by The Federal Ministry of Health in collaboration with the World Health Organization

than one family member at a time would require medicines. Thus the calculated medicine cost represents a minute fraction of what would actually be paid by a family at any given time. Therefore, most medicines are clearly unaffordable to the majority of Nigerians.

This study shows that the affordability of medicines is greatly dependent on the selection of medicine between the generic version and the innovator brands with the later being less affordable. Choice of facility was also important as there was decrease in cost of medicines in a descending order from the private clinics, through the public health facilities to the private pharmacies. Prescription patterns are also shown to have an effect on affordability of medicines.

Studies show that at least 65% of the populace use the private pharmacies for their health needs. Evenso, medicines are clearly unaffordable to most people especially the poor populations who also spend more than 90% of their income on food. Irrational selection of medicines can have a great impact on affordability.

Efforts to improve affordability should include

- A reduction in the procurement prices of medicines,
- Entrenching the rational use of medicines into the system
- Improving access to public health facilities.

### ***Choice of medicines***

For a treatment to be rational, the choice of medicine must be at the cost the patient and his community can afford. The study shows that the selection of medicines is very important in affordability of medicines and hence rational use. While the choice of a pharmacologic group may not be entirely a factor that can be controlled by the physician due to presentation of the disease state, other underlying factors such as age, concurrent diseases, adverse drug effects, drug-drug interaction etc. Nevertheless, it is important that choices must be carefully considered due to the cost implications to the patient. The cost of a medicine may be a barrier to achieving the therapeutic objective of controlling a chronic condition.

Due to various factors to be considered during the short encounter with the patient which may not be available to the prescriber, it is therefore important that standard treatment guidelines (STGs) are available for health workers at all levels of the health care system. STGs take many factors into consideration including cost of medicines which become useful to the prescriber and procurement personnel in making rational selection of medicines.

### ***Price Components and Cumulative mark-up***

Mark-ups represent a large proportion of the price the patient pays in Nigeria. Mark-ups vary from medicine to medicine and from sector to sector showing a tendency for increased mark-up as the medicines become cheaper. Interviews indicate a theoretical margin of 20% for the importer, 10% for the distributor and 30% for the retailer but our analysis shows that mark-ups are not constant but can be as low as 10% and as high as 900%. Thus prices are set considering some undetermined factors. An in-depth study on determinants of medicine prices would provide an insight to the pricing structure and help in formulating appropriate policies to improve prices patients pay.

Distribution costs have been shown to considerably increase prices and as the number of middle men increase, the cost of medicines increase. By reducing the number of middle men in procurement, public facilities can make a lot of savings and provide affordable medicines to

patients through direct procurement from manufacturers with appropriate price negotiations or competition.

The pharmaceutical sector in Nigeria like in other countries is a rather complex one with most of the actors (public health facilities, private pharmacies, private clinics, manufacturers, importers, distributors and wholesalers) have vested interest of maximising profits either for the organisation or for self which usually limits access to medicines. It is for this reason that price regulation is important with pharmaceuticals as well as other changes that will cause an improvement in the access of medicines. But as we know, change will certainly elicit both support and opposition from various stakeholders. Therefore it is important to carefully analyse the situation with further in-depth situation and stakeholder analysis and consultation before policy options are pursued. With this approach, the principal causes are unearthed and the options that would ensure definite changes are identified and implemented.

### ***International comparison***

Comparing prices in Nigeria with other countries has confirmed the high prices which are available in Nigeria. Additional insight gained with international comparisons indicates that while procurement prices were extremely high in Nigeria, mark-up seems to be quite low. It seems that importers and/or manufacturers of medicines take advantage of low cost of generics to make excessive profits from them. Thus, interventions into procurement may make a real difference in the cost of medicines in Nigeria.

### ***Limitations of the survey***

Despite the low availability of medicines in this study, the minimum requirement of four medicines to be included in the analysis was reached for a good number of medicines surveyed. Therefore, the accuracy of the conclusions may not be affected to a great extent in addition to the fact that price variations are not so large when medicine prices are considered. However, there are other limitations which should be taken into account in future studies. Such limitations include the quality of medicines considering the extent of medicine counterfeiting in Nigeria, the country of origin of innovator brands of products and the size of packaging.

## **CONCLUSIONS**

The following conclusions have been reached.

### ***Procurement Prices***

- Procurement in the public sector in Nigeria is far from being efficient as procurement prices are several times higher than international reference prices and procurement prices in other developing countries in Africa.
- The role of importers in the high cost of medicines needs to be further considered and investigated

### ***Patient Prices***

- The prices patients pay in the public sector are so high that there is little or no difference between prices in the public health facilities and private pharmacies. Dispensing doctors in private clinics consistently charge many times the prices patients pay in public health facilities and private pharmacies.
- Prices of innovator brands are considerably higher than their generic equivalents in all sectors. Prices of generic medicines vary widely between facilities and sectors. Indeed, generics are priced like innovator brands especially in private health clinics.

### ***Component of Medicine Prices***

- Local factors contribute in no small measure to the cost of medicines in Nigeria. The current multiple taxations regimes, levies and mark-ups on medicines are substantial and contribute to the high prices of medicines. Poor infrastructure development especially of power generation makes the cost of locally produced medicines high.

### ***Medicine Availability***

- Availability of medicines in the country is generally low in all sectors but this is more accentuated in both the public and private health care clinics. Generic medicines have been accepted in the country as they are more available than innovator brands in all sectors.

## **RECOMMENDATIONS**

### ***Policy issues***

- There may be need to incorporate medicine pricing as part of requirements before marketing authorisation is issued by the medicine regulatory authority.
- There is need to review procurement policy of the country. Considering the size and complexity of Nigeria, it will be rational to conduct further studies on the best procurement method that would be effective for the country taking into consideration methods that have worked in similar developing countries. Policy options include:
  - Establishment of autonomous or semi-autonomous procurement agency
  - Competitive tendering with price transparency
  - Pooled procurement with national buyers
  - The provision of incentives and capacity building in rational procurement
  - Parallel importation of single source products and price negotiations
  - Price information
- A generic medicine policy needs to be institutionalised in the country to encourage the selection, procurement, promotion, prescribing and dispensing of generic medicines. As such, acceptance of generic products by professionals and patients needs to be promoted. Quality assurance mechanisms such as prequalification of generic manufacturers may be instituted to provide confidence in generic products
- To reduce variability in prices and make them more affordable to patients, a pricing policy needs to be developed for the country.
- The government should make concerted efforts in order to improve infrastructure such as power and water generation to reduce high manufacturers' prices.
- The burden of taxation on the pharmaceutical sector should be reviewed. Multiple taxation by local, state and federal governments as well as high tariffs on raw materials, packaging materials and other ancillary materials used for manufacturing of medicines should be reduced. Essential medicines for priority diseases should be defined and exempted from all forms of taxation.
- The reviewed National Drug Policy has already incorporated many of the recommendations to reduce the cost of medicines such as the development of a pricing policy, generic prescribing and substitution policy, encouraging of local manufacturing by reducing taxes, tariffs etc. The challenge is the effective and coordinated implementation of this policy in order to derive the benefits for improvement of the health of the Nigerian populace through the attainment of the Millennium Development Goals (MDGs).

### ***Selection of medicines***

- Since selection of medicines is key to affordability and can be a major hindrance to access to medicines, a standard treatment guideline needs to be developed for the country to guide rational selection of cost effective medicines.

### ***Further research***

- Since the pharmaceutical sector especially in Nigeria is complex and have various actors who have benefited from its disorganised nature for decades, it is important to carefully analyse situations before solutions are proffered. Therefore further studies need to be undertaken to ascertain the following:
  - Actual prices patients pay using exit interview or household surveys in order to measure any discrepancies in the prices recorded from dispensers with actual prices patients pay
  - Determinants of prices of medicines in all sectors
  - In-depth studies to ascertain the reasons for poor availability of medicines in the country
  - Comprehensive stakeholder analysis to determine acceptable and workable policy interventions in the country.

## **ANNEXES**

1. National Pharmaceutical Sector Form (from Medicines Prices Survey)
2. List of medicines surveyed (Product table)
3. Pre-survey determination of innovator brand and most sold generic medicines for core and supplementary lists
4. Analysis of summary sheets
  - Annex 4a. Public sector procurement
  - Annex 4b. Private (not-for-profit) NGO procurement
  - Annex 4c: Cumulative mark-up and price composition sheets
  - Annex 4d. Patient prices in Public sector facilities
  - Annex 4e: Patient prices in Private sector pharmacies
  - Annex 4f: Private Clinics (other sector)
  - Annex 4g: Sector availability and price summary
  - Annex 4h: Medicines availability and price summary
  - Annex 4i: Affordability summary
5. List of medicines on the National Essential Medicines List
6. List of facilities and outlets sampled
7. Timetable of survey
8. Medicines data collection form

# Annex 1: Completed National Pharmaceutical Sector Form

Country: **NIGERIA**

Date: **15 JULY 2004**

Population: **116,928,000**

Rate of exchange (commercial “buy” rate) to US dollars on the first day of data collection: **1 USD = 133 NAIRA**

Sources of information: **WORLD HEALTH REPORT, NATIONAL DAILIES, FMOH, NAFDAC**

## General information on the pharmaceutical sector

Is there a formal National Medicines Policy document covering both the public and private sectors?  Yes  No

Is an Essential Medicines List (EML) available?  Yes  No

If yes, state total number of medicines on national EML: **384**

If yes, year of last revision: **2003**

If yes, is it (tick 3all that apply):

- National
- Regional
- Public sector only
- Both public and private sectors
- Other (please specify):

If yes, is the EML being used (tick 3all that apply):

- For registration of medicines nationally
- Public sector procurement only
- Insurance and/or reimbursement schemes
- Private sector
- Public sector

Is there a policy for generic prescribing or substitution?  Yes  No

Are there incentives for generic prescribing or substitution?  Yes  No

## Public procurement<sup>20</sup>

Is procurement in the public sector limited to a selection of

<sup>20</sup> If there is a public procurement system, there is usually a limited list of items that can be procured. Products procured on international tenders are sometimes registered in the recipient country only by generic names. Import permits to named suppliers are issued based on the approved list of tender awards. An open tender is one that is publicly announced; a closed one is sent to a selection of approved suppliers.

essential medicines?  Yes  No

If no, please specify if any other limitation is in force:  
Type of public sector procurement (tick all that apply):

International, competitive tender

Open

Closed (restricted)

National, competitive tender

Open

Closed (restricted)

**Negotiation/direct purchasing**

Are the products purchased all registered?  Yes  No

Is there a local preference?<sup>21</sup>  Yes  No

Are there public health programmes fully implemented by donor assistance which also provide medicines?  Yes  No  
(e.g. TB, family planning, etc.)

If yes, please specify: **TB, Family planning, ARVs, Onchocerciasis, Guinea worm eradication program,**

## **Distribution<sup>22</sup>**

Is there a public sector distribution centre/warehouse?  Yes  No

If yes, specify levels:

Are there private not-for-profit distribution centres:  Yes  No  
e.g. missions/nongovernmental organizations?

If yes, please specify: **Mostly for distribution of TB drugs**  
Number of licensed wholesalers:

## **Retail**

**Urban    Rural    Overall**

Number of inhabitants per pharmacy (approx.)

Number of inhabitants per qualified pharmacist (approx.)

Number of pharmacies with qualified pharmacists

Number of medicine outlets with pharmacy technician

Number of other licensed medicine outlets

## **Private sector<sup>23</sup>**

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21 A local preference means that local companies will be preferred even if their prices are not the cheapest. Local preference is normally in the range of 10-20%.

22 The public sector often has a central storage and distribution centre which may have at least one sublevel. The private not-for-profit sector may be dominated by one type of NGO (e.g. church missions), but may also comprise others such as Bamako Initiative type projects, Red Cross or Red Crescent Society, Médecins Sans Frontières.

23 Retail outlets may be called pharmacies, medicine outlets, drug stores, chemists, etc. They may be run/owned by a qualified pharmacist (with diploma) or another category: e.g. pharmacy technician, or a lay person with short training.

Are there independent pharmacies?  Yes  No Number:  
 Are there chain pharmacies?  Yes  No Number:  
 Do doctors dispense medicines?<sup>24</sup>  Yes  No

If yes, approximate coverage or % of doctors who dispense: **80% (PRIVATE SECTOR DOCTORS)**

Are there pharmacies or medicine outlets in health facilities?  Yes  No

## Financing

(Give approximate figures, converted to US dollars at current exchange rate: commercial “buy” rate on the first day of data collection)

| Type of expenditure   | Approximate annual budget<br>(US dollars) |
|---|---|
| National public expenditure on medicines including government insurance, military, local purchases in past year | <b>UNKNOWN</b>                            |
| Estimated total private medicine expenditure in past year (out of pocket, private insurance, NGO/mission)       | <b>UNKNOWN</b>                            |
| Total value of international medicine aid or donations in past year   | <b>UNKNOWN</b>                            |
| What percentage of medicines by value are imported?   | <b>% UNKNOWN</b>                          |

## Government price policy

Is there a medicines regulatory authority?  Yes  No

Is pricing regulated?  Yes  No

Is setting prices part of market authorization/registration?  Yes  No

Do registration fees differ between:

- Innovator brand and generic equivalents  Yes  No
- Imported and locally produced medicines  Yes  No

## Public sector

Are there margins (mark-ups) in the distribution chain?  Yes  No

- Central medical stores %
- Regional store %
- Other store (specify) %
- Public medicine outlet %

Are there any other fees or levies?  Yes  No

If yes, please describe:

## Private retail sector

Are there maximum profit margins?  Yes  No

<sup>24</sup> Many countries allow doctors to dispense and sell medicines.

If yes (if they vary, give maximum and minimum):

- Wholesale %
- Retail %

Is there a maximum retail price (sales price)?  Yes  No  
(If it varies, give maximum and minimum)

- Maximum:
- Minimum:

Do patients pay professional fees (e.g. dispensing fee)?  Yes  No

If yes, please describe:

“Other” sector

Are there maximum profit margins?  Yes  No

If yes (if they vary, give maximum and minimum):

Wholesale %

Retail %

Is there a maximum sales price?  Yes  No

### **Insurance, risk-sharing or prepayment schemes**

Are there any health insurance, risk-sharing or prepayment schemes or revolving medicine funds?  Yes  No

If yes, please describe: universal compulsory but not yet functional

Are all medicines covered?  Yes  No

If no, state which medicines are covered (e.g. EML, public health programmes):

Not yet defined

Are some patients / groups of patients exempted, regardless of insurance coverage? (e.g. children < X yrs, war veterans)  Yes  No

If yes, please specify: Not yet defined

Estimated percentage of population covered unknown %

Is it official policy to supply all medicines free at primary health care level?  Yes  No

If no, are some free?  Yes  No

If yes, tick 3 all that apply:

- Tuberculosis**
- Malaria** (in some states)
- Oral rehydration salts
- Family planning**
- Others, please specify:

Are there official user charges/patient co-payments/fees?  Yes  No

Are all medicines supplied free at hospitals?  Yes  No

If no, are some free?  Yes  No

If yes, please specify:

## Annex 2: List of medicines surveyed (Product table)

| Med. No. | CORE LIST                |                   |                       |                      |                    | "Innovator" Product |                      |                       | Most Sold Generic Version (Nat'l) |                |                       |
|----------|--------------------------|-------------------|-----------------------|----------------------|--------------------|---------------------|----------------------|-----------------------|-----------------------------------|----------------|-----------------------|
|          | Medicine Name            | Medicine Strength | Dosage Form           | Target Pack Size     | Core List (yes/no) | Name                | Manufacturer         | Country of Production | Name                              | Manufacturer   | Country of Production |
| 1.       | Aciclovir                | 200 mg            | Tab                   | 25                   | Yes                | Zovirax             | GSK                  | ENGLAND               | Virest                            | Hovid          | MALAYSIA              |
| 2.       | Amitriptyline            | 25 mg             | Tab                   | 100                  | Yes                | Tryptizol           | MSD                  | UK                    | Amitriptyline                     | APS            | ENGLAND               |
| 3.       | Amoxicillin              | 250 mg            | Caps                  | 21                   | Yes                | Amoxil              | SKB (GSK)            | INDIA                 | Reichamox                         | Medreich       | ENGLAND               |
| 4.       | <sup>25</sup> Artesunate | 100 mg            | Tab                   | 20*                  | Yes                | Arsumax             | Sanofi               | FRANCE                | Artesunate                        | Meko pharm/    | VIETNAM               |
| 5.       | Atenolol                 | 50 mg             | Tab                   | 60                   | Yes                | Tenormin            | AstraZeneca          | UK                    | Atenolol                          | Alpharma       | UK                    |
| 6.       | Beclometasone            | 50 mcg/ dose      | Inhaler               | 1 inhaler: 200 doses | Yes                | Becotide            | GSK                  | ENGLAND               | Beclofort                         | Glaxo Wellcome | ENGLAND               |
| 7.       | Captopril                | 25 mg             | Tab                   | 60                   | Yes                | Capoten             | BMS                  | UK                    | Captopril                         | APS            | UK                    |
| 8.       | Carbamazepine            | 200 mg            | Tab                   | 100                  | Yes                | Tegretol            | Novartis             | SWITZERLAND           | Carzepin                          | Hovid          | MALAYSIA              |
| 9.       | Ceftriaxone              | 1 g               | Inj powder            | 1 vial               | Yes                | Rocephin            | Roche/Swipha         | SWITZERLAND           | Powecef                           | Wockhardt      | INDIA                 |
| 10.      | Ciprofloxacin            | 500 mg            | Tab                   | 1                    | Yes                | Ciproxin            | Bayer                | GERMANY               | Ciprotab                          | Fidson         | INDIA                 |
| 11.      | Co-trimoxazole           | (8+40) mg/mL      | Paediatric suspension | 100 mL               | Yes                | Bactrim             | Roche/Swipha         | NIGERIA               | Primpex                           | SKG            | NIGERIA               |
| 12.      | Diazepam                 | 5 mg              | Tab                   | 100                  | Yes                | Valium              | Roche/Swipha         | NIGERIA               | Diazepam                          | Vitabiotics    | NIGERIA               |
| 13.      | Fluconazole              | 200 mg            | caps/tab              | 30                   | No                 | Diflucan            | Pfizer               | FRANCE                | Fluzoral                          | GPO, Bangkok   | THAILAND              |
| 14.      | Fluoxetine               | 20 mg             | caps/tab              | 30                   | No                 | Prozac              | Lilly                | SPAIN                 | Fluoxetine                        | Ranbaxy        | INDIA                 |
| 15.      | Fluphenazine decanoate   | 25 mg/ML          | Inj                   | 1 ampoule            | No                 | Modecate            | Sanofi-Winthrop/ BMS | FRANCE                | Monasan                           | Duopharm       |                       |
| 16.      | Glibenclamide            | 5 mg              | Tab                   | 60                   | Yes                | Daonil              | HMR/Aventis          | SOUTH AFRICA          | Glanil                            | NGC            | NIGERIA               |
| 17.      | Hydrochlorothiazide      | 25 mg             | Tab                   | 30                   | Yes                | Dichlotride         | MSD                  | UK                    | Esidrex                           | Novartis       | FRANCE                |
| 18.      | Indinavir                | 400 mg            | Caps                  | 180                  | Yes                | Crixivan            | MSD                  | UK                    |                                   |                |                       |
| 19.      | Metformin                | 500 mg            | Tab                   | 100                  | Yes                | Glucophage          | Merck                | UNITED KINGDOM        | Diabetmin                         | Hovid          | MALAYSIA              |
| 20.      | Nevirapine               | 200 mg            | Tab                   | 60                   | Yes                | Viramune            | Boehringer I         | GERMANY               |                                   |                |                       |
| 21.      | Nifedipine Retard        | 20 mg             | Tab                   | 100                  | Yes                | Adalat Retard       | Bayer                | GERMANY               | Nifecard Retard                   | Lek            | SLOVENIA              |
| 22.      | Omeprazole               | 20 mg             | Caps                  | 30                   | Yes                | Losec               | AstraZeneca          | SWEDEN                | Meprasil                          | Fidson         | NIGERIA               |
| 23.      | Phenytoin                | 100 mg            | caps/tab              | 100                  | Yes                | Epanutin            | Pfizer               | RUSSIA                | Epitoin                           | Hovid          | MALAYSIA              |
| 24.      | Pyrimethamine with       | (25+500) mg       | Tab                   | 3                    | Yes                | Fansidar            | Roche/Swipha         | NIGERIA               | Amalar                            | Brown & Bulk   | INDIA                 |

<sup>25</sup> Based on treatment of malaria in an adult around 70 kg with artesunate as single treatment: 4 mg/kg for 7 days (WHO Model Formulary, 2002)

| CORE LIST |             |                 |         |                      |     | "Innovator" Product |     |         | Most Sold Generic Version (Nat'l) |         |         |
|-----------|-------------|-----------------|---------|----------------------|-----|---------------------|-----|---------|-----------------------------------|---------|---------|
|           | sulfadoxine |                 |         |                      |     |                     |     |         |                                   |         |         |
| 25.       | Ranitidine  | 150 mg          | Tab     | 60                   | Yes | Zantac              | GSK | EGYPT   | Peptard                           | Neimeth | NIGERIA |
| 26.       | Salbutamol  | 0.1 mg per dose | Inhaler | 1 inhaler: 200 doses | Yes | Ventolin            | GSK | FRANCE  |                                   |         |         |
| 27.       | Zidovudine  | 100 mg          | Caps    | 100                  | Yes | Retrovir            | GSK | ENGLAND |                                   |         |         |

| Supplementary List |                        |                   |             |                  |                    | "Innovator" Product |                     |                       | Most Sold Generic Version (Nat'l) |              |                       |
|--------------------|------------------------|-------------------|-------------|------------------|--------------------|---------------------|---------------------|-----------------------|-----------------------------------|--------------|-----------------------|
| Med. No.           | Medicine Name          | Medicine Strength | Dosage Form | Target Pack Size | Core List (yes/no) | Name                | Manufacturer        | Country of Production | Name                              | Manufacturer | Country of Production |
| 1.                 | Amoxicillin            | 500mg             | Cap         | 100              | No                 | Amoxil              | Beecham/SKG         | India                 | Reichamox                         | Medriech     | India                 |
| 2.                 | Ampicillin/Cloxacillin | 500mg             | Cap         | 100              | No                 | Ampiclox            | Beecham/SKG         | India                 | Reichlox                          | Medreich     | India                 |
| 3.                 | Cimetidine             | 200mg             | Tab         | 100              | No                 | Tagamet             | SKF Int             | England               | Altramet                          | Taylek       | Slovenia              |
| 4.                 | Clotrimazole           | 1%                | Pessary     | 20g              | No                 | Canesten            | Bayer               | UK                    | Sabresten                         | Gemini       | Nigeria               |
| 5.                 | Diclofenac sodium      | 100mg             | Tab         | 100              | No                 | Voltarol            | Novartis            | Switzerland           | Abitren                           | Teva         | Israel                |
| 6.                 | Dihydroartemisin       | 60mg              | Tab         | 8                | No                 | Cotecxin            | CHINA PHARM (Cotec) | China                 | Alaxin                            | GVS Labs     | India                 |
| 7.                 | Fluconazole            | 50mg              | Tab         | 3                | Yes                | Diflucan            | Pfizer              | France                | Flucamed                          | Drugfield    | Nigeria               |
| 8.                 | Ketoprofen             | 150mg             | Tab         | 7                | No                 | Oruvail             | M & B               | France                | Ketoprofen                        | Teylek       | Slovenia              |

### Annex 3: Pre-survey determination of Core and Supplementary lists

#### Annex 3a: Determination of innovator brand and most sold generic equivalents in the Core list

| A  | B             | C            | D                | E            | F                     | G                   | I        |
|--|---------------|--------------|------------------|--------------|-----------------------|---------------------|----------|
| Generic name, dosage form, strength      | Brand name(s) | Manufacturer | Brand name found | Manufacturer | Pack size recommended | Price of pack found | Comments |
| Aciclovir tab 200 mg                     | Zovirax       | GSK          |                  |              | 25                    |                     |          |
| <i>Most sold generic equivalent</i>      |               |              |                  |              | 25                    |                     |          |
| <i>Next most sold generic equivalent</i> |               |              |                  |              | 25                    |                     |          |
| Amitriptyline tab 25 mg                  | Tryptizol     | MSD          |                  |              | 100                   |                     |          |
| <i>Most sold generic equivalent</i>      |               |              |                  |              | 100                   |                     |          |
| <i>Next most sold generic equivalent</i> |               |              |                  |              | 100                   |                     |          |
| Amoxicillin caps/tab 250 mg              | Amoxil        | SKB (GSK)    |                  |              | 21                    |                     |          |
| <i>Most sold generic equivalent</i>      |               |              |                  |              | 21                    |                     |          |
| <i>Next most sold generic equivalent</i> |               |              |                  |              | 21                    |                     |          |
| Artesunate tab 100 mg                    | Arsumax       | Sanofi       |                  |              | 20*                   |                     |          |
| <i>Most sold generic equivalent</i>      |               |              |                  |              | 20*                   |                     |          |
| <i>Next most sold generic equivalent</i> |               |              |                  |              | 20*                   |                     |          |
| Atenolol tab 50 mg                       | Tenormin      | AstraZeneca  |                  |              | 60                    |                     |          |
| <i>Most sold generic equivalent</i>      |               |              |                  |              | 60                    |                     |          |
| <i>Next most sold generic equivalent</i> |               |              |                  |              | 60                    |                     |          |
| Beclometasone inhaler 50 mcg/ dose       | Becotide      | GSK          |                  |              | 1 inhaler: 200 doses  |                     |          |
| <i>Most sold generic equivalent</i>      |               |              |                  |              | 1 inhaler: 200 doses  |                     |          |
| <i>Next most sold generic equivalent</i> |               |              |                  |              | 1 inhaler: 200 doses  |                     |          |
| Captopril tab 25 mg                      | Capoten       | BMS          |                  |              | 60                    |                     |          |
| <i>Most sold generic equivalent</i>      |               |              |                  |              | 60                    |                     |          |
| <i>Next most sold generic equivalent</i> |               |              |                  |              | 60                    |                     |          |
| Carbamazepine tab 200 mg                 | Tegretol      | Novartis     |                  |              | 100                   |                     |          |
| <i>Most sold generic equivalent</i>      |               |              |                  |              | 100                   |                     |          |
| <i>Next most sold generic equivalent</i> |               |              |                  |              | 100                   |                     |          |
| Ceftriaxone inj 1 g powder               | Rocephin      | Roche        |                  |              | 1 vial                |                     |          |
| <i>Most sold generic equivalent</i>      |               |              |                  |              | 1 vial                |                     |          |
| <i>Next most sold generic equivalent</i> |               |              |                  |              | 1 vial                |                     |          |
| Ciprofloxacin tab 500 mg                 | Ciproxin      | Bayer        |                  |              | 1                     |                     |          |

| A   | B             | C                    | D                | E            | F                     | G                   | I        |
|---|---------------|----------------------|------------------|--------------|-----------------------|---------------------|----------|
| Generic name, dosage form, strength         | Brand name(s) | Manufacturer         | Brand name found | Manufacturer | Pack size recommended | Price of pack found | Comments |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 1                     |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 1                     |                     |          |
| Co-trimoxazole paed suspension (8+40) mg/MI | Bactrim       | Roche                |                  |              | 100 mL                |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 100 mL                |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 100 mL                |                     |          |
| Diazepam tab 5 mg                           | Valium        | Roche                |                  |              | 100                   |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 100                   |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 100                   |                     |          |
| Diclofenac tab 25 mg                        | Voltarol      | Novartis             |                  |              | 100                   |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 100                   |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 100                   |                     |          |
| Fluconazole caps/tab 200 mg                 | Diflucan      | Pfizer               |                  |              | 30                    |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 30                    |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 30                    |                     |          |
| Fluoxetine caps/tab 20 mg                   | Prozac        | Lilly                |                  |              | 30                    |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 30                    |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 30                    |                     |          |
| Fluphenazine decanoate inj 25 mg/mL         | Modecate      | Sanofi-Winthrop/ BMS |                  |              | 1 ampoule             |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 1 ampoule             |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 1 ampoule             |                     |          |
| Glibenclamide tab 5 mg                      | Daonil        | HMR                  |                  |              | 60                    |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 60                    |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 60                    |                     |          |
| Hydrochlorothiazide tab 25 mg               | Dichlotride   | MSD                  |                  |              | 30                    |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 30                    |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 30                    |                     |          |
| Indinavir caps 400 mg                       | Crixivan      | MSD                  |                  |              | 180                   |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 180                   |                     |          |
| <i>Next most sold generic equivalent</i>    |               |                      |                  |              | 180                   |                     |          |
| Losartan tab 50 mg                          | Cozaar        | MSD                  |                  |              | 30                    |                     |          |
| <i>Most sold generic equivalent</i>         |               |                      |                  |              | 30                    |                     |          |

| A  | B             | C            | D                | E            | F                     | G                   | I        |
|--|---------------|--------------|------------------|--------------|-----------------------|---------------------|----------|
| Generic name, dosage form, strength            | Brand name(s) | Manufacturer | Brand name found | Manufacturer | Pack size recommended | Price of pack found | Comments |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 30                    |                     |          |
| Lovastatin tab 20 mg                           | Mevacor       | MSD          |                  |              | 60                    |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 60                    |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 60                    |                     |          |
| Metformin tab 500 mg                           | Glucophage    | Merck        |                  |              | 100                   |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 100                   |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 100                   |                     |          |
| Nevirapine tab 200 mg                          | Viramune      | Boehringer I |                  |              | 60                    |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 60                    |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 60                    |                     |          |
| Nifedipine Retard tab 20 mg                    | Adalat Retard | Bayer        |                  |              | 100                   |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 100                   |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 100                   |                     |          |
| Omeprazole caps 20 mg                          | Losec         | AstraZeneca  |                  |              | 30                    |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 30                    |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 30                    |                     |          |
| Phenytoin caps/tab 100 mg                      | Epanutin      | Pfizer       |                  |              | 100                   |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 100                   |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 100                   |                     |          |
| Pyrimethamine with sulfadoxine tab (25+500) mg | Fansidar      | Roche        |                  |              | 3                     |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 3                     |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 3                     |                     |          |
| Ranitidine tab 150 mg                          | Zantac        | GSK          |                  |              | 60                    |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 60                    |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 60                    |                     |          |
| Salbutamol inhaler 0.1 mg per dose             | Ventoline     | GSK          |                  |              | 1 inhaler: 200 doses  |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 1 inhaler: 200 doses  |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 1 inhaler: 200 doses  |                     |          |
| Zidovudine caps 100 mg                         | Retrovir      | GSK          |                  |              | 100                   |                     |          |
| <i>Most sold generic equivalent</i>            |               |              |                  |              | 100                   |                     |          |
| <i>Next most sold generic equivalent</i>       |               |              |                  |              | 100                   |                     |          |

\* Based on treatment of malaria in an adult around 70 kg with artesunate as single treatment: 4 mg/kg for 7 days (WHO Model Formulary, 2002)

### Annex 3b: DETERMINATION OF SUPPLEMENTARY LIST

| Condition                  | Selection of medicines from EDL                         | Rank in terms of sales | Brand name of the 3 most sold | Manufacturer |
|----------------------------|---|------------------------|-------------------------------|--------------|
| Major tranquilizers        | Fluoxetine  |                        |                               |              |
|                            | Lithium carbonate                                       |                        |                               |              |
|                            | Chlorpromazine  |                        |                               |              |
|                            | Flupenthixol  |                        |                               |              |
|                            | Fluphenazine  |                        |                               |              |
|                            | Haloperidol   |                        |                               |              |
| Anti-hypertensives         |   |                        |                               |              |
|                            | Co-amilozide  |                        |                               |              |
|                            | Amlodipine  |                        |                               |              |
|                            | Atenolol  |                        |                               |              |
|                            | Captopril   |                        |                               |              |
|                            | Hydralazine   |                        |                               |              |
|                            | Methyldopa  |                        |                               |              |
|                            | Nifedipine  |                        |                               |              |
|                            | Prazosin plus Polythiazide                              |                        |                               |              |
|                            | Reserpine plus<br>Dihydroergocristine<br>plus Clopamide |                        |                               |              |
| Diuretics                  |   |                        |                               |              |
|                            | Amiloride plus<br>Hydrochlorothiazide<br>(coamilozide)  |                        |                               |              |
|                            | Bendrofluazide  |                        |                               |              |
|                            | Frusemide   |                        |                               |              |
|                            | Hydrochlorothiazide                                     |                        |                               |              |
|                            | Spirolactone  |                        |                               |              |
| Type 2 anti-diabetic drugs |   |                        |                               |              |
|                            | Glibenclamide   |                        |                               |              |
|                            | Metformin   |                        |                               |              |
| Peptic ulcer drugs         |   |                        |                               |              |
|                            | Chlorpropamide  |                        |                               |              |
|                            | Cimetidine  |                        |                               |              |

| Condition       | Selection of medicines from EDL | Rank in terms of sales | Brand name of the 3 most sold | Manufacturer |
|-----------------|---------------------------------|------------------------|-------------------------------|--------------|
|                 | Ranitidine                      |                        |                               |              |
|                 | Omeprazole                      |                        |                               |              |
|                 |                                 |                        |                               |              |
| NSAIDS          | Diclofenac                      |                        |                               |              |
|                 | Ibuprofen                       |                        |                               |              |
|                 | Indomethacin                    |                        |                               |              |
|                 | Ketoprofen                      |                        |                               |              |
| ANTICONVULSANTS |                                 |                        |                               |              |
|                 | Carbamazepine                   |                        |                               |              |
|                 | Clonazepam                      |                        |                               |              |
|                 | Diazepam                        |                        |                               |              |
|                 | Ethosuximide                    |                        |                               |              |
|                 | Magnesium sulphate              |                        |                               |              |
|                 | Paraldehyde                     |                        |                               |              |
|                 | Phenobarbitone                  |                        |                               |              |
|                 | Phenytoin sodium                |                        |                               |              |
|                 | Sodium valproate                |                        |                               |              |

## Annex 4: Analysis summary sheets

### Annex 4a. Public sector procurement

| Medicines Procurements (n= 3 in survey)  |           |              |  |           |       |              |
|--|-----------|--------------|--|-----------|-------|--------------|
| Includes Both Core and Non-Core Medicines (n=34 on list)                                     |           |              |  |           |       |              |
| Analysis Includes All Meds. With 1+ Procurement Prices                                       |           |              | Analysis Includes Only Meds. With 1+ Procurement Prices for Both Types in Pair |           |       |              |
| Brand  | Most Sold | Lowest Price | Brand  | Most Sold | Brand | Lowest Price |
| Number of Medicines For Which 1+ Procurement Prices Were Found                               |           |              |  |           |       |              |
| No. of meds. included  | 3         | 5            | 18   | 2         | 2     | 3            |
|  |           |              |  | 3         | 5     | 5            |
| Summary of Medicine-specific Median Price Ratios (MPRs) For Meds. With 1+ Procurement Prices |           |              |  |           |       |              |
| Median MPR   | 4.01      | 5.28         | 3.29   | 14.70     | 6.01  | 4.01         |
| 25 %ile MPR  | 2.52      | 4.08         | 1.91   | 7.86      | 5.65  | 2.52         |
| 75 %ile MPR  | 16.19     | 6.21         | 5.96   | 21.54     | 6.37  | 16.19        |
| Minimum MPR  | 1.03      | 1.51         | 0.76   | 1.03      | 5.28  | 0.76         |
| Maximum MPR  | 28.37     | 6.74         | 19.18  | 28.37     | 6.74  | 7.09         |
| Reference Price Data Used = MSH  |           |              |  |           |       |              |

### Annex 4b. PRIVATE (NOT FOR PROFIT) NGO PROCUREMENT

| Medicines Procurements (n= 1 in survey)  |           |              |  |           |       |              |
|--|-----------|--------------|--|-----------|-------|--------------|
| Includes Both Core and Non-Core Medicines (n=34 on list)                                     |           |              |  |           |       |              |
| Analysis Includes All Meds. With 1+ Procurement Prices                                       |           |              | Analysis Includes Only Meds. With 1+ Procurement Prices for Both Types in Pair |           |       |              |
| Brand  | Most Sold | Lowest Price | Brand  | Most Sold | Brand | Lowest Price |
| Number of Medicines For Which 1+ Procurement Prices Were Found                               |           |              |  |           |       |              |
| No. of meds. included  | 0         | 0            | 9  | 0         | 0     | 0            |
|  |           |              |  | 0         | 0     | 0            |
| Summary of Medicine-specific Median Price Ratios (MPRs) For Meds. With 1+ Procurement Prices |           |              |  |           |       |              |
| Median MPR   |           |              | 0.65   |           |       |              |
| 25 %ile MPR  |           |              | 0.52   |           |       |              |
| 75 %ile MPR  |           |              | 0.68   |           |       |              |
| Minimum MPR  |           |              | 0.01   |           |       |              |
| Maximum MPR  |           |              | 1.02   |           |       |              |
| Reference Price Data Used = MSH  |           |              |  |           |       |              |

## Annex 4c: Cumulative mark-up and price composition sheets

| Price Composition:<br>Cumulative Mark-ups |                   |             |                                       |                                     |          |           |              |
|---|-------------------|-------------|---------------------------------------|-------------------------------------|----------|-----------|--------------|
| Reference Price Data Used = MSH 2003      |                   |             |                                       |                                     |          |           |              |
| Select Medicine Name 3                    | Medicine Strength | Dosage Form | Sector                                | Item                                | Brand    | Most Sold | Lowest Price |
| Diazepam                                  | 5 mg              | cap/tab     | Public Procurement                    | Manufacturer pack price             | 110.000  |           | 500.000      |
|   |                   |             |                                       | Manufacturer pack size (# of units) | 12       |           | 1000         |
|   |                   |             |                                       | Manufacturer unit price (MUP)       | 9.1667   |           | 0.5000       |
|   |                   |             |                                       | Ratio: MUP to reference unit price  | 19.69    |           | 1.07         |
|   |                   |             |                                       | Sector median unit price (SMUP)     |          |           | 0.8000       |
|   |                   |             |                                       | % mark-up: SMUP over MUP            |          |           | 60.0%        |
|   |                   |             | Public facilities Patient Charge      | Manufacturer pack price             | 110.000  |           | 500.000      |
|   |                   |             |                                       | Manufacturer pack size (# of units) | 12       |           | 1000         |
|   |                   |             |                                       | Manufacturer unit price (MUP)       | 9.1667   |           | 0.5000       |
|   |                   |             |                                       | Ratio: MUP to reference unit price  | 19.69    |           | 1.07         |
|   |                   |             |                                       | Sector median unit price (SMUP)     | 10.0000  |           | 1.5000       |
|   |                   |             |                                       | % mark-up: SMUP over MUP            | 9.1%     |           | 200.0%       |
|   |                   |             | Private pharmacies retail Price       | Manufacturer pack price             | 110.000  |           | 500.000      |
|   |                   |             |                                       | Manufacturer pack size (# of units) | 12       |           | 1000         |
|   |                   |             |                                       | Manufacturer unit price (MUP)       | 9.1667   |           | 0.5000       |
|   |                   |             |                                       | Ratio: MUP to reference unit price  | 19.69    |           | 1.07         |
|   |                   |             |                                       | Sector median unit price (SMUP)     | 13.3333  |           | 2.5000       |
|   |                   |             |                                       | % mark-up: SMUP over MUP            | 45.5%    |           | 400.0%       |
|   |                   |             | Private clinics Patient Charge        | Manufacturer pack price             | 110.000  |           | 500.000      |
|   |                   |             |                                       | Manufacturer pack size (# of units) | 12       |           | 1000         |
| Manufacturer unit price (MUP)             | 9.1667            |             |                                       | 0.5000                              |          |           |              |
| Ratio: MUP to reference unit price        | 19.69             |             |                                       | 1.07                                |          |           |              |
| Sector median unit price (SMUP)           | 30.2084           |             |                                       | 5.0000                              |          |           |              |
| % mark-up: SMUP over MUP                  | 229.5%            |             |                                       | 900.0%                              |          |           |              |
| Glibenclamide                             | 5 mg              | cap/tab     | Public facilities Patient Procurement | Manufacturer pack price             | 1665.000 | 800.000   | 380.000      |
|   |                   |             |                                       | Manufacturer pack size (# of units) | 100      | 100       | 100          |
|   |                   |             |                                       | Manufacturer unit price (MUP)       | 16.6500  | 8.0000    | 3.8000       |
|   |                   |             |                                       | Ratio: MUP to reference unit price  | 30.53    | 14.67     | 6.97         |
|   |                   |             |                                       | Sector median unit price (SMUP)     |          |           | 8.9286       |
|   |                   |             |                                       | % mark-up: SMUP over MUP            |          |           | 135.0%       |
|   |                   |             | Public facilities Patient Charge      | Manufacturer pack price             | 1665.000 | 800.000   | 380.000      |
|   |                   |             |                                       | Manufacturer pack size (# of units) | 100      | 100       | 100          |
|   |                   |             |                                       | Manufacturer unit price (MUP)       | 16.6500  | 8.0000    | 3.8000       |
|   |                   |             |                                       | Ratio: MUP to reference unit price  | 30.53    | 14.67     | 6.97         |
|   |                   |             |                                       | Sector median unit price (SMUP)     |          | 12.5000   | 10.0000      |
|   |                   |             |                                       | % mark-up: SMUP over MUP            |          | 56.3%     | 163.2%       |
|   |                   |             | Private pharmacies retail Price       | Manufacturer pack price             | 1665.000 | 800.000   | 380.000      |
|   |                   |             |                                       | Manufacturer pack size (# of units) | 100      | 100       | 100          |
|   |                   |             |                                       | Manufacturer unit price (MUP)       | 16.6500  | 8.0000    | 3.8000       |
|   |                   |             |                                       | Ratio: MUP to reference unit price  | 30.53    | 14.67     | 6.97         |
|   |                   |             |                                       | Sector median unit price (SMUP)     | 18.5000  | 12.0000   | 10.0000      |
|   |                   |             |                                       | % mark-up: SMUP over MUP            | 11.1%    | 50.0%     | 163.2%       |
|   |                   |             | Private clinics Patient Charge        | Manufacturer pack price             | 1665.000 | 800.000   | 380.000      |
|   |                   |             |                                       | Manufacturer pack size (# of units) | 100      | 100       | 100          |
| Manufacturer unit price (MUP)             | 16.6500           | 8.0000      |                                       | 3.8000                              |          |           |              |
| Ratio: MUP to reference unit price        | 30.53             | 14.67       |                                       | 6.97                                |          |           |              |
| Sector median unit price (SMUP)           |                   | 18.0000     |                                       | 15.0000                             |          |           |              |
| % mark-up: SMUP over MUP                  |                   | 125.0%      |                                       | 294.7%                              |          |           |              |

## Annex 4d. Patient prices in Public sector facilities

| Sector Medicines Outlets (n=42 in survey)   |           |              |   |           |       |              |           |              |       |
|---|-----------|--------------|---|-----------|-------|--------------|-----------|--------------|-------|
| Includes Both Core and Non-Core Medicines (n=34 on list)                              |           |              |   |           |       |              |           |              |       |
| Analysis Includes All Meds.   |           |              | Analysis Includes Only Medicines With Prices Found for Both Types in Pair |           |       |              |           |              |       |
| Brand   | Most Sold | Lowest Price | Brand   | Most Sold | Brand | Lowest Price | Most Sold | Lowest Price |       |
| Overall Percent Availability of Medicines on List in Outlets Included in Analysis     |           |              |   |           |       |              |           |              |       |
| Median availability   | 2.4%      | 2.4%         | 22.6%   |           |       |              |           |              |       |
| 25 %ile availability  | 0.0%      | 0.0%         | 5.4%  |           |       |              |           |              |       |
| 75 %ile availability  | 8.9%      | 11.3%        | 45.2%   |           |       |              |           |              |       |
| Number of Listed Medicines For Which Prices Were Found in 4+ Outlets                  |           |              |   |           |       |              |           |              |       |
| No. of meds. included   | 7         | 9            | 19  | 3         | 3     | 6            | 6         | 9            | 9     |
| Summary of Medicine-specific Median Price Ratios (MPRs) For Meds. Found in 4+ Outlets |           |              |   |           |       |              |           |              |       |
| Median MPR  | 7.35      | 6.04         | 3.50  | 7.35      | 4.12  | 8.49         | 3.54      | 6.04         | 6.04  |
| 25 %ile MPR   | 6.04      | 4.12         | 2.56  | 6.16      | 3.96  | 7.16         | 3.29      | 4.12         | 3.50  |
| 75 %ile MPR   | 11.40     | 7.91         | 6.50  | 14.42     | 4.21  | 12.28        | 3.73      | 7.91         | 7.32  |
| Minimum MPR   | 2.57      | 3.07         | 1.92  | 4.98      | 3.80  | 4.98         | 2.51      | 3.07         | 1.92  |
| Maximum MPR   | 21.48     | 22.92        | 18.34   | 21.48     | 4.30  | 21.48        | 4.88      | 22.92        | 18.34 |
| Reference Price Data Used = MSH   |           |              |   |           |       |              |           |              |       |

## Annex 4e: Patient prices in Private sector pharmacies

| Sector Medicines Outlets (n=44 in survey)   |           |              |   |           |       |              |           |              |       |
|---|-----------|--------------|---|-----------|-------|--------------|-----------|--------------|-------|
| Includes Both Core and Non-Core Medicines (n=34 on list)                              |           |              |   |           |       |              |           |              |       |
| Analysis Includes All Meds.   |           |              | Analysis Includes Only Medicines With Prices Found for Both Types in Pair |           |       |              |           |              |       |
| Brand   | Most Sold | Lowest Price | Brand   | Most Sold | Brand | Lowest Price | Most Sold | Lowest Price |       |
| Overall Percent Availability of Medicines on List in Outlets Included in Analysis     |           |              |   |           |       |              |           |              |       |
| Median availability   | 21.6%     | 13.6%        | 34.1%   |           |       |              |           |              |       |
| 25 %ile availability  | 3.4%      | 0.6%         | 14.2%   |           |       |              |           |              |       |
| 75 %ile availability  | 56.8%     | 33.5%        | 68.8%   |           |       |              |           |              |       |
| Number of Listed Medicines For Which Prices Were Found in 4+ Outlets                  |           |              |   |           |       |              |           |              |       |
| No. of meds. included   | 18        | 17           | 22  | 14        | 14    | 17           | 17        | 17           | 17    |
| Summary of Medicine-specific Median Price Ratios (MPRs) For Meds. Found in 4+ Outlets |           |              |   |           |       |              |           |              |       |
| Median MPR  | 14.55     | 5.85         | 4.32  | 14.83     | 5.95  | 14.63        | 4.88      | 5.85         | 4.88  |
| 25 %ile MPR   | 6.61      | 3.79         | 3.11  | 7.16      | 4.05  | 6.76         | 3.01      | 3.79         | 3.27  |
| 75 %ile MPR   | 21.11     | 7.91         | 6.73  | 26.70     | 7.85  | 21.18        | 6.96      | 7.91         | 6.96  |
| Minimum MPR   | 2.33      | 3.02         | 1.89  | 5.19      | 3.02  | 5.19         | 1.89      | 3.02         | 2.02  |
| Maximum MPR   | 50.53     | 42.96        | 42.96   | 50.53     | 22.01 | 50.53        | 18.34     | 42.96        | 42.96 |
| Reference Price Data Used = MSH   |           |              |   |           |       |              |           |              |       |

## Annex 4f: Private Clinics (other sector)

| Sector Medicines Outlets (n=39 in survey)   |       |       |              |  |  |   |       |       |              |       |       |
|---|-------|-------|--------------|--|--|---|-------|-------|--------------|-------|-------|
| Includes Both Core and Non-Core Medicines (n=34 on list)                              |       |       |              |  |  |   |       |       |              |       |       |
| Analysis Includes All Meds.   |       |       |              |  |  | Analysis Includes Only Medicines With Prices Found for Both Types in Pair |       |       |              |       |       |
| Brand   |       |       | Most Sold    |  |  | Brand   |       |       | Most Sold    |       |       |
| Lowest Price  |       |       | Lowest Price |  |  | Lowest Price  |       |       | Lowest Price |       |       |
| Overall Percent Availability of Medicines on List in Outlets Included in Analysis     |       |       |              |  |  |   |       |       |              |       |       |
| Median availability   | 5.1%  | 2.6%  | 16.7%        |  |  |   |       |       |              |       |       |
| 25 %ile availability  | 2.6%  | 0.0%  | 3.2%         |  |  |   |       |       |              |       |       |
| 75 %ile availability  | 9.6%  | 5.1%  | 41.0%        |  |  |   |       |       |              |       |       |
| Number of Listed Medicines For Which Prices Were Found in 4+ Outlets                  |       |       |              |  |  |   |       |       |              |       |       |
| No. of meds. included   | 6     | 6     | 18           |  |  | 3   | 3     | 5     | 5            | 6     | 6     |
| Summary of Medicine-specific Median Price Ratios (MPRs) For Meds. Found in 4+ Outlets |       |       |              |  |  |   |       |       |              |       |       |
| Median MPR  | 11.89 | 11.94 | 8.00         |  |  | 24.38   | 11.70 | 15.11 | 8.45         | 11.94 | 10.59 |
| 25 %ile MPR   | 8.24  | 8.94  | 5.98         |  |  | 16.24   | 9.86  | 8.67  | 7.56         | 8.94  | 8.95  |
| 75 %ile MPR   | 22.06 | 26.06 | 16.07        |  |  | 44.64   | 21.20 | 24.38 | 10.74        | 26.06 | 13.66 |
| Minimum MPR   | 4.26  | 4.11  | 3.83         |  |  | 8.10  | 8.03  | 8.10  | 5.88         | 4.11  | 3.83  |
| Maximum MPR   | 64.89 | 33.01 | 27.51        |  |  | 64.89   | 30.69 | 64.89 | 14.63        | 33.01 | 27.51 |
| Reference Price Data Used = MSH   |       |       |              |  |  |   |       |       |              |       |       |

## Annex 4g: Sector availability and price summary

### Summary of Medicines Availability and Median MPR by Product Type Includes Both Core and Non-Core Medicines (n=34 on list)

|                                |                                       |  |                                      |
|--------------------------------|---------------------------------------|--|--------------------------------------|
| Procurement<br>(n=3<br>orders) | Public<br>Sector<br>(n=42<br>outlets) | Private<br>Sector<br>(n=44<br>outlets) | Other<br>Sector<br>(n=39<br>outlets) |
|--------------------------------|---------------------------------------|--|--------------------------------------|

#### Median Percent Availability

|              |    |       |       |       |
|--------------|----|-------|-------|-------|
| Brand        | NA | 2.4%  | 21.6% | 5.1%  |
| Most Sold    | NA | 2.4%  | 13.6% | 2.6%  |
| Lowest Price | NA | 22.6% | 34.1% | 16.7% |

#### No. of Products With Minimum No. of Prices Obtained

|                          |    |    |    |    |
|--------------------------|----|----|----|----|
| <i># Prices Required</i> | 1  | 4  | 4  | 4  |
| Brand                    | 3  | 7  | 18 | 6  |
| Most Sold                | 5  | 9  | 17 | 6  |
| Lowest Price             | 18 | 19 | 22 | 18 |

#### Median MPR for Medicines With Minimum No. of Prices

|              |      |      |       |       |
|--------------|------|------|-------|-------|
| Brand        | 4.01 | 7.35 | 14.55 | 11.89 |
| Most Sold    | 5.28 | 6.04 | 5.85  | 11.94 |
| Lowest Price | 3.29 | 3.50 | 4.32  | 8.00  |

Reference Price Data Used = MSH

### Comparisons of Median MPRs for Medicines With Prices in Both Sectors Includes Both Core and Non-Core Medicines (n=34 on list)

|              | Procurement<br>(n=3 orders) | Public<br>Sector<br>(n=42<br>outlets) | # of Meds.<br>in Both<br>Sectors | Ratio<br>Public to<br>Procurement |              | Procurement<br>(n=3 orders) | Private<br>Sector (n=44<br>outlets) | # of Meds.<br>in Both<br>Sectors | Ratio<br>Private to<br>Procurement |
|--------------|-----------------------------|---------------------------------------|----------------------------------|-----------------------------------|--------------|-----------------------------|-------------------------------------|----------------------------------|------------------------------------|
| Brand        | 4.01                        | 4.98                                  | 1                                | 124.1%                            | Brand        | 4.01                        | 18.12                               | 3                                | 451.5%                             |
| Most Sold    | 4.68                        | 5.17                                  | 2                                | 110.4%                            | Most Sold    | 5.28                        | 4.83                                | 5                                | 91.5%                              |
| Lowest Price | 2.60                        | 3.68                                  | 16                               | 141.6%                            | Lowest Price | 3.29                        | 4.66                                | 18                               | 141.7%                             |

|              | Procurement<br>(n=3 orders) | Other<br>Sector<br>(n=39<br>outlets) | # of Meds.<br>in Both<br>Sectors | Ratio<br>Other to<br>Procurement |              | Public<br>Sector<br>(n=42<br>outlets) | Private<br>Sector (n=44<br>outlets) | # of Meds.<br>in Both<br>Sectors | Ratio<br>Private to<br>Public |
|--------------|-----------------------------|--------------------------------------|----------------------------------|----------------------------------|--------------|---------------------------------------|-------------------------------------|----------------------------------|-------------------------------|
| Brand        | 4.01                        | 8.10                                 | 1                                | 201.8%                           | Brand        | 7.35                                  | 8.35                                | 7                                | 113.7%                        |
| Most Sold    | 4.08                        | 30.69                                | 1                                | 751.9%                           | Most Sold    | 6.04                                  | 6.79                                | 9                                | 112.5%                        |
| Lowest Price | 2.60                        | 9.45                                 | 16                               | 362.9%                           | Lowest Price | 3.50                                  | 3.86                                | 19                               | 110.4%                        |

|              | Public<br>Sector<br>(n=42<br>outlets) | Other<br>Sector<br>(n=39<br>outlets) | # of Meds.<br>in Both<br>Sectors | Ratio<br>Other to<br>Public |              | Private<br>Sector<br>(n=44<br>outlets) | Other Sector<br>(n=39<br>outlets) | # of Meds.<br>in Both<br>Sectors | Ratio<br>Other to<br>Private |
|--------------|---------------------------------------|--------------------------------------|----------------------------------|-----------------------------|--------------|--|-----------------------------------|----------------------------------|------------------------------|
| Brand        | 8.49                                  | 11.89                                | 6                                | 140.0%                      | Brand        | 9.05                                   | 11.89                             | 6                                | 131.4%                       |
| Most Sold    | 4.30                                  | 12.18                                | 5                                | 283.6%                      | Most Sold    | 5.34                                   | 11.94                             | 6                                | 223.5%                       |
| Lowest Price | 3.54                                  | 8.00                                 | 18                               | 225.8%                      | Lowest Price | 4.14                                   | 8.00                              | 18                               | 193.4%                       |

Reference Price Data Used = MSH

## Annex 4h: Medicines availability and price summary

|                           |                    | Medicines Availability in Outlets |                           |                        |                          |                           |                        |                          |                           |                        |
|---------------------------|--------------------|-----------------------------------|---------------------------|------------------------|--------------------------|---------------------------|------------------------|--------------------------|---------------------------|------------------------|
|                           |                    | Brand                             |                           |                        | Most Sold                |                           |                        | Lowest Price             |                           |                        |
| Medicine Name             | Core List (yes/no) | Public Facilities (n=42)          | Private Pharmacies (n=44) | Private Clinics (n=39) | Public Facilities (n=42) | Private Pharmacies (n=44) | Private clinics (n=39) | Public Facilities (n=42) | Private Pharmacies (n=44) | Private Clinics (n=39) |
| Aciclovir                 | yes                | 0.0%                              | 6.8%                      | 2.6%                   | 2.4%                     | 22.7%                     | 2.6%                   | 7.1%                     | 27.3%                     | 5.1%                   |
| Amitriptyline             | yes                | 0.0%                              | 2.3%                      | 2.6%                   | 0.0%                     | 2.3%                      | 0.0%                   | 26.2%                    | 31.8%                     | 28.2%                  |
| Amoxicillin               | yes                | 2.4%                              | 50.0%                     | 5.1%                   | 2.4%                     | 6.8%                      | 2.6%                   | 66.7%                    | 54.5%                     | 33.3%                  |
| Amoxicillin (2)           | no                 | 2.4%                              | 68.2%                     | 7.7%                   | 7.1%                     | 27.3%                     | 5.1%                   | 73.8%                    | 81.8%                     | 51.3%                  |
| Amoxicillin/cloxacillin   | no                 | 2.4%                              | 84.1%                     | 7.7%                   | 4.8%                     | 29.5%                     | 5.1%                   | 88.1%                    | 93.2%                     | 59.0%                  |
| Artesunate                | yes                | 0.0%                              | 0.0%                      | 0.0%                   | 0.0%                     | 0.0%                      | 0.0%                   | 0.0%                     | 0.0%                      | 2.6%                   |
| Atenolol                  | yes                | 0.0%                              | 20.5%                     | 2.6%                   | 9.5%                     | 9.1%                      | 7.7%                   | 21.4%                    | 40.9%                     | 20.5%                  |
| Beclometasone inhaler     | yes                | 4.8%                              | 6.8%                      | 2.6%                   | 0.0%                     | 0.0%                      | 0.0%                   | 0.0%                     | 0.0%                      | 0.0%                   |
| Captopril                 | yes                | 0.0%                              | 0.0%                      | 0.0%                   | 0.0%                     | 9.1%                      | 0.0%                   | 21.4%                    | 38.6%                     | 12.8%                  |
| Carbamazepine             | yes                | 9.5%                              | 36.4%                     | 15.4%                  | 4.8%                     | 6.8%                      | 0.0%                   | 11.9%                    | 15.9%                     | 10.3%                  |
| Ceftriaxone injection     | yes                | 11.9%                             | 68.2%                     | 17.9%                  | 16.7%                    | 9.1%                      | 0.0%                   | 33.3%                    | 38.6%                     | 23.1%                  |
| Cimetidine                | no                 | 0.0%                              | 36.4%                     | 2.6%                   | 19.0%                    | 34.1%                     | 5.1%                   | 42.9%                    | 54.5%                     | 23.1%                  |
| Ciprofloxacin             | yes                | 0.0%                              | 18.2%                     | 7.7%                   | 7.1%                     | 61.4%                     | 5.1%                   | 69.0%                    | 93.2%                     | 64.1%                  |
| Clotrimazole              | no                 | 0.0%                              | 20.5%                     | 2.6%                   | 7.1%                     | 65.9%                     | 5.1%                   | 45.2%                    | 88.6%                     | 48.7%                  |
| Co-trimoxazole suspension | yes                | 11.9%                             | 38.6%                     | 5.1%                   | 0.0%                     | 31.8%                     | 5.1%                   | 78.6%                    | 79.5%                     | 64.1%                  |
| Diazepam                  | yes                | 31.0%                             | 40.9%                     | 10.3%                  | 16.7%                    | 13.6%                     | 12.8%                  | 54.8%                    | 29.5%                     | 51.3%                  |
| Diclofenac Sodium         | no                 | 2.4%                              | 22.7%                     | 0.0%                   | 0.0%                     | 13.6%                     | 2.6%                   | 23.8%                    | 20.5%                     | 17.9%                  |
| Dihydroartemisinin        | no                 | 7.1%                              | 68.2%                     | 12.8%                  | 2.4%                     | 29.5%                     | 5.1%                   | 4.8%                     | 29.5%                     | 7.7%                   |
| Fluconazole (2)           | no                 | 19.0%                             | 61.4%                     | 17.9%                  | 11.9%                    | 43.2%                     | 10.3%                  | 11.9%                    | 43.2%                     | 10.3%                  |
| Fluoxetine                | yes                | 0.0%                              | 2.3%                      | 2.6%                   | 0.0%                     | 0.0%                      | 0.0%                   | 0.0%                     | 0.0%                      | 2.6%                   |
| Fluphenazine injection    | yes                | 0.0%                              | 2.3%                      | 0.0%                   | 0.0%                     | 4.5%                      | 2.6%                   | 9.5%                     | 13.6%                     | 5.1%                   |
| Glibenclamide             | yes                | 7.1%                              | 31.8%                     | 7.7%                   | 21.4%                    | 68.2%                     | 23.1%                  | 45.2%                    | 75.0%                     | 43.6%                  |
| Hydrochlorothiazide       | yes                | 0.0%                              | 0.0%                      | 0.0%                   | 2.4%                     | 18.2%                     | 0.0%                   | 7.1%                     | 18.2%                     | 2.6%                   |
| Indinavir                 | yes                | 0.0%                              | 0.0%                      | 0.0%                   | 0.0%                     | 0.0%                      | 0.0%                   | 0.0%                     | 0.0%                      | 0.0%                   |
| Ketoprofen                | no                 | 9.5%                              | 59.1%                     | 10.3%                  | 0.0%                     | 0.0%                      | 0.0%                   | 0.0%                     | 0.0%                      | 2.6%                   |
| Metformin                 | yes                | 14.3%                             | 50.0%                     | 25.6%                  | 16.7%                    | 22.7%                     | 15.4%                  | 28.6%                    | 36.4%                     | 30.8%                  |
| Nevirapine                | yes                | 0.0%                              | 0.0%                      | 5.1%                   | 2.4%                     | 0.0%                      | 0.0%                   | 7.1%                     | 0.0%                      | 0.0%                   |
| Nifedipine Retard         | yes                | 0.0%                              | 15.9%                     | 7.7%                   | 26.2%                    | 75.0%                     | 15.4%                  | 61.9%                    | 84.1%                     | 46.2%                  |
| Omeprazole                | yes                | 4.8%                              | 13.6%                     | 2.6%                   | 14.3%                    | 61.4%                     | 12.8%                  | 35.7%                    | 70.5%                     | 23.1%                  |
| Phenytoin                 | yes                | 2.4%                              | 9.1%                      | 5.1%                   | 0.0%                     | 0.0%                      | 0.0%                   | 4.8%                     | 25.0%                     | 5.1%                   |
| Ranitidine                | yes                | 0.0%                              | 59.1%                     | 7.7%                   | 31.0%                    | 40.9%                     | 0.0%                   | 38.1%                    | 63.6%                     | 15.4%                  |
| Salbutamol inhaler        | yes                | 19.0%                             | 84.1%                     | 25.6%                  | 0.0%                     | 0.0%                      | 0.0%                   | 0.0%                     | 0.0%                      | 0.0%                   |
| Sulfadoxine-pyrimethamine | yes                | 14.3%                             | 86.4%                     | 23.1%                  | 4.8%                     | 59.1%                     | 12.8%                  | 73.8%                    | 97.7%                     | 53.8%                  |
| Zidovudine                | yes                | 2.4%                              | 0.0%                      | 2.6%                   | 0.0%                     | 0.0%                      | 0.0%                   | 0.0%                     | 0.0%                      | 0.0%                   |

|                           |                    | Medicines Median Price Ratios (MPRs) in Procurements and Outlets<br>(Reference Price Data Used = MSH) |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
|---------------------------|--------------------|---|--------------------------|---------------------------|------------------------|-------------------|--------------------------|---------------------------|------------------------|-------------------|--------------------------|---------------------------|------------------------|
|                           |                    | Brand   |                          |                           |                        | Most Sold         |                          |                           |                        | Lowest Price      |                          |                           |                        |
| Medicine Name             | Core List (yes/no) | Procurement (n=3)   | Public facilities (n=42) | Private pharmacies (n=44) | Private clinics (n=39) | Procurement (n=3) | Public facilities (n=42) | Private Pharmacies (n=44) | Private Clinics (n=39) | Procurement (n=3) | Public facilities (n=42) | Private pharmacies (n=44) | Private Clinics (n=39) |
| Aciclovir                 | yes                |   |                          |                           |                        | 6.21              |                          | 4.66                      |                        | 6.21              |                          | 4.19                      |                        |
| Amitriptyline             | yes                |   |                          |                           |                        |                   |                          |                           |                        | 1.58              | 2.97                     | 4.45                      | 19.79                  |
| Amoxicillin               | yes                |   |                          | 6.56                      |                        |                   |                          |                           |                        | 3.06              | 2.62                     | 2.40                      | 6.56                   |
| Amoxicillin (2)           | no                 |   |                          | 6.05                      |                        | 1.51              |                          | 3.02                      |                        | 1.51              | 2.02                     | 2.02                      | 4.03                   |
| Amoxicillin/cloxacillin   | no                 |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Artesunate                | yes                |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Atenolol                  | yes                |   |                          | 50.53                     |                        |                   | 6.41                     | 7.65                      |                        | 11.26             | 8.08                     | 7.07                      | 21.94                  |
| Beclometasone inhaler     | yes                |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Captopril                 | yes                |   |                          |                           |                        |                   |                          | 3.66                      |                        | 4.13              | 1.99                     | 3.05                      | 7.12                   |
| Carbamazepine             | yes                |   | 9.63                     | 11.33                     | 15.11                  |                   |                          |                           |                        | 1.74              | 3.78                     | 1.89                      | 7.56                   |
| Ceftriaxone               | yes                |   | 7.35                     | 6.76                      | 8.67                   |                   | 4.12                     | 3.79                      |                        |                   | 3.50                     | 3.82                      | 5.88                   |
| Cimetidine                | no                 |   |                          | 15.04                     |                        |                   | 7.91                     | 7.91                      |                        | 3.52              | 7.32                     | 5.94                      | 4.75                   |
| Ciprofloxacin             | yes                | 28.37   |                          | 39.01                     |                        | 6.74              |                          | 13.71                     |                        | 7.09              | 11.35                    | 9.46                      | 16.55                  |
| Clotriazole               | no                 |   |                          | 5.19                      |                        |                   |                          | 5.19                      |                        | 1.90              | 2.49                     | 2.91                      | 5.19                   |
| Co-trimoxazole suspension | yes                |   | 7.10                     | 8.35                      |                        |                   |                          | 6.06                      |                        | 2.01              | 2.51                     | 3.34                      | 6.27                   |
| Diazepam                  | yes                |   | 21.48                    | 28.64                     | 64.89                  | 4.08              | 4.30                     | 4.83                      | 30.69                  | 1.93              | 3.22                     | 5.37                      | 10.74                  |
| Diclofenac                | no                 |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Dihydroartemisi           | no                 |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Fluconazole (2)           | no                 |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Fluoxetine                | yes                |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Fluphenazine injection    | yes                |   |                          |                           |                        |                   |                          |                           |                        |                   | 2.90                     | 3.86                      |                        |
| Glibenclamide             | yes                |   |                          | 33.93                     |                        |                   | 22.92                    | 22.01                     | 33.01                  | 17.36             | 18.34                    | 18.34                     | 27.51                  |
| Hydrochlorothia           | yes                |   |                          |                           |                        |                   |                          | 42.96                     |                        | 19.18             |                          | 42.96                     |                        |
| Indinavir                 | yes                |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Ketoprofen                | no                 |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Metformin                 | yes                | 4.01  | 4.98                     | 5.73                      | 8.10                   |                   | 3.80                     | 3.38                      | 8.03                   | 0.76              | 3.59                     | 3.27                      | 8.45                   |
| Nevirapine                | yes                |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |
| Nifedipine                | yes                |   |                          | 20.89                     |                        |                   | 8.70                     | 8.01                      | 12.18                  | 5.22              | 6.96                     | 6.96                      | 10.44                  |
| Omeprazole                | yes                |   |                          | 14.47                     |                        |                   | 3.07                     | 3.07                      | 4.11                   |                   | 1.92                     | 3.01                      | 3.83                   |
| Phenytoin                 | yes                |   |                          | 21.18                     |                        |                   |                          |                           |                        |                   |                          | 10.59                     |                        |
| Ranitidine                | yes                | 1.03  |                          | 18.12                     |                        | 5.28              | 6.04                     | 6.79                      |                        | 4.53              | 6.04                     | 6.04                      | 16.61                  |
| Salbutamol                | yes                |   | 2.57                     | 2.33                      | 4.26                   |                   |                          |                           |                        |                   |                          |                           |                        |
| Sulfadoxine-pyrimethamine | yes                |   | 13.17                    | 14.63                     | 24.38                  |                   |                          | 5.85                      | 11.70                  | 2.15              | 4.88                     | 4.88                      | 14.63                  |
| Zidovudine                | yes                |   |                          |                           |                        |                   |                          |                           |                        |                   |                          |                           |                        |

## Annex 4i: Affordability summary

| Standard Treatment Affordability                                 |                   |             |                              |                                |              |                        |             |                            |             |                             |             |                          |             |
|--|-------------------|-------------|------------------------------|--------------------------------|--------------|------------------------|-------------|----------------------------|-------------|-----------------------------|-------------|--------------------------|-------------|
| Daily wage of lowest paid government worker (in local currency): |                   |             |                              |                                |              |                        |             |                            |             |                             | 183.3333    |                          |             |
| <b>Diabetes</b>  |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name   | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Glibenclamide  | 5 mg              | cap/tab     | 30                           | 60                             | Brand        |                        |             |                            |             | 1110.00                     | 6.1         |                          |             |
|  |                   |             |                              |                                | Most Sold    |                        |             | 750.00                     | 4.1         | 720.00                      | 3.9         | 1080.00                  | 5.9         |
|  |                   |             |                              |                                | Lowest Price | 567.86                 | 3.1         | 600.00                     | 3.3         | 600.00                      | 3.3         | 900.00                   | 4.9         |
| <b>Hypertension</b>  |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name   | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Hydrochlorothiazide  | 25 mg             | cap/tab     | 30                           | 30                             | Brand        |                        |             |                            |             |                             |             |                          |             |
|  |                   |             |                              |                                | Most Sold    |                        |             |                            |             | 600.00                      | 3.3         |                          |             |
|  |                   |             |                              |                                | Lowest Price | 267.86                 | 1.5         |                            |             | 600.00                      | 3.3         |                          |             |
| <b>Hypertension</b>  |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name   | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Atenolol   | 50 mg             | cap/tab     | 30                           | 30                             | Brand        |                        |             |                            |             | 1875.00                     | 10.2        |                          |             |
|  |                   |             |                              |                                | Most Sold    |                        |             | 237.86                     | 1.3         | 283.93                      | 1.5         |                          |             |
|  |                   |             |                              |                                | Lowest Price | 417.75                 | 2.3         | 300.00                     | 1.6         | 262.50                      | 1.4         | 814.29                   | 4.4         |
| <b>Adult resp. infects.</b>                                      |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name   | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Amoxicillin  | 250 mg            | cap/tab     | 7                            | 21                             | Brand        |                        |             |                            |             | 315.00                      | 1.7         |                          |             |
|  |                   |             |                              |                                | Most Sold    |                        |             |                            |             |                             |             |                          |             |
|  |                   |             |                              |                                | Lowest Price | 147.00                 | 0.8         | 126.00                     | 0.7         | 115.50                      | 0.6         | 315.00                   | 1.7         |
| <b>Pediatric resp. infects.</b>                                  |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name   | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Co-trimoxazole Susp.   | 8+40 mg/ml        | millilitre  | 7                            | 70                             | Brand        |                        |             | 238.00                     | 1.3         | 280.00                      | 1.5         |                          |             |
|  |                   |             |                              |                                | Most Sold    |                        |             |                            |             | 203.00                      | 1.1         |                          |             |
|  |                   |             |                              |                                | Lowest Price | 67.20                  | 0.4         | 84.00                      | 0.5         | 112.00                      | 0.6         | 210.00                   | 1.1         |
| <b>Gonorrhoea</b>  |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name   | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Ciprofloxacin  | 500 mg            | cap/tab     | 1                            | 1                              | Brand        | 120.00                 | 0.7         |                            |             | 165.00                      | 0.9         |                          |             |
|  |                   |             |                              |                                | Most Sold    | 28.50                  | 0.2         |                            |             | 58.00                       | 0.3         |                          |             |
|  |                   |             |                              |                                | Lowest Price | 30.00                  | 0.2         | 48.00                      | 0.3         | 40.00                       | 0.2         | 70.00                    | 0.4         |

| Peptic Ulcer              |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
|---------------------------|-------------------|-------------|------------------------------|--------------------------------|--------------|------------------------|-------------|----------------------------|-------------|-----------------------------|-------------|--------------------------|-------------|
| Select Medicine Name      | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Omeprazole                | 20 mg             | cap/tab     | 28                           | 28                             | Brand        |                        |             |                            |             | 10570.00                    | 57.7        |                          |             |
|                           |                   |             |                              |                                | Most Sold    |                        |             | 2245.00                    | 12.2        | 2240.00                     | 12.2        | 3000.00                  | 16.4        |
|                           |                   |             |                              |                                | Lowest Price |                        |             | 1400.00                    | 7.6         | 2200.00                     | 12.0        | 2800.00                  | 15.3        |
| Depression                |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name      | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Amitriptyline             | 25 mg             | cap/tab     | 30                           | 90                             | Brand        |                        |             |                            |             |                             |             |                          |             |
|                           |                   |             |                              |                                | Most Sold    |                        |             |                            |             |                             |             |                          |             |
|                           |                   |             |                              |                                | Lowest Price | 144.00                 | 0.8         | 270.00                     | 1.5         | 405.00                      | 2.2         | 1800.00                  | 9.8         |
| Asthma                    |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name      | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Salbutamol inhaler        | 0.1 mg/dose       | dose        | as needed                    | 200                            | Brand        |                        |             | 662.51                     | 3.6         | 600.00                      | 3.3         | 1100.00                  | 6.0         |
|                           |                   |             |                              |                                | Most Sold    |                        |             |                            |             |                             |             |                          |             |
|                           |                   |             |                              |                                | Lowest Price |                        |             |                            |             |                             |             |                          |             |
| Peptic ulcer              |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name      | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Ranitidine                | 150 mg            | cap/tab     | 30                           | 60                             | Brand        | 204.00                 | 1.1         |                            |             | 3600.00                     | 19.6        |                          |             |
|                           |                   |             |                              |                                | Most Sold    | 1050.00                | 5.7         | 1200.00                    | 6.5         | 1350.00                     | 7.4         |                          |             |
|                           |                   |             |                              |                                | Lowest Price | 900.00                 | 4.9         | 1200.00                    | 6.5         | 1200.00                     | 6.5         | 3300.00                  | 18.0        |
| Infection                 |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name      | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Ceftriaxone injection     | 1 g/vial          | gram        | 3                            | 3                              | Brand        |                        |             | 7500.00                    | 40.9        | 6900.00                     | 37.6        | 8850.00                  | 48.3        |
|                           |                   |             |                              |                                | Most Sold    |                        |             | 4200.00                    | 22.9        | 3870.00                     | 21.1        |                          |             |
|                           |                   |             |                              |                                | Lowest Price |                        |             | 3570.00                    | 19.5        | 3900.00                     | 21.3        | 6000.00                  | 32.7        |
| Infection                 |                   |             |                              |                                |              | Public (Procurement)   |             | Public Facilities (Retail) |             | Private Pharmacies (Retail) |             | Private Clinics (Retail) |             |
| Select Medicine Name      | Medicine Strength | Dosage Form | Treatment Duration (in Days) | Total # of Units per Treatment | Product Type | Median Treatment Price | Days' Wages | Median Treatment Price     | Days' Wages | Median Treatment Price      | Days' Wages | Median Treatment Price   | Days' Wages |
| Sulfadoxine-pyrimethamine | 500+25 mg         | cap/tab     | 1                            | 3                              | Brand        |                        |             | 135.00                     | 0.7         | 150.00                      | 0.8         | 250.00                   | 1.4         |
|                           |                   |             |                              |                                | Most Sold    |                        |             | 60.00                      | 0.3         | 120.00                      | 0.7         |                          |             |
|                           |                   |             |                              |                                | Lowest Price | 22.00                  | 0.1         | 50.00                      | 0.3         | 50.00                       | 0.3         | 150.00                   | 0.8         |

## Annex 5: List of Medicines on the essential medicines list

All the 34 medicines on the core and supplementary list are on the essential medicines list (2003 edition).

| SN  | Medicine Name                  | Essential medicines list (all levels) |
|-----|--------------------------------|---------------------------------------|
| 1.  | Aciclovir                      | Yes                                   |
| 2.  | Amitriptyline                  | Yes                                   |
| 3.  | Amoxicillin 250mg              | Yes                                   |
| 4.  | Amoxicillin 500mg              | Yes                                   |
| 5.  | Ampicillin/Cloxacillin 500mg   | Yes                                   |
| 6.  | Artesunate                     | Yes                                   |
| 7.  | Atenolol                       | Yes                                   |
| 8.  | Beclomethasone                 | Yes                                   |
| 9.  | Captopril                      | Yes                                   |
| 10. | Carbamazepine                  | Yes                                   |
| 11. | Ceftriaxone                    | Yes                                   |
| 12. | Cimetidine                     | Yes                                   |
| 13. | Ciprofloxacin                  | Yes                                   |
| 14. | Clotrimazole                   | Yes                                   |
| 15. | Co-trimoxazole                 | Yes                                   |
| 16. | Diazepam                       | Yes                                   |
| 17. | Diclofenac sodium              | Yes                                   |
| 18. | Dihydroartemisin               | Yes                                   |
| 19. | Fluconazole 50mg               | Yes                                   |
| 20. | Fluoxetine                     | Yes                                   |
| 21. | Fluphenazine decanoate         | Yes                                   |
| 22. | Glibenclamide                  | Yes                                   |
| 23. | Hydrochlorothiazide            | Yes                                   |
| 24. | Indinavir                      | Yes                                   |
| 25. | Ketoprofen                     | Yes                                   |
| 26. | Metformin                      | Yes                                   |
| 27. | Nevirapine                     | Yes                                   |
| 28. | Nifedipine Retard              | Yes                                   |
| 29. | Omeprazole                     | Yes                                   |
| 30. | Phenytoin                      | Yes                                   |
| 31. | Pyrimethamine with sulfadoxine | Yes                                   |
| 32. | Ranitidine                     | Yes                                   |
| 33. | Salbutamol                     | Yes                                   |
| 34. | Zidovudine                     | Yes                                   |

## Annex 6: List of facilities and outlets sampled

### GEOGRAPHICAL AREA: NORTH EAST ZONE

| Public Health Facilities                  | Private Pharmacies                  | Private Clinics                        |
|---|-------------------------------------|--|
| State Specialist Hospital, Maiduguri      | Rata Pharmacy Chem. Ltd., Maiduguri | Sauki Clinic Biu                       |
| University of Maiduguri Teaching Hospital | Ben Climax Pharmacy, Maiduguri      | Ayamsu Memorial Med. Centre, Maiduguri |
| General Hospital, Biu                     | Simple Pharmacy, Maiduguri          | Kanem Hospital, Maiduguri              |
| General Hospital, Hawul                   | Elicol Pharmacy, Maiduguri          | Alpha Medical Centre, Maiduguri        |
| General Hospital, Kwaya-Kusar             | Hentah Pharmacy Nig. Ltd, Maiduguri | Borno Medical Clinic, Maiduguri        |
| General Hospital, Magumeri                | Samsunny Pharmacy, Biu              |  |
| General Hospital, Shani                   | Alhaya Pharmacy, Jere               |  |

### GEOGRAPHICAL AREA: NORTH CENTRAL ZONE

| Public Health Facilities  | Private Pharmacies                | Private Clinics                     |
|---------------------------|-----------------------------------|-------------------------------------|
| Wuse General Hospital     | Chedec Pharm. Limited             | Sauki Private Hospital, Wuse Zone 6 |
| Maitama District Hospital | El-Elyon Pharmacy, Garki          | Hugo Medical Centre, Maitama        |
| Abaji General Hospital    | Lawcas Pharmacy, Limited Wuse II  | Ganiya Hospital, Abaji              |
| Gwarimpa General Hospital | MIC pharmaceutical & Stores Karmo | Kefat Medical Centre, Gwarimpa      |
| Kuje General Hospital     | Zochem Pharmacy, Gwarimpa         | Mureen Medical Hospital, Gwagwalada |
| Bwari General Hospital    | Anes Pharmacy & Stores, Bwari     | Bwari Medical Centre, Bwari         |
|                           | Class A Pharmacy & Stores, Kubwa  | Express Hospital, Kubwa             |

### GEOGRAPHICAL AREA: NORTH WEST ZONE

| Public Health Facilities                   | Private Pharmacies                     | Private Clinics                  |
|--|--|----------------------------------|
| Aminu Kano Teaching Hospital, Kano         | Aicon Pharmaceutical Ltd. Nasarawa     | Almu Memorial Hospital, Tarauni  |
| Mohamadu Abdullahi Wase Specialist Hosp.,  | Lamco Pharm. Nig. Ltd. Kano            | Takai Gaskiya Hosp. & Mat. Takai |
| Sheikh Mohammed Jidda General Hosp., Kano  | Primedec Pharmacy Stores, Nasarawa     | Kura Surgery & Maternity, Kura   |
| Wudil General Hospital, Wudil              | Zeenat Pharmacy, Tarauni               | Sauki Clinic, Wudil              |
| Kura General Hospital, Kura                | Mishbah Pharmacy and Stores, Kano      | Ijeoma Clinic, Fagge             |
| Tudun Wada General Hospital                | Rapha Pharmacy, Tarauni                | Classic Clinic, Nasarawa         |
| Murtala Mohammed Specialist Hospital, Kano | Pal Pharmacy & General Ent. Ltd, Fagge | Great Shepherd Clinic, Kano      |

### GEOGRAPHICAL AREA: SOUTH EAST ZONE

| Public Health Facilities                        | Private Pharmacies           | Private Clinics                           |
|---|------------------------------|---|
| Nnamdi Azikiwe University Teaching Hosp., Nnewi | Georgie Chemist              | Urban Hospital, Isu-Aniocha               |
| General Hospital Onitsha                        | Holy Mary Limited            | Silgrey Royal Hospital and Maternity Awka |
| General Hospital Osamalla                       | Onwughalu Pharmacy, Osumenyi | Union Hospital Ukpok                      |
| General Hospital, Amanuke                       | Selak Pharmacy               | Chinazo Hospital and Maternity Umunachi   |
| General Hospital, Ifite-Ukpo                    | MacDech Pharmacy, Odeke      | Ebenator Medical Centre, Nnewi            |
| General Hospital, Nkpor                         | Inxs Pharmacy, Onitsha       | St. Lwanga Hospital Okpoko                |
| General Hospital Awka                           | Cintas pharmacy limited      | St. Charles Borromeo Hospital, Onitsha    |

### GEOGRAPHICAL AREA: SOUTH SOUTH ZONE

| Public Health Facilities                 | Private Pharmacies                  | Private Clinics                      |
|--|-------------------------------------|--------------------------------------|
| Univ. of Calabar Teaching Hosp., Calabar | Vitamed Pharmacy, Calabar           | Mevon Specialist Clinic, Calabar     |
| General Hospital Calabar                 | Kamel Pharmacy, Calabar             | Bakor Medical Centre, Calabar        |
| General Hospital, Akamkpa                | Butex Pharmacy, Calabar             | Nkem Medical Centre, Ugher           |
| General Hospital, Obubra                 | Anijah Pharmacy, Ikom               | Dr. Eyaba Memorial Clinic, Obubra    |
| General Hospital, Ugep                   | Maryland Pharmacy, Obudu            | Rapha Medical Centre, Abakpa, Ogoja  |
| General Hospital, Ogoja                  | Hilary Pharmacy, Ogoja              | Foundation Clinic, Ogoja             |
| Lutheran Health Centre, Yahe-Yala        | Jipharmak Stores, Ikom              | Offoboche Specialist Hospital, Okuku |
|  | Joemaneul Mayfair Pharmacy, Calabar |                                      |

## **GEOGRAPHICAL AREA: SOUTH WEST ZONE**

| <b>Public Health Facilities</b> | <b>Private Pharmacies</b>        | <b>Private Clinics</b>                      |
|---------------------------------|----------------------------------|---|
| General Hospital, Epe           | Adekanbi Pharmacy Limited        | Olaniba Memorial Specialist Hospital, Aguda |
| Ajeromi General Hospital        | Olu-Iwa Pharmaceutical Chemists  | Gold Cross Hospital, Eti - Osa              |
| Badagry General Hospital        | Nobis Pharmacy, Badagry Exp. Way | St. Nicholas Hospital, Lagos                |
| Onikan Health Centre            | Standard Generic Pharmacy        | Havana Specialist Hospital, Surulere        |
| General Hospital Ikorodu        | Bernados Pharmacy, Ojuelegba     | Patelson Specialist Clinic, Surulere        |
| Agbowo General Hospital         | Dominion Pharmacy, Ikorodu       | Kadol Medical Centre, Apapa                 |
|                                 | Rommar Pharmacy                  | Bimlad Clinic, Oshodi-Isole                 |

## **Annex 7: Timetable of survey**

|   | <b>Date</b>                    |
|---|--------------------------------|
| Appoint advisory group and survey planning and preparations | August 26, 2004                |
| Training of data collectors                                 | August 31 – September 2, 2004  |
| Data collection period                                      | September 6 – 16, 2004         |
| Data analysis   | September 19– November 7, 2004 |
| Preparation of draft reports                                | November 10 – July 20, 2005    |
| Stakeholder meeting   | July 22, 2005                  |
| Final report published                                      | August 2005                    |
| Implementation of advocacy and dissemination plan           | 2006 – 2007 Biennium           |

## Annex 8: Medicine Price Data Collection form

Use one form for each public or private health facility or private pharmacy

Date:                      State:                      LGA:                       Urban/ Rural

Name of health facility/pharmacy:

Public facility/Private clinic/Private Pharmacy ID:

Distance in km from nearest town (population >50 000):

Type of facility:

- Public facility                       Private pharmacy  
 Private clinic                       CMS

Type of price in public and private sector:

- Procurement price                       Price the patient pays

### ***Public Sector*** procurement details

- From State CMS (health facility)  
 Facility procurement (health facility)  
 Competitive bidding (State CMS)  
 Others (specify)

Name of manager of the facility:

Name of person(s) who provided information on medicine prices and availability (if different):

Mobile telephone number(s):

Data collectors:

Verification

To be completed at the end of the day

Signed:

Date:

## CORE LIST

| A                                      | B             | C             | D                        | E                     | F               | G                   | H                     | I        |
|--|---------------|---------------|--------------------------|-----------------------|-----------------|---------------------|-----------------------|----------|
| Generic name, dosage form, strength    | Brand name(s) | Manufacturer  | Available tick ✓ for yes | Pack size recommended | Pack size found | Price of pack found | Unit price (4 digits) | Comments |
| Aciclovir tab 200 mg                   | Zovirax       | GSK           |                          | 25                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>    | Virest        | Hovid         |                          | 25                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i> |               |               |                          | 25                    |                 |                     |                       |          |
| Amitriptyline tab 25 mg                | Tryptizol     | MSD           |                          | 100                   |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>    | Amitriptyline | APS           |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i> |               |               |                          | 100                   |                 |                     |                       |          |
| Amoxicillin caps/tab 250 mg            | Amoxil        | SKB (GSK)     |                          | 21                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>    | Reichamox     | Medreich      |                          | 21                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i> |               |               |                          | 21                    |                 |                     |                       |          |
| <sup>26</sup> Artesunate tab 100 mg    | Arsumax       | Sanofi        |                          | 20*                   |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>    | Artesunate    | Meko pharm/   |                          | 20*                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i> |               |               |                          | 20*                   |                 |                     |                       |          |
| Atenolol tab 50 mg                     | Tenormin      | AstraZeneca   |                          | 60                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>    | Atenolol      | Alpharma      |                          | 60                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i> |               |               |                          | 60                    |                 |                     |                       |          |
| Beclometasone inhaler 50 mcg/ dose     | Becotide      | GSK           |                          | 1 inhaler: 200 doses  |                 |                     | /dose                 |          |
| <i>Most sold generic equivalent</i>    | Beclofort     | Glaxowellcome |                          | 1 inhaler: 200 doses  |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i> |               |               |                          | 1 inhaler: 200 doses  |                 |                     |                       |          |
| Captopril tab 25 mg                    | Capoten       | BMS           |                          | 60                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>    | Captopril     | APS           |                          | 60                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i> |               |               |                          | 60                    |                 |                     |                       |          |
| Carbamazepine tab 200 mg               | Tegretol      | Novartis      |                          | 100                   |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>    | Carzepin      | Hovid         |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i> |               |               |                          | 100                   |                 |                     |                       |          |
| Ceftriaxone inj 1 g powder             | Rocephin      | Roche/Swipha  |                          | 1 vial                |                 |                     | /vial                 |          |

<sup>26</sup> Based on treatment of malaria in an adult around 70 kg with artesunate as single treatment: 4 mg/kg for 7 days (WHO Model Formulary, 2002)

| A   | B             | C                   | D                        | E                     | F               | G                   | H                     | I        |
|---|---------------|---------------------|--------------------------|-----------------------|-----------------|---------------------|-----------------------|----------|
| Generic name, dosage form, strength         | Brand name(s) | Manufacturer        | Available tick ✓ for yes | Pack size recommended | Pack size found | Price of pack found | Unit price (4 digits) | Comments |
| <i>Most sold generic equivalent</i>         | Powecef       | Wockhardt           |                          | 1 vial                |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 1 vial                |                 |                     |                       |          |
| Ciprofloxacin tab 500 mg                    | Ciproxin      | Bayer               |                          | 1                     |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>         | Ciprotab      | Fidson              |                          | 1                     |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 1                     |                 |                     |                       |          |
| Co-trimoxazole paed suspension (8+40) mg/ML | Bactrim       | Roche/Swipha        |                          | 100 mL                |                 |                     | /mL                   |          |
| <i>Most sold generic equivalent</i>         | Primpex       | SKG                 |                          | 100 mL                |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 100 mL                |                 |                     |                       |          |
| Diazepam tab 5 mg                           | Valium        | Roche/Swipha        |                          | 100                   |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>         | Diazepam      | Vitabiotics         |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 100                   |                 |                     |                       |          |
| Fluconazole caps/tab 200 mg                 | Diflucan      | Pfizer              |                          | 30                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>         | Fluzoral      | GPO, Bangkok        |                          | 30                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 30                    |                 |                     |                       |          |
| Fluoxetine caps/tab 20 mg                   | Prozac        | Lilly               |                          | 30                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>         | Fluoxetine    | Ranbaxy             |                          | 30                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 30                    |                 |                     |                       |          |
| Fluphenazine decanoate inj 25 mg/mL         | Modecate      | Sanofi-Winthrop/BMS |                          | 1 ampoule             |                 |                     | /mL                   |          |
| <i>Most sold generic equivalent</i>         | Monasan       | Duopharm            |                          | 1 ampoule             |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 1 ampoule             |                 |                     |                       |          |
| Glibenclamide tab 5 mg                      | Daonil        | HMR/Aventis         |                          | 60                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>         | Glanil        | NGC                 |                          | 60                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 60                    |                 |                     |                       |          |
| Hydrochlorothiazide tab 25 mg               | Dichlotride   | MSD                 |                          | 30                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>         | Esidrex       | Novartis            |                          | 30                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 30                    |                 |                     |                       |          |
| Indinavir caps 400 mg                       | Crixivan      | MSD                 |                          | 180                   |                 |                     | /caps                 |          |
| <i>Most sold generic equivalent</i>         |               |                     |                          | 180                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>      |               |                     |                          | 180                   |                 |                     |                       |          |

| A  | B               | C            | D                        | E                     | F               | G                   | H                     | I        |
|--|-----------------|--------------|--------------------------|-----------------------|-----------------|---------------------|-----------------------|----------|
| Generic name, dosage form, strength            | Brand name(s)   | Manufacturer | Available tick ✓ for yes | Pack size recommended | Pack size found | Price of pack found | Unit price (4 digits) | Comments |
| Metformin tab 500 mg                           | Glucophage      | Merck        |                          | 100                   |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>            | Diabetmin       | Hovid        |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |                 |              |                          | 100                   |                 |                     |                       |          |
| Nevirapine tab 200 mg                          | Viramune        | Boehringer I |                          | 60                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>            |                 |              |                          | 60                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |                 |              |                          | 60                    |                 |                     |                       |          |
| Nifedipine Retard tab 20 mg                    | Adalat Retard   | Bayer        |                          | 100                   |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>            | Nifecard Retard | Lek          |                          | 50                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |                 |              |                          | 100                   |                 |                     |                       |          |
| Omeprazole caps 20 mg                          | Losec           | AstraZeneca  |                          | 30                    |                 |                     | /caps                 |          |
| <i>Most sold generic equivalent</i>            | Meprasil        | Fidson       |                          | 30                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |                 |              |                          | 30                    |                 |                     |                       |          |
| Phenytoin caps/tab 100 mg                      | Epanutin        | Pfizer       |                          | 100                   |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>            | Epitoin         | Hovid        |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |                 |              |                          | 100                   |                 |                     |                       |          |
| Pyrimethamine with sulfadoxine tab (25+500) mg | Fansidar        | Roche/Swipha |                          | 3                     |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>            | Amalar          | Brown & Bulk |                          | 3                     |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |                 |              |                          | 3                     |                 |                     |                       |          |
| Ranitidine tab 150 mg                          | Zantac          | GSK          |                          | 60                    |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>            | Peptard         | Neimeth      |                          | 60                    |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |                 |              |                          | 60                    |                 |                     |                       |          |
| Salbutamol inhaler 0.1 mg per dose             | Ventolin        | GSK          |                          | 1 inhaler: 200 doses  |                 |                     | /dose                 |          |
| <i>Most sold generic equivalent</i>            |                 |              |                          | 1 inhaler: 200 doses  |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |                 |              |                          | 1 inhaler: 200 doses  |                 |                     |                       |          |
| Zidovudine caps 100 mg                         | Retrovir        | GSK          |                          | 100                   |                 |                     | /caps                 |          |
| <i>Most sold generic equivalent</i>            |                 |              |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |                 |              |                          | 100                   |                 |                     |                       |          |

## SUPPLEMENTARY LIST

| A  | B             | C            | D                        | E                     | F               | G                   | H                     | I        |
|--|---------------|--------------|--------------------------|-----------------------|-----------------|---------------------|-----------------------|----------|
| Generic name, dosage form, strength            | Brand name(s) | Manufacturer | Available tick ✓ for yes | Pack size recommended | Pack size found | Price of pack found | Unit price (4 digits) | Comments |
| <i>Amoxicillin cap 500mg</i>                   | Amoxil        | Beecham      |                          | 100                   |                 |                     | /cap                  |          |
| <i>Most sold generic equivalent</i>            | Reichamox     | Medreich     |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |               |              |                          | 100                   |                 |                     |                       |          |
| Ampicillin/Cloxacillin cap 500mg               | Ampiclox      | Beecham/SKB  |                          | 100                   |                 |                     | /cap                  |          |
| <i>Most sold generic equivalent</i>            | Reichlox      | Medreich     |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |               |              |                          | 100                   |                 |                     |                       |          |
| Cimetidine tab 200mg                           | Tagamet       | SKF Int      |                          | 100                   |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>            | Altramet      | Taylek       |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |               |              |                          | 100                   |                 |                     |                       |          |
| Co-trimoxazole paed suspension<br>(8+40) mg/ML | Septrin       | Roche/Swipha |                          | 50 mL                 |                 |                     | /mL                   |          |
| <i>Most sold generic equivalent</i>            | Primpex       | SKG          |                          | 50 mL                 |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |               |              |                          | 50 mL                 |                 |                     |                       |          |
| Diclofenac sodium tab 100mg                    | Voltarol      | Novartis     |                          | 100                   |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>            | Abitren       | Teva         |                          | 100                   |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |               |              |                          | 100                   |                 |                     |                       |          |
| Dihydroartemisin tab 60mg                      | Cotecxin      | Cotec        |                          | 8                     |                 |                     | /tab                  |          |
| <i>Most sold generic equivalent</i>            | Alaxin        | GVS Labs     |                          | 8                     |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |               |              |                          | 8                     |                 |                     |                       |          |
| Fluconazole cap 50mg                           | Diflucan      | Pfizer       |                          | 3                     |                 |                     | /cap                  |          |
| <i>Most sold generic equivalent</i>            | Flucamed      | Drugfield    |                          | 3                     |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |               |              |                          | 3                     |                 |                     |                       |          |
| Ketoprofen cap 200mg                           | Oruvail       | M & B        |                          | 7                     |                 |                     | /cap                  |          |
| <i>Most sold generic equivalent</i>            | Ketoprofen    | Taylek       |                          | 7                     |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i>         |               |              |                          | 7                     |                 |                     |                       |          |
| Clotrimazole cream 1%                          | Canesten      | Bayer        |                          | 1                     |                 |                     | /tube                 |          |

| A                                      | B             | C            | D                        | E                     | F               | G                   | H                     | I        |
|--|---------------|--------------|--------------------------|-----------------------|-----------------|---------------------|-----------------------|----------|
| Generic name, dosage form, strength    | Brand name(s) | Manufacturer | Available tick ✓ for yes | Pack size recommended | Pack size found | Price of pack found | Unit price (4 digits) | Comments |
| <i>Most sold generic equivalent</i>    | Sabresten     | Gemini       |                          | 1                     |                 |                     |                       |          |
| <i>Lowest price generic equivalent</i> |               |              |                          | 1                     |                 |                     |                       |          |