

**AN EVALUATION OF DRUG USE IN PUBLIC AND PRIVATE
HEALTH FACILITIES IN KENYA: A CASE OF THIKA
DISTRICT**

**BY
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**A research project report submitted in partial fulfillment for the requirements of
the Master of Arts Degree in Project Planning and Management of the
University of Nairobi**

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DECLARATION

This project report is my original work and has not been presented for a degree in any other university.

Signed.....Date.....

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L50/70776/07

This project report has been submitted for examination with my approval as the university supervisor.

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DEDICATION

I wish to dedicate this research project to my daughter Neema Munguti and wife Betty Makena who supported me throughout the entire research process. Lastly, I wish to thank God for giving me strength to undertake this study.

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ABBREVIATIONS AND ACRONYMS

ACT	Artemisinin Combination Therapy
A.L	Artemether Lumefantrine
ART	Antiretroviral
HAI	Health Action International
HIV	Human Immunodeficiency Virus
KEDL	Kenya Essential Drugs List
KEMSA	Kenya Medical Supplies Agency
NSAIDS	Non-Steroidal Anti-inflammatory Drugs
ORS	Oral Rehydration Salts
PMTCT	Prevention of Mother-to-child-transmission
SWAp	Sector Wide Approach
UN	United Nations
WHO	World Health Organisation

ABSTRACT

The drug supply system to health institutions especially the Public Health Institutions in Kenya has for a long time been characterized by many pitfalls. Rational use of medicines requires that a patient receives appropriate medications to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them. A previous study on drug use in Public Health facilities in Kenya was conducted by Health Action International Africa in collaboration with the World Health Organization in April 2003. The baseline survey was conducted in Nairobi, Eastern, Nyanza, Rift Valley and Coast provinces and it was found out that the availability of essential medicines in Public Health facilities was 90%. The survey also established that there was a general tendency to over prescribe antibiotics with 78% of patients receiving antibiotic prescriptions, irrational dispensing was found at 70% of Public Health Institutions. The survey however was not conducted in Central Province and did not evaluate private health facilities, an important component of health care delivery in Kenya. The objectives of the study were to establish the pharmaceutical prescribing practices, patient care factors and health facility factors that affect drug use in Health Facilities and how these factors compare between Public and Private Health Facilities. The study was conducted as a cross sectional survey consisting of 1260 respondents within 42 Health Facilities in Thika District. The sample consisted of 25 Public Health Facilities with 750 respondents and 17 Private Healthcare Facilities with 510 respondents. The data was collected on the three key indicators of rational drug use as provided by the World Health Organization namely prescribing factors, patient care factors and health facility factors. The data collected was analyzed using Statistical Package for Social Sciences. The results on prescribing indicators showed that Private Health Facilities prescribe on average 3.10 drugs compared to Public Facilities which prescribe an average of 2.83. The Public Facilities had on average 77.16% of all prescriptions with an antibiotic prescribed compared to Private Facilities which had an average of 62.44% of antibiotics prescribed. The results showed that antibiotic use in Kenya is higher than in other countries which is a source of concern due to the associated risk of higher antibiotic resistance when antibiotics are over prescribed. The results on patient care factors indicated that the average consultation time in Public Health Facilities 8.10 minutes while the average consultation time in Private Health Facilities was 8.4 minutes. The results on patient care factors indicate that both the consultation time and dispensing time in Kenya is longer than in other countries signifying more personalized attention to patients by the Kenyan clinicians. The average dispensing time in Public Health Facilities was 118.32 seconds while the average dispensing time in Private Health Facilities was 225.82 seconds. The results on Health Facility factors showed that the average cost per prescription was ksh 228.26 in Public Health Facilities while in Private Health Facilities it was ksh 476.32 indicating that Public Health Facilities prescribed cheaper drugs. It was concluded from the study that in order to improve drug use in the health sector, a countrywide study should be conducted in order to establish drug use information where data is unavailable. The results from the study are important to the Ministry of Health in drug use strategy formulation, the county of Kiambu in developing the Kiambu County Health Plan, medical insurance companies in computing insurance premiums based on the average cost of a prescription of drugs and other stakeholders in the Healthcare Sector.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The Kenyan Vision 2030 prioritizes the Health Sector as one of the key sectors to spur economic growth and development. The vision's goal for the Health Sector is to provide equitable and affordable quality Health services to all Kenyans. This is in recognition of the fact that good Health and Nutrition boosts the human capacity to be productive, consequently enhancing economic growth, contributing to poverty reduction and the realization of the Vision's social goals.

This builds on the achievements of the *Economic Recovery Strategy* (ERS) (2003-2007) and the National Health Sector Strategic Plan II (NHSSP) (2005-2010) which was formulated with an aim of reversing the downward trends in health indicators during the 1990s.

Kenya also plans to restructure its Health delivery system to shift its emphasis from curative to promotive and preventive health care. In turn, this will lower the nations' disease burden. This is aimed at contributing towards achievement of health related Millennium Development Goals (MDGs). The NHSSP II and Kenya Vision 2030 and the flagship projects for the Medium Term Plan of 2008-2012 propose a number of reforms in the Health Sector – some of which aim to strengthen the Kenya Medical Supplies Agency (KEMSA) to foster efficiency and effectiveness in execution of its mandate.

Reform of the Health commodity supply system in Kenya is one of the key priorities of the Health Sector. This is underscored in respective policy documents and processes that sought to undertake reforms targeting the medical supply system.

The 1994 Kenya Health Policy Framework identified drugs and pharmaceutical supplies as the most critical area requiring policy reforms. The availability of trained staff and facilities which are accessible to the population are necessary components of primary health programs, but they alone are not sufficient to provide effective Health care. Pharmaceuticals and other drug products must also be available. The importance of pharmaceuticals in Primary Health Programs must be recognized in light of the following four observations: Drugs improve health leading causes of discomfort, disability, and death in the developing world are often preventable or treatable with pharmaceutical products, drugs promote trust and involvement in health services. The availability and effectiveness of drugs is a key factor in generating and maintaining public interest and participation in health related activities, Drugs are costly: In developing countries, the economic impact of drug costs for government programs is immense, often representing as much as 40% of health care budgets. Substantive supply improvements are feasible The most encouraging observation about pharmaceutical supply is that useful improvements can be made in a wide variety of circumstances (Dukes et al, 1997)

In 1963 when Kenya got its Independence, the population was about eight million people. The resources available at that time were adequate to fund a free health care system in public sector thus drug supply to public government institutions was operating smoothly with no regular drug stock outs. With the introduction of the essential drug concept in the early 1970s and the publication of the first WHO model

list of essential drugs, it became increasingly clear that the scarce financial resources needed to be cautiously used in order to contain the increasing drug costs and ensure sustained availability and accessibility of essential drugs. Five decades later the population has increased approximately five times to about forty million Kenyans. Our health institutions have expanded in size and numbers and the appreciation of modern medicines has grown. With it comes the rise in demand for Public Health Services and Pharmaceutical products. New diseases have appeared within the same period like HIV-AIDS and others increased in magnitude for example, Tuberculosis, diabetes and hypertension due to lifestyle changes. This has created a demand for more specialized medicines. (National Drug Policy, 2002). The irrational use of medicines is a major problem worldwide. The World Health Organization estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately and that half of all patients fail to take them correctly. The overuse, underuse or misuse of medicines results in wastage of scarce resources and widespread health hazards (WHO, 2012).

There is need for adoption of drug management concepts that ensure the available resources are used to achieve maximum health improvements for all citizens. A cross sectional survey study of drug use in public and private health institutions in Thika District was carried out.

1.2 Statement of the problem

The World Health Organization estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly. The overuse, underuse or misuse of medicines results in wastage of scarce resources and widespread health hazards (WHO, 2012).

In 1985, the WHO convened a major conference in Nairobi on the Rational Use of Drugs (WHO,1987). Since that time efforts have increased to improve drug use practices (Walker et al, 1990; Laing, 1990). Public Health Facilities have over the years experienced erratic and sometimes non supply of essential drugs. Recurrent drug stock outs, drug expiries and unreliable drug delivery schedules have forced many Kenyans to avoid seeking health services from Government Health Institutions. Those patients who get the medications usually do not receive the entire cocktail or combination of medicines required for their illness. As a result, the disease burden has snowballed leading to disability or death to many Kenyans. These cases all increase the cost of accessing good healthcare.

1.3 Purpose of the study

The purpose of this study was to investigate and evaluate drug use in Public and Private Health facilities in Thika District.

1.4 Objectives of the study

The objectives of this study were:

1. To establish the Pharmaceutical prescribing practices by Health Providers which affect drug use in Health Facilities in Thika District.
2. To explore Patient care factors that affect use of drugs in Health Facilities in Thika District.
3. To determine the Health Facility specific factors which affect drug use in Health Facilities in Thika District.

1.5 Research questions

This study sought to answer the following questions:

1. What are the Pharmaceutical prescribing practices by health providers that affect drug use Health Facilities in Thika District?
2. What are the patient care factors that affect drug use in Health Facilities in Thika District?
3. What are the Health Facility specific factors that affect rational drug use in Health Facilities in Thika District?

1.6 Significance of the study

The drug supply system to Public Health Institutions in Kenya has for a long time been characterized by many pitfalls. This culminated in the Minister of Medical Services on July 14, 2008 vide Gazette Notice No. 6238 appointing a National Task Force to analyze the operations of the Kenya Medical Supplies Agency in particular and the public drug supply system in general. An inefficient drug supply system erodes public confidence in health care, increases the disease burden in a country and consequently results in mortalities from preventable diseases.

This study seeks to critically analyze the public drug supply system in general and narrowing down specifically to the rational drug use in Public and Private Health Facilities in Thika District. Results obtained in this study will be recommended to the Thika District Health Management Team (DHMT) to improve the use of drugs in the District. The findings will also be presented to the Pharmaceutical Society of Kenya Annual Scientific Conference that brings together all practicing Pharmacists in the republic of Kenya with an aim to improving policy on rational drug use.

1.7 Delimitations of the study

The study confined itself to the Public and Private sector drug use system by analyzing core drug use indicators.

1.8 Limitations of the study

The Republic of Kenya has a total of four thousand and one (4001) health facilities ranging from dispensaries to Referral hospitals. The study focused on drug use at only one District, Thika District. This was due to financial and time constraints.

1.9 Assumptions of the study

The study took into account the following assumptions:

1. The information gathered in the data collection forms is the actual truth of the facts on the ground and it is not biased.
2. The findings can be used to deduce the drug use practices in all Public and Private Health Institutions in Kenya.

1.10 Definitions of significant terms used in the study

Compliance The degree to which patients adhere to medical advice and take medicines as directed.

Consumption The rate at which items are issued to clients or patients. It is also known as demand.

Dispense To prepare and distribute to a patient a course of therapy on the basis of a prescription.

Efficacy	The ability of a drug to cause the desired pharmacological effect.
Essential drugs	They are drugs that meet the basic drug requirements for the greater population in a given country.
Evaluation	Any process by which toxicity, metabolism, absorption, elimination, and safe dosage range for a drug or group of drugs is determined through clinical assessment in humans or veterinary animals.
Formulary List	A list of drugs approved for use in a specific health care setting.
Formulary Manual	A manual containing clinically oriented summary pharmacological information about a selected number of drugs.
Generic Name	The approved or non proprietary name of a drug. It is generally the international non proprietary name given by the World Health Organization (W.H.O).
Generic Substitution	Dispensing a product that is generically equivalent to the prescribed product in terms of the active ingredients, identical strength, concentration and route of administration.
Good Manufacturing Practices	Performance standards for pharmaceutical manufacturers established by WHO and many national governments. They include criteria for personnel, facilities,

equipment, materials, manufacturing operations, labeling, packaging quality control and stability testing.

Indicator Criterion used to measure changes, directly or indirectly and to assess the extent to which the targets and objectives of a program or project are being attained.

Indicator Drug One of a small number of representative drugs selected to be used with performance indicators to assess the performance of a drug supply system.

Irrational Prescribing Prescribing that does not conform to good standards of treatment e.g. extravagant prescribing, over prescribing, incorrect prescribing, multiple prescribing, under prescribing of medications.

Labeling Placing written or symbolic instructions on the immediate container in which drugs are dispensed.

Management Cycle The process consisting of the three interconnected functions of planning, implementing and monitoring and evaluation.

Pharmacovigilance The science of collecting, monitoring, researching, assessing and evaluating information from healthcare providers and patients on the adverse effects of medication.

Polypharmacy Use of too many medicines per patient.

- Prescribing** The act of determining what medication the patient should have and the correct dosage and duration of treatment.
- Stock out** Complete absence of an item that is normally expected to be on hand.
- Therapeutic Substitution** Interchange of one drug product with another that differs in composition but is considered to have similar pharmacological and therapeutic activities in accordance with written protocols previously established and approved.
- Work plans** Short term plans of usually six to twelve months which list for each major objective the target outputs, required tasks, individual responsibilities, schedule and budget.

1.11 Organization of the study

Chapter one gives an introduction and background information to this study. Chapter two covers the literature review on relevant research carried out globally, regionally and locally on drug use. Chapter three dwells on the details of the research methodology. Chapter four covers the data analysis, presentation and interpretation while chapter five summarizes the results, discussion, conclusions and the recommendations made from this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter contains the literature review for drug use from a global perspective, and examines drug use in both developed and developing countries. The literature review finally narrows down to the Kenyan situation. The chapter also contains a conceptual framework and finally a discussion on the knowledge gap.

2.2 The World Health Organization

In 1975, the World Health Organization defined essential drugs as those drugs that meet the health needs of the majority of the population. During the Alma-Ata conference sponsored by the United Nations Children's Fund (UNICEF) and World Health Organization in September 1978, the availability and accessibility of essential drugs were reaffirmed as basic components of primary health care (WHO, 2004). Low accessibility to essential drugs is a growing concern in many developing countries. High technology and expensive new medications create further financial strain in public health care. According to the WHO, one third of the world's population lives without regular access to essential drugs (Hodgkin, 1998).

The WHO stipulates that medicine use is rational (appropriate, proper, correct) when patients receive the appropriate medicines, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost both to them and the community. Irrational (inappropriate, improper, incorrect) use of medicines is when one or more of these conditions are not met. (Holloway, 2011)

The WHO concept of essential medicines was established over 35 years ago and has developed since then into a powerful tool to promote health equity on a global scale. The latest WHO Model List of Essential Medicines comprises of over 350 medicines and although healthcare professionals in high income countries might not be familiar with the term 'WHO Model List of Essential Medicines' the majority of governments in developing countries use the concept as the basis for procurement, supply and use of medicines for their healthcare system.

2.3 Drug Use in England

Most Healthcare in England is provided by the National Health Service which is a publicly funded healthcare system. The pharmacies (other than those within hospitals) are privately owned but have contracts with the National Health Service to supply prescriptions drugs to patients. (WHO, 2012)

The National Health Service is the sixth largest employer in the world with 1.5 million employees (The Economist, 2012). A study by the York Health Economics Consortium and the School of Pharmacy, University of London in 2011 found that the National Health Service was losing 300 million pounds per annum due to medicines wastage, at least half of which was avoidable. The study further found out that the opportunity cost to the National Health Service for people not taking their medicines properly and not getting the full benefits to their health was more than 500 million sterling pounds per year (Trueman et al, 2011)

2.4 Drug Use in Brazil

In Brazil, access to essential medicines became a constitutional right for its population of over 190 million and an obligation for the state in 1988. To ensure equal, universal and integral access to health care for all its citizens, the Brazilian Government

introduced the Unified Health System covering all Brazilian citizens. However, 30% of the population (equivalent to 57 million people) remained outside the reach of the public health-care system as at 2008. For these persons, health care and medicines had to be obtained through private insurance or through out-of-pocket payments, meaning that essential medicines were unaffordable and inaccessible for a substantial, and the poorest, part of the population (Ministry of Health, Brazil, 2012).

To improve access to essential medicines, the Brazilian Government introduced the Popular Pharmacy Programme Brazil in 2004, creating government owned pharmacies throughout the country where patients could obtain 107 medicines at low cost. The programme was expanded in 2006 to the private sector, making more low-cost medicines available at more locations (Ministry of Health, Brazil, 2012).

For all medicines, the Government reimburses 90% of the pharmacy retail price of generic medicines. Since 2011, selected medicines for diabetes and hypertension have become available free of charge at the pharmacies participating in the programme. As a result, access to, and use of essential medicines has increased. This implies that by prioritizing national reimbursement policies, a government can improve the affordability and accessibility of essential medicines (Ministry of Health, Brazil, 2012). The programme has also decreased the financial burden on families (Shaver, 2010).

2.5 Drug Use in Oman, Asia

The Sultanate of Oman is located in the southeastern quarter of the Arabian Peninsula. It has experienced a remarkable improvement in the quality and availability of health care in the last 40 years. Through sustained commitment and investment, Oman has progressed from limited health care provision in the 1970s to the present

comprehensive universal health care model which has been internationally acclaimed for its performance and cost effectiveness (Alshishtawy, 2010).

Initially, Oman had no clear national policy to ensure the availability of safe and effective medicines to its population, nor a functioning health-care infrastructure, since health-care providers were limited and predominantly trained outside the country (Ministry of Health, Sultanate of Oman, 2011). Due to this diverse background and training, the quality of care provided as well as the medicines prescribed was inconsistent. In order to ensure the quality, safety and effectiveness of essential medicines at an affordable price in Oman, the Sultanate enacted a national medicine intervention in 2000 focusing on the prioritization of essential medicines prescribed through the public channel (Oman National Drug Policy, 2000)

The more responsible approach to medicines use is calculated to saved 10-20% of the forecasted medicine expenditure every year between 2003 and 2009 with no evident negative impact on the burden of disease in Oman (Ministry of Health, Sultanate of Oman, 2010)

2.6 Drug Use in Bhutan, Asia

The kingdom of Bhutan is located towards the eastern extreme of the Himalaya Mountains. The Ministry of Health of Bhutan initiated an Essential Drugs Programme in 1986 which included the creation of an Essential Medicines List, new treatment guidelines and the monitoring of medicines use. One key aspect of the programme was the focusing on improving the procurement and delivery of medicines (Stapleton, 2000).

The first key action undertaken by the Ministry of Health was to centralize the procurement of all medicines to be prescribed in public health-care facilities through a competitive yearly tendering system, as opposed to single – manufacturer emergency purchase. The effect was an increase in the availability of essential medicines from 6% to 66% within three years. The increase in competition among suppliers resulted in a 6% drop in average medicines prices between 1985 and 1990 (Stapleton, 2000).

2.7 Drug Use in Senegal

The parasitic disease malaria is a significant cause of death, mainly for children in sub Saharan Africa under five years of age (WHO, 2011). Prompt and accurate diagnosis of malaria is essential to provide the correct medical treatment. Following a parasitological confirmation, artemisinin-based combination therapy (ACT) is the evidence-based and cost-effective first choice treatment for uncomplicated malaria (WHO, 2010). Due to suboptimal availability and affordability of adequate diagnostics, febrile patients are often inappropriately treated with antimalarial artemisinin combination therapy medicines (WHO, 2011).

Senegal is a lower-middle-income country located in West Africa with a malaria incidence of more than 10% of the total population. The Government prioritized accurate diagnosis by introducing rapid diagnostic tests in 2007 as first-choice diagnostic for malaria suspected patients. As a result, between 2007 to the end of 2009, the use of rapid diagnostic tests rose from zero to virtually 100% of all febrile cases. Due to the increased diagnostic specificity, the proportion of patients treated with ACTs dropped from 60-80% of all presented febrile cases to 15-50%. Also, a the total exposure to ACTs in the population decreased which led to a decreased pressure towards resistance (Thiam, 2011)

2.8 Drug Use in Swaziland

One of the key achievements in the last decade in the battle against the Human Immunodeficiency Virus (HIV) pandemic has been the provision of antiretroviral treatment (ART) to infected mothers, to prevent mother-to-child-transmission (PMTCT) of HIV. In June 2001, the United Nations General Assembly adopted the Declaration of Commitment on HIV/AIDS. A focus of this Declaration was improved PMTCT and the reduction of infant HIV infections (UN, 2002).

Swaziland is a landlocked country in southern Africa. Swaziland has the highest prevalence of HIV in pregnant women in the world, increasing from 3.2% in 1992 to 42% in 2008. (WHO, 2006). The Swaziland Government acknowledged the urgency of reducing childhood HIV infections and prioritized the availability of appropriate medicines to do so. As a result, significant improvements have been achieved in access to these medicines, and integration of PMTCT in 80% of antenatal care facilities throughout the country by 2007. The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that in 2007, 67% of all HIV-positive pregnant women in Swaziland received antiretroviral medicines (Ministry of Health, Swaziland, 2010).

2.9 Drug Use in Kenya

There is low drug availability in most Public Health Facilities in developing countries. Kenya is not an exception to this situation. This is because of increasing pharmaceutical costs, government failure to collecting adequate revenues, misallocation of the government budget, and weak management (Abel-Smith B, 1994). In most developing countries, the private sector is often considered more efficient than the public sector. (Turshen, 1999).

Pharmaceuticals are expensive and consume a large part of the health care budget. Good drug supply systems are not only supported by a well-managed procurement system, but also enforce rational drug use, organizational management, and work in a supportive legal environment (Hogerzeil et al, 1993). There are ten functional areas of a drug supply management system that need to function efficiently. These ten functional areas can be divided into three categories: the legal framework (policy, legislation and regulation); the drug management cycle (drug selection, pharmaceutical procurement, pharmaceutical logistics, drug utilization/use, and product quality assurance); and the organizational management (system management, budget and finance, human resources management, and monitoring and management information) (Dukes et al, 1997).

2.9.1 Legal Framework

The legal framework provides a very important foundation upon which the operations of the drug supply system are anchored. Several policy documents and drug legislations regulate the Public drug supply system in Kenya.

2.9.1.1 The Kenya National Drug Policy of 2002

This National policy document was first developed in 1994. Its goal was to ensure that Pharmaceutical services in the country meet the requirements of all Kenyans for the prevention, diagnosis and treatment of diseases using efficacious, high quality, safe and cost – effective pharmaceutical products. The objectives of the Kenya National Drug Policy are: To ensure the constant availability of safe and effective drugs to all segments of the population, to provide drugs through the government, private, and non-governmental sectors at affordable prices, to facilitate rational use of

drugs through sound prescribing, good dispensing practices, and appropriate usage, to ensure that the quality of drugs manufactured in Kenya and those imported into meet internationally accepted quality standards, to encourage self-sufficiency through local manufacture of drugs for consumption and export and to ensure that the provision of drugs for veterinary services is consistent with this policy.

2.9.1.2 The Kenya Essential Drugs List of 2002

This is a list of drugs that specifies the level of care at which individual drugs may routinely be distributed, prescribed, and dispensed. These levels of care include: Referral hospitals, Provincial hospitals, District Hospitals, Sub district hospitals, health centers, dispensaries and community health workers respectively.

The Kenya Essential Drug List is a scientific endeavour to meet the health care needs and social needs of the population of Kenya. It is the basis for managing drug supply in the public health sector. It also serves as the basis for formulating the curriculums on drugs and therapeutics for medical, pharmacy, nursing, and other health training programmes; for prescribing in public hospitals, health centers, and dispensaries; for the supply of drugs to health facilities; and for encouraging the local production of the most essential drugs. It also serves as a pointer to donor agencies on the pharmaceutical requirements of Kenya. One sign that the concept of essential drugs has been accepted is the development, dissemination and use of a national essential drugs list or a local essential drugs formulary.

2.9.1.3 The Kenya National Guidelines on Safe Disposal of Pharmaceutical

Waste, 2001

Sound management of pharmaceutical wastes is a crucial component of

environmental and health protection and therefore is an integral feature of the health care service. Pharmaceutical services inevitably create waste that may be hazardous to health and hence the necessity of National guidelines on the safe and reliable methods for its handling.

Accumulation of pharmaceutical waste has several consequences which include: administrative – constraints of accumulated pharmaceutical waste are high storage demands and unnecessary human effort in managing the stocks, economic – the unwanted inventory constitutes significant capital that would otherwise be used for much needed pharmaceutical supplies. This contributes to unavailability of appropriate pharmaceutical supplies, health/environmental – the accumulated pharmaceutical waste poses significant environmental and health hazards especially if disposed off indiscriminately. This is a Public Health concern. These guidelines provide the most appropriate, affordable and applicable methods to be adopted for the safe handling and disposal of expired drugs, drugs damaged in transit, and obsolete drugs.

2.9.1.4 The Pharmacy and Poisons Act (CAP 244)

This is an Act of parliament whose role is “to control the profession of Pharmacy and the trade in drugs and poisons”. It regulates the manufacture of drugs, the registration of drugs, the advertisement of drugs and the importation and exportation of drugs.

2.9.1.5 The Narcotics and Psychotropic Substances (Control) Act, 1994 (CAP 245)

This is an act of parliament whose role is “to control the possession of, and trafficking in, narcotic drugs and psychotropic substances and cultivation of certain plants.....”

This Act regulates the possession, importation, exportation and distribution of addictive drugs like the opiates. It ensures that drugs meant for medicinal use do not end up in illicit narcotic trade.

2.9.1.6 The Public Procurement and Disposal Act, 2005

The Public Procurement and Disposal Act 2005 public were enacted with the singular purpose “to establish procedures for efficient public procurement and for the disposal of unserviceable, obsolete or surplus stores, assets and equipment by public entities and to provide for other related matters.” The Act provides for the procurement process of a public entity, contract management, supply chain management including inventory and distribution. It applies to everything a public entity does in relation to acquisition of drugs and medical supplies, their storage, distribution and disposal. In addition, it also applies to the contracts it enters into with the suppliers of such drugs and medical supplies.

2.9.1.7 The Government Financial Management Act, 2004

This act was enacted to “provide for the management of government financial affairs, to make certain provisions with respect to the exchequer account and the Consolidated Fund, to provide for persons to be responsible for government resources and to provide for other related matters.” The Act generally seeks to strengthen the mechanisms for the management and utilization of public funds. It provides for the refund of unexpected funds and provides for the flow of funds for procurement of medical supplies by facilities.

2.9.1.8 The Public Officers Ethics Act, 2003

The application of this act extends to all public officers. It sets a specific code of

conduct and ethics for public officers under its mandate. Such officers are required to be efficient and honest, professional and uphold the rule of law. A public officer is to refrain from improper enrichment, avoid conflict of interests, and is prohibited from sexual harassment.

2.9.2 Drug Management Cycle

The Management of drug supply is organized around the four basic functions of the drug management cycle. These basic functions are the following: drug selection: includes issues such as what products should be available and in what quantities, drug procurement: includes purchasing methods, finance, terms of payment, sources of supply, quality assurance, and decisions to make or buy a product, drug distribution: includes import management, inventory control, storage, waste management, and transport, rational drug use: includes prescribing and dispensing practices, packaging and labeling, training auxiliary personnel, and educating consumers. At the center of the drug management cycle is a core of management support systems that includes Organization, financing and its sustainability, information management and human resource management (Dukes et al, 1997).

2.9.3 Drug Selection

Sound drug selection is a cornerstone of a progressive, equity-oriented pharmaceutical policy. The core concept of essential drugs (ED), endorsed by many countries, “is that the use of a limited number of carefully selected medicines based on agreed clinical guidelines leads to a better supply of medicines, to more rational prescribing and to lower costs” (WHO, 2003). Good selection of drugs is one of the most cost effective areas for intervention. An essential drug list may be selected for use in one or more health facilities or for the public sector as a whole. For the latter case, the list usually

indicates the level of the health care system where each drug may be used (Kenya Essential Drug List, 2002).

As most essential drugs are available as generics in the international market, their price is usually remarkably low. The proportion of generic drugs over the total available gives a key indication about the efficiency of the system. In some cases, it helps to assess the response capacity of the health sectors to shock. Some countries have shifted towards generic drugs to adjust to economic distress, or to the increased drug demand induced by HIV/AIDS. A rapid check during visits to health facilities informs whether the formulary or the essential drugs' lists are available, known and used by health workers. The drugs available at the health facility dispensing outlet must be compared with those supposed to be available, according to list(s) and formulary, if they exist. When the drug selection is inefficient, the results include; the purchase of too many products, purchase of unnecessarily expensive products, purchase of inappropriate products and purchase of inappropriate quantities (Kenya Essential Drug List, 2002).

Essential drugs should therefore be selected based on their relevance to the pattern of prevalent disease, proven efficacy and safety, adequate scientific data and evidence of performance in a variety of settings, good quality, favorable cost benefit ratio, desirable pharmacokinetic properties, and possibilities for local manufacture (KEDL, 2002).

2.9.4 Drug Procurement

An efficient pharmaceutical procurement system is a major determinant of drug availability and the total health costs. In the developing countries, drug purchases

represent the single largest health expenditure after personnel costs. The procurement system in the health sector in Kenya suffers from, a multiplicity of parallel procurement systems, a complexity full of inefficiencies and lack of clarity and synergy. This convoluted system is captured in the so called “spaghetti” procurement system. This represents a failed commodity supply chain system. The maintenance of the parallel procurement programme by development partners is against the Paris Declaration which among others advocated for increasing alignment of aid with partner countries’ priorities, systems and procedures and assisting to strengthen their capacities (The Paris Declaration, 2005). Negotiations on the Joint Financing Agreement (JFA) under the Sector Wide Approach (SWAp, 2005) process which was expected to create a pooled fund for the procurement of commodities in the health sector seem to have stalled, and the direct consequence is the multiplicity of parallel procurement systems within the Public Health sector.

In 2006, the Ministry of Health developed a Position Paper on Health Sector Procurement whose goal was to facilitate a more efficient and effective procurement process in the Public Health Sector. An effective procurement process ensures the availability of the drug in the right quantities, at reasonable prices, and at recognized standards of quality. Drugs may be acquired through purchase, donation or manufacture. Procurement of pharmaceuticals must be done based on good pharmaceutical procurement practices. This involves procuring drugs by “generic name” as this eliminates the issue of bias towards branded drugs since good quality medications are available at a lower price (WHO, 1999) Drug procurement should also be limited to the essential drugs list or formulary list since no health program can afford to purchase all drugs available on the market. This simplifies and reduces inventory holding costs.

2.9.5 Drug Distribution

Designing a system for storing and distributing drugs, medical supplies and equipment is complex and important storage and distribution cost are a significant component of a health budget. An effective drug distribution system relies on good system design and good management. A well designed and well managed distribution system should maintain a constant supply of drugs while keeping the drugs in good condition throughout the distribution process (WHO,1999).

The distribution system should minimize drug losses due to spoilage and expiry, maintain accurate inventory records, rationalize drug storage points, efficiently use available transportation resources, reduce theft and fraud and provide information for forecasting drug needs. A distribution system requires systematic cost effectiveness analysis and operational planning (WHO,1999).

2.9.6 Rational Drug Use

Rational use of medicines requires that a patient receives medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and the lowest cost to them. Irrational use of medicines is a major problem worldwide. The overuse, underuse or misuse of medicines results in wastage of scarce resources and widespread health hazards (WHO,2010).

The examples of irrational use of medicines include: use of too many medicines per patient ("poly-pharmacy"), inappropriate use of antimicrobials, often in inadequate dosage, for non-bacterial infections; over-use of injections when oral formulations would be more appropriate; failure to prescribe in accordance with clinical guidelines;

inappropriate self-medication, often of prescription-only medicines; non-adherence to dosing regimens (WHO,2010)

The use of pharmaceuticals is influenced by factors both inside and outside the Public Health Programs. Medical directors and clinicians as well as policymakers and managers usually collect data on patterns of drug use, specific drug use problems and monitor drug use over time. The drug prescribers, pharmacist and patients all require information on drugs. The sources of drug use information can be classified into: Primary (articles or papers on original research), secondary (reviews of the primary literature), tertiary (formulary manuals, standard treatment manuals, textbooks and review articles or drug product information approved by drug regulatory agencies) (Dukes et al, 1997).

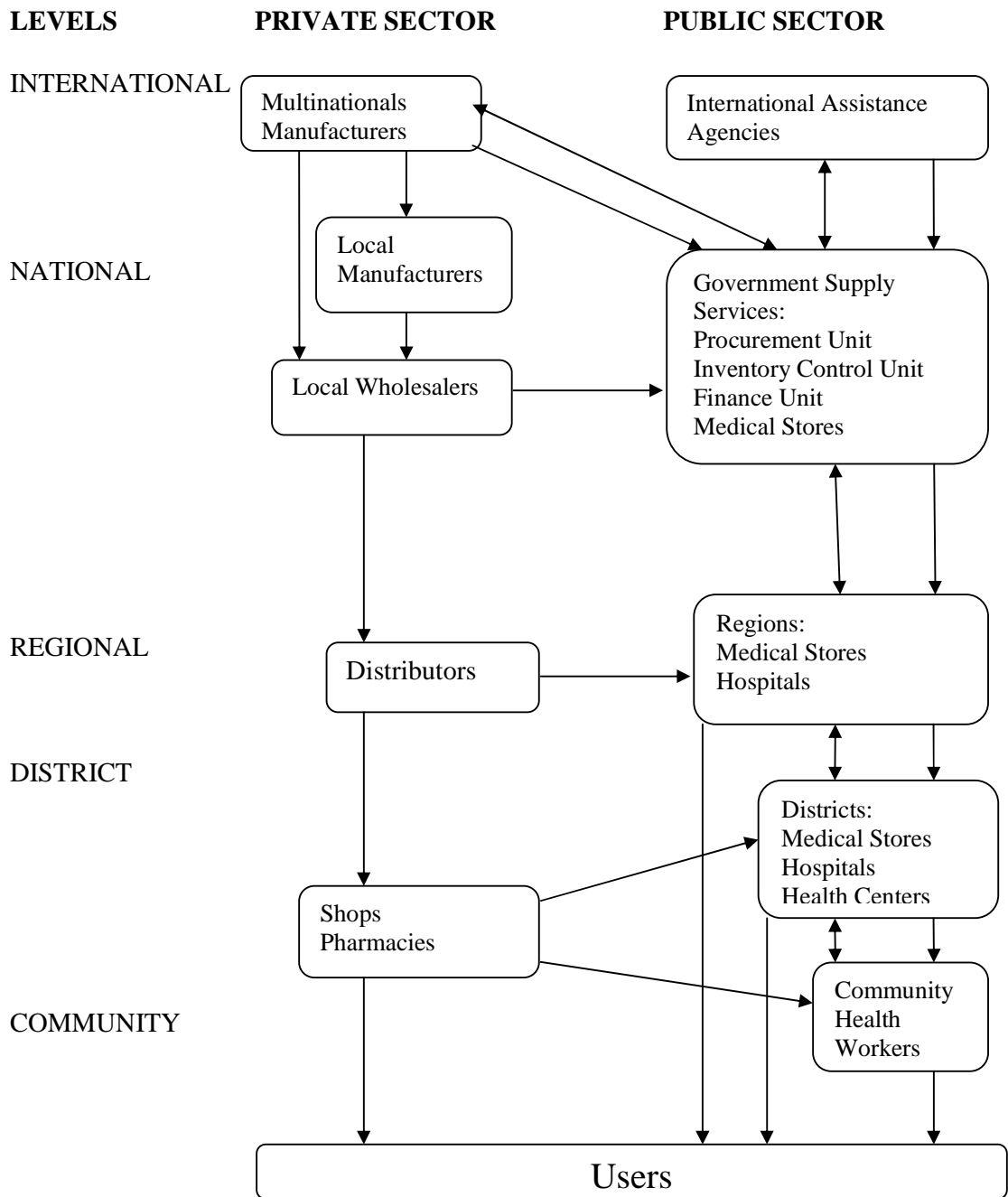


Figure 1: A typical drug supply system (Dukes et al, 1997)

2.9.7 National Drug Quality Control Laboratory

The Pharmacy and Poisons Act creates a quality control laboratory for drugs and other medicinal substances. The Laboratory is mandated to examine and test drugs and ensure they are of they meet the minimum standards for use. The National Quality Control Laboratory performs chemical, biological, biochemical, physiological, and pharmacological analysis of both locally manufactured and imported drugs.

2.9.8 Kenya Medical Supplies Agency

A stakeholders' conference held at Kenya College of Communication and Technology, Mbagathi in June 1998 to deliberate on the way forward for the drug supplies in public health facilities resolved that "In order to improve the quality of health care services and ensure its sustainability in the long term, it was necessary to set up an autonomous and legally mandated body corporate, independent of the day to day management of the Ministry of Health, with the capacity to plan, procure, warehouse and distribute drugs and other medical supplies to all public health facilities". The reform initiatives culminated into the establishment of the Kenya Medical Supplies Agency (KEMSA) as a state corporation through the Legal Notice No. 17 of 2000.

KEMSA was established as a state corporation with the following three key objectives: to develop and operate a viable commercial service for the procurement and sale of drugs and other medical supplies; to provide a secure source of drugs and other medical supplies for the public health institutions; and to advice the Health Management Boards and the general public on matters related to the procurement, cost effectiveness and rational use of drugs and other medical supplies. KEMSA is

mandated to deliver medical commodities to all public health facilities summarized below:

Table 2.1: Classification of Health Facilities in Kenya

Type of Health Facility	No.
Dispensaries	3,169
Health Centres	642
Rural Health Demonstration Centres	10
Rural Health Training Centres	5
Sub District Hospitals	96
District Hospitals	70
Provincial General Hospitals	7
National Referral Hospital	2
TOTAL	4,001

Source: KEMSA Report, 2009

2.9.9 Conceptual Framework

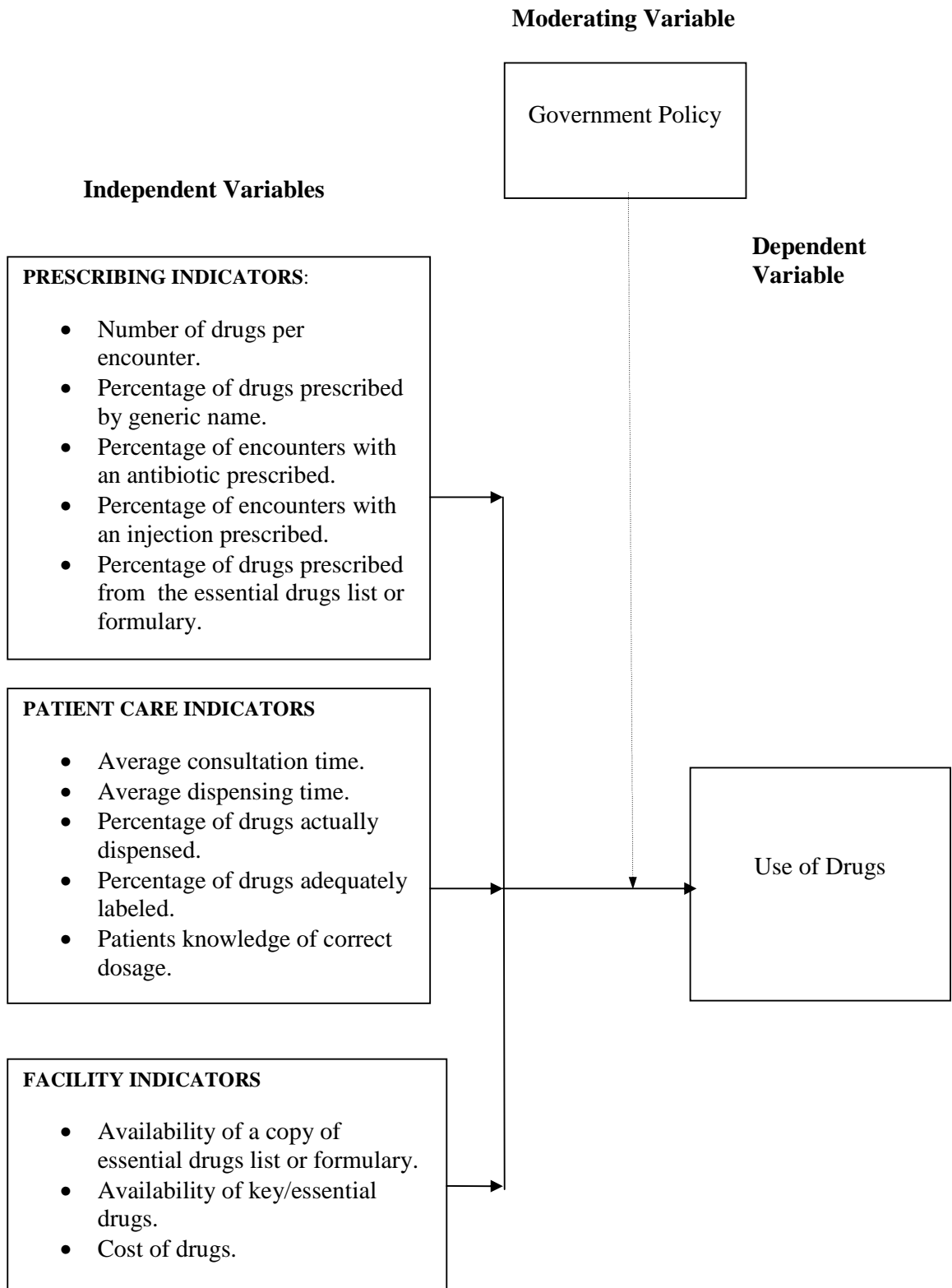


Figure 2: Conceptual Framework

2.9.10 Conceptualization of Variables

The indicators of prescribing practices measure the performance of Healthcare Providers in several key dimensions related to the rational use of drugs. The indicators are based on the practices observed in a sample of clinical encounters taking place at outpatient Health Facilities for the treatment of acute or chronic illnesses. The prescribing indicators measure general prescribing tendencies within a given setting, independent of specific diagnosis. The determination of the average number of drugs measures the degree of polypharmacy while the determination of the percentage of drugs prescribed by generic name measures the tendency to prescribe by generic name. The determination of the percentage of encounters with an antibiotic or injection measures the overall level of use of two important but commonly overused and costly forms of drug delivery. The determination of the percentage of drugs prescribed from the essential drugs list measures the degree to which practices conform to a national drug policy (WHO, 1993).

The indicators of patient care are based on an understanding that in order to determine the way drugs are used, it is important to consider what takes place at Health Facilities from both the Provider's and patient's perspectives. The patient care indicators address key aspects of what patients experience at Health Facilities, and how well they have been prepared to deal with the Pharmaceuticals that have been prescribed and dispensed. The determination of the average consultation and dispensing times measure the time the medical and pharmaceutical personnel spend with patients in the process of consultation and dispensing. The determination of the percentage of drugs actually dispensed measures the degree to which Health Facilities are able to provide the drugs which were prescribed. The determination of the percentage of drugs adequately labeled measures the degree to which dispensers record essential

information on the drug packages they dispense while a determination of the patients knowledge of correct dosage measures the effectiveness of the information given to patients on the dosage schedule of the drugs they receive (WHO, 1993).

The indicators on Health Facilities are based on the understanding that the ability to prescribe drugs rationally is influenced by features of the working environment. The determination on the availability of a copy of an Essential Drug List indicates the extent to which reference to the National Essential Drugs List is used in the prescribing of drugs while the determination of the availability of key drugs measures the degree of stock outs of essential drugs in the Health Facility (WHO, 1993).

The drug use indicators were developed by the World Health Organization to be used as measures of performance in the following three general areas related to the rational use of drugs in primary health care: Pharmaceutical prescribing practices by health providers; key elements of patient care, covering both clinical consultation and pharmaceutical dispensing; availability of facility-specific factors which support rational use of drugs, such as key essential drugs and minimum pharmaceutical information to the health worker (WHO, 1993).

In April 2003, a Pharmaceutical Sector Baseline Survey was commissioned by the Ministry of Health and conducted with financial and technical support from the World Health Organization, Department of Essential Medicines and Policy/Drug Action Programme (WHO EDM), the WHO Country Office in Kenya and Health Action International (HAI) Africa. This survey assessed the situation regarding access and use of quality medicines in Public Health Institutions.

The data obtained from this survey showed that the availability of essential medicines in Public Health Facilities was more than 90% with 97% of Public Health Facilities having greater than 75% availability. 45% of the households surveyed sought healthcare from Public Health Facilities, and 6% of all households surveyed could not obtain all the prescribed medicines due to financial incapability. The cost of treatment of most common diseases in Public Health Facilities demonstrated considerable variation ranging from an equivalent of a quarter of a day's lowest government salary for the treatment of child malaria in public health facilities to an equivalent of more than a day and a half's salary for the treatment of adult pneumonia in private pharmacy outlets.

A general tendency to over-prescribe medicines especially antibiotics was established with a national median of 78% patients receiving antibiotics. Irrational dispensing was also demonstrated in 70% of Public Health Facilities, more than three-quarters of dispensed medicines were inadequately labeled. In 27% of Public Health Facilities, less than half of the respondents understood how to take their medicines. Performance measures suggested there was a considerable need to improve prescribing and dispensing practices in Public Health Facilities. Prescribers were found not to have access to key sources of therapeutic information they needed in daily practice. Standard Treatment Guidelines (STG) were found in only 13% of Public Health Facilities and the Kenya Essential Drugs List (EDL) was found in only 17% of Public Health Facilities. Less than half of Public Health Facilities had more than 90% prescribing practice that conforms to the EDL.

This survey recommended the need to investigate the reasons for underperformance identified in the areas affecting access, quality and rational use of essential medicines. (HAI, WHO; 2003). A major shortcoming of the Pharmaceutical Sector Baseline Survey was that it did not evaluate Private Health Facilities, an important component of Healthcare delivery in Kenya. The survey also did not collect any data on Central Province.

2.9.11 Summary of Literature Review

The WHO stipulates that medicine use is rational (appropriate, proper, correct) when patients receive the appropriate medicines, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost both to them and the community. The irrational use of drugs is a major problem in both the developed and developing countries in the world. The WHO has developed three indicators of drug use that form the basis of evaluating drug use in Health Facilities. This indicators are: Prescribing practices indicators which measure the performance of Healthcare Providers in several key dimensions related to the rational use of drugs; Patient care indicators which evaluate key aspects of what patients experience at Health Facilities, and how well they have been prepared to deal with the Pharmaceuticals that have been prescribed and dispensed and Health Facility indicators which are based on the understanding that the ability to prescribe drugs rationally is influenced by features of the working environment.

2.9.12 Knowledge Gap

There is limited information on the three key indicators of drug use in Thika District. There was therefore a need to do a study to evaluate drug use in both Public and Private Health Facilities in Thika District.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives the methodology components and includes research design, target population, the sampling method and sample size determination, data collection procedures and data analysis procedures.

3.2 Research design

A cross sectional survey design was used in the sampled Public and Private Health Facilities in Thika District. The cross sectional survey method was chosen because it enabled the examination of the relationship between the independent variables (prescribing, patient care and facility indicators) and the dependent variable (rational drug use).

3.3 Target population

The target population consisted of all Public and Private Health Facilities located in Thika District. Thika District has a total of seventy three (73) Health Facilities consisting of thirty one (31) Public Health Facilities and forty two (42) Private Health Facilities which are listed in Appendix 7.

The WHO recommends a minimum of 30 encounters within a Health Facility for a drug use study (WHO, 1993). The target population based on this WHO benchmark on the number of respondents within a Health Facility was 2190.

3.4 Sampling Method and Sample Size Determination

Thika District has a total of 73 Health Facilities which consist of 31 Public Health Facilities and 42 Private Health Facilities.

According to Mugenda and Mugenda, 1999; when dealing with a finite population of less than 10,000, the following formula is applicable:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where:

n_0 = the desired sample size for a target population greater than 10,000.

n = the sample size for a small population.

N = the population size.

$$\begin{aligned} n &= 384 / 1 + (384 - 1)/73 \\ &= 61 \text{ Health Facilities} \end{aligned}$$

The 61 Health Facilities each with a target of 30 encounters had a sample population of 1830 respondents. The study sampled 25 Public Health Facilities with a sample population of 750 respondents and 36 Private Health Facilities with a sample population of 1080 respondents. The WHO recommends a minimum sample of 20 Health Facilities within a geographical region with a minimum sample of 600 encounters (WHO, 1993).

Stratified sampling method was used to classify all the 73 health institutions in Thika District into two categories with the stratification being based on whether the Facility is a Public Health Facility or a Private Health Facility. A systematic random sample of 25 Public Facilities and 36 Private Facilities were chosen. The first 30 patients visiting the Health Facility within the data collection date constituted the sample for the facility as specified by the WHO methodology for a drug use study (WHO, 1993).

3.5 Data collection instruments

Data was collected on the following three key indicators of rational drug use: Prescribing factors, Patient care factors and health facility factors. Data collection forms were used to collect data. A patient Identifier Code was used in filling the forms rather than the patients' names to ensure confidentiality of respondents.

3.5.1 Data collection form on prescribing factors

Prescribing indicators measure the performance of Healthcare Providers in several key dimensions related to the appropriate use of drugs. This involved observation and prospective data collection from patients attending the Health Facility on the day of data collection.

The data was collected on the following prescribing factors:

1. Number of drugs per encounter which sought to measure the degree of polypharmacy.
2. Drugs prescribed by generic name which measured the tendency to prescribe by the recommended generic name.
3. Encounters with an antibiotic/injection prescribed which measured the overall level of use of two important but commonly overused and costly forms of drug therapy.
4. Drugs prescribed from the Kenya Essential Drug List which sought to measure the degree to which prescribing practices conform to a national drug policy, as indicated by prescribing from the KEDL.

3.5.2 Data collection form on patient care factors

Patient care indicators measure key aspects of patients experience at Health Facilities and how the patients have been prepared to deal with the pharmaceuticals/drugs dispensed to them.

The data was collected by observation and prospectively on the following aspects of patient care:

1. Consultation time which aimed to measure the time that medical personnel spend with patients in the process of consultation and prescribing.
2. Dispensing time which aimed to measure the time that dispensing personnel spend with patients.
3. Drugs actually dispensed which measured the degree to which health facilities are able to provide the drugs which are prescribed.
4. Drugs adequately labeled which measured the degree to which dispensers' record essential information on the drug packages they dispense.
5. Patient's knowledge of correct dosage which aimed to measure the effectiveness of the information given to the patients on the dosage schedule of the drugs they receive.

3.5.3 Data collection form on Health Facility factors

Health facility indicators measure the availability of essential medicines and access to unbiased information about these drugs by health workers.

The data was collected by observation on the following Health Facility factors:

1. The availability of a copy of the Kenya Essential Drug List. This ascertained the extent to which copies of the KEDL are available at health facilities.

2. The availability of key drugs. This measured the availability at Health Facilities of key drugs recommended for treatment of some common health problems.

Prescribers can only treat patients in a rational way if essential drugs are available on a regular basis. The WHO guidelines recommend a short list of 10-15 essential drugs that represent a basket of essential drugs needed to treat common health problems. A short list of 14 essential drugs (a basket of key drugs) for this study is given in Appendix 8.

The collection of data was effected through the filling of the following data collection forms.

- Form I Prescribing Indicator Form (Appendix 2)
- Form II Patient Care Form (Appendix 3)
- Form III Facility Summary Form (Appendix 4)
- Form IV Facility Indicator Reporting Form (Appendix 5)
- Form V Drug Use Indicators Consolidation Form (Appendix 6)

3.6 Validity of Instruments

Validity determines whether the research measures that which it was intended to measure and how truthful the research results are. Caution was exercised to ensure the confidence of the respondents with the researcher was established through full introduction by the investigator and ensuring the questions are framed in a manner that is non-judgmental and non-intrusive into their personal life. The purpose of the study was also fully explained to the respondents so that they did not withhold vital information. Data was collected and analysed by the investigator to minimize errors

caused by different investigators. Triangulation was used to enhance the quality of data collected at institutions with similar questions being asked to respondents in different ways.

All the completed forms remained in the custody of the investigator. The personal computer and laptops used to store and analyse data were password protected. Compact discs, flash discs and hard copies of all documents were safely stored by the investigator. The research assistants engaged were trained pharmaceutical technologists hence conversant with pharmaceutical and medical terminologies used in the data collection.

3.7 Reliability of instruments

Reliability of research instruments refers to the extent to which the results of a study can be reproduced when a similar methodology is used. The tools used in this study were adopted from the World Health Organization (WHO, 1993).

The World Health Organization undertook a systematic programme to develop, field test and refine drug use indicators based on earlier studies in Uganda and Yemen. The methodology for collecting the necessary data was tested in Indonesia, Bangladesh and Nepal. The World Health Organization then revised the drug use indicators and used them again in Sudan, Uganda, Malawi, Nigeria and Tanzania (WHO, 1993).

The split - half method was used to test the reliability of instruments. The test instruments were randomly divided into two halves. The split half test reliability coefficient was then determined. A coefficient of reliability of 0.86 was obtained showing that the instruments were reliable.

3.8 Data analysis

The collected data was edited and coded before data entry. The data was then analyzed by using the statistical package for social sciences version 21.0. The results were presented using tables and percentages.

3.8.1 Average number of drugs per encounter (C)

The numbers of encounters were determined even if no drug was given (A). The total number of drugs prescribed during these encounters was summed up (B). The average number of drugs was calculated as:

$$C=B/A$$

3.8.2 Percentage of drugs prescribed by generic name (E)

This was calculated as total number of generic drugs prescribed (D) divided by total number of drugs prescribed (B) multiplied by 100.

$$E = (D/B) \times 100$$

3.8.3 Percentage of encounters with antibiotic prescribed (G)

This was derived by dividing the total number of patients who received an antibiotic (F) by the number of encounters (A) and multiplying by 100.

$$G= (F/A) \times 100$$

3.8.4 Percentage of encounters with an injection prescribed (I)

The total number of patients who received an injection (H) was divided by the total number of encounters (A) and multiplied by 100.

$$I= (H/A) \times 100$$

3.8.5 Percentage of drugs prescribed from the EDL (K)

The total number of EDL drugs prescribed (J) was divided by the total number of drugs prescribed (B) and multiplied by 100.

$$K = (J/B) \times 100$$

3.8.6 Average consultation time (P)

The number of cases observed (N) were counted. All consulting times (O) were added up together and divided by the number of cases (N) to get the average consulting time (P) which was expressed in minutes.

$$P = O/N$$

3.8.7 Average dispensing time (S)

The total number of cases observed was counted (Q). The dispensing times were added together (R) and divided by the number of cases (Q). The time(s) was expressed in seconds.

$$S = R/Q$$

The analyzed data for both the Public Health Facilities and Private Health Facilities was consolidated in a Drug Use Indicators Consolidation Form.

Finally, the results were discussed, conclusions made and recommendations stated.

3.9 Ethical Consideration

The research assistants were briefly trained on their role as data collectors. Care was taken not to lose the confidence of the respondents through full introduction by the investigator or research assistant and ensuring the questions were framed in a manner that was non-judgmental and not too intrusive into the personal life of respondents.

Research authorization was also sort from and granted by the Thika District Research and Ethics Committee.

3.10 Operationalization of Variables

The operationalization of variables is given in Table 3.1

Table 3.1: Operationalization of variables

Objective	Independent Variable	Indicators	Measurement Scale	Type of Statistical Analysis
To establish the pharmaceutical prescribing practices by health providers that affect drug use in health facilities in Thika District.	Pharmaceutical prescribing practices by health providers that affect drug use in health facilities.	No. of drugs per encounter. Percentage of drugs prescribed by generic name. Percentage of antibiotics prescribed. Percentage of injection prescribed. Percentage of drugs prescribed from the essential drugs list/formulary.	Ratio	Descriptive
To explore patient care factors that affect rational drug use in health facilities in Thika District.	Patient care factors that affect rational drug use in health facilities.	Average consultation time. Average dispensing time. Percentage of drugs actually dispensed. Percentage of drugs adequately labeled. Patients knowledge of correct dosage.	Ratio	Descriptive
To determine the health facility specific factors that affect drug use in health facilities in Thika District.	Health facility specific factors that affect drug use in health facilities.	Availability of a copy of essential drugs list or formulary. Availability of key/essential drugs. Cost of drugs.	Nominal	Descriptive
	Dependent Variable To evaluate rational drug use	Pharmaceutical prescribing practices Patient care factors Health facility specific factors	Ordinal	Descriptive

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter contains the data analysis, presentation and interpretation of the research findings. The data collected was interpreted on the basis of each research objective.

4.2 Response rate

A total of 42 Health Facilities with 1260 respondents out of the sampled 61 Health Facilities with a total of 1830 respondents were studied. A response rate of 68.9% was obtained in the study. The 42 Health Facilities consisted of 25 Public Health Facilities with 750 respondents and 17 Private Health Facilities with 510 respondents. The response rate of 1260 respondents consisting of 750 Public Health respondents and 17 Private Health respondents is acceptable in drug use studies. The WHO recommends a minimum of 20 Health Facilities consisting of 600 respondents for a drug use study and if groups of facilities are to be compared, at least 10 facilities consisting of 300 respondents should be included in each group (WHO, 1993).

4.3 Average number of drugs prescribed

The results of average number of drugs prescribed are shown in Table 4.1.

Table 4.1: Average number of drugs prescribed

	No. of Facilities	No. of Respondents	Average No. of drugs prescribed
Public Facilities	25	750	2.83
Private Facilities	17	510	3.10
Total	42	1260	2.97

In the Public Health Facilities with 750 respondents, the number of drugs prescribed ranged from 2.1 to 3.3 with a mean of 2.83 drugs. In Private Facilities with 510 respondents, the average was 3.10 drugs with the highest being 4.27 and the lowest 2.33 drugs.

4.4 Percentage of generics drugs

The results of percentage number of generic drugs are shown in Table 4.2.

Table 4.2: Percentage of drugs that were generics

	No. of Facilities	No. of Respondents	Percentage drugs that were generics
Public Facilities	25	750	64
Private Facilities	17	510	37.09
Total	42	1260	50.55

The percentage of generic drugs prescribed in Public Facilities with 750 respondents ranged from 41% to 98.8% with an average of 64%. In Private Facilities with 510 respondents, an average of 37.09% of the drugs were generics with some reporting as high as 78.5% and some as low as 8.2%.

4.5 Percentage of antibiotics prescribed

The results of the percentage of antibiotics prescribed are shown in Table 4.3.

Table 4.3: Percentage of antibiotics used

	No. of Facilities	No. of Respondents	Percentage of antibiotics used
Public Facilities	25	750	77.16
Private Facilities	17	510	62.44
Total	42	1260	69.8

The Public Health Facilities with 750 respondents had 77.16% of all encounters containing an antibiotic in the prescription. Some Public Facilities reported to have antibiotic prescription encounters of 100%. The Private Health Facilities with 510 respondents had a mean of 62.44 % of antibiotic encounters.

4.6 Percentage of drugs given as injections

The results of the percentage of drugs given as injections are shown in Table 4.4.

Table 4.4: Percentage of drugs that were injections

	No. of Facilities	No. of Respondents	Percentage drugs given that were injections
Public Facilities	25	750	10.19
Private Facilities	17	510	16.94
Total	42	1260	13.57

Across the 25 Public Health Facilities with 750 respondents, 10.19% injections were administered with a range of between 0 and 42.1 %. In Private Facilities with 510 respondents, 16.94% of the drugs prescribed were injections.

4.7 Percentage of drugs in the essential drugs list

The results of the percentage of drugs in the essential drugs list are shown in Table 4.5.

Table 4.5: Percentage of drugs that were on the essential drugs list

	No. of Facilities	No. of Respondents	Percentage drugs that were on the essential drugs list
Public Facilities	25	750	89.28
Private Facilities	-	-	-
Total	42	750	89.28

The Essential Drugs List prescribes the essential drugs that must always be available in all facilities at any one time. Overall, of all the drugs prescribed in the Public Health Facilities, 89.28 were in this list. The figures ranged from 80% to 98.4%. There was no figure collected for the Private Facilities since they do not stock according to this list.

4.8 Average consultation time

The results of the average consultation time are shown in Table 4.6.

Table 4.6: Average consultation time

	No. of Facilities	No. of Respondents	Average consultation time in Minutes
Public Facilities	25	750	8.10
Private Facilities	17	510	8.40
Total	42	1260	8.25

This is the time it takes for the patient to interact with the prescriber. In the Public Health Facilities with 750 respondents, this took an average of 8.10 minutes the longest time was 12.6 minutes while the shortest was 5 minutes. In Private Health

Facilities with 510 respondents, consultation took an average of 8.4 minutes. The longest was 10.7 minutes while the shortest was 4.5 minutes.

4.9 Average dispensing time

The results of the average dispensing time are shown in Table 4.7.

Table 4.7: Average dispensing time

	No. of Facilities	No. of Respondents	Average dispensing time in Seconds
Public Facilities	25	750	118.32
Private Facilities	17	510	225.82
Total	42	1260	172.07

In Public Health Facilities with 750 respondents, the average dispensing time was 118.32 seconds with the longest being 245.5 seconds and the shortest 48.6 seconds. In Private Facilities with 510 respondents, the average dispensing time was 225.82 seconds.

3.6 Percentage of drugs actually dispensed

The results of the percentage of drugs actually dispensed are shown in Table 4.8.

Table 4.8: Percentage of drugs actually dispensed

	No. of Facilities	No. of Respondents	Percentage of drugs actually dispensed
Public Facilities	25	750	86.6
Private Facilities	17	510	92.81
Total	42	1260	89.71

This parameter compares the number of drugs prescribed and those actually obtained by the patient from that Health Facility. On average of all drugs prescribed in the Public Facilities with 750 respondents, 86.6% were available. The Facility that dispensed most of the prescribed drugs had 100% while that which lacked most had 58.7%. In the Private Facilities with 510 respondents, 92.81% of the drugs prescribed were actually dispensed

3.7 Percentage of drugs adequately labeled

The results of the percentage of drugs adequately labeled are shown in Table 4.9.

Table 4.9: Percentage of drugs adequately labeled

	No. of Facilities	No. of Respondents	Percentage drugs adequately labeled
Public Facilities	25	750	87.42
Private Facilities	17	510	96.28
Total	42	1260	91.85

Proper labeling ensures that patients can revisit the instructions later and take their drugs as instructed. In the Public Facilities with 750 respondents, 87.42% of the drugs dispensed were adequately labeled. In some facilities 100% proper labeling was achieved. The percentage of drugs adequately labeled in Private Facilities with 510 respondents averaged at 96.28%.

3.8 Adequate knowledge of dosage

The results of the percentage of patients with adequate knowledge of dosage are shown in Table 4.10

Table 4.10: Adequate knowledge on dosage

	No. of Facilities	No. of Respondents	Percentage with adequate knowledge on dosage
Public Facilities	25	750	81.21
Private Facilities	17	510	94.24
Total	42	1260	87.73

In the Public Facilities with 750 respondents, 81.21% of the patients had adequate knowledge concerning the dosage of the drugs prescribed. Those with least knowledge accounted for 70% while those with the highest had 100%. In Private Health Facilities with 510 respondents, 94.24% of the patients had adequate knowledge of the dosage of the drugs they received.

4.13 Percentage of drugs in stock

The results of the percentage of drugs in stock are shown in Table 4.11.

Table 4.11: Percentage of drugs in stock

	No. of Facilities	No. of Respondents	Percentage drugs in stock
Public Facilities	25	750	80.29
Private Facilities	17	510	97.91
Total	42	1260	89.1

In Public Facilities with 750 respondents, 80.29% of the drugs required were available in stock. In some facilities 100% were found to be available in stock. The facility with the least number of drugs in stock had only 57.1%. The Private Facilities with 510 respondents had 97.91% of the drugs prescribed in stock.

4.14 Average cost per prescription

The results of the average cost per prescription are shown in Table 4.12.

Table 4.12: Average cost per prescription

	No. of Facilities	No. of Respondents	Average cost per prescription
Public Facilities	25	750	228.26
Private Facilities	17	510	476.32
Total	42	1260	352.29

The average cost of drugs in Public Facilities with 750 respondents was Ksh 228.26.

The most expensive prescription cost Ksh 442.15 while the cheapest was Ksh 157.5.

The cost per prescription in the Private Facilities with 510 respondents was on average Ksh 476.32.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of key findings, discussion, conclusions and recommendations of the research findings on the drug use in Public and Private Health Facilities in Thika District.

5.2 Summary of findings

This section summarizes the main findings for each objective of the study.

5.2.1 Findings on prescribing indicators

In the Public Health Facilities the number of drugs prescribed was 2.83 while in private facilities the average was 3.10.

The average percentage of generic drugs prescribed in Public Facilities was 64% while in Private Facilities an average of 37.09% of the drugs were generics. In relation to antibiotics prescription encounters, Public Facilities had 77.16% of encounters and Private Facilities had a mean of 62.44 % of encounters.

Across the 25 Public Health Facilities with 750 respondents, 10.19% injections were administered on average while in Private Facilities with 510 respondents, 16.94% of the drugs prescribed were injections. In Public Facilities, 89.28% of all drugs prescribed were in the Essential Drug List.

5.2.2 Findings on patient care indicators

In the Public Health Facilities with 750 respondents, the average consultation time was 8.10 minutes while in Private Facilities with 510 respondents, consultation took

an average of 8.4 minutes. In Public Health Facilities, the average dispensing time was 118.32 seconds while in Private Facilities the average dispensing time was 225.82 seconds.

On average of all drugs prescribed in the Public Facilities with 750 respondents, 86.6% were actually dispensed while in the Private Facilities with 510 respondents, 92.81% of the drugs prescribed were actually dispensed. In the Public Facilities, 87.42% of the drugs dispensed were adequately labeled while the percentage of drugs adequately labeled in Private Facilities averaged at 96.28%.

In the Public Facilities, 81.21% of the patients had adequate knowledge concerning the dosage of the drugs prescribed while in Private Health Facilities 94.24% of the patients had adequate knowledge of the dosage of the drugs they received.

5.2.3 Findings on Health Facility indicators

In Public Facilities with 750 respondents, 80.29% of the drugs required in the Public Facilities were available in stock while the Private Facilities with 510 respondents had 97.91% of the drugs prescribed in stock.

The average cost of drugs prescribed in Public Facilities was KSh 228.26 while the average cost per prescription in the Private Facilities was Ksh 476.32.

5.3 Discussion

The key findings are discussed below following the objectives of the study.

5.3.1 Pharmaceutical prescribing practices

The Pharmaceutical prescribing practices are evaluated by determining the number of drugs prescribed and out of these drugs, the percentage of generic drugs, antibiotic drugs, and injections in the prescriptions. The evaluation also entails determining if prescribers are prescribing drugs as guided by the essential drugs list.

5.3.1.1 Number of drugs prescribed

In the Public Health Facilities with 750 respondents, the average number of drugs prescribed was 2.83. In Private Facilities with 510 respondents, the average was 3.10. This indicates that most of the patients attending these facilities required about three drugs for their ailments. This indicates that Private Facilities prescribe more drugs to the patients as they are profit oriented and have these drugs in stock hence benefiting from the sale of the dispensed drugs. Similar studies in other countries indicate 1.5 drugs in Yemen, 1.9 in Uganda, 1.4 in Sudan, 1.8 in Mali, 3.3 in India, 1.4 in Bangladesh, 1.3 in Zimbabwe, 3.8 in Nigeria and 2.2 in Tanzania (WHO, 1993). According to similar studies conducted in other countries, Kenya ranks third in the number of drugs prescribed per encounter.

5.3.1.2 Percentage of generic drugs prescribed

The average percentage of generic drugs prescribed in Public Facilities with 750 respondents was 64%. In Private Facilities with 510 respondents, an average of 37.09% of the drugs were generics. Studies in Sudan reported 63%, India 59%, Zimbabwe 94%, Tanzania 82%, Nigeria 58%, Nepal 44% and Ecuador 37% (WHO, 1993). Private Facilities seem to prefer prescribing branded drugs as opposed to generics possibly since branded drugs have higher costs and hence better economic margins.

5.3.1.3 Percentage of antibiotics prescribed

Of all the prescription encounters in Public Health Facilities, 77.16% of the encounters had an antibiotic prescribed. The Private Facilities prescribed a mean of 62.44 % of antibiotics. Studies in other countries indicate much lower average

percentages of antibiotics prescribed for example Yemen 46%, Uganda 56%, Sudan 63%, Mali 34%, Bangladesh 31%, Zimbabwe 29% and Ecuador 27% (WHO, 1993).

The percentage of antibiotics prescribed in both Public and Private Facilities in Kenya are higher than in other countries which is a source of great concern.

5.3.1.4 Percentage of injections prescribed

Across the 25 Public Health Facilities with 750 respondents, 10.19% injections were administered on average. In Private Facilities with 510 respondents, 16.94% of the drugs prescribed were injections. In a similar study, Yemen reported 25%, Uganda 48%, Sudan 36%, Mali 19%, India 17%, Bangladesh 0.2% and Nepal 5% (WHO, 1993).

5.3.1.5 Percentage of drugs in the essential drugs list

The Essential Drugs List prescribes the essential drugs that must always be available in all Health Facilities at any one time. Overall, of all the drugs prescribed in the Public Facilities, 89.28% were in this list. There was no figure collected for the Private Facilities since they do not stock according to this Essential Drugs List. In Tanzania a figure of 88% was reported while in Nepal it was 86.6% (WHO, 1993).

5.3.2 Patient Care Factors

The patient care factors are evaluated by determining the consultation and dispensing characteristics of a Health Facility.

5.3.2.1 Average consultation time

In the Public Health Facilities with 750 respondents, the average consultation time was 8.10 minutes, the longest being 12.6 minutes while the shortest was 5 minutes. In Private Facilities with 510 respondents, consultation took an average of 8.4 minutes.

The longest was 10.7 minutes while the shortest was 4.5 minutes. Similar studies reported 2.3 minutes in Mali, 3 minutes in India, 3 minutes in Tanzania, 6.3 minutes in Nigeria and 3.5 minutes in Nepal (WHO, 1993).

The average consultation time for both the Public and Private Health Facilities seems higher than in other countries. This is a positive observation as this possibly indicates that the patient is given adequate medical examination by the clinician before prescriptions are issued.

5.3.2.2 Average dispensing time

In Public Health Facilities with 750 respondents, the average dispensing time was 118.32 seconds with the longest being 245.5seconds and the shortest 48.6 seconds. In Private Facilities with 510 respondents, the average dispensing time was 225.82 seconds. In Tanzania it was reported as 77.8 seconds, 12.5 seconds in Nigeria and 86.1 seconds in Nepal (WHO, 1993).

The dispensing time in both Public and Private Facilities seems higher than in other countries, which is impressive as it indicates the dispensers are giving adequate time to the dispensing process and hence minimizing drug use errors by the patient.

5.3.2.3 Percentage of drugs actually dispensed

On average of all drugs prescribed in the Public Facilities, 86.6% were actually dispensed. The facility that dispensed most of the prescribed drugs had 100% while that which lacked most had 58.7%. In the Private Facilities 92.81% of the drugs prescribed were actually dispensed. In a study in Nigeria 70% was reported while 83% was reported in Nepal (WHO, 1993).

The percentage of dispensed drugs in both Public and Private Facilities is higher than in other countries which is a positive sign that the drug supply system in Kenya is efficient hence minimizing drug stock outs.

5.3.2.4 Percentage of drugs adequately labeled

In the Public Facilities with 510 respondents, 87.42 of the drugs dispensed were adequately labeled. In some facilities 100% proper labeling was achieved. The percentage of drugs adequately labeled in Private Facilities with 510 respondents averaged at 96.28%. The results show that the Private Facilities give more personalized attention to the patient during the dispensing process and hence their patients are better equipped in how to use the drugs dispensed. This reduces drug use errors for private patients compared to patients visiting Public Health Facilities

5.3.2.5 Percentage of patients with adequate knowledge on dosage

In the Public Facilities, 81.21% of the patients had adequate knowledge concerning the dosage of the drugs prescribed. Those with least knowledge accounted for 70% while those with the highest had 100%. In Private Health Facilities 94.24% of the patients had adequate knowledge of the dosage of the drugs they received. In Mali, a similar study revealed 27%, India 82%, Bangladesh 63%, Tanzania 75%, Nigeria 81% and Nepal 56%. The results point to better drug use in Kenya as compared the other countries since the patient are more informed on how the drugs are to be used.

5.3.3 Facility Specific Factors

The Facility specific factors that are evaluated in determining drug use include: Percentage of drugs available in stock and the average cost of the drugs prescribed.

5.3.3.1 Percentage of drugs available in stock

A percentage of 80.29 of the drugs required in the Public Facilities were available in stock. In some facilities 100% were found to be available in stock. The facility with the least number of drugs in stock had only 57.1%. The Private Facilities had 97.91% of the drugs prescribed in stock. In Mali, a similar study revealed 67%, Tanzania 72%, Nigeria 62%, Nepal 90% and Ecuador 38%.

The Private Facilities had more drugs in stock than Public Facilities possibly due to their commercial orientation and hence the need to ensure every prescription generated is filled without referring the patients outside the facility.

5.3.3.2 Average cost of drugs

The average cost of drugs in Public Facilities with 750 respondents was KSh 228.26. The most expensive prescription cost Ksh 442.15 while the cheapest was KSh 157.5. The cost per prescription in the Private Facilities with 510 respondents was on average Ksh 476.32.

The cost of filling a prescription in Private Facilities was markedly higher than in Public Facilities. This may be explained by the observation that Private Facilities were mainly prescribing branded (more expensive) drugs as compared to Public Facilities that focused on prescribing generic (cheaper cost) drugs.

5.4 Conclusions

The following conclusions were made from the study;

1. The Pharmaceutical prescribing factors included the average number of drugs per encounter, the percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an

injection prescribed and the percentage of drugs prescribed from the essential drugs list.

The Public Health Facilities prescribed less drugs on average compared to the Private Facilities. The study also reveals a high number of drugs per encounter compared to most other countries. The Public Facilities prescribed more drugs by generic name compared to Private Facilities. However, compared to other countries the percentage is still low. Public Facilities prescribed more antibiotics compared to private ones. Compared to other countries, Kenyan Health Facilities seems to prescribe more antibiotics raising the question of probable misuse and increased risk of antibiotics resistance.

Public Facilities gave fewer injections than Private Facilities. Kenya's number is also much less compared to other countries. These may be attributed to recent campaigns for safe injections. The Public Facilities prescribed most of their drugs from the essential drugs list. The private sector does not follow this list in their routine work. Kenya compares very closely with other countries like Tanzania and Nepal.

2. Patient care indicators were average consultation time, average dispensing time, percentage of drugs actually dispensed, percentage of drugs adequately labeled and percentage of knowledge of correct dosage. The average consultation time was not very different across both Private and Public Facilities. It was much higher than in other countries that have had similar studies. It may indicate that our health care giver pay more attention to their patients. The average dispensing time was much higher in Private Facilities compared to Public Facilities. Due to work

load in public sector, the dispensers may spend less time explaining the details of the prescription. However, Kenya scored much better compared to other countries. The Private Facilities actually dispensed more drugs compared to the Public Facilities which is not unexpected. However the figure was impressive compared to Tanzania and Nepal.

In terms of labeling the Private Facilities did much better than the Public Facilities, perhaps due to the longer dispensing time taken.

Patients from the Public Facilities had less knowledge concerning the dosage of drugs compared to their Private Facility counterparts. This may also be attributable to the longer dispensing times in the Private Facilities.

3. The health facility indicators used in this study was the availability of key drugs and the average cost of drugs per prescription. Public Facilities had a good stock but not better than the Private Facilities. However, compared to other countries, Kenya still scored well.

With respect to cost, and not unexpected, the Private Facilities generated more costly prescriptions compared to the Public Facilities. Overall, the Private Facilities scored better than the Public Facilities in most of the drug use parameters.

5.5 Recommendations

The following recommendations were made from this study;

- 1 Prescribing indicators are an important aspect of rational drug use. The health facilities need to improve on some of the aspects in order to improve patient care index.
- 2 Patient care factors need to be given more emphasis by both prescribers and dispenser as this influences treatment outcomes.

- 3 The government needs to put more emphasis on provision of adequate drugs in health facilities. This will minimize the stock outs and improve treatment outcomes.
- 4 There needs to be benchmarking between the private and public facilities so that patients attending both facilities do not get very varying health care.

5.6 Areas for further studies

The following areas are suggested for further studies;

1. Based on the observed higher incidence of antibiotics prescribing as compared to other countries, a study on local resistance patterns to commonly used antibiotics should be conducted.
2. It is also suggested that another study should be conducted in order to determine what fraction of patients proceeds to the community pharmacies to fill their prescription when not all drugs are dispensed at the Public Facilities.

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APPENDICES

APPENDIX 1: INTRODUCTION LETTER

JOHN MUNGUTI KISENGI
P.O.BOX 342 – 01000
THIKA

Dear Respondent,

My name is John Munguti Kisengi and I am pursuing a Master of Arts degree in Project Planning and Management at the University of Nairobi. I am conducting a research project on drug use in private and public health institutions within Thika District.

I wish to assure you that the information collected will be treated with the highest confidentiality.

Thank you.

Yours Faithfully,

JOHN MUNGUTI KISENGI

L50/70776/07

APPENDIX 2: PRESCRIBING INDICATOR FORM

NAME OF INSTITUTION:

NAME OF INVESTIGATOR:DATE.....

	Date	No. of drugs	No. of generics	Antibiotics (0/1)*	Injections (0/1)*	No. on EDL
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
Total						
Average						
Percentage						

*0 = No 1= Yes

APPENDIX 3: PATIENT CARE FORM

NAME OF INSTITUTION:

NAME OF INVESTIGATOR:DATE.....

	Patient Identifier	Consulting Time (Mins)	Dispensing Time (Secs)	No. of Drugs prescribed	No. of drugs dispensed	No. labeled well	Knows dosage (0/1)*
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
	Total						
	Average						
	Percentage						

*0 = No 1= Yes

APPENDIX 5: FACILITY INDICATOR REPORTING FORM

NAME OF INSTITUTION:

NAME OF INVESTIGATOR:DATE.....

Average number of drugs prescribed	
Percentage of drugs prescribed by generic names	
Percentage of encounters with an antibiotic prescribed	
Percentage of encounters with an injection prescribed	
Percentage of drugs prescribed on Essential Drugs List	
Average consultation time (Minutes)	
Average dispensing time (Seconds)	
Percentage of drugs actually dispensed	
Percentage of drugs adequately labeled	
Percentage of patients with adequate knowledge of dosage	
Availability of Essential Drugs List (0/1)*	
Percentage availability of key indicator drugs	

*0 = No 1= Yes

APPENDIX 7: LIST OF PUBLIC AND PRIVATE HEALTH INSTITUTIONS IN THIKA DISTRICT

A. PUBLIC HEALTH FACILITIES

1. Athi Dispensary
2. Gatuanyaga Dispensary
3. Gatunyu Dispensary
4. Gatura Health Centre
5. Giathanini Dispensary
6. Githurai Community Clinic
7. Gituamba Dispensary
8. Ithanga Dispensary
9. Juja Farm Dispensary
10. Karangi Dispensary
11. Kiandutu Health Centre
12. Kigoro Dispensary
13. Kihumbu-ini Community Dispensary
14. Kinyangi Health Centre
15. Kirwara Health Centre
16. Kiunyu Dispensary
17. Mchana Estate Dispensary
18. Mitubiri Dispensary
19. Mtaro Dispensary
20. Mukurwe Dispensary
21. Munyu Health Centre
22. Ndakaini Public Health Dispensary
23. Ndula Dispensary
24. Ndunyu Chege Dispensary
25. Ndururumo Dispensary
26. Ngelelya Dispensary
27. Ngoliba Health Centre
28. Oakland Dispensary
29. Ruiru District Hospital
30. Thika District Hospital
31. Woodpark Dispensary

B. PRIVATE HEALTH FACILITIES

1. African Muslim Agency Clinic
2. Afya Medical Clinic
3. Boore Clinic
4. Canan Medical Clinic
5. Central Memorial Hospital
6. Dr Wachira Clinic
7. Family Care Medical Centre
8. Gawa Medical Clinic
9. Glory Medical Clinic

10. Health Care Nursing Home
11. Immaculate Heart of Mary Hospital
12. JKUAT Dispensary
13. Joyland Medical Clinic
14. Kakuzi Limited Dispensary
15. Kalimoni Hospital
16. Kihumbuini (PCEA) Dispensary
17. Life Care Ministry Clinic
18. Mary Help of The Sick Hospital
19. Mt Sinai Nursing Home
20. Mulumba Mission Hospital
21. Munyu Health Centre
22. Naidu Hospital
23. Ndakaini Clinic
24. Neema Medicare Centre
25. New Hope Medical Clinic
26. Plains View Nursing Home
27. Royal Medical Clinic
28. Ruiru East Medical Clinic
29. Ruiru Private Hospital
30. Sama Medical Clinic
31. Shammah Clinic
32. Shikamoo Medical Centre
33. Siloam Medical Centre
34. Sinai Hospital and Maternity
35. St James Clinic
36. St Luke Medical Care Clinic
37. St Teresia Medical clinic
38. Thika Medical Clinic
39. Thika Nursing Home
40. Thika School for the blind Dispensary
41. Trinity Clinic
42. View Point Clinic

**APPENDIX 8: A MODEL LIST OF KEY ESSENTIAL DRUGS FOR EVALUATING
DRUG AVAILABILITY**

COMMON HEALTH PROBLEM	KEY DRUG
Diarrhoea	Oral Rehydration Salts
	Cotrimoxazole
Acute Respiratory Tract Infections	Cotrimoxazole
	Procaine Penicillin injection
	Pediatric paracetamol tablets
Malaria	Artemether Lumefantrine tablets
Anaemia	Ferrous salt + Folic acid tablets
Worm infestations	Benzimidazoles (Mebendazole and albendazole) tablets
Conjunctivitis	Tetracycline eye ointment
Skin disinfection	Iodine, gentian violet or local alternative
Fungal skin infection	Benzoic acid + salicylic acid ointment
Pain	NSAIDS (Acetylsalicylic acid paracetamol tablets, mefenamic acid)
Prophylactic drugs	Vitamins (Vit A, B Complex)
	Ferrous Salt + Folic Acid tablets

APPENDIX 9: DRUG USE INDICATORS CONSOLIDATION FORM – PUBLIC FACILITIES

Facility	Average of drugs prescribed	Percent generics	Percent antibiotics	Percent injection	Percentage on EDL	Average consultation time (Minutes)	Average dispensing time (Seconds)	Percentage of drugs actually dispensed	Percentage of drugs adequately labeled	Percentage with adequate knowledge of dosage	Percent of drugs in stock	Average cost per prescription
Munyu H.C	2.87	59.3	76.7	10	88.4	8.8	94.4	94.3	82.9	76.7	85.7	157.30
Kigoro Disp	3.15	62.4	63	25.9	84.7	6.06	102.9	87.3	82.6	81.5	78.6	316.80
Mukurwe Disp	2.79	58	69	6.9	85.2	10.3	101.6	82.5	70	73.3	71.4	199.30
Gatunyu Disp	3.33	60	100	11.1	80	5.8	165	89.3	100	100	78.6	139.65
Ndakaini Disp	2.81	60.5	74.1	14.8	84.2	4.7	115.6	88	90.9	82.1	71.4	229.50
Ndunyu Disp	2.55	62.2	58.6	3.4	89.2	9	75.9	82.9	100	80	78.6	198.10
Ndurumumo Disp	2.97	48.8	86.2	20.7	96.5	9.7	98.4	86.5	93.5	80	78.6	214.00
Thika Level 5	2.60	41	60	0	64.1	5.9	195	58.7	100	70	85.7	559.50
Kirwara Hosp	2.67	50	61.1	5.6	89.6	5.3	180	93.9	100	100	85.7	274.10
Karangi Disp	2.24	60.5	70.6	0	86.8	7.2	210	73.7	100	88.2	78.6	187.40
Gatuanyaga Disp	3.00	43.3	80	0	90	10	89.8	84.7	100	80	78.6	171.85
Gatura H.C	3.20	53.1	85	0	98.4	6.7	245.5	67.7	100	90	71.4	138.10
Athi Dispensary	2.26	60.5	68.4	42.1	83.7	6.5	129	90	94.4	72.2	78.6	180.00
Ndula Disp	3.30	69.7	87	4.3	92.1	8	126.7	93.4	98.6	82.6	78.6	175.85
Ngoliba H.C	2.81	76.7	88.5	15.4	93.2	5	141.7	88.9	90.6	73.1	78.6	167.90
Kihumbuini	3.20	57.3	66.7	13.3	89.6	7.4	81.9	92.7	64	83.3	85.7	169.70

Disp												
Naro Dispensary	2.75	66.2	75	14.3	93.5	8.4	88.7	73.4	67.2	82.8	78.6	204.75
Kiunyu Disp	2.87	59.3	83.3	6.7	89.5	8.8	102.4	84.5	71.8	80	57.1	183.80
Ngelelya Disp	2.90	52.9	63.3	0	85.4	10.3	101.5	97.7	60.7	73.3	78.6	158.40
Kinyangi H.C	2.97	48.8	86.2	0	95.3	9.4	99.4	100	83.5	83.3	100	315.50
Kiandutu H.C	3.00	98.8	96.4	3.6	96.4	11.6	53.7	100	85.7	72.7	85.7	277.50
Juja Farm Disp	2.13	96.9	86.7	13.3	95.3	12.6	99.9	84.7	91.8	86.7	85.7	242.80
Gikono H.C	2.77	94	90	13.3	91.6	8.6	48.6	91.2	96.8	75	78.6	199.20
Ruiru Hosp	2.90	63.2	63.3	16.7	95.4	9.1	105.1	82.4	62.9	86.7	78.6	203.30
Ithanga Disp	2.80	97.6	90	13.3	94	7.4	105.2	96.6	97.6	76.7	100	442.15
MEAN	2.83	64	77.16	10.19	89.28	8.1	118.32	86.6	87.42	81.21	80.29	228.26

APPENDIX 10: DRUG USE INDICATORS CONSOLIDATION FORM – PRIVATE FACILITIES

Facility	Average of drugs prescribed	Percent generics	Percent antibiotics	Percent injection	Percentage on EDL	Average consultation time	Facility	Average of drugs prescribed	Percent generics	Percent antibiotics	Percent injection	Percentage on EDL
Mary Mission	3.05	32.8	63.6	27.3	-	10	210	94.2	92.8	96.7	100	695.30
Kalimoni Mission	4.00	78.5	71.4	28.6	-	9.4	101.5	100	100	80	100	615.60
Ruiru Hospital	3.17	38.4	68.8	28.1	-	11.1	70.9	96.8	100	100	100	512.05
Plainsview Nursing	3.70	37.4	62.1	34.5	-	6.7	196	95.5	100	100	100	305.95
St. Mulumba Hosp	2.73	43.9	33.3	3.3	-	4.5	162	100	100	73.3	92.9	620.80
Dr. Wachira Clinic	2.76	39.3	87.9	6.1	-	9.4	403.3	100	100	100	100	346.00
Gawa Medical	3.46	46.7	46.2	38.5	-	9.2	108.1	75.9	90.2	100	100	260.25
Family Care Med.	2.88	31.6	76.5	2.9	-	8.1	115	89.5	93.5	96.7	100	459.85
Mt Sinai Hosp.	3.33	44.6	33.3	3.3	-	10.5	240	91	91.2	93.3	100	717.30
Naidu Hosp.	3.27	20.0	73.9	8.7	-	7.5	106.7	90.8	96.6	100	100	738.85
Shikamoo Medical	2.71	25.6	72.4	0	-	8.1	214	96.1	87.7	96.2	92.9	359.30
St Luke	4.27	38.3	76.7	36.7	-	10.7	220	94.4	100	100	100	538.90

Hospital												
Joyland Medical	2.00	8.2	56.7	0	-	8.7	147.9	86	93.9	87	100	338.30
Immaculate Hosp.	2.93	45.5	70	6.7	-	9.4	85	100	100	83.3	92.9	313.70
Kakuzi Dispensary	2.80	42.9	72	20	-	6.4	105.6	89	98.8	95.7	100	552.50
Boore Clinic	2.33	23.2	30	0	-	8.5	132	82.9	96.6	100	92.9	431.20
View Point Clinic	3.36	33.7	66.7	43.3	-	4.7	248	95.7	95.6	100	92.9	291.6
MEAN	3.1	37.09	62.44	16.94		8.4	225.82	92.81	96.28	94.24	97.91	476.32

APPENDIX 11: RESEARCH AUTHORIZATION LETTER



REPUBLIC OF KENYA
MINISTRY OF PUBLIC HEALTH AND SANITATION

Tel. Thika 067 216221/2 fax 21446
Email address: dmothika@gmail.com
All correspondence should be addressed to DMOH
When replying please quote

DISTRICT MEDICAL OFFICER OF HEALTH
THIKA DISTRICT
P.O. BOX 227
THIKA

Date: 18th April 2013

Ref: No./DMOH/TKA/GEN/Vol. 2/

JOHN MUNGUTI KISENGI

P.O.BOX 342-01000

THIKA.

Dear Sir,

RE: REQUEST TO CARRY OUT DATA COLLECTION WITHIN THIKA DISTRICT HEALTH FACILITIES

Reference is made to the above subject.

We are in receipt of your request to carry out data collection for your research titled: *'An evaluation of drug use in public and private health facilities in Kenya; A case study of Thika District'*.

On behalf of the research and ethics committee of the District Health Management Team (DHMT), I am pleased to inform you that your request has been granted. Please ensure that all data collected from patients is treated with utmost confidentiality and that your data collection is conducted while observing high ethical standards.

Finally, the District Health Management Team would wish that you share a copy of the findings with us.

Kind regards,


MEDICAL OFFICER OF HEALTH
THIKA DISTRICT HOSPITAL
P.O. Box 227 THIKA

DR GERALD MUNYAO MUENDO

DISTRICT PHARMACIST - THIKA

FOR: DISTRICT MEDICAL OFFICER OF HEALTH