STRATEGIES TO IMPROVE RATIONAL USE OF DRUG IN AFGHANISTAN

Frohar Aziz

Afghanistan

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STRATEGIES TO IMPROVE RATIONAL USE OF DRUG IN AFGHANISTAN

A thesis submitted in partial fulfilment of the requirement for the degree of Master of Public health

By

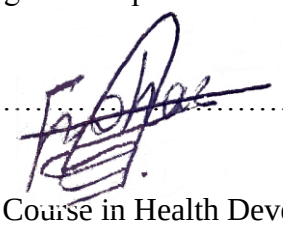
Frohar Aziz

Afghanistan

Declaration:

Where other people's work has been used either from printed source, internet or any other source this has been carefully acknowledged and referenced in accordance with departmental requirements.

The Thesis "Strategies to Improve Rational Use of Drug in Afghanistan" is my own work.

Signature: ……  ……..

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List of Abbreviation

ADR	Adverse Drug Reaction
AFG	Afghanis
BPHS	Basic Package of Health Services
CMS	Central Medicine Store
DFID	Department For International Development
DRA	Drug Regulatory Authority
DTC	Drug Therapeutic Committee
EC	European Commission
EDL	Essential Drug List
EPHS	Essential Package of Health Services
EPI	Expanded Program on Immunization
FIP	International Pharmaceutical Federation
GDP	Gross Domestic Product
GDPA	General Directorate of Pharmaceutical Affairs
HAI	Health Action International
HIV	Human Immunodeficiency Virus
IDU	International Donor Community
ISO	International Standards Organization
LDL	Licensed Drug List
MOH	Ministry Of Health
MoPH	Ministry of Public Health
MSH	Managing Science for Health
NDP	National Drug Policy
NDTC	National Drug Therapeutic Committee
NGOs	Non-Governmental Organizations
NHP	National Health Policy
NHS	National Health Strategy
NMB	National Medicine Board
PMIS	Pharmaceutical Management Information System
PPOS	Provincial Pharmacy Offices

SM	Strengthening Mechanism
SPS	Strengthening Pharmaceutical Systems
STG	Standard Treatment Guideline
THE	Total Health Expenditure
TPE	Total Pharmaceutical Expenditure
USAID	United States Agency on International Development
WB	World Bank
WHO	World Health Organization

Abstract

Rational use of drug defines as patient receives medication appropriately based on his/her need, appropriate dose, in an adequate period of time and finally with the lowest cost (WHO 1987). Rational use of drug is a problem in Afghanistan. Strategies are available to address this issue through development of national drug policy, treatment guidelines, drug therapeutic committee and essential drug list. These strategies were not adequately developed in Afghanistan (MoPH/ WHO 2011).

This study is a literature review.

The general objective of this study is to identify, describe and analyze the strategies to improve rational use of drug in Afghanistan.

To identify and describe the good practice for strategies to improve rational use of drug using WHO framework (educational, managerial, regulatory and economic) strategies which was developed by Kathleen Holloway in 2005. This framework was adapted to support me to identify and to describe the good practice and the situation in Afghanistan.

Within the strategies in Afghanistan, we addressed several gaps as lack of patient centered approach, lack of educational programs for the health professionals, lack of Drug Regulatory Authority and irrational prescription.

Based on the good practice, in Afghanistan, 1- patient centered approach need to be improved by providing sufficient information on their drug and being interactively engaged with patients. 2-The educational programs for the doctors and pharmacists lack certain subjects with respect to rational use of drug that need to be targeted by the government to enrich the curricula. 3-Strategies are needed to establish pharmacovigilance unit, to accredit the drug quality control laboratory. 4- Providing of reimbursement system for essential drug is essential to improve rational use of drug and drug affordability

Key words: Rational use of drug, strategies, good practice, Afghanistan, essential drug

The Word Count: 11,752

Introduction

Afghanistan has faced with several problems regarding the rational use of drug. There are major factors that contribute to irrational use of drug in Afghanistan are: poor supply system, availability of counterfeit drugs, and poor knowledge of health professionals and patients.

Although Ministry of Public Health together with Non-Governmental Organizations (NGOs) has put efforts to improve rational use of drug, but there still are some areas that are not adequately targeted by the government.

I am a pharmacist (PharmD) working at the Food and Drug Quality Control Department at Ministry of Public Health of Afghanistan. Based on my own experience, I have seen many poor quality and counterfeit drugs in my workplace. It is the only drug quality control laboratory in Afghanistan. However due to illegal importation of drugs, not all drugs are tested in this laboratory. In addition, the lack of technical standards, guidelines as well as unavailability of proper resources are contributing to lack of sufficient analytical tests.

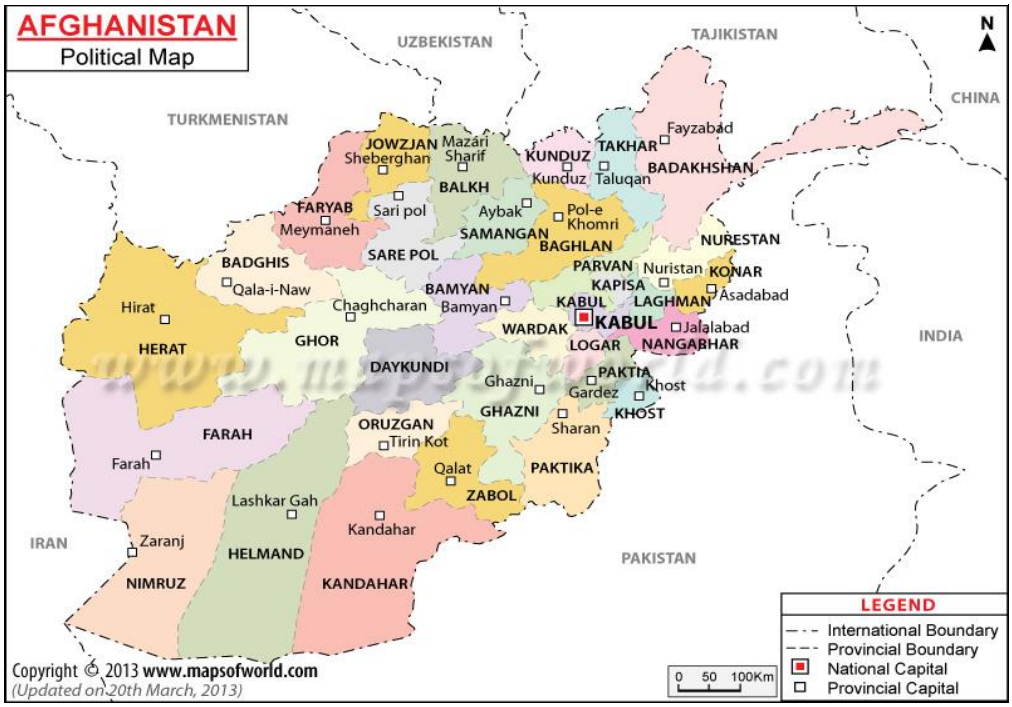
In order to utilize my experience and my professional background, I wanted to select this topic and title it “strategies to improve rational use of drug in Afghanistan”.

Chapter 1 Country Background Information

1.1 Geography:

Afghanistan is a landlocked country which is located in south central Asia. The country is surrounded by six countries including Pakistan, Iran, Tajikistan, Uzbekistan, Turkmenistan and China. Afghanistan is divided into 34 provinces, 398 districts. Overall there are 15 cities and 32 towns. The districts are divided into smaller villages (APHI/MoPH et al. 2011).

Figure 1 Map of Afghanistan



Source: Maps of World (available at): http://www.mapsofworld.com/afghanistan/afghanistan-political-map.html

1.2 Economy:

Despite of investment, international aids and increase of domestic production since 2002, Afghanistan is still placed as one of the poorest and least developed countries in the world and is mostly donor depend. In 2010, the nation's Gross Domestic Product (GDP) was US$17 billion. GDP per capita was about $ 572. Approximately 36 percent of population is unemployed and live in poverty. There are shortage of safe drinking water, housing and electricity (APHI/MoPH et al. 2011).

1.3 Demography:

The total population of Afghanistan in 2010 was 29.7 million with annual population growth rate of 2.6 percent. The growth rate is 2.3 percent in rural areas and 4.7 percent in urban areas. In addition, 85 percent of people live in rural areas and 15 percent are living in urban areas (APHI/MoPH et al. 2011).

1.4 Health sector:

The health sector reform has established since 1980 in Afghanistan, but due to 23 years of war and conflict the implementation was slow. The National Health Policy (NHP) and National Health Strategy (NHS) were developed in 2002-2004 with coordination of EC (European Commission), World Bank (WB) and Ministry of Public Health (MoPH). After the departure of the Taliban regime, the Basic Package of Health Services (BPHS) was established under framework of governmental health policy. The BPHS consists of cost effective interventions addressing specially the vulnerable groups including women and children. In 2003, MoPH has developed a strategy to contract out the BPHS to NGOs and now 31 out of 34 provinces are covered by contracting out and 3 remaining provinces are covered by both an experiment called SM (Strengthening Mechanism) and NGOs. The Essential Package of Health Services (EPHS) was established aiming to complete the BPHS and to support the hospital referral system. BPHS and EPHS are now the contents of MoPH strategic program for providing of health services (MoPH 2005).

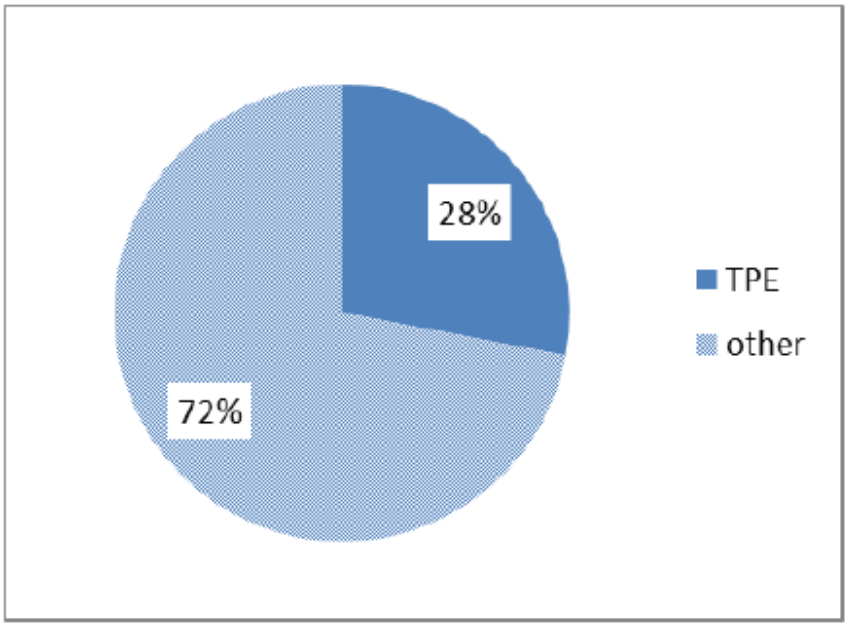
Afghanistan owned support for rational use of drug through the Essential Drugs List (EDL), licensed drug list (LDL), National Drug and Therapeutics Committee, and other policies and guidelines from US agency and donors to improve rational use of drug (Green et al. 2010). The current national drug policy that was adapted in year 2003 consists of drug supply, control, safety, quality, rational use, advertising, promotion and financing. However there are areas which are not covered by the policy such as the local manufacture procurement, management, distribution, pricing, technical cooperation, implementation, monitoring, evaluation and research (Karwar and Inu, 2011).

1.5 Health Expenditure:

In 2008, the Total Health Expenditure (THE) was 52 billion AFG (1,043 million US $) annually. The total annual health expenditure per capita was 2100 AFG (42 US $). The Total Pharmaceutical Expenditure (TPE) in Afghanistan was 14450 million AFG (289 million US

$). Also per capita pharmaceutical expenditure is 588 AFG (11.76 US $) (MoPH/ WHO 2011).

Figure 2 The total TPE out of THE in Afghanistan



Source: (MoPH/ WHO 2011)

Chapter 2 Problem Statement and Justification

Rational use of drug defines as patient receives medication appropriately based on his/her need, appropriate dose, in an adequate period of time and finally with the lowest cost (WHO 1987). Around the world, only 50% of patients use the correct form of a prescription. More than 50% of drugs that are prescribed are sold and distributed inappropriately (Yousefi, 2012). Rational use of drug is considered as an important issue for the treatment of the disease and is related to drug information such as being up to date, accessible and accurate. If the aforementioned issues cannot be met, the consequences for rational use of drug will be increased and lead to mortality and morbidity, drug waste, adverse drug reaction and finally economic failure (Çelik et al. 2013).

Worldwide, two billion people do not have access to essential drugs (Villacorta-Linaza 2009). Only one third of the world population has access to essential drugs. Essential drugs are considered to be most important for the rational use of drugs and better health outcomes. Essential drugs are those that should have proper dosage form with sufficient active ingredient amount, should be available all the times and finally should provide the healthcare need of a society (Desalegn 2013). In spite of access to essential drugs, the drugs are available with insufficient ingredient and do not respond to their needs (MSH 2012b). From patients who receive the right drug 50 percent of them cannot use it in a proper way (Embrey, n.d.2011). Almost 50 percent of pharmaceutical costs are wasted through irrational use of drugs. Overall the use of drugs are affected by various factors such as provider experience, economic factors, cultural factors, community beliefs and personal beliefs (MSH 2012b).

There is huge problem of irrational use of drugs worldwide. Use of antibiotics are increasing which contributes to antimicrabial resistance, mobidity and mortality, and use of unsterile injectables that leads to blood borne diseases such as HIV, hepatitis B and C. In 97 different developing countries 71 percent of irrational use of drugs occurred in public health sector, and 29 percent in private health sector (Dijk 2011).

Globally there are strategies to improve rational use of drug in different perspectives.

In 2002, WHO developed strategies to improve rational use of drugs:

- Multidisiplinary national body, including MOH (Ministry Of Health) authority, society, health professionals and pharmaceutical industries. These national bodies are contributing on how drugs are used, implementing and evaluating the interventions for promoting rational use of drug.

- Standard Treatment Guideline (STG), Drug Therapeutic Committee (DTC) and EDL as tools for proper diagnosis, treatment and rational use of drug
- Education and training for rational use of drug
- Appropriate enforced regulation
- Sufficient government expenditure on drugs availability
- Avoidance or preserve financial incentives

In 2005, Kathleen Holloway, developed a framework for improving rational use of drug which focuses on four different strategies; educational, managerial, regulatory and economic.

In 2012, MSH (Managing Science for Health) developed a framework for improving rational use of drug in three levels:

- Places: health facilities, laboratories, pharmacies, drug shops, communities and households
- With public and private systems: prescribers, dispensers, technicians, patients and caregivers
- Education, management, regulation and economic strategies

Afghanistan has faced with several challenges related to rational use of drug as many other developing countries (Paterson and Karimi, 2005). Irrational prescribing and dispensing practices and use of drugs are widespread across Afghanistan. Lack of information about drugs and lack of guidelines for treatment lead to improper treatment and irrational use of drug (Harper & Strote 2011). Furthermore, poor implementation and enforcement of regulation and poor resources including human resources are the big obstacles related to rational use of drug (MoPH/ WHO 2011).

Some studies and programs that were conducted are Afghanistan Medicine Quality Assurance Assessment, pharmaceutical human resource development by SPS (Strengthening Pharmaceutical Systems) project/MSH. In 2002, the SPS project/MSH funded by USAID (United States Agency for International Development) was established to support MoPH and to focus on developing of DTC, developing of STG, establishing of coordinated pharmaceutical procurement and distribution system, human resource development and improving of rational use of drug (Bennett 2013). WHO in 2002 conducted pharmaceutical assessment of manufacturing, warehouses and quality control laboratory. DFID (Department for International Development) in 2005 conducted study of public and private pharmaceutical markets. In 2007, John Hopkins University carried out an assessment of drug quality in health facilities. In 2007-2008, EC conducted an assessment of pharmaceutical market, financing

and policy regulation (Karwar et al. 2011). This study is designed to look into strategies to improve rational use of drug and to address irrational use of drug which is a problem in Afghanistan. It seeks to answer the following questions: What is the situation of rational use of drug in Afghanistan? What are the gaps in the strategies to improve rational use of drug in Afghanistan? What is the good practice for strategies to improve rational use of drug? And how could things be improved in Afghanistan?

2.1 General Objective

To identify, describe and analyze the strategies to improve rational use of drug in Afghanistan.

2.2 Specific objectives:

1- To identify and describe the good practice for strategies to improve rational use of drug using WHO framework
2- To identify and describe the situation of rational use of drug in Afghanistan using WHO framework
3- To identify the gaps in the strategies to improve rational use of drug in Afghanistan
4- To provide recommendations for MoPH and other actors to ensure the rational use of drug in Afghanistan

2.3 Methodology:

2.3.1 Study Design:

This study is a literature review.

2.3.2 Study Method:

PubMed, Google scholar and Science Direct were used as electronic databases to search for journal articles. For the purpose of gray literatures, the MoPH, MSH, FIP (International Pharmaceutical Federation) and WHO websites were used to gather information to find out the strategies to improve rational use of drug in Afghanistan. As software, Mendeley was used in order to organize the references.

The key words were searched both single and combined: Afghanistan, developing countries, demographic information, strategy, policy, rational use drug, essential drug, guideline, good practice, educational strategies, managerial strategies, regulatory strategies, economic strategies, pharmacovigilance, essential drugs, drug quality control, accreditation, prescription, dispensing drug, supply system, drug therapeutic committee, drug registration,

regulation and enforcement, pharmaceutical market, drug price, user fee and reimbursement mechanism.

Inclusion criteria: Published literatures from year 1987 up to 2013 which focus on rational use of drug. For the first time rational use of drug was defined by WHO in conference of experts in Nairobi in 1985 and then the report was published by WHO in 1987.

Exclusion criteria: This study excludes documents or literatures before year 1987

Language: English

2.4 The conceptual framework:

I reviewed the following conceptual frameworks on improving rational use of drug:

- Managing of rational medicine use, framework of improving medicine use (MSH 2012a)
- WHO medicine strategy framework, framework of different measures of success (WHO 2004)
- Rational use of drugs: an overview (Holloway 2009), frame work of strategies to improve rational use of drug

The last conceptual framework was developed by Dr. Kathleen Holloway working in WHO in 2005. I found it more comprehensive, applicable and especially more adaptable framework for the problem of irrational use of drug in Afghanistan.

This framework comprises of four different strategies for improving rational use of drug:

- Educational strategies
- Managerial strategies
- Economic strategies
- Regulatory strategies

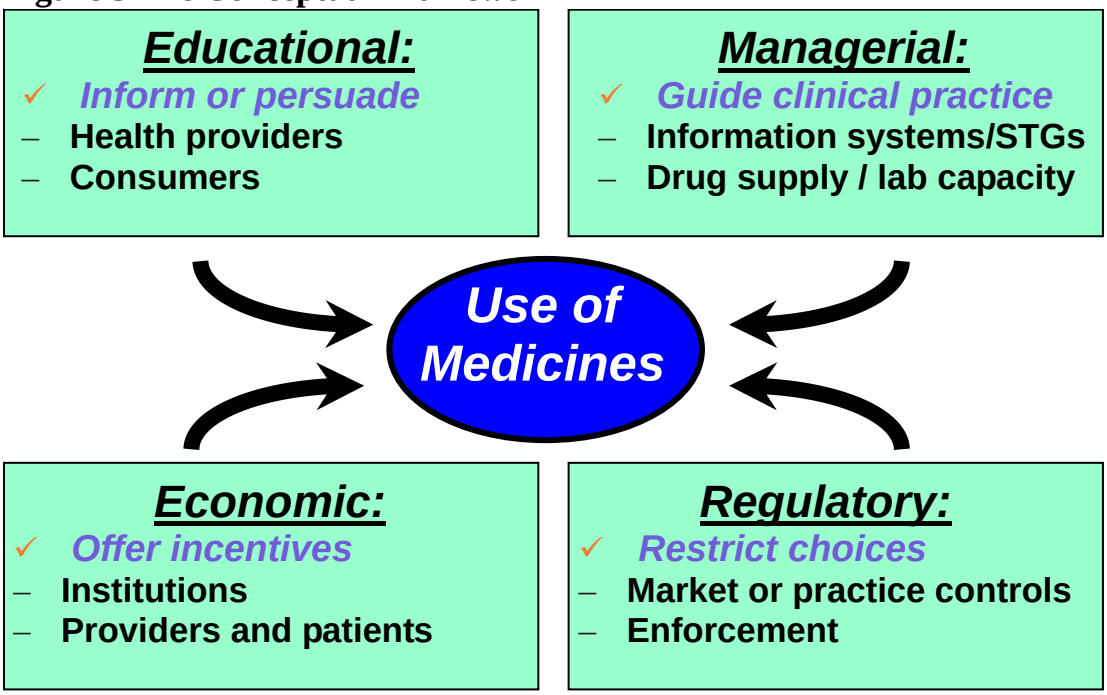
Educational strategies cover strategies for both health professionals and patients in three interventions of training for health professionals, printed materials, and media based approaches to improve rational use of drug.

Managerial strategies are drug supply system, dispensing strategies and strategies for prescribers including STGs.

Regulatory strategies include interventions that need government regulation and enforcement for example drug registration, licensing and quality control of drug to improve rational prescription and use of drugs.

Economic strategies include prescription fees and financial reimbursement mechanisms

Figure 3 The Conceptual Framework



Source: (Holloway 2009)

2.5 Study limitation

This study is based on literature review. Describing and analyzing of situation hugely depend on the availability of literatures and finding of proper literatures. In general, finding of proper references for strategies is difficult. For searching of the strategies several keywords have to be used in order to find the proper ones. There was widespread terminologies being used some used interventions and some other strategies. In addition, different combination of strategies aspects were used that sometimes it was difficult for the author to organize them based on the framework that is used. Most of the literatures both from the good practice and from Afghanistan are focusing on provider perspective and only a few are focusing on consumer perspective. In fact inappropriate use of drug is more common in consumer side which was not adequately addressed.

The author found the literatures from internet search engines hence, other documents that might be available which are either unpublished or with native language in Afghanistan, cannot be found through internet search. Overall, the author had adapted a comprehensive framework containing four different strategies to improve rational use of drug in Afghanistan. Due to time limitations some concepts have not been addressed such as Intellectual property Rights and traditional drugs are not covered. It needs more time and studies to be covered in future studies.

Chapter 3 Findings

This chapter is organized as follows: In each section, I will present the normative position and/or the good practice of strategies based on conceptual framework and then I present the situation and approaches used in Afghanistan. In doing so, I identify gaps in the situation in Afghanistan – and also reflect upon what could be done differently, looking back at the globally accepted good practices in the field of rational use of drug.

Thereafter, in the next chapters I discuss the key findings, and arrive at the key conclusions - and formulate recommendations based on both the global standards, and feasibility in the Afghan context.

3.1 Educational

Education is considered as a vital component for promoting of rational use of drug. Many countries are not eager to develop programs to promote rational use of drug and also in many countries drugs are not available at primary health centers or even at hospitals. Sustainable efforts are needed in order to promote rational use of drug for both general population and for health professionals (WHO 2006a).

In many countries the health professionals do not know how to communicate and provide information for their patients. Patients also do not have access to essential information on their drugs or even governments have not prioritized education on promoting rational use of drug in medical education curricula (WHO 2006a).

Patients have their own reasons and perceptions on using of drugs. These are related to a number of factors such as socio cultural issues, personal beliefs, experience, financial and psychological factors. People treat the symptoms not the disease itself. Also, they are not given the information on their disease and the drugs given to them and how these work. The same conditions in use of antibiotic patients do not know why they have to take it full course. This is because health professionals are not taught on how to explain drugs for patients. However, improving knowledge of the patients and the way to take the drugs correctly is crucial for improving rational use of drug but knowledge itself does not necessarily improve rational use of drug. For example, smoker will not stop smoking even after understanding the consequence of smoking which is lung cancer. The thing needs to be applied is to understand patient on why these changes are needed. In addition, the information is necessary to be linked to patient‘s beliefs (Chetley et al. 2007).

3.1.1 Public Education:

Public education on drugs is important for proper use of prescribed or dispensed drugs, patient instruction at the time of illness and non-medicine therapy. Education can be provided through materials and media like posters, flip charts, radio, TV, newspaper and also by talking and communication with people (WHO 2006a).

Public education for programs are summarized as follows (WHO 2006a):

1- Patient oriented programs: This program is about patient knowledge and perception on his or her prescribed drugs. The rational use of drug society in Delhi revealed that compared to control group, patients who understand information on drugs, also understand the drugs prescribed for them. Patient knowledge depends on level of background knowledge on drugs, socio-demographic status and drug use habit (WHO 2006a). Incorrect use of drugs can occur when patient does not take full course of treatment or oppositely takes one drug several times or taking drugs from untrained drug seller or using of injectable more than oral based on patient beliefs that injectable is more useful than oral. Irrational use of drug also covering the overuse and incorrect use of drugs that can bring economic burden on health system and on patients due to spending huge amount of money for improper prescribing. Under use of drug in early stage of disease that can bridges to prolong disease as well as financial cost for the patient (Harper & Strote 2011).

2- Community oriented programs: these programs include spreading of informative posters or articles in the community to educate people about use of drugs. A study in Nepal showed that people who had studied articles on use of drug were aware of drug and even the precaution of drug compared to control group. The same in Indonesia about use of injections that there was a decrease in number of injection use compared to control group (WHO 2006a). Interactive communication is more useful. Evidences from both developed and developing countries have shown that communication approaches with people and engaging them interactively and understand the emotion and perception of patients are more beneficial and effective than only disseminating the information (Chetley et al. 2007). As (Chetley et al., 2007) argue that " Knowledge alone does not change the behavior". Community oriented programs can be better managed if pharmacists are involved. Pharmacists are the best communicators with patients in preventing disease, preventing from

overuse, underuse and incorrect use of drugs. Engaging of pharmacists in such programs will improve health outcome (Elizabeth Lai, Le Trac 2013).

3- Women and mothers: Women play an important role in rational use of drug and are important health workers for their children at the same time because, mothers often bring drugs at home and administer to their children. Studies show that education of rational use of drug for mothers, housewives, and school teachers is helpful in reduction of irrational use of drug (WHO 2006a). Meanwhile, if the mother's perceptions and taught on using of drugs is considered, it will be more beneficial. As a study that was conducted in Ghana found that most of mothers were knowledgeable on using of drugs but it was poorly practiced at home while administering drugs to their children (Chetley et al. 2007).

3.1.2 Health Professionals

Health professionals comprise of (doctors, nurses and pharmacists) are important personnel for spreading information about rational use of drug (WHO 2002).

Besides them, other health workers, administrators, health insurance workers, drug wholesalers and retailers also need to know about rational use of drug practices.

The ways of promoting rational use of drug for health professionals are described below (WHO 2002):

3.1.2.1 Printed Material:

A number of strategies and guidelines can be used by health professionals such as STGs, formularies and journals. These materials are helpful to avoid improper treatment and irrational use of drug (WHO 2002).

3.1.2.2 Face to Face Meeting:

Applying of face to face meeting for health professionals and providing them information on rational use of drug including prescription practices on how to prescribe, proper diagnosis of disease and proper consultation with their patients are helpful for promoting rational use of drug (WHO 2002). Studies in Nepal and Indonesia show a significant reduction in prescribing of antibiotics and injection respectively when face to face methods were applied for the health professionals. Hence, Poor knowledge of the health professionals and patients can cause improper treatment and irrational use of drug in different steps of the treatment (WHO 2006a).

3.1.2.3 Medical Education and Undergraduate Education:

Medical education on rational use of drug for under graduate students at medical institute including doctors, nurses and pharmacists is an important training tool. The medical education curriculum needs to adapt rational use of drug concept to ensure that students can understand rational use of drug. This method contains drug treatment with examples of different patients with a structured or open type questions. This method will help students to understand the problem of patients and treatment of them. This method can be applied on good prescribing practices, essential drugs concepts, STGs and pharmacotherapy aspects. Also this method is on problem based learning for prescribing drugs on how to prescribe and what to prescribe. The students need to be trained and be aware on prescription patterns of drugs (WHO 2006a). Also, providing of drug promotion topics is essential to improving rational use of drug. In most developing countries due to lack of resources and lack of governmental wills the drugs promotional activities rely only on information provided by drug industries. While many other drug promotional activities can be achieved throughout the world such as article writing, continuous medical education and clinical researches on drugs (Piriou & Hayes 2011).

To extent the pharmacy students curricula, the following topics are essential to be developed (Mintzes 2005):

Table 1 Topics for Pharmacy Faculty Curricula

1-Pharmaceutical marketing	8-Pharmaceutical policy / Pharmacy and law
2-Hospital pharmacy	9-Drug promotion
3-Pharmaceutical sales techniques; Principles of pharmaceutical marketing	10-Drugs & behavior (drugs & society), drug education
4-Pharmacoepidemiology	11-Ethics in pharmacy practice
5-Clinical pharmacy	12-Pharmacoeconomics
6-Healthcare management	13- Information and communication
7-International health care systems	14-Non-prescription drug therapy

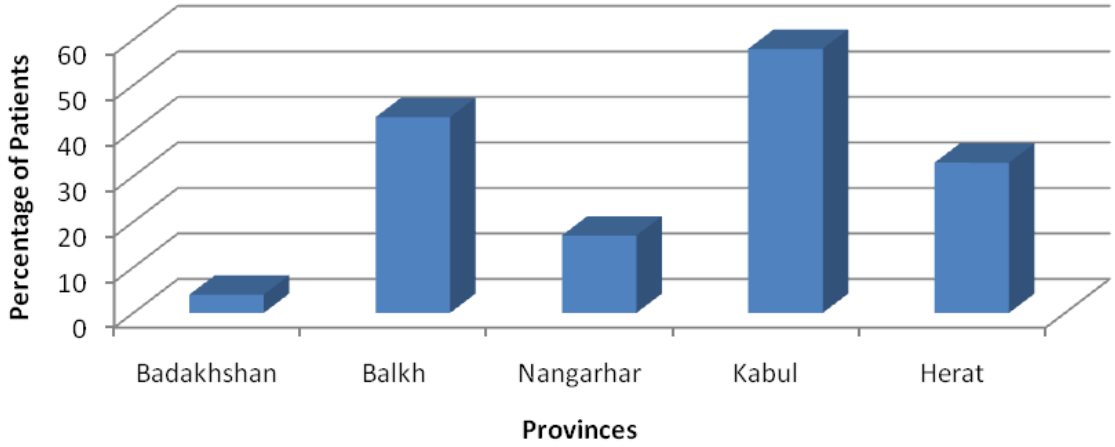
Source: (Mintzes 2005)

Pharmacists play a key role in terms of therapeutic outcome and improve quality of life of patients. Pharmacists are best in providing drugs, needed drugs information, counselling and monitoring the therapy of drug (Wiedenmayer et al. 2006).

3.1.3 Educational Strategies in Afghanistan

In Afghanistan, many patients do not know how to take their drugs. They often think that antibiotics are more beneficial for simple diseases such as common cold. They think that the injectable drugs are more useful than pills. Only 29 percent of patients on average are aware of their drug amount (dose) (Green et al. 2010).

Figure 4 Percentage of patients who had knowledge on their drug dose (by provinces)



Source: (Green et al. 2010)

Over the past few years, the number of unqualified people who work in pharmacies has drastically increased in both public and private pharmaceutical services. In private sector, the ratio of pharmacists compare to pharmacies was only 1:4. Oppositely, Pharmacists are often working in other organizations except pharmacy sector. (FIP 2011) .

Patients often take their drugs from unqualified staffs in pharmacies who are not pharmacists and do not know how to provide information for patients. Health professionals have also difficulty in proper communication with patient and providing sufficient information on drugs they use (Bennett 2013).

In Afghanistan, medical curricula for the doctors and nurses only covers pharmacotherapy concept and does not cover the issues of: Use of STGs, EML and pharmacovigilance (MoPH/ WHO 2011). These concepts will be discussed in the chapter of Managerial Strategies.

In Afghanistan, many efforts are taken to address rational use of drug. The SPS project conducted an assessment at Kabul University/ Faculty of Pharmacy and Ghanzanfar Institute of Health Sciences together with GDPA (General Directorate of Pharmaceutical Affairs), directorate of human resource of MoPH and Ministry of Higher Education as stakeholders. This assessment found several gaps with regards to rational use of drug, managing drug

supply, data collection and analysis of pharmaceutical system compare to WHO standards. To address these gaps, the SPS conducted 21 training for MoPH staff and pharmacy faculty students (Bennett 2013).

In June 2013, SPS project conducted trainings to address rational use of drug in Kabul and Baghlan health facilities for the health professionals. The aim of this training was to improve rational use of drug through improving their ability to communicate with their patients, proper diagnosis, to provide sufficient information for drug they prescribed and to improve dispensing (Bennett 2013).

The SPS project with collaboration of GDPA funded by USAID, conducted programs to improve rational use of drug both for health professionals and public awareness. Public awareness including short messages with colorful paintings on use of drug were done through developing into posters and broadcasted through radio and TV (Bennett 2013). The first message for patients was "When you receive medicine from the pharmacist, be sure you ask how to correctly use it." (SPS 2012). Before applying the interventions, doctors and pharmacists were understood on how to provide and design information and how to catch the attention of patients to the informative posters. The information on TV and radio were short dramas covering the message on use of drug (SPS 2012) .

Aside from several documents that are published by SPS on rational use of drug, there isn't any clinical researches or journal articles that have been published for further drug promotional activities in Afghanistan (Bennett 2013).

3.2 Managerial Strategies

3.2.1 Pharmaceutical Supply System

Pharmaceutical supply system is an important part in delivering of health services to health system. Drugs are often expensive to afford and to distribute. Poor quality of drugs, high cost and improper use of drugs causes waste of resources, illnesses and even death. Pharmaceutical system includes set of activities in order to ensure the availability, proper use, safety, effectiveness and quality of drugs in health care setting (Islam 2007). The drug supply system is the most important and complex part which often policy makers are struggling in terms of its huge cost. Some countries have problems in maintaining a proper supply system due to lack of resources. To increase the efficiency of pharmaceutical supply system, the pharmaceutical supply cycle components (selection, procurement, distribution and use) needs to be applied properly (MSH 2012b).

There are five approaches for pharmaceutical supply system in public health services: (MSH 2012c)

- Central Medicine Store
- Autonomous supply agencies
- Direct delivery system
- Primary distributor system
- Primary private system

➢ Central Medicine Store (CMS)

CMS is a traditional approach for drug supply which government is responsible for the entire process of supply including procurement and distribution of drugs. This approach however can face lack of resources, transport, warehouses but there is possibility for the government to manage it by contracting out (outsource) to outside parties who are able to provide services with high quality and the lowest cost (MSH 2012c).

➢ Autonomous Supply Agency

Autonomous supply agency; is a semi-governmental approach that either it is managed by the government or by NGOs. This approach is involved with procurement and distribution of bulk of drugs from warehouses and it is a better approach to minimize the problems raised by CMS in terms of lack of resources. But in this approach government is not fully involved therefore it could lead to difficulties in maintaining the infrastructure, permission of law and regulations (MSH 2012c).

➢ Direct Delivery System

In this approach, suppliers have their own capacity to deliver drugs directly to district and health facilities without any financial or cost related problems. It system will reduce the financial problems that government faces in terms of transportation and storage but it will increase the responsibility of medical staff who are working in health facilities because they are responsible for ordering and receiving the drugs (MSH 2012c).

➢ Primary Distributor System

In this approach, supplier is not directly involved in distribution of drugs in the health facilities. Two contracts are applied; firstly the government contracts with drug supplier regarding price of the drugs and the second contract is with primary distributor or distributors depending on the level of health facility. As a result, suppliers deliver the drugs to primary distributors who are responsible for distribution of drugs in health facilities (MSH 2012c).

- Primary Private System

This system can operate either in governmental facilities that can be for profit and non-profit with contracting out or operates independently.

Overall the roles of public and private pharmaceutical supply systems are different across the world and the aim is to improve accessibility to drugs and to improve rational use of drug (MSH 2012c).

Drug supply system ensures availability, affordability, accessibility and effectiveness of drugs for health care services. It has impact on rational use of drug. Although, the impact on rational use of drug is not merely based on accessibility, affordability and effectiveness of the drugs but it relates to other factors; for example if variety of drugs exist in health facilities it will overwhelm health workers in terms of choosing the appropriate drugs for the patients and causes financial waste on drug supply system (WHO 1998a). It is understood that the cost of improper medication is high and inappropriate treatment is risky while proper medication is more cost effective. Hence, pharmacists are responsible to ensure that drugs are selected, distributed and stored properly and finally delivered to the patients (Wiedenmayer et al. 2006).

Any disruption in supply of drug can affect the patients and health providers which can result in interruption of ongoing therapies and use of alternative drugs. A good management system can reduce the risk of drug shortages but will not necessarily prevent the drug shortage. The risks of drug shortage can be better managed by having a proactive monitoring; meaning to develop a good practice guideline to reduce drug shortage, to understand the root causes (risk factors), to timely intervene and communicate with actors. A proper management system is needed to monitor the quality standard and availability of drugs to ensure a continued quality drug supply system (EFPIA 2013).

3.2.2 Dispensing and Prescription Strategies and Drug Information Systems

For the prescription and dispensing levels, indicators were adapted by WHO to ensure that drug are prescribed and dispensed properly (WHO 2002).

Prescription indicators are:

- Percentage of medicines prescribed by generic name
- Percentage of encounters with an antibiotic prescribed
- Percentage of encounters with an injection prescribed
- Percentage of medicines prescribed from essential medicines list

1- Patient Care Indicators:

- Average consultation time
- Average dispensing time
- Percentage of medicines actually dispensed
- Percentage of medicines adequately labelled
- Percentage of patients with knowledge of correct doses (WHO 2002).

2- Dispensing covers incorrect interpretation of prescription, inadequate labelling, and lack of adherence to packages. If there is lack of information from patients, improper communication with patient, lack of laboratory resources and inadequate examination of patient fintally it will lead to improper treatment and irrational use of drug (MSH 2012b).

3.2.2.1 Standard Treatment Guideline (STG)

STG is an organized and systematic tool for treatment of appropriate medical conditions that helps prescriber make decision on treatment choices. This clinical guideline is an important guideline for promoting rational use of drug. This guideline need to be adapted at all levels of health care; primary, secondary and tertiary (WHO 2002). STG helps health professionals to use the drugs which are from EDL. Furthermore, based on guideline, patient will receive the optimal treatment with the lowest cost (Green & Gammouh 2012).

Guidelines are not often evidence based but they are based upon the existing practices and experiences. Hence, inaccurate guidelines may provide wrong information, improper treatment and irrational use of drug ultimately (Green & Gammouh 2012).

3.2.2.2 Drug Therapeutic Committee (DTC)

DTC or pharmacy therapeutic committee is a committee, ensuring that drugs are used in a safe and effective manner. This committee includes health professionals; doctors and pharmacists which provide the way of cost effective use of drug and promoting rational use of drug. This committee is also responsible for developing and adapting of clinical guidelines for health institutions and districts health facilities (WHO 2002).

3.2.2.3 Essential Drug List (EDL)

Essential drugs are those available everywhere and with an affordable price. Besides, these drugs are needed to be safe, effective and with good quality (MSF 2013). The selection of these drugs are based on prevalence of disease, treatment, training and experience of health professionals, financial resources, genetics, demographic and environmental factors (WHO 2000).

3.2.2.4 Pharmacovigilance

Pharmacovigilance is the science and activities which are addressed to detection, assessment, understanding and prevention of Adverse Drug Reaction (ADR) and its possible risks. Pharmacovigilance detects the risk, risk factors and minimize them in an effective and timely manner. Pharmacovigilance is not only restricted with preventing ADR and potential risk factors but concerns about treatment failure, medication error, misuse and abuse of drugs, counterfeit drugs, poor quality drug, interaction between drug and food and irrational use of drug. It will also present proper information on safety of drugs, promoting more rational use of drug and increase public confidence and trust (WHO 2006b). A health care with pharmacovigilance unit can improve drug safety, provide a warning for health workers and patients to take a proper action on time and reduce the ADR (FIP 2006). Pharmacists are knowledgeable on drug therapy regimen, to improve drug effectiveness on patients and to prevent from ADR (Elizabeth Lai, Le Trac 2013). Pharmacists have an important role in monitoring the drugs in terms of safety. Although, safety needs to be approved by quality control and clinical trials but once it is released in market it needs to be checked and monitored properly (FIP 2006).

As it is mentioned in Erice Declaration: (Hugman 2006:2)

"Monitoring, evaluating and communicating drug safety is a public-health activity with profound implications that depend on the integrity and collective responsibility of all Parties – consumers, health professionals, researchers, academia, media, pharmaceutical industry, drug regulators, governments and international organizations – working together."

Major improvements can be achieved to reduce ADR if pharmacists be actively involved in surveillance of drug safety and pharmaceutical care (FIP 2006).

Pharmacovigilance as a discipline supported by WHO Collaborating Centre for International Drug Monitoring, in Uppsala, Sweden (the Uppsala Monitoring Centre). The DRA is integrated with pharmacovigilance in order to monitor the drug safety, effectiveness and rational use of drug (WHO 2006b).

3.2.3 Managerial Strategies in Afghanistan

Pharmaceutical system is generally managed by two administrations.

1: The GDPA of MoPH which is responsible to oversee pharmaceutical system in provinces through provincial pharmacy offices (PPOS) (Harper & Strote 2011). The GDPA is also

responsible for managing of drug supply system in BPHS and EPHS in entire 34 provinces which are CMSs (MoPH/ WHO 2011).

2: The International Donor Community (IDC) including WB, EC and USAID are responsible for supplying and financing of drugs through BPHS by contracting it out with NGOs. The public system contracts the whole supply system including procurement, import, storage, distribution and dispensing for and EPHS with national and international NGOs to maintain the drug supply system. There are other private drugs suppliers including licensed and unlicensed importers, distributes and whole sellers (Harper and Strote, 2011).

In 2011, the Associated Award build upon the SPS project's achievements and working together with MoPH to strengthen drug supply system in Afghanistan through strengthening the capacity of government (MoPH) and strong coordination among donors, United Nation agencies, NGOs and other relevant departments of MoPH. Furthermore, this project is working together with MoPH to develop PMIS (Pharmaceutical Management Information System) in order to improve all pharmaceutical indicators in all levels of health system. PMIS is a system which performs demand estimation, monitoring and evaluation, analysis large amount of data and resource allocation. This system leads the decision makers to a proper pharmaceutical system planning (SPS 2011). The SPS project has also supported MoPH to strengthen pharmaceutical system, improving access to essential drugs and improving of drug supply system (Bennett 2013).

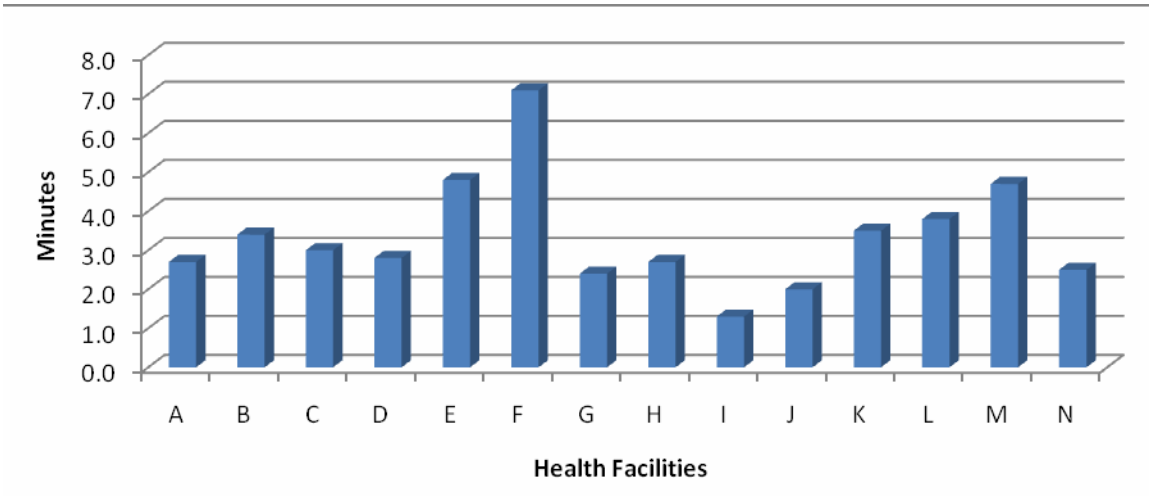
Afghanistan owns National Drug Policy (NDP) that was adapted in year 2003. The policy does not have implementation plan and is not monitored regularly (MoPH/ WHO 2011).

The drug supply system is poor in Afghanistan especially in provinces. There is long term drug shortage in both health facilities and hospitals that lead prescribers to prescribe alternative drug which is not proper and ultimately leads to irrational use of drug. Based on a survey conducted at health facilities aimed to understand the situation of use of drugs, the average of 15 important drugs stock out per month was 6.6 days. In the hospitals the average stock out time for 15 key drugs was 8.7 days per month. Health facilities and hospitals were poor in terms of using EDL and guidelines for rational use of drug (Green et al. 2010).

Although, Afghanistan has developed strategies and guidelines and EDL for promoting rational use of drug but the availability of these documents is poor (Green et al. 2010). Many health professionals in Afghanistan have treated patients without STGs. These guidelines are either incomplete and out of date or not available. They are often struggling to make decision on the drugs they want to prescribe. This situation contributes to improper use of antibiotics, injections, drug resistance and irrational use of drug (Bennett 2013).

The survey of health facilities and hospitals in Afghanistan also revealed that, generic drugs and essentials drugs were widely prescribed and dispensed at health facilities and hospitals with percentages of 96 and 97 respectively and these drugs were not a concern of irrational use of drug. Antibiotics appeared in 58 percent of prescriptions and also injections appear up to 18 percent in health facilities. In hospitals, 90 percent of patients received antibiotics and 58 percent at health facility level. These will lead to ADR, financial cost and irrational use of drug. The patient care indicators were also poor, the average consultation time between prescriber and patient was very low 3.3 minutes (Green et al. 2010), while the consultation time has to be 15 minutes (Gottschalk & Flocke 2005). The dispensing time of pharmacist to prepare drugs for patient including consultation on using of drugs was 13.3 second on average. There was also poor and insufficient labeling of drugs that did not include information such as number of drugs, duration, number of times used in a day. Poor labelling and providing of insufficient information about drugs for the patients are the examples of irrational use of drug in Afghanistan (Green et al. 2010).

Figure 5 The average consultation time of prescriber with patient in minutes in health facilities



Source: (Green et al. 2010)

The survey also affirmed that the EDL was available in 29 percent of hospitals and 37 percent of health facilities, guideline for infectious disease control was 29 percent. Also drug information resources (bulletins and posters) were 14 percent in hospitals and 0 percent in health facilities (Green et al. 2010).

In 2010, the SPS project together with technical support of MoPH, Kabul Medical University started to work on developing of STGs for BPHS. The SPS members introduced the concept and principles of STGs to stakeholders. Beside the establishment of STGs health

professionals were also trained on revision of STGs in future without external support (Bennett 2013).

Establishment of DTC was one of the other achievements of the SPS project through rational use of drug. In 2009, the SPS started to establish NDTC (National Drug Therapeutic Committee) with agreement of MoPH and involving of stakeholders. The target was to establish NDTC at hospitals and health facilities as a result the SPS project established NDTC at five hospitals in Kabul and in other provinces (Bennett 2013).

Pharmacovigilance has still remained a problem in Afghanistan. There is no any committee or programs in place to carry out pharmacovigilance activities including ADR, causality assessment, risk assessment, risk management, case investigation and crisis management in Afghanistan. In addition, it is not covered by NDP as well (MoPH/ WHO 2011).

3.3 Regulatory Strategies

Problems regarding the safety and quality of drugs occur in many places around the world. The problem is caused by existence of counterfeit or fake drugs and substandard products (Ratanawijitrasin & Wondemagegnehu 2002).

Evidence shows a repeated increase in number of these products across the world. Such products can cause financial waste, long treatment, increasing drug resistance and death (ICDRA 2004).

To address this issue, WHO Pharmaceutical expert committee established the "International Pharmacopeia" to regulate the quality control and quality assurance aspects(WHO 2007).

Other legal structure for drug regulations are: drug law, drug regulatory agencies, drug evaluation board, and quality control laboratories. Drug law provides a base for drug regulation standards and guidelines. These standards are necessary to be developed under drug law considering all aspects and practices. It also needs to be transparent and comprehensive for all involved parties. Several steps including licensing, inspection, assessment, registration, quality control and monitoring are extremely important to be taken into consideration to assure that safe and qualified drugs are handed to consumers (Ratanawijitrasin & Wondemagegnehu 2002). Pharmacists have greater responsibility to detect and report the counterfeit and substandard drugs with their possible risks including ADR in order to improve health outcome (FIP/WHO 2011).

3.3.1 Pharmaceutical Market

Unsafe drug is a public health problem globally. Poor qualities of drugs are observed around 10 percent in pharmaceutical trade and 25 percent in developing countries. Poor quality of

drugs is those with a copy of genuine product without having any of the correct active ingredients. Unsafe drugs are those covering counterfeit and substandard products. While counterfeit drugs are those mislabeled deceivably. Substandard drugs are comprised of the poor and insufficient ingredients. In fact, the amount of ingredient has significant impact on health of patients. Thus, substandard drugs are partially beneficial for the patient than counterfeit drug which is fake because substandard drugs have active ingredient which is not sufficient (Bate et al. 2012).

Poor quality and counterfeit drugs have negatively impact on rational use of drug as a result of long treatment, risk on health of patients, financial cost and even deaths (WHO 2006b). Counterfeit drugs are not easily determined, modern technology makes it even easier to produce copies of genuine product and pass cross borders. The key intervention for reducing of these drugs are sustainable quality control in all stages including manufacturing, distribution and in the markets (FIP 2003).

3.3.2 Drug Registration:

Drug registration is the first process of legitimating drugs. Although, we cannot argue that quality of drugs is as a result of product registration, but unregistered drugs are more likely to be counterfeited. Moreover, having drug regulation on drug registration is not enough unless there is powerful market surveillance that control the drugs in market, regulation enforcement and give penalties for those who ignoring the rules (Bate et al. 2012).

3.3.3 Regulation Enforcement

In 1988, the WHO took an initial step to publish "Ethical criteria for medicinal drug promotion "It is a guideline on drugs which helps countries for developing drug regulation. Drug regulation is different in terms of content, implementation and enforcement across the world. Nowadays, less than 49 percent of countries have developed a legislative framework in order to regulate the pharmaceutical activities (Piriou & Hayes 2011). Legislative framework is legal base for controlling activities in public and private pharmaceutical sector. This framework includes certain administrative measures and sanctions in response to activities against rules and regulation which are the responsibility of Drug Regulatory Authority (DRA) (WHO 2006c).

The regulations which relates to drug safety is classified into two ex and ante regulations (Bate et al. 2012):

The ante regulations are applied on legitimate manufacturers and legitimate products before the product goes to market. The DRA is responsible to carry out this process and to ensure

that the drugs are safe based on the standard that is regulated in the countries. However, it differs across the countries (Bate et al. 2012).

The ex-regulation is applied by DRA on drugs which already exist in the market in order to monitor the counterfeit drugs in market and enforce penalties for counterfeiters. Penalties are also different in countries that are either monetary or non-monetary. As Egypt has adapted penalties for counterfeiters monetary penalty $90-9000 and non-monetary is 2 months up to 3 years prison (Bate et al. 2012).

Generally the DRA is a functioning agency which regulates several activities that are related to drug registration, manufacturer regulation, importer, exporter, distributer, prescriber and dispenser. Other issues of policy implementation are; to ensure the availability, lower price of drugs and ADR monitoring of the products in market. The DRA has to ensure the safety, effectiveness and quality of drugs produced, imported distributed and dispensed (WHO 2006c). Since access to essential drugs is one of the important issues in public health interventions and also providing of appropriate drug information is essential for rational use of drug. Therefore, the DRA also has to ensure the access to essential drug. Furthermore, it has to ensure that appropriate drug information is provided by the manufacturer (ICDRA 2004). The Quality control is a part of the DRA which ensures the quality and effectiveness of drugs. The quality control has to ensure that drugs are stored properly and has not passed the expiry date. High humidity, high temperature, poor storage condition, poor protection against direct sunlight, dust and pest are challenging for drug safety that can result in degradation of drugs (WHO 2006c). Lack of enforcement of drug policies due to lack of resources, lack of control, insufficient staff or politics will lead to unregistered and poor quality drugs (MSH et al. 1995)

3.3.4 Drug Quality Control Laboratory

The drug quality control laboratory is a functioning unit that is responsible for sampling, specification and testing of drugs. However, the activities are not limited to laboratory practices but also it is involved in activities which are related to drug quality control and quality assurance (WHO 2007).

The accurate and reliable results are obtained when the laboratory accreditation requirement conditions are fulfilled. These conditions are: qualification and training of staff, appropriate equipment, proper condition or environment condition for testing, inspection, proper recording and reporting (ILAC 2011).

3.3.5 Regulatory Strategies in Afghanistan

The pharmaceutical regulation is poorly developed and implemented and is not currently following the global standards (Bennett 2013). The DRA functioning under the cover of GDPA which regulates the drug system and is responsible for drugs inspection, importing control, licensing, post market surveillance and regulation enforcement of public and private pharmaceutical sectors. The DRA does not cover pharmacovigilance, there is no monitoring system in place to monitor ADR in Afghanistan (MoPH/ WHO 2011).

Based on the DRA, the drugs are needed to be imported through authorized borders. Due to lack of human and financial resources the inspection is not applied in borders (MoPH/ WHO 2011). There are a number of smuggled, counterfeit drugs (mislabeling and poor quality), expired drugs and even banned drugs (due to their harmful side effects) available in market which often are sold to poor people because of their cheap price (Paterson & Karimi 2005). According to the DRA, importers, distributers and wholesalers are needed to be licensed and registered (MoPH/ WHO 2011). While many drug importers and whole sellers are not registered (Harper & Strote 2011). Also about 60-80 percent of imports are done by smuggling hence, smuggling of drugs bring a challenge in pharmaceutical system in Afghanistan especially by private sector. Due to open borders with neighboring countries Iran and Pakistan, huge numbers of drugs are imported in Afghanistan without customs payment. Drugs which are smuggled have low quality and have insufficient active ingredients (Paterson & Karimi 2005). The DRA has still failed to address registration and legalizing of the drugs in Afghanistan (MoPH/ WHO 2011).

The MoPH quality control laboratory is responsible for testing the quality of imported drugs, market drugs and testing for registration requirements. The laboratory tests the drugs for the following purposes summarized in table below: (MoPH/ WHO 2011)

Table 2 Reasons for testing drugs in Quality Control Laboratory in Afghanistan

For quality monitoring in the public sector	No
For quality monitoring of private sector	No
When there are complaints or problem reports	Yes
For product registration	Yes
For public procurement prequalification	No
For public program products prior to acceptance and or distribution	No

Source: (MoPH/ WHO 2011)

This laboratory is however not functioning under the DRA and is directly under authority of MoPH. The laboratory is not internationally accredited, suffers from poor resources (human,

material and equipment) and operates in an unsuitable condition. The DRA has not developed Pharmacopeia for drug quality control and quality assurance purposes. There is lack of control in borders and customs control. Moreover, different stakeholders are involved that are not often identified(Paterson & Karimi 2005).

In addition, in market, there is a number of street vendors who are selling drugs for people without having education or even training about drugs (Paterson & Karimi 2005). This condition needs to be controlled through inspection, enforcement and good governance for drugs in order to enforce the regulation (Harper & Strote 2011).

The SPS project with technical support of GDPA/ MoPH established a mechanism to improve and strengthen pharmaceutical regulation. They started working to strengthen stakeholder's coordination, need assessment, developing standards and strategies for drug regulation. It is understood that quality of drugs is an important part of pharmaceutical system. To address this issue, MoPH has established a National Medicine Board (NMB) in 2009. NMB is a multidisciplinary body which regulates the activities concerned with drug quality. In 2010, the SPS started working to strengthen the technical capacity of NMB as it was requested by MoPH. The SPS helped NMB through determining their tasks and accountability, developing of regulatory tools and developing of certain indicators for monitoring the progress (Bennett 2013).

The SPS conducted survey of quality assurance and drugs in public and private health facilities. There are lack of standards and policies of pharmaceutical sector. Besides, policy implementation, registration and licensing procedures are weak (Bennett 2013).

In summary, Afghanistan has poor and insufficient drug regulatory system and poorly implemented, it needs to be adapted and harmonized with internationally drug regulation procedures (Harper & Strote 2011).

3.4 Economic Strategies

3.4.1 Financial Incentives and Reimbursement Mechanism

Over the past years, insufficient financing for health services became problematic in many low income countries. Many countries cannot even provide basic health needs for their population due to poor financing. Beside other factors, irrational use of drug accounts for wastage of resources (Holloway et al. 2001). Expenditures on drugs accounts for 26-65 percent of total health expenditure and 60-90 percent of out of pocket expenditure on health in developing countries (WHO 2006c). In health care system, information between patient and health professional is imperfect. Patients are not knowledgeable on their health needs,

this circumstance is called “information asymmetry” where patient has less information and is not able to take proper decision on his/her health (Dupas 2012). Hence, households are suffering more than 40 percent of their income on health including drugs. Governments are struggling either with allocating resources on drugs or out of pocket expenses on health services including drugs. WHO has developed financial strategy to tackle with high price of drug and to improve affordability of drugs through financial incentives. High price of drugs is one of the barriers to access drugs (WHO 2006c). One of the requirements of pharmaceutical practices is contribution of Pharmacists in rational and economic prescription. Pharmacists need to be actively involved in pharmacotherapy and appropriate prescription in terms of financial aspect (FIP/WHO 2011).

Improving of prepayment mechanisms such as user fees are useful especially for those who cannot afford the drug price (WHO 2006c).

3.4.1.1 User Fees:

User fee is a cost sharing method and it is applied to reduce excessive demand and increase the level of revenues. However, if the cost of drug is high, it is more likely to have negatively impact on poor people and reduce their access to health care including drugs. It is necessary to understand that user fee does not cover the whole costs of drugs and but it is a contribution to the cost. Sometimes, this issue is misinterpreted by consumers which results excessive demand for drugs and irrational use of drug. User fees can improve rational use of drug as providing an incentive for patient and decreasing the cost of drugs, it has also disadvantage that encourages patients to use more drugs because of its low price (WHO 1998b).

In terms of irrational prescription, many studies have been carried out to find out the impact of user fees on cost of irrational prescription and adverse effects of drugs. Financial incentive can reduce prescription of drugs and the drug cost. However, reduction in prescription does not necessarily represent efficiency of treatment for patients who cannot afford treatment cost (Holloway et al. 2001).

There are two kinds of user fees applying on prescription cost. Single fee per prescription (flat prescription fees) and fee per drug item. Single fee per prescription can increase over prescription that leads to financial waste on patient and reduce benefit of user fee for prescription. Fee per drug item will reduce over prescription and is cost effective. However, based on a study in Nepal, which applied these two kinds of user fees, there was not much significant difference between these two user fees in terms of prescription cost but fee per drug item discourages over prescription (Holloway et al. 2001).

Prescribers who are often selling drugs tend to prescribe more drugs because of their financial profit. For the health system it is necessary to not engage doctors in dispensing of drugs in order to reduce over prescription (Holloway et al. 2001).

3.4.1.2 Reimbursement:

Reimbursement method can improve rational use of drug by reducing the cost of drugs from patient's side through developing of insurance schemes or government funds. Patients who get their drugs from private pharmacies, the government can reimburse the cost of drugs dispensed in pharmacies or the reimbursed goes to patients directly (WHO 2006c).

Free or reimbursed drugs, if the essential drugs reimbursed or have been provided free from government to patients it will lead to rational prescribing by prescribers as a result of patient's pressure on prescriber for prescribing those drugs. In addition, if the reimbursed essential drug are harmonized based on STGs, it will also lead to more rational prescribing (MSH 2012b).

3.4.2 Economic Strategies in Afghanistan

It is difficult to measure the economic situation of drugs in Afghanistan. There is no any national drug budget or statistical data on drug financing (Harper & Strote 2011). Drugs are provided by different sources of public and private pharmaceutical sectors (MoPH/ WHO, 2011).

According to constitution law in Afghanistan, public health services provide services free of charges. Health services including drugs for treatment of Malaria, Tuberculosis, HIV/AIDS, sexual transmitted disease and EPI (Expanded Program on Immunization) are also covered for free. Price of drugs is not regulated in Afghanistan. Public health sector only provides 50 percent of drugs to patients and often drugs are not available in public health sector and people buy their drugs from private health sectors (out of pocket expenses) (MoPH/ WHO 2011). Up to 20-30 percent of drugs used in Afghanistan are donated drugs and the rest 70-80 percent are supplied by other private sectors which is provided by various companies with different prices (Paterson & Karimi 2005). There is no any drug price monitoring carried out by HAI (Health Action International) in Afghanistan to find out the drug prices differences (MoPH/ WHO 2011). Most of donated drugs have short time to be expired and counterfeit by repackaging that are hugely available in market (Paterson & Karimi 2005).

Irrational prescription is an important issue of irrational use of drug and especially for antibiotics that are widely used in Afghanistan. Irrational prescription mostly happens in private sector than in public sector (Green et al. 2010). Most of doctors in private sectors

overprescribe because; often doctors owned both private clinics and pharmacies or they have mutual financial contract with owners of the pharmacies. In most of times doctors prescribe using anonymous abbreviations which is often difficult to understand in pharmacies except their own pharmacies. Or they tell patients to buy drugs from their own pharmacies (Paterson & Karimi 2005). The average number of drugs per encounter in private sector is 2.4 and 1.88 in public sector (Green et al. 2010). In addition, out of pocket expenditure on drugs is high specially in private sector and people tend to go to private sector because of its availability and personal perception of its high quality (Harper & Strote 2011). For Afghanistan which has a "Free market" it is difficult to regulate or enforce the price of drugs (Paterson & Karimi,2005).

Chapter 4 Discussion

Throughout the findings part I exposed several gaps in that need to be addressed in Afghanistan. In this chapter I discuss the key findings in light of the current situation in Afghanistan. Through this process I arrive at key conclusions - and formulate recommendations based on both the global standards, and feasibility in the Afghan context – these are presented in the next chapter.

4.1 Lack of patient centered approaches

Considering the knowledge of the patients is an important issue because, the outcome of the treatment hugely depends on them. Patients are the ones who are using the drugs. Meanwhile, if the patient is not knowledgeable on his or her drugs it will lead to irrational use of drug that we discussed early.

In spite of several interventions by the SPS project that were done in Afghanistan, none of them provided detailed information based on patients perspective and behavior. In addition, the education programs for patients were not interactively engaged the patients. We are not assured do they actually apply the information given to them while using their drugs. Based on Ghana experience that we mentioned, probably most of patients understand their drugs but they will not apply or will not care because they are not understood on consequences of taking no drug.

Providing only one side information via mass Medias or directly to the patients is not useful unless the information is harmonized based on patient behavior. Hence, Patients have to know why I am taking drug or why I have to take full course of antibiotics. Will patients be satisfied when told her to take a drug three times a day? Surely they need to know the reason behind of taking drugs.

The government needs to promote patient centered approaches in health facilities for patients, in communities, educational programs and in schools in order to ensure that drugs are being used appropriately by the patients.

Coordination among stakeholders including Ministry of Education, as well as MoPH, mass media, donors and NGOs is crucial.

4.2 Lack of Educational curricula

We already know that educational programs are useful for better prescription practices and appropriate medication and providing proper information for the patients.

Although, several education programs were applied for the doctors and pharmacists by the SPS project. We found two gaps that are summarized as below:

1- Enriching of the curricula for the doctors in medical universities was not addressed by the strategies in spite of providing several educational programs for the doctors by the SPS. As it is mentioned before, that the educational curricula of the doctors does not include STGs and essential drugs concepts. In addition, providing educational programs for the doctors who are practically working in health facilities and hospitals is insufficient unless we ensure that these concepts are already covered by medical universities' curricula. It needs to be targeted by the government through an inter sectorial coordination between MoPH, Ministry of Higher Education and relevant donors and NGOs, to ensure that doctors who are graduating from medical universities are knowledgeable enough for applying these concepts in practical.
2- We discussed the role of pharmacists in all of the good practices of strategies in terms of proper communication with patients, managing drug supply system, cost effective therapy, safety and quality of drugs. Compare to our findings which affirms that pharmacists in Afghanistan are often busy with non -professional carriers. In additions, there is lack of pharmacists and instead, other people with no professional background are working as pharmacists in pharmacies and providing information on drugs to the patients which are poor. Furthermore, strategies were not able to adequately target this issue and also enrichment the pharmacy Faculty's curricula with respect to the role of the pharmacist in health system. It is necessary for the MOPH to take further actions to engage more pharmacists, to avoid business of non-professional people in pharmacies and to enrich the curricula based on the concepts summarized in table one.

4.3 The DRA is poorly functioning

It has been understood that the DRA concerns with a number of activities which lack of them contributes to availability of poor quality and counterfeit drugs which leads to irrational use of drug. We imagine circumstances where patients are aware of their drugs and know how to use them. Furthermore, doctors are knowledgeable enough to prescription practices and also STGs and other drug information resources are available. If drugs are available with poor quality and are counterfeit it will lead to irrational use drugs that mentioned earlier. Our findings describe that, the DRA activities are poor due to human and financial resources; lack of inspection in borders, unidentified stakeholders in boarders, unregistered importers and

wholesalers, no pharmacovigilance unit and the drug quality control laboratory in Afghanistan is poor. We found that the strategies in Afghanistan often targeted drug education programs and strengthening supply systems and have not prioritized these issues. There are many counterfeit drugs available in market and there is no pharmacovigilance and no ADR monitoring has been applied. Probably many patients' health is deteriorated as a result of counterfeit drugs in Afghanistan that was addressed to many other factors and or even ignored.

To overcome to this problem, a mechanism needs to be created by the Government to establish pharmacovigilance unit under the DRA to monitor ADR, misuse, quality, safety of drugs and to avoid availability of counterfeit drugs, enforce regulation, strengthening capacity building of drug quality control laboratory to test the drugs based on, strengthening post market surveillance, engaging of pharmacists are more useful to further improve pharmacovigilance activities. However, it might be difficult for the government of Afghanistan to address issues without proper and sustainable resources, good governance and stakeholders' commitment and coordination and control in borders. Open borders of neighboring countries is an important problem in Afghanistan, where the MoPH is not only responsible for this problem. Roles of ministries such as Ministry of Interior Affairs, local police and people as inter sectorial coordination is critical in detecting counterfeiters and smugglers who are importing poor quality drugs. Also other stakeholder's coordination such as Ministry of Finance, donors and NGOs is important to accredit to drug quality control laboratory in Afghanistan.

4.4 Irrational prescription

Generally we mentioned earlier that irrational prescription leads to irrational use of drug through high prescribing antibiotics, high out of pocket expenses in private sector, poor availability of EDL and long term shortages of drugs which results prescription of alternative drugs.

The consequences of irrational prescription are also known which are prolonging treatment, ADR and financial damage to the patients.

Based on Afghanistan context we analyze this issue considering two aspects:

1- Irrational prescription occurs in many health facilities and especially in hospitals. In Afghanistan, many reasons have contributed to this problem which was discussed above.

2- It is also understood that irrational prescription occurs mainly in private sector due to over- prescription of drugs by doctors based on economic aspects which leads to high out of pocket expenses for the patients

In Afghanistan, the SPS project put lots of efforts to address this issue by providing STGs to BPHS, training on rational prescription and strengthening supply system but the question is: Are these activities sufficient to solve the problem of irrational prescription? Doctors due to financial reasons will over prescribe in spite of understanding its bad consequences and availability of STGs. The out of pocket expenses is also high. The main gap that we found is addressed to the issue of over prescription specifically for the private sector. Private sectors where 70 percent of drugs are provided for the people and patients often buy their drugs from private pharmacies through out of pocket payment. In addition, doctors are often owner of the pharmacies that more bridges to this gap in Afghanistan. There is no any strategy in place to address over prescription based on economic aspects. The government also cannot refuse the private sectors because private sectors are providing a huge amount of drugs for the consumers.

Our finding suggests establishment of reimbursement mechanism by the government systems to reimburse the cost of the essential drugs prescription by applying of insurance schemes or government revenue that will encourage rational prescription and drug affordability to the patients. The other strategy is applying the user fee strategy of fee per drug item that reduces the over prescription based on experience of a study conducted in Nepal. Furthermore, the government needs to have stronger control the involvement of doctors in the private sectors and to ensure that they are not financially engaged in pharmacies.

Although it might be challenge for the government to control the private sectors while applying of these methods due to certain problems raised by private sector in terms of over reporting the drugs, or do they actually sell the drugs for free or not? That needs to be considered. In addition, if the government face to insufficient fund which leads to delay in receiving the reimbursement that can increase the cost of drug by private sector. On the other hand, reimbursement has an advantage that will discourage drug vendors who are illegally selling drugs on street for the patients with the lowest cost in Afghanistan that was mentioned earlier.

Chapter 5 Conclusion and Recommendation

Rational use of drug is a priority for Afghanistan. Based on the discussion, four main gaps are found in strategies of rational use of drug which are important. Thus, in order to improve rational use of drug these four gaps which are lack of patient centered approach, lack of education curricula, lack of the DRA activities and irrational prescription are required to be prioritized.

It is necessary to improve patient centered approaches in all educational programs for the consumers and expanding these programs into schools and communities. The educational programs should be provided in such a way to consider people own beliefs and thoughts on drugs and engage people interactively. Considering the pharmacists as good communicators with people in terms use of drugs is essential.

Curricula for the doctors and pharmacist are required to be enriched and expanded with the needed subjects which were mentioned earlier. Education for the doctors in medical universities in terms of appropriate treatment based on STGs and essential drug concept will be a good approach for rational use of drug before they start working in hospitals and health facilities. The curricula of pharmacists are needed to be expanded based on the role of the pharmacist in all strategies of rational use of drug.

Problems with safety and quality of drugs still exist in Afghanistan. Considering the establishment of Pharmacovigilance is critical. The DRA is not sufficiently active to tackle the issues concerning the safety and quality of drugs and enforce regulation in Afghanistan. Strategies are needed to address this issue by establishing pharmacovigilance to be able to strengthen surveillance system to control safety, ADR, quality of drugs and also strengthening the drug control laboratory in terms of human and financial resources and infrastructure.

Irrational prescription is going to increase mostly in private sector. People often buy drugs through out of pocket. Government needs to target this issue by providing reimbursement approach for private pharmacies principally for the essential drugs and/or applying of fee per drug item not fee per prescription. On one hand, in applying reimbursement, we will be assured that essential drugs are being used by the patients. On the other hand, it will reduce over prescription by applying user fee as fee per drug item which improves rational prescription in Afghanistan.

The following issues are the recommendation for the MoPH and other stakeholders including Ministry of Finance (for funding issues), donors, NGOs, Ministry of Higher Education

(involving in enriching curricula), Ministry of Interior Affairs (for controlling the borders and prevent from importing of counterfeit drugs), medical associations (for improving rational use of drug through conducting further researches) and pharmaceutical companies:

- Conducting interactive educational programs on rational use of drug for other through community oriented programs and patients in health facilities (Patient centered approach)
- Educational curricula of doctors in Kabul Medical University should be revised and the concepts of STGs, pharmacovigilance and EDL should be included. Curricula of pharmacists from Kabul University should be expanded to the topics summarized in table one
- Improving drug promotional activities such as conducting of clinical research and writing of journal articles should be promoted by medical associations including doctors, nurses and pharmacists
- Government (MoPH) should establish pharmacovigilance unit under the cover of the DRA in order to control the drug safety, rational use of drug, health risk assessment including ADR and drug information.
- Manufacturers, importers and donors should provide adequate information on their drugs to the DRA. Additionally they have to ensure that their products meet appropriate standards of safety and quality.
- Drug quality control authority should be accredited based on the international standard guidelines and should be established in an appropriate place. It is better to work under the cover of the DRA in order to expand its activities.
- Long term commitment of stakeholders is necessary through all steps for maintaining sustainable fund, promoting educational programs and providing of safe and qualified drugs for people
- Relevant actors of Ministry of Interior Affairs should have a regular control on borders to avoid importations of counterfeit and smuggled drugs
- Applying of user fees as fee per drug item for the patients and reimbursement system in pharmacies in order to prevent from over prescription by doctors and to improve affordability of drugs to the patients
- Government should control and ensure that doctors who are prescribing in private sectors should not be engaged with pharmacies in order to prevent from over prescription

References:

APHI/MoPH, CSO & Macro, ICF, IIHMR, W., 2011. *Afghanistan Mortality Survey 2010*, Kabul: Afghan Public Health Institute/Ministry of Public Health, Central Statistics Organization, ICF Macro, Indian Institute of Health Management Research, World Health Organization Regional Office for the Eastern Mediterranean.

Bate, R., Jin, G.Z. & Mathur, A., 2012. *Counterfeit or Substandard ? The Role of Regulation and Distribution Channel in Drug Safety*, Combridge.

Bennett, R.J., 2013. *SPS Afghanistan Leader with Associate: A Retrospective Report*, Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

Çelik, E., Şencan, M.N. & Clark, M.P., 2013. Factors Affecting Rational Drug Use (RDU), Compliance and Wastage. *Turk Journal of Pharmaceutical Science*, 10(1), pp.151–169.

Chetley, A., Hardon, A. & Hodgkin, Catherine, Haaland, Ane, Fresle, D., 2007. *How to improve the use of medicines by consumers* Tercera ed., Geneva: World Health Organization.

Desalegn, A.A., 2013. Assessment of drug use pattern using WHO prescribing indicators at Hawassa University Teaching and Referral Hospital, south Ethiopia: a cross-sectional study. *BMC health services research*, 13, p.170.

Dijk, K.H. and L. van, 2011. The World Medicines Situation 2011: Rational Use of Medicines. In *The World Medicines Situation 2011*. Geneva: World Health Organization, p. 24.

Dupas, P., 2012. Global Health Systems : Pricing and User Fees. *Elsevier Encyclopedia of Health Economics*, (March), pp.1–17.

EFPIA, 2013. *EFPIA Good Practice – October 2013: Reducing Risk for Drug Products Shortages*, Bruxelles: European Federation of Pharmaceutical Industries and Associations.

Elizabeth Lai, Le Trac, A.L., 2013. Expanding the Pharmacist's Role in Public Health. *Universal Journal of Public Health*, 1(3), pp.79–85.

FIP, 2003. *FIP statement of policy on counterfeit medicines*, The Hague: International Pharmaceutical Federation.

FIP, 2011. *International Pharmacy Journal*, The Hague: International Pharmaceutical Federation.

FIP, 2006. *The role of the pharmacist in pharmacovigilance*, The Hague: International Pharmaceutical Federation.

FIP/WHO, 2011. *Joint FIP/WHO guidelines on good pharmacy practice: standards for quality of pharmacy services*, Geneva: International Pharmaceutical Federation/ World Health Organization.

Gottschalk, A. & Flocke, S.A., 2005. Time spent in face-to-face patient care and work outside the examination room. *Annals of family medicine*, 3(6), pp.488–93.

Green, T. & Gammouh, S., 2012. Strategies to Improve the Use of Medicines — Standard Treatment Guidelines. In *Drug and Therapeutics Committee Training Course*. Amman: Rational Pharmaceutical Management Plus Program of Management Sciences for Health, p. 31.

Green, T., Omari, M.Z. & Siddiqui, Abdul Zahir, Anwari, Jamahir, and Noorzaee, A., 2010. *Afghanistan Medicine Use Study: A Survey of 28 Health Facilities in 5 Provinces*, Submitted to the U.S. Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

Harper, J. & Strote, G., 2011. Afghanistan Pharmaceutical Sector Development: Problems and Prospects. *Southern Med Review*, 4(1), pp.29–39.

Holloway, K., 2009. Rational Use of Drugs: an Overview. In *Technical Briefing Seminar*. Geneva: World Health Organization, pp. 1–43.

Holloway, K. a, Gautam, B.R. & Reeves, B.C., 2001. The effects of different kinds of user fee on prescribing costs in rural Nepal. *Health policy and planning*, 16(4), pp.421–7. Available at: http://www.ncbi.nlm.nih.gov/pubmed/11739367.

Hugman, B., 2006. The Erice Declaration: The Critical Role of Communication in Drug Safety. *Drug safety: an international journal of medical toxicology and drug experience*, 29(1), pp.1–3:2.

ICDRA, 2004. *International Conference of Drug Regulatory Authorities: Progress Report and Recommendations Progress*, Hongkong: Eleventh International Conference of Drug Regulatory Authorities.

ILAC, 2011. *Laboratory Accreditation or ISO 9001 Certification*, Silverwater, Australia: International Laboratory Accreditation Cooperation.

Islam, M., 2007. Pharmaceutical Management Module. In *Health Systems Assessment Approach: A How-To Manual*. Arlington, VA: Management Sciences for Health, pp. 1–44.

Karwar, W., Omari, M.Z. & Fatehzada, Zakeria, Noorzaee, Aisha, Yusuf, Inua, Lee, David Morris, Mark Layloff, T., 2011. *Afghanistan Medicines Quality Assurance Assessment – A Qualitative Survey*, Submitted to the USAID by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

Mintzes, B., 2005. *Educational initiatives for medical and pharmacy students about drug promotion: an international cross-sectional survey*, Geneva: World Health Organization and Health Action International.

MoPH, 2005. *National Health Policy 2005-2009 and National Health Strategy 2005-2006: A Policy and Strategy to Accelerate Implementation*, Kabul: Ministry of Public Health.

MoPH/ WHO, 2011. *Afghanistan Pharmaceutical Country Profile*, Kabul: Ministry of Public Health / World Health Organization.

MSF, 2013. *Essential Drugs: Practical Guidelines* 2013th ed. J. Pinel, F. Weiss, & V. Henkens, Myriam(MD), Grouzard, eds., Paris: Médecins Sans Frontières.

MSH, 2012a. Managing for Rational Medicine Use. In *Managing Access to Medicines and Health Technologies*. Arlington: Management Sciences for Health, p. 16.

MSH, 2012b. *MDS-3:Managing Access to Medicines and Health Technologies* 3rd ed., Arlington VA: Managing Drug Supply-3, Management Sciences for Health.

MSH, 2012c. Pharmaceutical Supply Strategies. In *Managing Access to Medicines and Health Technologies*. Arlington VA: Management Sciences for Health, p. 21.

MSH, URC & PAHO, 1995. *Rapid Pharmaceutical Management Assessment: An Indicator-Based Approach,* Arlington: Management Sciences for Health,University Research Corporation, Pan American Health Organization.

Paterson, A. & Karimi, A., 2005. *Understanding Markets in Afghanistan: A Study of the Market for Pharmaceuticals*, Kabul: Afghanistan Research and Evaluation Unit.

Piriou, C. & Hayes, E., 2011. *Medicines Promotion: Assessing the Nature, Extent and Impact of Regulation. Report and Preliminary Methodology for Pilot-testing,* California: Health Action International (HAI) Global.

Ratanawijitrasin, S. & Wondemagegnehu, E., 2002. *Effective Drug Regulation: A Multicountry Study,* Geneva: World Health Organisation.

SPS, 2011. *Strengthening Pharmaceutical Management in Afghanistan*, Arlington, VA: Management Sciences for Health, Strengthening Pharmaceutical Systems.

SPS, 2012. *Success Story: Public Education Promotes Rational Medicine Use*, Kabul: Management Sciences for Health, Strengthening Pharmaceutical Systems.

Villacorta-Linaza, R., 2009. Bridging the Gap: The Role of Pharmacists in Managing the Drug Supply Cycle within Non-governmental Organizations. *International Journal of Health Planning and Management*, 24, pp.73–86.

WHO, 1998a. Essential Drugs Monitor. *WHO Action Programme on Essential Drugs and Vaccines*, (25 & 26), p.36.

WHO, 1998b. *Financing Drugs in South-East Asia: Report of the Second Meeting of the WHO/SEARO Working Group on Drug Financing, Yogyakarta, Indonesia, 24-28 November 1997*, Geneva: World Health Organization.

WHO, 2007. *Quality assurance of Pharmaceuticals: A compendium of guidelines and related materials* 2nd ed., Geneva: World Health Organization.

WHO, 1987. *The Rational Use of Drugs: Report of the Conference of Experts Nairobi, 25- 29 November 1985,* Geneva: World Health Organization.

WHO, 2006a. *The Role of Education in the Rational Use of Medicines* 1st ed., SEARO Technical Publication, New Delhi: World Health Organization Regional Office for South-East Asia.

WHO, 2006b. *The Safety of Medicines in Public Health Programmes: Pharmacovigilance and essential tool*, Geneva: World Health Organization.

WHO, 2000. *The use of essential drugs. Ninth report of the WHO Expert Committee.*, Geneva: WHO Technical Report Series, No. 895, World Health Organization.

WHO, 2006c. *Using Indicators to Measure Country Pharmaceutical Situations: Fact Book on WHO Level 1 and Level 11 Monitoring Indicators*, Geneva: World Health Organisation.

WHO, 2004. *WHO Medicine Strategy 2004-2007: Countries at the Core*, Geneva: World Health Organisation.

WHO, 2002. *WHO Policy Perspectives on Medicine - Promoting Rational Use of Medicines: Core Components*, Geneva: World Health Organisation.

Wiedenmayer, K., Summers, R.S. & Mackie, Clare A., Gous, Andries G. S., Everard, Marthe, Tromp, D., 2006. *Developing pharmacy practice A focus on patient care* 2006th ed., The Hague: World Health Organization and International Pharmaceutical Federation.

Yousefi, N., Majdzadeh, R. & Valadkhani, Mahboube, Nedjat, Saharnaz, Mohammadi, H., 2012. Reasons for Physicians' Tendency to Irrational Prescription of Corticosteroids. *Iranian Red Crescent medical journal*, 14(11), pp.713–8.