Availability, Price and Affordability of Medicines for Treating NCDs in the Ugandan Private Sector

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Abstract

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Globally, access to medicines is a major public health challenge (Wirtz et al., 2017). Countries have committed to improving access to medicines through universal health coverage and the Sustainable Development Goals (SDGs) (UN General Assembly, 2015). For example, in the context of the growing burden of Non-Communicable Diseases (NCDs), the WHO Global NCD Action Plan 2013–2020 has a target on access to medicines for NCDs: "80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major NCDs in both public and private facilities" (WHO, 2013). In Uganda, household out of pocket expenditure (OOP) accounts for 37% of the health expenditures, yet households spend 95% of the OOP on curative health care visits.

This study was secondary analysis of data collected in a cross sectional survey of private for profit retail pharmacies and set out to assess the availability, price and affordability of medicines for diabetes, hypertension, and seizures in private medicines retail outlets in Uganda.

Results and Conclusion: Our study found that whereas a large proportion of medicines to treat NCDs were reasonably available, in line with the WHO target of ensuring at least 80% availability, they are not affordable to a lot of Ugandans. Availability of Insulin though is still below the required target. A lot of effort should be put in ensuring people do not have to choose between filling their life-saving medicine prescriptions and feeding their families. Recent efforts by the government that are geared towards establishing a national health insurance scheme as well as promoting local manufacture of medicines will go a long way towards reducing the cost to families and hence improving access.

Contents

1.0 Introduction

1.1 Background

Globally, access to medicines is a major public health challenge (Wirtz et al., 2017). Countries have committed to improving access to medicines through universal health coverage and the Sustainable Development Goals (SDGs) (UN General Assembly, 2015). For example, in the context of the growing burden of Non-Communicable Diseases (NCDs), the WHO Global NCD Action Plan 2013–2020 has a target on access to medicines for NCDs: “80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major NCDs in both public and private facilities” (WHO, 2013).

NCDs account for more than 41 million deaths globally, representing about 71% of all annual deaths. Fifteen million of these deaths are in the age range of 30 to 69 years with low and middle-income countries (LMICs) accounting for more than 85% (WHO, 2018). In May 2012, WHO member states made a commitment to reduce NCD associated premature deaths by 25% by the year 2025. One of the nine major targets aimed at achieving this goal is ensuring at least 80% access to essential NCD medicines(Hogerzeil et al., 2013). Access to medicines to treat NCDs is woefully short of this target, especially in LMICs even when compared to access to medicines for treatment of infectious and acute ailments. In a study looking at medicine price, availability and affordability in 36 LMIC, Cameron et. Al., found mean availability of essential medicines in these countries was about 36% for NCDs compared to 54% for acute diseases in the public sector while the private sector availability was at 55% for NCDs compared to 66% for acute ailments but at a higher price (Cameron, et. al., 2009). In Sub-Saharan Africa, NCDs are on course to account for 75% as many deaths as communicable, maternal, perinatal, and nutritional diseases, with diabetes and cardiovascular diseases predominating(WHO, 2008).

Often, many individuals in LMICs purchase medicines for NCDs from private retail outlets due to poor availability in the public sector(Cameron et al., 2009). Affordability of medicines, especially those of chronic conditions like NCDs, is a key issue of concern for governments worldwide, as well as private sector payers (Wirtz et al., 2017). In LMICs, medicines account for a large proportion of household expenditure on health(WHO, 2010). In Uganda, household out of pocket expenditure (OOP) accounts for 37% of the health expenditures, yet households spend 95% of the OOP on curative health care visits (Ministry of Health, 2017).

Effective management and response to NCDs requires improvements in both availability and affordability of the relevant medicines (Wirtz and Moucheraud, 2017). Despite the fact that robust evidence is required for tracking progress toward the global health goals for NCD management, information about availability and affordability of medicines, especially in LMICs is weak (WHO, 2016). In this study, we explore the availability, price and affordability of medicines for diabetes, hypertension, and seizures in private retail outlets in Uganda.

1.2 Objectives of the study

1. To assess the availability of medicines for diabetes, hypertension, and seizures in private medicines retail outlets in Uganda
2. To assess variation in prices of medicines for diabetes, hypertension, and seizures in private medicines retail outlets in Uganda
3. To assess the affordability of medicines for diabetes, hypertension, and seizures in private medicines outlets in Uganda

2.0 Methodology

2.1 Study Design

The study was a secondary analysis of data collected in a cross-sectional survey of medicines prices, conducted as part of market intelligence activities by the Guardian Group of pharmacies in Uganda The market intelligence study used a standardized methodology co-developed by WHO and Health Action International (HAI)[1].

2.2 Survey areas

The market intelligence survey by Guardian Health Ltd, one of the largest retail pharmacy chains in Uganda collected from four regions of the country: Central, Eastern, Western, and Northern. In each region two districts were selected. The largest region, which is central, and the capital city (Kampala) followed by the second largest city/town were purposively selected. In each of the four regions, two districts with major towns were selected. Consideration was made to ensure that the districts were within one day's car travel from the capital city.

2.3 Sectors and medicine outlets

The market intelligence survey covered private-for-profit sector facilities. In each region, ten (10) private-for-profit facilities were sampled for a total of 40 facilities across the four regions. We found this survey appropriate for the analysis because the standard WHO/HAI methodology recommends thirty outlets per sector for a survey to achieve enough data points for analysis (Madden et al., 2010). The market intelligence survey used major public health facilities in the four regions as the reference points for selection of private-for-profit (PFP) retail facilities for the

[1] www.haiweb.org/medicineprices

survey, under the assumption that public health facilities are drivers of demand in private for profit outlets due to frequent stock outs.

Table 1: Sample frame for retail outlets

	CENTRAL	EASTERN	NORTHERN	WESTERN	TOTAL
Private (PFP)	**10**	**10**	**10**	**10**	**40**

2.4 Sampling strategy

The market intelligence survey used public hospitals as anchors to locate outlets for inclusion in each region. Medicine outlets were selected within three hours' travel of each public hospital. Only registered medicine outlets were considered in the survey. The official list of registered pharmacies from the national medicines regulatory agency (National Drug Authority) was used to locate, select and verify registration status. For each medicine outlet in the sample, a back-up outlet was identified (the next closest outlet). In the event that a medicine outlet was closed or moved, the nearest sector outlet was chosen as a replacement.

2.5 NCD medicines include in the analysis

Our analysis included a subset of NCD medicines covered as part of the market intelligence survey in three broad categories: antidiabetics, anti-hypertensives and anti-seizure medicines. The list of medicines included in the analysis is shown in Table 2.

Table 2: List of medicines

Medicine name, strength and dosage form	
Antidiabetics	Metformin 500mg tablet, Glibenclamide 5mg Tablet, Insulin

Anti-hypertensives	Nifedipine 20 mg Retard Tablet, Captopril 25mg Tablet, Amlodipine 5mg Tablet
Anti-seizure	Carbamazepine 200mg tablet, Diazepam 5mg tablet

2.6 Respondents in market intelligence survey

The market intelligence survey included facility leaders, attendants, owners or any suitable person delegated by the leaders or owners of the private medicine retail pharmacy outlets. Some of the respondents were medical doctors, clinical officers, nurses, midwives, health assistants, pharmacists, or dispensers.

2.7 Market intelligence survey field team

Four pharmacy technicians and four nurses were used to collect data during the market intelligence survey. Prior to data collection, the survey team participated in training.

2.8 Data collection

The survey team visited the medicine outlets to collect data on medicines physically available on the day of data collection and prices. Standardized data collection forms were used. For each medicine, data was collected on the lowest priced product, innovator brand product, and highest priced product. If the price was not written on the pack, the dispenser was asked the price charged to patients for that given product. Any discount or other factor affecting the product price was documented.

2.9 Variable definitions

Availability of the medicines was defined as being: a) available in stock and for sale to clients on the day of the survey, and b) not available. Expired medicines in a given facility were considered not available. Price was defined as the cost of the cheapest available brands of the medicines.

As part of the price definition, additional data on brand name, manufacturer, pack size, pack price and unit price were collected.

2.10 Data analysis

Data from the market surveillance survey were entered into an expanded standardized WHO/HAI international price workbook, that has built-in data quality and validation checks. The price of medicines was compared in local currencies as a median price ratio. We also calculated the following: (1) price and availability comparisons within regions, (2) comparisons of prices and availability of individual medicines, (3) estimates of affordability of individual medicines, and (4) average percentage availability and prices of the medicines

2.10.1. Affordability

The WHO/HAI definition of affordability was used during the analysis i.e., the number of days the lowest paid government worker would have to pay for one treatment course of an acute condition or one month's treatment of a chronic condition. (WHO and HAI, 2008). Therefore, the total one-month as well as one-year cost of a course of treatment for each medicine was computed using the lowest available price for the product at a given facility. Thereafter, affordability of medicines was computed using the monthly wage of the lowest paid unskilled government employee.

2.10.2 Price

International reference prices (IRPs) served as benchmarks to determine whether medicines prices were high or low (MSH) (Management Sciences for Health), 2016). We calculated a medicine price ratio (MPR) to compare the IRP with the price of products from our survey. This

ratio serves as an indicator for how much greater or less the local price is compared to the IRP. A ratio of three or less for the private sector indicates that the products are reasonably priced.

2.10.3 Other analyses

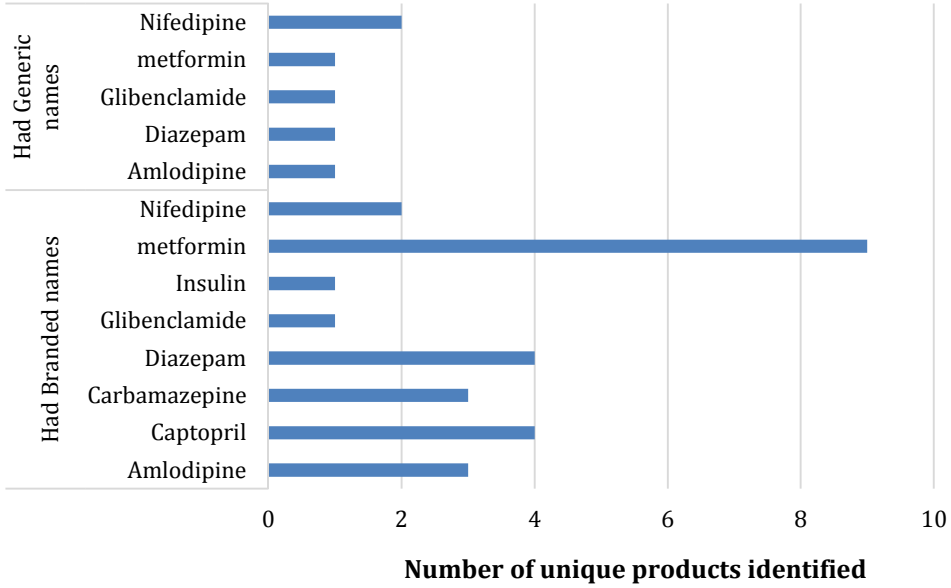
We also described the types, formulations and brands available and their median costs as well as price variations between treatment courses.

3.0 Results

3.1 Broad characteristics

From a total of 40 private retail outlets spread across the four major geographical regions, 33 unique products of the eight medicines surveyed were identified. Eighty two percent of them had brand names while only 18% had generic names. Among the medicines surveyed, metformin had the highest number of unique products (10 products) on the market, followed by diazepam (five products) while Insulin had only one brand identified among the facilities surveyed. Furthermore, metformin had the highest number of unique products with branded names (nine products), followed by diazepam (four products), and captopril (four products). Most products (18) were manufactured in India. Details on number of products identified as well as country of origin are shown in Figure 1.

Figure 1: Number of unique products identified by name category

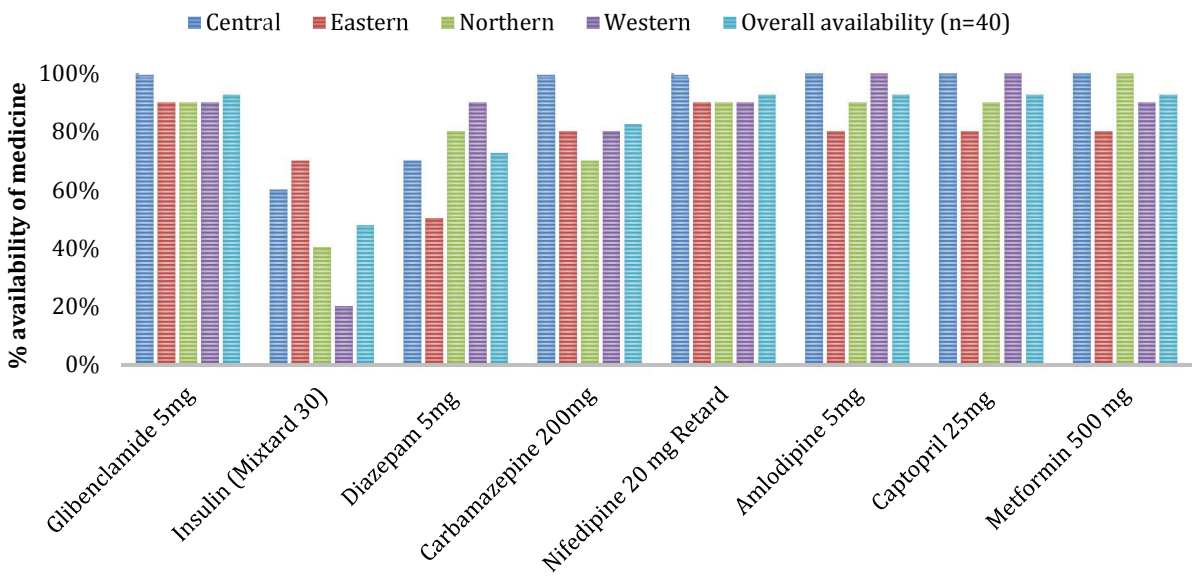


Country of origin	Count of country
Cyprus	4
France	1
Germany	1
India	18
Kenya	2
Uganda	4
United Kingdom	1
Not Known	2
Total	**33**

3.2 Availability

On average, 83% of the private retail facilities had medicines for NCDs. Glibenclamide, nifedipine Retard, amlodipine, captopril and metformin tablets had the highest availability i.e., were found in 93% of the facilities. On the other hand, Insulin (Mixtard 30) had the lowest availability and was found in 48% of the facilities. Details of availability by region of Uganda are shown in the Figure 2.

Figure 2: Percentage availability of medicines for Non-Communicable Diseases in private retail facilities by region



Availability was largely comparable across the regions for medicines surveyed with exception of Insulin (Mixtard 30), diazepam and carbamazepine. There were substantial regional variations in the availability of Insulin (Mixtard 30) in private facilities. For example, whereas 70% of the facilities surveyed in the eastern region had Insulin (Mixtard 30) in stock on the day of the visit, only 20% of the facilities in the western region had Insulin (Mixtard 30) in stock. Similarly, 70% of the facilities in the northern region had carbamazepine in stock while all the facilities surveyed in the central region had the medicines for NCDs in stock.

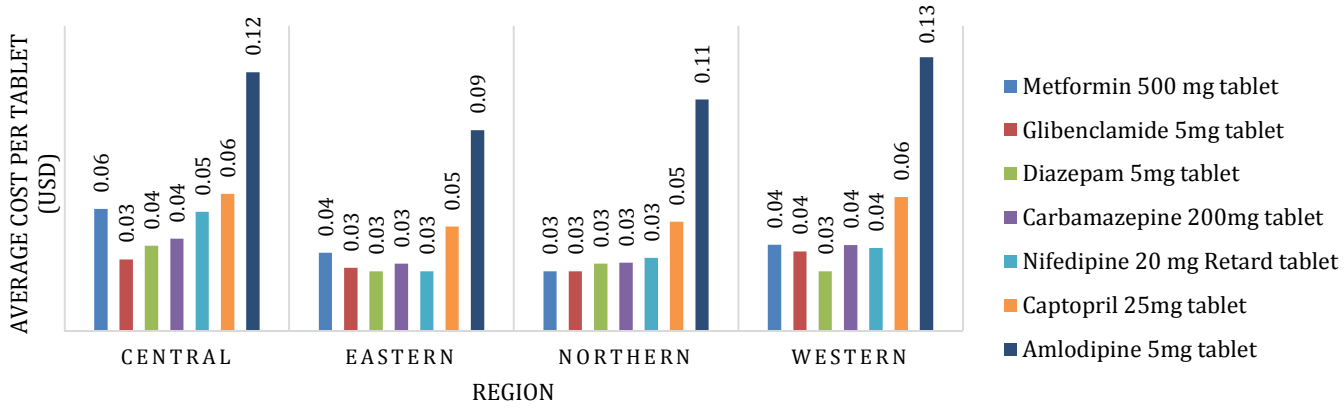
3.3 Price

3.3.1 Medicines prices

Overall, among the tablet formulations surveyed for treating NCDs, Amlodipine had the highest average unit prices per tablet (USD 0.11), following by Captopril (USD 0.06), while average

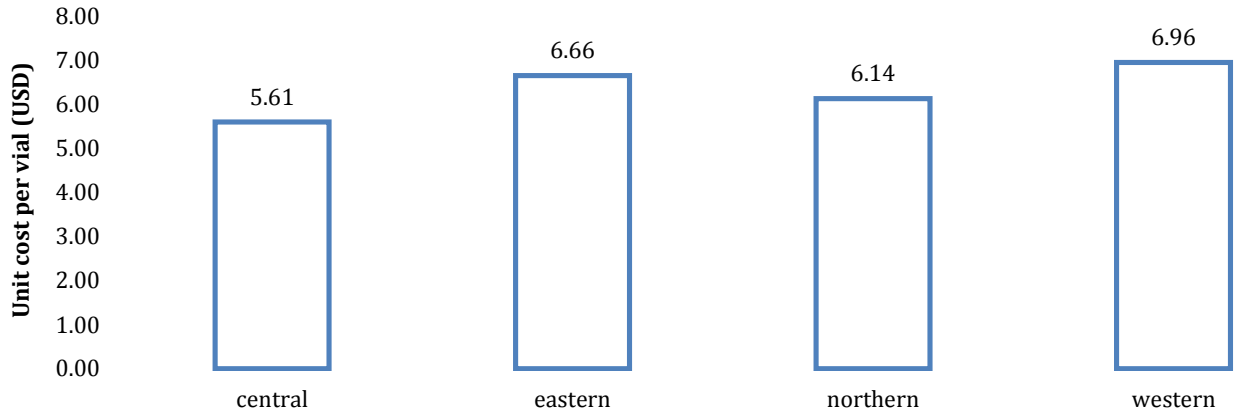
prices of the other medicines were generally comparable. For example, Metformin (USD 0.04), Glibenclamide (USD 0.03), Diazepam (USD 0.03), Carbamazepine (USD 0.04), and Nifedipine Retard (USD 0.04) had similar prices per unit. Details are shown in Figure 3 by region.

Figure 3: Unit prices of the medicines (only those with tablet formulations) by region



Generally, facilities in the central and western regions had fairly higher medicines retail prices compared to those from other regions, especially for Amlodipine tablets. Furthermore, Insulin (Mixtard 30) had the highest retail unit price of all the medicines included in the analysis, with an average of USD 6.25 per vial. However, there were no substantial variations in the prices of NCD medicines surveyed across the regions as shown in the Figure 4 below.

Figure 4: Retail unit cost of Insulin (Mixtard 30) in private medicines outlet by region



3.3.2 Comparisons of Median Price Ratios

Comparisons were made between medicines prices and the international reference drug prices, at a discount rate of 3% and also accounting for the currency inflation. These comparisons were reported as medicine price ratios (MPRs) as shown in Table 3.

Table 3: Medicine Price Ratios reflecting price comparisons with the International Reference Prices

Medicine name	Medicine Price Ratio
Diazepam 5mg tab	3.3
Glibenclamide 5mg tab	5.7
Metformin 500 mg tab	2.7
Insulin (Mixtard 30)	1.2
Nifedipine retard tab 20mg	2.0
Amlodipine 5mg tab	7.3
Captopril 25mg tab	7.6
Carbamazepine 200mg	1.9

Overall, all the eight medicines assessed were more expensive than the International reference prices (IRPs). However, glibenclamide, amlodipine and captopril had unreasonably higher prices compared to the IRPs: they were greater than five times higher than the IRP. This suggests that medicines for management of NCDs in Uganda are far more expensive compared to the IRPs.

3.4 Affordability

Treatments less than or equal to one days' wages were considered affordable. The daily wage of the lowest paid government worker (attendants) is about UGX 6255 (US$ 1.71) as per the Ministry of Public Service salary structure[2]. Table 4 shows the number of days it would take the lowest paid Ugandan government worker to pay for treatment of the most common diseases.

Generally, treatment regimens for hypertension, seizures and diabetes (using Insulin) were not affordable to the lowest paid government worker. These treatments required more than one day's wage for the lowest paid government worker to obtain them from a private medicines retail outlet in Uganda. However, treatment regimens containing glibenclamide were widely noted to be affordable. Insulin (Mixtard 30) was not affordable to the lowest paid government worker, where it required more than a week's wages to obtain therapy to cater for a given month.

4.0 Discussion

In this study, we assessed the availability, price and affordability of medicines commonly used for treating NCDs in Uganda's private sector retail market. Overall, availability, at 83%, which was higher than the WHO's medicines target of 80%. Most of the available medicines were generics from India, which are usually considered to be relatively cheaper than their European or

[2] Ministry of Public Service New Salary Scales for Public servants for FY 2017/18

American name-brand medicines. Metformin had the highest number of unique products on the market, which could be a good factor in improving its availability. The people have a lot more options to choose from and there is a high likelihood that completion amongst brands would drive prices down.

There were no substantial variations in availability of medicines for treating NCDs across regions in Uganda although it was observed that the central region had slightly higher availability while the eastern region outlets had lower availability compared to the other regions. The reason for this could be that there are a lot more prescribers (healthcare providers) in the central region compared to other areas. Additionally, the central region has better infrastructure than other areas of the country, which makes distribution much easier. Insulin had the lowest availability across regions at 48%. This is lower than what another recent study on access to some NCD medicines in Uganda that found availability to be 60%. Insulin also had the largest regional variation; with the eastern region having the highest availability at 70% while the west had the lowest at 20%. This low availability of insulin could be attributable to high prices, shortage of physicians to prescribe it, special requirement for a cold chain among others.

All medicines surveyed were priced higher than IRP with insulin being the most reasonably priced with a MPR of 1.2. Captopril, with an MPR of more than 7.5 was the most highly priced compared to international reference prices. It is worth noting that insulin didn't have any other brand on the market and its price wasn't much different than the IRP. This could be because there are very few manufacturers for this product. The price set by the manufacturer will largely be uniform across the regions in which the product is distributed. It will also be higher because the few manufacturers enjoy oligopoly pricing.

The prices for the other medicines were a lot higher than IRPs and this could be explained by the fact that Uganda is a free market economy that does not regulate prices. It follows that whereas these products may be cheaper in India, their distributors in Uganda tend to benchmark their prices on innovator brands and then look to displace them by pricing slightly lower but not low enough as to be close to the marginal cost. They therefore run very high margins as a result. Competition does help drive some of the prices down but once a brand is established in the market, it is a lot harder for it to lose its market share especially for NCD medicines that are taken over long periods. Patients tend to have brand loyalty and those considerations tend to figure a lot more than price considerations.

For hypertensive medicines, prices were higher than global estimates. The high cost of hypertension management is further exacerbated by the fact that hypertension is often accompanied by co-morbidities of other NCDs such as diabetes.

Of all the surveyed medicines, insulin was the least affordable, requiring more than a week's wages to cover the cost of a month's supply. This is consistent with other studies that have repeatedly found insulin to be unaffordable. Davis Kibirige et al, 2017, found that a patient required about 5 days' wages to cover the cost of insulin (Kibirige et al, 2017). It should be noted that insulin is a core requirement in the treatment of insulin dependent diabetes mellitus and unfortunately doesn't seem to have many generics or even a substitute. This therefore means that policy makers have to devise ways of improving access to this essential drug to the masses through a combination of approaches like promoting importation of generics, increased government funding to cover the cost of these drugs, promoting local manufacture of generics, and prevention of NCDs.

Despite the fact that insulin is essential for the survival of patients with Type 1 diabetes and is also required for enhanced management in some individuals with Type 2 diabetes, its poor availability and unaffordability presents a serious bottleneck towards universal health coverage, especially among the most vulnerable populations (Beran et al., 2016). However, little has been documented as to why insulin is largely unaffordable. The most common assertion is that there is often monopoly of the brands from the big manufacturers taking up the market share and with very limited competition, in addition to absence of better alternatives to fill the evident demand (Beran et al., 2016).

Considering the fact that many of the patients with NCDs often present with multiple comorbidities and are also prescribed more than one drug for management of a condition(s), these findings suggest that treatment regimens for NCDs from private medicines retail outlets in Uganda are generally not affordable. Furthermore, many of the households in Uganda have several members who may have one or more NCDs. This may compromise family-level productivity and result in more out of pocket expenditure, as well as cyclic impoverishment.

The study had a number of limitations. The scope of diseases covered was not so wide as to represent all NCDs seen in the country. We however tried to cover the most common ones. We only assessed the private, for profit pharmacies. Pharmacies tend to be found in urban areas yet the majority of Ugandans live in rural areas. There is likelihood that access to medicines for Ugandans in rural areas is that much lower than we see in this study because facilities aren't as readily available. Whereas we tried to cover the entire country in terms of geographical scope, the data we used was mainly collected from major towns in these regions. These may not necessarily be representative of the entre regions. Additionally, the data for this study came from

already existing market intelligence data and thus represents a secondary analysis. While primary data would have been preferable, a primary survey we were constrained by resources.

Affordability was assessed using the lowest paid unskilled government worker. Most Ugandans work in the informal sector and they tend to earn less than their government counterparts. This method of assessment may have overestimated affordability

In Conclusion, our study found that whereas a large proportion of medicines to treat NCDs were reasonably available, in line with the WHO target of ensuring at least 80% availability, they are not affordable to a lot of Ugandans. Availability of Insulin though is still below the required target. A lot of effort should be put in ensuring people do not have to choose between filling their life-saving medicine prescriptions and feeding their families. Recent efforts by the government that are geared towards establishing a national health insurance scheme as well as promoting local manufacture of medicines will go a long way towards reducing the cost to families and hence improving access.

Table 4: Affordability of medicines used for management of NCDs in the private retail outlets

Condition	Treatment regimen	Treatment duration (in days) per month*	No. of units per treatment*	Median unit cost (USD)	Monthly cost of Treatment (USD)	Days' wages	Annual cost of Treatment (USD)
Anxiety	Diazepam 5mg tab	42	42	0.03	0.96	0.53	10.8
Diabetes	Glibenclamide	30	30	0.03	0.90	0.53	10.8

	5mg tab						
	Metformin 500 mg tab	30	30	0.04	1.20	0.70	14.4
	Insulin (Mixtard 30) vials	30	02	6.25	12.5	7.31	150
Hypertension	Nifedipine retard 20mg tab	30	60	0.04	2.40	1.40	28.8
	Amlodipine 5mg tab	30	30	0.11	3.30	1.93	39.6
	Captopril 25mg tab	30	60	0.06	3.60	2.11	43.2
Epilepsy/ convulsions	Carbamazepine 200mg tab	30	60	0.04	2.40	1.40	28.8

*Figures obtained from the Uganda Clinical Guidelines, 2016

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