

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES



**COST AS A BARRIER TO ACCESS: AVAILABILTY, AFFORDABILITY
AND IDENTIFYING COMPONENT COST OF ESSENTIAL MEDICINES**

BY

MOHAMMEDSIED NURU (B.PHARM)

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List of abbreviations

ARVs	Antiretrovirals
ATP	Ability To Pay
CIF	Cost Insurance and Freight
CSA	Central Statistical Authority
DACA	Drug Administration and Control Authority
EDL	Essential Drugs List
EML	Essential Medicine List
ERCS	Ethiopian Red Cross Society
FMOH	Federal Ministry of Health
GDP	Gross Domestic Product
HAI	Health Action International
HH	Household
IB	Innovator Brand
IRP	International Reference Price
LPG	Lowest Price Generics
LIDE	List of Drugs for Ethiopia
MDGs	Millennium Development Goals
MOH	Ministry of Health
MPR	Median Price Ratio
MSH	Management Science for Health
MUP	Manufacturers Unit Price
NGO	Non Governmental Organization
OR	Odds Ratio
PFSA	Pharmaceuticals Fund and Supply Agency
SD	Standard Deviation
SPSS	Statistical Package for Social Science Research
SP	Special Pharmacy
USD	United States Dollar
WHO	World Health Organization

Duties, taxes, mark-ups, distribution costs and dispensing fees are often high, regularly constituting between 30% and 45% of retail prices, but occasionally up to 80% or more of the total (Bale, 2001). Prices are also influenced by whether the country observes patents, the level of domestic production of medicines, lack of competition between pharmaceutical manufacturers and weak or non-existent price controls (Quick JD et al, 1997).

In Ethiopia, import and wholesale are done by the public sector, private sector, NGO's and international organizations. The Pharmaceuticals Fund and Supply Agency (PFSA) is responsible for import and distribution to the public sector. PFSA has eight wholesale distribution branches (2 in Addis Ababa and 6 in different regions). The public procurement is done through international and local tenders as well as by direct purchasing or negotiation and it is also limited to the List of Drugs for Ethiopia (LIDE).

There are 11 manufacturers of pharmaceuticals out of this one is governmental. In the private sector, the total number of importers wholesalers has increased from only 11 in 1993 to 107 in 2007 (DACA, 2007). Procurement in the private sector is done by direct order to manufacturers abroad and it is also limited to the LIDE.

The drug retail activity is carried out by the public sector, private sector, city councils and the Ethiopian Red Cross Society (ERCS). In 2007, there were 320 pharmacies, 577 drug shops and 2121 rural drug vendors (FMOH, 2007). Moreover, each health care facility has its own medicine retail outlet.

In 2005/06, the total government drug budget was about 230 million birr, which was approximately 21% of the recurrent government health budget and represented a per capita drug budget of 3.2 birr. The total annual drug expenditure in the same year was estimated at 2.5 billion birr; out of which 1.1 billion birr was donation (WHO, 2007).

There are public health programs such as TB/Leprosy Control, Family Planning, Malaria Control, and HIV/AIDS Control, which are assisted by donors. Sources of drug financing

2. Literature Review

“Essential medicines are those that satisfy the priority health care needs of the population. They are selected with due regard to public health relevance, evidence on efficacy and safety, and comparative cost-effectiveness. Essential medicines are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford.” (WHO, 2002).

Essential medicines are central to a health system’s success and the care it provides its clients. In developing countries, pharmaceutical costs are a health unit’s largest expenditure after personnel costs (MSH, 1997), comprising 40-60% of total health costs (Perez-Casas et al, 2001).

This is true of both the public and the private sector: Kawasaki and Patten report that mission health facilities in eastern Africa regularly allocate 28% of their budget to medicines alone (Kawasaki & Patton 2002). Average per capita spending on pharmaceuticals in high-income countries is 100 times higher than in low-income countries (about US\$ 400 compared with US\$ 4).The World Health Organization (WHO) estimates that 15% of the world’s population consumes over 90% of the global production of pharmaceuticals (by value) (WHO, 2004).

Furthermore, new pharmaceutical inventions, new diseases and a growing population put constant demands for additional pharmaceutical resources on the health sector. With fixed budgets and limited financial resources available, countries cannot simply increase their health budget in order to increase or maintain access to essential medicines.

In Member Countries of the Organization for Economic Co-operation and Development (OECD), many direct and indirect pharmaceutical price regulations remain in effect. However, in many low- and middle-income countries, national medicine pricing policies

have been shifting from price controls to deregulation under the influence of structural adjustment and reform programmers (Jacobzone, 2000).

National policies, medicine pricing and procurement strategies are required to ensure that medicines are affordable. While policies are also greatly needed to improve health infrastructure and financing as well as to ensure the rational use of medicines, high medicine prices are one of the biggest obstacles to access. Nevertheless, even in the face of a weak infrastructure and poverty, improvements in access can be achieved (Myhr, 2000).

Prices of the same medicines frequently vary between countries; some commonly used medicines have been found to be more expensive in developing countries than in industrialized ones and many studies have shown that affordability is unrelated to purchasing power (Bala & sogo, 2002).

The ex-manufacturer prices to countries – in particular for the private sector – are often confidential. Medicine price indicator guides provide the sales prices from large wholesalers of generically equivalent medicines to governments. However, they do not give the price patients must pay in either the public or private sectors and often do not include new, essential but patented medicines. A few countries have publicly available prices (Myhr, 2000).

2.1. Availability of medicines

In the public sector, the availability of generic medicines was very low, ranging from 9.7% in Yemen to 79.2% in Mongolia. Regional availability ranged from 29.4% in Africa to 54.4% in the Americas; mean availability in the public sector was lower than in the private sector in all regions (Cameron, 2008).

In the private sector, availability of generics was low, ranging from 50.1% in the western Pacific to 75.1% in Southeast Asia. High private sector availability of generics was recorded

in Syria (97.5%) and Chennai, India (91.8%), whereas low availability was seen In Chad (14.8%), Kuwait (36.3%), the Philippines (33.6%), and China (34.6% in Shandong and 38.3% in Shanghai). Similarly, private sector availability of generics in Africa ranged widely, from 14.8% in Chad to 79.1% in Ethiopia (WHO, 2006).

In many countries medicines are supplied free of charge to all or to specific categories of patients (Danzon, 2000). This is praiseworthy provided the medicines are available. Sadly for the sick and poor, this is rarely the case (Margaret & Dalia, 2007).

For example, asthma is a common chronic disease. As shown in Table 1, salbutamol inhaler was not found in any of the public sector facilities sampled in Uganda (where medicines in the public sector are free) or Mali, and in Indonesia only 13% of the facilities sampled stocked salbutamol inhalers (originator brand only). Therefore, asthmatic patients are forced to purchase an inhaler from the private sector where it is clearly unaffordable in all three countries (days worked to purchase 1 inhaler ranged from 2 to nearly 6 days) (Margaret & Dalia, 2007).

Table 1: Availability of salbutamol inhaler (public sector) and affordability (private sector)

	National Essential Medicines List	Availability		Affordability	
		Public sector facilities		Private Retail Pharmacies	
		Originator	Generic	Originator	Generic
Uganda	yes	0%	0%	5.6 days	2.0 days
Mali	yes	0%	0%	4.2 days	2.7 days
Indonesia	no	13%	0 %	4.1 days	

Source: (Margaret & Dalia, 2007)

2.2. Prices of medicines

High prices can limit access to basic medicines is an obvious statement. But it is worth stressing that high prices are an even bigger problem when consumers lack health insurance

and must meet all health care expenses out of their own pockets, as is the case for most citizens of the developing world. Furthermore, given the state of credit markets in most developing countries, external financing is also not a realistic option for the poor of the developing world (Saggi, 2007).

Some governments are purchasing expensive originator brand medicines that have been off patent for years (and hence cheaper generics exist). For example, in China/Shandong Province, Malaysia and Kuwait the survey data showed that no generics of carbamazepine were procured for the public sector. The originator brands purchased were high priced (MPRs 3.2 - 9). In Morocco and Kazakhstan both generics and the more expensive originator brand was procured by the government. Governments should not purchase expensive originator brands where quality-assured cheaper generics are available (Margaret & Dalia, 2007).

People are paying high prices for medicines; the price of originator brand atenolol 50mg tablets is over 40 times the international reference price in China/Shandong Province, Malaysia and Kuwait countries except India (where it is still high at 5 times the reference price). Even the lowest priced generic is very expensive in the above countries. The originator brand, Tenormin[®], shows marked price variation (Margaret & Dalia, 2007).

Huge brand premiums e.g. in Uganda some originator brands are approximately 13 times the generic. High brand premiums are problematic if cheaper generics are not widely available, or the originator brand is sold to maximize pharmacy profits, or the medicine is patented and faces no competition, or doctors prescribe by originator brand name and in some cases generic substitution is not permitted (Myrh, 2000).

2.3 Affordability of treatment

2.3.1. Ability to pay

In many developing countries people are expected to contribute to the cost of health care from their own pockets. As a result, people's ability to pay (ATP) for health care, or the affordability of health care, has become a critical policy issue in developing countries, and a particularly urgent issue where households face combined user fee burdens from various essential service sectors such as health, education and water(Steven, 1996).

The interactions between households and the health system are important determinants of households' ability to cope with the costs of ill health. Health systems are frequently ineffective in reaching the poor, and often impose regressive cost burdens (Steven, 1996).

These problems are aggravated by the increasing burden of chronic illness in poorer countries. Poor households adapt their healthcare use to avoid costs they cannot meet, at the risk of deteriorating health. Financial strategies (e.g. borrowing, and reducing expenditure on other basic needs) used to finance healthcare may jeopardize household livelihoods, potentially leading to further impoverishment. Social resources and local infrastructure (such as transport, availability of healthcare) are important in enabling households to cope with the affordability of treatment (Jane Goudge et al, 2007).

2.3.2. Affordability to specific treatment

Affordable treatments are a vital prerequisite for ensuring access to essential medicines. The following acute and chronic conditions illustrate the dire situation for people in a number of countries when purchasing medicines from private retail pharmacies. A month's treatment with ranitidine tablets for a peptic ulcer, purchased by the lowest paid government worker, is unaffordable in all but West Bengal, India - for generics as well as the originator brand.

The affordability of fluoxetine treatment is startling. Armenians need to work over 50 days for a month's treatment – a totally unacceptable situation, when there are no public sector

This can be illustrated by taking the following table, which presents comparison examples of hidden costs, potentially under government control, from countries around the world. While each individual charge might seem inconsequential, their compounded effect results in hidden charges that consistently add more than 50% to the base price (Levison, 2003).

Table 2: Example of hidden costs on pharmaceutical purchases

	Sri Lanka	Kenya	Tanzania	S. Africa	Brazil	Armenia	Kosovo	Pune, India	Nepal	Mauritius
Import tariff	0%	0%	10%		11.7%	0%	1%	0%	4%	5%
Port charges	4%	8%	1%				4%	0%		
Clearance and freight		1%	2%						1.5%	5%
Pre-shipment inspect		2.75%	1.2%							
Pharmacy board fee			2%							
Importer's margins	25%						15%	25%	10%	
VAT				14%	18%	20%	0%			
Central govt. tax								4%		
Local town duty								1.5%		
Wholesaler	8.5%	15%	0%	21.2%	7%	25%	15%	10%	10%	14%
Retail	16.25%	20%	50%	50%	22%	25%	25%	15%	16%	27%
Total mark up	63.97%	54.22	74.3%	74.0%	82.3%	87.5%	73.6%	81.9%	48.8%	59.2%

Source :(Levison, 2003)

The prices of medicines are well above their production costs, and the profits of those in the distribution chain (pharmacists, dispensing doctors, wholesalers and even some governments) are frequently high, so there is an opportunity to bring prices down and so improve access to treatment (Bale, 2001).

100% markup (Levison, 2003). Second, Vendors often offer discounts to preferred customers either for bulk purchases or for customer loyalty (Gray & Matsebula, 2000). In Sierra Leone, a previous employee of the private sector reported a 33% discount on a 50% wholesale markup for ‘prime’ customers. In Malawi, one private hospital adds a 70% markup and gives a 20% discount (Levison, 2003).

Instead of regulating by sector, governments have the option of regulating markups based on the number of “competitors” for a medicine. Unlike the method seen in Table 3, the reference pricing mechanisms described in Table 4 below focus governmental intervention on those product prices that the market system will not be able to influence.

Table 4: Types of mark up based on “competitors”

Drug: number of manufacturers	Cost control mechanism	Comments
Brand name drug (Single manufacturer)	Government price regulation.	Government can use Reference pricing.
Drug with therapeutic equivalent “Me-too” drugs (At least two manufacturers)	Leave to market forces.	There must be unimpeded access to information and competition.
Generic equivalents exist (Numerous manufacturers)	Government to remove barriers to competition (e.g. tariffs, taxes).	There must be price information and assured access.

Source :(Levison, 2003)

Government should set price controls for single manufacturer (brand name) drugs. As the evidence from Brazil showed, for drugs with therapeutic equivalents, market forces (competition) is sufficient to reduce cost, as long as the market is allowed to operate freely.

For drugs with generic equivalents, again the market will act to reduce cost, but the government can assist by guaranteeing that imported drugs are equal market participants by removing barriers to competition such as import duties (Levison, 2003).

This tri-partite mechanism is a large component of the system employed in Australia by their Pharmaceutical Benefits Scheme (PBS), which, despite constant expansion of the pharmaceutical sector, pays lower manufacturer prices than the US, UK, Canada or Sweden (Productivity Commission, 2001).

If needed, the government could strengthen these cost control mechanisms by setting a maximum price per month for a specific treatment. Public health workers can support these cost control mechanisms by surveying retail outlets and publishing prices (Levison, 2003).

2.6. The case of Ethiopia

In case of Ethiopia availability of the generic equivalents varied from sector to sector and from medicine –to medicine. For example, availability of lowest price generics was 76.5 %, 96 % and 78.6 % in the public health facilities, private pharmacies and SP/ERCS outlets, respectively. In contrast availability of most sold generics was 29.4 %, 68 % and 37.5 % in the public health facilities, private pharmacies and SP/ERCS outlets, respectively (FMOH&WHO ,2005).

Measured in terms of affordability, the cost of treating common diseases varied between innovator products and generic versions. For example, there was nearly 4-fold difference between the price of innovator brand of amoxicillin and its generic equivalent in the private pharmacies. Nearly 12-fold difference was also observed between the price of innovator brand glibenclamide and its generic equivalent in the private pharmacies (FMOH &WHO, 2005).

When a family with a combination of four disease conditions is considered, it was shown that the breadwinner, who is a lowest paid government employee, would need to work for nearly 3 days from public health facilities and 4.6 days for both SP/ERCS medicine outlets and private pharmacies to purchase the necessary lowest price generic version medicines (FMOH & WHO, 2005).

When the above situations are seen in the light of the income level of the Ethiopian people and the proportion of the total household income spent on medicines, it seems that costs of treatment of common diseases are unaffordable to the majority of the Ethiopian people (FMOH & WHO, 2005).

Regarding mark-ups on medicines prices, there is no ceiling set by law on the wholesale and retail mark-ups in all sectors. However, it was noted that wholesale mark-ups in general range from 20% - 40% of the landed costs of imported products and 5 % -10% of the ex-factory prices of locally manufactured products. Retail mark-ups range from 20 % - 30 %, depending on the type of the sector. But the rates in the private sector are unpredictable (FMOH & WHO, 2005).

4.7. Study variables

Independent variables

Sex, age, level of education, marital status, employment, occupation, tax, import duties, whole sellers mark up, retailer mark up, percentage contribution of each add-on cost, procurement cost.

Dependent variables

- ✓ Medicine price at the retail value
- ✓ Availability of Essential medicines
- ✓ Affordability of essential medicines

4.8. Data entry, clean up and analysis

The data collected on the medicine price data collection form were entered by data entry clerk into the software International Medicines Price Workbook (v. 3.06). The prices were double entered to ensure accuracy. The Workbook's auto checker was also used to assist in the verification process.

The availability of individual medicines is calculated as the percentage (%) of medicine outlets where the medicine was found. Mean (average) availability is also reported for the overall 'basket' of medicines surveyed.

The Workbook software calculated the median price ratio (MPR) for each medicine type in each sector only if the medicine was available in at least four facilities. The MPR was the comparison of the local median unit price of the medicine with the median unit price in the Management Sciences for Health 2007 Price Indicator Guide (the IRP)(MSH, 2007).

$$\text{Medicine Price Ratio (MPR)} = \frac{\text{Median local unit price}}{\text{International reference unit price}}$$

The IRPs are the medians of recent procurement or tender prices offered by predominantly not-for-profit suppliers to developing countries for multi-source products (MSH, 2007). Normally, an MPR of 1 or less is taken as efficient procurement in the public sector (WHO & HAI, 2007).

To assess affordability data was collected on the prices of medicines and exit interview were employed. Ten common diseases from acute and chronic diseases in Ethiopia were selected and the affordability of treatment was computed using the daily wage of the lowest-paid government worker, which has been assessed as Birr 9.674 per day.

After data collection for the exit interview, each questionnaire was checked visually for completeness. The data were entered, cleaned using SPSS version 14.0 statistical software packages for analysis. Frequencies and measures of variation were used to describe the study population in relation to socio-demographic and other relevant variables. The strength of association and statistical significance between independent and dependent variables were assessed using crude odds ratio (with 95% confidence interval and P value). Multiple logistic regression analysis was performed using SPSS version 14.0 statistical software program to control the potential confounding variables.

4.9. Ethical consideration

Health research approval

Approval was obtained from the School of Pharmacy and Addis Ababa Health Research Ethics Review Committees.

Informed consent

The informed written and verbal consent process involved the data collector giving a verbal explanation to each potential participant on the nature of the study, its purpose, the procedures involved and the expected duration. Each potential participant was also informed that participation in the study was voluntary and that he/she could withdraw at any time, and that withdrawal of consent wouldn't affect his /her subsequent treatment or relationship with the facility staff or any other person.

The participants were assured that all information gathered would be treated as confidential and would be accessible only to the researchers, who would be responsible for its safe keeping. The confidentiality of both written and verbal responses was made known to the participants. The participants were also asked not to write their names and identification to assure anonymity.

5. Results

5.1. Availability of medicines on the day of data collection

5.1.1 Addis Ababa

In Addis Ababa, some of the public health facilities provide medicines for free patients only and the others give service both for free and self paid patients. Out of the five public facilities surveyed two facilities which were under the administration of Addis Ababa Health Bureau were giving services for free patients only.

Table 5: Mean availability of medicines on the day of data collection, public, other and private sector retail outlets in Addis Ababa, October 2008.

	Public sector (n = 5 outlets)		Other sector (n=5 outlets)		Private sector (n = 5 outlets)	
	All medicines (n = 27 medicines)		All medicines (n = 27 medicines)		All medicines (n = 27 medicines)	
	Originator brand	Lowest price generic	Originator brand	Lowest price generic	Originator brand	Lowest price generic
Mean availability (standard deviation)	0 %	71.9%	14.8 %	76.9%	47.4 %	85.2 %
	0 %	(29.5 %)	19.9 %	(31.7%)	(45.1 %)	(26.9 %)

Table 5 shows the average availability of surveyed medicines of the three sectors in Addis Ababa. Generally availability of the lowest priced generics was higher in the private sector (85.2%) followed by the other and public sector with average availability of 76.9% and 71.9% respectively.

When analysis is limited to generic medicines listed on the National EML there were a slight increase for the three sectors studied, from 85.2% to 85.6%, 76.9% to 80% and from 71.9% to 75.2% for private, other and public sectors respectively (Fig 1).

When we see the average availability of generic antibiotics and antimicrobials are generally found in more than 60% of the three sectors studied except for Amoxicillin 250 mg (40%) in the public sector, 50% and 60% for other and private sectors respectively but Beclomethasone inhaler used for asthmatic patients was not found in any of the outlets of the public sector (Fig 2).

5.1.2. Benishangul Gumuz

The data for the public sector was collected from Assosa and Pawe hospitals as well as three randomly selected health centers. Five retail outlets from each private and other sector were selected based on their proximity to the public facilities. The public facilities serve both for free and self paying patients.

As shown in table 6; the public sector of Benishangul Gumuz, average availability was very low, and only 46.7% of the generic drugs were available. In the private pharmacies, the average availability of all surveyed medicines was 39.3% for generics and 0.7% for originator brands. In the other sector, only generics were found (43.2 %).

Table 6: Mean availability of medicines on the day of data collection, public, other and private sectors in Benishangul Gumuz, October 2008.

	Public sector (n = 5 outlets)		Other sector (n=5 outlets)		Private sector (n = 5 outlets)	
	All medicines (n = 27 medicines)		All medicines (n = 27 medicines)		All medicines (n = 27 medicines)	
	Innovator brand	Lowest price generic	Innovator brand	Lowest price generic	Innovator brand	Lowest price generic
Mean availability (standard deviation)	0.0% (0.0%)	46.7% (33.7%)	0.0% (0.0%)	43.2% (31.8%)	0.7% (3.8%)	39.3% (39.0%)
Mean availability (standard deviation)	0.0% (0.0%)	46.7% (33.7%)	0.0% (0.0%)	43.2% (31.8%)	0.7% (3.8%)	39.3% (39.0%)

5.2. Public sector prices

Single order procurement prices were collected from PFSA and its median MPR was calculated. The procurement prices from PFSA were tender prices of 2007. Of the 27 medicines included in the survey, 22 generics were found in the public procurement sector; the public sector is procuring exclusively generic. Based on the median MPR, the public sector is procuring generics at 0.95 times their international reference prices (IRP) or 5% lower than the international price. Thus, the government procurement agency is purchasing efficiently. The inter quartile range shows little variation in median price ratios across individual medicines (0.64, 1.35).

In Addis Ababa out of the five public facilities four offered medicines for free, Therefore in these four facilities, only medicine availability data was collected. For the innovator brands, retail prices were not obtained in both study areas since the public facilities were required to buy from PFSA only. On the other hand, in Benishangul Gumuz regional state the median MPRs of seven lowest price generics were 2.66 with inter quartile range (1.91, 3.32).

6.2.1. Comparison of procurement and retail prices in the public sector of Benishangul Gumuz

In order to compare the procurement price with retail prices, only those medicines found in both public procurement and public sector medicine outlets were included in the analysis. Result shows that retail prices in the public sector are 90.4% higher than procurement prices for generic equivalents.

Out of the medicines found in both public procurement and retail outlets, the retail price is much higher for Mebendazol tablet and Tetracycline eye ointment which is 162% and 457% higher than their procurement price respectively (Fig 4).

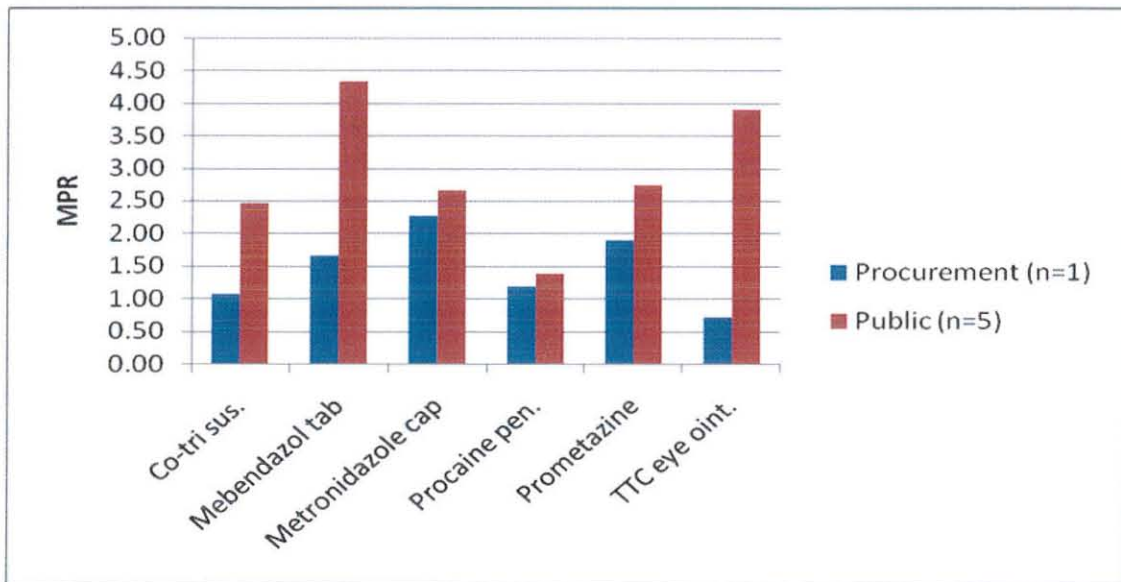


Fig. 4: Procurement and retail prices in the public sector: median price ratio for selected lowest priced generic medicines in Benishangul Gumuz, October 2008.

5.3. Private sector retail prices

As shown in table 7, in the private sector originator brand medicines are generally sold at 27.47 times their international reference price. Half of the originator brand medicines were priced at 16.37 (25th percentile) to 39.42 (75th percentile) times their international reference price in Addis Ababa. There is, therefore, higher variation in MPRs across individual originator brand medicines in the private sector of Addis Ababa and originator brand medicines were not found in Benishangul Gumuz Regional State.

The lowest price generic medicines are generally sold at 2.71 and 3.68 times their international reference price in Addis Ababa and Benishangul Gumuz respectively. Half of the lowest priced generic medicines were priced at 1.68 (25th percentile) to 4.25 (75th percentile) times their international reference price in Addis Ababa and 2.16 (25th percentile) to 6.64 (75th percentile) in Benishangul Gumuz.

Among the lowest price generic medicines; Clotrimazole topical cream (MPR = 29.89 and 23.85) and Tetracycline eye ointment (MPR = 8.86 and 7.09) were several times higher than their international reference prices in Benishangul Gumuz and Addis Ababa respectively.

Table 7: Ratio of median unit price to IRP in the private sector of Addis Ababa and Benishangul Gumuz, October 2008.

Region	Product type	Median MPR	25 % ile	75 % ile
Addis Ababa	Innovator brand (n = 11 medicines)	27.47	16.37	39.42
	Lowest price generic (n =22 medicines)	2.71	1.68	4.25
Benishangul Gumuz	Innovator brand (n = 0 medicines)	NF*	NF	NF
	Lowest price generic (n = 8 medicines)	3.68	2.16	6.64

*NF Data was not found

5.3.1. Brand premium among the private sector in Addis Ababa

As shown in table 8, only those medicines, for which both (n=9) the originator brand and a generically equivalent product were found, were included in the analysis to allow for the comparison of prices between the two product types. Results show that in the private sector, originator brands cost 15.2 times more, on average, than their generic equivalents. Thus, patients are paying substantially more to purchase originator brand medicines when lower-cost generics are available.

Table 8: Comparison of the prices of originator brands and generically equivalent products: in Addis Ababa, October 2008.

Type (n = 9 medicines)	Median MPR	25 %ile	75 %ile
Originator brand	29.35	23.93	40.5
Lowest price generic	1.92	1.42	3.38

5.4. Other sector retail prices

The results below in table 9 show that in the other sector innovator brand medicines were not found both in Addis Ababa and Benishangul Gumuz. The lowest price generic medicines are generally sold at 2.52 and 4.9 times their international reference price in Addis Ababa and Benishangul Gumuz respectively. Half of the lowest priced generic medicines were priced at 1.58 (25th percentile) to 3.24 (75th percentile) times their international reference price in Addis Ababa 3.10 (25th percentile) to 10.85 (75th percentile) in Benishangul Gumuz.

Table 9: Ratio of median unit price to IRP in the other sector of Addis Ababa and Benishangul Gumuz, October 2008.

Region	Product type	Median MPR	25 %ile	75 %ile
Addis Ababa	Innovator brand (n =0medicines)	NF*	NF	NF
	Lowest price generic (n = 13 medicines)	2.52	1.58	3.24
Benishangul Gumuz	Innovator brand (n = 0 medicines)	NF	NF	NF
	Lowest price generic (n = 4 medicines)	4.9	3.1	10.85

* NF Not found

5.5. Comparison of individual medicines prices

Table 10 and Fig. 5 illustrate that from the generic products, lowest price generic Omeprazole had the lowest median price ratio in all sectors (MPR= 0.70 in public health facilities, 0.72 in other sector outlets and 0.78 in the private pharmacies) while Clotrimazole topical cream had the highest median price (MPR=27.85) and (MPR=24.87) when sold in the private pharmacies and other sector respectively.

From among all the generic products sold in the public health facilities, metronidazole 250 mg capsule (which is a locally manufactured generic product) had a median price 4.83 times its international reference price.

Table 10: Median MPRs of some commonly used medicines in three sectors of Addis Ababa and Benishangul Gumuz ,October 2008.

Medicine name	Innovator brand	Lowest priced generic		
	Addis Ababa	BG	Addis Ababa	
	Private	Public	Other	Private
Clotrimazole topical cr.	170.97		24.87	27.85
Cotrimoxazole tab.	40.5	2.18	1.64	2.18
Diclofenac tab.	116.3	2.25	2.25	3.38
Methyldopa tab		1.08	1.7	1.61
Metronidazole cap		2.78	3.44	4.83
Omeprazole cap	38.34	0.70	0.72	0.78
Procaine penicillin inj.		1.27	1.28	2.11
Ranitidine tab	27.47		1.00	1.3
Salbutamol inhaler			0.70	1.04
TTC eye oint.		3.9	4.79	7.53

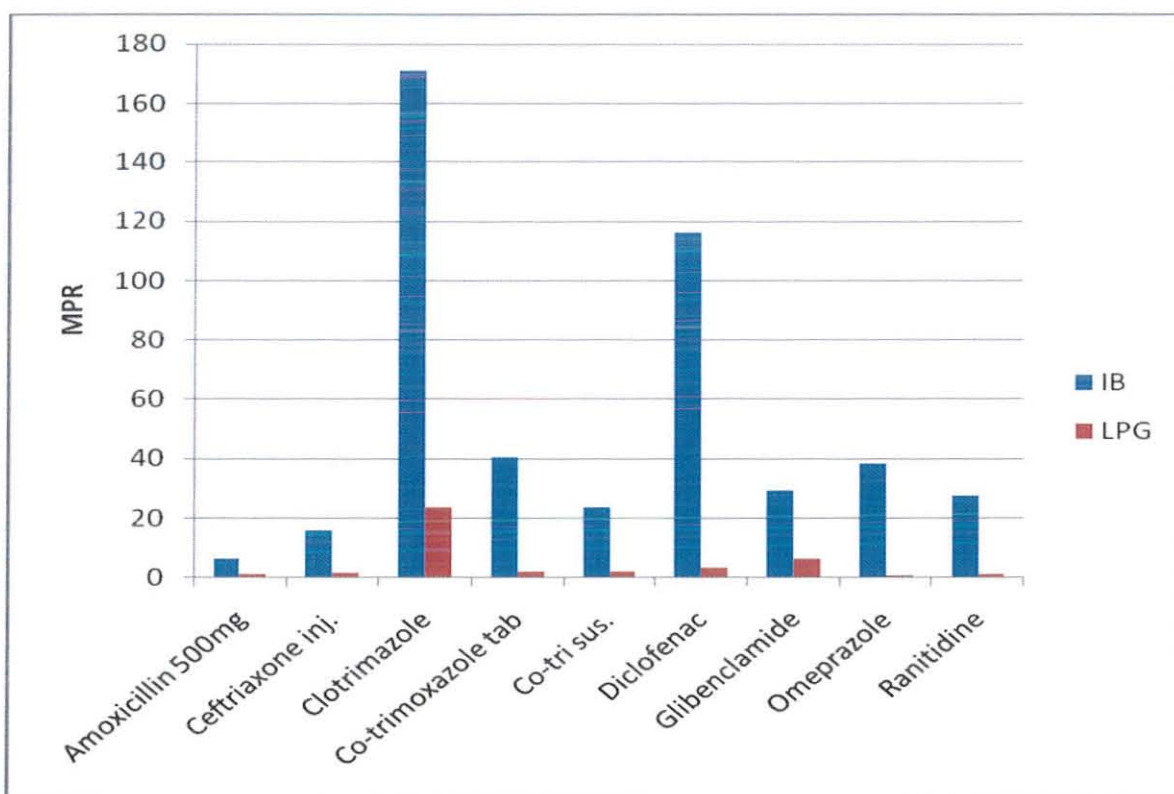


Fig. 5: Median price ratios for selected medicines, innovator brand and generic equivalents, private sector of Addis Ababa, October 2008.

Innovator brand products generally have high median price ratios. For example, Clotrimazole topical cream and Diclofenac 50 mg tablet in the private pharmacies had the highest median price ratio among the innovator brand products and their median price is nearly 170 and 116 times its international reference price (MPR=170.97 and MPR=116.3) respectively. Compared to the price of its generic equivalent in the private pharmacies, innovator brand Diclofenac 50 mg tablet was 103 times that of the lowest price generic equivalent (MPR=3.38).

5.6. Comparison of retail prices in the public, other and private sectors

As shown in table 11, only those medicines found in both sector medicine outlets were included in the analysis to allow for the comparison of prices between the two sectors. Since the public facilities in Addis Ababa provide medicines for free data were not found for the patient price. So the comparison in Addis Ababa is limited to the percentage difference between other and private sectors only.

Table 11: Retail prices of lowest generic medicines in the public, other and private sectors of Addis Ababa and Benishangul Gumuz, October 2008.

Region	Type of medicine	% difference Private To Public	% difference other to Public	% difference Other to Private
Addis Ababa	Lowest price generic	NF*	NF	-25.4% (n=13 medicines)
Benishangul Gumuz	Lowest price generic	81.8% (n=5 medicines)	91.7% (n=2 medicines)	39.7% (n=4 medicines)

*NF Data were not found

In the private pharmacies of Addis Ababa, retail prices were 25.4 % above retail prices in other sector outlets with respect to lowest price generics. In Benishangul Gumuz, the retail prices of the LPG in private pharmacies were 81.8% and 39.7% above the retail prices in public health facilities and other sectors respectively. In addition to that, retail prices in the other sector were 91.7% above to that of public health facilities (Table 11).

Table 12: Number of days' wages of the lowest paid government worker needed to purchase standard treatments in Addis Ababa, October 2008.

Disease condition and 'standard' treatment			Day's wages to pay for treatment		
Condition	Drug name, strength, dosage form	Treatment schedule	Lowest price generic		Innovator brand
			Other sector	private sector	private sector
Asthma	Salbutamol 100 mcg/dose inhaler	1 inhaler of 200 doses	NF	2	NF
Diabetes	Glibenclamide 5 mg cap/tab	1 tab x 2 x 30 days = 60	0.7	1.6	6.8
Hypertension	Methyldopa 250 mg cap/tab	1 tab x 30 days = 30	1.4	1.3	NF
	Hydrochlorothiazide 25 mg cap/tab	1 tab x 2 x 30 days = 60	1.6	1.9	NF
Depression	Amitriptyline 25 mg cap/tab	1 tab x 3 for 30 days = 90	2	3.5	NF
Pediatric respiratory infection	Co-trimoxazole 8+40 mg/ml suspension	5ml twice a day for 7 days = 70 ml	0.5	0.6	6.8
Adult respiratory infection	Amoxicillin 500mg cap/tab	1 cap x 3 for 7 days = 21	1.1	1.4	6.3
	Ceftriaxone 1 g/vial injection	1 vial	NF	1.5	14.7
Arthritis	Diclofenac 50mg cap/tab	1 tab x 2 x 30 days = 60	1.2	0.9	32
Ulcer	Ranitidine 150 mg Cap/tab	1 tab x 2 x 30 days = 60	1.8	1.8	39.3
	Omeprazole 20mg cap/tab	1 cap x 30 days = 30	1.2	0.9	49.8

While treatment of pediatric respiratory infection was the most affordable in all the sectors of Addis Ababa and Benishangul Gumuz as it takes less than a day's wage to treat (Table 12 and 13), the treatment of Depression with Amitriptyline was the least affordable requiring 3.5 days' wages for the full course of treatment (one month) when purchased from the private pharmacy of Addis Ababa.

Table 13: Number of days' wages of the lowest paid government worker needed to purchase standard treatments in Benishangul Gumuz, October 2008.

Disease condition and 'standard' treatment			Day's wages to pay for treatment		
Condition	Drug name, strength, dosage form	Treatment schedule	Lowest price generic		
			Other	private	public
Diabetes	Glibenclamide 5 mg cap/tab	1 tab x 2 x 30 days = 60	1.6	1.9	1.0
Hypertension	Methyldopa 250 mg cap/tab	1 tab x 30 days = 30	1.2	1.4	0.9
Pediatric respiratory infection	Co-trimoxazole 8+40 mg/ml suspension	5ml twice a day for 7 days = 70 ml	NF	0.6	0.5
Adult respiratory infection	Amoxicillin 500mg cap/tab	1 cap x 3 for 7 days = 21	1.2	1.5	1.1
Ulcer	Omeprazole 20mg cap/tab	1 cap x 30 days = 30	0.6	1.9	0.9

Generic Omeprazole is 3.3 times more affordable in other sector than private pharmacies in Benishangul Gumuz. Treatment with generic Omeprazole is about 2700% less expensive than the innovator brand of the same product for a month's course of therapy in Addis Ababa. This means that a worker would need to work additional 48 days to be able to afford the innovator brand of the same medicine.

As shown in fig 6, if we assume a family where the father has diabetes, the mother has ulcer and the child has respiratory tract infection. The lowest-paid government worker had to pay a total treatment cost of 2.4 and 4.4 days' wages in the public and private sector of Benishangul Gumuz respectively, while the total treatment cost 3.1 days' salary in the private sector of Addis Ababa. If innovator brands are purchased, treatment costs would raise to 63.6 days' salary.

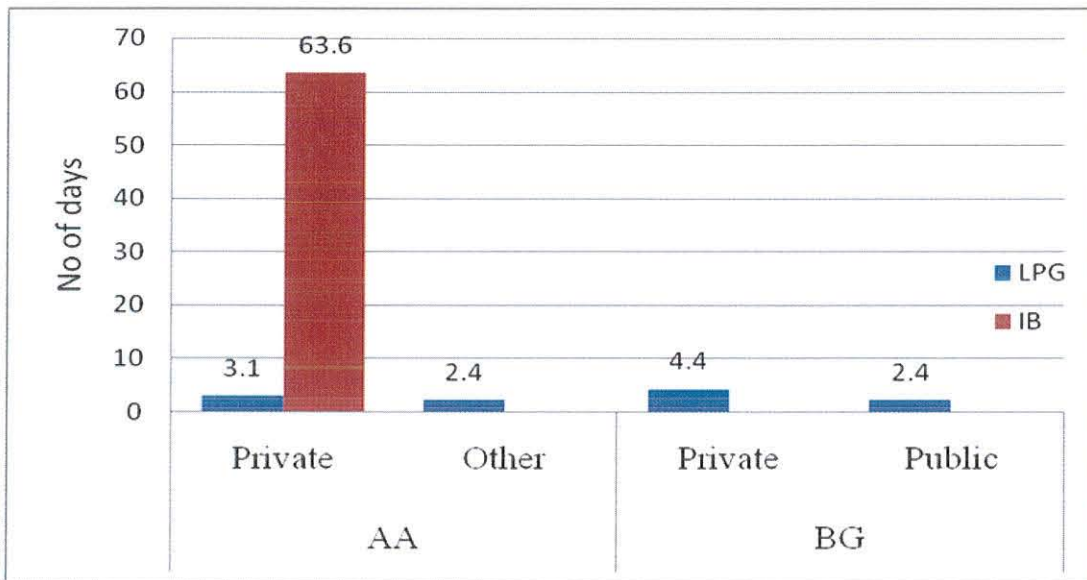


Fig 6: Treatment cost of a combination of ARI, ulcer, and diabetes mellitus in a family using LPG and IB, October 2008.

5.7.2. Reported socio-demographic characteristics of exit interview respondents

The total sample size taken from the five facilities in Addis Ababa and Benishangul Gumuz was 150. Out of these, 140(93.3%) household heads and 10(6.7%) adult household members responded for the questionnaire. Around 97 (64.7%) were males and 53 (35.3%) of them were females. As shown in table 14, the mean age of the respondents was 37.2 years (SD of 11.8 and Range of 20 – 72 years). The majority of the respondents were married and 53.3% of them were self employed. More than 85% of the study population can at least read and write. The average family size per household was 4.8 (SD of 2.6, Range of 1-18).

The average estimated monthly income of the 143 respondents, who were willing to report their income(n=143), was 828.53 ETB and the median was 721 ETB. Twenty five percent of the respondents had income less than 500 ETB and 75% earn less than 1108 ETB. The average total household expenditure was 902.2 ETB and the first quartile lies at 556.9 ETB and the third quartile at 1113 ETB.

Table 14: Socio-demographic characteristics of exit interview participants, Addis Ababa and Benishangul Gumuz, October 2008.

Socio-Demographic characteristics	Frequency	%
Age group (n=150)		
<25	14	9.3
25-40	77	51.3
>40	59	39.3
Residence (n=150)		
Urban	99	66
Rural	51	34
Educational status (n=150)		
Illiterate	20	11.3
Can read and write	13	8.7
1-6	20	11.3
7-12	65	41.3
College and above	32	21.3
Occupation (n=150)		
Government employee	37	24.7
Private organization employee	22	14.7
Self employed	83	55.3
Unemployed	2	1.3
Others*	6	4
Marital status(n=150)		
Single	46	30.7
Married	102	68
Divorced	1	0.7
Widowed	1	0.7
Family size (n=150)		
<3	79	52.7
3-6	43	28.7
>6	28	18.7
Households own (n=150)		
Radio	133	88.7
Electricity	100	66.7
Tap water	88	58.7
Television	79	52.7
Monthly Income(n=143)		
<500	31	20.7
500-1000	67	44.7
>1000	45	30
Affordability of treatment (n=150)		
Yes	91	60.7
No	59	39.3

Regarding possession of the households, the majority of the Respondents (60.9%) live in their own home, 133 (88.7%), 88 (58.7%), 100 (66.7%) and 79 (52.7%) of the households possess radio, tap water, electricity and television, respectively.

In Benishangul Gumuz, the commonest agricultural products on the area are maize (70.7%), Sorghum (52.6%) and Nug (46.3%). The mean amount of Maize and Sorghum produced per household was 4.3 and 5.5 Quintal respectively. On average, the households own 3.2, 2.9, 4.4 and 6.0 cattle, sheep, goat and hen respectively.

5.7.3. Factors affecting ability to pay for treatment

Exit interview was done on average monthly income, out of pocket expenditure and different socio-demographic characteristics. Therefore, it was tried to assess which factors are influencing individual's ability to pay for the prescribed medicines. Different socio-demographic and economic related variables were entered in stepwise regression. As can be seen in Table 15, type of the facility was found as an explanatory variable for client's ability to pay. Respondents from Benishangul governmental hospital were 6.2 times more likely able to pay and also other sectors of Benishangul and Addis Ababa were 3.8 and 6.5 times more likely able to pay for the prescribed medicines as compared to the private sector of Addis Ababa respectively (P- values of 0.002, 0.015 & 0.001 respectively).

Residence was also identified as a factor that has an effect on ability to pay for the prescribed medicines. Respondents who reside in rural area were 0.425 times less likely able to pay for the prescribed as compared to urban dwellers (p- value=0.015).

Educational status of the head of the household was also found to be associated with their ability to pay. People who are 1-6 grades were 3.5 times and those who finished high school were 16.3 times more likely able to pay than illiterate once. This was statistically significant at p value of 0.000 and 0.014 respectively (p<0.01).

Table 15: The ability to pay characteristics of exit interview participants, Addis Ababa and Benishangul Gumuz, October 2008.

Variables	Frequency	P-value	Crude OR (95% CI)	Adjusted OR (95% CI)
Type of organization				
◆ Private Addis	29	.002	1.00	
◆ Private BG	30	.342	1.663 (.582-4.747)	**
◆ Other Addis	31	.001	6.514 (2.087-20.329)	
◆ Other BG	30	.015	3.800 (1.293-11.70)	
◆ Governmental BG	30	.002	6.243(1.994-19.542)	
Residence				
◆ Urban	99		1.00	**
◆ Rural	51	.015	.425 (.292-.849)	
HH has Electricity				
◆ Yes	100	.026	2.199 (1.099-4.402)	**
◆ No	50		1.00	
Education				
◆ Illiterate	20	.005	1.00	
◆ Informal education	13	.176	2.722 (.638-11.61)	**
◆ 1-6	20	.061	3.500(.945-12.966)	
◆ 7-12	65	.030	3.284(1.120-9.633)	
◆ >12	32	.000	16.333(3.954-67.473)	
Average HH Income				
◆ <500	31	.000	1.00	
◆ 500-1000	67	.000	29.659(6.481-135.732)	42.729(3.263,559.587)
◆ >1000	45	.000	67.062(13.219-340.21)	.004* 41.646(2.095,827.873) .014*
Average HH Expenditure				
◆ <500	32	.000	1.00	
◆ 500-1000	69	.000	13.125(4.119-41.821)	**
◆ >1000	49	.000	42.000(11.239-156.95)	
Amount of payment				
◆ <10	36		1.00	
◆ >10	114	.000	0.094(.027-.325)	0.028(0.002, 0.358) .006*

*P value

** This was not significant after controlling confounding factors

The monthly income of the respondents was also associated with their ability to pay. As compared to those respondents with income <500 Birr, those with income 500-1000 were almost 29 times and those with income >1000 were 67 times more likely able to pay for the prescribed medicines at P values of 0.000. This factor was even found to be significant after controlling for potential confounders like educational status of the head of the house hold, amount of payment for the prescribed medicines and type of facility (adjusted OR=42.72 and 41.646, p-values=0.004 and 0.014 respectively).The amount of payment for the prescribed medicines had also shown an impact on the affordability.

Average household monthly expenditure was found as a predictor for client's ability to pay for the prescribed medicines. Respondents with average monthly expenditure of more than 1000 ETB were 42 times and those with average monthly expenditure 500-1000 were 13 times more likely able to afford as compared to those whose monthly expenditure less than 500 ETB ($p < 0.01$) (Table 15).

5.8. Component cost of medicines

The final price paid for a medicine whether by the government or a patient reflects the manufacturers selling price plus all the intervening price additions. These additions include the cost of importing, distributing and dispensing the medicine. The results from key informant interview show that there is no ceiling set by law on the wholesale and retail mark-ups in the country. However, generally PFSA charges 20-40% wholesale mark-up on imported medicines and 5-10% on locally manufactured products.

As shown in fig 7, the private sector of Addis Ababa, for a locally produced product, the manufacturer's selling price represents around 72% of the final patient price. The wholesaler and retailer mark-ups on the average account for 11% and 17% of the patient price respectively. Whereas, in Benishangul Gumuz for the same locally produced product; the manufacturer's selling price represents around 63% of the final patient price. Similarly the wholesaler and retailer mark-ups account for 16% and 21 % of the patient price respectively.

71% respectively. Handling cost and import tariff represent each 1% of the final price charged to patients (Fig 10). But this is not the case when we see the proportions of the cumulative mark up of the CIF; the import tariff represents 5% of the CIF with retail mark-up accounting 247.5 % of the whole seller price (Fig 9).

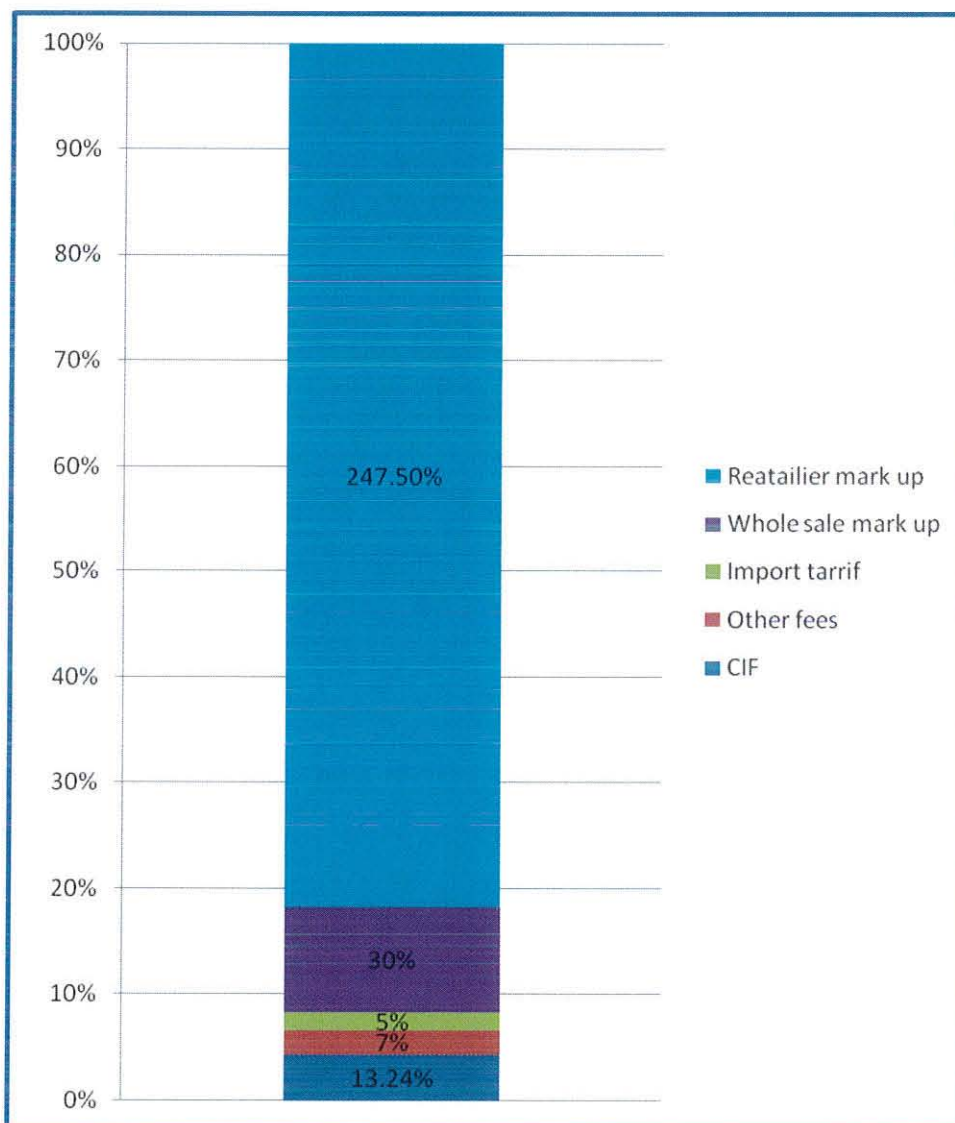


Fig 9: Proportions of cumulative mark up on the CIF price of imported generic medicine of public sector in Benishangul Gumuz, October 2008.

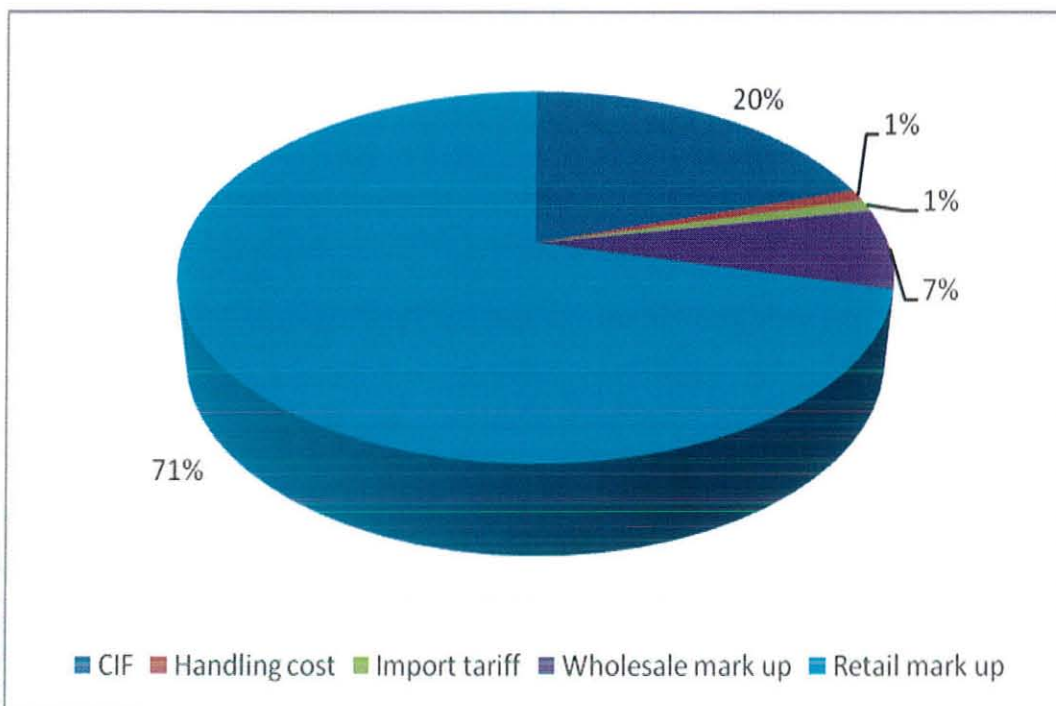


Fig 10: Percentage contribution of price components of imported generic medicine to final Price in Benishangul Gumuz, October 2008.

6. Discussion

In Ethiopia, public procurement prices are relatively efficient, as shown by purchase prices with MPR of 0.95, that is 5% lower than the international reference prices. Although the majority of medicines procured fell below the International Reference Prices, the fact that some items were much higher than the IRP indicated some inconsistencies in the procurement process. For example the procurement prices for clotrimazole topical cream and metronidazole capsule were 6.6 and 2.3 times higher than the international market respectively.

Even though Ethiopia is purchasing below the international price but a little bit higher when compared to other East African countries with MPR (of) 0.55 and 0.67 for Kenya and Tanzania respectively (WHO, 2006). The price of most locally produced products were higher than the IRP; this is because the public procurement agency (PFSA) gives an incentive of 10-15% trade off to local manufacturers.

The innovator products were not found in public procurement sector. The non-availability of this brand of innovator brand products in the public procurement sector is due to the fact that the procurement of medicines is governed by the National Essential Medicine list and standard treatment guidelines where only generic medicines are encouraged.

The finding of the present study found very large differences in the prices of the same generic product between the three sectors surveyed and also between the innovator brand and their generic equivalents.

There were also significant inter-regional differences within the private sector for the same medicine, with prices in Benishangul Gumuz being often most expensive, the median of median prices of lowest price generic products were almost three times and four times in Addis Ababa and Benishangul Gumuz respectively; above the international reference prices

The low availability of medicines at public sector could have direct implications on access, as patients are then forced to buy these medicines from private pharmacies or other sector. Due to non availability of many drugs, many patients now dig deep into their pockets to pay for medicines (Zulkefli, 2006) .Better availability in the public sector would put pressure on private sector to lower generic prices.

Measured in terms of affordability, the daily wage of the lowest-paid government worker is used to estimate treatment affordability. At the time of the survey, the lowest paid unskilled government worker earned 9.674 ETB (US\$ 0.98) per day. According to the World Development Report 2005, 77.8% of the population of Ethiopia lives on less than US\$ 2 per day and 23% on less than US\$ 1 per day (World Bank, 2006).

A substantial proportion of the population earns less than the salary of the lowest paid government worker and hence the affordability for many Ethiopians will be lower than what is presented for this worker Further, the cost to the patient varied considerably depending on whether the patient sought treatment in the public, other or private sector; and whether the patient was prescribed the innovator brand or the generic equivalent.

Overall, medicines were found to be unaffordable to a large proportion of the population; purchasing treatments for chronic conditions was found to require many more days' work than purchasing treatments for acute conditions. In the private sector of Addis Ababa, the majority of treatments cost more than the daily wage of the lowest paid government worker when lowest price generics are used. The treatment of peptic ulcer using ranitidine for a month would need to spend 1.8 days when generics are used. If originator brand omeprazole is prescribed and dispensed, the lowest paid government worker would need to spend 49.8 days' wages to purchase medicines from the private sector.

The burden is especially great for a family needing treatment for several conditions at the same time, e.g. using the lowest priced generic medicines, it would take at least 3.1 days' wages for the lowest paid unskilled government worker to purchase a medicines for a child

day's wage is not meant to cover the cost of medicines only. In other words, the portion of monthly income of the lowest paid government employee that can be spent on medicines alone is much less than his/her one day's wage. When above parameters considered together show that cost of treatment for common diseases seem to be unaffordable to the majority of the population in Ethiopia.

Prices of medicines are determined by a combination of variables, including government policy, degree of competition in the public and private markets, health system capacity, intellectual property protection, non-tariff barriers and import tariffs. Also, the cost of medicines incorporates several added costs prior to reaching patients and includes the base prices (i.e. its price as sold from the manufacturer) as well as all costs for transportation, storage, import tariffs and taxes, wholesale and retail mark-ups, staff salaries, stock losses and procurement practices. These hidden costs can be often more than double the manufacturer's price (Perez-Casas et al., 2001). In order to reduce costs, stakeholders in the health sector need to understand what the hidden cost components are and how they affect the total cost.

The present study demonstrated add-on costs had a substantial impact on medicine prices in all sectors in Ethiopia. In retail pharmacies, actual markups of 25%–247% were found for generics, and 25%–55% for innovators. In Kenya, the private retail sector (for imported medicine) had a wholesale markup of 15%–30% and a maximum retailer markup of 20%–33%. While the retailer's markup is 15%–25% (HAI, 2007). In Brazil, the private retailer's markup was around 27% (HAI, 2006). In Nigeria a retailer margin of 30% was found for generic cotrimoxazole suspension (HAI, 2006) much lower than the present study of Benishangul Gumuz (247.5%).

Generally, high markups along the supply chain drive up prices and make medicines less affordable; therefore prices of medicines can be lowered substantially by reducing the markups. Components analysis indicated high MPRs on the costliest IBs, principally reflecting high manufacturers' prices.

The IB prices remain unaffected even in the presence of generic competition because they are being sold with progressive profits to the manufacturers, distributors, and retailers. Generics are more affordable than IBs, and they could be even more so if markups were restricted and there were incentives to encourage increased use of generics.

Medicine price determination is a complex process, and most national markets are highly segmented with different procedures applying in different sectors and to different medicines. “Free markets” do not apply with medicines under patent, as these by definition confer a degree of market exclusivity to the manufacturer. Manufacturers frequently set different prices in different markets even within the same country (Babar et al., 2007).

In Ethiopia, for IB medicines, generally the conditions for a properly functioning market are not met, as there is a supplier monopoly for these particular medicines. The actual situation in Ethiopia differs from sector to sector as well as by type of medicine. Branded generics, the most numerous generics, are more akin to other branded commodities, in that they compete with each other and are therefore subject to normal supply and demand pressures in determining their prices.

The higher markups on generics observed in the components analysis suggest that the prices of innovator drugs are used as a limit to generic pricing. In such a situation, price controlled generics may be a sensible way out of the problem. Nevertheless, printed maximum retail prices on packs of selected generic medicines as in India, could be used as a mechanism to ensure that retail prices do not diverge excessively from IRPs. In the process, this would put downward pressure on other generic prices and on the prices of IBs (by raising the price differential or “brand premium”) (Kotawani, 2007).

Overall high prices in Ethiopia, compared to the reference prices, might be exemplified when retail generics from private sector cost six to eight times’ international bulk purchase prices. Therefore, government involvement in pharmaceutical pricing practices is necessary because leaving the financing and supply of drugs entirely to the market economy may also fail to

achieve public health objectives. Pricing regulations can be found in most of the European and Middle Eastern countries, Australia, New Zealand, the Far East, and Canada (Taylor, 2008).

However, Ethiopia, a low-income developing country, so far practices none of the pricing methods mentioned above. Price controls can also be implemented in a variety of ways, some of which cause less distortion in the medicines market than others. Perhaps the most efficient and effective is to use, in purchasing, price benchmarks in countries at comparable economic levels, to ensure that a country is not becoming a “high price island”. Reference pricing sets or limits the price of an individual drug by comparison with the price of other drugs in other countries.

Access to affordable and lower priced medicines are the aims of National Drug Policy of Ethiopia (ENDP, 1993), but according to this study’s findings, these aims are not being achieved. A medicine pricing policy and a price monitoring system is required in Ethiopia. Prices may also be controlled by fixing margins of retailers and wholesalers, and enforced by marking maximum prices on packs.

7. Limitation of the study

Study results may be limited by the fact that data are inherently subject to outside influences such as market fluctuations and delivery schedules. In addition, the reliability of median price ratios is dependant on the number of supplier prices used to determine the median MSH international reference price of each medicine. In cases where very few supplier prices are available, or where there is no supplier price and the buyer price is used as a proxy, MPR results can be skewed by a particularly high/low international reference price.

A further limitation is that availability is determined for the list of survey medicines, and therefore does not account for the availability of alternate strengths or dosage forms, or of therapeutic alternatives. Finally, the methodology does not include informal sectors, such as markets and general stores, as the quality of the medicines found in such sectors cannot be assured.

- The community's ability to pay was influenced by socio-economic factors, price of the prescribed medicines and belief about health.
- There is no control on prices of medicines in Ethiopia. Consequently, wholesale and retail mark ups vary from sector to sector and from medicine-to-medicine depending on the market situation.
- The major contributors to the total cost of medicines to patients were retail mark-ups followed by wholesale mark-ups.

References

A Cameron, M Ewen, D Ross-Degnan, D Ball and R Laing (2008). Medicine prices, availability, and affordability in 36 developing and middle-income countries: a secondary analysis. *The Lancet*, 373, 9659: 240 - 249

Aida Caldera and Ziga Zarnic (2006). Affordability of Pharmaceutical Drugs in Developing Countries Working Paper No. 419 Kiel Institute for World Economics: Germany

Anita Kotwani (2007). Medicine Prices, Availability, Price Regulation and Components: Indian Surveys Available at: www.who.int/whr/. Accessed: Mar 3 2009.

Australian Government Productivity Commission (2001). International pharmaceutical price differences, research report Canberra. Available at: <http://www.pc.gov.au/study/pbsprices>. Accessed: Feb 30 2009.

Bale H. (2001). Consumption and Trade in Off-patented Medicines. CMH Working Paper Series. Paper no WG 4:3 Available at: <http://www.who.int/whosis> Accessed: Dec30, 2008.

Babar ZUD, Ibrahim MIM, Singh H, Bukahri NI and Creese A (2007). Evaluating drug prices, availability, affordability, and price components: Implications for access to drugs in Malaysia. *PLoS Med* 4(3): e82. doi:10.1371

Bala, K. & Sagoo, K. (2002). *Patents and Prices*, Health Action International, HAINews. Available at: <http://www.haiweb.org/pubs/hainews/> Accessed: Feb 28 2009.

Bloor K, Maynard A, Freemantle N (1996). Lessons from international experience in controlling pharmaceutical expenditures III: Regulating industry. *BMJ* 313: 33–35.

CSA (2007). The 2004/2005 Household income, consumption and expenditure survey key findings. Addis Ababa: Central Statistical Authority of the Federal Democratic Republic of Ethiopia May 2007.

CSA (2008). Summary and statistical report of the 2007 population and housing census. Central Statistical Agency of Ethiopia Addis Ababa: Ethiopia

DACA (2007). List of importers and whole sellers in Ethiopia. Addis Ababa: Ethiopia

Danzon PM (2000). Making sense of drug prices. *Regulation* 23: 56–63.

Danzon PM, Chao L-W (2000). Cross-national price differences for pharmaceuticals: how large, and why? *Journal of Health Economics*, 19:159–195.

Department of Health, Pricing and Supply Branch (2003). Pharmaceutical price regulation scheme Discussion paper. <http://www.dh.gov.uk/>. Accessed: Mar 20 2009.

ENDP (1993). National Drug Policy of the Transitional Government of Ethiopia. Drug Administration and Control Authority Addis Ababa: Ethiopia

FMOH (2007). Health and health related indicators. Federal Ministry of Health Addis Ababa: Ethiopia

FMOH and WHO (2005). Survey on prices of medicine in Ethiopia. Federal Ministry of Health Addis Ababa: Ethiopia

Frehywot (2006). Willingness to pay for insecticide treated bed net, its utilization and influencing factors in Arbaminch Zuria District, SNNPR, Ethiopia (Unpublished)

Jacobzone S. (2000). Pharmaceutical policies in OECD countries: reconciling social and industrial goals. OECD, Available at <http://www.oilis.oecd.org/> Accessed: Dec 20 2008.

Jan Goudge, Tebogo Gumede, Lucy Gilson, Steve Russell, Stephen M. Tollman and Anne Mills (2007). Coping with the cost burdens of illness: Combining qualitative and quantitative methods in longitudinal, household research: *Scand J Public Health* 2007; 35; 181

Kawasaki E. and Patton J. (2002). Drug Supply Systems of Missionary Organizations: Identifying Factors Affecting Expansion and Efficiency: Case Studies from Uganda and Kenya, WHO Department of Essential Drugs and Medicines Policy, Geneva, WHO

Kumar S (2004). India to extend price controls on drugs. *BMJ* 329: 368.

LCFRD (Library of Congress-Federal Research Division) (2005). Country Profile: Ethiopia. U.S.A.

Levison L and Laing R. (2003). The hidden cost of medicines. *Essential Drugs Monitor*, 33:20–21

MSH (1997). Managing Drug Supply: The Selection, Procurement, Distribution and Use of Pharmaceuticals, 2nd edn, Management Sciences for Health in collaboration with the World Health Organization. Kumarian Press, Hartford, CT.

MSH (2007). International Drug Price Indicator Guide <http://erc.msh.org> Accessed: Jan 10, 2008.

Margaret Ewen & Dalia Dey (2007) Medicines: too costly and too scarce, Available at <http://www.who.org> Accessed: Jan 15 2009.

Myhr K (2000). Comparing Prices of Essential Drugs between Four East African Countries and with International Prices. MSF Conference, Nairobi. <http://www.accessmed-msf.org/prodpublications.asp> Accessed: Jan 12 2009.

Perez-Casas, C., Herranz, E., and Ford, N. (2001). 'Pricing of drugs and donations: options for sustainable equity pricing', *Trop.Med.Int.Health* 6, 11: 960-964

Quick JD, Rankin JR, Laing RO, O'Connor RW, Hogerzeil HV, et al. editors (1997) Managing drug supply. 2nd Ed. West Hartford (Connecticut): Kumarian Press. pp. 7-9

R S Taylor, M F Drummond, G Salkeld, and D Sullivan (2004). Inclusion of cost effectiveness in licensing requirements of new drugs: the fourth hurdle Report, AusInfo, Canberra *BMJ* 329:23

Saggi, Kamal (2007). Trade-Related Policy Coherence and Access to Essential Medicine, ICTSD Programme on Intellectual Property Rights and Sustainable Development, International Centre for Trade and Sustainable Development, Geneva, Switzerland.

Sarmiento AZ (1995). Alternate drug pricing policies in the Americas. Geneva: World Health Organization. Health Economics and Drugs, DAP Series No.1.WHO/DAP/95.6.

Sirkia T and Rajaniemi S (2003). Country report, Finland pharmaceutical pricing and reimbursement policies .European Commission. Available at: <http://ec.europa.eu/enterprise> Accessed: Feb 30 2009.

Steven Russell (1996). Ability to pay for health care: concepts and evidence: *health policy and planning*; 11(3): 219-237.

WHO (2006). Medicine prices surveys and proposed interventions to improve sustainable access to affordable medicines in 6 sub-Saharan African countries Available at www.who.int/medicines/library/edm_general/who-wto-hosbjor. Accessed: Feb 30 2009.

World Bank (2006). World development indicators. World Bank, 2006.

Zulkefli AS (2006). Move to cap prices of essential medicines. New Strait Times. Available at: http://202.144.202.76/new_mps/cfm/. Accessed: Nov 12 2008.

Zaheer-ud and Izham M. (2003). Affordability of medicines in Malaysia – consumer perceptions. *Essential Drugs Monitor*, 33:18-19

Annex 1

Operational definitions

Affordability: The cost of treatment in relation to peoples' income. In this survey, the daily wage of the lowest paid unskilled national government worker is used for comparison with the cost of a defined course of treatment for a specific condition.

Brand name: The product that was first authorized world wide for marketing (normally as a patented product) on the basis of the documentation of its efficacy, safety and quality, according to requirements at the time of authorization: e.g. Valium.

Cost, insurance, freight (CIF): Shipping term meaning the seller must pay the costs, insurance and freight charges necessary to bring the goods to the port of destination.

Cumulative per cent mark-up: is a measure of how much higher a certain price is above the MSP price. For example, if the MSP price is 100 and the price at the end of Stage 2 is 118, the cumulative % mark-up is 18%.

Lowest price generic medicine: A generic medicine which has the lowest price among the generic medicine available.

Mark-up: A certain percentage added to a purchasing price to cover the cost and profit of the wholesaler or retailer.

Other sector: A retailer other than private and public retail outlets. Eg Special pharmacies and ERCS pharmacies.

Per cent contribution to the final price is a measure of a certain price as a percentage of the final medicine price. For example, if the total Stage 2 costs are 23.00 and the final medicine price is 46.00, the per cent contribution of Stage 2 to the final price is 50%.

Annex 2

Medicine Price Data Collection form

Use one form for each health facility and pharmacy

Date:

Area number:

Name of town/village/district:

Name of health facility/pharmacy (optional):

Health facility/pharmacy unique study ID (mandatory):

Type of health facility:

Public Private retail pharmacy

other (please specify):

Type of price in public and private not-for-profit sector:

Procurement price Price the patient pays

Name of manager of the facility:

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

Data collectors:

Verification

To be completed by the area supervisor at the end of the day

Signed:

Date:

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	Brand name(s)	Manufacturer	Available tick ✓ for yes	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
Ciprofloxacin tab 500 mg	Ciproxin	Bayer		1			/tab	
<i>Lowest price generic equivalent</i>				1			/tab	
Clotrimazol topical cream 1%	Canestan	Bayer		15gm			/tube	
<i>Lowest price generic equivalent</i>				15 gm			/tube	
Co-trimoxazole 400+80 mg	Bactrim	Roche		20			/tab	
<i>Lowest price generic equivalent</i>				20			/tab	
Co-trimoxazole paed suspension (8+40) mg/mL	Bactrim	Roche		100 mL			/mL	
<i>Lowest price generic equivalent</i>				100 mL			/mL	
Diclofenac tab 50 mg	Voltarol	Novartis		100			/tab	
<i>Lowest price generic equivalent</i>				100			/tab	
Fluconazole caps/tab 200 mg	Diflucan	Pfizer		30			/tab	
<i>Lowest price generic equivalent</i>				30			/tab	
Glibenclamide tab 5 mg	Daonil	HMR		60			/tab	
<i>Lowest price generic equivalent</i>				60			/tab	
Hydrochlorothiazide tab 25 mg	Dichlotride	MSD		30			/tab	
<i>Lowest price generic equivalent</i>				30			/tab	
Mebendazol 100mg	Vermox	Janssen pharma		6			/tab	
<i>Lowest price generic equivalent</i>				6			/tab	
Methyl dopa	Aldomet	MSD		60			/tab	
<i>Lowest price generic equivalent</i>				60			/tab	
Metronidazole 250mg	Flagyl	Aventis		60			/tab	
<i>Lowest price generic equivalent</i>				60			/tab	

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	Brand name(s)	Manufacturer	Available tick ✓ for yes	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
Ciprofloxacin tab 500 mg	Ciproxin	Bayer		1			/tab	
<i>Lowest price generic equivalent</i>				1			/tab	
Clotrimazol topical cream 1%	Canestan	Bayer		15gm			/tube	
<i>Lowest price generic equivalent</i>				15 gm			/tube	
Co-trimoxazole 400+80 mg	Bactrim	Roche		20			/tab	
<i>Lowest price generic equivalent</i>				20			/tab	
Co-trimoxazole paed suspension (8+40) mg/mL	Bactrim	Roche		100 mL			/mL	
<i>Lowest price generic equivalent</i>				100 mL			/mL	
Diclofenac tab 50 mg	Voltarol	Novartis		100			/tab	
<i>Lowest price generic equivalent</i>				100			/tab	
Fluconazole caps/tab 200 mg	Diflucan	Pfizer		30			/tab	
<i>Lowest price generic equivalent</i>				30			/tab	
Glibenclamide tab 5 mg	Daonil	HMR		60			/tab	
<i>Lowest price generic equivalent</i>				60			/tab	
Hydrochlorothiazide tab 25 mg	Dichlotride	MSD		30			/tab	
<i>Lowest price generic equivalent</i>				30			/tab	
Mebendazol 100mg	Vermox	Janssen pharma		6			/tab	
<i>Lowest price generic equivalent</i>				6			/tab	
Methyl dopa	Aldomet	MSD		60			/tab	
<i>Lowest price generic equivalent</i>				60			/tab	
Metronidazole 250mg	Flagyl	Aventis		60			/tab	
<i>Lowest price generic equivalent</i>				60			/tab	

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	Brand name(s)	Manufacturer	Available tick ✓ for yes	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
Metformin tab 500 mg	Glucophage	Merck		100			/tab	
<i>Lowest price generic equivalent</i>				100			/tab	
Omeprazole caps 20 mg	Losec	AstraZeneca		30			/caps	
<i>Lowest price generic equivalent</i>				30			/caps	
Phenytoin caps/tab 100 mg	Epanutin	Pfizer		100			/tab	
<i>Lowest price generic equivalent</i>				100			/tab	
Penicillin procaine benzyl 4MIU/Vial				1			/vial	
<i>Lowest price generic equivalent</i>				1				
Prometazine tab 25 mg				100			/tab	
<i>Lowest price generic equivalent</i>				100			/tab	
Artemeter with Lumefantrin tab	Coartem	Roche		3			/tab	
<i>Lowest price generic equivalent</i>				3			/tab	
Ranitidine tab 150 mg	Zantac	GSK		60			/tab	
<i>Lowest price generic equivalent</i>				60			/tab	
Tetracycline eye ointment 1%	Acromycin	Lederle		5 gm			/tube	
<i>Lowest price generic equivalent</i>				5 gm				
Salbutamol inhaler 0.1 mg per dose	Ventoline	GSK		1 inhaler: 200 doses			/dose	
<i>Lowest price generic equivalent</i>				1 inhaler: 200 doses			/dose	

A	B	C	D	E	F	G	H	I
Generic name, dosage form, strength	Brand name(s)	Manufacturer	Available tick ✓ for yes	Pack size recommended	Pack size found	Price of pack found	Unit price (4 digits)	Comments
Efavirenz(EFV) cap 200 mg	Sustiva	BMS		60			/cap	
<i>Lowest price generic equivalent</i>				60			/cap	
Lamivudine(3TC) tab 150 mg	Epivir	GSK		60			/tab	
<i>Lowest price generic equivalent</i>				60			/tab	
Nevirapine tab 200mg	Viramune	Boehringer		60			/tab	
<i>Lowest price generic equivalent</i>				60			/tab	
Zidovudine caps 100 mg	Retrovir	GSK		60			/caps	
<i>Lowest price generic equivalent</i>				60			/caps	

Price components data collection form

Name of data collector:	Mohammedsied Nuru
Region:	A.A/Benishangul Gumuz
Sector:	Public/Private/Other sector
Name/code of dispensing outlet:	
Product name, dosage, strength:	Amoxicillin Can 500 mg
Manufacturer:	GSK and AnF
Pack size:	
Product type:	<input type="checkbox"/> Innovator brand <input type="checkbox"/> generic
Production:	<input type="checkbox"/> imported <input type="checkbox"/> locally produced
Any additional information about target medicine:	

	Type of charge	Charge basis	Price to which charge is applied	Amount of charge	Comments
Stage 1	Manufacturers selling price	price			
	Insurance and freight				
	CIF				

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Annex 4. Individual Consent form for exit interview questionnaire

Cost as a barrier to access; Availability, affordability and component cost of essential medicines in Addis Ababa and Benishangul Gumuz Regional state

- Date of interview _____ Interviewer identification _____
- Time to complete interview: start time _____
Finish time _____
Total (minutes) _____

Instruction to the interviewer: it is critical that you read this greeting to the client, and continue only if she/he gives her/his consent. For each item in the rest of the interview circle the response(s) or describe as appropriate.

Good morning /after noon. My name is _____ and I am here today on behalf of the research team of Addis Ababa University to collect information on the availability and price of medicines. The Regional Health and administrative bodies have approved this research. We would like to ask you some questions about your personal and household characteristics such as income, education, household member, and your view about affordability of medicines.

If you agree to participate, it will take about 30 minutes for us to complete this interview. I will not write down your name and every thing you tell me will be kept confidential. If you choose not to participate, it will not affect services you receive in this facility. However, we would be very happy if you participated. May we continue?

Indicate that the client consented: (circle as appropriate) yes__ No__

(If No, thank the client for her/his time and go to the next interview.)

To be completed by the interviewer

I certify that I have read the above statement to the interviewee and the client has consented.

Name/Sign. _____

Supervisor's name: _____ Signature: _____

Checked on: _____ (day)/ _____ (month) 2001 E.C.

Annex 5

Exit Interview

1. General Information

Date of the interview _____

Name of organization _____

Residence _____

2. Age of the respondent _____

3. Sex Male Female

4. Marital status. A. Single

B. Married

C. Divorced

D. Widowed

5. Educational status of the head of household

A. Illiterate

B. Can read and write

C. 1-6

D. 7-12

E. College and above

6. Are you head of the household? Yes No

7. How many people reside in the household? _____

8. What is the Occupation of the head of the household?

A. Government employee

B. Private organization employee

C. Self employed

D. Unemployed

E. Other

9. Average monthly income from this work _____

10. If the respondent is a farmer

A. Type of production? _____

B. How much (yearly)? _____

11. Do you have any other source of income? If yes how much? _____

12. Does your household have? If yes mark "X"

A. Tap water

E. Car

B. Electricity

F. Home

C. Radio

G. Land

D. Television

H Domestic Animals How many? _____

13. What is the average household expenditure per month for each of the following?

A. Food items _____

F. Transport _____

K. Edir+ Ekub _____

B. Electricity _____

G. Telephone _____

L. Health _____

C. Water _____

H. House rent _____

M. Tax _____

D. Clothing _____

I. Fuel _____

N. Others _____

E. Education _____

J. Saving _____

14. What was your problem? _____

15. Can you show me what is prescribed for your disease? _____

16. How much did you pay for the prescribed medicine? _____

17. Is the treatment affordable for you?

Yes No

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Annex 4. Individual Consent form for exit interview questionnaire

Cost as a barrier to access; Availability, affordability and component cost of essential medicines in Addis Ababa and Benishangul Gumuz Regional state

- Date of interview _____ Interviewer identification _____
- Time to complete interview: start time _____
Finish time _____
Total (minutes) _____

Instruction to the interviewer: it is critical that you read this greeting to the client, and continue only if she/he gives her/his consent. For each item in the rest of the interview circle the response(s) or describe as appropriate.

Good morning /after noon. My name is _____ and I am here today on behalf of the research team of Addis Ababa University to collect information on the availability and price of medicines. The Regional Health and administrative bodies have approved this research. We would like to ask you some questions about your personal and household characteristics such as income, education, household member, and your view about affordability of medicines.

If you agree to participate, it will take about 30 minutes for us to complete this interview. I will not write down your name and every thing you tell me will be kept confidential. If you choose not to participate, it will not affect services you receive in this facility. However, we would be very happy if you participated. May we continue?

Indicate that the client consented: (circle as appropriate) yes__ No__

(If No, thank the client for her/his time and go to the next interview.)

To be completed by the interviewer

I certify that I have read the above statement to the interviewee and the client has consented.

Name/Sign. _____

Supervisor's name: _____ Signature: _____

Checked on: _____ (day)/ _____ (month) 2001 E.C.

Annex 6: Structured questionnaire

Questions	Responses	Explanations
1. NATIONAL MEDICINES (DRUGS) POLICY (NMP)		
1.1 Is there a National Medicines Policy (NMP) document? <i>If no, skip to 2.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	A national medicines (drug) policy document is a written expression of the government's medium to long term goals and priorities for the pharmaceutical sector and the main strategies for attaining them.
a) If yes, is it an official or draft document?	<input type="checkbox"/> Official <input type="checkbox"/> Draft <input type="checkbox"/> Don't Know	Mark "official" if the NMP document has been endorsed or officially adopted by the government otherwise mark "draft".
b) What year was it last updated?	Year <input type="text"/>	Indicate the year of last update whether the document is still in draft form or has been officially adopted.
1.2 Is there an NMP implementation plan that sets activities, responsibilities, budget and timeline?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
a) If yes, when was it last updated?	Year <input type="text"/>	
2. REGULATORY SYSTEM		
Regulatory authority		
2.2 Is there an existing formal medicines regulatory authority?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
2.3 What are the sources of funding for the medicines regulatory authority: Regular budget from the government:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
Fees from registration of medicines:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
Other:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
2.4 Is there medicines regulatory authority website providing publicly accessible information on any of the following: legislation, regulatory procedures, prescribing information (such as indications, CI's, side effects, etc.), authorised companies, and/or approved medicines?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	

Questions	Responses	Explanations
Marketing authorization		
2.7 Are there legal provisions for marketing authorization?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	Marketing authorization is an official document issued by the medicines regulatory authority for the purpose of marketing or free distribution of a product after evaluation for safety, efficacy and quality and/or after registration of a product for marketing.
2.8 How many medicinal products have been approved to be marketed? <i>(count total number of unique dosage forms and strengths)</i>	Number <input type="text"/>	Tablets, capsules, injections, elixirs and suppositories should be counted in different strengths.
2.9 Is a list of all registered products publicly accessible?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
Licensing		
2.14 Are there legal provisions for licensing of the following:		
Manufacturers:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
Wholesalers or distributors:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
Importers or exporters of medicines:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
Quality control		
2.19 Is there a quality management system in place?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	This question is asking if there is an officially defined protocol for ensuring the quality of medicines, including testing of medicines to be registered, collection and testing of samples, reporting results, corrective actions to be taken when poor results are found and preventative measures to be taken to reduce future incidence of poor results.
2.20 Are medicine samples tested for the following regulatory purposes:		
Medicines registration:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
Post-marketing surveillance:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
2.23 What is the total number of samples tested in the last calendar year that failed to meet quality standards?	Number <input type="text"/>	
2.24 Are there regulatory procedures to ensure quality control of donated medicines?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
2.24 Are there regulatory procedures to ensure quality control of imported medicines?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	

Questions	Responses		Explanations
Dispensing and prescribing			
2.30 Are there legal provisions for the following:			
Licensing and practice of prescribers:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
Licensing and practice of pharmacy:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
2.31 Is prescribing by generic name obligatory in the:			
Public sector:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
Private sector:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
2.32 Is generic substitution permitted at:			
Public pharmacies:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
Private pharmacies:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
2.33 Are there incentives to dispense generic medicines at:			Incentives may include dispensing fees or mark-ups which provide financial incentive for dispensers to dispense lower-priced generic medicines.
Public pharmacies:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
Private pharmacies:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
Promotion and advertising			
2.34 Are there provisions in the medicines legislation/regulations covering promotion and/or advertising of medicines?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
3. MEDICINES SUPPLY SYSTEM			
3.1 Is public sector procurement pooled at the national level (i.e. there is centralised procurement for the regions/provinces)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		Mark "yes" if public sector procurement is centralised and medicines are procured for the entire public sector by a national procurement body even if in some instances, such as cases of stock outages, public sector facilities procure medicines through other means.
3.2 Who is responsible for public sector medicines procurement and distribution:	<i>Procurement</i>	<i>Distribution</i>	
Ministry of Health:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	
Non-governmental organization (NGO):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	

Questions	Responses		Explanations
Private institution contracted by the government:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	Mark "yes" for private institution contracted by the government if the government contracts or makes an agreement with a private entity to procure or distribute medicines for the public sector, e.g. if an agreement is made with a private company to distribute medical items and supplies to public sector district warehouses and health facilities.
Individual health institutions:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	
3.3 What type of tender process is used for public sector procurement and what is the percentage of the total cost for each:		<i>Percentage of total cost</i>	Competitive tender is a procedure for procuring medicines which puts a number of suppliers into competition. Purchasing is done on the basis
National competitive tender:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	_____%	National competitive tender is open to all or a limited number of local suppliers only.
International competitive tender:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	_____%	International competitive tender is open to all or a limited number of local and international suppliers though sometimes conditions give preference to either local or international suppliers.
Negotiation/direct purchasing:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	_____%	In negotiation/direct purchasing the buyer approaches one or a small number of suppliers and either buys at the quoted prices or bargains for a specific service arrangement.
3.6 Is public sector procurement limited to medicines on the Essential Medicines List (EML)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know		
4. MEDICINES FINANCING			
4.1 What is the total public or government expenditure for medicines in Birr (US\$) for the most recent year for which data are available?	US\$ _____ Year _____		This question is asking for the total amount the government has spent on medicines, including government allotment, health ministry expenditure, donor contributions channelled through the government, etc.

Questions	Responses	Explanations										
Percentage co-payments for medicines:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	A percentage co-payment is a fixed percentage of the cost of prescribed medicines that a patient must pay to cover part of the cost of medicines, the other part being paid by an insurer or government. The amount a patient pays will depend on the medicine and the number of units of that medicine prescribed.										
4.4 Is revenue from fees or the sale of medicines used to pay the salaries or supplement the income of public health personnel in the same facility?	<input type="checkbox"/> Always <input type="checkbox"/> Frequently <input type="checkbox"/> Occasionally <input type="checkbox"/> Never <input type="checkbox"/> DK	Mark "yes" if any percentage of collected fees or medicines sales is used to pay salaries, expenses and/or in any way supplement the income of public health personnel in the same facility.										
4.5 Do prescribers dispense medicines?	<table border="0"> <tr> <td><i>Public sector</i></td> <td><i>Private sector</i></td> </tr> <tr> <td><input type="checkbox"/> Always</td> <td><input type="checkbox"/> Always</td> </tr> <tr> <td><input type="checkbox"/> Frequently</td> <td><input type="checkbox"/> Frequently</td> </tr> <tr> <td><input type="checkbox"/> Occasionally</td> <td><input type="checkbox"/> Occasionally</td> </tr> <tr> <td><input type="checkbox"/> Never <input type="checkbox"/> DK</td> <td><input type="checkbox"/> Never <input type="checkbox"/> DK</td> </tr> </table>	<i>Public sector</i>	<i>Private sector</i>	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Frequently	<input type="checkbox"/> Frequently	<input type="checkbox"/> Occasionally	<input type="checkbox"/> Occasionally	<input type="checkbox"/> Never <input type="checkbox"/> DK	<input type="checkbox"/> Never <input type="checkbox"/> DK	
<i>Public sector</i>	<i>Private sector</i>											
<input type="checkbox"/> Always	<input type="checkbox"/> Always											
<input type="checkbox"/> Frequently	<input type="checkbox"/> Frequently											
<input type="checkbox"/> Occasionally	<input type="checkbox"/> Occasionally											
<input type="checkbox"/> Never <input type="checkbox"/> DK	<input type="checkbox"/> Never <input type="checkbox"/> DK											
4.6 What proportion of the population has health insurance?	<table border="0"> <tr> <td><input type="checkbox"/> All</td> <td><input type="checkbox"/> Some</td> <td><input type="checkbox"/> All</td> <td><input type="checkbox"/> Some</td> </tr> <tr> <td><input type="checkbox"/> None</td> <td><input type="checkbox"/> DK</td> <td><input type="checkbox"/> None</td> <td><input type="checkbox"/> DK</td> </tr> </table>	<input type="checkbox"/> All	<input type="checkbox"/> Some	<input type="checkbox"/> All	<input type="checkbox"/> Some	<input type="checkbox"/> None	<input type="checkbox"/> DK	<input type="checkbox"/> None	<input type="checkbox"/> DK			
<input type="checkbox"/> All	<input type="checkbox"/> Some	<input type="checkbox"/> All	<input type="checkbox"/> Some									
<input type="checkbox"/> None	<input type="checkbox"/> DK	<input type="checkbox"/> None	<input type="checkbox"/> DK									
4.7 Are medicines covered by health insurance?	<table border="0"> <tr> <td><input type="checkbox"/> All</td> <td><input type="checkbox"/> Some</td> <td><input type="checkbox"/> All</td> <td><input type="checkbox"/> Some</td> </tr> <tr> <td><input type="checkbox"/> None</td> <td><input type="checkbox"/> DK</td> <td><input type="checkbox"/> None</td> <td><input type="checkbox"/> DK</td> </tr> </table>	<input type="checkbox"/> All	<input type="checkbox"/> Some	<input type="checkbox"/> All	<input type="checkbox"/> Some	<input type="checkbox"/> None	<input type="checkbox"/> DK	<input type="checkbox"/> None	<input type="checkbox"/> DK			
<input type="checkbox"/> All	<input type="checkbox"/> Some	<input type="checkbox"/> All	<input type="checkbox"/> Some									
<input type="checkbox"/> None	<input type="checkbox"/> DK	<input type="checkbox"/> None	<input type="checkbox"/> DK									
4.9 Is a national medicine prices monitoring system for retail/patient prices in place?	<table border="0"> <tr> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> </tr> <tr> <td><input type="checkbox"/> DK</td> <td><input type="checkbox"/> DK</td> <td><input type="checkbox"/> DK</td> </tr> </table>	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DK	<input type="checkbox"/> DK	<input type="checkbox"/> DK	A national medicine prices monitoring system for retail/patient prices is any means of regularly tracking and comparing over time retail/patient medicine prices in the public, private and/or NGO sectors.				
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No										
<input type="checkbox"/> DK	<input type="checkbox"/> DK	<input type="checkbox"/> DK										
4.10 Are there regulations mandating retail/patient medicine price information to be made publicly accessible?	<table border="0"> <tr> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> </tr> <tr> <td><input type="checkbox"/> DK</td> <td><input type="checkbox"/> DK</td> <td><input type="checkbox"/> DK</td> </tr> </table>	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DK	<input type="checkbox"/> DK	<input type="checkbox"/> DK	In order for retail/patient medicine price information to be considered publicly accessible, one or more of the following or similar measures should be taken: prices should be available on the web or to anyone contacting the responsible authority, prices should be periodically published in national newspapers or official publications, prices should be posted in health facilities/pharmacies, etc.				
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No										
<input type="checkbox"/> DK	<input type="checkbox"/> DK	<input type="checkbox"/> DK										

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Questions	Responses			Explanations
4.11 Are there 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?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	Countries may have differing definitions for medicine donations which may include not only products but also monetary gifts earmarked for a particular product from a named source (e.g. manufacturer, organization or other country).
6. RATIONAL USE OF MEDICINES				
6.1 Is there a national Essential Medicines List (EML)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know			Essential medicines are those that satisfy the priority health care needs of the population. They are selected with due regard to disease prevalence, evidence on efficacy and safety, and comparative cost-effectiveness.
a) If yes, how many unique medicine formulations does the national EML contain?	Number: <input type="text"/>			
c) When was the national EML last updated?	Year: <input type="text"/>			
d) Is the national EML being used in the following:				Mark "yes" if the EML is currently being used.
Public sector procurement:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know			
Public insurance reimbursement:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know			
Private insurance reimbursement:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know			
e) Is there a committee responsible for the selection of products on the national EML?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know			This refers to a formally recognised committee with members of different expertise and from different agencies/organizations.
6.2 Are the following types of standard treatment guidelines (STG) produced by the health ministry for major conditions?	<i>National STG</i> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	<i>Hospital level STG</i> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	<i>Primary care STG</i> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK	
a) If yes, when were the STGs last updated?	Year <input type="text"/>	Year <input type="text"/>	Year <input type="text"/>	
6.16 How frequently are the following types of medicines sold over the counter without any prescription:				This question is asking how often antibiotics and injections which require a prescription to be dispensed are sold without a prescription, regardless of laws prohibiting such practice.
Antibiotics:	<input type="checkbox"/> Always	<input type="checkbox"/> Frequently <input type="checkbox"/> Occasionally		
Injections:	<input type="checkbox"/> Always	<input type="checkbox"/> Frequently <input type="checkbox"/> Occasionally		

S5.2 Does the government set the price of some/all generic products?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	
a) If yes, please describe how this is done (e.g. direct price controls, national reference pricing):		National reference pricing refers to setting prices by comparing the prices of similar medicines (by molecule or therapeutic class; originator brand or generics) on the national market.
S5.3 Are prices set in the private sector for medicines on the national Essential Medicines List?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No national EML	This question is asking whether price-setting is limited to medicines on the national EML.
S5.4 Are prices of medicines set as part of market authorization?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	Marketing authorization is an official document issued by the medicines regulatory authority for the purpose of marketing or free distribution of a product after evaluation for safety, efficacy and quality and/or after registration of a product for marketing.

Annex 7

አዲስ አበባ ዩኒቨርሲቲ

በፋርማሲ ትምህርት ቤት ፋርማሲዮቲክስ ዲፓርትመንት

ደህና አደራችሁ/ዋላችሁ። ስሜ _____ እባላለሁ። የመጣሁት ከአዲስ አበባ ዩኒቨርሲቲ ፋርማሲዮቲክስ ዲፓርትመንት ሲሆን ስለ መድሀኒት ዋጋ እና ለህብረተሰቡ ተመጣጣኝ መሆኑን ጥናት ለማድረግ ነው። የክልሉ ጤና ቢሮ እና የሚመለከታቸው አካላት ለዚህ ጥናት ፍቃዳቸውን ገልፀዋል። ስለሆነም አንዳንድ መረጃዎች ስለ ገቢዎና ቤተሰብዎ ሁኔታ ልጠይቆት እፈልጋለሁ።

እዚህ ጥናት ለመሳተፍ ፍቃደኛ ከሆኑ መጠይቁ ወደ 30 ደቂቃ አካባቢ ይፈጃል። እርሶ የሚሰጡኝ መረጃ ሚስጥራዊነቱ የተጠበቀና ለሌላ ሰው አላሳልፎ እንደማልሰጥ ላረጋግጥሎ እወዳለሁ።

ለመሳተፍ ፈቃደኛ ነዎት አዎ አይ

Annex 8

የመጠየቂያ ፎርም

1. ጠቅላላ መረጃ

.ጥያቄው የተደረገበት ቀን-----

.የድርጅቱ ስም -----

.የሚኖሩበት አካባቢ-----

2. የተጠያቂው እድሜ -----

3. የተጠያቂው ፆታ ወንድ ሴት

4. የትዳር ሁኔታ ሀ. ያላገባ

 ለ. ያገባ

 ሐ. የፈታ

 መ. የሞተበት/ባት

 ሠ. የተለያዩ

5. የትምህርት ሁኔታ ሀ. መፃፍና ማንበብ የማይችል

 ለ. መፃፍና ማንበብ የሚችል

 ሐ. ከ 1-6

 መ. ከ 7-12

 ሠ. ከ 12ኛ ክፍል በላይ

6. የቤትዎ አስተዳዳሪ ነዎት? አዎ አይደለም

7. ከቤተሰብዎ ውስጥ ምን ያህል ሰው ይኖራል?-----

8. የቤቱ አስተዳዳሪ ስራ ምንድን ነው?

ሀ. የመንግስት ተቀጣሪ

ለ. በግል ድርጅት ተቀጣሪ

ሐ. በግሉ የሚሰራ

መ. ስራ የሌለው

ሠ. ሌላ ካለ ይገለፅ

9. ከዚህ ስራ በወር ምን ያህል ያገኛሉ?-----

9.1 ተጠያቂው ገበሬ ከሆኑ

ሀ/ የምርት አይነት

ለ/ ምን ያህል ያመርታሉ (በአመት)

10. ሌላ የገቢ ምንጭ ወይንም ለቤተሰቡ የሚረዳ አለ? ካለ ምን ያህል?-----

11. ቤተሰቡ ከታች የተዘረዘሩት ነገሮች ካሉት X ምልክት ያድርጉ

ሀ. የባንክ ወኃ

ረ. ቤት

ለ. መብራት

ሰ. መሬት

ሐ. ሬድዮ

ሸ. የቤት እንስሳት ካለ ምን ያህል

መ.ቴሌቪዥን

ሠ. መኪና

12. ቤተሰብዎ ከታች ለተዘረዘሩት በወር ምን ያህል ይክፍላል፡፡

ለምግብ-----ለመብራት-----ለውሃ-----ለትምህርት-----

ለልብስ-----ለዘር-----ለመጓጓዣ-----ለስልክ-----

ለቤት ኪራይ-----ለጋዝ-----ለማዳበሪያ-----ለእድር-----

ለዕቁብ-----ተቀማጭ-----ግብር-----ሌላ-----

13. ህመምዎ ምንድን ነው?-----

14. የታዘዘልዎት መድሀኒት ሊያሳዩኝ ይችላሉ?-----

15. ለመድሀኒት ምን ያህል ክፍለው?-----

16. ለመዳሀኒት የክፈሉት ተመጣጣኝ ነው ብለው ያስባሉ?

አዎ

አይደለም

Annex 9

Declaration

I the undersigned, declare that this is my original work, has never been presented in this or any other university and that all the source materials used for the thesis have been duly acknowledged.

Name Mohammedsied Nuru Mohammednur

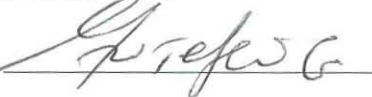
Signature 

Place Addis Ababa

Date of submission 07/09/09

This thesis has been submitted for examination with my approval as a university advisor.

Name Dr. Teferi Gedif

Signature 

Date _____

Name Dr. Damen Hailemariam

Signature 

Date _____