DRUG USE

AND

PURCHASING DETERMINANTS

IN AN ADDIS ABABA DISTRICT

by:

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ABSTRACT

This study assesses the overall drug use pattern (with and without prescription) in an Addis Ababa community, potential drug sources, factors associated with increased drug consumption and purchasing following an illness episode. It employed a cross-sectional community-based survey of a sample of 1185 households, selected randomly from the source population of all 23 kebeles of the previous Yeka District of Addis Ababa. A structured questionnaire was developed, pretested and implemented for the purpose of the survey.

The study showed that 85.2% of the studied sample population took somekind of drug (prescribed or non-prescribed) and 14.8% did nothing following an illness during the four week study period.

Drug users and nonusers were compared with respect to demographic and socio-economic variables. The use was higher among children less than 5 years of age, in high income groups, and among those with higher average haelth care expenditure per episode. There was no sex difference observed in relation to drug taking with or without prescription. 86.9% and 84.1% of males and females, respectively, took drugs. Of these drug users, 95.5% took them with prescription and 4.5% without.It is believed that the high use rate of drug taking and

spesifically drugs with prescription following an illness in the district might be explaind with the burden of morbidity in the district.

been carried out on prescription and non prescription drug use, but the situation in developing countries is different, and in Ethiopia only a few research works have been conducted in this area.

From a number of studies conducted in various developed countries the major factors that are associated with increased drug use were documented. In Etiopia , inspite of high use rate lack of information on users characteristics is unfortunate . Due to the lack of available information on drug use patterns in general and on prescribed and nonprescribed drugs, in particular , it is difficult to predict pattern of drug consumption in our community.

The objective of this study was to assess the overall drug usage pattern in the community , sources of the drugs and determinants /factors that influence drug purchasing and usage (e.g. age, income, sex, educational level and average monthly health care expenditure). It was carried out in Yeka District of Addis Ababa administrative region, which was selected for the study because it was the residency assignment area of the principal investigator.

2. LITERATURE REVIEW

2.1 Background

Medicine taking, whether physician or self-initiated, is the most frequent health related activity in developed countries. Similarly, in developing countries it has been described as the most frequent of all preventive and health seeking behaviours (1, 15, 34). It is one of those factors that plays an important role in protecting and maintaining the health of the people (2, 3, 4). Regardless of their potential to cure diseases, it is the availability of drugs that encourages the public to visit health care facilities (4). Various geographic differences of drug consumption, marked inequalities, and increased consumption have been shown in several studies (5,10,13). According to available data 40 - 60% of the health care budgets in developing countries goes to drugs (1, 4, 9, 11), yet between 60 and 80 percent of the population in many underdeveloped countries, especially those living in rural areas, lack access to even the most essential drugs (10,11). In most developing countries, drugs consume a larger proportion of the health care budget than the average 8- 10 % utilized in the industrialized countries (11). For example, Tanzania spends 22% percent of its health care

budget on drugs, India 19%, Thailand 30%, Bangladesh 64%, and Nepal 44%. Mozambique spends about 20% of its government health budget on drugs, while Burma spends 24.5% and Sri Lanka 8.0% (10, 11, 12).

The differences that exist in the effective economic demand for pharmaceuticals between the developed and developing countries are increasing. For example, the German Federal Republic spends US$53.40 per person per year; Japan US$38.50, and the United State, $35.10. In contrast, Nigeria spends US$1.20 per person per year, India US$0.75, and Sri Lanka US$0.58 (12).

Hafdan Mahler, the former WHO Director General, noted that "the public health service of the 67 poorest developing countries excluding China spends less in total (on all drugs) than the rich countries spend on tranquillizers" (33). The percapita annual expenditure on medicine in Africa in 1975 was 0.75 pounds, in Asia 0.28 pounds, and 9.00 pounds in the United Kingdom (11).

The available data on Subsaharan countries showed that the amount of money allocated for health has dropped considerably in recent times. In the first five years of the 1980s it has decreased by 4.9% in Senegal, by 30.7% in Mali, 53.0% in Cote d'Ivoire, and 33.7% in Ghana (14). Overall percapita health expenditure in Subsaharan Africa was US$5.16 in 1975, $5.17 in 1980, and $4.70 in 1985 (14).

Though there is a lack of accurate figures, market surveys indicate that developing countries account for less than 20% of world pharmaceutical consumption (36). According to a 1976 WHO report Europe consumed 45% of world pharmaceuticals, the Americas 26.9%, Asia 23.7%; Africa 2.4% and Oceania 1.1% (36).

From all the continents documented facts revealed the existence of wide-spread use of medicine. This world-wide use of pharmaceuticals is not a unique characteristic or social problem of any specific community or social strata. Rather, it has become a world- wide practice or phenomena. The development of pharmaceuticals in modern times has resulted in the growth of huge multinational drug companies in the developed world (31,36) . In order to tackle the existing situation it is believed that the provision of pharmaceuticals/ medicines is an essential element in health service development with in the context of the global strategy of Health For All By the Year 2000 (HFA/2000) (6).

According to the authors of a comprehensive drug utilization review "the consumption of drugs is the result of drug-giving by health workers (health care providers) and drug-taking by consumers" (5). Furthermore, they state that the rate and duration of drug consumption was dependent on:

a) prescribing, whether appropriate or not;

b) dispensing behaviour of the pharmacist;

c) administration of drugs by health professionals; and

d) self-medication and ingestion by patients.

The massive investment in medical research in the past 40-50 years, since the discovery of antibiotics in the early 1940s, has produced a great increase in scientific knowledge available for the practice of medicine. One of the prominent manifestations of this scientific knowledge has been the increase in the number of drugs available for the treatment of disease.

2.2 DRUG UTILIZATION STUDIES

Among the earlier studies that investigated drug utilization are those by: Jefferys, Brotherston and Cartwright on drug consumption in a working class English community (16); Greenlick and Darky in Windsor, Ontario (8), a cross-national comparison of medical care utilization study reported by White and Murnaghan (20); the comparison of medical care use in Sweden and the United States by Anderson, Smedby and Andersen (15); and an international collaborative study of medical care utilization in twelve survey areas in seven nations (15).

Various similar studies have also been conducted

at a national level. They include: one by Rosch, Rempp and Magdelarine that focused on consumption patterns over a twelve month period in France (15); a study conducted in the United States that covered a two week study period of drug use; and a study that was conducted in Finland over a five month consumption period (15).

Rabin (1972), in his thorough literature review of drug usage conducted before 1969, described the existence of some inconsistencies in the characteristics linked to drug use (15). In particular, he indicated the existence of variation in prescribed drug use among different population.

Rabin and Bush (23), in a study conducted in Baltimore, reported an association between race and drug usage. They found that non-whites were less likely to use prescribed drugs than whites (25% vs 35%) as well as non-prescribed medicines (29% vs 36%) (23).

The issue of drug use was further investigated by Gagnon, et. al., (43) in study conducted in rural Rougemont, Bahama households. Unlike that of the Rabin and Bush study in Baltimore (23), where they reported that 25% of the non-whites used prescribed drugs and 29% non- prescribed drugs and 35% of whites took prescribed drugs and 36% non-prescribed drugs.Gagnon et al , reported that use of prescription drugs by blacks is slightly higher, with 31% of them having used prescribed

drugs and 69% non-prescribed drugs , where as 72% of whites in Rougemont, Bahama study took prescribed and 56% non-prescribed drugs . However, a significant difference in the use of prescribed drugs between whites in both studies was observed: 56% of the Rougemont, Bahama whites had taken at least one prescription drug during the four-one week period compared to 35 % of the Baltimore whites (23).

The use of non-prescription drugs in Rougemont, Bahama corresponds with the pattern reported by Jefferys, Brotherston and Cartwright in their English study where 67% of the studied sample used non-prescribed drugs during the four week study period (16).

Non-prescribed drugs are frequently used for the symptomatic treatment of common and acute illnesses, (23) and their high use may indicate that the first line of defense in illness is self-medication with non-prescription drugs (17). Persons with poorer physical mental health have been shown to use non-prescribed drugs more than persons in better health (17). Non-prescription drug use is found to be more likely influenced by a person's real or perceived health needs.

The use of non-prescribed drugs has also been shown to be related to various socio-demographic factors, including age, sex, race, education, family size and social class (15,23).

Females, whites, one member-families, the more educated, and the upper classes tend to use or spend more on non-prescribed medicine (25,26). Some data indicate the elderly use non-prescribed drugs more frequently than younger persons (35), unlike Rabin & Bush study (23). where they reported the highest rate to be for the 15 to 44 age group (23). In general, the influence of income on non-prescribed drug use has not been shown. However, it has been demonstrated that those who pay nothing or only some of the costs of prescribed medicines were less likely to use non-prescribed medicines than those paying the full cost (25).

Knapp(24) found that prescription drugs were used 31% while non- prescription drugs used for over 70%. According to Johnson and Clyder: "Sex, income, education and mental health, tendency regarding self-treatment and level of concern with health matters were the variables most highly related to non-prescribed drug use" (26). Though some of the findings are contradictory, it seems to be consistent that older people and females generally taken more drugs than younger people and males.

However, persons visiting a physician are more likely taking a prescribed drugs and not seeing a physician taking a non-prescribed drug" (35).

Abraham Chaiton, et.al., (18) in their study of patterns of drug use found that 35.8% of respondents in

the community survey and 78.6% in the practice survey had taken at least one prescribed medicine in the previous 48 hours. The general findings of cross-national studies, where similar recall periods were employed, have identified considerable differences in the number of persons taking prescribed medicines. White and Murnaghan (15) reported "that 27 percent of the Chittenden, Vermont sample 19 percent of the chester, England sample, and only 12 percent of the Yugoslavian sample had taken prescribed medicines during the previous 48 hours Further, in the review article prescribed and non-prescribed drug Rabin stated that users of prescribed medicines during the previous two days were highest in the United States (in Northwestern Vermont) with a rate of 344 per 1000 papulation, and lowest in Banet, Yugoslavia with 160 per 1,000 population. Overall, 27 per 1,000 population had taken prescribed drugs during the pervious two days. Anderson, Smedby and Andersen, in their study comparison of Sweden and the United States, found that during the twelve month study period 62% of the Swedes and 47% of the Americans sampled had used prescribed medicines (15).

In another study of prescribed and non-prescribed drug use within the household context in Baltimore, Maryland, Osterweis, Bush and Zuckerman (1), they reported that prescribed drug use accounted for 41% of

the variance in drug use and 28% of the variance for non-prescribed drug use. Joseph, et.al, in their prescribed and non - prescribed drug use behaviour within the household context in the USA during the two week study period found that 40% of the studied population used prescribed drug , and 20% non - prescribed drug (17).

2.3 Factors Associated with Drug Use

Age, sex, social status, education, family size, morbidity, cultural heritage, occupation, residence (rural vs. urban), neighbourhood, individual attitudes, and personality are among the factors that have been associated with the use of medicines (5, 15,17).

Studies have shown that women were more likely than men to use or purchase prescribed drugs. Among the people in English housing estate, Jefferys, Brotherston and Cartwright found that 27% of their sample had taken prescribed medicines in the four week period,and 67% had taken non-preacribed drugs. According to the authors consumption during the study period was higher among women than men at all ages from 10 years on wards (16).

Anderson, Smedby and Andersen in their cross-national study found that 70% of women and 54% of men in the adult Swedish sample had taken prescribed medicines during the twelve month study period. In the United

States sample, 54% of men and 60% of women had used prescribed drugs (15). Margaret and Baker, also reported a similar trend, with females receiving more prescription drugs than males and drug use increased with age (21, 22). The sex and age differences that were observed in the previous studies both for prescribed and non prescribed drugs was also observed by Rabin and Bush (23). According to the authors "the range of rates for males using prescribed medicines varied from 61% for those less than 2 years of age to 12% for those aged 15 - 24 years. For females, the proportion using prescribed medicine ranged from 77% for those 75 years and older to 17% for those aged 6 - 14 years. The use of prescribed medicine for males and females in early years are similar, with the use by male children slightly exceeding that by female children. After 10 years rates for females rise sharply while the rates for males decline. After childhood the use among females remained higher than that among males. However, according to the report the rate difference by sex started to decrease after child bearing years but widened again for those over 65 years (23).

Jefferys, Brotherston and Cartwright (16) found that "among children, the proportion of boys taking prescribed or non-prescribed medicines did not differ significantly from the proportion of girls. 70 percent, of the

children under 10 years old had been given medicines of some sort, and 21 percent of them had taken medicine on a doctor's prescription. The authors further reported that among children in the 10 - 14 age group consumption of medicine was less frequent than amongst other age group. However, over 60% of both sexes took medicines of one sort or another. In the late teens, consumption, particularly of prescribed medicines, declined to a lower level for boys, but rose for girls. Among women aged 20 - 25 the rise continued, with over 80% having taken medicines during the 4 week period. This proportion varied in subsequent age groups, although there was a slight tendency for the proportion who took prescribed medicines to increase with advancing age. The sex difference in the proportion taking medicines which began to emerge during the teen age years was maintained and indeed increased during early adult life. Only after age 45 did the gap between the proportion of men and women taking medicines, both with and without prescriptions, begin to narrow (11).

Females, who made up 53% of the population used 62% of the kinds. They were more likely to be medicine users than males except for children, and are more likely to be using more than one kind of medicine in all age groups except for 6 - 14 year group (23).

In general studies have found that educational

achievement and social class are also associated with consumption of prescribed drugs. Anderson and his colleagues in the cross-national study reveal of that persons with a "high education level" in both Sweden and the United States were more likely to have consumed prescribed drugs during the twelve months study period than persons with low educational level (67% vs. 51%) (15). Rabin also in his review of prescribed and non prescribed drug use reports that the use of prescribed drugs is also associated with social class. "In Sweden 63% of persons of 'low' social class and 68% of persons of 'high' social class had taken prescribed drugs during the twelve month study period, in the United States 44% of those of 'low' social class and 52% of those 'high' social class had used prescribed medicines (15).

Income has been found to be the most important variable in explaining differences in use of medicines (35). However, it is found that it was not consistent in all studies. Rabin and Bush (23) reported that use of prescribed or non-prescribed medicine use did not vary with economic class, unlike the study of Rabin and Bush.

Kasper and Wilson (35) reported that children from less educated and poor families are 15-20% less likelihood of using a prescription drug than better off children. However, according to the authors it appears that prescription drug use corresponds, to the level of

physician visit. In general, differences in access for older persons were not observed regardless of income or education. The elderly poor however, required more prescriptions than the better off (5, 35). However, in children under six years of age the differences in use of prescribed medicines are affected by income level. They stated that "76% of 'high income' children under six years of age used at least one medicine, compared to 54% for the lowest income group, among adults this was not observed. the authors reported that this difference in consumption of drugs that was observed in children under six years of age disappears once the poor children see a physician (35). The positive correlation which was found between medicine use and economic status was not found in another study which took account of family size as well as income to determine economic status (23).

On a global scale Carruthers, et al, (5) in their comprehensive literature review of drugs utilization, and Rabin and Bush (23) , documented that drug use has increased worldwide at rates exceeding increases in national income in many countries (5, 15).

2.4 Drug Use in Developing Countries

It is evident that drugs play a greater role in developing countries than developed countries to prevent and treat infections due to the higher prevalence of

infectious and parasitic diseases in developing countries (11). Infection and parasitic diseases account for over four times the proportion of deaths in under- developed countries (11). For these reasons it may seem that it is justifiable that a much larger amount of money be spent on antibiotics and antiparasitic drugs in developing countries; with 24% in India and nearly 50% in Tanzania compared to 15% in the United Kingdom, 5.2% in Switzerland, and 4.6% in Germany (11).

Lack of adequate health care at the global level is predominantly a Third World problem and a direct result of the constraints and inabilities of these countries to secure the basic necessities of life, such as food, shelter and essential drugs(44). Varying degrees of serious shortages of the essential medicaments have and are occurring the reason being a high dependency on importation (11)

General lack and inconsistency in supply of drugs in the public sector in developing countries leads or forces patients to visit private pharmacies (7). Private pharmacies are found to be the predominant drug dispensers and prescription only drugs are available for sale in informal drug stores as well as in formal pharmacies without a prescription (27). In their study of buying drugs in Addis Ababa pharmacies Kloos,etal(28) reported that 21% of their studied sample used pharmacies

as the most frequently used health resource in Addis Ababa . Of the 87% individual who reported used commercial drug retailers 61 (70%) had used government pharmacies and the remaining private pharmacies, drug shops. Logan (29), from his study of pharmacists and their clients in Mexico reported that 41.7% of their sample consulted a pharmacist at least once a month, and only 10.4% reported never using pharmacies at all. Trisha (30) reported that 64% of patients were buying medicine over the counter with out-a prescription. The author claimed that this figure varied considerably from pharmacy to pharmacy from 30%-95%. Ferguson (31), in her case study in El Salvador, found that about 38% of the families railed on the pharmacies as their first health care source; in 1977 the fifty-two private pharmacies sold approximately the same amount of medicines as the seventy-two state hospitals and 277 public health centre together distributed to their clients (37). From the study that was conduted in Nepal (32), the investigator reported that 41% of the studied people did not purchase all the prescribed medicine , 68%of those who purchased used two sources.

Drug utilization studies, whether institutional or community based, are important tools as indicators and feedback sources of drug use in the country and as well as of patterns of drug prescribing behaviour by

physicians or community health workers (19). However, in the Third World there has not yet been systematic research into the distribution and use of drugs at the community level (30). What lay people in developing countries do with the drugs after buying them over the counter has hardly been studied; both qualitative and quantitative assessments are lacking (46,30).

"The majority of drugs available in Ethiopia are imported and very expensive. Many of them are not necessarily related to the community's need. In order to solve these problems the country has developed an essential drug program. Based on the concept formulated by the World Health Organization, it is hoped to create a system where by good quality drugs that are essential for the treatment of prevalent disease conditions will be available at a low cost" (41).

The Ministry of Health of Ethiopia spends considerable amount of money on drugs. For example, according to the information the total drug expenditure for the five hospitals in Addis Ababa for the fiscal year 1991 was about birr 3,021,916 (excluding donated drugs with an estimated costs of birr one million) (42). However, drug shortages are significant in many of the hospitals, health centres and health stations in Addis Ababa. This drug shortage is mainly attributed to poor management and lack of supply of drugs. This issue was

assessed using existing morbidity reporting information and stock balance cards for drugs in two health centres by Pezzino and Hailu in wollo (39), and Abadir and Didd Huka in Addis Ababa (4). They assess the pattern of drug consumption and use over a given period of time , they assessed total expenditures and quantities of drug consumed. Irrespective of their study period and geographic locations both studies found that the actual consumption by far exceeded the theoretical consumption. The results obtained from both studies also indicated that significant amounts of money were spent on a limited group of drugs (39, 4).

Sekhar(38), in a pharmacy based study in Addis Ababa, found that antibiotics were the most frequently prescribed drugs, and that they also ranked second to anthelmenthics for being bought without prescription . A similar trend was observed by Leka and Abadir (40) in their study of prescription patterns of drugs in Ethiopia. Antibiotics were the most frequently prescribed drugs and were followed by analgesics. Kloos (28) in his study of drugs purchasing in Addis Ababa found a similar pattern of antibiotic drug use.

Drug utilization studies that have been carried out in Ethiopia are interesting and useful. However, more indepth systematic research is needed. Many difficulties have hampered the direct comparison of many of the works

on drug utilization. Different recall periods, different drugs studied, and different methodological applications are all present in the studies conducted in Ethiopia. Drug-use and purchasing patterns in Ethiopia are still mostly unknown; the literature is generally devoid of such studies.

3. OBJECTIVES

3.1 General Objective

This study was intended to investigate the overall drug usage pattern in the community and the source of the drugs. The second aim of the study was to assess determinants that influence drug purchasing and drug source in the study population.

3.2 Specific Objectives

The specific objectives of this investigation were:

- To assess the drug purchasing pattern in Yeka district.
- to obtain information on illness episodes four weeks prior to the interview date by category of illness.
- To assess the sources of drugs for the community.
- to assess the determinants associated with the use and selection of drugs.
- To determine preferences of various health care sources in relation to drug use.

4. METHODS

This community based cross-sectional study was conducted to investigate the overall drug usage pattern, alternate drug sources, and to assess determinants that influences drug purchasing and usage in Yeka district of Addis Ababa.

4.1 The Study Area

Yeka, the site chosen for this study, was one of the eighteen awraja's* of Addis Ababa Administrative Region. It is located in the northeast of the city and has an area of 15.8 sq. kms. During the study period the awraja was divided into 23 kebeles and three keftegnas. The extrapolated population of the awraja based on 1984 (G.C.) housing census of Central Statistics Authorities (CSA) was about 116, 496 (Alemeyehu, 1993), thereby giving a population density of 7373 people per square kilometre, within the awraja there were two health centres, one health station, two health posts, five private drug shops, and no hospital.

* The classification of awrajas/districts has been recently dropped by the government and replaced by smaller woredas.

4.2 Source Population

The source population of the study is the total population of the 23 kebeles of the previous Yeka District of Addis Ababa Administrative Region.

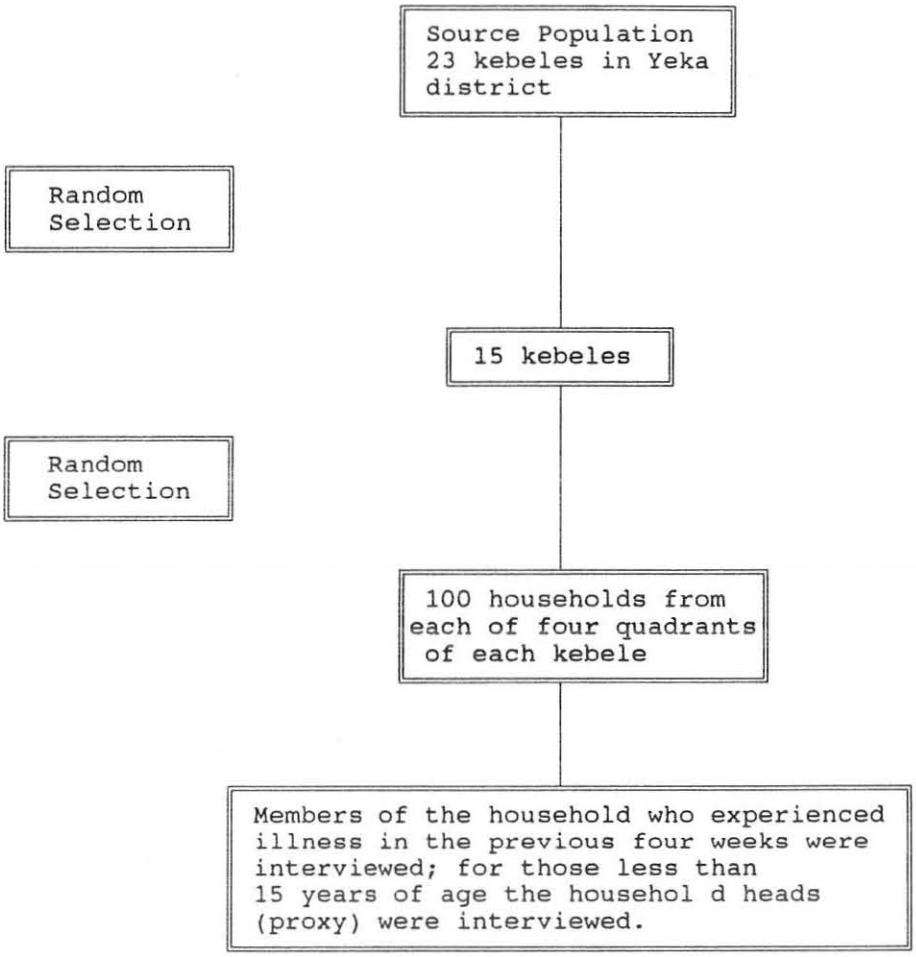
4.3 The Study Population

The study was conducted on a sample population found in randomly selected households. From the 23 kebeles of Yeka District 15 kebeles were randomly selected by selecting kebele numbers prepared on equally shaped papers. From each of these 15 kebeles 100 households were selected randomly in each of four quadrants. Each kebele was roughly divided into four quadrants to give equal chances to all households within the kebele. Random selection of 15 kebeles was prefered believing that it gives equal chances to all kebeles , and as well to minimize the sample size taking into consideration the time and cost analysis.

Criteria for Inclusion: Households were selected on the basis of having at least one family member who had experienced an episodes illness within the four weeks preceding the interview date were included. Sick adults were interviewed, and for those less than 15 years of age

the household heads or reliable informant was interviewed (see Figure 1). Those households where potential participants were absent despite repeated visits to their home, were excluded.

Figure 1. Sampling Procedure



After identifying the first house by simple random sample, the interviewers went on to enter the next nearest household to the right of the interviewed house until one with the a sick person within the past four weeks preceding the interview date was met. If a person was sick more than one time his last illness episode was used for the purpose of this study.

The first house was identified by a simple technique. Taking the centre of each quadrant as a reference point an empty bottle was rotated on a flat surface; and the house in front of the neck of the bottle was taken as the first house. In places where the first house in front of the bottle was found to be an organization, the house to the right of it was taken as the first household.

The questionnaire was prepared first in English then translated into Amharic. The Amharic version was then back translated into English by a third person to maintain the validity and reliability. The interviewers used the Amharic Version of the questionnaire.

4.4 Recruitment and Training of Interviewers

Eight twelfth grade graduate were recruited to implement the questionnaire survey. Rigorous training of the interviewers was conducted regarding interview techniques and they were briefed on the objectives of the

study. The training program consisted of discussion, roleplay, and a practice interview with each other. Interviewers also received instructions on how to approach people and handle problems in case any might arise during the study process. Further, the interviewers were briefed about the need of maximizing confidentiality of responses and the need to obtain permission and commitment from the respondent before starting the interview. See the respondents' consent and confidentiality guide in (Appendix B).

4.5 Pretest

After training a pretest was conducted by the trained interviewers and principal investigator in one non selected kebele. Results were then discussed by the interviewers. Based on the these certain corrections were made in order to make the questions clearer and more understandable.

4.6 Sample Size Calculations

The sample size calculation was based on obtaining the estimated maximum sample population. The maximum acceptable discrepancy (100p-100II) between the sample and population percentage was taken +- 3% precision with 95% certainty. The (95% confidence limit in 2 tails normal distribution namely Z = $\pm$1.96 the standard error

of estimated percentage is then calculated.

$$100x\sqrt{\Pi(1-\Pi)/n}$$

The allowable discrepancy alpha ± 3 percentage between the sample and population percentage

$$100p-100\Pi=\pm 3$$

$$\sqrt{n}=\frac{zx100x\sqrt{\Pi(1-\Pi)}}{3}$$

$$\sqrt{n}=\frac{1.96x100x\sqrt{\Pi(1-\Pi)}}{3}$$

$$\sqrt{n}=\frac{(196)}{3}\sqrt{\Pi(1-\Pi)^2}$$

$$n=(196/3)^2X\Pi(1-\Pi)$$

$$n = 4268.44 \times .25$$

$$= \underline{\underline{1067}}$$

However to increase precision 10-11% of the repaired sample size was taken additionally increased the sample size to 1185.

4.7 Variables

This study took into consideration the need to measure the following variables:

1. Socio-demographic characteristics: age, sex, religion, ethnicity, educational level, occupation, marital status, average monthly income

and average monthly health care, expenditure.

2. Specific drug(s) purchased and being utilized, where purchased and how they are utilized, and on whose advice.

3. Knowledge about the drug, and prior use of the drug (if self or (selected drug).

4. Preference of health service institution and the reason why preferred.

5. Affordability and availability of drugs in various health service institutions and private shops.

4.8 Measures

In the survey respondents (sick persons or proxies) were asked whether they had taken any kind of drug for their illness in four weeks preceding the interview date. If they answered no they were asked to give reasons for not taking a drug for their illness. If they answered yes, they were further asked to specify the drug, and to show the package, the label or prescription if available. The drug taken was coded and categorized. Unspecified drug category was formed because respondents and proxies were sometimes not able to specify the name of the drug.

Then asked from where they got their drugs. If they answered from a "pharmacy" they were asked did they take the drug "with" or "without" a prescription. Those who answered that they took it without a prescription were

then asked to specify reasons why and who initiated the treatment. They were also asked about the quality of drugs about overdose of drugs, preference of drugs according to the advice of the authorized health worker (physician or other).

4.9 Drug Purchasing

Those respondents who took medicine with prescription from health service institutions were asked whether they got their drug with payment or not. If they had paid they were then asked whether they were able to buy all the prescribed drugs or not. If not they were requested to give reasons for not doing so.

Respondents were also asked about their preference of health care sources in relation to acquiring drugs, their availability affordability, and the level of satisfaction they had with these drug sources (see the complete questionnaire in Appendix C).

4.10 Data Collection

In order to facilitate the data collection process discussions were also conducted about the objectives of the study with regional and district representatives of Ministry of Health. Letters for collaborations were written to district administrative offices describing the purpose of the study. Through district officials another letter was issued to kebele leaders and to whom it may

concern. The document/letter was given to the interviewers for their reference.

Face-to-face interviews were conducted and the information was obtained by the structured questionnaire administered in respondents' homes by the trained students, from mid December 1992 G.C. up to the end of January 1993 G.C. Each household interview took an average of 30 - 40 minutes to administer.

4.11 Monitoring of Data Collection and Quality Control

To maximize the quality of data collected, the investigator worked closely with the interviewers through-out the entire collection process . All completed questionnaires were returned daily to the investigator they were then checked page by page to see if it had been completed properly. Problems were discussed on the next day prior to any further data collection.

4.12 Coding and Data Processing

The responses obtained from the study were tabulated and coded. Every response of the questionnaire fit into one and only one category.

The coded questionnaire responses were entered into a computer program (EPI-INFO 5.0) in order to analyze the patterns of drug use with the various independent variables age income level, educational status, monthly

health care expense, sex, etc. Frequency tables, percentages, odds ratios and confidence limit tests were done to enhance the analyses.

This was performed with and without stratification. The stratified analyses were performed using the Mantel-Henzel method to adjust the caparison for any imbalance in the comparison of the group being compared with respect to other variables.

4.13 Operational Definitions

Pharmacy: A drug shop where any kind of medicine is retailed, and where the compounding of drugs is allowed(45) .

Drug Shop: A pharmacy where any kind of medicine retailed, but where they are not allowed to compound drugs(45).

With Prescription: A modern drug taken or bought with written prescription from an authorized health worker.

Without Prescription: A modern drug taken or bought on the patient's own initiative or on advice of a pharmacist or lay person

No Medication /didn't take: No modern medicine was given or taken.

Drug (Modern): " any substance or mixture of substances that is manufactured, sold, offered for sale

or represented for use in (1) the treatment , mitigation, prevention or diagnosis of diseases, an abnormal physical state or the symptoms thereof in man or animal"(48).

Affordable: Cost that the community to be able to meet the expense of; have or spare the price of.

4.14 Ethical consideration

Informal consent to participate in the study was obtained before starting the interview, confidentiality of responses also assured (see appendix B). After the study all used questionnaire will be destroyed.

5. RESULTS

From the implementation of the questionnaire survey many data were collected and much information gained.

5.1 Description of the Surveyed Population

This study revealed much concerning drug use patterns following an illness. 40.5% (480/1185) of the studied sample were males, and 59.5% (705/1185) females. As shown in Table 1, children under five years accounted for 10.5% of the studied population; 5 - 14 years for 13.1%; of 15 - 30 years for 29.5 % ; 46 - 60 years 16.8%; and 7.8% of the sample were above 60 years of age. Educational levels, income, monthly health expenditures and sex distribution of the studied sample are shown on Tables 1 and 2.

Table 1: **Age and Sex Distribution of Survey Respondents in yeka awraja from Dec.1992 to endofJan.1993**

Age Group (yr)	Sex		Total in each group	%
	Males	Females		
0 - 4	67	57	124	10.5
5 - 14	84	72	156	13.1
15 - 30	121	229	350	29.5
31 - 45	101	163	264	22.3
46 - 60	71	128	199	16.8
> 60	36	56	92	7.8
All age group	480	705	1185	100.0
	(40.5%)	(59.5%)		

Table 2: Characteristics of Surveyed Population

Characteristics	Category	Number	Percent
Sex	Males	480	40.5
	Females	705	59.5
	Total	1185	100.0
Age (in year)	0 - 4	124	10.5
	5 - 14	156	13.1
	15 - 30	350	29.5
	31 - 45	264	22.3
	45 - 60	199	16.8
	> 60	92	7.8
	Total	1185	100.0
Educational level	Illiterate	359	30.3
	Literacy campaign	135	11.4
	1 - 8 grade	332	28.0
	9 - 12 "	322	27.2
	> 12 "	37	3.1
	Total	1185	100.0
Income	< 100 birr	221	27.2
	100 - 249	270	33.2
	250 - 500	186	22.9
	> 500	136	16.7
	Total	813*	100.0
Health care expenditure	No expense	359	41.6
	< 100 birr	378	43.9
	> 100 birr	125	14.5
	Total	862*	100.0

* Don't know and no responses were excluded.

27.2% (221/813) of the studied population had an average monthly income of less than 100 birr; 32.5% had an income between 100 and 249 birr; 22.9% had an income between 250 and 500 birr, while the population that had an income greater than 500 birr accounted for 16.7% .

Of the sample population 30.3% (359/1185) can't read and write; 11.4% had participated in literacy campaign; 28.0% had elementary education (grade 1 - 8); 27.2% had high school (grade 9 - 12) education; and 3.1% had post grade 12 education.

5.2 Drug Use

Overall 85.2% (1010/1185) of the studied population reported they had used somekind medicinal drug in the four weeks study period. Of the studied population 14.8%(175/1185) did not obtain any drug(s) for their illness during the study period . Of those who took drug 95.5% (954/999*) obtained the drug(s) with prescription and 4.5% (45/999*) took the drugs without having a prescription (see Table 3).

Table 3: **Drug Taking With or Without a Prescription**

Medication	Frequency(N=999)	Percent
With prescription	954	95.5
Without prescription	45	4.5

* 11 did not answered.

Of the sick persons who used somekind of drug in the four week period 98.9% had taken only one type of drug, 19.4% two kinds, and about 2.3% three or more types.

From the study result 86.9% (417/480) of males had taken some kind of drug during the four weeks period; and 84.1% (543/705) of females did so (see Table 4 and 5). Various reasons were given for not taking and drug (see Table 9).

Table 4: **Percent of Respondents Taking a Drug After An Illness (with and Without a Prescription)**

Medication	S E X			
	Males [n=480]		Females [n=705]	
	Number	Percent	Number	Percent
No drug taken	63	13.1	112	15.9
Drug taken	417	86.9	593	84.1

* The result was not found statstically siginificant.

Table 5: Percent of Persons Taking Drug With or Without Prescription by Sex

Medication	S E X			
	Males		Females	
	Number	Percent	Number	Percent
Without prescription	21	5.1	24	4.1
With prescription	393	94.9	561	95.9
Total	414*	100.0	585**	100.0

* Three didn't specify (Males)
** Eight didn't specify (Females)

The total also shows that there are no marked differences in drug consumption except in children under age of 5 years where there more consumption was observed.

Table 6: Percentage Distribution of Respondents (Sick Persons) Who Took any Drug With and/or Without Prescription by Age Group

Age group (in years)	Total in each group	Number of those took drug	Percent
0 - 4	124	117	94.3
5 - 14	156	131	83.9
15 - 30	350	290	82.8
31 - 45	264	229	86.7
46 - 60	199	165	82.9
> 60	92	78	84.8

$p > 0.05$

5.3 Self-Medication

Buying drug(s) from pharmacy or drug shop without a prescription was minimal among the studied population within the four weeks recall period prior to the interview date. Only 4.5% (45/999*) of the respondents stated that they had taken drug themselves or been advised by others to do. Among the reasons given by the respondents 31.1% stated the illness was not serious followed by the illness was an emergency 24.4% and others(see Table 7).

* 11 didn't answered.

Table 7. Reasons for Taking a Drug Without Prescription

Reasons	Number	% of the total reasons
1. Illness was not serious	14	31.1
2. Illness was an emergency	11	24.4
3. Prior knowledge of the drug	6	13.3
4. Had similar illness before	5	11.1
5. Neighbour or friend gave the drug	4	9.0
6. Others	5	11.1
Total	45	100.0

Among those who took drug without a prescription 60.0% (27/45) of them took it by self-selection and 40% (18/45) advised by others.

Table 8: Prescription Drug Taking During Four Weeks in yeka Awraja, (December 1992 - January 1993)

Drug category	Males	Females	Total	Percent
Antibiotics	116	150	266	26.3
Analgesics	53	68	121	12.0
Respiratory drugs	40	176	216	21.4
Gastrointestinal drugs	27	37	64	6.4
Cardiovascular drugs	17	42	59	5.8
unspecified drug	114	52	166	16.4
Other	50	68	118	11.7
Total	417	593	1010	100.0

5.4 CONSUMED DRUGS

Among those taking various types, more persons (26.3%) used antibiotics than any other category excluding those unspecified drug category. Respiratory drugs were the second most frequently consumed drugs during the four week study period (at 21.4%). Analgesics were consumed by 12.0% (121/1010); 6.4% consumed gastrointestinal drugs; cardiovascular drugs were taken by about 6.0%; and 16.4% (166/1010) of the respondents were not able to specify the drug(s) they had taken during the four week recall period (see Table 8). It was also found that 13.8% (138/999) of the respondents misreported the type of drug they took for their illness, when reconfirmation was subsequently carried out by checking the drug package, label or prescription.

Table 9: **Percentage Distribution of Reasons for Not Taking Drugs**

Reasons	Number	Percent
1. Not enough money	74	42.3
2. Prefer traditional/ home treatment	38	21.7
3. Drug was not prescribed	24	13.7
4. The illness was not serious	20	11.4
5. Too busy	10	5.9
6. Others	9	5.0
Total	175	100.0

84.7% of those who took a drug for their illness believed that not taking the full dose of specific (prescribed) drug leads to certain harmful consequences, 11.9% (119/1010) stated that they were not aware of any harmful conscequences and 2.5% (25/1010) stated they don't think that medicines were harmful. "No cure" from illness and prolonged recovery were the most frequent reasons given as harmful consequences of not taking the full dose of the prescribed medicine,(with 64.8% (555/826) and 19.5% (161/826) respectively.

5.5 DRUG PURCHASING AND DRUG SOURCES

Among those who got their prescription at health facilities, 37.7% (261/692) bought their drugs at private pharmacies; 22.7% (157/692) at hospitals, 13.0% (90/692) at health centres; 13.0% (90/692) at government/city council pharmacies, 6.9% (48/692) from private clinics, 4.0% from health stations, and 2.6% from different sources.

Of those 692 respondents who bought prescribed drugs, 94% (650/692) were able to buy all prescribed drugs while 6.0% (41/692) could not. However, almost 90.0% (37/41) of those 6.0% who could not buy all prescribed drugs were able to buy some of the drugs (partially). Only 9.8% (4/41) could not buy any kind of drug. Unavailability of required/prescribed drug was their major reason for not buying prescribed drug(s).

Of the 958 respondents who got their drugs from government health service institutions 72% (692/958) purchased them , and 27% (266/958) got them free with the Health centres being the major supplier of free drugs. 44.4% of these free drugs were given by the health centres, while the hospitals gave about 35.7%.

5.6 INCOME

The relationships of drug use any kind (with or without a prescription) and income level (Table 10) were observed for all age groups. It was found to be more likely in age group 46-60 . 95 percent of high income adults 46 - 60 years of age used more drug compared to the 78.4 percent for the lowest income group. Irrespective of age, income level also has an impact on drug use; those with high incomes are more likely to take more drugs (see Table 10).

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Table 10: Drug (Medicine) Use (With or Without) Prescription by Age, Income Education, Health Care Expense

Population Characteristics	All ages	Age (in Years)					
		Percent of population using an drug					
		0 - 4	5-14	15-30	31-45	46-60	> 60
Income level							
Less than 100 birr	86.9	95.0	82.7	89.4	89.8	78.4	92.0
100 - 249	88.5	91.7	83.3	89.3	92.4	80.9	91.7
250 - 500	88.7	92.8	100.0	82.2	84.4	100.0	100.0
>500	94.8	100.0	88.0	97.8*	96.5*	95.0*	80.0
Educational level							
Read and write	80.0	-	83.3	78.6	84.6	74.4*	76.5*
1 - 8 grade	85.8	-	87.7	82.3	86.2	88.6	87.5
9 - 12 "	86.3	-	90.0	83.9	90.1	91.3	100.0
> 12 "	91.9	-	50.0	100.0	92.3	90.9	100.0
Health care expenditure							
No expense	75.5	92.6	79.6	62.0	71.6	75.4	80.6
< 100 birr	93.9	100.0	90.2	90.8	98.9	94.2	93.3
> 100 birr	96.0	77.8	91.7	97.5	100.0	94.1	100.0
Sex							
Males	86.8	95.5	84.5	82.6	90.1	87.3	80.5
Females	84.1	93.0	83.3	83.0	84.7	80.5	87.5

5.7 EDUCATIONAL LEVEL

Without regard to age, education of the family heads or the sick person appear to have impact on drug use(see table 10) . When the population was stratified by age those least educated in the less than 30 age group took more drugs than those with higher levels of education in the same age group. 83% of those in the low education group of the 5-14 year olds used drugs compared to 50% of the higher education level. After the age of 15 years drug consumption increases with age .

5.8 HEALTH CARE EXPENDITURE

When population was stratified by age children under 5 year of age used 92.6% of children in family with no expense used drug compared to 77.8% of those will 100 birr or more monthly health care expenditure . This may be due to an effect of free drug supply for those under five children or due to high morbidity in those with low socioeconomic status . Marked difference in drug use was observed in age group 15 - 30 years of age where those with less or no monthly health care expense are less likely than those with high health care expenditure, to have used drugs.

5.9 Availability of Drugs

Among those studied excluding don't knows and non-responses, about 46.4% (499/1076) of respondents were satisfied with the availability of drugs in government health service institutions and 50.1% (539/1076) not satisfied and 3.5% gave other reasons. 55.3% (497/899) were satisfied with the availability of drugs in public pharmacies and 44.7% (402/899) were not satisfied. When coming to private pharmacies 28.5% (258/904) were satisfied with the availability of drugs in private pharmacies and 71.5% (646/904) were not satisfied (see table 11).

Table 11: **Satisfaction with the Availability of Drugs in Different Health Care Institutions.**

Government Health Service institutions	Number	Percent of total responses
Why satisfied		
1. Able to get drugs	499	46.4
Why not Satisfied		
1. Unavailability of drugs	539	50.1
2. Others	38	3.5
Total	1076*	100.0
Public/ Government Pharmacy		
Why satisfied		
1. Affordable/fair drug price	274	30.5
2. Able to get drugs occasionally	139	15.5
3. Able to get all required drugs	84	9.3
Why not Satisfied		
1. Drugs unavailable	343	38.2
2. Others	59	6.5
Total	899*	100.0
Private Pharmacy		
Why satisfied		
1. Able to find drug and purchase	258	28.5
Why not Satisfied		
1. Drug too expensive	456	50.6
2. Not able to find required drug	150	16.5
3. Other	40	4.4
Total	904*	100.0

* Don't Know and No Response Not Included

5.10 Affordability

47.2% of all 1185 respondents stated that the drugs to be affordable/fair in government health service institution ,public (government) found to be affordable to 49.0% of all 1185 respondents, while drugs in private pharmacy was affordable only to 5.6% of the studied sample during the study period.

5.11 Preference of Health Care Source in Relation to Drugs and Treatments

27.6% of all 1185 respondents reported they prefer to go to pharmacy rather than government health service institutions. 73% of the studied sample preferred government health service institutions.

5.12 Reasons for Preference of Pharmacy

11.6% Of those 1185 respondents reported that they prefer pharmacies, and the frequent reasonses given was long waiting time in government health service institutions; 10.6% of them stated that drug is available, 6.7% preferred pharmacy because their illness was an emergency and they had no time to visit government health service institutions; only 1.8% of 1185 reported being close by, the same number of respondents answered that drug in pharmacy is better than government health

service institution (respondents perceived quality of drugs).

5.13. Factors associated with drug consumption

When drug taking was cross-tabulated with age, sex, average monthly income, educational level, and average monthly expenditure the chi-square test showed that drug taking was significantly associated with these variables ($p<0.05$), except for sex and educational levrel. Rate ratio (odds ratio) and 95% confidence limits were calculated to assess the strength of association of drug taking with groups (categories) in each variable. The results can be summarized as in Table 12.

Table 12. Drug Consumption Factors of Sick Persons in Yeka Awraja (district) December 1992 - January 1993.

Characteristics	Take drug		OR	95% CL
	Yes	No		
Age				
0 - 4	117(11.6)	7(4.0)*	1.00	
5 - 14	131(13.6)	25(14.3)	0.31	(0.12,0.80)
15 - 30	290(28.7)	60(34.3)	0.29	(0.12,0.68)
31 - 45	229(22.3)	35(20.0)	0.39	(0.15, 0.96
46 - 60	165(16.3)	34(19.4)	0.29	(0.11,0.71)
> 60	78(7.8)	14(8)	0.33	(0.12,0.93)
Total	1010	175		
Income				
0 - 99	192(26.5)	29(32.9)*	1.00	
100 - 249	239(33.0)	31(35.3)	1.16	(0.66,2.07)
250 - 500	165(22.7)	21(23.9)	1.19	(0.63,2.25)
500+	129(17.8)	7(7.9)	2.78	(1.12,7.21)
Total	725	88		
Education level				
Lit.campaign	108(15.3)	27(22.5)*	1.00	
1 - 8 grade	285(40.4)	47(39.2)	1.52	(0.87,2.64)
9 - 12 "	279(39.5)	43(35.8)	1.62	(0.92,2.84)
> 12 "	34(4.8)	3(2.5)	2.83	(0.75,12.53
Total	706	120		
Health care exp				
No expense	271(36.3)	88(75.9)*	1.00	
< 100 birr	355(47.6)	23(19.8)	5.01	(3.01,8.40)
> 100 birr	120(16.1)	5(4.3)	7.79	(2.95,22.36)
Sex				
Male	417(86.9)	63(13.1)*	1.00	
Female	593(84.1)	112(15.9)	0.80	(0.57,1.13)

* Referent group.OR = Odds Ratio. 95%Cl. = 95% confidence limits

Table 13. Factors Associated with Purchasing of Drugs in Yeka District December 1992 - January 1993.

Characteristics	Bought drug Yes	Bought drug No	OR	95% CL
Age				
0 - 4	58(8.4)	59(22.2)	*1.00	
5 - 14	82(11.8)	42(15.8)	1.99	(1.14,3.45)
15 - 30	203(29.4)	63(23.7)	3.28	(2.02,5.33)
31 - 45	169(24.4)	51(19.1)	3.37	(2.03,5.60)
46 - 60	120(17.3)	37(13.9)	3.30	(1.91,5.72
> 60	60(8.7)	14(5.3)	4.36	(2.09,9.19)
Total	692	266		
Income				
< 100 birr	123(23.3)	63(40.9)	*1.00	-
100 - 249	167(31.6)	58(37.7)	1.47	(0.94,2.31)
250 - 500	132(25.0)	19(12.3)	3.56	(1.95,6.55)
> 500	106(20.1)	14(9.1)	3.88	(1.98,7.71)
Total	528	154		
Monthly health care expense				
No expense	122(24.1)	140(68.6)	*1.00	
<100 birr	278(54.8)	56(27.5)	5.70	(3.85 8.45
> 100 birr	107(21.1)	8(3.9)	15.35	(6.90,35.50
Total	507	204		
Education level				
Lit.campaign	42(8.5)	33(19.8)	*1.00	
1 - 8 grade	194(39.4	77(46.1)	1.98	(1.13.3.47
9 - 12 "	203(41.2)	54(32.3)	2.95	(1.65,5.29
> 12 "	24(4.9)	3(1.8)	6.29	(1.60,28.80

5.14. Morbidity

Cough was the most frequent complait among studied population, followed with gastrointestinal complaints and febrile conditions. They represented 19.2%

(228/1185), 15.9% (189/1185) 13.3% (158/1185) respectively. Respiratory condition other than cough accounted for 9.0% (107/1185), genetourinary complaints for 4.8% (57/1185), cardiovascular disorders for 4.0% (47/1185) and others 22.5% (267/1185).

6. DISCUSSION

Findings of this study showed that pharmacies are the main suppliers of drugs for the community. Among 692 respondents who got their prescriptions at a health service institution 37.7% (261/692) subsequently bought their drugs from private pharmacies, 27.7% from hospitals, and 13% from city council (government pharmacies), 13.0% from health centres, 6.9% from private clinics, 4% from health stations and . The predominance of pharmacies as a health sources was also previously reported by Kloos /28/. In his study on drugs purchasing in Addis Ababa he reported that 21.0% of the interviewed sample used pharmacies as the most frequently used health resource.

Concerning the actual purchasing only 5.6% of the respondents in this study stated that prices in private pharmacies were affordable, whereas public pharmacy and government health service institution drugs were reported to be affordable by 49.0% and 47.2% of the respondents respectively.

This is encouraging, however better availability might need better management and supply mechanism, feedback information is a key for the betterment of drug management.

This study demonstrated that parallel to the government health service institutions and pharmacies a new generation of drug sources is flourishing some 6.9% (48/692) of the respondents get their drugs from private clinics. However, it is not higher percentage compared to those who get their drugs from govermental institutions and pharmacies. It is helpful, necessary and encouraging to have such services available, especially for emergencies, but certain things need due considerations; i.e., who prescribing, the type of drug given, and to whom to be prescribed.

The types of drugs most frequently taken for different conditions are shown in Table 8. Antibiotics and respiratory drugs are the most highly consumed drug categories; 26.2% of the studied sample took antibiotics, followed by respiratory drugs (21.4%) and analgesics (12.0%). Similar results were reported in previous studies by Abadir and Leka (40) with 27% being antibiotics followed by analgesics with 19%. And it is also important to consider that respondents sometimes failed to classify their prescribed drugs, so that the proportion of particular types is likely to be underestimated.

The 16.4% usage rate of the unspecified drug group reported in this study and the 13.8% misreporting of drug use found during the study period may be accounted for by

low perception and knowledge in the community about drug use. Though it seems contradictory with this discussion, it is worth mentioning that the advice and education given to patients by health professionals during drug dispensing and health education sessions is encouraging. 84.7% of those who took a prescribed drug after an illness reported that they were aware of the harmful consequences of not taking the full dose. However, the remaining low level of understanding about drugs and drug usage needs due consideration.

The most frequent reason given for not taking a drug following an illness was found to be lack of money (35.4%) as discussed earlier, followed by preference of home treatment (21.7% - 38/175), and not receiving a prescription (13.7%) and unavailability of drugs (6.9%). The study, therefore, showed that drug unavailability was not the most frequent reason for not taking drugs.

Among reasons given for taking drug without prescription was that the illness was not serious (31.1%), followed by the illness was an emergency and 11.1% reported that they took the drug without prescription because they had used the drug previously (i.e. they had prior knowledge of the drug), unlike the 58.1% reported by Kloos (28).

The study shows that some socio-demographic characteristics influence drug consumption. Age(being

younger), high income level, and high average monthly health care expenditure were found to have a positive impact on high drug use ($p<0.05$).

Drug taking was found to be highest for age group 0 - 4 years. Those with high income are found to consume more drugs than the low income groups, and high educational level is associated with high consumption.

Patterns of drug use suggest that children less than 5 years of age consume more than the older age groups. The age group 0 - 4 years (constituting 10.5% of the total studied population) consumed about 11.6% of the total kinds of drugs. It seems that increased drug use by the 0 - 4 age group follows high morbidity and mortality patterns that have been reported in this segment of the population. The pattern of drug taking decreases with age, though it is not entirely consistent.

There was no marked sex difference observed. 86.9% (417/480) of the males used drugs, as 84.1% (593/705) of the females. Similar pattern were observed in the use of nonprescription and prescription drugs. 95.9% and 94.9% of females and males, respectively, used drugs with a prescription and 4.1% and 5.1% without.

Drug taking behaviour of developed countries by far differs from that of developing countries . Reviewed literatures of drug utilization studies of developed countries where there is distnict demarcation of

prescription and non-prescription drugs though they differ from country to country needs cautions approach in developing countries due to the availability of prescription only drugs with out a prescription in formal and informal sectors. The 95.5% consumption of drug with prescription among those sick persons and 4.5% with out prescription is not in agreement with finding of those reviewed literatures due to the difference in definitions of 'prescription drugs' and' non-prescription drugs' in the literature and 'with or without prescription' in this study.

The subjects of this study were those persons who were sick in the four weeks of study period. It is believed that morbidity is one of the most important factor that predisposes to the use of drugs and medicines are morelikely to be used by persons who had illness episodes. Therefore it seems that the high use rate of drug taking following an illness in the district might be explained with the high burden of morbidity in the district. The 95.5% use of drug with a prescription can also be explained by the fact that the majority of the sick persons visited health institutions and took drug that was prescribed.

The majority of government health service institutions with in the district were supplying drugs free of charges, it seems that the free distribution of

modern drugs in those health institutions might not contributed to the equity of drug ditribution rather fostering over medication of the community and may be one of the factors that contributed for the high use rate of drugs and specifically drug taking with prescription among the studies population. However it needs further indepth research study.

Before coming to a concluding remarks, some of the limitation of this study are discussed below.

- The existence of substantial variations in drug consumption between seasons (dry and wet) and seasonal differences in illness episodes between dry and wet season needs to be taken in to consideration.

- Apart from seasonal variations of drug consumption and illness the other limitation of this study was that healthy persons who took drug (eg. women who are using contraceptives and those taking vitamins for prevention) were not included.

The fact that those with high income level and higher education status took/purchase more drugs seems due to easy accessibility of purchasing or taking of drugs they have i.e. they have money at different time in point, therefore economic inaccessibility was minimal. Relatively high level of formal education often includes specific health-related knowledge, as well as enabling people to obtain health related information when they

need it. It also is likely to make people more cognizant of the role that health care plays in maintaining or regaining their health; in other words, educational attainment can make effective users of health care. Educated people may for that reason alone demand more health care than uneducated people. (47)

In this study among those who didn't take modern drugs following an illness the frequent barrier to accessibility to modern drug was found to be lack of money 42.3% (74/175) and preference of home/traditional treatment 21.7% (38/175).

7. CONCLUSIONS and RECOMENDATION

1. This study has demonstrated that overall drug consumption in the community following an illness is very high, likely due to high morbidity patterns, especially of communicable diseases. Drugs purchased with a prescription following an illness accounted for 95.5% (1010/1185), whereas only 4.5% (175/1185) were obtained without a prescription following an illness. We can conclude from this that obtaining drugs was almost done in an acceptable (predictable way), though there should be implemented regulations to control the purchasing of drugs without a prescription and drugs requires to be categorized into prescription and non-prescription.

2. In addition the study showed the association of some socio-demographic variables (among the studied variables) with drug usage. It was found that age(being younger), high income level, and high average monthly health care expenditure are associated with high use of drugs ($p<0.05$). Those with higher educational level took more drugs than those with low educational level, however it is not statisticaly significant. The association of drug taking and sex was not demonstrated, unlike in other reports where females were more prone to consume drugs. Instead, males were found to be taking slightly more drugs than females (86.9% vs. 84.1%), however it was not statisticaly significant.

3. In relation to drug source, this study's findings strengthen the findings of previous studies in many developing countries and in Ethiopia as well, that have demonstrated the predominance of commercial drug retailers in health care system.

4. The 16.4% 166/1010) of unspecified drug taking behaviour and 13.8% (138/999) misreporting of consumed drugs needs due attention. Therefore togenerate awareness of the community's attitudes towards drug and drug taking behaviours, health education needs to be designed and implemented by health workers .

5. The study result showed that about 46.4% of the studied population was satisfied with the less costly drugs sold in the government health service institutions than with private retailers, though the higher cost in the private shops did not deter the patient from purchasing the needed medication. However, making essential drugs more widely available at affodable cost in the government health service institutions would assists the majority of the poor population.

6. The reported 27.6% of 1185 respondents who preferred the private pharmacies as the major drug supplier, even with the high prices stands in contrast with the finding that lack of money was the most frequent reason for not taking drugs following an illness (35.4% 62/175). This, then, contributes to sustaining the community in a state

of desperation, in a "no way out" situation. In a society like Ethiopia with its low socio-economic status, and where cultural heritage predominates, the high morbidity and mortality rates call for due attention. Sustainable, long lasting community-based drug source schemes might be of great benefit.

7. General lack and inconsistency in supply of drugs to public sector is the main reason for being unsatisfied with government health service institutions .

8. It is believed that good available data on drug use and drug regulations will help to track patterns of drug use, in places where there is such a lack of information, it is believed that social surveys can contribute a lot. This study supports this belief by providing new and reliable information. It is also believed that the results of this study might help to encourage interested groups to do further research in this field.

8. REFERENCES

1. Osterweis M., Bush , P.J. and Zuckerman, A.E., "Family Context as a Predictor of Individual Medicine Use," Soc. Sci. Med., 13a , 287-291, 1979.
2. C. Chandra Sekhar, R. K. Raino and P. Gundu Rao, "Drug Scene in Ethiopia," The East African Medical Journal, 57(1): 44- 49, 1980.
3. David Ofori-Adjei, Agnes B. Amoa, Sam Adjei, Bamako Initiative Technical Baseline Survey for the Implementation of the BAMAKO Initiative in Ghana, (New York: UNICEF, 1990).
4. Mohammed Abadir and Didd Huka, "A Pilot survey of Drug Consumption and Use in Arada Health Centre in Addis Ababa," Eth. Pharm. J., Vol. 9(1), 1991.
5. Carruthers, G., Goldberg, T., Segal, H., and Sellers, E., Drug Utilization A Comprehensive Literature Review. (Toronto: Ontario Ministry of Health, 1987).
6. Kloos. H., Tesgaye Chama, Dawit Abem, KefeleGebre-Tasdik and Solomon Beley, "Utilization of Selected Pharmacies and Drug in Addis Ababa; A Study in Medical Geography," Ethio. Med. J. 24(3), 105-111, 1986.

7. A. Ugalde and N. Homedes, "Medicines and Rural Health Services: An Experiment in the Dominican Republic," in: Sjaak Van Der Geest and Susan Reynois Whyte (eds), The Context of Medicines in Developing Countries, Studies in Pharmaceutical Anthropology. 57-79, 1988.

8. Greenlick, M.R. and Darsky, B.J., "A Comparison of General Drug Utilization in a Metropolitan Community with Utilization Under a Drug Prepayment Plan," American J. of Public Health 58: 2121-2136, 1964.

9. WHO, Selection of Essential Drugs, Tech. Rep. Series #641 (Geneva: World Health Organization, 1979).

10. Masuma Mamdani, Godfrey Wolker, Essential Drugs and Developing Countries. A Review and Selected Annotated Bibliography, (London: Evaluation and Planning Centre of Health Care, London School of Hygiene and Tropical Medicine, 1985).

11. Ydkin, J.S., "Use and Measure of Drugs in the Third World," Dan. Med. Bull, 31 (suppl.1): 11-17, 1984.

12. V.T. Hert Gunaratne, Bring Down Drug Costs - the Sri Lankan Example (WHF 1(1,2), 1980).

13. Ingeberg Baksans, "Patterns of Drug Utilization - National and International Aspects - Antihypertensive Drugs," Acta Med. Scan. Suppl,

683, 67-69.

14. UNICEF, Economic Crisis, Adjustment, and the Bamako Initiative: Health Care Financing in the Economic Context of Subsaharan Africa, Bamako Initiative Technical Report, (Kinshasa, Zaire: UNICEF, 1990).

15. Rabin, D.L., "Use of Medicines: A Review of Prescribed and non Prescribed Medicine Use," Medical Care Review, 29(1): 668-99, 1972.

16. Jeffereys, M., Cartwright, A., "Consumption of Medicines on a Working Class Housing Estimate," B. J. Prev. Med. 14: 64-76, 1960.

17. Joseph, D., Jackson, Mickey, C. Smith, Thomas, R. Sharpe, Robert,A. Freeman and Ronaldny. 1982. "An Investigation of Prescribed and Nonprescribed Medicine Use Behavior within the Household Context," Soc. Sci. Med. 16(23): 2009-2015, 1982.

18. Abraham Chaiton, Walter O. Spitzer, Robin S. Roberts, M. Tech, Terrane Delmore, "Pattern of Medical Drug Use - A Community Focus," CMA Journal, 114(33) 34-37, 1976.

19. Kathyryn Dean, "Self-Care Responses to Illness: A Selected Review," Soc. Sci. Med., Vol. 15A: 673-687, 1981.

20. White K. Andjilkovic D. Pearsor,R. Mabry J. Ross A. and Sagan O. 1967. "International Comparisons of Medical Care Utilization," N. Eng. J. Med., 277.

516, 1967.

21. Kevin Quinn, Margarat. J. Baker, "Prescription Drug Use in Saskatchewan," CMAJ, 146(12): 2177-2186, 1992.

22. Skegg D.C.G., "Relation Between Drug Utilization and Morbidity," Acta. Med. Scan., 683: 81-87, 1984.

23. Rabin, D.L. and Bush, P.J., "Whose Using Medicine?" J. Comm. Health, 1(2): 106-117, 1975.

24. Knapp, D.A., and Knapp, D.E., "Decision Making and Self Medication," Am. J. Hosp. Pharmacy, 29: 1004-1012, 1972.

25. Bush, P.J and Rabin D.L., "Who is Using Non Prescribed Drugs," Med. Care., 14: 1014, 1976.

26. Richard E. Johnson, and Clyder Pope, "Health Status and Social Factors in Nonprescribed Drug Use," Med. Care. 21(2), 1983.

27. Goran Tomson and Goran Sterkey, "Self-Prescribed by Way of Pharmacies in Three Asian Developing Countries," The Lancet, (2) Sept 13: 620-621, 1983.

28. Kloos H., Berhanu Grahun, Asress Tefri, Keffalo Gebre Tsadik and Solomon Bely, "Buying Drugs in Addis Ababa: A Quantitative Analysis," in: Staak Van Der Geets and Susan Regnois Whyte (eds), The Context of Medicine in Developing Countries, Studies in Pharmaceutical Anthropology, 1988, 81-106.

29. K.Logan, "Pharmacists and Their Clients in a Mexican Urban Context," in Stak Van Der Geets and Susan Reybius Whyte (eds.), The Context of Medicine in Developing Countries, Studies in Pharmaceutical Anthropology, 107-129, 1988.

30. Trisha Greenhalgm, "Drug Prescription and Self-Medication in India - An Exploratory Survey," Soc. Sci. Med. 25(3): 307-318, 1987.

31. Ferguson, A., "Commercial Pharmaceutical Medicine and medicalization. A Case Study From El Salvador," in: Staak Van Der Geets and Susan Reypois Whyte (eds), The Context of Medicines in Developing Countries, Studies in Pharmaceutical Anthropology. 19-46, 1988.

32. Anand K. Tamang Shanta Basnet Dixit, Knowledge, Attitude and Practice Toward Health and Essential Drugs in Rural Nepal. Bamako Initiative Tech. Rep. Series #10, 1992.

33. Mahler H., "The Meaning of 'Health For All by the Year of 2000,'" World Health Forum, 2(1): 5-22, 1981.

34. Alfredo R.A. Bengzon, "The Evaluation of a Rational Drug Policy: Kumariah Baisaw Bramanian (eds). Toward National Drug Use Proceedings of the International Consultation of Rational Drug Use in Undergraduate Medical/Pharmacy Education. Bush,

P.J., Rabin, D.L. 1977. Who's Using them ? Am. J. Pharm. Assoc. 145. 17: 227-230, 1990.

35. Kasper, J.A., and Renate Wilson, "Use of Prescribed Medicines: A Proxy Indicator of Access and Health Status," International Journal of Health Services, 13(3): 433-42, 1983.

36. Oscar Gish, Lorettacee Feller, International Trade in Pharmaceuticals. Planning Pharmaceuticals for Primary Health Care: The Supply and Utilization of Drugs in the Third World 1979.

37. SJaak Van Der Geest, "The Articulation of Formal and Informal Medicine Distribution in South Cameroon. in: S. Van Der Geest and S.R. Whyte (eds.), The Context of Medicine in Developing Countries, 131-148, 1988.

38. Chandra Sekhar, Rajinder K. Raina, and Pillai G.K., "Some Aspects of Drug Use in Ethiopia," Tropical Doctor, 11: 116-118, 1981.

39. Gianffano Pezzino and Mesfin Haile, "The Right Drugs in the Right Amounts," World Health Forum, 12(2), 1991.

40. Teodros Leka and Mohammed Abadir, "Prescription Patterns of Analysis - Drugs in Rural and Regional Hospitals of Ethiopia," Ethiop. J. Health Service 4(1), 21-29, 1990.

41. Ethiopian Ministry of Health, Essential Drugs Therapeutic and Diagnostic Manual for Health Worker in Ethiopia, pp.

42. Hailu Ketema and Mehret Yirdaw, "A Survey on the Role of Pharmasists in Patient counselling in Selected Addis Ababa Hospitals," Eth. Pharm J., 10: 61-71, 1992.

43. Jean Paul Ganon, Eva J. Salber, Sandra B. Green, Patterns of Prescription and Nonprescription Drug Use in a South Rural Area, 1978.

44. HassAn M. Ali, "Problems in Assessing Rationality of Drug Utilization in Less Developed Countries," Acta Med Scad. Supp., 721, pp.27-30

45. Kitaw Yayeyirad, Self-Care:a study of three communities in Ethiopia, Etiop.J.Health Dev.,2(2),1987

46. Blumr and Krelman K. Factors affecting individuals use of Medicines, In pharmaceuticals and Health policy. 126-186, 1987.

47. Diter k. Zschock , Health care financing in developing countries, American public health association international health programs. monograph series #1, 1982.

48. 22nd Report of WHO expert committee on specification for pharmaceuticals preparations, Tech.Rep.Series # 418, 1969.

APPENDIX A:

INTERVIEWERS GUIDE

Interviewers:-Your attitude towards the interview process, your personal qualities and approach will strongly affect the quality of the study results. Therefore, your appearance,personality, politeness, patience, enthusiasm, cooperativeness and creativity are required and requested. Try to overcome your first nervous moment when you try to convince the subject to take part in the study. However, remember that questions are only to be answered on a voluntary basis.

In order to secure consistency in the process of data collection and to avoid misinterpretation, you are asked to strictly follow the following instructions.

1. Introduce yourself and the purpose of your visit .
2. Make sure that the respondent is fully convinced and cooperative with respect to participation.
3. Before starting the interview make sure that there has been a sick person in the house within the past four weeks.
4. Read the questions as they are written.
5. Use pencils to fill in all answers.
6. Write clearly and neatly.
7. Try as hard as possible to get all the questions answered. Do not leave any question blank, but write no response if the respondent is not able to

answer the question.

8. If there is more than one sick person in a house use separate questionnaire forms for each of them.
9. If a person in the house was sick twice in the past four weeks, use the latest illness for the purpose of the questionnaire.
10. Do not ever forget to write the household/patient number, date and your name in the spaces provided on the top of each blank questionnaire.
11. If you find the house closed or no respondent present, make up to two return visits.If still no one is present use an alternate house.
12. Please, interview respondents alone (privately).

APPENDIX B:

Respondents Guide (Consent and Confidentiality Form)

Good morning/afternoon. My name is _____ and I have been hired to help carry out a study For Dr. Alemayehu Belayneh.

Dr. Alemeyehu is a doctor and postgraduate student in the Department of Community Health at Addis Ababa University. This study is a requirement for his Masters Degree in Public Health .

The purpose of this study is to gather information on the use of drugs, where there are obtained, and about the factors associated with purchasing them. In addition,this study will also gather information on the availability and affordabilty of drugs. Finally, it will come up with certain conclusions and recommendations for the Ministry of Health.

There is no risk to you from answering these questions. The regional office of the Ministry of Health, the district health management office, district administrative and kebele officials, are fully informed about the study.

The questions that I am about to ask are to be answered on a voluntary basis. Please keep in mind that there is no right or wrong answer. All information is important and all your answers will be kept confidential. I will not even ask your name.

But before beginning, I would like to invite you to answer these questions to the best of your ability ? Do you agree ?

Yes _____

No _____

APPENDIX:C

Questionnaire on Purchasing Determinants and Drug Usage in Yeka District

a. Before starting the interview make sure that there has been a sick person in the house within the past four weeks. If there is not, go to the next house.

b. Introduce yourself and the purpose of your visit

c. Make sure that the respondent is fully convinced and cooperative with respect to the study.

A. Identification

Household No_____

Date _____

Questionnaire No _____

Interviewer _____

1. Are you the one who has been sick, or are you a parent of a child who has been sick in the past four weeks ?

   sick person _____ parent _____

2. What is your age/ the age of the sick person ?

   age _____ sex _____

3. What is your religion?

   1. Christian 2. Muslim

   3. other specific _____

4. What is your ethnicity?

   1. Oromo 2. Guragie

   3. Amhara 4. Tigrian

5. Other specify _____

5. Are you able to read and write?

1. Yes 2. No

5 (a).If yes, what is your highest attained educational status?

1. Elementary 2. Literacy Campaign

4. Secondary 5. Higher

6. What is your Occupation?

1. Government employee 2. Merchant

3. Jobless 4. Day labourer

5. Others specify _____

7. What is your marital status?

1. Married 2. Divorced

3. Separated 4. Single

5. Widowed

8. What is your family size ?_____ children_____ adult_____

I am very happy with your answers and cooperation so far. Now we shall you go further with some specific health related questions.

9. Do you know the location of the nearest health institution to you?

1. Yes 0. No 2. Don't know

9(a). If Yes, where is it ? _____

10. Do you think that this health institution is far from your home? 1. Yes 0. No

10(a). If Yes, how far? _____ km

_____ Hours/Second

11. Have you ever attended any government health institution

(Hospital, Health Centre, Clinic) before?

1. Yes 0. No

11(a) If YES; what was it ?

11(b) If yes, when was the last time ? _____

11(c) How often in general do you use such facilities ?

_____

12. What was the illness (or symptoms) that you (or your child) experienced in the last four weeks?

13. Did you(or your child) take any drug(s) for this illness?

1. Yes 0. No >> If No, go to question 13(g)

13(a) If yes, what drugs were taken ?

13(b) Can you show me the package taken? (Write name from package if different from response.)

13(c) Where did you get the drug(s) ?

13(d) (If the answer to question No. 13(c) is from pharmacy or drug shop, then ask) Was it with or without a prescription ?

With _____ > If 'with' precede Q.#18 Without _____

13(e) (If without) Why? _____.

13(f) Who advised you to get the drugs? _____

13(g) If No, then why did you not get any drugs?

14. Who advised you to visit the pharmacy or drug shop?

1. Decided myself 2. Friends

3. Relatives 4. Other, specify_____

15. Have you ever used a pharmacy or drug shop before to buy drug(s) without a prescription?

1. Yes 0. No

15(a) If yes: When was the last time ? _____

15(b) How often, in general, do you buy drugs without a prescription ?

15(c) Could you please explain how you usually get drugs from the pharmacy or drug shop without a prescription?_____

15(d) Are you always able to get drugs you want from the pharmacy

or drug shop without a prescription? _____

0. No 1. Yes

16. Do you think that visiting the pharmacy/drug shop is a good form of treatment?

1. Yes 0. No 2. No response

16(a) If yes, is it better than going to the health facility ?

0. No 1. Yes 2. Sometimes 3. Other ____

16(b) Why ? _____

17. Did the drug(s) you take help you?

1. Yes (Go to Q.#19) 2. No 3. Don't know/Not sure

18. (Only ask if respondent said 'with' to Q.#13(d)) Did

you pay for the drugs that were prescribed for you at the health institution ? 1. Yes 0. No

18(a)If FREE, from where did you get it?

(then go to Q. #19)

18(b) If PURCHASED, where did you buy the drug?

18(c) If purchased, did you buy all the drugs that were prescribed for you?

1. Yes (go to Q. #19) 0. No

18(d) If NO, did you buy some of drugs that were prescribed for you?

1. Yes 0. No

18(e) If NO, why did you not buy all the drugs prescribed for you?

19. Did you receive advice on how to take the drug(s)?

1. Yes 0. No

19(a) If YES, did you take the drug according to this advice?

1. Yes 0. No 2. Partially.

19(b) If No, why?

20. Do you believe that there are any consequences of not taking the full dose of drug?

1. Yes 0. No 2. Don't know

20(a) If YES, what are these consequences?

21. Did you experience any bad reaction to the drugs that you took within the last four weeks?

1. Yes 0. No 2. I do not remember

21(a) If YES, what was this reaction? _____

21(b) If YES, where did you get this drug? _____

We are just about to finish. So far you are doing well. I am pleased. Now I will ask you some more questions.

22. Do you sometimes prefer to go to the pharmacy/drug shop instead of local/nearest health facility when you are ill?

1. Yes 0. No

23. Why? _____

24. Does the availability of drugs in the health facilities that you use satisfy you?

1. Yes always 2. Yes sometimes

0. No 9. Do not know

24(a) Why? _____

25. Are the drugs in health institution affordable to you and your

family?

1. Yes 0. No 2. Other specify_____

26. Does the availability of drugs in private pharmacy/ drug shop satisfy you?

1. Yes always 2. Yes sometimes 0. No 9. Don't know

26(a) Why? _____

27. Are the drugs in the private pharmacies/ drug shops affordable to you and your family?

1. Yes 0. No 2. Don't know

28. Does the availability of drugs in the government (public) pharmacy/ drug shops satisfy you?

1. Yes always 2. Yes sometimes

0. No 9. Don't know

29. Why? _____

30. Are the drugs in the government (public) pharmacy or drug shop affordable to you and your family?

1. Yes 0. No 2. Don't know

31. Do you have any drugs stored in your house?

1. yes 0. NO (go to Q. # 32)

31(a) If yes, how many drugs?

1. One 2. Two

3. Three 4. More than three

31(b) What are the names of these drugs?

31(c) What will you do with these drugs? _____

32. What is the average monthly income of your family?

(write down figure given)

33. About how much do you think your family spends per month on health care (including visits to facilities, purchase of drugs, etc.)? _____

DECLARATION

I, the undersigned declare this thesis is my original work and has not be presented for a degree in this or any other university and that all sources of materials used for this thesis have been duly acknowledged.

Name Alemayhu Belayneh

Signature _____

Place Addis Ababa

Date of submission _____

This thesis has been submitted for examination with my approval as University Advisor.

Dr. David ZaKus _____ Ato Gabre-Emanuel Teka _____

Advisor Advisor