A STUDY OF AVAILABILITY OF ESSENTIAL MEDICINES AND SUPPLIES DURING DUAL PULL-PUSH SYSTEM OF DRUGS ACQUISITION IN

KALIRO DISTRICT, UGANDA

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DECLARATION

To the best of my knowledge, I hereby declare that this research report has not been submitted in full or in part to any other institution for any purpose. And that the views herein are my own, unless stated, and where such has been the case, acknowledgement or reference has been quoted.

Signed..... OKIROR BRUNO

Date.....

BPH/0001/102/DU

DEDICATION

This work is dedicated to Miss. Aduo Margaret Rose, for being the best mother, for her priceless support and devotion.

ACKNOWLEDGEMENT

First, to the almighty God, for his favor, ever enduring love, knowledge and wisdom he has granted to me. Special thanks to my supervisor Mr. Albert Onchweri, for his guidance. Thanks to Kaliro district Local government, the District Health Officer Kaliro, Dr. Kasewa Sarah and all staff of the health Department for their participation and support. Uttermost gratitude goes to the Belgian Technical Corporation – Uganda, for the financial support provided in both my bachelors' education and in this research.

LIST OF ACRONYM

DHO	District Health Officer
EMLU	Essential Medicine List for Uganda
GOU	Government of Uganda
HCs	Health Centres
HMIS	Health Management Information System
HSD	Health Sub District
HUs	Health Units
KDLG	Kaliro District Local Government
KIUTH	Kampala International University Teaching Hospital
MDG	Millennium Development Goals
мон	Ministry Of Health
NDA	National Drug Authority
NGO's	Non Governmental Organizations
NHP	National Health Policy
NMS	National Medical Stores
USD	US dollar

DEFINITION OF TERMS

Availability	Product availability is defined as "no out of stock of an item" according		
	to stock cards.		
Dual pull-push	Application of both pull and push methods at the same time		
Essential drugs	Selected drugs of the utmost importance - basic and indispensable for		
	health needs. They must be therapeutically effective, have acceptable		
	safety and be affordable.		
Health	Defined by MOH a state of complete physical, social and mental well		
	being of an individual or a community and not merely the absence of		
	disease or infirmity.		
Key informants	People trained in various fields and are in a position to release		
	information relevant to the study.		
РНС	Essential health care based on scientifically sound and socially		
	acceptable methods and technology, made universally accessible to		
	individuals, families and communities by their full participation		
Pull	Approach where health facility staff participated in determining the		
	medicines they needed		
Push	Approach where there is distribution of a standardized kit of essential		
	medicine by the national central supplier to health facilities,		
	irrespective of the disease burden and patient population		

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ABSTRACT

The Ugandan government has experimented with various supply chain models for delivery of essential drugs and supplies. In 2010, the dual pull-push system was adopted; however drug stock outs are still a common occurrence in health facilities.

This study on availability of essential medicines during the dual Pull-Push system in Kaliro District was undertaken; this was to be used as an indirect or direct indicator of availability of essential drugs and medical supplies during the dual pull-push method. The study combined quantitative and qualitative methods; the study mainly based on; Document review (stock cards, delivery notes, etc) and Key informant interviews.

Results showed that; average stock-out duration of essential medicines and supplies was 23.89% (20.47 % and 27.32% for medical supplies). ACT Artemether/lumefantrine 20/120 mg had the highest percentage out of stock followed by Cotrimoxazole 480mg Tablets 51.6% and 32.4 %, respectively. Among the short falls of the system was; Drug requisitions based on neither morbidity nor consumption methods of quantification, and among the challenges in the system was; delays during distribution, Supplying medicines with short shelf life, rare condition drugs or low usage drugs.

In conclusion, the trend of essential medicines and supplies availability of during the dual Pull-push system seemed to be declining since its inception in 2010. It was thus recommended that National medical stores involve stake holders at all stages of medicines and supplies planning especially the DHOs, who are the final consumers in the supply chain and Government adopt a revolving drug fund system, in the form of 'Special Pharmacies and drug stores' to enhance availability of essential drugs in public facilities and improve quality of health care.

CHAPTER ONE

1.0.0 Introduction

This chapter gives an overview of the study and it includes the background to the study, statement of the problem, broad objective, specific objectives, research questions, justification, scope of the study and operational definitions.

1.1.0 Background

By the 1970s, it was recognised that causes of poor health in less developed countries, such as inadequate or poor nutrition, poor housing and sanitary conditions, and inadequate water, needed to be addressed. It was also recognised that access to the right modern medicines was crucial for health care. The World Health Organisation began promoting the concept of Essential Drugs in 1975 (Beverley Snell, 2014).

Availability of medicines is important as far as the reduction of mortality and morbidity associated with disease burden are concerned. However, lack of essential medicines is still one of the most serious public health problems. About 30 % of the world's population lacks the medicines they need. The situation is worse in the poorest parts of Africa and Asia where the figure rises to over 50 % (WHO, 2004) The Ugandan government has experimented with various supply chain models for delivery of essential drugs and supplies. Between 1985 and 2001, the health sector relied on the push approach or essential drug kit Supply systems (the service provider determined the type and quantities of Essential Medicines and Health Supplies (EMHS) to deliver and distribute to all public health facilities. However, in 2002, the pull system was adopted; districts, local governments and Health units requested medicines and health supplies that matched the disease burden, Patient profile, and budget ceilings for EMHS for each respective budget cycle, the Shift to the pull system was accompanied by intensive capacity building in supply chain Management at national and facility levels (Bukuluki, *et al.*, 2013)

After more than eight years of considerable investment in and experimentation with the pull system, it was abandoned in 2010 and replaced with a dual pull-push system. The pull system was maintained for Health Centre (HC) IVs and Hospitals, while the push system was adopted for rural

and hard-to-reach health facilities including HC III and HC II. The former (HC IVs and hospitals) were considered to have the human resources and technical capacity to effectively manage the supply chain (Bukuluki, *et al.*, 2013).

1.2.0 Problem statement

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Availability of medicines and medical supplies is a critical factor in health care delivery and has been known to increase both health workers' and the public's confidence in the health care system, improving healthcare seeking practices and more generally, medical coverage to the entire population(WHO, 2004).

According to the World Health Report (WHO, 2008), nearly 30,000 children die every day from diseases that could easily have been treated if they had had access to essential medicines (Beverley Snell, 2014). While these most basic medicines are much needed by individuals in the communities, stock outs and expiry are still a common occurrence. Poor coordination appears to be responsible for some stock outs and expiry incidents. For example, expiry due to treatment policy change and duplicate procurement can be prevented by sound coordination between key stakeholders. Even though a medicine procurement and supply management task force was set up by Uganda's Ministry of Health to plan the phasing out of Chloroquine and Sulfadoxine/Pyrimethamine, the expiry of large stocks of the latter suggests a serious lapse in coordination (Lynch, *et al.*, 2005).

In Kaliro district, where more that 70% of the population are peasants who entirely depend on subsistence farming, for their livelihood (Kaliro District Planning unit 2012), in-affordability to essential medicines is thus a very likely factor. Thus, non availability of this much needed essential medicines, especially in the public health facilities were most go to seek services, will inevitably choke healthcare delivery in the district, contribute to high morbidity and high mortality patterns, immunization coverage will be low. During stock outs, most patients who will be sent to purchase medicines in the private drug outlets, will often purchase incomplete doses of treatment or even go without medication because of un-affordability of medicines purchased from the private sector.

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1.3.0 Justification

Universal Accesses to essential medicines is a right for all, it is important that patients access the necessary medicines at all times in order to control the disease burden. More so being expensive commodities, medicines and medical supplies ought to be utilized optimally to avoid wastage. This study was thus undertaken in order to provide health planners, information on availability of essential medicines during the dual Pull-Push system in Kaliro District, this information was also to be used as an indirect or direct indicator of availability of essential drugs and medical supplies during the dual pull-push method as expected and provide information on stock out patterns and there possible causes in Kaliro district. Therefore the study would help highlight any supply chain shortfalls and locally existing factors that affect availability of medical supplies in Kaliro district.

1.3.0 Purpose of the study

1.3:1 Broad Objective

Assess the availability of essential medicines and supplies during dual pull-push system of drugs acquisition in Kaliro District, Uganda.

1.4.0 Specific objectives

- 1) Determine the duration of out of stock of essential medicines and supplies in Kaliro District.
- 2) Identify the drugs and supplies that commonly stock out in Kaliro District.
- To assess factors that affect availability of essential medicines and medical supplies in Kaliro District.

1.4:1 Research questions

- a) What is the average duration out of stock of essential medicines and supplies?
- b) What are the drugs and supplies that commonly stock out in Kaliro District?
- c) What are the factors that affect availability of essential medicines and medical supplies?

1.5.0 Hypothesis

Availability of Essential Medicines and supplies is better/Improved during the Dual Pull-push system in kaliro district.

Null hypothesis

The Dual Pull-push system has not improved Availability of Essential Medicines and supplies in kaliro district.

CHAPTER TWO: LITERATURE REVIEW

2.0.0 Introduction

This chapter includes all the relevant literature that is directly or indirectly related to this study. In this chapter, key variables of the selected areas of the research study were expounded on. It starts with an overview of the Pull and push pull systems of pharmaceutical management, Availability of medicines, Duration of stock outs of essential medicines and supplies, Drugs and supplies that commonly stock out, as well as Availability and Factors affecting availability of medicines and supplies.

2.1.0 The "Pull" and "push"

While the push and pull systems of pharmaceutical management have context-dependent merits, the way they were implemented appears to be less systematic and therefore had several limitations. The study reveals that the push system was implemented in a drastic fashion, as opposed to a systematic and gradual process involving all stakeholders. The culture of originating policies from the top without meaningful participation of stakeholders, especially in the context of decentralization, institutionalizes top-bottom approaches that inhibit development of sustainable policy and institutional frameworks. As a result, in resource-constrained settings like Uganda, such drastic policy shifts do not get owned by stakeholders and may not lead to desired outcomes. Evidence shows that when individuals don't feel appreciated and involved in creating the change likely to impact their lives, they tend to be demotivated and thus unable to appreciate and participate in change processes.

Efficient and timely procurement

The **basis** of good procurement is record-keeping. Pharmacists need to know what is being used but also need to be confident that the medicines are being used correctly. It is important to ensure distribution of the *treatment guidelines* to all workers together with on-going education and supervision. Workers in clinics don't always understand the link between what is used, how records are kept, and stock maintenance. Stock-outs can be frequent meaning that patients are denied access to their medicines. All these issues were demonstrated during a survey undertaken in a range of remote health facilities in Fiji in November 2008 (Fiji Pharmaceutical and Biomedical Services,

2009). Orders from clinics to the central medical store need to be placed in a timely fashion and these orders, if they are based on the use of medicines according to the treatment guidelines, will be the basis of calculations of quantities for national procurement (WHO 2007, WHO 2009). It is important also, to order additional stock to cover emergencies and possible expansion of services. An appropriate *buffer* stock level needs to be put in place. *Estimating Drug Requirements, A Practical Manual* (WHO, 1988b) is a useful guide for quantifying needs. Stock management is rarely taught in medicine, nursing or pharmacy courses, so many of these issues are neglected, resulting in a negative impact on access to medicines.

Management of Essential drugs

Essential drugs are managed as a dual push-push system, the government of Uganda and DANIDA purchase essential drug kits from the international market. In addition, the government purchases other required drugs both locally and internationally in bulk. Once in country, the NMS packs them into kits and labels them for each clinic. The amount per kit is determined periodically using morbidity and demographic data. The kits are distributed quarterly to the districts, which in turn ensures that they are directly delivered to the clinics as soon as they are received. Patient load and stockout data is reported on a monthly basis to the central level. The NMS uses this data to review the order quantities for each of the kits and make adjustments accordingly. The current max is set at 5 months and min at 2 months for both the districts and the clinics (Sangeeta, *et al.*, 2000).

Selection of essential medicines

In support of access to essential medicines, countries are encouraged by the WHO to develop their own standard lists, using the WHO list as a model. In 1977, the WHO prepared a model list of essential medicines that included about 200 generic medicines and vaccines. The list is reviewed and updated regularly and safety, affordability, need and efficacy (SANE) remain the criteria for selection of medicines in the WHO Model List (WHO, 2011).

Quantification of Medicines

Vertical supply chains for specific health commodities, such as ARVs, TB treatments, and immunizations, often follow different quantification methods specific to systems set up by donors and international agencies. For quantification and determining orders for drugs and other health commodities (not including equipment), the Uganda health system relies on dispense-to-user data

gained from health unit monthly reports. The reports, part of the HMIS, list rates of consumption for a variety of health commodities, and note number of stock-out days. However, the accuracy of the dispense-to-user data is questionable. Facilities do not always order correctly or on time. Moreover, since the quantification and health commodity order system does not account for stock on hand at the facilities, the district-level does not have an accurate view of the health commodities that are available, or in danger of stock-out. Furthermore, the quantification utilizes dispense-touser data from previous months, and health commodity ordering does not accurately forecast the future needs of a facility (Ministry of Health and Makerere University School of Public Health, 2012).

Forms Used in the drug management System

Stock Cards are used at all levels of the system for each commodity. At the NMS, they were kept with each product. However, in many cases they were not updated since the computer system also keeps this data. In the districts, stock cards were also kept with the supplies or on the

While there is no column for losses and adjustment, most of the storekeepers interviewed were aware that they should record it as a negative balance. Requisition and Issue Voucher are used at every level of the system to order supplies. A multiple of three copies per order is used. The first copy stays with the facility ordering the supplies, the other two copies are sent to the supplier. The supplier retains one copy and the third copy is returned to the recipient with the supplies. The form also has a column for current balance. However, in most of the records reviewed, the team found that that column was usually not filled out. If this data were provided, the central level would have the data on stock on hand and would be better able to determine the inventory in the country. Health Unit Monthly Report was used by the clinics and the districts to report to the level above. The four-page form provides service statistics data. For family planning, the form reports on service statistics and number of contraceptives dispensed to clients by brand. The health workers draw in the various columns that they need. In the case of the contraceptive register, the columns were titled in a different sequence from page to page. This practice can result in increased errors when health workers are aggregating data at the end of the month (Sangeeta, *et al.*, 2000).

2.2.0 Availability of medicines

Product availability is defined as "no out of stock of an item" according to stock cards. Full time availability of an item was determined by establishing the percentage of medicines and health supplies that did not experience any stock outs during the review period in any of the surveyed facilities. The figures below show the percentage of medicines and health supplies that were fully available in all health facilities surveyed throughout a six-month period after introduction of the regional kits (Ministry of Health, 2013).

A study found that the revolving drug fund system in Ethiopia has improved availability of medicines at facility-level. It can also improve affordability by protecting people from purchasing drugs in the private sector, where drugs were on average a third more expensive than the Special Pharmacy (Carasso et al., 2009).

2.3.0 Duration of stock outs of essential medicines and supplies

In study conducted in Malaysia, The average availability of key medicines in the public health clinics for the country was 95.4%. Although the average availability of essential medicines in Malaysia was high being more than 95.0%, in certain areas in Sabah availability was less than 80.0% and still a problem. The average stock-out duration of key medicines was 6.5 days. However, average availability of key medicines in the public district drug stores was 89.2%; with average stock-out duration of 32.4 days (Saleh and Ibrahim, 2005).

According to a study in a rural Ugandan hospital, the median number of days out of stock for drugs and medical supplies was higher in the Push system compared to the Pull system (94 versus 24 days and 8 versus 0, respectively). However, the difference in the median days for the medical supplies in the two periods was not significantly different. In addition, the average percentage day's out-of stock for drugs and medical supplies were higher in the Push system compared to the Pull system (15.3 % versus 3.5 % and 1.8 % versus 1.3 %, respectively). The difference in average percentage days out-of-stock for medical supplies was not significantly different. The percentage number of drugs and medical supplies out-of-stock in 2000 2001 period was also higher than in 2004 2005 period (77.8 % versus 66.7 % and 72.7 % versus 36.4 %, respectively). These differences were not statistically significant. However when comparisons were made for percentage number of drugs out-of-stock for more than 30 days, the difference for drugs was statistically significant while that for supplies was not different. In addition, there was higher volume and number of expired drugs and medical supplies in the 2001 2002 period compared to the 2004 -2005 period. However, according to the report of the supplies officer, most of the drugs that expired in the Pull system were purchased under the Push system (Tumwine, *et al.*, 2010).

2.4.0 Drugs and supplies that commonly stock out

As noted by a study in a rural Ugandan hospital, Quinine tablets had the highest percentage stockout in the Push system followed by ciprofloxacin (52.7 and 42.9 %, respectively). On the other hand, diclofenac injection had the highest percentage stockout in the Pull system followed by ferrous sulphate tablets (14.8 and 11.8 %, respectively). Among medical supplies, cotton wool had the highest percentage stock-out in the Push system while cannulas had the highest percentage stock out in the Pull system (5.2 and 7.4 %, respectively) (Tumwine, *et al.*, 2010).

As with many African countries, Uganda is struggling to develop adequate healthcare systems (Kumar, *et al.*, 2009). A survey reveals that 32-50 percent of medicines essential for treating common diseases, such as malaria, pneumonia, diarrhea, HIV/AIDS, tuberculosis, diabetes, and hypertension, are not available (Okiror, 2009). A total of 65 percent of facilities across Uganda experienced medical stock shortages in 2008 (Ministry of Health (MoH), 2009). One critical problem is establishing supply chains for drugs and medical equipment to ensure availability at local treatment facilities (that is, health centers (HCs)). Stock shortages are a general problem for many drug-supply chains in countries with a lack of financial resources, health system infrastructures, capacities, and competencies (Lalvani, *et al.*, 2010; Kaufmann, *et al.*, 2011). Hence, knowledge of the causes and possible solutions for drug shortages is of interest outside the specific region (Jahre, *et al.*, 2012).

2.5.0 Factors affecting availability of medicines and supplies

In study by Tumwine, *et al*, 2010, among factors that the key informants felt were affecting the availability of drugs were the low levels of staffing and lack of training in the system of procurement. "Very few people including myself and one pharmacy staff were trained in drug quantification and the Pull system of procurement. We were supposed to train other staff but because of the heavy workload due to having low number of staff, we have never managed to train others" reported one key informant. Lack of transport was also identified as a hindrance to drug availability. "Joint Medical Stores which is our main supplier does not provide transport like the National Medical Stores used to during the Push system. The hospital has only got one small omnibus necessitating bigger orders to be supplied in installments. This leads to delays in receiving some drugs and also increases the transportation costs" reported one key informant. Lack of funds to purchase drugs also affected their availability. "Sometimes the funds available on our credit lines are not sufficient and the orders have to be reconciled with the available money. We end up purchasing less drugs than we need" reported another. Key informants also felt that abrupt changes of policies may also cause expiry of drugs. (Tumwine, *et al*, 2010).

2.6.0 Conclusion

The available literature as reviewed indicates that there is inadequate up-to-date information on availability of essential medicines within the public and private sectors. It's also noted that different countries have tried out numerous interventions to ensure availability of basic medicines to the community and avert expiration of medicines. Although the reviewed literature confirms that factors such as poor coordination; poor quantification, re-order and procurement systems; inefficient management, irrational drug use and record keeping; distribution difficulties and weak Primary Health Care systems and insufficient community participation, are the reasons for in availability and stock out essential medicines, it has not been clear the level of medicines' availability in the public sector. It is in this regard that this study is under taken.

CHAPTER THREE: METHODS AND MATERIALS

3.0.0 Introduction

This chapter consists of the study design, study area, study population, sampling size determination, method of data collection, Data processing and analysis, quality control, ethical considerations, dissemination of results and limitations

3.1.0 Study design

The study combined both Quantitative-Qualitative retrospective and prospective methods (Bryman and Bell, 2011). The study employed two methods of data collection; Document review (Stock cards and delivery notes) and researcher guided Key informant interviews. The study design used was adopted from the World Health Organization study protocol. Availability of essential medicines was measured by establishing the average number of days when the essential drugs stock-out.

3.1.1 Study variables

Table 1: Shows study variables

Objective	Variable	Indicator
1. Establish the duration of stock	Duration of stock outs of	• Average/Mean Days out of
outs of essential medicines and	essential medicines and supplies	stock
supplies.		• Average/Mean % of days out of stock
2. Identify the essential drugs and	Essential medicines which were	• Names of medicines among
supplies that commonly stock out	commonly out of stock	the indicator drugs which
or expire in Kanto District:		commonly stock out
3.To assess factors affecting	Factors affecting availability and	• A list of Factors affecting
availability of essential medicines	expiry of essential medicines and	availability and expiry of
and medical supplies	medical supplies	essential medicines and
		medical supplies

3.2.0 Study area

The study was conducted in Kaliro district. Kaliro was created by an act of parliament in July 2005 and became operational in September 2005. It is bordered by Lake Kyoga in the North, Iganga District in the South, Namutumba District in the East and Kamuli District in the West. Administratively, it has one county Bulamogi comprising of six lower local governments. Of these, one is a self-accounting town council and five sub counties with a total of 34 parishes and 294 villages. Generally, the standards of living are very poor with most persons living below a dollar a day. The means of lively hood is predominantly subsistence farming, major foods grown are; cassava, potatoes, Maize, Rice, grown at subsistence (Kaliro Local government Development Planning, 2012/13).

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Kaliro District is served by a total of 20 health facilities. Of these, 13 are government health units and 7 are non government. Of the government facilities there is one health centre four (Bumanya HC IV) which is the last referral facility, 5 health centre IIIs and 7 HC IIs Of the NGO/Private facilities, one is a HCIII (Budini) and 6 are Health centre IIs (Kaliro district Health strategic plan, 2012/13).

3.3.0 Sample size determination

Health unit Sample size determination was proportionate sampling, so as to include all health care levels; one Health Center IV, three Healths Center IIIs and three Health Center IIs, shall be randomly sellected. The key informants were identified through snowball sampling (Bryman and Bell, 2011). Six tracer medicines and four supplies were adapted from the MOH indicator drugs to measure availability of medicines and health supplies to provide priority healthcare (Ministry of Health, 2013).

3.4.0 Study population

Seven HCs were selected using a stratified approach, so as to iclude all health care levels; 1HC IV, 3 HC IIIs and 3 HC IIs. 2 Key informants from the district Health office, were purposively selected and interviewed; the DHO and the district stores' In-charge. A total of 9 (1 from HC IV, 4 From HC III and 4 from HC II) health unit in-charges and health Staff working the drugs' stores were purposively selected and interviewed.

3.6.0 Data collection

Stock cards, delivery notes and delivery schedules were reviewed; key informant interviews were conducted.

<u>Stock cards</u>

Stock cards, were reviewed for consumption period of 4 years, period during which the dual push-Pull system (2010-2014) was in operation. The Study was guided by a pre-adopted list of Six essential drugs adopted from MOH; that drugs represented the different program areas and where present at all health care levels, were used as tracer drugs for this part of the study: artemisininbased combination therapy (ACTs such as Coartem; (lowest weight brand)), sulfadoxine pyrimethamine (malaria treatment), co-trimoxazole (antibiotic for bacterial infections, particularly for HIV/AIDS patients, in four sizes), oral rehydration salt (diarrhea treatment), medroxyprogesterone injection (birth control), and measles vaccine. (Ministry Of Health, 2012)

Key informant interviews

Qualitative data was collected using key informant interviews; Quantitative data was collected using data interview guides. The topics to be discussed with the key informants include: factors affecting availability of drugs, methods of drug quantification used, the drug ordering system.

3.7.0 Quality control

Before the survey

The researcher recruited research assistants who underwent pre-training, the training covered; the aim of the study, its objectives, and methods of data collection. Thereafter, the research assistants were assessed to ensure they each had understood what was to be done during the study. The questionnaire was pre tested in Mitooma health centre IV and Kasheshero centre III and Iraramira HC II. Mitooma district; corrections, modifications and inclusion made were found necessary.

During the Survey

The researcher and the research assistants converged each morning for briefing on the locations to be visited and to pick interview questionnaires and location guides. The team would then converge in the evenings to share experiences and challenges encountered during data collection.

After the Survey

All interview questionnaires/guides used, were checked on a basis of completeness and consistency by the researcher.

3.8.0 Data analysis

All Data was transcribed and entered in Microsoft Word. Qualitative analysis was performed for theme identification using a content analysis approach. Data entry was done manually using pens, papers, calculators. Results were presented in tables, graphs, charts, and pyramids.

3.9.0 Ethical considerations

The study was approval by Kampala international University, School of Pharmacy Research Committee. A Letter of introduction was obtained from the Dean School of Pharmacy; Kampala International University. The District Health Officer for Kaliro district approved the study to be conducted in the health facilities that are situated in the district. All participants gave an informed consent before interviews were conducted. All other ethical issues pertaining to maintaining of confidentiality were strictly adhered to and observed during the study.

3.10.0 Dissemination of findings

Findings were given to each of the following;

- The kampala International University School of pharmacy.
- University library.
- The District Health Officer
- BTC-Uganda

3.11.0 Limitations

- In some health facilities, not all stock cards were fully or correctly filled, some did not cover all the full span of the study; stock cards that did not cover at least half of the duration, were not considered
- During the interview, some health centers had either lost or misplaced stock card s to some items and so return follow up was required, which made had economic implications.
- In Namwiwa HC III and Namugongo HC III, the in-charges were not present at the time of interview and so the staff found could not fully answer questions on logistical management, phone call interviews had to be undertaken in this case.

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CHAPTER FOUR: RESULTS

4.0.0 Introduction

Nine Health facilities were visited; 1HC IV, 3 HC IIIs and 3 HC IIs. 2 Key informants from the district Health office, were interviewed; the DHO and the district stores' In-charge. A total of 9 (1 from HC IV, 4 From HC III and 4 from HC II) health unit in-charges and health Staff working the drugs' stores were purposively interviewed.

4.1.0 Average duration of stock outs of essential medicines and supplies

The average stock-out duration of essential medicines and supplies was 23.89% (20.47 % and 27.32% for medical supplies)

	Days	% out	Days	% out	Days	% out	Days	% out
	out of	of stock	out of	of stock	out of	of stock	out of	of stock
	for	1 COT 2010/11	Stock	101 2011/12	Stock	$\frac{101}{2012}$	Stock	tor 2012/14
	2010/11	2010/11	2011/12	2011/12	$\frac{101}{2012/13}$	2012/15	2013/14	2013/14
Item								
ACT Artemether/lumefantrine 20/120mg Tab (Child dose)	134	37.3	144	40	235	65.4	229	63.7
Cotrimoxazole 480mg Tab	116	32.21	124	34.6	116	32.2	110	30.6
Medroxy progesterone 150mg/ml		<u> </u>						
	48	13.5	41	11.4	31	8.9	26	7.2
Measles vaccine inj1M/SC								
	17	4.8	15	4.3	6	1.9	10	2.8
Oral rehydration Salts	80	22.4	75	20.8	192	18.8	63	17.6
Sulphadowing overmatheming 500 (25mg Tab (SP)	<u> </u>						<u> </u>	
Supradoxine-pyrinetranane 5007 25mg rab (617	26	7.4	18	5.2	16	4.6	13	3.7
Syringes 2cc needle disposable 21G	1.00	140	4.60		4.5.0			
	169	46.9	163	45.5	158	44.1	164	45.7
Cotton	62	17.3	56	15.8	52	14.5	46	12.8
Surgical gloves latex- 7.5								
	107	29.8	129	35.9	105	29.4	94	26.3
Malaria rapid diagnostic test	78	21.8	78.3	21.7	59	16.7	46	12.9

Table 1 shows Average duration of stock outs of essential medicines and supplies



Graph 1 shows Average duration of stock outs of essential medicines and supplies

Availability of essential medicines and supplies in Kaliro district

The average availability of key medicines in the public health facilities was 76.11% (79.53 % and 72.68 for medical supplies), Essential medicines and medical supplies that where available at the district



The table 2 shows Availability of essential medicines and supplies in Kaliro district

4.2.0 Essential medicines that commonly stock out in the district

ACT Artemether/lumefantrine 20/120 mg had the highest percentage stock-out followed by Cotrimoxazole 480mg Tablets 51.6 and 32.4 %, respectively.

The table 3 shows Essential medicines that commonly stock out in the d	district
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Item	No. of HFs out of stock last 1 month	% of HFs out of stock last 1 month	No. of HFs out of stock since 3 months	% HFs out of stock last 3 month
ACT Artemether/lumefantrine 20/120mg Tab (Child dose)	6	15	7	12
Cotrimoxazole 480mg Tab	5	12	7	12
Medroxy progesterone 150mg/ml	3	7	4	7
Measles vaccine inj1M/SC	2	5	1	2
Oral rehydration Salts	4	10	7	12
Sulphadoxine-pyrimethamine 500/25mg Tab (SP)	3	8	2	4
Syringes 2cc needle disposable 21G	6	15	9	16
Cotton	3	8	6	11
Surgical gloves latex- 7.5	4	10	6	11
Malaria rapid diagnostic test	4	10	7	13

4.3.0 Factors influencing availability of essential medicines and medical supplies

The respondents identified factors affecting availability of essential medicines and medical supplies as; Drug requisitions based on neither morbidity nor consumption methods of quantification, Requisitions are based on credit available, poor distribution of logistics, such delays during distribution, Supplying medicines with short shelf life, rare condition drugs or low usage drugs, Pushing some medicines more that can be utilized by a specified health unit, Sometimes the requisitions are not fully honored as requested by the health units and Population difference in the catchment areas.

It was also noted that the lead time was either inconsistent and thus made it hard to tell when the drugs would be delivered or was too are long, to sustain a supply till its next replenishment, more so the supplier did not consider individual unit consumption rates, however

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0.0 Introductions

This chapter is divided into three sections. The commencing section covers and discusses the results of the research study derived from inferential statistics of the previous section. The chapter also presents the variables of the selected areas of the research study in relation to the study problem and objectives.

5.1.0 Discussions

5.1.1 Method of essential drugs acquisition

The method of essential drugs acquisition used in Kaliro district is different from that as recommended in the World health Organization, 1995, *Estimating Drug Requirements* Practical Manual, which recommends two methods of drugs acquisition; morbidity and mortality methods

5.1.2 Average duration of stock outs of essential medicines and supplies

As note the average availability of key medicines in the public health facilities was lower than that as observed in a study in Malaysia, or in the study by Tumwine et al. The average stock-out duration was also notably higher as compared to that the studies above. The difference could possibly be attributed to the differences in the etiological differences in the locations from which theses studies were conducted.

5.1.3 Essential medicines that commonly stock out in the district

In the study ACT Artemether/lumefantrine 20/120 mg had the highest percentage stock-out followed by Cotrimoxazole 480mg, unlike what was noted by Tumwine, *et al.*, 2010 which noted Quinine tablets had the highest percentage stock-out in the Push system followed by ciprofloxacin and while diclofenac injection had the highest percentage stockout in the Pull system followed by ferrous sulphate tablets.

5.1.4 Factors affected availability of essential medicines and medical supplies

The factors that affected availability of essential medicines and medical supplies where quite diverse, while some varied from facility to facility, some factors were consistently mentioned in most of the facilities like; ensuring consistence in the schedules of delivery and consideration of the unique peculiarities that exist at the different health facilities. This differed from factors identified by Tumwine, *et al*, 2010, which identified the factors as; low levels of staffing and lack of training in the system of procurement. "Very few people including myself and one pharmacy staff were trained in drug quantification and the Pull system of procurement.

5.2.0 Conclusions

The trend of essential medicines and supplies availability of during the dual Pull-push system seemed to be declining since its initiation in 2010. And while most of the key informants thought that adopting the pull-push method of drugs acquisition only at health centres IV, was not the most appropriate intervention as pertains to ensuring consistent availability of medicines, some actually said it would actually work well if it was adopted at all levels and simply required to ensure consistence in the schedules of delivery and very importantly, put into consideration the unique peculiarities that exist at the different health facilities

5.3.0 Recommendations

- 1. National medical stores should involve stake holders at all stages of medicines and supplies planning especially the DHOs, who are the final consumers in the supply chain.
- 2. Government can adopt a revolving drug fund system, in the form of 'Special Pharmacies and drug stores' to enhance availability of essential drugs in public facilities and improve quality of health care.
- 3. If there is to be any the transition processes in the future, involve an inclusive and representative approach, where DHOs, Chief administrative officers and individuals key to the supply chain process are consulted or involved.
- 4. Furthermore, rigorous coordination between suppliers and their clients is critical to the success of the "pull" system of supply of medicines used by Uganda's National Medical. Medicine selection and quantification should be matched with disease trend / patterns, consumer tastes and prescribing habits.
- 5. Training of health workers in proper quantification and Rational use of medicines and medical supplies
- 6. Improve on the consistency of medicines' supplies
- 7. Adopting a dual pull and push system at all levels
- Unit specific or consumption data should be collected and used as a base of quantities to be supplied per unit

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APPENDICES

APPENDIX I: CONSENT FORM

(To be read and signed by respondent)

STUDY TITLE: AVAILABILITY OF ESSENTIAL MEDICINES AND SUPPLIES DURING DUAL PULL-PUSH SYSTEM OF DRUGS ACQUISITION IN KALIRO DISTRICT, UGANDA

INVESTIGATOR: MS. OKIROR BRUNO, BPH/0001/102/DU. Kampala International University- Western Campus, P.O Box 71 Bushenyi Tel. +256776535035

SUPERVISOR: MR. ALBERT NYANCHOKA ONCHWERI, School of Pharmacy Kampala International University- Western Campus, P.O Box 71 Bushenyi

As a partial requirement in fulfilment of a Bachelors Degree in Pharmacy, The researcher named above, intends to carry out the study stated above in Kaliro District. This study will be helpful in improving health service delivery.

The investigator therefore requests for your voluntary participation in the study where you will be asked to answer some questions pertaining to essential medicines and logistics management system, medicines' stock out and possible causes of stock outs. You will also be asked to show/provide the researcher with the stock cards where the days out of stock will be determined.

All study Findings will be treated with uttermost confidentiality and will be strictly for research purpose. You are free to accept or withdraw from the study any time during the study.

Your co-operation will highly be appreciated. If you accept to participate in this study, sign below:

I....., the purpose, principles and activities in this study have been explained to me in the language I understand, after carefully understanding the procedures; hereby voluntarily agree to participate in this study.

Name of participant	signature	date
	"°,°,	//

APPENDIX II: QUESTIONNAIRE - English Version

(To be answered by respondent) QUESTIONNAIRE TO ASSES THE AVAILABILITY OF ESSENTIAL MEDICINES AND SUPPLIES DURING DUAL PULL-PUSH SYSTEM OF DRUGS ACQUISITION IN KALIRO DISTRICT

Date		• • • • •
Questionnaire	number	
Department / I	Health Unit	

1. Sex. Male [] Female []

2. How long you have been working in This Department.

1-5 ye	ears	[]	
5-10	vears	[]	
More	than 10 years		
3. Professional training.			
Gener	al medicine	[]	
Clinic	al Officer	[]	
Nursi	ng officer	[]	
Dispe	enser	[]	
Othe	s (specify)	• • • • • • • • • • • • • • • • • • • •	
4. Source of essential drugs(s)		
NMS		[]	
JMS		[]	
Priva	e Pharmacy	[]	
Othe	s (specify)	• • • • • • • • • • • • • • • • • • • •	
5. Drugs that commonly stoe	k out.		
Anti l	piotics.	Yes []	No []
Antil	Malarials. Ye	es []	No []

	Analgesics. Yes []	1	√o []		
	Others (specify)				
6. Any Team / comm	ittee(s) charged with drugs qu	antification?	Y	Zes []	No []
6. Do you have proble	ems with drugs quantification	P Yes	[]]	No []	
B) If yes specify Stand	lard				
	Lack of forms	/es []	No[]		
	Don't know what to do	Yes []	٢	No[]	
	Not trained on how to orde	er Yes []	Ν	No[]	
	Others (specify)		•••••		
7. Any standard guide	lines used when ordering esse	ntial drugs?			
	Standard NMS forms	Yes []	٢	No []	
	Non standardised forms	Yes []	N	No[]	
	None Yes []	No []			
	Others (specify)				
8. Have you ever expe	rienced stock out of essential	drugs?			
		Ye	s []	No[]	
8. Have you experienc	ed stock out of essential drug	s Last month?			
		Ye	s []	No []	
8. Have you experienc	ed stock out of essential drug	s this more tha	n three mon	ths.	
		Ye	s []	No[]	
9. Which method do y	ou use when ordering for ess	ential drugs?			
	We order for them		Yes []	No []	
	We do not order, we are just	given Y	[es []	No[]	
	Others (specify)		• • • •		
10. What methods of	drug quantification are used w	vhen ordering f	or essential o	drugs?	
	Bin cards	Yes	;[]	No []	
	Stock cards	Yes	[]	No []	
	Computer	Yes	3[]	No []	

Others (specify).....

11. a) In your opinion do you think the current method of drugs acquisition is appropriate?.

Yes [] No []

b) If No, Why

Lead time are long	Yes []		No []	
Doesn't consider individual u	unit consumption	rates	Yes []	No[]
It is had to tell when drugs w	vill be delivered	Yes []	No []
Others (specify)		• • • •		

13. Any suggestions for improving drugs Availability.

.....

11. In your opinion what is the cause of drugs expiry in this district (list in orders of significance)?.

Thank you.

APPENDIX III: DATA COLLECTION FORM

(To be filled by data collector)

DRUG AVAILABILITY SUMMARY FORM

Loc	ation:													
Investigator:		Date:												
#C	ases: Retrospective	covering d	ates _			to _								
	Name of medicine	Unit pack (eg tin of 1000)	Item available?	Stock card/ ledger book available (1/0)	Is physical count done every month and PC	Is the card filled correctly with name, strength, dosage form AMC, Special storage	Stocked out last months	Stocked out last three months	Av no of days out of stock for year one	Av no of days out of stock for year two	Av no of days out of stock for year three	Av no of days out of stock for year four	Total Av no. of days out of stock	% Total Av of days out of stock
1	ACT Artemether/lumefantrine 20/120mg(Child dose)	Pack of 30 blisters											,	
2	Contrimoxazole 480mg Tab	Tin of 100												
3	Depo provera 150mg/ml injiT	Pack of 25 vial	1											
4	measles vaccine inj1M/SC	vial	[[]				 						<u> </u>
5	Sulphurdoxine Pyrimethamine	cycle												
6	Sulphadoxine-pyrmethamine 500/25mg tab (SP) ¹⁷	Tin of 1000												
7	Syringes 2cc needle disposable 21G	Pack of 100												
8	Cotton	1 unit		 			······							
9	Surgical gloves latex- 7.5	1 pair		 										
10	Malaria rapid diagnostic test													
	SUM													

APPENDIX IV: TIME LINE

	Jan 2014	Feb 2014	Mar 2014	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015
ACTIVITY													
Topic selection													
Topic approval by supervisor													
Proposal development													
Proposal Presentation													
Data collection													
Data analysis													
port presentation / submission													

APPENDIX V: BUDGET

Activity(s)	Description / Justification	Responsible person	Unit cost	No.	Total Cost (Ugshs)
Pre Proposal development					
Laptop	Personal laptop to ease literature review, proposal development, data collection and report writing	Principle researcher	1,300,000/=	1	1,300,000/=
Purchase of Internet Modem	Internet Modem purchased to ease the literature search, data collection and report writing	Principle researcher	110,000/=	1	110,000/=
Digital Camera	For capturing still photos	Principle researcher	450,000/=	1	450,000/=
Proposal development					
Typing and printing	Proposal developed to guide the study	Principle researcher	30,000/=	2	60,000/=
Internet bundles	During Literature review	Principle researcher	100,000/=		100,000/=
Data collection					
Transport	Transport to and fro the district	Principle researcher	60,000/=	4	240,000/=
Research assistants	Data collection		60,000/=	2	120,000/=
Data analysis					
Statistical analysis			200,000/=	1	200,000/=
Report writing					1.
Typing and printing	Four copies of the report made	Principle researcher	110,000/=	4	150,000/=
Delivering feedback reports	Dissemination of findings	Principle researcher	60,000/=	2	120,000/=
Total			Philas Providence		2,850,000/=

APPENDIX VI: PICTURE ALBUM

Picture 1. Shows medicines and supplies that were found in one of the medicines stores



