

**Availability and Usage of Drugs at Household Level in Tanzania: Case Study in Kinondoni District, Dar es Salaam**

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**A survey was conducted in 400 households in Kinondoni District, Tanzania, to determine the availability, source, storage condition, and usage of medicinal drugs. Majority of the households (73.3 %) stored drugs at home. Seven hundred and sixty one (761) different types of drug preparations were encountered. Only 64.7 % of these drugs were in use at the time of study. About 45 % of the antibacterials found in the households were being kept for future use in self-medication. Large proportions of these drugs were obtained from authorised private health facilities. Only a minority (10 %) were obtained from unauthorised sources. Sixty seven percent of all the drugs kept at the households were not stored properly. Majority of the respondents (83 %) admitted practising self-medication. Sharing of drugs within and across households was also practised.**

**Key Words:** Household, storage condition, drug use status, self-medication.

## INTRODUCTION

The regular supply of essential drugs and vaccines is one of the indicators used to measure progress of a community towards attaining good primary health care. The least developed countries are often unable to achieve adequate and un-interrupted supply of drugs to the general population. Due to weak economies, most of these countries lack the capability to finance the national drug needs. Efficient management of the drug supply chain is one way of improving the financial sustainability. In order to get the most out of the meagre resources, the developing countries have to make improvements in the selection, procurement, distribution, storage and rational use of drugs.

The World Health Organisation (WHO) launched the Essential Drugs Programme (EDP), with the objective of promoting the efficient management of drug supply especially in the developing countries.

Tanzania launched EDP in 1983 [1]. In addition to addressing the selection and procurement in the drug supply chain, a lot of effort has been put on training healthcare providers on the concept of rational drug use. On this front, much success has been achieved. Several studies done in Tanzania using the International Network for Rational Use of Drugs (INRUD) indicators to survey rational prescribing have all shown good results [2-4].

In addition to rational prescribing, correct use of drugs depend on several other factors such as availability at the right time, proper storage, correct instruction on their use, and good compliance on the part of the patient [5]. Lack of any of these promotes irrational use of drugs. Availability and use of drugs at household levels is a good indicator of the proper use of drugs by individuals as their use or misuse is a result of interaction of several factors involved in the chain of drug supply. While many studies have been done on the prescribing patterns in

different levels of health facilities in Tanzania [2,4], not much is known about the availability and usage of drugs at household levels. This paper reports on the availability and usage of drugs at households in Kinondoni District, Dar es Salaam region, Tanzania.

## MATERIALS AND METHODS

### Setting

The study was undertaken in Kinondoni District, Dar es Salaam region. Dar es Salaam, the business capital of Tanzania is one of the densely populated regions, with an estimated population of about 3 million people. Its annual population growth of 8 % is the highest in the country compared to the national average of 3.5 % [6]. Kinondoni is one of the three districts of the region. It has one government hospital, 20 dispensaries, 90 private dispensaries, 37 pharmacies, 48 medical stores and many ordinary shops. The wide variety of health facilities gives the population a wide choice in terms of geographical accessibility whenever they fall sick.

### Study population

Four hundred (400) households in Kinondoni district, Dar es Salaam region were sampled using multistage random sampling starting from administrative ward to household level. A list of wards was obtained from the District Administrative Officer. From this list, 10 wards were randomly selected and from each selected ward, ten cell units were listed. A random sample of four cell leaders was picked using a table of random numbers. From each cell leader, a sampling frame of households was listed from which ten households were randomly picked for the study. The sample size was estimated using a well-established formula [7,8].

### Data collection and treatment

Trained research assistants under constant supervision of the authors carried out the study.

A standardized questionnaire was used as an instrument of data collection. It had four major components including identification of

interviewees, availability of drugs, type of drugs, storage of drugs and self-medication. The questionnaire was pre-tested before use for this study. The data was analysed using Epi-info version 6 software [9].

### Ethical considerations

Each respondent was asked about her/his willingness to participate in the study. Interviewees were assured of confidentiality on the information provided and on sensitive issues related to their privacy such as entering the house to make observations.

## RESULTS

Four hundred (400) household heads were interviewed of which, 67.8 % were females. Eighty percent (80 %) were married, 8 % single and the rest were either divorced, widowed or cohabitating. Of all the households, 73.3 % kept drugs at their homes. In all, 761 different types of drug preparations were stored at the households.

Figure 1 shows the pharmacological grouping of the drugs kept at the households. Drugs used for the treatment of infectious diseases (antimalarials, antibacterials and anthelmintics) were the most encountered types of drugs (37.4 %), followed by analgesics (21.5 %) and then cough preparations (9.9 %). Other types of drugs kept in the households were dermatological preparations (7.3 %) and blood modifying and nutritional drugs (6 %). A small proportion, (7.7 %) of all the drugs found in the households, were unidentified because they were not labelled. These included tablets, syrups and lotions. Other types of drugs, including herbal medicines were also kept and used by some households.

Figure 1 shows that most (64.7 %) of the drugs stored in the households were in use. The study established that 76.0 % of the unidentified drugs were in use at the time of this survey, indicating that the drugs were dispensed without being labelled or the labels got lost during handling. It was interesting to find out that 45.0 % of the antibiotics were not in use and were being kept for future use for self-medication.

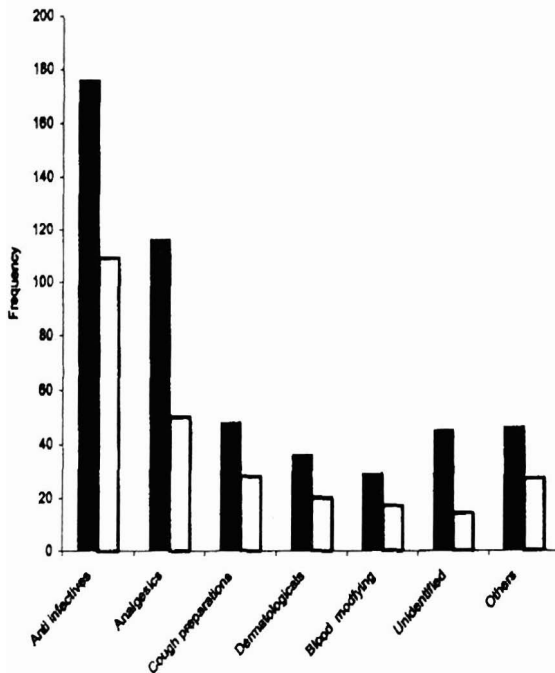


Figure 1. Use status of the drugs stored at the households. Current use ■, not in use □

Sixty seven percent of the drugs found in the households were obtained from private health facilities (pharmacies, medical stores, dispensaries and hospitals). Only a minority (10.0 %) of the drugs was obtained from "unauthorized" sources, in this case; friends and "ordinary" shops. Government hospitals/dispensaries accounted for 35.6 % of the source of unidentified drugs while medical stores supplied 28.8 % of the unidentified drugs. The authorized drug supply sources accounted for 78.0 % of the unidentified drugs.

In this study, storage was classified into two

categories as adopted from Kiyangi and Lauwo [10]. Unsuitable storage facilities were those in which the drugs were left in open air and easily accessible places including top of tables and on windowsills. Suitable facilities were those in which the drugs were in closed places such as first aid box, closed cupboard/drawers or refrigerators. About 67 % of all the drugs were stored in unsuitable places. Such storage conditions make the drugs more likely to deteriorate due to direct light, temperature and humidity hence reducing their potency. Besides, storage of drugs in open and easily accessible places poses a potential risk of drug poisoning to children.

Majority of drugs for non-chronic diseases, are prescribed for duration of less than two weeks. Table 1 summarizes an analysis of duration of the storage of the different formulations of drugs kept at home. Only a relatively small proportion (24.7 %) of tablets/capsules was kept for a period beyond two weeks. A third of the liquid preparations were stored for more than two weeks (mean storage time 87 days). Forty percent of liquid preparations and 15 % of injectables had expired.

The major reason advanced by 72.7 % of the household heads for storing drugs at home was for future use in self-medication especially as first aid in the treatment of minor ailments or emergencies. Only 1.4 % of households cited inaccessibility to health facilities as the reason for keeping drugs at home. Another reason for keeping drugs at home was a safeguard against perceived shortage (8.5 %). Ten percent of the households had no reason at all for storing the drugs at home.

Table 1. The mean duration of storage of the drugs kept in the households

Formulation Type	Storage Time (days)	Frequency	Mean Storage Time (days)	Standard Deviation
Tablets/capsules	1-14	235	4.3	3.6
	≥15	77	80.1	89.2
Oral Liquids	1-14	199	4.8	3.9
	≥15	99	87.0	90.4
Creams/ointments and lotions	1-14	66	4.9	3.7
	≥15	38	68.9	63.1
Injections (vials/ampoules)	1-14	27	4.9	3.3
	≥15	20	92.7	100.8

Eighty five percent of the respondents admitted to have practiced self-medication. Fever, headaches, common cold, diarrhea and stomach pain were symptoms for which most of the respondents would attempt self-medication. Eighty seven percent of the respondents used aspirin and paracetamol as analgesics to treat headaches. Other combination drugs, such as those containing paracetamol, aspirin, codeine and caffeine were also used.

Those who practiced self-medication for treating fever, which is a symptom for various diseases, used different types of drugs. Forty four percent of the respondents said that they would use antimalarials in combination with analgesics for fever symptoms, 32 % would use antimalarials only, while 2 % of the respondents would use antibiotics only. Five percent of the respondent said they would use the traditional herb "muarubaini" (*Azadirachta indica*) for fever symptoms.

When asked how they treated diarrhea symptoms, about 40 % of the respondents indicated that they would use antibiotics mentioning chloramphenicol, tetracycline and cotrimoxazole. Thirty percent of the households indicated that they would use Oral Rehydration Therapy (ORT) only for diarrhea cases, while 8 % indicated they would use ORT plus antibiotics. In the treatment of wounds, about 65 % used antiseptics and topical antibacterial agents like gentian violet and tincture of iodine. Twenty percent indicated that they would use antibiotics such as fortified procaine penicillin (PPF) powder emptied from vials or tetracycline and ampicillin emptied from capsules for wound management.

## DISCUSSION

The widespread use of household surveys to assess the epidemiology of irrational drug use affords little information about the willingness of respondents to disclose their use of drugs [10]. The list of drugs obtained depended on interviewee's willingness to show them. There is a possibility that not all drugs stored at the households were shown. The types of drugs kept in the households reflected the disease pattern of the area, which include malaria, respiratory infections and water-borne diseases. The use of herbal medicine in an urban setting indicates that herbal medicine has a role to play in primary

health care. The lower percentage of use of herbal medicine compared to that reported by the Kiyingi and Lauwo [10] may be explained by geographical location of the study area. Being an urban area, it had comparatively easily accessible health care facilities.

In view of the persistent shortages of drugs at government health facilities it was not surprising to find that most of the drugs were obtained from private health facilities, which include medical stores, pharmacies and dispensaries. As recommended by Vogel and Stephens [11], the private sector has an important role to play in augmenting the Government efforts to provide healthcare to the general population. The private facilities should also be important players in the promotion of rational drug use. In this study it was observed that most of the unidentified drugs were obtained from the government dispensaries and medical stores. There is a need of training the personnel working in the medical stores and government dispensaries on the importance of rational and proper dispensing.

Storage condition of drugs has a bearing on their effectiveness and safety. Improper storage may accelerate the rate of deterioration of labile and unstable formulations such as liquids. Cracking of emulsion or caking of suspensions is accelerated by storage at temperatures above room temperature. Such deterioration makes it difficult for the patient to consistently dispense the intended dose from the container. Storage of capsules under conditions of high temperature high humidity results in hardening of capsule shells and this may delay the disintegration of the formulations. Improper storage may lead to cases of drug poisoning for children and others in the household.

Most of the liquid preparations were supplied in 100 ml bottles. The amount is more than that required for most liquid preparations in the Standard Treatment Guidelines [12]. This fact is supported by the fact that more than a third of the liquid preparations were stored for more than 15 days (mean time 87 days) and nearly 40 % of these preparations had expired. The manufacturers have to be advised on the need to package their products according to the standard treatment guidelines as to reduce wastage.

The high percentage of respondents who admitted that they practise self-medication

agrees with the observations made by Trostle that in the event of illness, household members would engage in self-medication [13]. The extent of self-medication observed in this study is similar to those obtained by other authors [14]. The drugs used in self-medication and their appropriateness was much dependent on the presenting symptoms [15]. Considering the endemicity of malaria in the study area, and the fact that malaria mostly presents with fever and general body malaise symptoms, it seems that majority of the respondents have learnt to correctly self-medicate for the malaria symptoms. This is further substantiated by the observation that only a very small portion of the households used the second line antimalarial drugs, such as the sulfur-based antifolates and halofantrine for fever symptoms. However, clear irrational and inappropriate use of drugs was observed for those who applied antibiotic powders for wound treatment. Other cases of inappropriate self-medication were noted in the treatment of diarrhoea symptoms. The use of antibiotics in diarrhoeal diseases is associated with the misconception that every diarrhoeal condition is of bacterial aetiology. Putting more emphasis on the importance of oral rehydration salts (ORS) in treatment of diarrhoeal symptom would on long-term basis reduce the misuse of antibiotics in this area.

There was sharing drugs within the house (5.5 %) and across the households (7.2 %). The commonly shared drugs were analgesics and antimalarial drugs (65 %) followed by antibiotics. This irrational drug use may lead to under-dosage, over-dosage or poisoning.

### CONCLUSION

The survey has shown that most of the respondents kept drugs at their homes. Most of these drugs were obtained from the authorized health facilities. Although more than half of the stored drugs were in use, some of the drugs especially antibiotics, were being kept for future use. The majority of the drugs found at the households were stored in unsuitable places thus exposing them to the danger of deterioration. The major reason given by the respondents for storing drugs at home was for future use in self-medication.

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