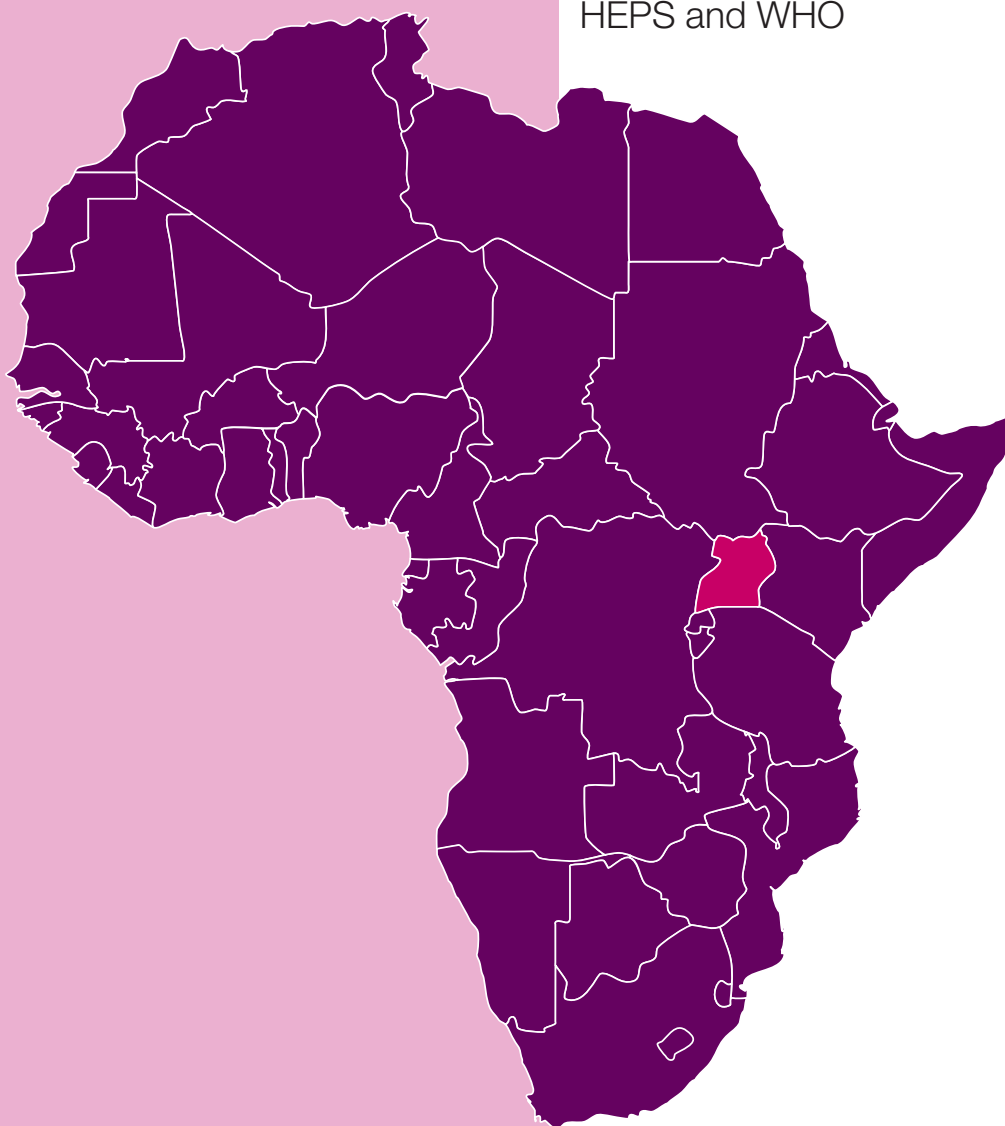


MMV Market Surveys

Supply Chain and Price Components of Antimalarial Medicines: Uganda 2007

A study by Medicines for Malaria Venture
in collaboration with Ministry of Health Uganda,
HEPS and WHO



Medicines for Malaria Venture

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Report drafted by Renia Coghlan, Martin Auton and Aziz Maija

Edited by Julie N. Reza and Jaya Banerji

Cover design: phg-Pascale Henriod, Nyon

Content layout design: Pierre Chassany, ComStone

Photos: MMV and Shutterstock

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For further information contact Renia Coghlan, coghlannr@mmv.org

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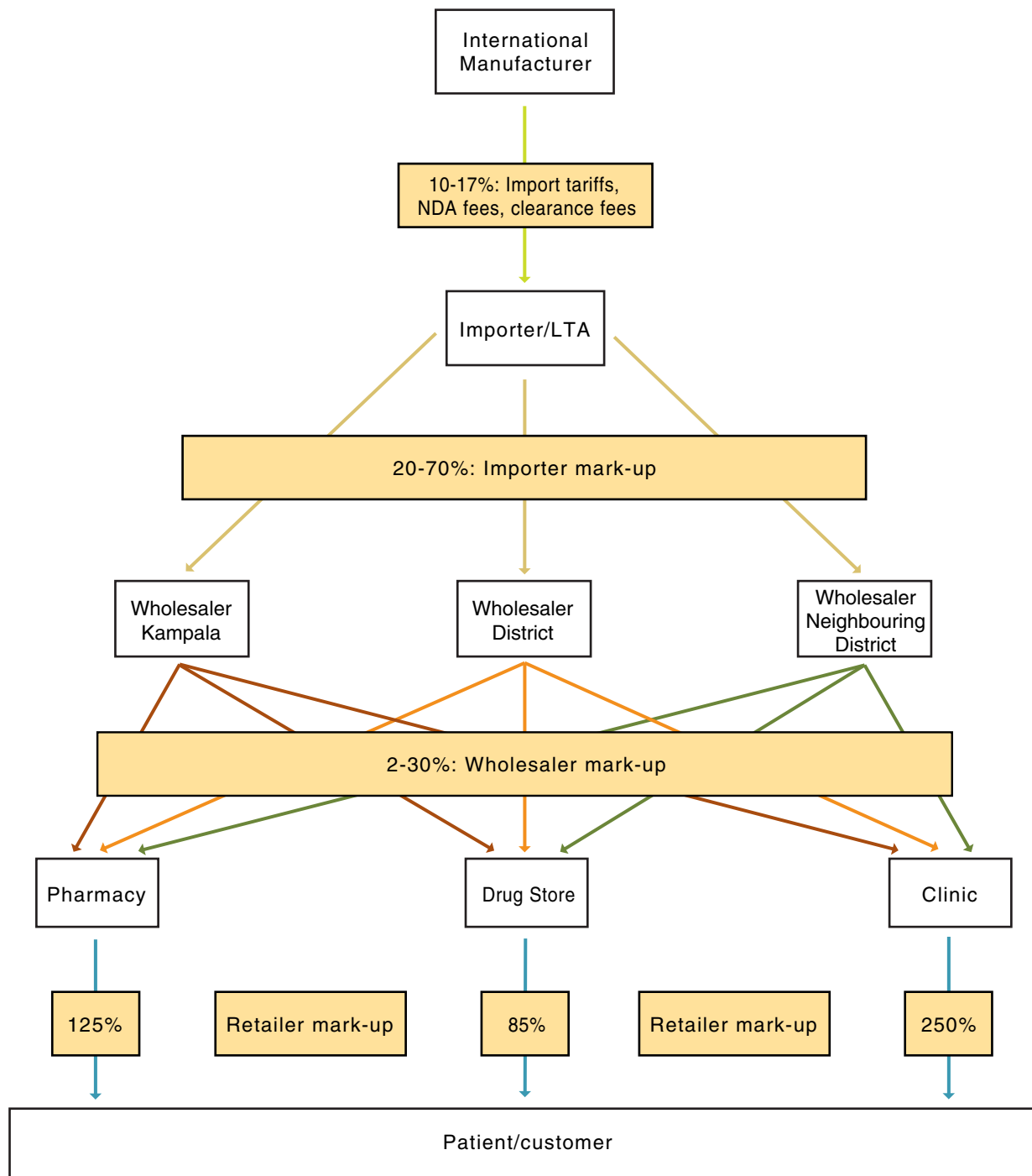
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Overview of findings

Price components are costs added along the supply chain, from manufacturer to consumer

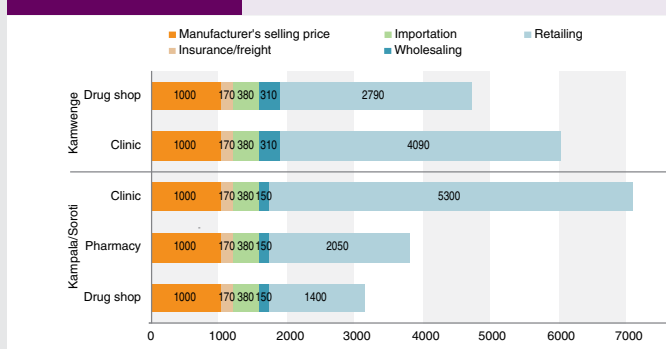
In Uganda, mark-ups are added at 4 levels in the supply chain for an imported product



Mark-ups are high

Up to
375%

The overall mark-up found in private clinics compared to other outlets

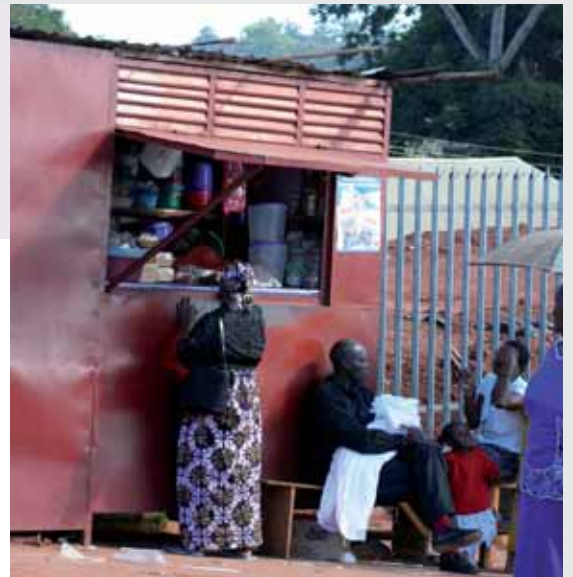
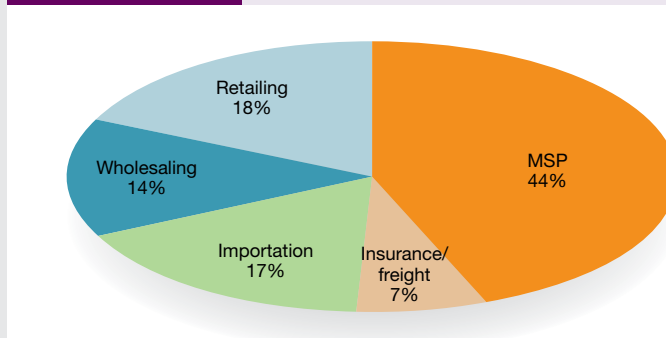


Retail mark-ups vary significantly

In some cases
as little as

18%

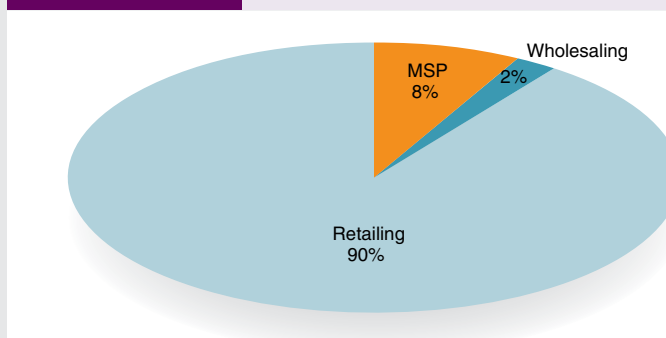
Of the final patient price can be the retail mark-up alone



In some cases
as much as

90%

Of the final patient price can be the retail mark-up alone, while as little as 8% may be due to the manufacturer's original selling price



Executive summary

Artemisinin combination therapies (ACTs) are the recommended treatment for uncomplicated malaria in Uganda. However, their uptake remains relatively low – in part due to availability issues, but also due to the high cost of ACTs in relation to cheaper, less effective alternatives. This is of great concern to all parties with an interest in access to medicines and the control of malaria, including governments, non-governmental organisations (NGOs), prescribers and patients – particularly in countries with high levels of poverty such as Uganda.

This study, led by Malaria for Medicines Venture in collaboration with the Ministry of Health Uganda, the Coalition for Health Promotion and Social Development (HEPS) and the World Health Organization (WHO) gives insight into the supply chain in Uganda, and how standard and variable price components contribute to final patient price of medicines. Together with the previously published report 'Understanding the Antimalarials Market: Uganda 2007 – an overview of the supply side', this report provides an evidence base for devising policies to replace ineffective medicines with ACTs.

Price components are the costs added to the manufacturer's selling price (MSP) as medicines pass along the supply chain from factory gate to consumer; they therefore affect final patient price and can influence the use of a particular medicine. This report identifies the structure of the medicines supply chain and the various

price components of eight manufactured¹ antimalarials and five other essential medicines available in public and private sectors in Uganda. The study combines policy and tariff data with informant interviews (from both public and private sector outlets) in three regions of Uganda: Kampala, Kamwenge, and Soroti.

■ Key Findings

- Price components are added to the manufacturer's selling price (MSP) by **three main players** in the supply chain – importer, wholesaler and outlet/retailer (e.g., pharmacy, drug store or clinic).
- The mark-ups added at each supply chain step, and hence the final patient price, vary considerably according to **sector** and **region**. This phenomenon is not restricted to antimalarial medicines.
- The **supply chain** is more complex for rural regions than for urban regions, particularly at wholesaler level. Mark-ups at this level can therefore vary greatly between regions.
- The **MSP** often makes a relatively small contribution (as little as 8%) to the final patient price when compared to the sum of mark-ups made further down the supply chain.

¹ The report considered manufactured medicines only, as opposed to herbal remedies.

- The patient price of **locally-produced** products is generally similar to **imported products** – suggesting that savings in insurance and freight are offset by higher retail mark-ups.
- **Retail mark-ups** generally make the greatest contribution to the final patient price in almost all sectors, accounting for up to 90% of the final patient price. **Private clinics** generally have the highest retail mark-up.
- The price of a product from the factory gate to the consumer was found to increase on average as follows:
 - For an imported product: overall mark-ups were found to be typically 150-250% in retail pharmacies; 120-200% in drug shops; and 280-375% in private clinics.
 - For locally-produced products: overall mark-ups were found to be typically 120% in retail pharmacies; 130% in drug shops; and 160% in the private clinics.

■ Conclusions

- **Retail mark-ups** may be affected by marketing practices such as '**cross subsidization**' and '**store traffic drivers**'; they may also be influenced by affordability.
- Price components have a **cumulative** impact. Thus, even a relatively small price component early in the supply chain can contribute significantly to final patient price.

Large price variations suggest (a) that the market for medicines is imperfect and (b) that the customer/patient does not shop around. Variations in mark-ups highlight the need to further understand their drivers, and to explore the potential for introducing new price/volume constructs.

Suggested recommendations

- Improve understanding of what leads outlets to stock and sell a particular product.
- Improve understanding of how products are priced at retail outlets.
- Pilot alternative approaches to encourage the private sector to move away from supplying older, ineffective classes of medicines to supplying ACTs (while recognising the need for sufficient incentive to maintain supplies).
- Encourage investment in initiatives to achieve economies of scale in uptake of ACTs, to achieve lower consumer prices and higher volume of product sold.
- Improve understanding of 'reasonable' margins required to cover standard business costs.
- Consider ways of increasing public awareness on recommended price levels (i.e., 'what the price should be') for different pharmaceutical products, while respecting national price liberalisation policies.

Background

In August 2008 Medicines for Malaria Venture (MMV) published a report entitled: 'Understanding the Antimalarials Market: Uganda 2007 – an overview of the supply side'². This report, based on studies carried out in 2007, gave an overview of the market for antimalarial medicines in Uganda – focusing on availability, price, and affordability. The report also touched on aspects of the supply chain and components of price for antimalarial medicines.

As price is an important factor in determining how and when medicines are used (by public or private facilities, and by consumers themselves), this supplementary report specifically focuses on the supply chain and price component issues.

WHAT ARE PRICE COMPONENTS?

Price components are all additional costs applied to the manufacturer's selling price (MSP) as medicines pass along the supply chain from the factory gate to the patient or consumer. The final price paid by that patient or consumer is made up of several price components, including:

- MSP
- Costs for freight and distribution
- Import tariffs, taxes, statutory responsibilities, and dispensing fees

- Mark-ups – to meet overheads and distribution expenses and, for commercial (for-profit) organisations, to ensure they make a profit after staffing costs, costs of property and equipment, and costs of investment in an inventory.

These price components arise from a variety of sources, including:

- Government-collected tariffs
- Mark-ups collected by the distribution chain
- Inefficient procedures in procurement.

WHY DO PRICE COMPONENTS MATTER?

Components of price affect the final price of antimalarials in two ways:

- They have a **direct** impact on the price of the medicine
- They have a **cumulative** impact on price; because they are applied to the running total as medicines move along the supply chain, each price component raises the price on which all subsequent charges are levied. Thus, even a relatively small price component early in the supply chain can contribute significantly to price, as its effects are compounded when other price components are applied.

This overall impact on the final price of medicines means that price components can affect the affordability and use of medicines, which is a concern for anyone involved in public health and access to medicines.

² Full report available at www.mmv.org/access/marketsurveys/Uganda2007

MALARIA IN UGANDA

Like many other developing countries, Uganda faces enormous problems in relation to poverty and health. The burden of malaria is enormous, with malaria and malaria-related illnesses being responsible for³ :

- 70-100,000 deaths per year (malaria-specific)
- 14% of all inpatient deaths
- 20-23% of hospital deaths among under 5s
- 46% of illness among children.

Uganda's malaria treatment policy has changed over recent years:

- In 2000, the first-line therapy for malaria changed from chloroquine (CQ) to CQ plus sulphadoxine-pyrimethamine (SP) (CQ+SP). The usefulness of this combination was short lived, however – CQ resistance was already very high and SP resistance had started to spread rapidly.

- In 2004, Uganda adopted artemisinin combination therapies (ACTs), in particular artemether-lumefantrine (AL), as the first-line treatment for uncomplicated malaria⁴. This new medicine policy was rolled out countrywide in 2006.

Uganda's National Medicine Policy (NMP) aims to make essential medicines accessible to all those who need them – by ensuring that they are affordable and always available in all parts of the country. For malaria, this means that ACTs (particularly AL) need to be accessible in the private sector as well as at public (i.e., government) health facilities; they also need to be available to everyone, in both urban and rural settings, at a reasonable price. Knowing more about how medicines are priced should contribute to achieving such a goal.

ANTIMALARIAL MEDICINES: ACCESS, AFFORDABILITY AND AVAILABILITY

Antimalarial medicines are available through the public or private sector. Uganda has:

- 2,939 public-sector health facilities (i.e., government facilities)
- 285 private-sector pharmacies and 2,600 private-sector drug shops

Access to public-sector health facilities is limited – only 49% of the population live within five kilometres of such a facility. As a result, approximately, 40-60% of antimalarials are sourced through the private sector, with patients and consumers purchasing their antimalarial supplies from private outlets such as pharmacies, private clinics, drug shops or retail shops⁵. The fact that patients and consumers have to purchase their own medicines in this way is important in a country where almost one-third of the

population lives below the poverty line⁶, and where studies have shown that antimalarials remain unaffordable to a significant proportion of the population.

Also important is the fact that although they are available (to some extent) at public health facilities, ACTs are not widely available in the private sector. Instead, CQ or SP remain the standard private sector treatments. The high cost of ACTs is one of the factors contributing to their low availability in this private-sector network, along with:

- Low awareness of ACTs among retailers and the community
- Prescription-only status of ACTs
- Reluctance to change from CQ (possibly because of its antipyretic effect).

THE ANTIMALARIALS MARKET IN UGANDA

The 'Understanding the Antimalarials Market: Uganda 2007 – an overview of the supply side' report, based on research

carried out in 9 districts, gives a good overview of the antimalarials market in Uganda. Key findings on next page.

³ Ministry of Health, quoted in the WHO/UNICEF Africa Malaria Report (2003) and MOH Surveillance Reports (2001)

⁴ With artesunate + amodiaquine as alternative first-line treatment for uncomplicated malaria and quinine as second line. For severe malaria: parenteral quinine or parenteral artemisinin derivatives as an alternative. For Intermittent Preventive Treatment (IPT) in pregnancy: sulphadoxine/pyrimethamine. Uncomplicated malaria in pregnant women during the first trimester: quinine and after the first trimester: ACTs may be used. For children below 5 kg body weight: quinine

⁵ Retail shops are not licensed to sell certain medicines, although in practice many do

⁶ Uganda National Health Survey 2005/6

WHAT OUTLETS WERE FOUND TO BE SELLING ANTIMALARIALS?

Antimalarial medicines were found in a wide range of outlets, which were categorised into eight types (see Table 1).

Table 1: Categorisation of outlets into eight types			
Types of Outlets	Description	Public/ private sector	Formal/ informal sector
1. Public facility	Public-sector health facility managed by the Ministry of Health – ranging from clinics to hospitals	Provide “public /not-for-profit” services	Formal (licensed) outlets/ providers
2. Community Drug Distributor (CDD)	Community-based distributor implementing home-based management of fever (HBMF) for the Ministry of Health ⁷		
3. NGO/mission	Private, not-for profit sector operating clinics and hospitals, collaborating with and supported by the Ministry of Health		
4. Retail pharmacy	Licensed by the National Drug Authority (NDA) within the last 3 years	Provide “private/ for-profit” services	Informal (unlicensed) outlets (<i>in terms of the supply of medicines</i>)
5. Drug shop	Licensed by the National Drug Authority (NDA) within the last 3 years		
6. Private clinic	Licensed by the Medical and Dental Practitioners Council within the last 3 years		
7. Retail store	Fixed structure unlicensed retail outlets selling medicines		
8. Market/vendor	Temporary/mobile structures/individuals		

WHICH ANTIMALARIAL MEDICINES WERE AVAILABLE ON THE MARKET?

The May 2007 National Drug Authority (NDA) register listed 182 antimalarial medicines. A comparison of this register with medicines available on the market (across the study districts) showed:

- Many *unregistered* medicines (including 12 CQ formulations) were found on the market
- Some *registered* medicines (including 10 of 27 registered ACTs) were not found on the market.

WHAT WAS THE PRICE OF A COURSE OF ANTIMALARIAL TREATMENT?

Price varied enormously – from the cheapest antimalarial (CQ or SP for adults), priced at USh 200 (USD 0.12)⁸, to the most expensive antimalarial (artemisinin monotherapy for children), priced at USh 40,000 (USD 24.00). A course of ACTs for adults was around 30-60 times more expensive than the price of ineffective non-artemisinin therapies, while a course of ACTs for a child of 5 years was around 5-10 times the price of ineffective non-artemisinin therapies. Typical prices of a course of oral treatment for adults, for example, were:

- ACT: USh 9,000-20,000 (USD 5.40-12.00)

- Artemisinin monotherapy: USh 10,000-27,500 (USD 6.00-16.50)
- Quinine: almost universally USh 4,200 (USD 2.50)
- Amodiaquine (AQ), CQ and SP: USh 200-1,000 (USD 0.12-0.60).

The cost of a treatment course varied widely for some medicines between and within districts, sectors and location, but did not vary at all for other medicines. **This implies a need for better understanding of the supply chain and drivers of cost in order to best influence consumer price.**

⁷ To date, this has involved the distribution of Homapak (pre-packaged CQ+SP)

⁸ USh = Ugandan Shilling, USD = United States dollar. Exchange rate used : 1 United States dollar = 1680 Uganda Shillings (28 April 2007)

Study objectives

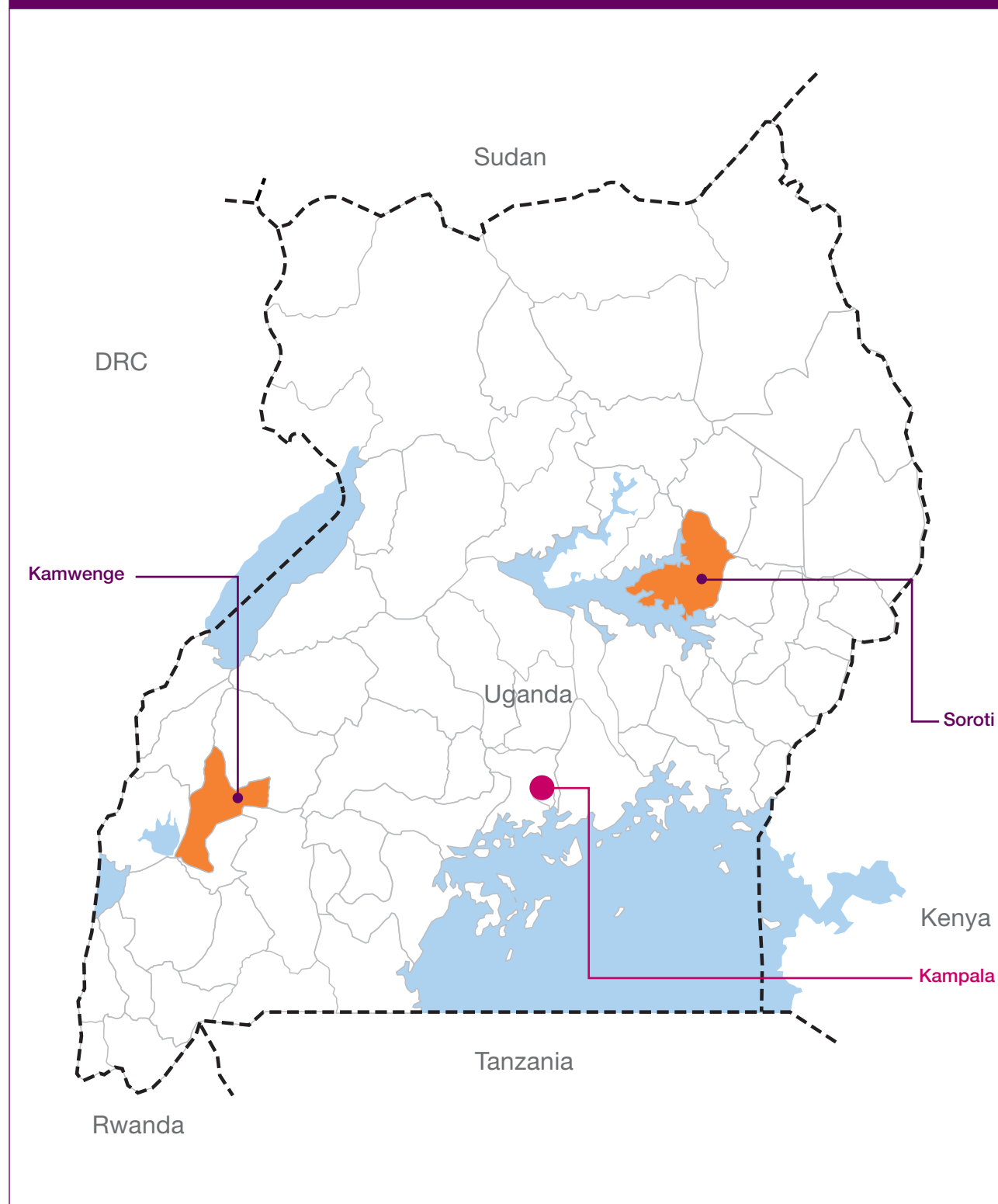
The principal objective of this study was to identify the various price components that contribute to the final patient price of manufactured antimalarial medicines and other essential medicines in both the public and private sectors (licensed and unlicensed) as medicines move along the supply chain. As the range of mark-ups is highly variable, the study focuses on examples and does not aim to provide statistically significant absolute findings.

Research questions included:

- What are the various components of the final patient price for antimalarial and other essential medicines added at various stages of the supply chain? i.e., at the:
 - Factory gate
 - Port of entry for imported medicines
 - Wholesalers
 - Retail outlet
- How do these price components vary between different sectors and between different regions of the country?



Figure 1: Map of Uganda with study areas for price components



Methodology

The study was conducted in 2007 as follows:

- Medicines were tracked in eight different public and private-sector outlets (see Table 1, page 10), at all stages between procurement from the manufacturer and retail sale to the patient.
- For each selected medicine, where possible, data was collected for both the originator brand product and the lowest price generic equivalent.
- The price components section of the study was based on data collected at central level⁹ alongside semi-structured interviews with key informants from different levels of the supply chain. The list of informants and supply chain stages was based on the methodology used in the 2004 WHO/Health Action International (HAI) survey conducted across Uganda¹⁰.

STUDY DISTRICTS

The following districts were selected:

1. Kampala – as the nucleus of the pharmaceutical supply chain in Uganda
2. Soroti – as a district with an intermediate level of pharmaceutical supply chain infrastructure and outlets
3. Kamwenge – as a distant rural district with very little pharmaceutical supply chain infrastructure and outlets.

MEDICINES

Eight antimalarial medicines and five other (non-antimalarial) essential medicines were studied for this report. The latter allowed a comparative assessment on whether antimalarial medicines were subject to specific price component costs different from other essential medicines. The originator brand (where relevant), the perceived market leader, low- and high-price versions, and locally-produced and imported products were included for each medicine studied.

Selection of antimalarial medicines

Antimalarial medicines were selected on the basis of current and previous malaria treatment guidelines; medicines widely used to treat malaria (though often not according to guidelines) were also included in the study.

The eight antimalarials selected for the study were:

1. Chloroquine tablets (250mg): Chloroquine (Uganda Pharmaceuticals) & Sugaquin
2. Sulphadoxine-pyrimethamine tablets (500mg/25mg): Fansidar (originator) & Kamsidar
3. Artemether-Lumefantrine tablets (20mg/120mg): Coartem (originator) & Lumarten
4. (B-)Artemether tablets (50mg): Artemedine
5. Artesunate+amodiaquine tablets (50mg / [153/200mg]): Larimal

6. Dihydroartemisinin-piperaquine phosphate tablets (40mg/320mg): Duocotexcin (originator)
7. Quinine injection (300mg/ml): Rotexmedica
8. Artemether injection (20mg/ml): Artenam paediatric.

Selection of other essential medicines

The other non-antimalarial essential medicines group included those investigated in 'components studies' carried out by other organisations in the East African Community (EAC) countries. The medicines were selected based on:

- Burden of disease for acute and chronic conditions (in Uganda and EAC countries)
- Single and multiple sources of manufacture, and previous studies that demonstrated interesting price dynamics.

The five other essential medicines selected for the study were:

1. Ciprofloxacin tablets (500mg): Ciprobid, Ladinin
2. Cotrimoxazole suspension (240mg/5ml): Septrin (originator), Metrim
3. Glibenclamide tablets (5mg): Betanase
4. Metronidazole tablets (200mg): Metronidazole (Cosmos), Metrogyl
5. Procaine penicillin fortified (4MIU): Alembic Ltd

⁹ In other words, data was collected at the entry point for imported medicines, from the National Medical Stores and the Joint Medical Stores)

¹⁰ <http://www.haiweb.org/medicineprices/manual/documents.html>

DATA COLLECTION

Data collection began at central level, with investigators gathering information on national policies that affect pharmaceutical prices, including information on:

- Policies on taxes levied on medicines (both along the supply chain and to the final customer)
- Policies on quality assurance (as set by the Ministry of Health), and associated charges for any required quality assurance tests
- Policies that control mark-ups in the supply chain
- Entry points of imported medicines into the country (noting port fees and costs incurred at customs), import tariffs on finished products, and financial charges incurred in importing pharmaceuticals (e.g., charges for letters of credit)

In the second part of data collection, information was collected on the medicines' supply chain and on price components added along the supply chain. To overcome

difficulties due to the existence of many possible distribution routes and intermediaries, researchers began the survey at the end of the supply chain (e.g., at outlets such as retail pharmacies) and then tracked the targeted medicine back to the beginning of the supply chain (i.e., the manufacturer/importer).

Data were collected through semi-structured interviews:

- **At outlets:** investigators collected information on procurement price and dispensing price. They also identified the wholesaler or public sector supplier for each medicine, and noted any mark-ups, taxes and dispensing fees
- **At wholesalers and public sector suppliers:** investigators collected information on wholesale mark-ups, local distribution costs and any taxes collected. They also identified the international supplier or local manufacturer.

Findings –1

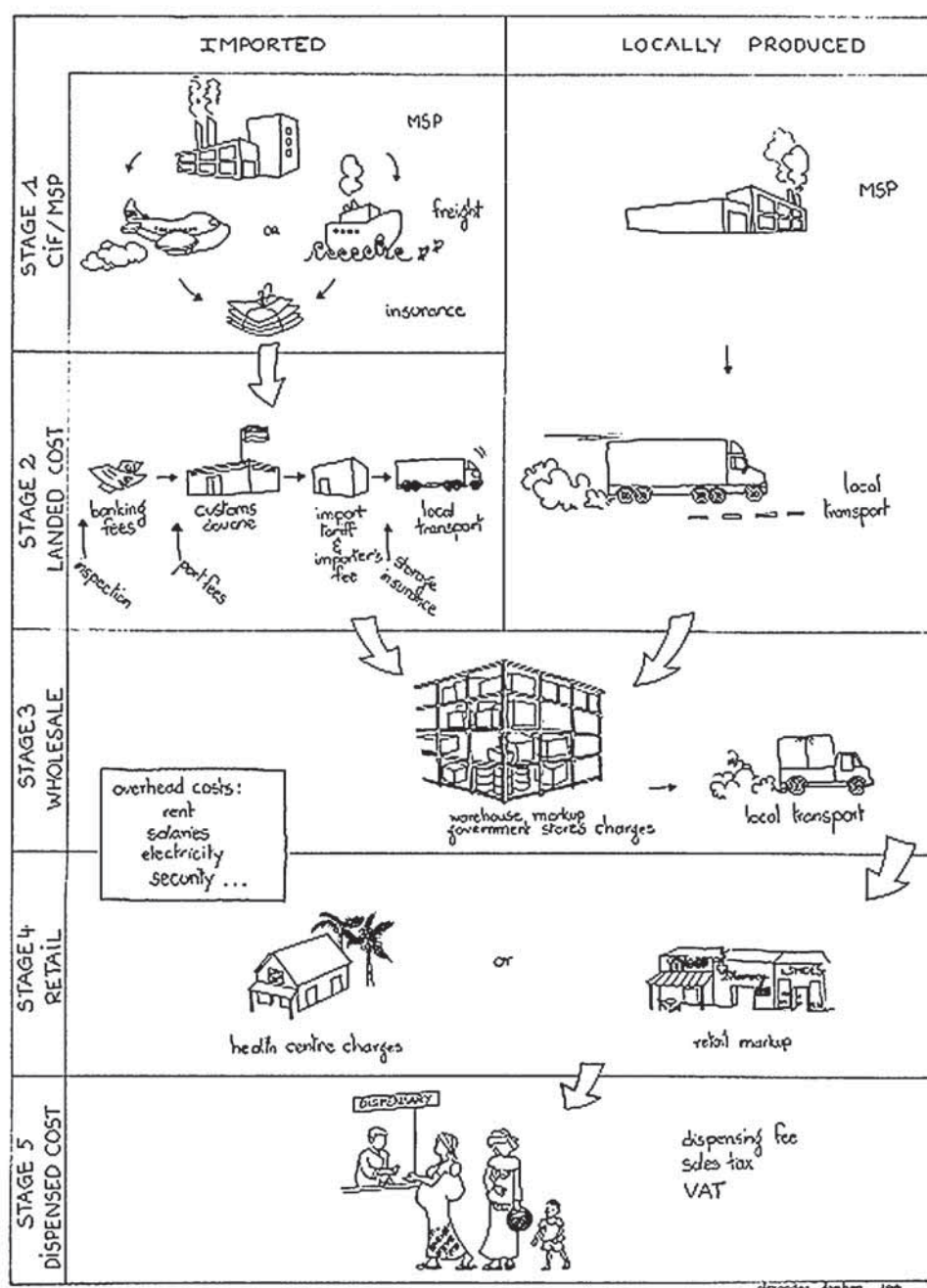
■ The medicines supply chain structure in Uganda

Medicines in Uganda are either imported from an international manufacturer or are manufactured locally (see Figure 2, which is based on the WHO/HAI medicines prices survey carried out in 2004; no dispensing fees or sales taxes are applied to medicines, so stage 5 does not apply to this study). Knowing the steps and activities at each stage of the supply chain will

help stakeholders understand how price components arise and how and why they are added onto the initial MSP.

This chapter takes a closer look at the supply chain structure in Uganda, the license fees charged at each stage of the supply chain, as well as the standard and variable elements of price components added at each stage.

Figure 2: The supply chain



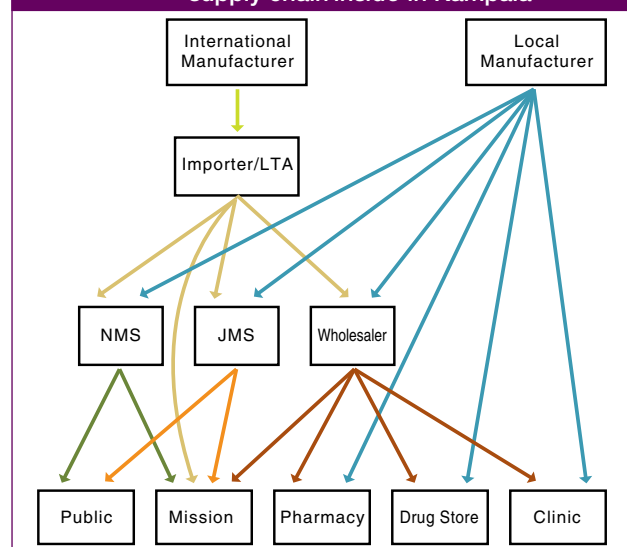
SUPPLY CHAIN STRUCTURE

The medicines supply chain could be divided into four main levels:

- Manufacturer
- Importer (for medicines manufactured outside Uganda)
- Wholesaler (National/Joint Medical Stores)
- Retail outlet – licensed (formal) and unlicensed (informal).

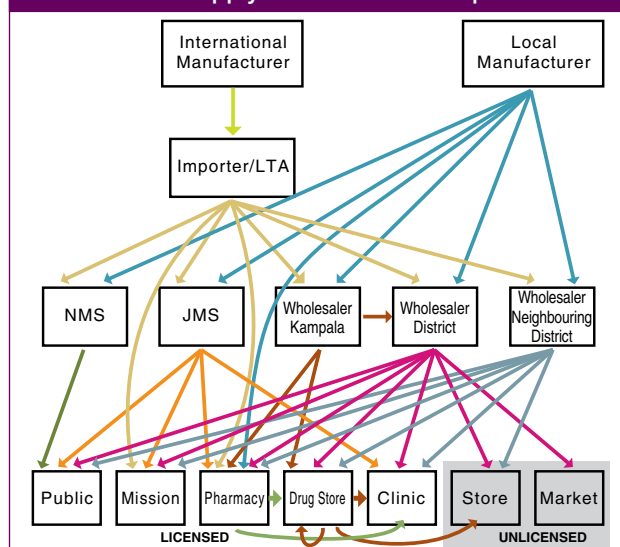
The way in which these levels interact can be complex, and can vary from region to region. For instance the supply chain inside Kampala, the capital city, differed from that found outside Kampala (see Figures 3 and 4 for representations of the supply chains inside and outside Kampala respectively).

Figure 3: Diagrammatic representation of the supply chain *inside* in Kampala



- Inside Kampala (Figure 3): The supply chain has few layers (e.g., local manufacturer -> wholesaler -> drug store). This is because private-sector retail outlets can find multiple wholesale sources within relatively short distances of each other, meaning that they can obtain their supplies directly from wholesale sources.

Figure 4: Diagrammatic representation of the supply chain *outside* Kampala



- Outside Kampala (Figure 4): The situation is more complex. There is quite a lot of horizontal trading between different wholesalers, adding layers to the supply chain (e.g., local manufacturer -> wholesaler Kampala -> wholesaler district -> drug store). Some retail outlets also perform wholesaler functions (e.g., drug store -> other drug stores or clinics). While some retail pharmacies can also have wholesale licenses, drug stores and clinics cannot; this means that this type of wholesaler activity is sometimes carried out illegitimately, outside the scope of licenses.

LICENSE FEES

The National Drug Authority (NDA) charges a number of fees for importation of medicines, registration of medicines, as well as fees for premises; these are listed below¹¹

Import/export fees

- Annual import or export permit: US\$ 300,000 (USD 180)
- Provision of import or export permit (per consignment): US\$ 100,000 (USD 60)
- Verification fee: 2% FOB¹²
- Quality control (QC) testing – included in the above unless there are more than three different batches of the same medicine in a shipment

Fees for registration of products:

- Initial registration:
 - Imported medicines: USD 1,000
 - Locally-produced medicines: USD 200 – less for essential medicines not currently registered of low commercial value

Retention fee:

- Imported medicines: USD 300
- Locally-produced medicines: USD 100 – less for essential medicines not currently registered of low commercial value

Fees for premises:

The NDA also charges the following annual fees for premises per year:

- Wholesaler: New applications: US\$ 1,035,000 (USD 600); renewals: US\$ 785,000 (USD 470) – less for municipal and rural areas
- Drug shop: New applications: US\$ 172,000 (USD 100); renewals: US\$ 132,000 (USD 80) – less for municipal and rural areas
- Pharmacy: New applications: US\$ 830,000 (USD 500); renewals: US\$ 630,000 (USD 375) – less for outside Kampala central division, municipal and rural areas

The Medical Council of Uganda charges US\$ 250,000 (USD 150) to license premises as private clinics.

STANDARD COSTS AT EACH STAGE OF THE SUPPLY CHAIN

Table 2: Price components added at different stages of the supply chain	
Steps in the supply chain	Price Components
Stage 1: Manufacturer	Includes manufacturer's selling price plus costs of transport to purchasing entity for locally-produced medicines
Stage 2: Importation	Banking fees for foreign currency; inspection charges; port fees; customs clearance; import tariff; importer mark-ups; and profit margin
Stage 3: Wholesaling	Wholesalers expenses – e.g., quality control, storage, handling, overhead expenses; and profit margin
Stage 4: Retailing outlets	Retailers expenses – e.g., storage, handling, overhead expenses; and profit margin

¹¹ The fees are correct based on figures obtained in August 2007. The exchange rate used is 1USD = 1,680 US\$ (28 April 2007)

¹² Freight on Board

Table 3 and Figures 5 and 6 summarise typical mark-ups in the supply chain for imported and locally-produced products.

Table 3: Typical mark-ups along the supply chain					
Stages in the supply chain		Add-on		Imported	Locally-produced
Stage 1		Insurance and freight		10-17%	n/a
Stage 2		NDA inspection fee		2%	n/a
		Clearance & finance/banking charges		2%	n/a
		Importer (higher for single source products)		20-70%	n/a
Stage 3		Wholesaler		2-30%	15%
Stage 4		Retailer (typically)	Pharmacy	125%	105%
			Drug shop	85%	115%
			Clinic	250%	145%
Overall mark-ups from ex-factory price			Pharmacy	150-250%	120%
			Drug shop	120-200%	130%
			Clinic	280-375%	160%

Figure 5: Typical mark-ups along the supply chain for an imported product

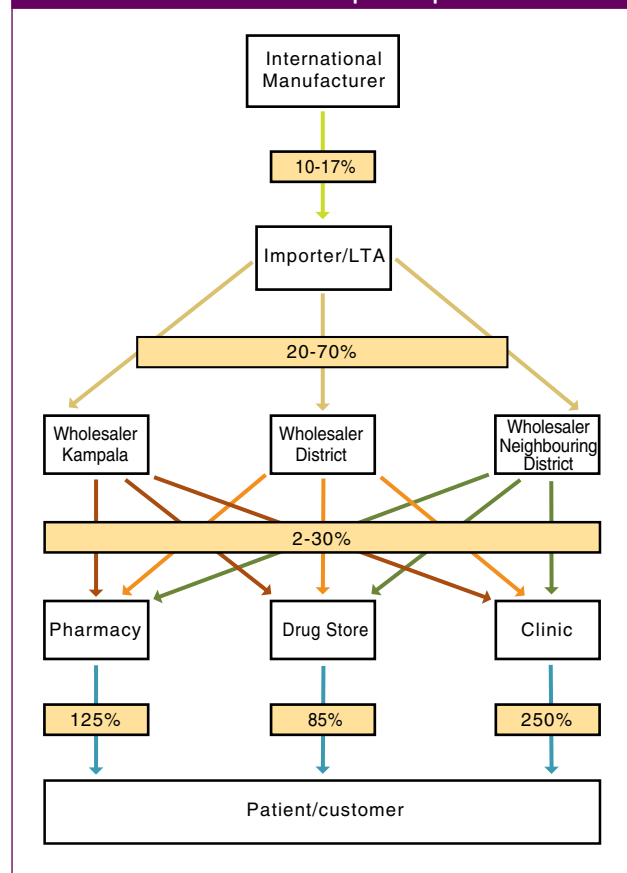
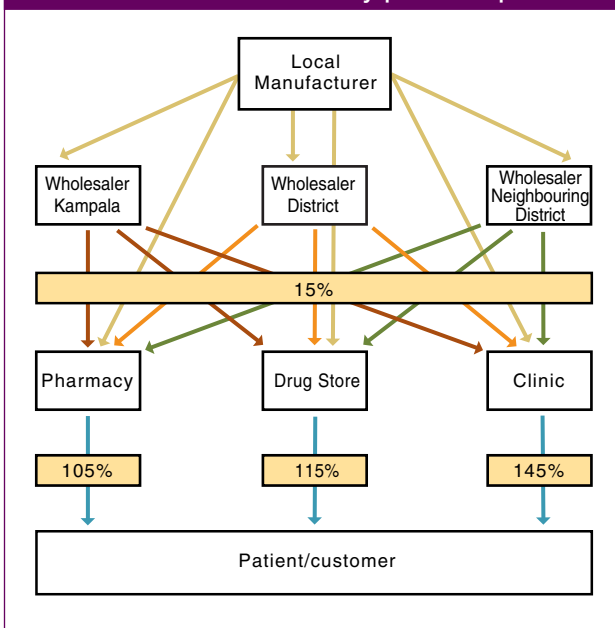


Figure 6: Typical mark-ups along the supply chain for a locally-produced product



Contribution to price of medicines at the manufacturer level

Manufacturers set the MSP – i.e., the price at which medicines are sold to others. Manufacturers may be international, in which case the medicines need to be imported, or they may be local. Local manufacturers can sell medicines to wholesale suppliers – or may operate as a wholesaler themselves, selling the medicines direct to outlets.

Charges that contribute to price as a result of importation

Importers are responsible for bringing medicines from international manufacturers into the country. Each registered imported medicine has a Local Technical Agent (LTA) who imports the medicine and is responsible for it on the Ugandan market. LTAs will then sell the medicine to wholesalers – or may act as wholesalers themselves, selling the medicines direct to outlets. The manufacturers may need to charge for insurance and freight.

Besides the operational costs of staffing, premises and vehicles, the main charges related to importing medicines are:

- Finance charges:
 - Letters of credit and foreign currency transaction fees
 - Charges for borrowing money – the interest rate is around 25-30% (August 2007)
 - A 'margin' – to allow for foreign currency fluctuations (devaluation)
- Shipping and insurance:
 - Shipping and insurance charges are sometimes included in the quoted price of the medicine. When calculated separately for imported medicines, shipping is calculated by size, weight, and means of transport
 - Freight costs by sea are around 6-7% FOB prices; by air up to 20%
 - Insurance is around 2% FOB price
- Clearance:
 - Costs are estimated at around 1% FOB price
 - NDA fees, including verification process (2% of FOB price) and fee for QC (where necessary).

Charges that contribute to price at wholesaler level

Wholesale suppliers procure medicines from importers and sell these on to other suppliers and/or to the various outlets; in turn the outlets supply the medicines to the public.

Contributions to mark-up arise at wholesaler level due to the costs of:

- Property and staff (including a pharmacist)
- Transportation
- Other business transactions
- Write-offs for expiry (which can account for 2-3% of inventory value).

The main wholesale source for the:

- *Public sector* is the National Medical Stores (NMS; see below)
- *NGO/mission sector* is the Joint Medical Stores (JMS; see below)
- *Informal (unlicensed) sector* largely appears to be pharmacies and drug shops.

The NMS is an autonomous government agency charged with the procurement, storage and distribution of essential medicines and supplies to the public sector. The NMS acts as a wholesaler. Only when medicines and equipment are out of stock from NMS can public health facilities source them from elsewhere. As well as the costs described above for wholesalers, at the NMS:

- Vertical programmes are charged a handling fee of 10%
- A mark up of 35% is added to cover for the overheads including delivery to health units.

At the JMS:

- A 10% mark-up is put on locally purchased medicines and an 18.5% mark-up added on imported medicines to cover overheads and operating costs.

NGO/Mission sector:

- Medicines are either provided free of charge, are directly charged for, or patients are charged a consultation fee for treatment which includes medicine costs
- Where medicines are charged, a mark-up of around 50% is made.

Charges added at the outlet/retailer level

Medicines are sold or supplied to patients through a number of public, private, licensed (formal), or unlicensed (informal) outlets; these fall into the eight sectors outlined in Table 1 (page 10).

The retail price mark-up comprises:

- Costs of property and transportation
- Other business transaction costs
- Costs of staff (licensed, formal-sector outlets¹³ are obliged to have a responsible health professional on staff – e.g., a pharmacist for a pharmacy, or a clinical officer or doctor for a clinic. Hence the higher salary costs.)
- Costs of write-offs for expiry (which can account for 2-3% of inventory value).

MAJOR DRIVERS OF VARIABLE ELEMENTS OF PRICE COMPONENTS

As well as standard mark-ups applied to the MSP as medicines pass along the medicine supply chain affecting the price of medicines, other variable mark-ups might also affect price. For example:

- ‘Cross subsidization’ – where the low cost of one medicine (usually a medicine for a chronic disease) is subsidized by the high cost of another
- ‘Store traffic drivers’ – where some medicines are sold cheaply to draw customers into the store. The hope is that once inside the outlet customers will buy other items with higher mark-ups.

Significant variations in mark-up were found at the retail level, irrespective of the basic price range of the medicine – indicating both the need to further understand the drivers of these variations, as well as to explore the potential for introducing new price/volume constructs.

The report clearly indicates the need for further research to explore essential, business-related mark-ups, i.e., those required to cover core business-related costs and reasonable profit, versus excess profit.

¹³ Retail pharmacies, drug shops, private clinics

Findings – 2

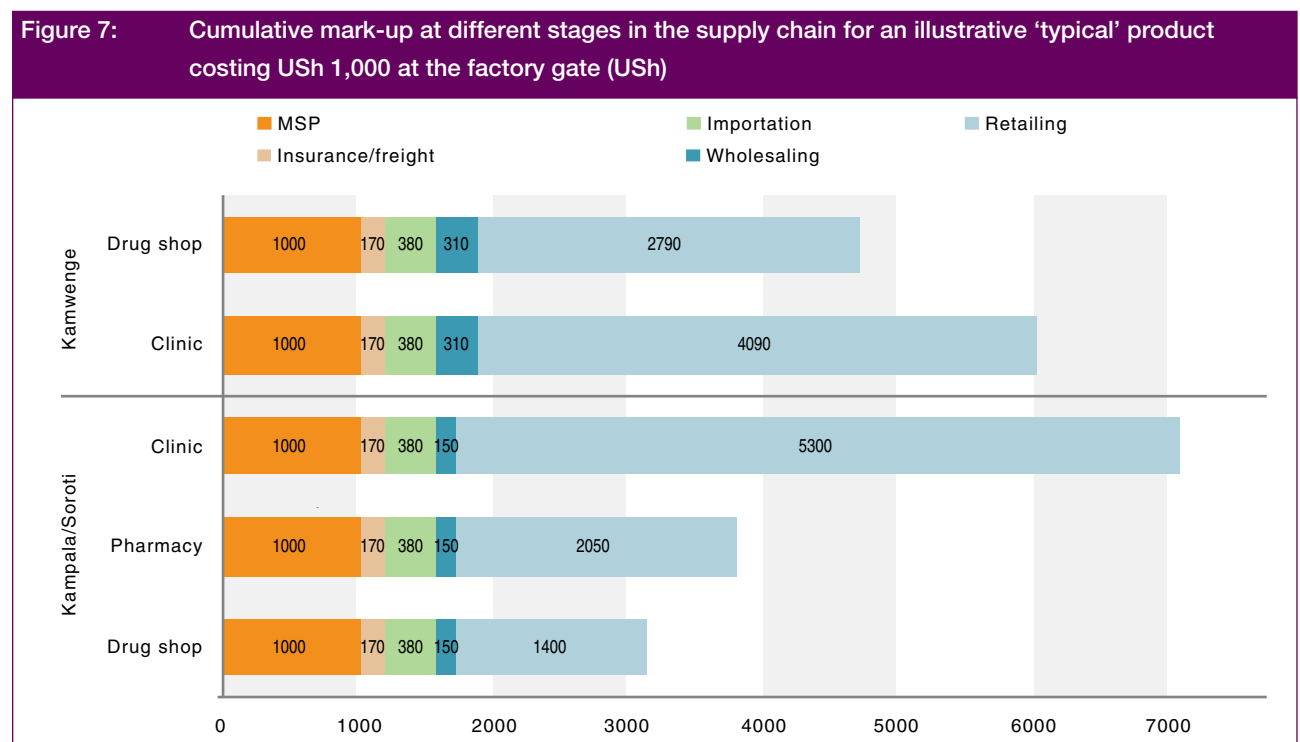
Detailed product-related data

Figures 7 to 35 on price components illustrate the differences in mark-ups between different products and between different outlet types in different regions. The findings have

emerged from interviews with providers in the supply chain, and are estimates of the effect on the price of a medicine as it passes through the supply chain.

A 'TYPICAL' MEDICINE

Figure 7 shows price composition of a typical imported product.



- MSP, insurance/freight costs, and importation mark-ups were identical for different outlets/regions
- Wholesale mark-ups were larger in Kamwenge (a rural district without a wholesaler network) than in Kampala/Soroti – probably due to reliance on wholesale supply of medicines from retail pharmacies in neighbouring districts
- In all districts, prices escalated at the retail level, with private clinics having much larger mark-up than other outlets. The final patient price in clinics in Kampala and Soroti, for example, was almost double the price in the pharmacy
- Despite higher wholesale costs, the comparatively lower patient prices in Kamwenge (a poorer district) might suggest that an 'affordability factor' is at work, where outlets adjust their prices towards levels that the community can afford.

Figures 8-11 represent some of this information in terms of the contribution of the various parts of the supply chain to the final patient price.

For instance, the mark-up at retail level varied according to type of outlet – from 45-76%, while MSP only accounted for 14-32% of the final price.

Figure 8: Proportion of final price (Pharmacy: Kampala/Soroti)

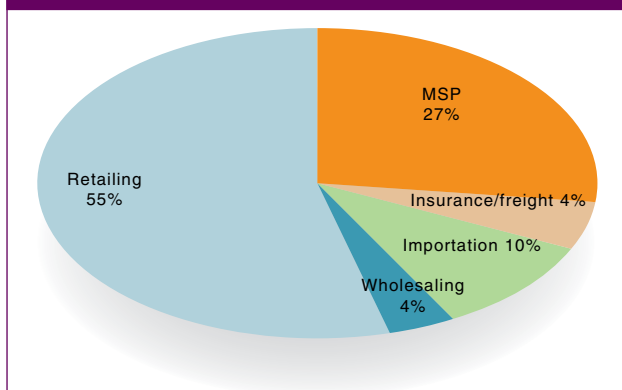


Figure 10: Proportion of final price (Drug Shop: Kampala/Soroti)

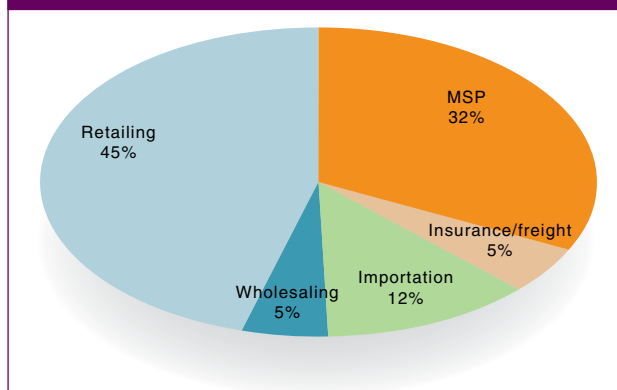


Figure 9: Proportion of final price (Clinic: Kampala/Soroti)

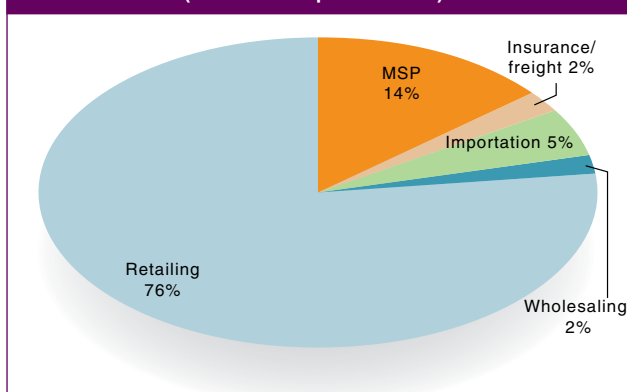
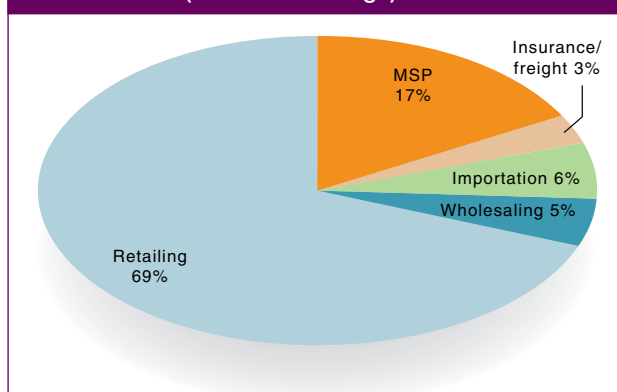


Figure 11: Proportion of final price (Clinic: Kamwenge)



- The MSP is often only a small component of the price to the patient, but can vary significantly in absolute terms

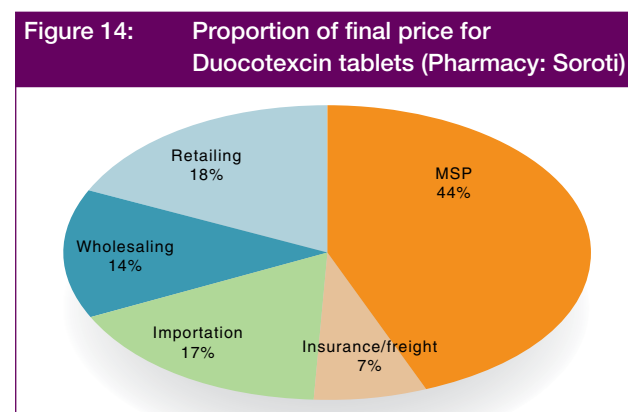
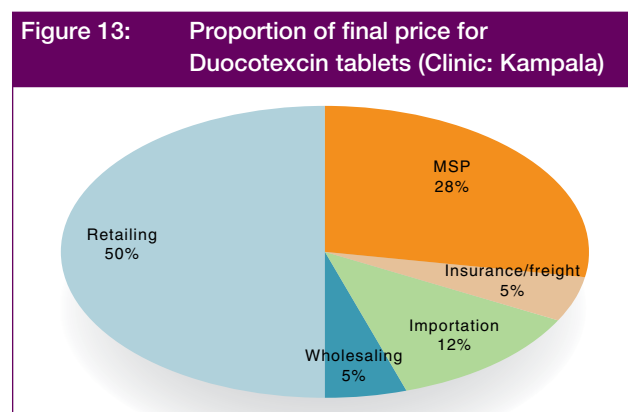
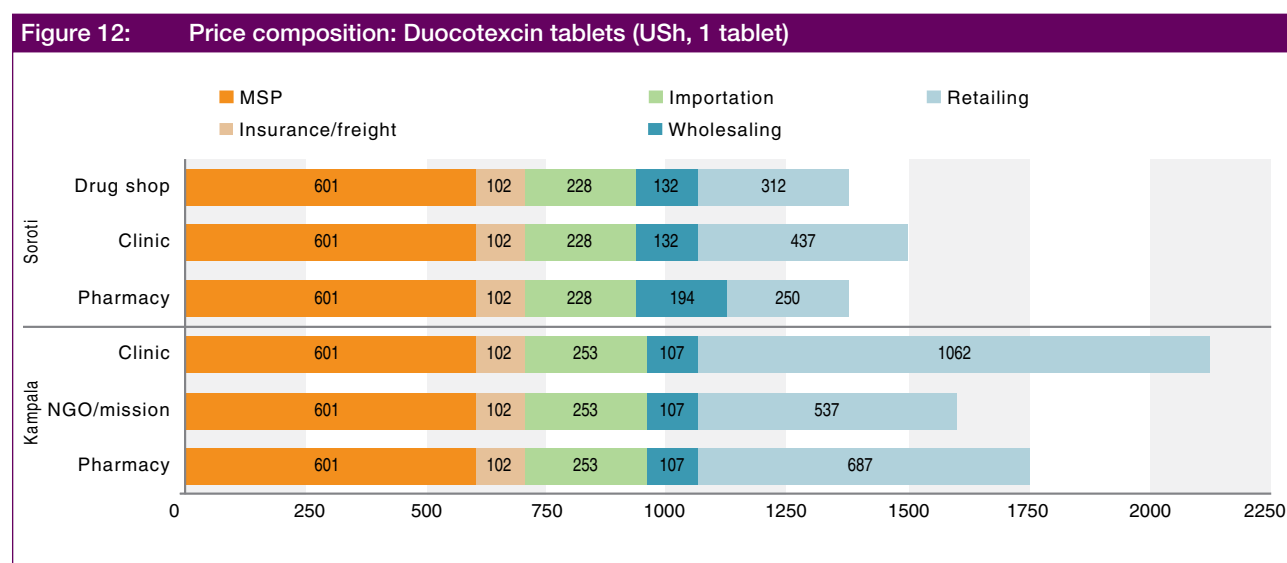
- Retail margins account for approximately half to three-quarters of the final patient price
- Retail margins can be three times higher in some locations and sectors than others

ANTIMALARIAL MEDICINES

Specific brands of originator and generic antimalarial medicines were investigated, applying the same process as above to illustrate the differences in mark-ups for different types of products.

Figures 12-14 present the observations for an *imported originator brand* ACT – Duocotexcin tablets¹⁴. Figure 12 presents the price composition. Patient prices (represented

by the end of bar) and retail mark-ups were fairly similar for most of the different outlets – except for the clinic and the pharmacy in Kampala, where higher retail mark-ups were applied. Also notable is the fact that wholesale mark-ups paid by outlets in Soroti were higher than those paid in Kampala, particularly in the case of the pharmacy wholesale supplier; despite this, the final patient price is lower than in Kampala, possibly due to the affordability factor.



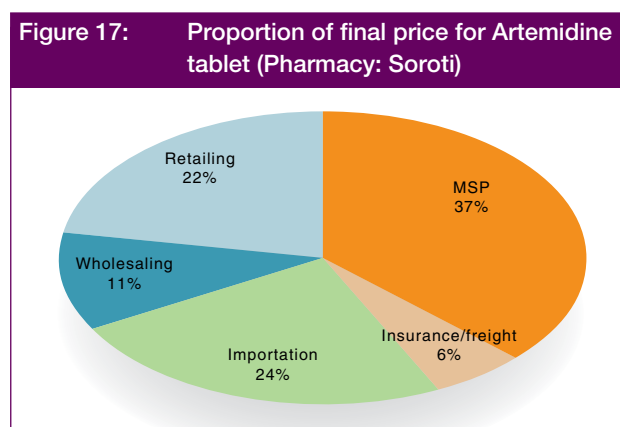
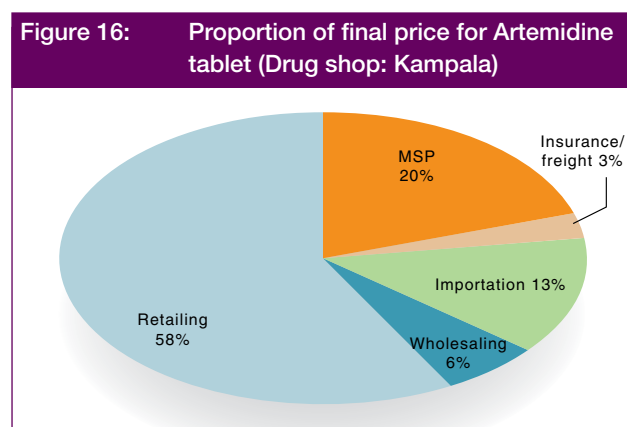
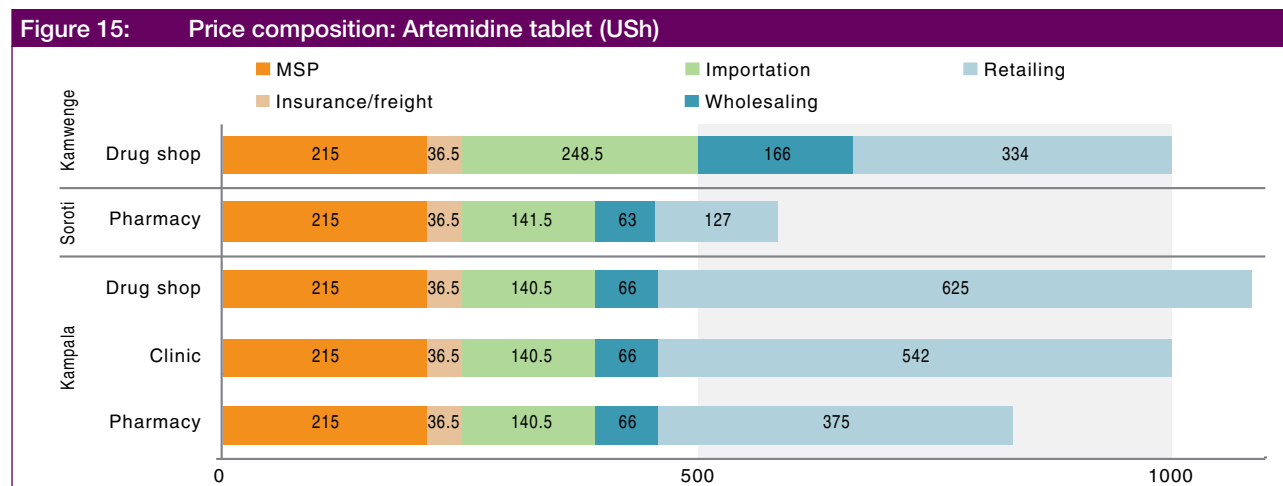
The contribution that different parts of the supply chain make to the final patient price differed markedly between that for the highest price (Figure 13, presenting a clinic in Kampala) and that for the lowest price (Figure 14, presenting a pharmacy in Soroti). At the Kampala clinic the largest contribution (50%) to price was added at by the retailer, while at the Soroti pharmacy the largest contribution (44%) to price was determined by the manufacturer. The absolute manufacturer price remained the same in both cases, reflecting the importance of the retail mark-up on the final patient price.

- The large difference in the final patient price found for this originator-brand medicine was related to the wide variability in retail mark-ups, with the highest being more than 4 times the lowest (in absolute USh terms)

¹⁴ Dihydroartemisinin-piperaquine 40/320mg; Holley Pharmaceuticals, China – only manufactured by a single manufacturer

Figures 15 to 17 present the observations for an *imported* artemisinin monotherapy, Artemidine tablet¹⁵. Except for a low price in the pharmacy in Soroti (due to a low retail mark-up), patient prices were similar in all cases (Figure 15, end of bar).

There was also a difference in importation mark-ups between that for the Kamwenge drug shop and other outlets. This is surprising as the importer is almost certainly the same, since in practice only the LTA imports the products.



A comparison of price components for a drug shop in Kampala (Figure 16) with those for a pharmacy in Soroti (Figure 17) again showed a marked difference made by the different parts of the supply chain; the contribution by the retail mark-up was much higher for the Kampala drug shop (58%) than for the Soroti pharmacy (22%).

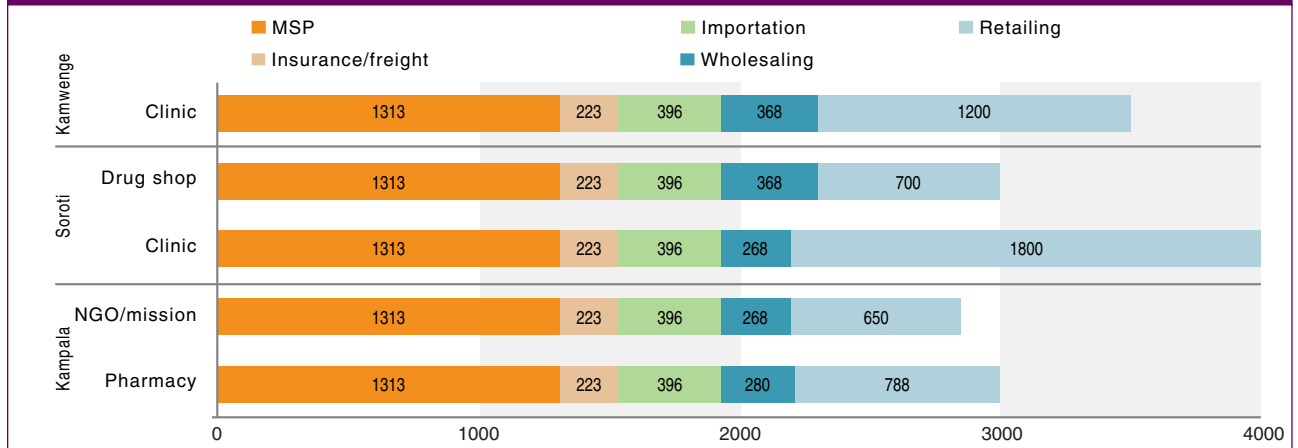
- Again, the large difference in the final patient price found for this limited-source medicine was related to the wide variation in retail mark-ups, with the highest being almost 5 times the lowest (in absolute USh terms)

¹⁵ Artemether, 80mg/ml; Kunming Pharmaceutical Corporation, China (limited source medicine – other versions manufactured by a relatively small number of other manufacturers)

A similar situation was observed for another imported artemisinin monotherapy injection, Artesunate paediatric

injection¹⁶, although patient prices (Figure 18, end of bar) were closer together than for Artemidine (above).

Figure 18: Price composition: Artesunate paediatric injection (US\$, 1 vial)



The situation was also similar for an *imported originator brand* SP: Fansidar tablets¹⁷ (Figure 19).

Figure 19: Price composition: Fansidar tablets (US\$, 1 tablet)



- The large difference in the final patient price found for an originator-brand medicine was related to the wide variation in retail mark-ups, with the highest being almost 4 times the lowest (in absolute US\$ terms)
- Wholesale source mark-ups were higher in Soroti (for the pharmacy) and in Kamwenge (for the clinic)

¹⁶ Artemether 20mg/ml (2ml); Ebewe Pharmaceuticals, Austria – other versions manufactured by a relatively small number of other manufacturers

¹⁷ Sulphadoxine-pyrimethamine 500/25mg; Roche, Switzerland

Figures 20-22 present the observations for a *locally-produced* SP: Kamsidar¹⁸. Patient prices (Figure 20, end

of bar) varied widely. All retail mark-ups were high, but markedly so for the pharmacy and clinic in Kampala.

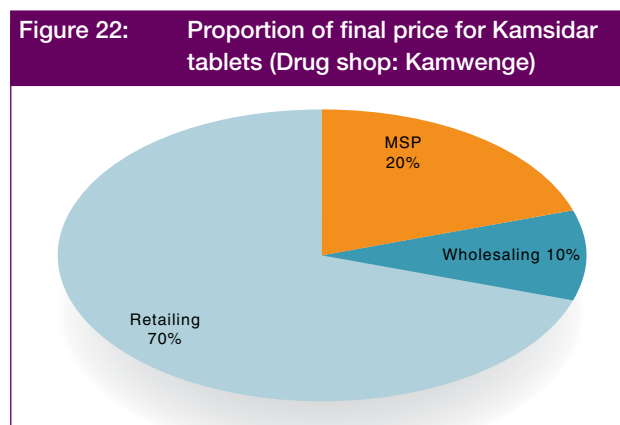
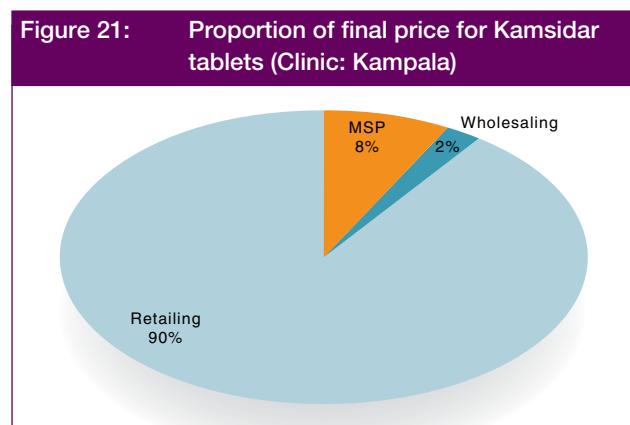
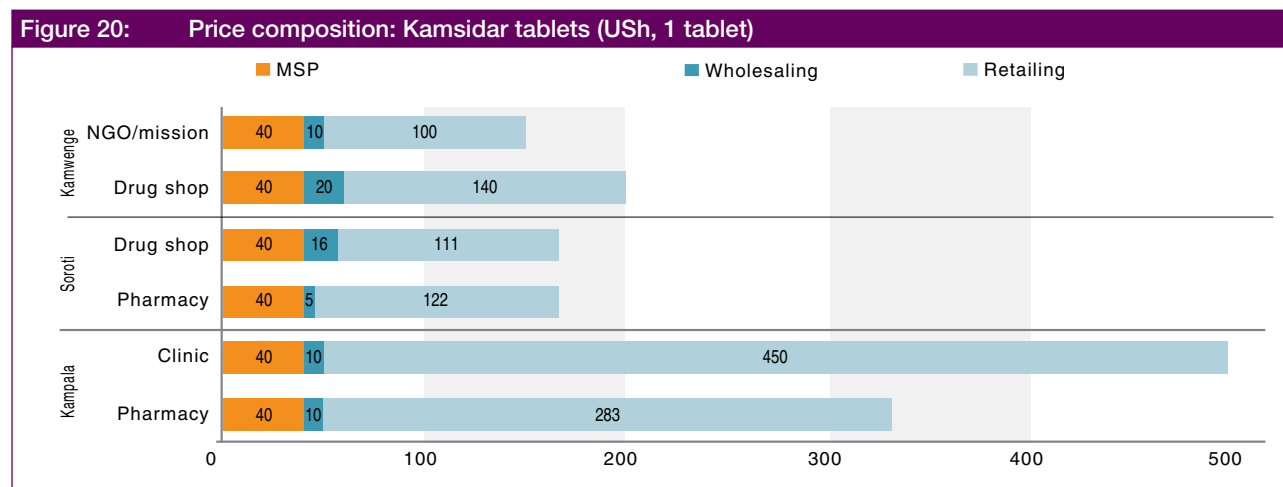


Figure 21 presents a clinic in Kampala where prices were highest – the retail mark-up accounted for 90% of the final patient price, while the MSP accounted for only 8% of the final patient price. Figure 22 presents a drug shop in Kamwenge where, in contrast, the patient price was much lower, even though the wholesale mark-up was higher than elsewhere. This is because the retail mark-up was lower, at 70%.

- The large difference in the final patient price found for this locally-produced, multi-source medicine was related to the wide variation in retail mark-ups with the highest being 4.5 times the lowest (in absolute US\$ terms)

¹⁸ Sulphadoxine-pyrimethamine 500/25mg; Kampala Pharmaceutical Industries, Uganda

Figures 23-25 present the observations for *locally-produced* premium CQ tablet, Sugaquin¹⁹. Patient prices (Figure 23,

end of bar) varied from USh 50 to USh100 – all with high retail mark-ups.

Figure 23: Price composition: Sugaquin tablets (USh, 1 tablet)

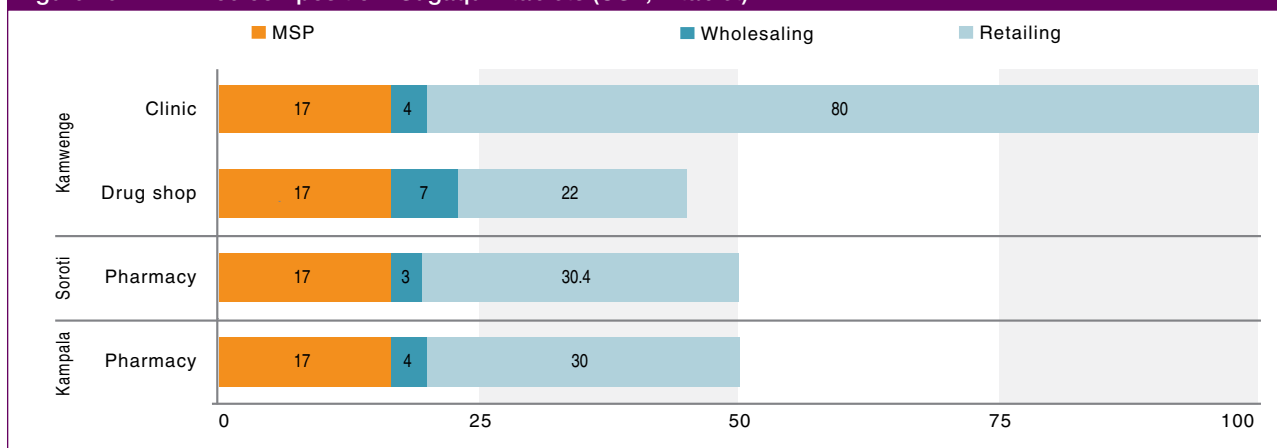


Figure 24: Proportion of final price for Sugaquin tablets (Clinic: Kamwenge)

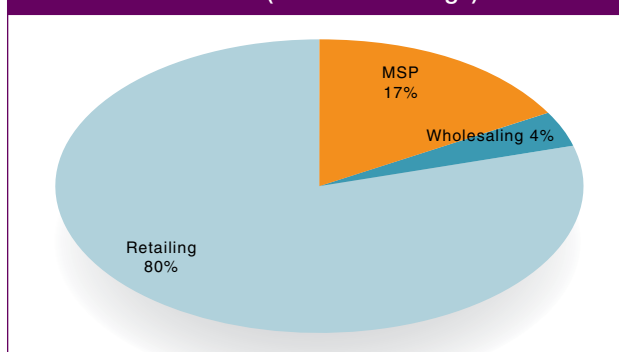
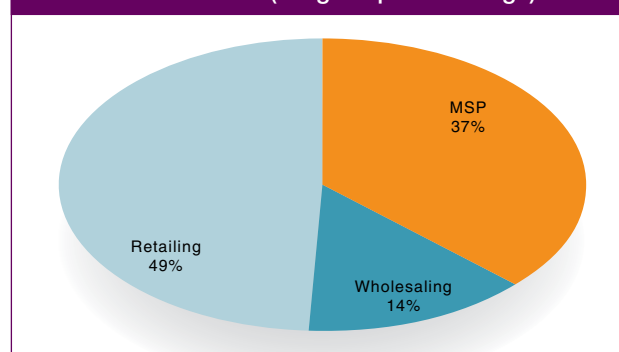


Figure 25: Proportion of final price for Sugaquin tablets (Drug shop: Kamwenge)



At the clinic in Kamwenge the retail mark-up accounted for 80% of the final patient price, while the ex-factory price accounted for only 17% of the final patient price (Figure 24). Figure 25 presents a drug shop in Kamwenge where the patient price was half as much, and the retail mark-up only accounted for 49% of the full patient price.

The overall trends were the same for the other antimalarial medicines studied (data not shown here).

- The large difference in the final patient price found for this locally-produced, multi-source medicine (marketed as a premium version with sugar coating) was related to a wide variation in retail mark-ups with the highest being 3.6 times the lowest (in absolute USh terms)

¹⁹ Chloroquine phosphate 250mg (sugar coated); Kampala Pharmaceuticals Industries, Uganda

OTHER ESSENTIAL MEDICINES

Figures 26-28 illustrate the mark-ups for Ciprobid tablets – an *imported, multi-source* generic ciprofloxacin tablet²⁰.

Figure 26 shows that insurance/freight, importation and

wholesale costs and mark-ups were modest. However, retail mark-ups were very high, particularly at the clinics in Kampala and Soroti.

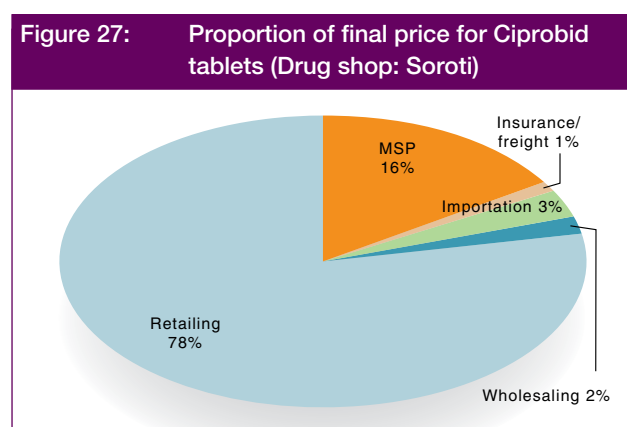
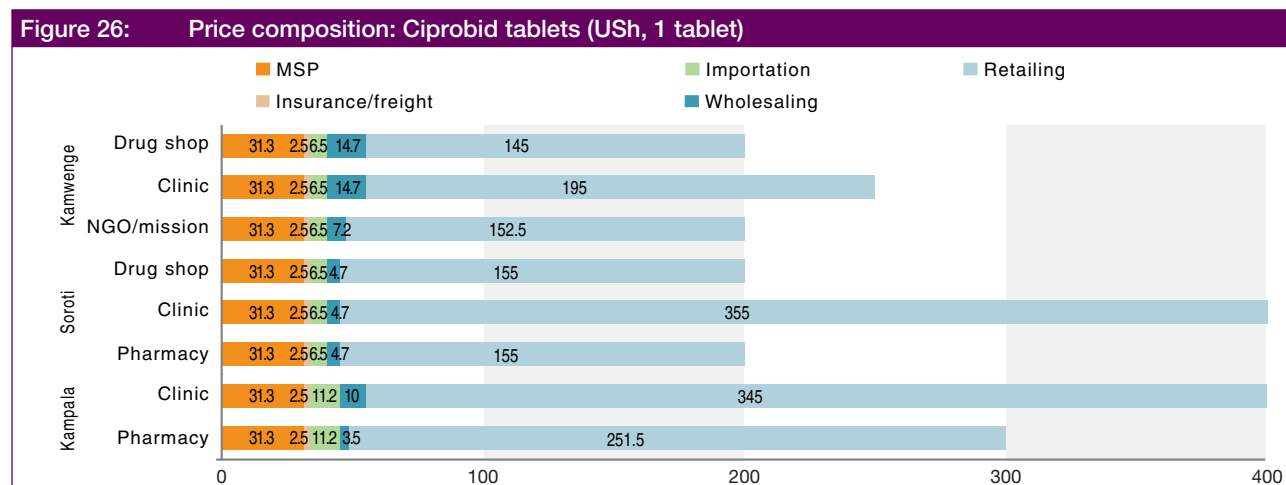


Figure 27 shows how the retail mark-up accounted for 78% of final patient price in the Soroti drug shop while the MSP only accounted for 16%.

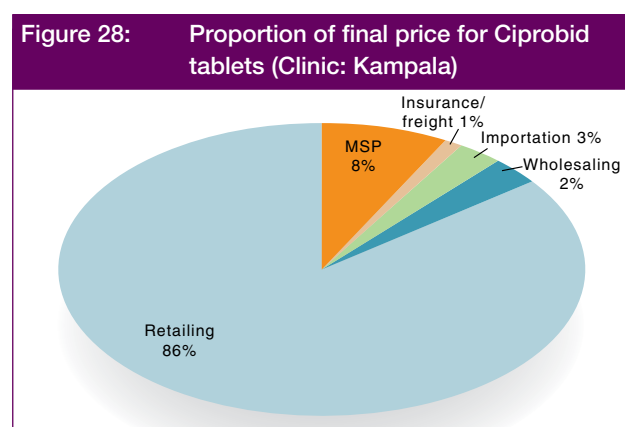


Figure 28 presents the situation for a clinic in Kampala, where the final price was twice that of the drug shop in Soroti. The MSP only accounted for 8% of the final patient price in the Kampala clinic while the retail mark-up accounted for 86%.

²⁰ Ciprofloxacin 500mg; Zydus-Cadila, India

Figures 29-31 illustrate an example of an *imported branded generic* antibiotic: Metrogyl tablets²¹.

Again, the final patient price varies greatly, largely as a result of different retail mark-ups.

Figure 29: Price composition: Metrogyl tablets (US\$, 1 tablet)

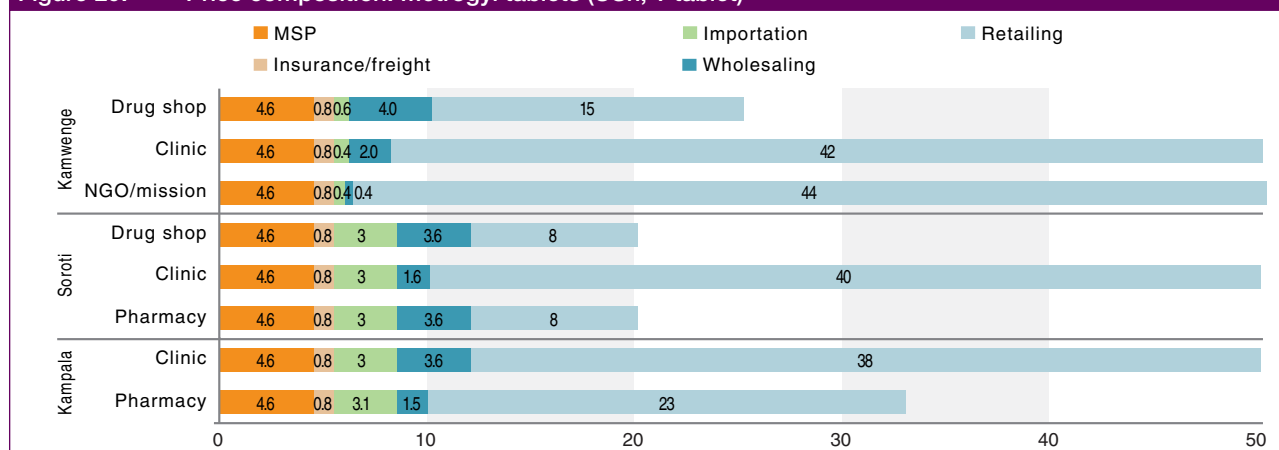


Figure 30: Proportion of final price for Metrogyl tablets (Drug shop: Soroti)

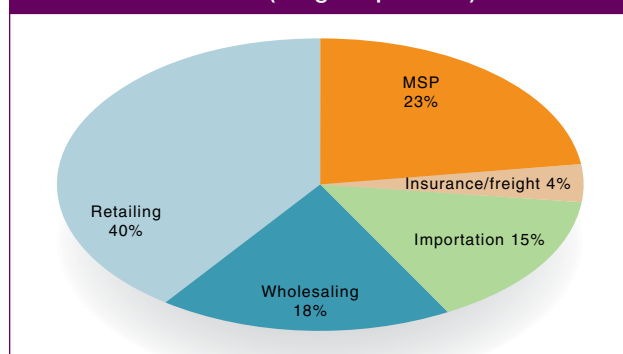


Figure 30 presents price components for a drug shop in Soroti. Here, the MSP only accounted for 23% of the final patient price; 40% being the retail mark-up. The wholesale contribution to final price was 15% – a larger proportion than for other medicines.

Figure 31: Proportion of final price for Metrogyl tablets (Clinic: Kampala)

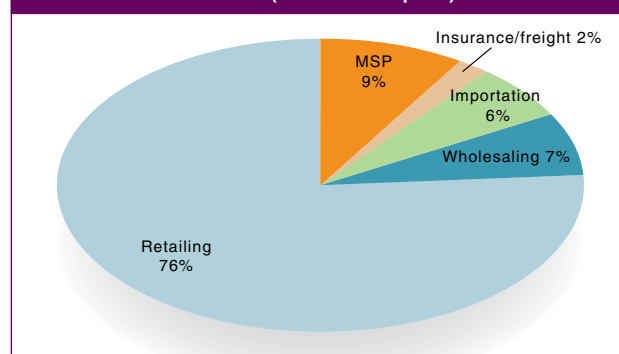
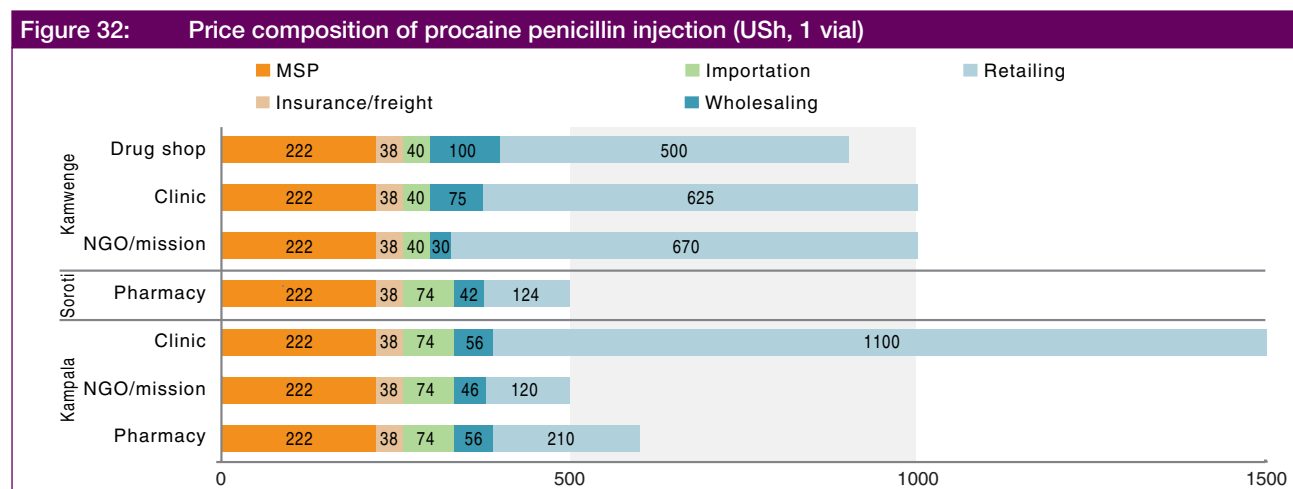


Figure 31 presents the situation for a clinic in Kampala where the final price was more than twice that of the drug shop in Soroti, but the MSP accounted for only 9%.

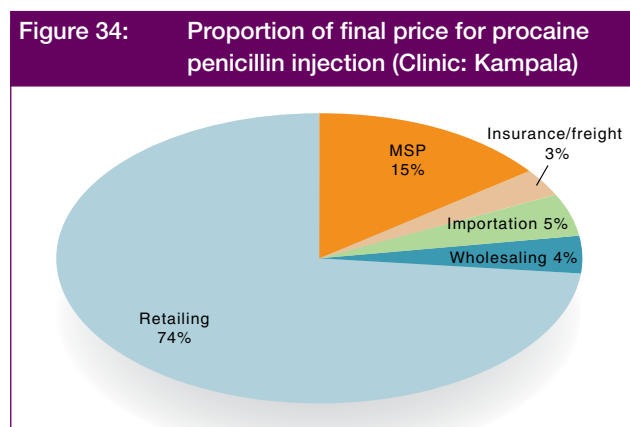
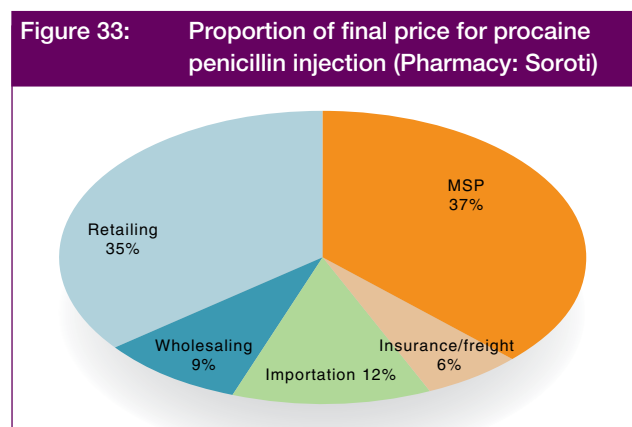
²¹ Metronidazole 200mg; J.B. Chemicals & Pharmaceuticals Ltd (Unique Pharmaceutical Laboratories)

Figures 32-34 show price components for an *imported branded generic* injectable antibiotic: fortified procaine

penicillin injection²² (Alembic Ltd). Prices varied between the lowest and highest by a factor of three.



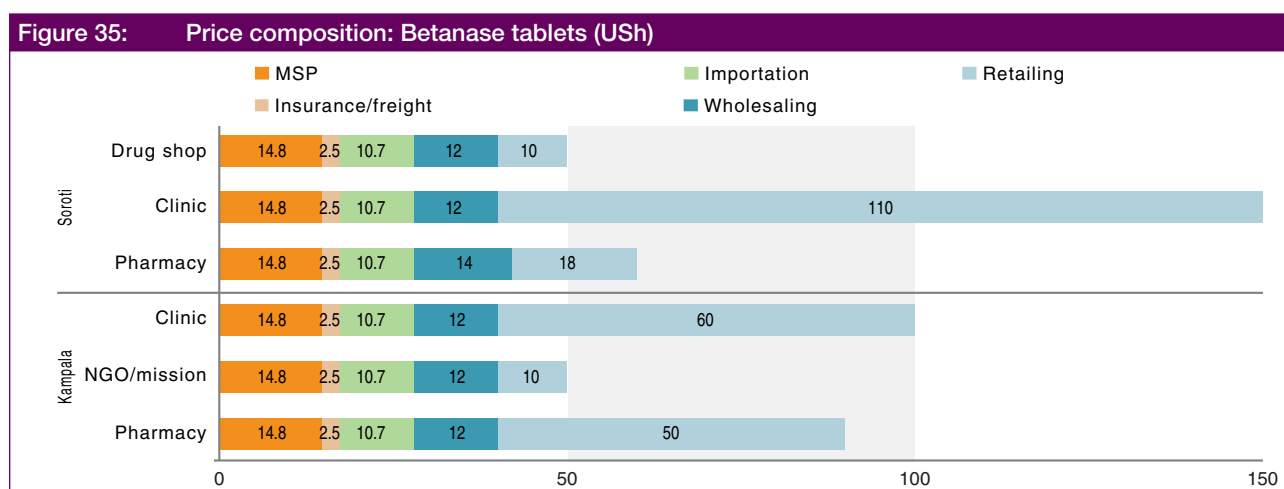
Figures 33 and 34 illustrate how widely the retail mark-up varies – from 35% (Soroti pharmacy) to 74% (Kampala clinic).



²² 4MIU; Alembic Ltd, India

Figure 35 illustrates an example of an *imported, branded generic* for diabetes: Betanase tablets²³. Again, prices varied by

a factor of three between the lowest and the highest final patient prices, largely due to the wide variation in retail mark-ups.



- Differences in mark-ups, especially at the retail level are not restricted to antimalarial medicines; they also differ for other medicines
- Mark-ups at the retail level are high – varying by product and by sector
- Private clinics have much higher mark-ups than other retail sectors
- Retail mark-ups can largely absorb all or most of the extra costs of distance - wholesale prices have been observed to be marginally higher outside Kampala; retail pharmacy mark-ups were marginally lower here
- The patient price of locally-produced products is generally similar to imported products – the savings achieved in insurance and freight being taken up through higher retail mark-ups

²³ Glibenclamide 5mg; Cadila, India

Conclusions

- Antimalarial medicines are available through a wide range of outlets in Uganda, both in the public and private sector. Some of these private-sector outlets are unlicensed, others licensed
- Price components are added to the manufacturer's selling price (MSP) by three main players in the supply chain – importer, wholesaler and outlet/retailer
- Price components have a cumulative impact. Thus, even a relatively small price component early in the supply chain can contribute significantly to price
- The mark-ups added at each stage of the supply chain, and hence the final patient price, vary considerably according to sector and region. This phenomenon is not restricted to antimalarial medicines
- The supply chain is more complex for rural regions than for urban regions, particularly at wholesaler level. Mark-ups at this level can therefore vary greatly between regions
- The MSP often makes a relatively small contribution (as little as 8%) to the final patient price when compared to the sum of mark-ups made further along the supply chain
- Although mark-ups at importation level would be expected to be the same for a particular medicine, these can sometimes vary
- The patient price of locally-produced products is generally similar to imported products – suggesting that savings in insurance and freight are offset by higher retail mark-ups
- Retail mark-ups generally make the greatest contribution to the final patient price in almost all sectors, sometimes accounting for up to 90% of the final patient price. Private clinics generally have the highest retail mark-up
- Retail mark-ups can be affected by marketing practices such as 'cross subsidization' and 'store traffic drivers'; they can also be influenced by the 'affordability factor'.

Large price variations suggest (a) that the market for medicines is imperfect and (b) that the customer/patient does not shop around. Variations in mark-ups highlight the need to further understand their drivers, and to explore the potential for introducing new price/volume constructs.

Suggested recommendations

- Improve understanding of what leads outlets to stock and sell a particular product
- Improve understanding of how products are priced at retail outlets
- Pilot alternative approaches to encourage the private sector to move away from supplying older, ineffective classes of medicines to supplying ACTs (while recognising the need for sufficient incentive to maintain supplies)
- Encourage investment in initiatives to achieve economies of scale in uptake of ACTs, to achieve lower consumer prices and higher volume of product sold.
- Improve understanding of 'reasonable' margins required to cover standard business costs.
- Consider ways of increasing public awareness on recommended price levels (i.e., 'what the price should be') for different pharmaceutical products, while respecting national price liberalisation policies.



Glossary

ACT	Artemisinin combination therapy
AL	Artemether-lumefantrine
AQ	Amodiaquine
CDD	Community Drug Distributor
CIF	Cost of product, insurance and freight (landed price)
CQ	Chloroquine
EAC	East African Community
FOB	Freight on Board
HAI	Health Action International (www.haiweb.org)
HBMF	Home-based management of fever
HEPS	Coalition for Health Promotion and Social Development (www.heps.org)
IPT	Intermittent preventive treatment
JMS	Joint Medical Stores (www.jms.co.ug)
LTA	Local Technical Agent
MMV	Medicines for Malaria Venture (www.mmv.org)
MSP	Manufacturer's selling price
NDA	National Drug Authority (Uganda) (www.nda.or.ug)
NMP	National Medicine Policy
NGO	Non-governmental organisation
NMS	National Medical Stores (www.natmedstores.org)
QC	Quality control
SP	Sulphadoxine-pyrimethamine
USD	United States dollar
USh	Ugandan shilling
WHO	World Health Organization (www.who.int)



Medicines for Malaria Venture

International Centre Cointrin
Entrance G, 3rd floor
Route de Pré-Bois 20
PO Box 1826
1215 Geneva 15
Switzerland

Tel +41 22 799 4060
Fax +41 22 799 4061
access@mmv.org
www.mmv.org