



PHARMACEUTICAL SITUATION ASSESSMENT – LEVEL II –

Health Facilities Survey
in UGANDA

Report of a survey conducted July-August 2008

December 2008

Ministry of Health

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This document has been produced with the financial assistance of the European Community. The views expressed herein are those of the authors and can therefore in no way be taken to reflect the official opinion of the European Community.



European Community

ACKNOWLEDGEMENTS

We are grateful to the World Health Organization (WHO) for providing funding and technical support for the research process. The District Health Officers (DHOs) in all the six districts where we conducted the survey endorsed our work and we gratefully acknowledge their support. We also extend our thanks to the Advisory Group:

- Joseph Mwoga, National Professional Officer, WHO
- Martin Oteba, Assistant Commissioner Pharmacy Division, Ministry of Health (MOH)
- Morries Seru, Principal Pharmacist, MOH
- Fred Sebisubi, Principal Pharmacist, MOH
- Rosette Mutambi, Executive Director, HEPS-Uganda

The commitment of the survey team – supervisors, data collectors and data entrants – was invaluable in the completion of this study. In addition, the following individuals provided various forms of assistance to the study:

- Joseph Mwoga (WHO) for overall co-ordination;
- Denis Kibira (HEPS) for overseeing the survey process;
- Stella Kirya (WHO) for managing the logistics; and
- Richard Hasunira (HEPS-Uganda) for editing this report.

Conflict of Interest Statement

None of the authors of this survey or anyone who had influence on the conduct, analysis or interpretation of the results has any competing financial or other interests.

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ABBREVIATION

| | |
|-------|---|
| AF | Affordability |
| AV | Availability |
| CME | Continuous medical education |
| CPE | Continuous pharmacy education |
| EML | Essential Medicines List |
| HDI | Human Development Index |
| GA | Geographic access |
| GDP | Gross domestic product |
| HAI | Health Action International |
| HEPS | Coalition for Health Promotion and Social Development |
| HFS | Health services survey |
| HH | Household |
| Ind. | Indicator |
| Inj | Injection |
| JMS | Joint Medical Stores |
| M | Mixed |
| MOH | Ministry of Health |
| MPR | Median Price Ratio |
| MSH | Management Sciences for Health |
| No. | Number |
| NDA | National Drug Authority |
| NMP | National Medicines Policy |
| NMS | National Medical Stores |
| OB | Originator brand |
| PHC | Primary Health Care |
| PNFP | Private not-for-profit facility |
| PSA | Pharmaceutical situation assessment |
| Q | Quintile |
| QL | Quality |
| RU | Rational use |
| SD | Standard deviation |
| SF | Survey formulary |
| STG | Standard treatment guidelines |
| UBOS | Uganda Bureau of Statistics |
| UGX | Uganda shillings (also UShs.) |
| UNDP | United Nations Development Programme |
| USD | United States dollars (also \$) |
| WHO | World Health Organization |
| % ile | Percentile |

FOREWORD

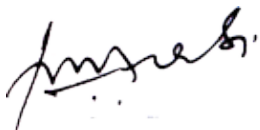
The development of the National Health Policy was informed by the national development framework, the Poverty Eradication Action Plan. The strategic plan to implement the policy commits the government to deliver a package of essential interventions commonly referred to as the National Minimum Health Care Package (NMHCP). Most of these interventions depend on essential medicines.

The National Medicines Policy (NMP) aims to contribute to the attainment of a good standard of health by the population of Uganda, through ensuring the availability, accessibility and affordability at all times of essential medicines of appropriate quality, safety and efficacy, and by promoting their rational use. Realisation of the NMP aspiration continues to be challenging because multiple factors. It is important therefore to have a systematic method for assessing the pharmaceutical situation in the country in order to have evidence that will help us improve our interventions and planning.

This pharmaceutical sector assessment using the WHO level II health facility tools is as timely as MOH is currently in the process of reviewing and updating the National Health Policy and Strategic Plan. The results will inform the process as it aims among the other things to answer the following key questions: whether people have access to essential medicines; whether people are getting medicines that are safe, effective and of good quality; whether these medicines are being properly used.

I congratulate the pharmaceutical division of the Ministry of Health for accomplishing this important work and urge them together with all partners to make use of this report.

Lastly, I acknowledge with gratitude the financial & technical support from World Health Organisation that enabled us to make this work a reality.



Dr S. Zaramba

DIRECTOR GENERAL OF HEALTH SERVICES

EXECUTIVE SUMMARY

Background

The Uganda Ministry of Health (MOH) conducted a nationwide study of the country's pharmaceutical situation in July-August 2008. Using a standard methodology developed by the World Health Organization (WHO), the study assessed the availability, affordability, rational use and other aspects of medicines at the health facility level (Level II Assessment).

Methods

The survey was conducted in six regions, each represented by one district: Arua, Lira, Kampala, Mbale, Hoima and Kabale. In each region, six public healthcare facilities, six mission facilities, 12 private drug outlets and one warehouse were surveyed. Data were captured using designed survey forms (Annex 2). Analysis was done with Excel® computer application. The WHO/Health Action International (HAI) workbook was used to analyze drug price data. Most results are expressed as medians (median values).

Key results

Access

Overall indicators of access show that key essential medicines selected for the country are partially available in public health facilities (45.7%), mission facilities (57.5%), and private pharmacies (56.3%). The length of stock-out duration in public health facility pharmacy/dispensary and mission facility dispensary was (72.9 and 7.6 days per year, respectively). Only 46.7% of facilities dispensed more than 75% of prescribed medicines (add figure for mission sector).

From the global list of medicines, mean availability of originator brand and generic medicines in the public sector was 0% and 24.7%, respectively. The mean availability of originator and generic medicines on the Essential Medicines List (EML) is 3.5% and 45.7%, respectively. In the private sector, the respective mean availability of originator brand and generic medicines was 0% and 44.3% (global list) and 3.5% and 45.7% (EML).

Concerning geographical accessibility, only a few patients (0.2%) interviewed took more than one hour to arrive at a public dispensing facility. Similar results were obtained for private pharmacies.

On drug prices (global list)

- Procurement data collected from purchases done outside National Medical Stores (NMS) and Joint Medical Stores (JMS) indicate that the median price ratio (MPR) for procurement prices was 1.03 times more than the international reference prices.
- Final patient prices for generic medicines in the private and mission sectors are about three times (3.01 and 2.88 respectively) their international reference prices.
- Final patient prices for originator brands in the private and mission sectors are about five (5.2) and three (3.2) times their international reference prices, respectively.
- In treating common conditions using standard regimens, the lowest paid government worker would need 1.7 day's wages (for asthma) and one day's wages (for diabetes) to purchase lowest-priced generic medicines from the private sector. If originator brands were to be dispensed, costs would escalate further.

Quality

There were minimal expired medicines (0%) on shelves which is an indication of an adequate quality of medicines. Adequacy of storage practices is 63.6% for both public and mission facilities and 54.8% for private facilities.

Use of medicines

The level of antibiotics prescribed is excessive (66.7%), while that of injectable medicines is low (16.7%). Tools to promote rational use are in place in health facilities. The Standard Treatment Guidelines (STGs) were found in 93.9% of surveyed facilities. However, the national EML was found in only 33.3% of health facilities. The selling of prescription medicines without prescription seems to be a widespread practice (in 61.1% of private facilities, over 75% of prescription medicines would be obtained without prescription). Majority of patients had been informed of how to take their medicines at home in public and private facilities (75.8%) and (85.7%) respectively. Medicine labelling was poor (2.8% and 30% respectively).

Additional indicators

The majority of dispensing facilities did not have a pharmacist. Nurses were the most frequent dispensers in all categories of facilities (44.4%). Nurses/midwives or clinical officers were the most frequent prescribers found (56%), and few prescribers (42%) have recently been trained in rational use of medicines.

Lessons learnt

The results of the survey show that the access components such as strategies to improve availability and enhance affordability of medicines should be improved in order to ensure equity in access to basic medical treatments, especially for the poor. Appropriate use of drugs should also be promoted.

Recommendations

Based on the results of the survey, the following recommendations have been made for improving access, quality and rational use of medicines in Uganda:

- There is need to improve availability of medicines in the public sector to increase access to especially the poor. This is because the public sector is the first point of call for health services for the majority of the poor people.
- A national price regulation mechanism is required to address unfair mark-ups in the private sector. This is because patient prices compare unfavourably with international reference prices.
- There is need for improvement in regulation of medicine outlets to improve storage conditions of medicines. This is because a large number of outlets were found not to have adequate storage conditions which have direct effect to the quality of medicines.
- Continuous medical education (CME) should be scaled up for all health workers involved in prescribing to curb indiscriminate prescribing of antibiotics in order to mitigate the potential development of resistance
- Continuous pharmacy education (CPE) is required to improve dispensing practices

1. BACKGROUND

1.1 Introduction

In July-August 2008, the Uganda Ministry of Health (MOH) conducted a nationwide study of the pharmaceutical situation in public and mission health facilities, private drug outlets, and warehouses supplying the country's public sector. The main aim was to document the degree of success in achieving strategic national pharmaceutical objectives.

This study used a standard methodology developed by the World Health Organisation (WHO) and Health Action International (HAI) to assess the pharmaceutical situation at the health facility level (Level II Assessment). This is an indicator-based approach that provides systematic data on access and rational use of quality medicines through a facility-based survey. The core indicators measure the most important information needed to understand the pharmaceutical situation in a country.

This study sought to answer the following questions:

- Are medicines available and affordable in public and private dispensing facilities to treat common conditions at primary care level?
- Do people have adequate geographical access to public and private dispensing facilities?
- Are there expired medicines in public and private dispensing facilities?
- Are medicines adequately stored and handled in public health facility dispensaries and warehouses supplying the public sector?
- Are medicines adequately prescribed, labelled and dispensed?
- Are patients informed on how to use their medicines?
- Are pharmacists present at dispensing facilities according to the law?
- Are pharmacists present at dispensing facilities?
- Which professionals are prescribing and dispensing?
- Do prescribers comply with good prescribing practices?
- How does Uganda compare with other countries with regard to access to and use of medicines?

1.2 Country background

Uganda is a relatively small-sized country, covering an area of about 241,551km², with land alone measuring about 199,807km² (82.7%) and the rest being open water and swamps. It is divided into 81 districts, each of which has an elaborate local government structure under a decentralized administrative system. The total population is estimated to have reached 29.6 million by mid-2008. The overwhelming majority of Ugandans (about 85%) live in rural areas¹.

Uganda is a low income country, with a GDP of US\$430 per capita². About 31% of the population lives in poverty (2005/06). Of the total labor force, approximately 3.2% were estimated to be unemployed in 2000.³ In 2005/06, the national unemployment rate was about 2%, while the total urban unemployment rate was about 7%.⁴

According to the most recent national census (2002), the average number of people per household is 4.7. Malaria and fever are the most prevalent illnesses in Uganda and are the biggest cause of death. However,

¹Uganda Bureau of Statistics (UBOS), *Statistical Abstract 2008*

²UBOS, *Statistical Abstract 2008*

³World Bank *World Development Indicators*:

<http://devdata.worldbank.org/wdi2006/contents/Section2.htm>

⁴UBOS 2008, STATISTICAL ABSTRACT 2008

among children below five years, the major cause of death is diarrhoea.

Table 1: General profile of Uganda

| Aspect | Indicator | Source | Year | No. |
|---------------------|--|--------|--------|---------|
| General data | Population (million) | UBOS | 2008 | 29.6 |
| | % rural population | UBOS | 2007 | 85.1 |
| | % women | UBOS | 2002 | 51.3 |
| | % under 5 yrs | N/A | N/A | N/A |
| | % over 60 yrs | UBOS | 2002 | 3.9 |
| Socioeconomic data | HDI | UNDP | 2005 | 0.581 |
| | GDP (billion UGX) | UBOS | 2007 | 23,009 |
| | GDP per capita (UGX) | UBOS | 2007 | 821,029 |
| | % under Poverty line | UBOS | 2005/6 | 31.1 |
| | Unemployment rate (%) | UBOS | 2005/6 | 2 |
| | Literacy rate (% among persons aged 10 years and above) | UBOS | 2005/6 | 69 |
| General health data | Infant mortality rate (per 1000 live births) | UBOS | 2002 | 76 |
| | Life expectancy at birth (years) | UBOS | 2002 | 50.4 |
| | Life expectancy in years of the population over 60 years | N/A | N/A | N/A |

1.3 Health sector

In Financial Year 2006/7, the per capita total government expenditure on health was US\$ 7.8⁵. In 2003, about 7.3% of GDP was spent on health, according to the World Health Report 2006. Of the estimated total expenditure on health, 30.4% is government expenditures, which represents 10.7% of all government expenditures. The remaining 69.6% of total expenditures on health is private – largely out-of-pocket – expenditures.

The public health sector is composed of seven levels – health centre I, health centre II, health centre III, health centre IV, general hospital, regional referral hospital, and national referral hospital. Health centre I is at the community level but this does not exist in practice. Health centre II is at parish level and is served by an enrolled comprehensive nurse; health centre III at sub-county level, with a clinical officer; health centre IV at county level, with a medical officer; and general hospital at district level. The referral facilities range from health centre IV to national referral hospital.

Uganda does not have a national health insurance scheme, but government was, at the time of this survey, in the process of formulating a policy for its establishment. Some private providers however, offer health cover for a section of population that can afford. The public health sector is complemented by the mission and private sectors.

⁵ Average exchange rate US\$1=UGX 1,850

Table 2: Health sector structure

| Facility category | Ownership (2006) | | | Total Number |
|-----------------------------|------------------|----------------|---------|--------------|
| | Govt | Mission (PNFP) | Private | |
| Health centre II | 1332 | 415 | 261 | 2008 |
| Health centre III | 762 | 186 | 7 | 955 |
| Health centre IV | 155 | 12 | 1 | 168 |
| General hospitals | 44 | 46 | 8 | 98 |
| Regional referral hospitals | 11 | - | - | 11 |
| National referral hospitals | 2 | - | - | 2 |
| Total | 2306 | 659 | 277 | 3242 |

1.4 Pharmaceutical sector

There are 440 licensed private retail pharmacies and 4,742 drug shops in the country as by 2007/8. Sectors which dispense a substantial proportion of medicines to patients include the public sector, the mission (private-not-for-profit) and the private sector. The three sectors are not mutually exclusive. In some public health facilities there are private wings which sell medicines to patients.

1.4.1 National Medicines (Drugs) Policy

In Uganda, a national medicines policy (NMP) document exists in official form. It was last updated in 2002. An implementation plan that sets out activities, responsibilities, a budget and a timeline is in place and is referred to as National Pharmaceutical Sector Strategic Plan 2002-07.

1.4.2 Regulatory system

In Uganda, the National Drug Authority (NDA) is the formal medicines regulatory authority which is funded through the regular budget from the government and fees from registration, importation and exportation of medicines. Legal provisions are in place requiring transparency and accountability and promoting a code of conduct in regulatory work. The NDA provides information on: legislation, regulatory procedures, prescribing information (such as indications, contraindications, side effects, etc.), authorized companies, and approved medicines.

Registration fees do not differ between originator brands and generic equivalents, but differ between imported and locally produced medicines. Legal provisions are in place for the licensing of manufacturers, wholesalers/distributors, importers and exporters of medicines.

In Uganda, there are legal provisions for marketing authorisation. A total of 468 medicinal products were registered and approved for marketing in 2007/8. A list of all registered products is publicly accessible on payment of a fee. There are provisions in the medicines regulation covering promotion and/or advertising of medicines.

A quality management system with an officially defined protocol for ensuring the quality of medicines is in place. Medicine samples are tested for medicines registration/post-marketing surveillance. In 2007/8, 1593 samples were quality tested, with 51 failing to meet quality standards. Regulatory procedures are in place for ensuring the quality of imported medicines. There are also legal provisions for the licensing and practice of both prescribers and pharmacists.

There is an obligation to prescribe by generic name in the public or private sector. Generic substitution is

permitted in public or private pharmacies. There are incentives to dispense generic medicines at public or private pharmacies.

1.4.3 Medicines supply system

Public sector procurement is pooled at the national level and is the responsibility of MOH through NMS, which is also tasked with distribution. The following tender processes are used for public sector procurement:

- National competitive tender – 90% of total cost
- International competitive tender – 10% of total cost
- Negotiation / direct purchasing – 0% of total cost

Public sector procurement is limited to medicines on the national essential medicines list (EML). There are regulations for local preference in public sector procurement. It must be noted however that, although national competitive tenders constitute 90%, 94% of the procurements are imported by the local suppliers and only 6% are manufactured locally.

1.4.4 Medicines financing

There is a national policy to provide all medicines free of charge at public health care facilities. The government also bears the cost of salaries of public health personnel. In Financial Year 2006/7, the public expenditure on medicines was US\$ 4.1 per capita. By value, approximately 94% of the expenditure went to imported medicines.

Prescribers in the public sector do not dispense medicines, but prescribers in the private sector occasionally do so.

In Uganda, there is no public health insurance. However, part of the population has private health insurance, which covers a limited list of medicines.

Uganda does not have a policy to regulate medicine prices. The government neither sets the price of originator brand products nor that of the generics which dominate the market. The country does not have a national medicine price monitoring system for retail/patient prices. There are no regulations mandating retail/patient medicine price information to be made publicly accessible.

There are official written guidelines on medicine donations that provide rules and regulations for donors and provide guidance to the public, private and/or NGO sectors on accepting and handling donated medicines.

1.4.5 Rational use of medicines

Uganda's EML, last updated in 2007, contains 538 unique medicine formulations. The national EML is used for public sector procurement. There is no committee to select products on the national EML.

The health ministry produces national STGs for major conditions. These were last updated in 2003.

Antibiotics are occasionally sold over the counter without a prescription and the same happens for injectables.

2. STUDY DESIGN AND METHODS

The survey with Level II indicators is a very important part of the pharmaceutical sector assessment. These indicators measure the outcome and impact of strategic pharmaceutical programs in a country: improved access, quality and rational use. Access is measured in terms of the availability and affordability of essential medicines, especially to the poor and in the public sector.

Measuring the actual quality of medicines by testing samples can be expensive. Instead, the presence of expired medicines on pharmacy shelves as well as the adequate handling and conservation conditions are indicators of the quality of medicines made available to the population. Finally, rational use is measured by examining the prescribing and dispensing habits of health providers and the implementation of key strategies such as STGs and EMLs.

Level II indicators are measured in public health facilities, mission health facilities, private drug outlets, and in warehouses supplying the public sector.

Initially, six districts were selected as “survey areas” for data collection. The major urban centre of Kampala was selected as one survey area and Arua/Lira were selected to represent a low income area. Additional four areas were chosen at random.

This resulted in the following six survey areas:

1. Kampala (major urban centre)
2. Mbale
3. Hoima
4. Kabale
5. Arua
6. Lira

Figure 1: Geographic location of the six survey areas sampled in the survey



In each survey area, the sample of public facilities was identified by first selecting the main public hospital, and a primary/rural health centre or lowest level public health facility. An additional four public medicine outlets (e.g. hospital medicine outlets, dispensaries) per survey area were then selected at random from all middle level public health care facilities. For each public facility the nearest private drug outlet was visited and a second private drug outlet was visited for a price comparison. Six mission health facilities were also visited per survey area. Additionally one warehouse that supplies the public sector was visited in each area, resulting in 36 public health facilities with dispensary, 36 mission health facilities, 72 private pharmacies and six warehouses visited.

In each facility surveyed, a set of Survey Forms (Annex 2) was applied. This allowed a standard method of gathering information to calculate the indicators. Box 1 summarizes the Level II indicators and lists the corresponding survey forms. Information on data collection and calculation can be found on the respective survey forms.

Table 3: Summary list of indicators and corresponding survey form used to collect the data

| Indicator | | Survey Form |
|----------------------------------|---|--------------|
| Access | | |
| 1 | Availability of key medicines in public health facility dispensaries, private drug outlets and warehouses supplying the public sector (country list) | 1, 10, 15 |
| 2 | Mean availability of originator brand and generic medicines in the public/private sector | 2 & 11 |
| 3 | % of prescribed medicines dispensed or administered to patients at public health facility dispensaries | 6 |
| 4 | Average stock-out duration in public health facility dispensaries and warehouses supplying the public sector | 4, 16 |
| 5 | Adequate record keeping in public health facility dispensaries and warehouses supplying the public sector | 4, 16 |
| 6 | Geographical accessibility of public health facility dispensaries and private drug outlets | 6, 14 |
| 6 | Indicators related to affordability and prices of drugs: · Patient prices for generic medicines/innovator drug in the public/private sector · Prices of generic/ innovator drug in public/private sector compared to international price index . · Affordability -ration of cost to treat common conditions using standard regimens, to the lowest daisy government worker wage for Asthma and diabetes (days' wages to purchase lowest priced generic medicines from public and private sector) | 2, 11 |
| Quality | | |
| 1 | % medicines expired in public health facility dispensaries, private drug outlets and warehouses supplying the public sector | 1, 10, 15 |
| 2 | Adequacy of storage conditions and of handling of medicines in public health facility dispensaries and warehouses supplying the public sector | 5, 13, 17 |
| Rational use of medicines | | |
| 1 | % medicines adequately labelled at public health facility dispensaries and private drug outlets | 6, 14 |
| 2 | % patients informed on how to take medicines at public health facility dispensaries and private drug outlets | 6, 14 |
| 3 | Average number of medicines per prescription at public health facility dispensaries and public health facilities | 6, 7 |
| 4 | % patients prescribed antibiotics in public health facilities | 7 |
| 5 | % patients prescribed injections in public health facilities | 7 |
| 6 | % prescribed medicines on the essential medicines list at public health facilities | 7 |
| 7 | % medicines prescribed by generic name (INN) at public health facilities | 7 |
| 8 | Availability of standard treatment guidelines at public health facilities | 8 |
| 9 | Availability of essential medicines list at public health facilities | 8 |
| 10 | % tracer cases treated according to recommended treatment protocol/guide at public health facilities | 9 |
| 11 | % prescription medicines bought with no prescription | 14 |
| Other information | | |
| 1 | % of facilities that comply with the law (presence of a pharmacist) | Section A, C |
| 2 | % facilities with pharmacist, nurse, pharmacy aide/ health assistant or untrained staff dispensing | Section A, C |
| 3 | % facilities with doctor, nurse, trained health worker/health aide prescribing | Section B |
| 4 | % facilities with prescriber trained in RDU | Section B |

The verification of availability, stock-out and expired medicines was based on a key medicines list, selected according to the first-line therapeutic choice to most common and important health conditions at the primary health care level. Availability was also measured using drugs in a global list, differentiating innovator and lowest priced generics.

Verification of affordability of treatment as well as compliance of prescribers to recommended treatment protocol/guide was performed considering tracer health conditions treated with drugs in the global list. Data collection methods included patient and health worker interviews after oral consent, check-list guided observation and clinical and pharmacy records review.

The survey was conducted after approval by MOH. District Health Officers (DHOs) were then contacted for specific approval and cooperation.

The field team consisted of 24 data collectors (four per region), in teams of two - a pharmacist and a social scientist - and six supervisors (pharmacists) who ensured quality of data collected. All field teams were trained in their specific roles and procedures during a four-day training conducted a week before the data collection exercise.

Data collection took place between 21st July and 10th August 2008. After a review of completed Survey Forms, data were typed in Summary Forms 1–4 and Workbook, both in Excel® and in freeware provided by the WHO survey package. These programs permitted indicator calculation.

Indicator measures on each survey forms were calculated manually and summaries were entered in an automated Excel® spreadsheet. The WHO-HAI work book was used for data on drug prices and affordability.

Limitations of the data

The study was not intended to give a detailed analysis of the pharmaceutical sector but to provide an overview of the national pharmaceutical situation in the country, to help in policy analysis and in the design of appropriate interventions.

The regions and facilities selected cumulatively represent the national situation.

Main difficulties during field work were:

- (1) Geographical access: Some areas were mountainous and difficult to reach by vehicle
- (2) Some sampled facilities were found closed
- (3) At mission and private facilities, there were very few or no patients for exit interviews

These were overcome:

- (1) Data collectors had to walk to those places that could not be accessed by vehicles
- (2) Facilities found closed were replaced from sample on consultation with Supervisors and Survey manager
- (3) At facilities where there were few patients for exit interviews, data collectors had to make another visit

Survey tried to collect procurement data at districts on purchases made from the primary health care programme. However, this information was not readily available from the public sector.

3. RESULTS AND DISCUSSION

Table 4: *Characteristics of the surveyed facilities, PSA-HFS Level II, Uganda, 2008*

| Region | Category of facility | Number of facilities | Number of outpatients interviewed | Observation |
|-----------|-----------------------|----------------------|-----------------------------------|---------------|
| Region 1: | Hospital | 1 | 30 | 66.7% Females |
| KAMPALA | Health Centre | 5 | 131 | 67.2% Females |
| | Mission health Centre | 6 | 12 | 66.7% |
| | Warehouse | 2 | - | - |
| | Private Pharmacy | 3 | 0 | - |
| | Private Drug outlet | 3 | 0 | - |
| | Region 2: | Hospital | 1 | 30 |
| MBALE | Health Centre | 5 | 120 | 73.3% |
| | Mission health Centre | 6 | 23 | 43.5% |
| | Warehouse | 1 | - | - |
| | Private Pharmacy | 1 | 30 | 53.3% |
| | Retail Drug outlet | 5 | 26 | 39.1% |
| Region 3: | Hospital | 1 | 30 | 83.3% Females |
| HOIMA | Health Centre | 5 | 128 | 60.2% Females |
| | Mission health Centre | 6 | 75 | 49.3% Females |
| | Warehouse | 1 | - | - |
| | Private Pharmacy | 1 | 20 | 75% Females |
| | Retail Drug outlet | 3 | 3 | 0 |
| Region 4: | Hospital | 1 | 30 | 63.3% females |
| KABALE | Health Centre | 5 | 60 | 71.7% Females |
| | Mission health Centre | 6 | 20 | 70% Females |
| | Warehouse | 1 | - | - |
| | Private Pharmacy | 0 | 0 | - |
| | Retail Drug outlet | 6 | 34 | 52.9% Females |
| Region 5: | Hospital | 1 | 30 | 70% Females |
| ARUA | Health Centre | 5 | 150 | 59.3% females |
| | Mission health Centre | 4 | 120 | 59.2% females |
| | Warehouse | 1 | - | - |
| | Private Pharmacy | 0 | - | - |
| | Retail Drug outlet | 6 | 180 | 43.3% |
| Region 6: | Hospital | 1 | 30 | 66.7% females |
| LIRA | Health Centre | 5 | 150 | 62% females |
| | Mission health Centre | 6 | 176 | 58.5% females |
| | Warehouse | - | - | - |
| | Private Pharmacy | 0 | - | - |
| | Retail Drug outlet | 6 | - | - |

Table 5: Characteristics of outpatients interviewed, PSA-HFS Level II, Uganda, 2008

| Category of health facilities | Number of outpatients interviewed | % Female | Age % | |
|-------------------------------|-----------------------------------|----------|-------------------|------|
| | | | | |
| Hospital | 179 | 69.3 | 1) under 5 yrs. | 17.9 |
| | | | 2) older children | 17.9 |
| | | | 3) adults | 58.7 |
| | | | 4) over 60 yrs | 5.6 |
| Health Centre | 739 | 64.7 | 1) under 5 yrs. | 28.1 |
| | | | 2) older children | 23.4 |
| | | | 3) adults | 45.2 |
| | | | 4) over 60 yrs | 3.2 |
| Mission health facility | 426 | 57 | 1) under 5 yrs. | 40.4 |
| | | | 2) older children | 15.7 |
| | | | 3) adults | 41.1 |
| | | | 4) over 60 yrs | 2.8 |
| Retail Drug Outlet | 295 | 53.2 | 1) under 5 yrs. | 12.5 |
| | | | 2) older children | 16.3 |
| | | | 3) adults | 67.1 |
| | | | 4) over 60 yrs | 4.1 |
| Total | 1,639 | 61.1 | 1) under 5 yrs. | 27.4 |
| | | | 2) older children | 19.5 |
| | | | 3) adults | 49.5 |
| | | | 4) over 60 yrs | 3.5 |

General Survey Data Comment:

- Most interview data concern patients that are adults and most of them (61.1%) were female. This profile was homogeneous among health facilities.

3.1 Access

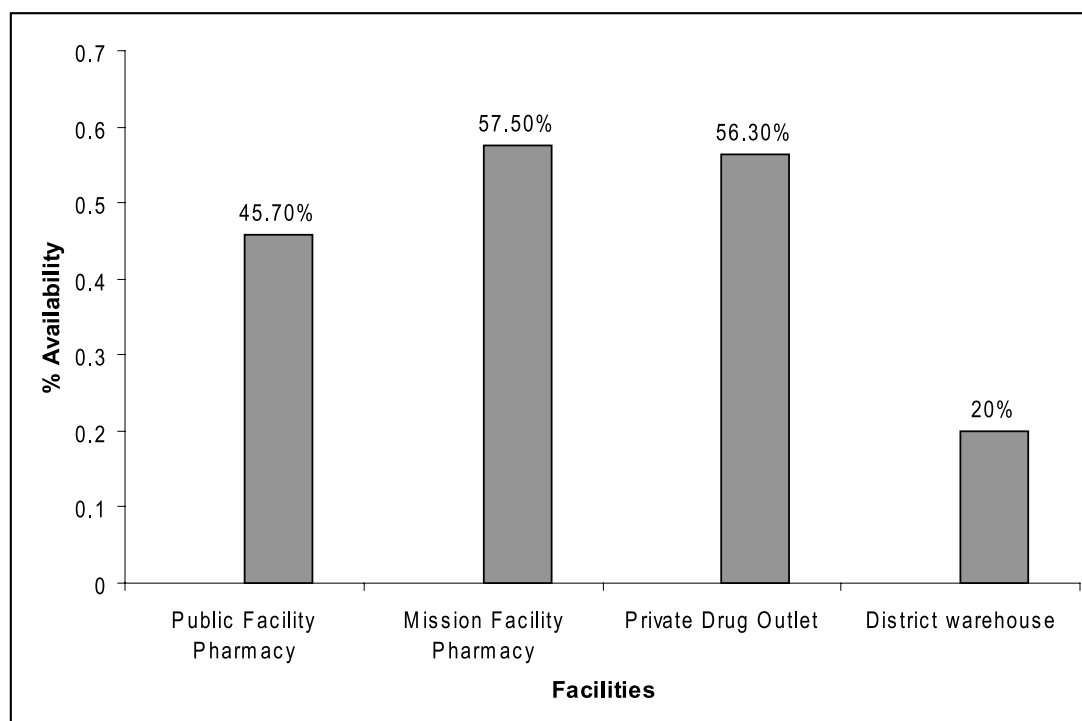
3.1.1 Key findings on access to medicines

Table 6: General Indicators for Access, PSA-HFS Level II, Uganda, 2008

| Indicator | National (Median) | 25th Per-centile | 75th Per-centile |
|---|-------------------|------------------|------------------|
| Availability | | | |
| Availability of key medicines (country list-EML) in | | | |
| Public health facility dispensaries | 45.7% | - | - |
| Mission health facilities | 57.5% | | |
| private drug outlets | 56.3% | | |
| warehouses supplying the public sector | 20.0% | 13.3% | 40.0% |
| Availability of key medicines (global list) in: | | | |
| Public health facility dispensaries | 24.7% | - | - |
| Mission health facilities | 40.6% | - | - |
| private drug outlets | 44.3% | - | - |
| % of prescribed medicines dispensed or administered to patients at public | 75% | 66% | 87% |
| Average stockout duration in | | | |
| Public health facility dispensaries | 72.9 | - | - |
| Mission health facility dispensaries | 7.6 | - | - |
| warehouses supplying the public sector | 0.0 | 0.0 | 146.0 |
| Adequate record keeping in | | | |
| Public health facility dispensaries | 66.7% | 58.3% | 73.3% |
| Mission health facility dispensaries | 66.7% | 33.3% | 80.0% |
| warehouses supplying the public sector | 60.0% | 0.0% | 60.0% |
| Drug prices and affordability | | | |
| Final patient price ratios for generic medicines: | | | |
| Private sector | 3.01 | - | -- |
| Mission sector | 2.88 | - | - |
| Ration of cost in treating common conditions using standard regimens to | | | |
| Asthma | 1.7 | - | - |
| Diabetes | 1.0 | - | - |
| Geographical accessibility | | | |
| % patients taking more than one hour to travel to | | | |
| Public health facility dispensaries | 0.2% | 0.1% | 0.3% |
| private drug outlets | 0.0% | 0.0% | 0.1% |
| Average transportation cost to the | | | |
| Public health facility dispensaries | 56.3 | 0.0 | 940.5 |
| Private drug outlets | 0.0 | 0.0 | 400.0 |
| Average Transport cost percentage to minimum daily salary to the | | | |
| Public health facility dispensaries | 0.0 | 0.0 | 0.3 |
| Private drug outlets | 0.0 | 0.0 | 0.1 |

There are two percentage availability indicators. Country list (Figure 2) was identified specifically for Uganda from EML. It is a key medicines list for the common health conditions at the primary health care level. The global list (Table 7) will allow comparison of drug prices and affordability situation with other countries.

Figure 2: Availability of key medicines (EML list) in public health facility dispensaries, mission health facility dispensaries, in private drug outlets, and in warehouses supplying the public sector. PSA-HFS Level II, Uganda, 2008.



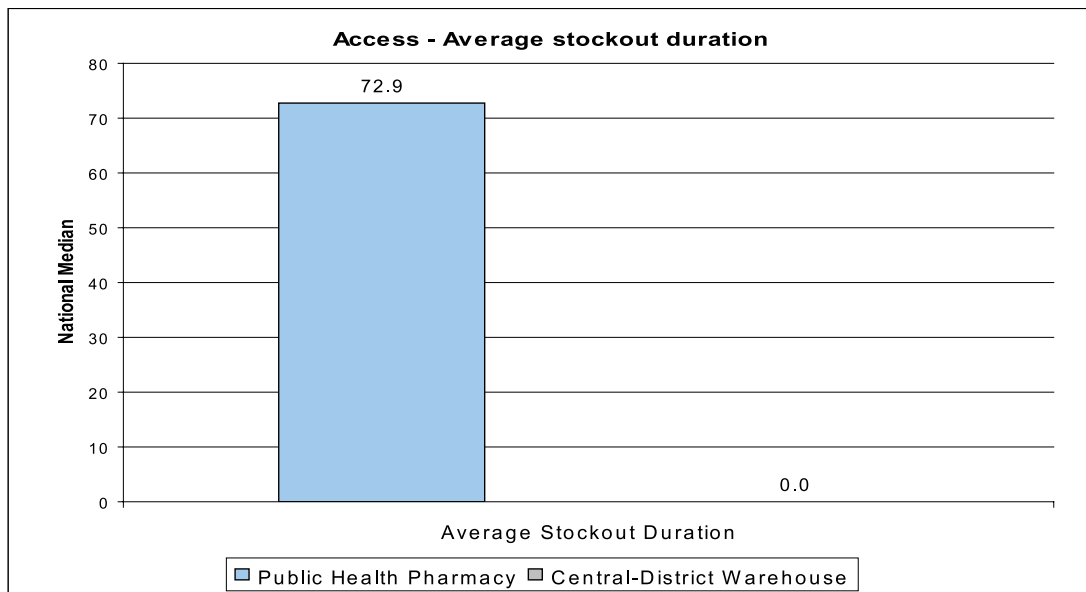
Availability was highest in mission health facilities. Availability in central district stores was low because these are used only as transit points for medicines on the way to the sub-district facilities, and not specifically expected to stock.

3.1.2 Availability of medicines on the day of data collection (global list)

Table 7: Mean availability of medicines (global list) on the day of data collection, public and private sectors. PSA-HFS Level II, Uganda, 2008

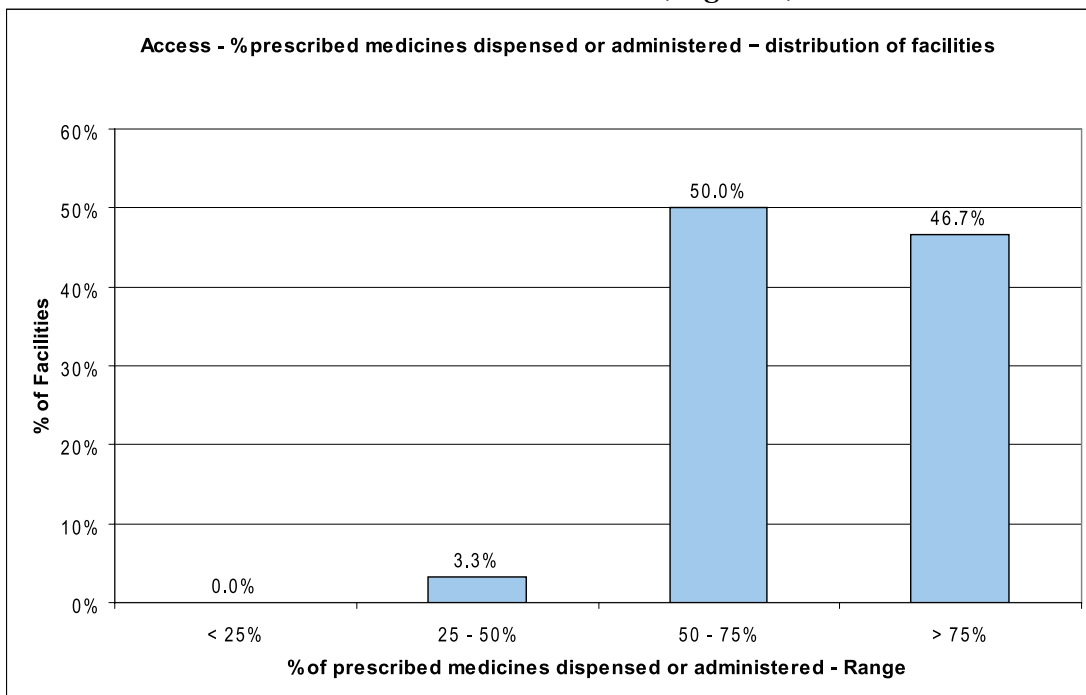
| | Public sector (n = 36 outlets) | | | | Private sector (n = 71 outlets) | |
|--|-------------------------------------|-----------------------|--|-----------------------|-------------------------------------|-----------------------|
| | All medicines (n = 13 medicines) | | EML medicines only (n = 27 medicines) | | All medicines (n = 13 medicines) | |
| | Originator brand | Low-est price generic | Originator brand | Low-est price generic | Originator brand | Low-est price generic |
| Mean availability (standard deviation) | 0 | 24.7% | 3.5% | 45.7% | 0 | 44.3% |

Figure 3: Average stock-out duration in public health facility dispensaries and in warehouses supplying the public sector. PSA-HFS Level II, Uganda, 2008. Average stock-out duration is the number of days in a year in which medicines were out of stock.



Stock-out duration in public health facilities was 72.9 days per year. District stores are not expected to stock medicines but only act as transit points.

Figure 4: Distribution of facilities according to the percentage of prescribed medicines dispensed or administered. PSA-HFS Level II, Uganda, 2008



50-75 % of facilities dispense 50% of prescribed medicines

According to the Annual Health Sector Performance report 2007/8 of the Ministry of Health, 46% of procurement is done through private sector and not centrally through NMS or Joint Medical Store (JMS). The survey collected data on procurements done by districts under the primary health care (PHC) programme.

Of the 28 medicines included in the survey, one originator brand and 22 generics were found in the public procurement sector; the public sector is therefore procuring predominantly generic products. Based on the median MPRs, the public sector is procuring generics at 1.03 times their international reference prices, and not procuring originator brands.

Table 8: Median MPRs for medicines found in public health facility procurement done locally through private sector. PSA-HFS Level II, Uganda 2008

| Product type | Median MPR Public Procurement |
|--|----------------------------------|
| Originator brand (n = medicines) | - |
| Lowest price generic (n = 23 medicines) | 1.03 |

3.1.3 Private sector patient prices

Table 9: Ratio of median unit price to MSH international reference price (median price ratio or MPR), median for all medicines found in private sector. PSA-HFS Level II, Uganda, 2008.

| Product type | Median MPR |
|--|------------|
| Originator brand (n = 1 medicines) | 5.2 |
| Lowest price generic (n = 28 medicines) | 3.16 |

The results above show that in the private sector:

- The Ugandan medicine market is generally generic. There are a few originator/ brand medicines but these were sold at 5.2 times their international reference price.
- Lowest price generic medicines are generally sold at 3.16 times their international reference price.

3.1.4 Comparison of patient prices in the private and NGO sectors

Table 10: Median MPRs for medicines found in both private and mission sectors. PSA-HFS Level II, Uganda, 2008

| Product type | Median MPR Private sector patient prices | Median MPR NGO sector patient prices | % difference NGO to private |
|--|--|--|--------------------------------|
| Originator brand | - | - | - |
| Lowest price generic (n = 25 medicines) | 3.01 | 2.88 | -4.4 |

In the above table, only those medicines found in both private and mission sector medicine outlets were included in the analysis to allow for the comparison of prices between the two sectors. Results show that final patient prices in the private sector are 4.4% higher than in the NGO sector for generic medicines.

3.1.5 Affordability of standard treatment regimens

The affordability of treatment for 13 common conditions was estimated as the number of days' wages of the lowest-paid unskilled government worker needed to purchase medicines prescribed at a standard dose. For acute conditions, treatment duration was defined as a full course of therapy, while for chronic diseases, the affordability of a 30-days' supply of medicines was determined. The daily wage of the lowest-paid unskilled government worker used in the analysis was Ugandan shillings three thousand.

Table 11: Number of days' wages of the lowest paid government worker needed to purchase standard treatments. PSA-HFS Level II, Uganda, 2008.

| Disease condition and 'standard' treatment | | | Day's wages to pay for treatment | | |
|--|----------------------------------|---------------------------------|--------------------------------------|---|---------------------------------------|
| Condition | Drug name, strength, dosage form | Treatment schedule | Lowest price generic - public sector | Lowest price generic – Mission (NGO) sector | Lowest price generic - private sector |
| Asthma | Salbutamol 100 mcg/dose inhaler | 1 inhaler of 200 doses | - | 1.8 | 1.7 |
| Diabetes | Glibenclamide 5 mg cap/tab | 1 cap/tab x 2 x 30 days = 60 | - | 1.0 | 1.0 |
| Hypertension | Atenolol 50 mg cap/tab | 1 cap/tab x 30 days = 30 | - | 0.8 | 1.0 |
| Hypertension | Captopril 25 mg cap/tab | 1 cap/tab x 2 x 30 days = 60 | - | 2.0 | 2.0 |
| Hypercholesterolaemia | Simvastatin 20 mg cap/tab | 1 cap/tab x 30 days = 30 | - | - | 5.0 |
| Depression | Amitriptyline 25 mg cap/tab | 1 cap/tab x 3 for 30 days = 90 | - | 1.5 | 2.3 |
| Adult respiratory infection | Ciprofloxacin 500 mg cap/tab | 1 cap/tab x 2 for 7 days = 14 | - | 0.7 | 0.9 |
| Paediatric respiratory infection | Co-trimoxazole 8+40 mg/ml | 5ml twice a day for 7 days = 70 | - | 0.4 | 0.4 |
| Adult respiratory infection | Amoxicillin 500mg cap/tab | 1 cap/tab x 3 for 7 days = 21 | - | 0.5 | 0.7 |
| Adult respiratory infection | Ceftriaxone 1 g/vial injection | 1 vial | - | 1.0 | 1.0 |
| Anxiety | Diazepam 5mg cap/tab | 1 cap/tab x 7 days = 7 | - | 0 | 0.1 |
| Arthritis | Diclofenac 50mg cap/tab | 1 cap/tab x 2 x 30 days = 60 | - | 1.0 | 1.0 |
| Pain/inflammation | Paracetamol 24mg/ml sus- | child 1 year: 120mg (=5ml) | - | 0.1 | 0.1 |
| Ulcer | Omeprazole 20mg cap/tab | 1 cap/tab x 30 days = 30 | - | 1.5 | 2.0 |

Although medicines are free in the public sector, availability being very low, patients have to resort to private sector and sometimes mission (NGO) sector.

In the private sector, the affordability of lowest price generics in the public sector was poor for most conditions, with standard treatment costing a days' wage or more. Treatments costing over a days' wage of the lowest paid government worker include:

- Asthma, Salbutamol inhaler 100mcg/dose 200 doses can (1.7 day's wages)
- Hypertension, Captopril 25mg 30 units (2 days)
- Hypercholesterolemia, Simvastatin 20mg 30 units (5 days)
- Depression, Amitriptylline 25mg 90 units (2.3 days)
- Ulcer, omeprazole 20mg 30 units (2 days)

The most affordable standard treatments were those for treating acute conditions like:

- Anxiety (0.1 day's wages)
- Pain/inflammation 0.1 day's wages)

When originator brand medicines are prescribed and dispensed in the private sector, several treatments cost well over one days' wage. For example, treating adult uncomplicated malaria with Artemether/Lumefantrine costs 6 day's wages. It should be noted that treatment costs refer to medicines only and do not include the additional costs of consultation and diagnostic tests. Further, many people in Uganda earn less than the lowest government wage; as such even treatments which appear affordable are too costly for the poorest segments of the population. Finally, even where individual treatments appear affordable, individuals or families who need multiple medications may quickly face unmanageable drug costs. An example is provided below of a family where the father has diabetes and the child has asthma. If the family is earning the equivalent of the lowest-paid government worker's salary, total treatment costs are 3 days' wages in both the mission and private sector if the lowest price generics are purchased.

3.1.6 Key findings on access to medicines

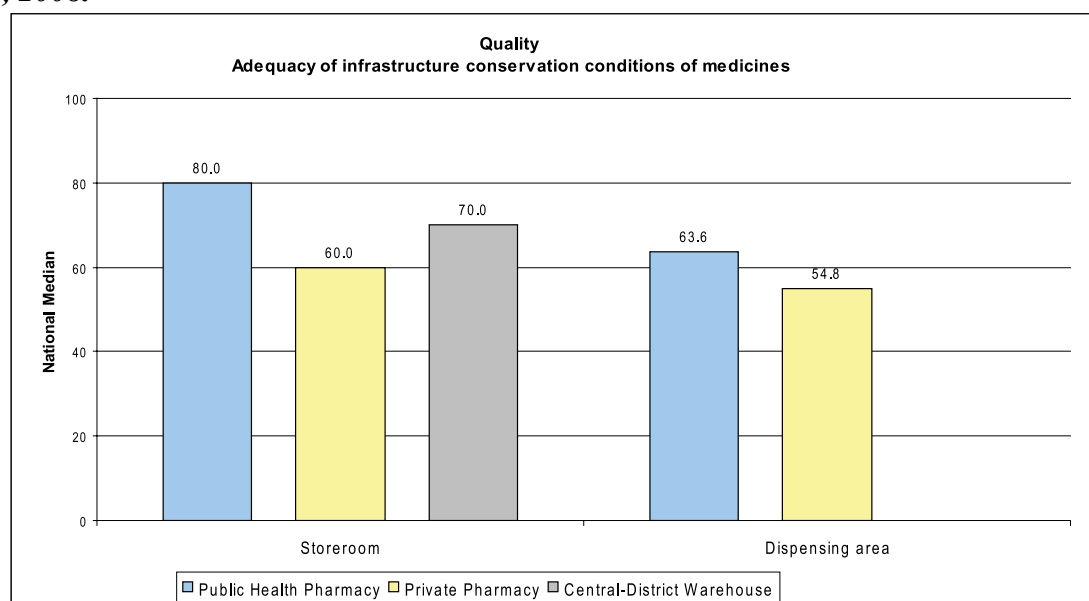
- The percent availability of key medicines (EML) reached 47.5% in the public health facility dispensaries, 57.5% in the mission sector and 56.3% in the private drug outlets, and 20% in the warehouses supplying the public sector, showing a weak performance of this indicator among these sectors, being worst in the warehouses supplying the public sector.
- 75% of prescribed medicines were dispensed or administered to patients at public health facility dispensaries indicating that a moderate percentage of patients had their prescribed medicines obtained at the public health facility dispensaries with a uniform/different performance of this indicator among the health facilities.
- The stock-out duration was 72.9 days/year in the public health facilities, 7.6 days/year in mission facilities and 0 days/year in the warehouses, indicating that though the mission facilities are adequately supplied of medicines for most part of the year, the public facilities are not..
- Stock records adequacy in public facilities was at 66.6%, 66.7% in mission facilities and 60% in district warehouses. A moderate number of facilities showed adequate recording keeping.
- The median for the percentage of patients taking more than one hour to travel to medicine dispensing facility was 0.2% and 0.0% for the public and private sector respectively, indicating a better geographical accessibility for the public/private sector.
- The average transport costs to the public and private dispensary facilities comprise 0.0 and 0.0 of the minimum daily salary respectively, indicating a low burden to poor people.

3.2 Quality of medicines

Table 12: General indicators for quality of medicines, PSA-HFS Level II, Uganda, 2008

| Indicator | National (Median) | 25th Per-centile | 75th Per-centile |
|--|-------------------|------------------|------------------|
| % medicines expired in | | | |
| public health facility dispensaries | 0.0 | 0.0 | 0.0 |
| Mission health facility dispensaries | 0.0 | 0.0 | 0.0 |
| private drug outlets | 0.0 | 0.0 | 0.0 |
| warehouses supplying the public sector | 0.0 | 0.0 | 0.0 |
| Adequacy of storage conditions of medicines in storerooms of public health facility dispensaries | 80.0 | 62.5 | 90.0 |
| dispensing rooms of public health facility dispensaries | 63.6 | 54.5 | 74.8 |
| Storerooms of mission health facility dispensaries | 63.6 | 54.6 | 83.0 |
| Dispensing rooms of mission health facilities | 63.6 | 50.0 | 80.0 |
| storerooms of private drug outlets | 60.0 | 55.0 | 70.0 |
| dispensing rooms of private drug outlets | 54.8 | 45.5 | 72.8 |
| storerooms of warehouses supplying the public sector | 70.0 | 70.0 | 100.0 |

Figure 5: Adequacy of infrastructure of conservation conditions of medicines, PSA-HFS Level II, Uganda, 2008.



The percentage of expired medicines was 0 in the public health facility dispensaries, private drug outlets and warehouses supplying the public sector, respectively, indicating that there were hardly any expired medicines were found on the shelves of these facilities.

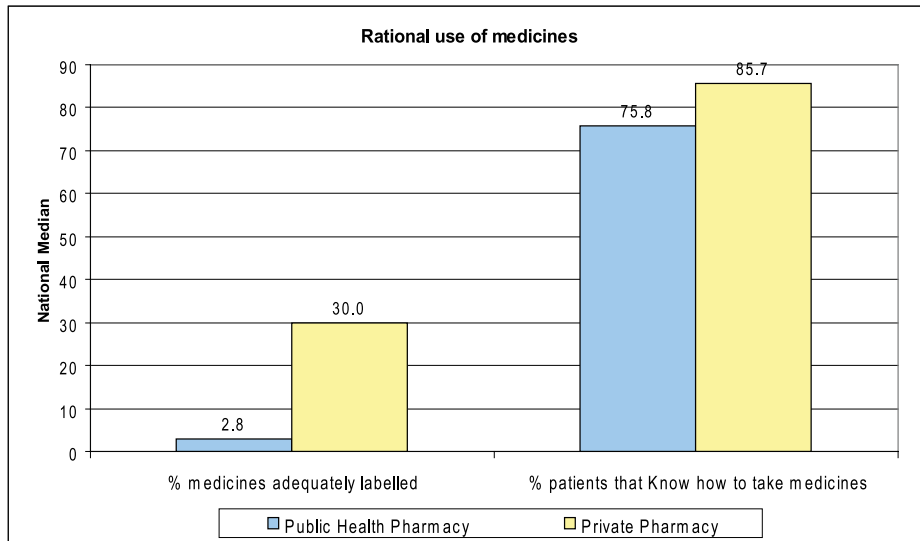
The best result for the adequacy of infrastructure for conservation conditions of medicines was found in public sector storerooms, and the worst in private sector dispensing area, rating 80% and 54.8% respectively.

3.2.1 Key findings on quality of medicines

- Since most results here were fair it is possible to infer that the quality of medicines provided in the country is not an important concern in this part of the supplying chain.
- However, most public health facility storerooms had inadequate space and there were several piles of expired drugs in some facilities although not found on shelves for dispensing.

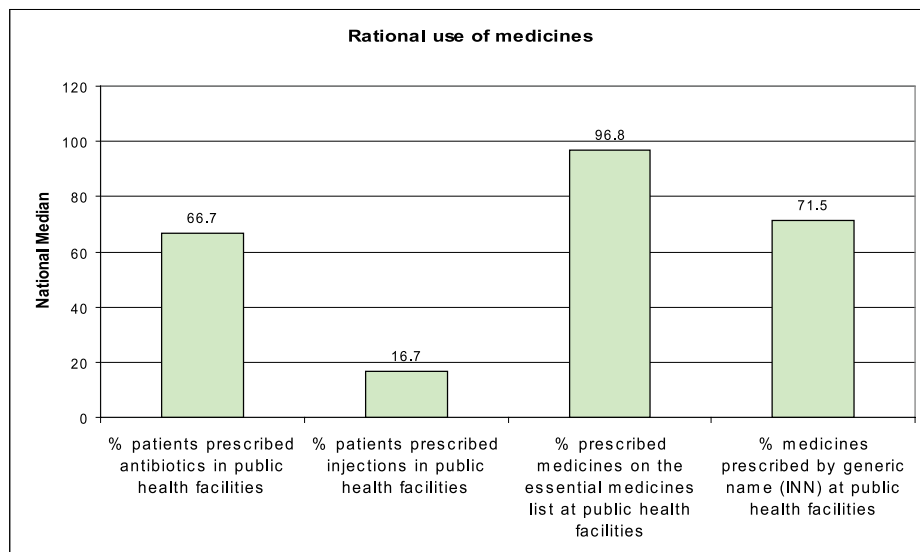
3.3 Rational use

Figure 6: Adequacy of medicine labelling and patient knowledge on how to take medicines



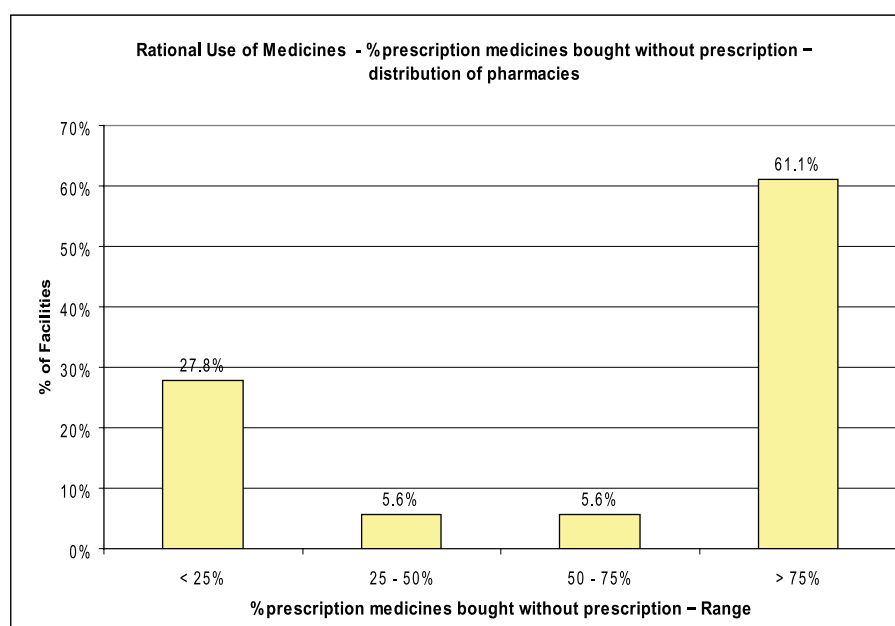
Labelling of medicines was extremely poor especially in public sector but patients had a good knowledge on how they were to take the medicines

Figure 7: Medicine prescribing habits in public sector



The high percentage of patients that were prescribed antibiotics (66.7%) may refer to misuse of these medicines. However, use of injections was low (16.7%)

Figure 8: Percentage of prescribed medicines bought without prescription in private sector



In 61.1% of private facilities, over 75% of prescription medicines would be obtained without prescription

Table 13: General indicators for Rational use of medicines, PSA-HFS Level II, Uganda, 2008

| Indicator | National (Median) | 25th Per-centile | 75th Per-centile |
|---|-------------------|------------------|------------------|
| Prescribing indicators | | | |
| Average number of medicines per prescription at public health facility dispensaries and public health facilities(SF6) | 3.0 | 3.0 | 3.0 |
| Average number of medicines per prescription at public health facility dispensaries and public health facilities(SF7) | 2.9 | 2.6 | 3.3 |
| % patients prescribed antibiotics in public health facilities | 66.7 | 60.0 | 73.3 |
| % patients prescribed injections in public health facilities | 16.7 | 6.7 | 30.0 |
| % prescribed medicines on the essential medicines list at public health facilities | 96.8 | 93.7 | 100.0 |
| % medicines prescribed by generic name (INN) at public health facilities | 71.5 | 57.8 | 80.8 |
| Patient care indicators | | | |
| % medicines adequately labeled at public health facility dispensaries | 3.0 | 0.0 | 66.0 |
| Mission health facility dispensaries | 13.0 | 0.0 | 50.0 |
| private dispensaries | 30.0 | 3.1 | 59.0 |
| % patients know how to take medicines at public health facility dispensaries | 76.0 | 67.0 | 90.0 |
| Mission health facility dispensaries | 77.0 | 57.0 | 100.0 |
| private dispensaries | 85.7 | 68.4 | 100.0 |
| Prescription medicines bought without prescription | 97.8 | 29.5 | 100.0 |
| Facility specific factors for the rational use of medicines | | | |
| Availability of standard treatment guidelines (UCG-2003) at public health facilities | 80.6 | - | - |
| Availability of standard treatment guidelines (UCG-2003) at mission health facilities | 93.9 | - | - |
| Availability of essential medicines list (UEML-2007) at public health facilities | 33.3 | - | - |
| Availability of essential medicines list (UEML-2007) at mission health facilities | 33.3 | - | - |

3.3.1 Key Findings on rational use of medicines

- The EML and the Standard Treatment Guidelines (STG) were found in 33.3% and 80.6% of the public healthcare facilities respectively, indicating that although the STG is available the distribution of EML to the health care professionals is inadequate.
- The average number of medicines per prescription at the public facility dispensaries was 3, which may be considered adequate.
- The percentage of patients with antibiotics prescribed in the public facilities was 66.7%, which may be considered high, indicating irrational prescribing patterns for this group of medicines.
- The percentage of patients with injections prescribed in the public facilities was 16.7%, which may be considered adequate, indicating adequate prescribing patterns for this group of medicines.
- A median percentage 96.8% was found for medicines prescribed according to the Uganda Essential Medicines List, indicating a good adherence of physicians to this list. The list was last updated in 2007 and although prescribing habits in public facilities adhere to it, poor dissemination may be a factor in its low availability in facilities (33.3%).
- 71.5% of medicines in the surveyed prescriptions were prescribed by generic name, which enforces access to medicines and rational use. However, Uganda has no policy on generics/generic substitution.
- The percentage of medicines adequately labelled was 3%, at public health facility dispensaries, 13% at mission facility dispensaries and 30% at private pharmacies. However, it was found that a higher percentage of people knew how to take their medicines.

Table 14: Adherence of prescribers in public facilities to recommended treatment guidelines. PSA-HFS Level II, Uganda, 2008

| Indicator | Information source | Median | National Average | Standard Deviation |
|---|---|--------|------------------|--------------------|
| Non-bacterial diarrhoea in children under age 5 | Total number of cases, | 10.0 | 8.9 | 2.9 |
| | % ORS | 65.0 | 63.6 | 31.6 |
| | % Antibiotics | 50.0 | 51.7 | 33.9 |
| | % Antidiarrhoeal and/or Antispasmodic | 0.0 | 5.3 | 16.1 |
| Mild/moderate pneumonia in children under age 5 | Total number of cases | 10.0 | 8.8 | 2.9 |
| | % receiving any one first line antibiotic | 70.0 | 61.6 | 33.3 |
| | % receiving more than one antibiotic | 40.0 | 42.9 | 31.1 |
| Non-pneumonia ARI in patients of any age | Total number of cases | 10.0 | 9.1 | 2.8 |
| | % Antibiotics | 100.0 | 80.3 | 31.4 |

- Whereas prescribers are doing a good job on conditions such as mild/moderate pneumonia and ARI, they are likely to not to adhere to treatment guidelines for diarrhoea

3.4 Additional information

Table 15: Dispenser profile and compliance with the law, PSA-HFS Level II, Uganda, 2008. The law in Uganda does not require a pharmacist present in facilities lower than hospitals and pharmacies

| Professional dispensing during the visit | Public sector % | Mission sector % | Private sector % |
|--|-----------------|------------------|------------------|
| pharmacist | - | - | - |
| nurse | 44.4 | 48.5 | 44.4 |
| pharmacy aide/ health assistant | 16.7 | 0.0 | 5.6 |
| untrained staff | 38.9 | 48.5 | 50.0 |
| Facilities that comply with the law (presence of a pharmacist) | - | - | 8.3 |

Table 16: Prescriber profile in the public sector, PSA-HFS Level II, Uganda, 2008.

| % Facilities where | doctor | Nurse/Midwife/ Clinical officer | trained health worker/health aide |
|---|--------|------------------------------------|---|
| The professional was present during the visit | 19.0 | 64.0 | 19.0 |
| The most senior prescriber present | 36.0 | 56.0 | 3.0 |
| The most senior professional attended RDU-related training within the previous year | 42.0 | | |

3.4.1 Key findings on additional information

- A pharmacist was not found in any of the public facility dispensaries and in only 8.3% private pharmacies. The law does not require the presence of a pharmacist in the public health sub-district facilities and drug shops that comprised the survey.
- Nurses were the most frequent dispenser found in the public sector, mission and private sector respectively. Untrained staffs were more likely to be found in the private sector.
- The most frequent prescribers found in the public health care facilities were the nurses, midwives and clinical officers. Also the most senior prescribers found were nurses, midwives and clinical officers and 42% of which participated in rational use of medicines training in the previous year.

4. CONCLUSIONS AND RECOMMENDED INTERVENTIONS AND/OR NEXT STEPS

The results of this preliminary analysis suggest that a mix of policies needs to be implemented to make medicines more accessible and used in a more rational way. Although further investigation is required to obtain a more in-depth understanding of the causes and consequences of the findings, the results of this survey provide broad directions for future research and action. It is therefore recommended that the following steps be taken to improve medicine access and medicines use in Uganda:

- There is need to improve availability of medicines in the public sector to increase access to especially the poor
- A national price regulation mechanism is required to address unfair mark-ups in the private sector
- There is need for improvement in regulation of medicine outlets to improve storage conditions of medicines
- CME should be scaled up for all health workers involved in prescribing to curb indiscriminate prescribing of antibiotics in order to mitigate the potential development of resistance
- Continuous CPE is required to improve dispensing practices

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- *UNDP: Uganda Human Development Report 2007, Kampala*

- *Uganda Bureau of Statistics (UBOS): Statistical Abstract 2008, Kampala*

Annex I: Medicines Availability in Outlets

| Medicine Name | Brand | | | Lowest Price | | |
|-------------------------------|---------------|----------------|------------|---------------|----------------|------------|
| | Public (n=36) | Private (n=71) | NGO (n=35) | Public (n=36) | Private (n=71) | NGO (n=35) |
| Albendazole | 0.0% | 0.0% | 0.0% | 58.3% | 52.1% | 42.9% |
| Albendazole 200mg | 0.0% | 0.0% | 0.0% | 5.6% | 35.2% | 14.3% |
| Amitriptyline | 0.0% | 0.0% | 0.0% | 25.0% | 19.7% | 25.7% |
| Amoxicillin | 0.0% | 0.0% | 0.0% | 61.1% | 83.1% | 91.4% |
| Amoxicillin suspension | 0.0% | 0.0% | 0.0% | 5.6% | 81.7% | 71.4% |
| Artemether+lumefantrine | 80.6% | 9.9% | 42.9% | 0.0% | 9.9% | 0.0% |
| Atenolol | | 0.0% | 2.9% | | 18.3% | 20.0% |
| Benzoic acid + salicylic acid | 0.0% | 0.0% | 0.0% | 8.3% | 28.2% | 17.1% |
| Captopril | | 0.0% | 0.0% | | 23.9% | 11.4% |
| Ceftriaxone injection | | 0.0% | 0.0% | | 23.9% | 20.0% |
| Chlorhexidine | 0.0% | 0.0% | 0.0% | 66.7% | 16.9% | 60.0% |
| Chlorpheniramine | 0.0% | 0.0% | 0.0% | 66.7% | 88.7% | 82.9% |
| Ciprofloxacin | 0.0% | 0.0% | 0.0% | 52.8% | 73.2% | 91.4% |
| Co-trimoxazole | 0.0% | 0.0% | 0.0% | 91.7% | 87.3% | 88.6% |
| Co-trimoxazole suspension | 0.0% | 0.0% | 0.0% | 5.6% | 76.1% | 74.3% |
| Diazepam | 0.0% | 0.0% | 0.0% | 63.9% | 49.3% | 74.3% |
| Diclofenac | 0.0% | 0.0% | 0.0% | 25.0% | 90.1% | 60.0% |
| Glibenclamide | 0.0% | 0.0% | 0.0% | 19.4% | 21.1% | 22.9% |
| Mebendazole | 0.0% | 0.0% | 0.0% | 75.0% | 80.3% | 82.9% |
| Metronidazole | 0.0% | 0.0% | 0.0% | 77.8% | 91.5% | 88.6% |
| Omeprazole | | 0.0% | 0.0% | | 66.2% | 45.7% |
| Oral rehydration salts | 0.0% | 0.0% | 0.0% | 86.1% | 56.3% | 82.9% |
| Paracetamol | 0.0% | 0.0% | 0.0% | 75.0% | 98.6% | 85.7% |
| Paracetamol suspension | 0.0% | 0.0% | 0.0% | 0.0% | 85.9% | 40.0% |
| Salbutamol inhaler | 0.0% | 0.0% | 0.0% | 5.6% | 21.1% | 14.3% |
| Simvastatin | | 0.0% | 0.0% | | 7.0% | 0.0% |
| Sulphadoxine+ pyrimethamine | 0.0% | 0.0% | 0.0% | 91.7% | 80.3% | 82.9% |
| Tetracycline eye ointment | 0.0% | 0.0% | 0.0% | 83.3% | 60.6% | 71.4% |



