Republic of the Sudan
Notional Ministry of Health
Directorate General of Pharmacy

Evaluation of the Revolving Drug Fund (RDF) Project in the Sudan

The leadership's perspectives

2008

SUDAN CURRNCY PRINTING PRESS

WHO is grateful to the European Commission for their generous contribution to this work. The study would not have been possible without their financial support.

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Acknowledgements

Directorate general of Pharmacy (DGoP) would like to thank the team worked in this evaluation for their hard work and time and the World Health Organization (WHO) for their financial support.

The team sincere appreciation is extended to Dr. Asim Ahmed Elnoor for his clear guidance and valuable advices throughout the implimintation of this study.

The team would also like to thank Dr. Nahid Idries Salih, technical officer WHO, Sudan for her continuous support and motivation during the conduction of this study and they would also like to express their gratitude to Dr. Muna Hassan Mustafa WHO Sudan for her valuable role during the writing of this report.

The task force would like to expresses their gratitude to the health care managers in RDF facilities. Special thanks are owed to the pharmacists serving in the public and private health care facilities within the seven surveyed states. They would also like to thank Mr. Mohamad Hamad Ahmed for his valuable statistical advice.

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Acronyms and abbreviations

BI	Bamako Initiative
CMS	Central Medical Supplies
EML	Essential Medicines List
GDP	Gross Domestic Product
MDS	Managing Drug Supply
MoH	Ministry of Health
MPR	Median Price Ratio
MSH	Management Sciences for Health
NGOs	Non Governmental Organizations
PHC	Primary Health Centre
RDF	Revolving Drug Fund
RPMA	Rapid Pharmaceuticals Management Assessment
SNF	Sudan National Formulary
STGs	Standard Treatment Guidelines
WB	World Bank
WHO	World Health Organization

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Executive summary

The aim of this study was to generate baseline data regarding the accessibility to essential drugs, the affordability and willingness of patients to pay in addition to gathering information about patients' satisfaction regarding the RDF services in the Northern Sudan.

It was carried as a cross-sectional facility based study and was conducted in the following states: Gezira, White Nile, Kassala, Blue Nile and Gadarif. These states were selected to insure that vast demographic variations in Sudan are represented. Darfur state was also included in the sample in order to represent post conflict states. Southern Sudan was not included in the study due to political, financial and logistic reasons.

Two baskets of drugs were selected to be included in the study. The first basket which included 16 key drugs (Table 1) was investigated for availability, presence expired drugs, price and duration of out of stock. A basket that included 15 supplementary drugs (Table 2) has been selected to measure availability, verify the existence of drugs due to expire or have been expired.

The mean value of the key drugs available in public sector was found to be 92.6% and the mean value of the key drugs available within the surveyed health care facilities in the private sectors was found to be 90.5%.The mean value of the availability of supplementary drugs in the public sector was 84.3%, while in the private sector it was found to be 80.5%.The mean value of key drugs available in the main medical stores with RDF services was

91.7%.The mean value of out of stock duration (in days) of key drugs in RDF main stores was 22.8 days.

The RDF health care facilities were described as easily accessible by 64.8% of the study participants, and 70.6% of the participants have declared their satisfaction regarding the availability of prescribed drugs. In addition 71.7% of the interviewed subjects stated that they are able to buy their prescribed medications. Overall 84% of the candidates stated that they were satisfied with the services delivered to them through the RDF health care facilities.

Although the performance of the RDF system seems to be satisfactory according to the results obtained, continuing of the efforts to increase the awareness about the RDF services among the public essential in addition the continuous evaluation of the quality of the services provided is recommended.

Chapter (1)

Introduction

1.0 Introduction

Sudan is the largest country in Africa, situated in the northeast to central part of the continent. It is the tenth largest country in the world by area, is roughly near the size of Europe and shares frontiers with nine countries. It is dominated by the river Nile and its tributaries.

The discovery of oil in the 1996 led to the rapid development of infrastructure and build up of a new modern society. Sudan derives most of its national revenue from oil, cotton, gum acacia and animal exports.

The dramatic increase in health care costs in the last two decades has drawn the attention of healthcare leaders, policy makers, planners and researchers. Governments worldwide are seeking proper and effective financing mechanisms for health care. Although this problem affects developed countries as well, it is more acute in underdeveloped and developing countries due to their low ability to obtain the proportion of their gross domestic product (GDP) in taxes.

Many initiatives and conferences were held by World Health Organization (WHO) to over- come the problem of financing health services (one of which is pharmaceutical services), for instance, the Bamako initiative (BI) and the Almahata Declaration in the years 1988 and 1978, respectively. One of the important recommendations set by these initiatives is to apply the cost recovery system (user fees).

The BI depended on user fees to achieve its goals which were to raise and control revenues at the primary health level through community based activities and to enhance community management capacities (Gilson, 1997). In developing countries, and since the BI, user fees have been charged commonly in order to raise much-needed revenue. Many governments (particularly in Africa) have found themselves unable to maintain a continuous supply of drugs. The introduction of cost-sharing through user fees has been proposed as one of the strategies to lighten the physical burden of most governments, preserve the sustainability of the drug distribution system as well as to improve the efficiency of the overall public health sector. Cost-sharing is the drug financing program that is sustainable with contribution from both public sector as well as community (through user fees). Facing shortage of drug supplies for health care facilities in many developing countries, it was recommended by the WB in 1987, that some mechanisms of user charges should be implemented in the community. Furthermore, the money recovered should be used for the replenishment of drug supplies in that community.

The World Bank (WB) defines the term RDF as community financing for the availability of essential drugs at full cost prices (World Bank, 1994). RDFs, which are one type of drug sales program or cost recovery systems, attempt to mobilize financial resources based on a domestic willingness of people to pay for health services. RDF is one method for financing drugs and other pharmaceutical supplies, in which, after an initial capital investment, drug supplies are replenished with monies collected from the sales of drugs.

RDF services are attractive, because they are theoretically self-financing after a one-time capital investment by the community, the government, outside donors or loans. The one-time initial investment could be either in drugs or in money (cash/hard currency). In the later case, cash is spent to purchase drugs for initial drug stock (World Bank reports 1998).

The scope in Sudan

The availability and accessibility of good quality essential drugs has been a challenge for the Ministry of Health (MOH) in Sudan since the attainment of independence in 1956. The problem was particularly acute at the level of rural health care facilities. Attempts to address the issue resulted in the introduction of the essential drug list in the early 1980s, followed by revolving drug fund (RDF) which was set up in 1989 in Khartoum state, the capital of Sudan it is focusing to improve access to high quality drugs across the Khartoum state. An evaluation in 2004 showed that the fund has successfully managed a number of threats to its financial sustainability and has expanded its network of facilities, the range of products and the financial assets. The scheme now supplies essential drugs to 3 millions out of the 5 millions population of Khartoum each year, at prices between 40% and 100% less than alternative sources. However, results illustrated the tension between achieving an efficient cost-recovery system and access for the poorest (Witter, 2004).

RDF scheme in our country was the reflection of Sudan's commitment towards Bamako's recommendations. The start-up effort to implement such a complex system as the RDF can only be done in phases. Success depends on developing and testing drug supply procedures, community sensitization, selection and training of personnel, renovation or construction of facilities and financial management system. A phased approach over a reasonable period of time led to public acceptance, a well designed fee collection system, a management capacity building and a well-trained RDF staff. In addition, a phased approach offers advantage of firmly establishing a reliable drug supply, effective financial management and efficient pricing, inventory and accountability systems. The main

strategy used in achieving the project goals was the development of improved financial and drug management systems focusing on the following areas:

- Drug selection,
- Procurement,
- Storage and stock control,
- Distribution,
- Auditing, and
- Accounting.

The improvement of logistics support at the RDF and in the health care facilities could be achieved via: proper selection, improved procurement and controlled distribution of drugs and installation of an efficient management system [e.g. by developing health information systems (HIS)] like the Oracle, Cerner, and Procure, Cuba … etc.).

The launching of the RDF in Khartoum state/Sudan started in 1989 with just **n= 13** primary health care centers (PHC) mainly located in urban and pre-urban areas of Khartoum state (Gamaleldin, 2000).

Then it was instituted in June 2002 by Central Medical Supplies (CMS) which is a public organization responsible for drug distribution in Sudan, so as to cover the whole country. The scheme was phased in three steps as follows:

Phase I:

The scheme was launched in the year 2002 with only seven states representing the whole country, these states were:

Red sea, Gadaref, Algazeera, White Nile, North Kordofan, South Darfur and Northern state

Phase II:

In the year 2003, another ten states were covered under the umbrella of RDF, which included:

Kassala, River Nile, Blue Nile, Sinnar, South Kordofan, West Kordofan, North Darfur, West Bahr Al-Gazal, Higher Nile and Bahr Aljebel

Phase III:

In the year 2004, Unity and West Darfur states were covered

The implementation of RDF services was shown in the appendices in the Sudan map.

The overall coverage of the project included nineteen out of twenty six states as documented in the records of CMS/Khartoum-Sudan (Unpublished report of RDF in Sudan, 2008).

1.1. Pharmaceutical policies

In Sudan, several structures to regulate and manage the pharmaceutical area are in place, but to become effective most of them need substantial strengthening. However, the basic tools for an effective national essential drugs program are in place. The pharmaceutical policy and the national essential drugs list is reviewed and updated on regular basis.

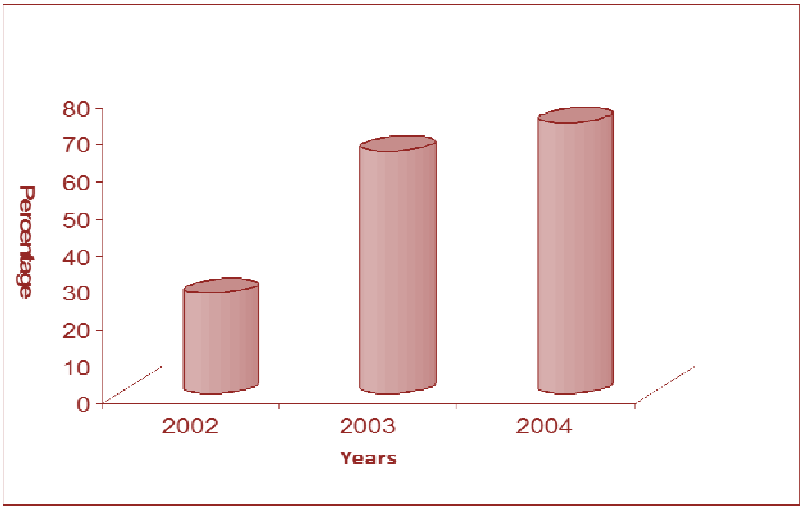


Figure 1: The percentage of RDF services coverage across the 26 states of Sudan

1.2. The pros and cons of RDF services

RDF services have been established in, Afghanistan, Bolivia, India, Indonesia, Niger and other countries across the globe. However, the establishment and maintenance of RDF has been faced with some difficulties. The factors that affect RDF can be summarized in Loss of money, high operating costs, failure to collect payment, unanticipated price increases due to inflation, too low prices for intended level of cost recovery, unanticipated losses of the drugs, community non-compliance and rapid expansion of the program. The success factors for RDF are political commitment, RDF management and the community willingness

Chapter (2)

Aims and objectives

2.0 Aims and objectives

2.1. Problem statement

Pharmaceutical supply systems (chains) in many developing countries have serious and critical problems, including ineffective procedures in selection and economically inefficient procurement and distribution systems. The impact of these problems on drug supplies is inefficient availability (out of stocks and overstocks), unaffordable prices and low quality of pharmaceuticals.

Prior to the implementation of the RDF project, there was a problem of unsustainable pharmaceutical supplies in public health units at different levels in diverse health care settings. However, the size of the problem has reduced after the launch of the RDF services. This study is intended to evaluate the weaknesses and strengths of the RDF system in place.

2.2. The stated objectives of the evaluation

2.2.1 Main objective

The main objective was to evaluate the role of RDF in improving accessibility to essential drugs (availability, geographical coverage and affordability).

2.2.2 Specific objectives

The followings were the specific objectives of this evaluation study**:**

1. To assess the accessibility of essential drugs in terms of physical availability, geographical coverage and affordability.
2. To measure the affordability and willingness of patients to pay for their needs for essential drugs.
3. To assess patient satisfaction regarding RDF services.

Chapter (3)

Methodology

3.0 Methodology

Data collection took place in July-August 2008, from the different health care facilities in both public (covered by RDF system) and private.

The study was based on the drug management cycle framework in the Management Sciences for Health **(MSH)**, focusing mainly on supply as one of the framework components. Indicators (drug lists) and interview questions (patient satisfaction) used in this study were designed in accordance to:

- Assessment guidelines from managing drug supply (MDS) by the **MSH** and the WHO,
- The rapid pharmaceutical management assessment (RPMA) to assess the structures, policies and processes, and
- The accessibility to essential drugs through the RDFs service.

As well there were stock-outs reports at various public health institutions around the country.

3.1. The study design

Descriptive cross sectional facility based study.

3.2. Study Setting:

The study was conducted in seven from the 15 northern states taking the consideration of the vast demographic variation in Sudan, namely Gezira, Northern, White Nile, Kassala, Blue Nile and the Gadarif states in addition to Darfur so post conflict areas can be represented and compared as a case study with the rest of the country.

3.3. Study Population

1. The head of RDF at each state (for collection of RDF main stores data).
2. The health care facilities covered with RDF services:
    - One public / teaching hospital.
    - Three rural hospitals.
    - Two primary health centers.
3. Three private drug outlets.
4. Clients.

3.4. Sampling

Stratified cluster sampling was used to select participants from the study population in order to obtain a uniform distribution of subjects with relation to their diverse social and economical backgrounds.

The data on accessibility was collected from different level of facilities from the different states to get a clear and representative data about the RDF system at different levels of its supply chains.

3.4.1. Sample Size:

Fifteen clients from each health care center, thirty from each rural hospital and sixty clients from the teaching or referral hospital included in the sample were chosen. The assessment target was approximately (N= 180) subjects from each state. This constituted a total target of (N= 1260). The study subjects had been interviewed by the investigators when leaving the dispensing area or the health facility.

3.5. Indicators and measurements

- **Access**
  1. Availability of key medicines in public health facility dispensaries, private drug outlets and warehouses supplying the public sector (Survey Forms 3, 4, 5, 8A,8B and 13)
  2. Percentage of prescribed medicines dispensed or administered to patients at public health facility dispensaries (Survey Form 6)
  3. Stock out duration at public health facility dispensaries and warehouses supplying the public sector (Survey Forms 2, 3, 4, 6)
  4. Percentage of Adequate record keeping at public health facility dispensaries and warehouses supplying the public sector (Survey Forms 6)
  5. Affordability of treatment for adults and children under 5 years of age at public health facility dispensaries and private drug outlets (Survey Forms 7A, 7B)
  6. Percentage of average international price paid for a set of indicator drugs (C/R/F)

- **Purpose**

    1. Average cost of medicines and related fees at public health facilities (Survey Form 6)

- **Quality**

    1. Presence of expired medicines in public health facility dispensaries, private drug outlets and warehouses supplying the public sector (Survey Forms1, 2, 3, 4, 8A, 8B)

3.6. The pilot study

The survey part of the study has been critically appraised and tested in the Nile river state. This state was not included in the planned states covered by the main study. The study data was collected from the following health care facilities:

- RDF main store, three health care facilities and three private pharmacies. A total of 15 samples were collected regarding availability and pricing.
- Thirty samples regarding patient's satisfaction were collected from Atbara teaching hospital, Eldamar and Elfadlab rural hospitals in the Nile river state.

3.7. Selecting basket of key drugs

1. List of 16 key drugs

A list of 16 key drugs used to treat common health problems has been selected to measure availability, presence of expired drugs, price and the duration of drugs out of the stock (Table1).

Table 1 : List of key drugs used to treat common health problems

S. N.	Generic name	Strength	Dosage form	Target pack size
1	Adrenaline	1 mg/ml	Ampoule	1
2	Amoxicillin	250 mg	Capsule	21
3	Atenolol	50 mg	Tablet	10
4	Benzyl pencillin sodium	1000000 IU	Vial	1
5	Chlorpheniramine maleate Injection	10 mg/ml	Ampoule	1
6	Clotrimazole ointment (antifungal)	1%	Tube	1
7	Co-trimoxazole Suspension	8+40 mg/ml	Powder	1
8	Diclofenac Sodium	25 mg	Tablet	10
9	Ferrous sulphate + Folic acid	60 mg + 0.4 mg	Capsule/ Tablet	10
10	Mebendazole	100 mg	Tablet	10
11	Metronidazole	250 mg	Tablet	10
12	Paracetamol	24 mg/ml	Syrup	60
13	Phenobarbitone Sodium	30 mg	Tablet	10
14	Pyridoxine HCl (Vit. B 6)	50 mg / ml	Ampoule	1
15	Salbutamol Sulphate	4 mg	Tablet	10
16	Tetracycline HCl eye ointment	0.1 mg/g	Tube	1

2. List of supplementary drugs

A list of fifteen supplementary drugs has been selected to measure the availability of drugs and verify the existence of drugs due to expiry and/or have been expired.

Table 2: List of supplementary drugs

S. N.	Generic name	Strength	Dosage form	Target pack size
1	Insulin (soluble-Neutral-Regular)	100 IU	Ampoule	1
2	maleate Chlorphineramine	4 mg	Tablet	10
3	Antitetanus (Toxoid) vaccine		Vial	1
4	Glibencalmide 5 mg	5 mg	Tablet	30
5	Dextrose in normal saline infusion	0.5% Dextrose, 0.9% N. Saline	Infusion	1
6	Chloramphenicol	0.5 %	eye drop	1
7	Ciprofloxacin HCl	250 or 500 mg	Tablet	10
8	Hydrocortisone	100 mg	Injection	1
9	Hyoscine butylbromide	20 mg / ml	Injection	1
10	Frusemide	20 mg / ml	Injection	1
11	Gauze bandage			1
12	Anti-scorpion		Injection	1
13	Promethazine HCl	25 mg/ml	Injection	1
14	Disposable syringe	5 ml	Ampoule	1
15	Diazepam	10 mg / ml	Injection	1

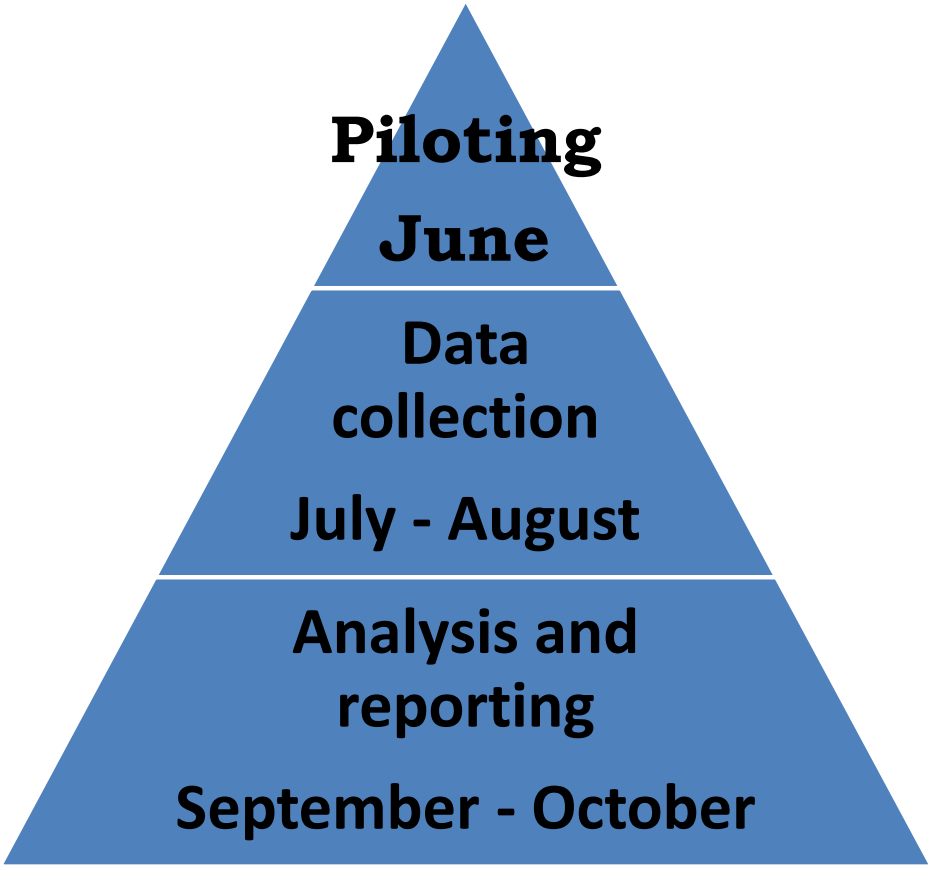


Figure2: The RDF services evaluation schedule mapping

Chapter (4)

Results

4.0 Results

The distribution of the surveyed health care facilities with RDF and/or without RDF (for comparison) services was depicted in (Table 3).

Table 3: The distribution of health care facilities

Health facility	Total Number
Public health care facilities (with and/or without RDF services)	39
Private health care facilities (without RDF services)	21
Warehouses (drug stores)	7
Grand total	67

4.1 Accessibility (availability of drugs) in both public and private health care facilities

The mean value of the key drugs available in public sector was (92.6%) with a (56.3% to 100.0%) range. However, the majority of the key drugs were available 100.0% at (75% of the health facilities). On the other hand, the mean value of the key drugs available within the surveyed health care facilities in the private sectors was (90.5%). The majority and the range were similar to that reported in the health care facilities pertaining to the public sector.

The differences observed between the two health care settings i.e. the public and the private was statistically significant ($p < 0.05$). The details of these results are shown in (Table 4).

With regards to the availability of the supplementary drugs in the public sector, the mean value was (84.3%) with the preponderance of (93.3%, 75% percentile) and a range of (46.7% to 100%). The mean value of supplementary drugs availability was found to be (80.5%), with a (33.3% to 93.3%) range and the majority (86.7%, 75% percentile). Also the differences observed between the public and the private health care settings in this parameter was statistically significant ($p < 0.05$). The details of these results are presented in table 4. The mean value of key drugs available in the main medical stores with RDF services was (91.7%) with a range of (81.3% to 100.0%) and the majority of them were available in (100%, 75% percentile). The mean value of out of stock duration (in days) of

key drugs in RDF main stores was found to be (22.8), with a (6.2 to 44.5) range, while the majority lied between 34.7 and 75% percentile. The details of these results are presented in (Table 4).

Table 4: Availability of key (n= 16) and supplementary (n= 15) drugs in both public and private sectors

Indicator Availability (% in stock)	Minimum value	Maximum value	Median	Mean †(±SD)
Key drugs (n= 16)				
Public health care facility	56.3	100.0	93.8	*92.6 ±11.7
Private pharmacy	56.3	100.0	93.8	90.5 ±11.7
Supplementary drugs (n= 15)				
Public health care facility	*46.7	*100.0	*86.7	*84.3 ±13.2
Private pharmacy	33.3	93.3	83.3	80.5 ±14.2
Availability of key drugs (n= 16) in RDF main stores				
Availability (% in stock)	81.3	100.0	93.8	91.7 ±6.5
Out of stock (days)	6.2	44.5	18.6	22.8 ±15.8

Key:

* The highest percentage achieved. †**SD**= Standard deviation.

4.2 Coverage

The percentage of coverage of RDF services among health care facilities (public sector) varies considerably among the seven states that were included in the study. The coverage among the hospitals at states was found to be ranging from 100% in Kassala, Gadarif, White Nile, to 42% in Northern state. In South Darfur (conflict area) state the RDF coverage was found to be 30%. However, with respect to the coverage in the primary health centers; it varies between 92% to zero as depicted in (Table 5 and Figure 2).

The difference in mean value of coverage of RDF services between the hospital and primary health centers was statistically significant ($p < 0.05$).

Table 5: The percentage coverage of RDF services among health care facilities (public sector)-Sudan, 2008

State name	Hospital coverage (%)	Primary health care center coverage (%)
Kassala	100	92
Gezira	98	73
Blue Nile	82	28
Gadarif	100	13
Whit Nile	100	0
Northern	42	0
South Darfur	30	0
Mean	78.9	29.4

Note: The descending fashion of percentage coverage across the 7 states.

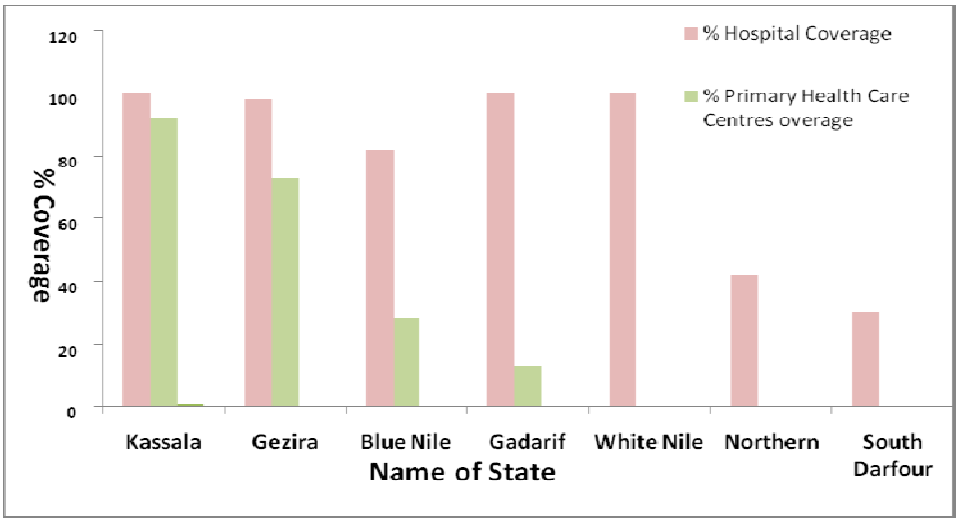


Figure 3: Comparison in drug coverage between (hospitals and primary health centers) in the seven states

- **Comparison of key drugs price between public health (RDF) and private pharmacies**

The reference prices did not include any additives as it is the suppliers' prices and it was calculated for the same unit number.

Median price ratio (MPR) for drugs was (3.46 times) in public health facilities and (5.05 times) in private.

The lowest difference in drug price in the surveyed public health care facilities was for adrenaline injection (1.9), while in the private facilities it was for paracetamol tablet (2.6). The highest difference in drug price in the public facilities was for mebendazole tablet (14.40) times, the same drug in the private with difference of (17.7) times (Figure 3)

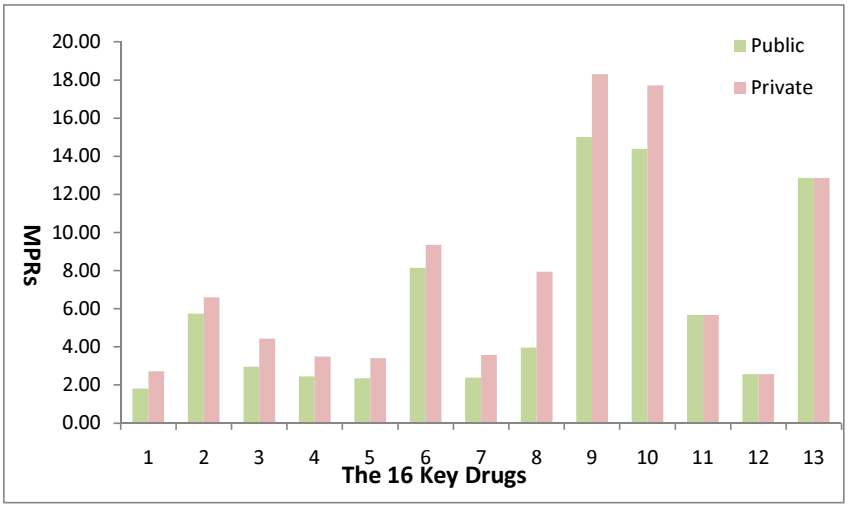


Figure 4: Comparison of Drugs medium price ratios (MPRs) between the public and private sectors

4.3 The quality of RDF services (patient satisfaction)

1. Demographic characteristics of interviewed subjects

From the seven states in Sudan, 1105 subjects were interviewed about their satisfaction with the quality of service provided in RDF health care facilities. The reference measure against which the subjects were interviewed was regarding the approved accessibility indicators.

The demographic characters of the interviewed population was made of [n= 522], (47.2%) are females as shown in (figure 4). In terms of the educational status, more than one-third of the subjects [n= 399, (36.11%)) have primary and secondary education, [n= 332,

(30.04%)] with higher school certificates, [n= 217, (19.64%)] did not have any schooling and [n= 129, (11.67%)] were university and/or with post graduate studies (Figure 5). Nearly two thirds [n= 700, (63.4%)] of the subjects were interviewed from rural health care facilities and the remaining from urban health care facilities.

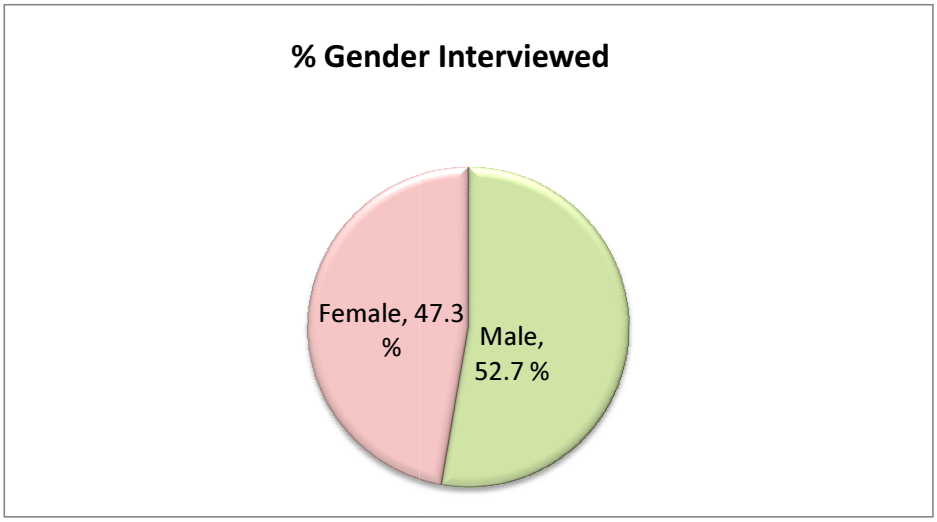


Figure 5: The gender distribution of the interviewed subjects

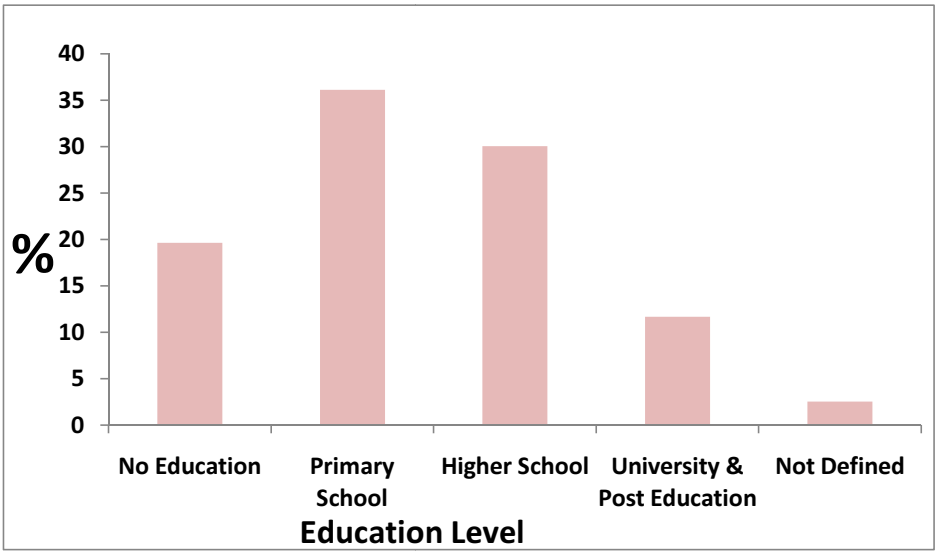


Figure 6: Educational level of the interviewed subjects

2. Accessibility of RDF health care facilities

The RDF health care facilities were described as easily accessible by [n= 716, (64.8%)] (Table 7). Regarding the patients' methods of reaching RDF health care facilities [n= 354, (32%)] of the clients walked to reach them. In terms of the time needed to reach the facilities more than two third of the respondents [n= 751, (68%)] said that they were less than 30 minutes away from health care facility. The majority (63.8%) of those interviewed were in the rural health facilities (Table 6).

Table 6: Participants responses about the regular source of drugs supply

Indicator	Frequency (n)	Percentage (%)
Hospitals	704	63.7*
Health care centers	176	15.9
Private pharmacies	170	15.4
Other health care facilities	46	4.2
Not sure	9	0.8
Grand total	**1105**	**100.0**

Key: *The highest percentage achieved.

3. Dispensing time

Nearly half of the respondents [n= 520, (47.1%)] stated that the time consumed in dispensing area to receive available prescribed drugs is suitable, while [n= 481, (43.5%)] of them described the time as short (Figure6).

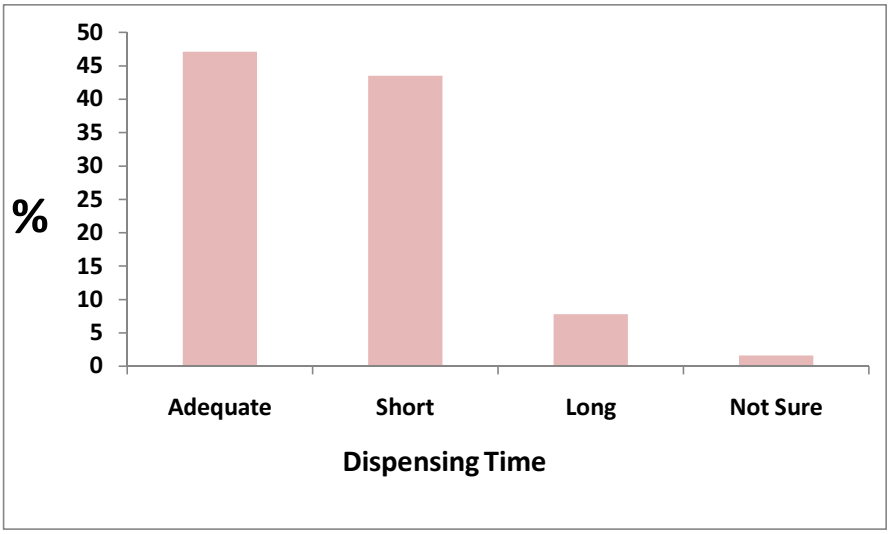


Figure 7: Dispensing time (waiting time) to receive prescribed drugs in RDF health care facilities (patient satisfaction)

4. Availability of prescribed drugs

Regarding patients' satisfaction, [n= 780, (70.6%)] of the subjects interviewed were satisfied with the availability of prescribed drugs in RDF facilities. However, [n= 49, (4.4%)] of them complained of the unavailability of prescribed drugs (Table 7 and Figure 7).

In this assessment [n= 787, (71.2%)] of the respondents heard about the RDF system. More than half of the respondents (53.0%) stated that they regularly visited RDF health care facilities (Figure 8).

Table7: Participants views about drugs availability and accessibility in RDF main stores

Indicator	Frequency (n)	Percentage (%)
Availability of drugs		
Always available	780	70.6*
Some time available	257	23.3
Not available	49	4.4
Not sure	19	1.7

Accessibility to drugs		
Easy	716	64.8*
Some what	214	19.4
Difficult	162	14.7
Not sure	13	1.1
Grand total	**1105**	**100.0**

Key: *The highest percentage achieved.

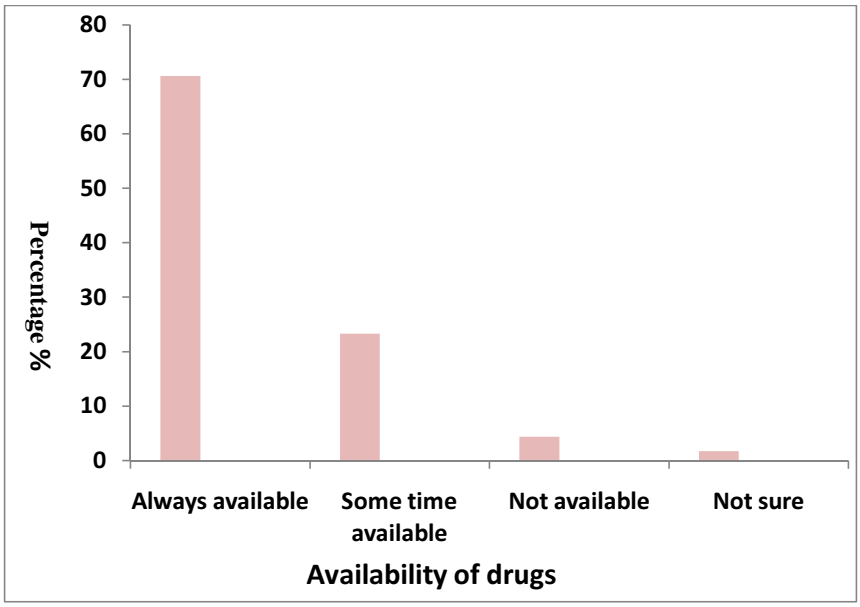


Figure 8: The availability of drugs in RDF health care facilities (patient Satisfaction)

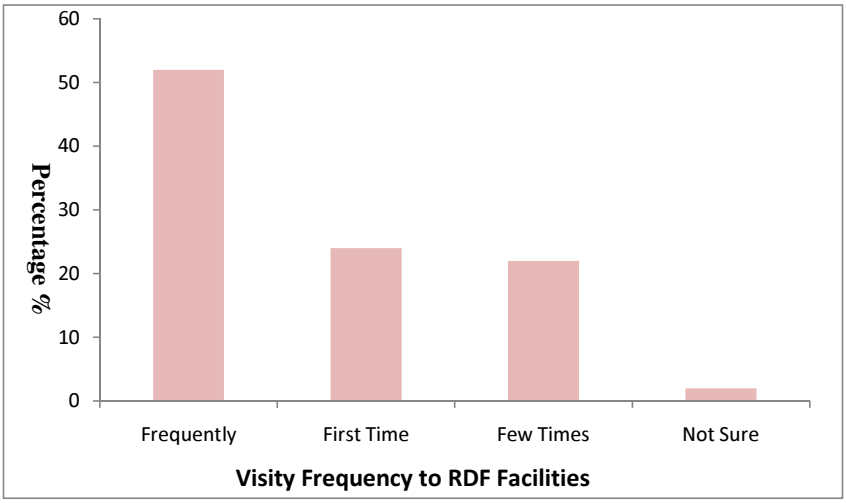


Figure 9: The visited frequency of interviewed subjects to RDF health care facilities

5. Affordability to drugs

Regarding affordability [n= 792, (71.7%)] of the interviewed subjects stated that they are able to buy their prescribed drugs . However, [n= 266, (24.1%)] of them stated that the reason for their inability to afford the medication prescribed for them is due to unavailability of prescribed drugs in that facility (Table 6).

In term of drug prices [n= 482, (43.6%)] of participants declared that the drugs' price was acceptable and [n= 467, (42.3%)] have stated that drugs were low-priced. (Figure7). The majority of the clients 954, (86.3%) had willingness to purchase their drugs (Figure 8). On the basis of the regular source of drugs, [n= 704 (63.7%)] of the respondents stated that they get their prescribed drugs from hospitals, [n= 176, (15.9%)] from health care centers and [n=170, (15.4%)] from private pharmacies (Figure 10).

On comparing current services with what was available five years ago, [n= 875, (79.2%)] of the respondents have stated that current services are better than what was available five years ago regarding the availability of medicines. In addition [n= 796, (72%)] of them stated that current drugs prices are better than the prices five years ago. Regarding patients' satisfaction of the dispensing of their prescribed medicines [n= 829, (75%)] of clients were got all their prescribed medicines.

Of the total clients interviewed [n= 657, (59.5%)] were not covered with Health Insurance Services. While [n= 436, (39.5%)] of them were covered. Generally [n= 929, (84%)] of

the candidates stated that they were satisfied with the services delivered to them through the RDF health care facilities.

On analyzing the relationship between the patient's coverage with Health Insurance Services and the cost of medicines in health care facilities, out of the of the total who described the cost of services as cheap, 285(60%) were not covered with Health Insurance Services, while 181(38.8%) of those were covered with Health Insurance Services.

Table 8: Affordability of purchasing drugs (measured in days per day income) (According to WHO measures)

S.N	Affordability of treatment (days)	Public health	Private pharmacies	p- value
*A	**Pneumonia**	0.015	0.022	< 0.05
†B	**Anaemia**	0.024	0.033	< 0.05
‡C	**Hypertension**	0.016	0.024	< 0.05
§D	**Chronic disease**	0.016	0.016	N/A
~E	**Antibiotics**	0.008	0.010	> 0.05

Key: *A= Affordability for the treatment of pneumonia in children under 5 years using benzyl penicillin every 6 hours for 2 days.

†B= Affordability for the treatment and prevention of anemia using ferrous sulphate and folic acid (combined formula) once for 30 days.

‡C= Affordability for the treatment of hypertension using atenolol 50 mg once for 30 days.

§D= Affordability of treatment of epilepsy or psychiatric illness using Phenobarbitone once for 30 days.

~E= Affordability of treatment of worm manifestation using mebendazole twice per day for 6 days (3 days and 3 days after one week).

Note:

Daily wage of lowest paid government worker (in local currency): 250 SDG (According to the assessment data).

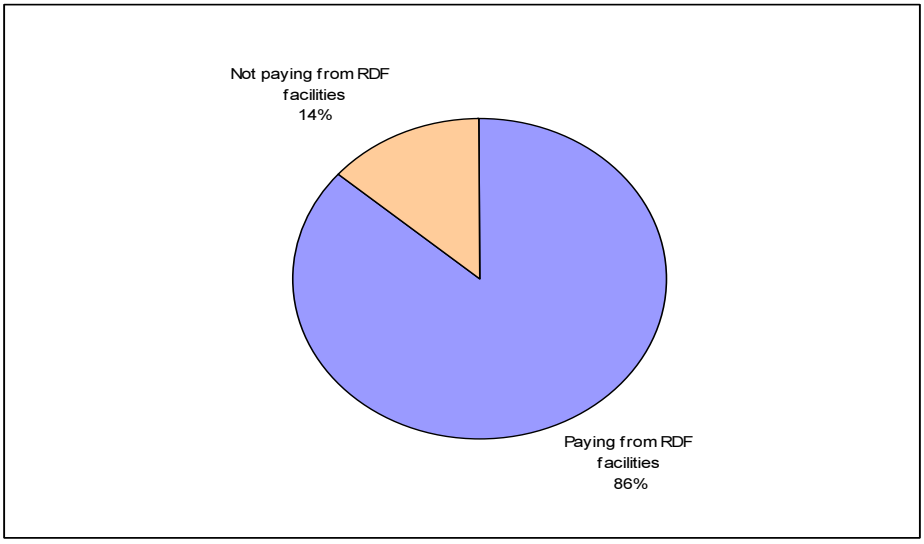


Figure 10: Patients willingness to pay in RDF health care facilities

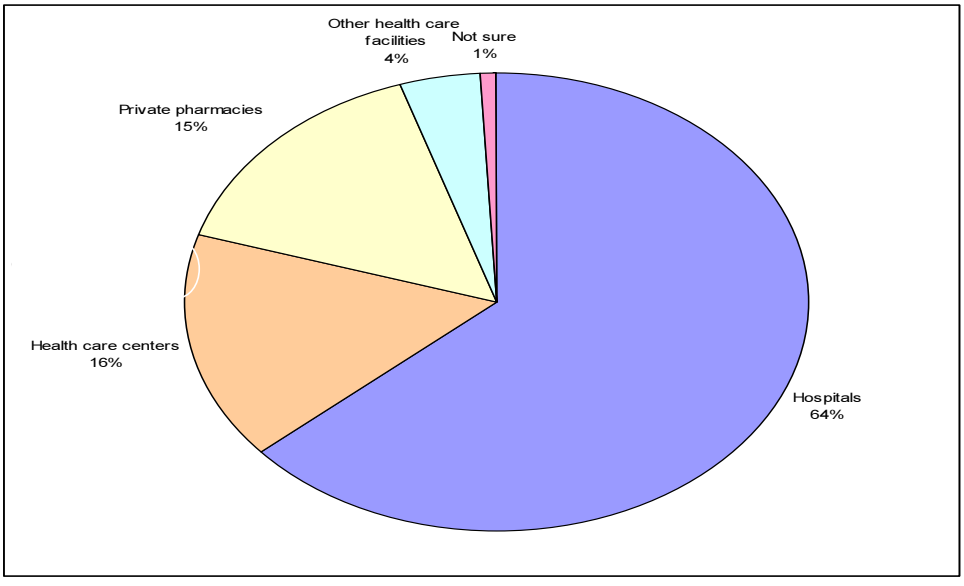


Figure 11: The patient's regular source of prescribed drugs

6. The percentage of expired drugs in RDF health care facilities

There were no expired drugs on the shelves.

Chapter (5)

Discussions

5.0 Discussions

Countries worldwide have made considerable efforts in trying to bring health to every person through national health policies and plans based on primary health care principles. Although some countries in the African region have indicated their commitment to RDF services implementation and have adopted the health district as the basic unit for delivery of essential health services, they were faced by various problems. These setbacks included weak structures, poor attention to RDF principles, declining financial resources allocated to health and in most cases, inadequate political commitment regarding RDF system.

In terms of infrastructure, RDF health care facility system should be organized in a manner that insures the safe and effective provision of health services. Once constructed, the health care facility should meet the following criteria:

- Reasonable walking distance for the targeted population,
- Proximity to all-weather road,
- Controlled access to the site, and
- Functioning communication system.

1.Accessibility (availability of drugs) in both public and private health care facilities

The majority of public health care facilities had availability of 100.0% of key drugs and 93.3% for supplementary drugs, which indicated a more proper procurement and supply systems. However, unlike many other studies which indicated the availability of drugs in the private sector is usually higher than at the public sector. In this study we found that the availability of drugs in public sector is higher as compared to the private sector. This finding may in part be attributed to the presence of higher representation of drugs in the parental forms (not favorite in economic term in private). In RDF warehouses (stores) the average availability was 93.8% and average stock out duration was 22.8 days, which highlights the possible risks when key drugs are out of stock.

2. RDF drug coverage

Marked variations were evident when comparing the coverage of drugs in hospitals and health centers. The coverage of the hospital was considerably higher approaching 100.0% in 4 states. The coverage was lower in south Darfur (30.0%) and was 42% in Northern state. This finding indicates inter states variations.

3. Affordability of drugs (WHO standard)

To treat pneumonia (one of the top ten diseases in Sudan) for a child under 5 years the cost was found to be 0.015 and 0.022 days of wages, in public and private sectors respectively. In addition to the cost of oral antibiotic used post exposure.

Treatment of hypertension using atenolol was found to costs\ 0.016 and 0.024 days of wages, in public and private sectors respectively.

Treatment and prevention of anemia using ferrous sulphate and folic acid (combined formula) once for 30 days was found to cost 0.024 and 0.033 days of wages, in public and private sectors respectively.

The cost for treatment of epilepsy or psychiatric illness using Phenobarbitone once for 30 days was found to be 0.016 and 0.016 days of wages, in public and private sectors respectively.

The cost for treatment of worm manifestation using mebendazole twice per day for 6 days (3 days and 3 days after one week) was found to be 0.008 and 0.010 days of wages, in public and private sectors respectively.

Most of the medicines in the evaluation were affordable (WHO indicate that if the cost of treatment is less than one day of wage the drug is affordable).

4. Key drugs price compared with reference price

Median MPR for drugs with minimum times of prices was 3.46 times in public health facilities and 5.05 times in private sector. We found marked decrease in medium MPR when comparing it with medium MPR found in a similar study (National Pharmaceutical Sector-North Sudan 2006).

The lowest difference in price in public was for adrenaline (1.86) while in private it was for paracetamol (2.57), the highest difference in price in the public sector was for mebendazole, which was (14.40) times same drugs in the private sector with a difference of (17.72) times (Figure 4,8). It is noted that there are some drugs in both sectors that are considerably highly priced in comparison with the international prices; namely, mebendazole, salbutamol (albuterol), phenobarbitone and clotrimazole ointment.

5. Quality of RDF services (patient satisfaction)

This study assessed the overall patient satisfaction regarding health services provided by RDF. One thousand one hundred and five respondents were interviewed concerning their satisfaction with the delivered services. Accessibility is one of the principles of health care

for all, as stated in Alma Ata declaration on primary health care (Saade and Gilbert 2000). The current study showed that nearly two third of respondents (64.8%) have a convenient access to the RDF health care facilities. Moreover, more than two third of the respondents (68%) said they could reach their RDF health care facilities within less than 30 minutes, although (63.8%) of those interviewed were in rural health care facilities. Similar results (45.5%) were obtained in Egypt regarding accessibility of primary health care facilities (Gadallah et al, 2003).

In general, the obtained results showed that the majority of patients (70.6%) were satisfied with the availability of prescribed drugs. While [n= 49, (4.4%)] of them complained of the unavailability of prescribed drugs. In Egypt 26% of respondents were dissatisfied with availability of prescribed drugs (Gadallah et al, 2003).

Regarding affordability of prescribed drugs, 75% of respondents appeared satisfied with the services and stated that they have the ability to buy their drugs. However, 10.2% of them reported that the prescribed drugs were not affordable in the RDF health care facilities.

In the present study 90% of interviewed clients reported that the time they waited to get their prescribed drugs was acceptable and short. Expired drugs were not found in any sector, this was similar to the results of two previous studies in National Pharmaceutical Sector-North Sudan 2006, which indicated that the auditing system was in place (unpublished report).

Chapter (6)

Conclusions

6.0. Conclusions

The main conclusions that were drawn from this evaluation are:

1. There was a high level of awareness among the community towards the RDF services.
2. The availability of key drugs in public sector was very high.
3. The RDF services accessibility of essential drugs in terms of physical availability, geographical coverage and affordability was evident and documented.
4. The accessibility to essential drugs in terms of physical geographical coverage is acceptable and there was no evidence that distance to RDF health care facilities represented any barrier.
5. There was a high level of satisfaction among the interviewed subjects regarding RDF services.
6. The affordability and willingness to purchase prescribed pharmaceuticals was acceptable.

Chapter (7)

Recommendations

7.0 Recommendations

The following were found to be of high importance for further improvements in RDF services:

1. Expand the coverage to public health care facilities without RDF services in order to sustain the accessibility of essential drugs in these settings.
2. Continue the efforts aiming to increase the public awareness towards RDF services.
3. Continuous evaluation of quality of services provided by the RDF scheme.

Chapter (8)

References

8.0 References

Automotive quality systems handbook,

Brundtland GH, WHO/Essential Medicines and Pharmaceutical Policies (EMP), REGIONAL STRATEGY FOR IMPROVING ACCESS TO ESSENTIAL MEDICINES)

Central Medical Supplies (CMS): Unpublished report of RDF in Sudan, 2008.

Gadallah M, Zaki B, Rady M, Anwer1 W and Sallam I (2003). Patient satisfaction with primary health care services in two districts in Lower and Upper Egypt. Eastern Mediterranean Health Journal, Vol. 9, No. 3, pp 422-430.

Gamaledin Khalafalla (2000): Management of revolving drug fund: Experience of Khartoum state-Sudan.

Gilson L. 1997. The lessons of user fee experience in Africa. Health Policy and Planning.

Management Sciences for Health MSH and WHO/DAP. Managing drug supply: The selection, procurement, distribution and use of pharmaceuticals. Connecticut, Kumarin Press, 1997.

National Pharmaceutical Sector-North Sudan 2006.
Papoz L, Delcourt C, Ponton-Sanchez A, Lokrou A, Darrack R, Toure IA, Cuisinier-Raynal JC. Clinical classification of diabetes in tropical West Africa. Diabetes Res Clin Pract. 1998; 39(3): 219-27.

POPLINE Searchable documents.

Regional strategy for improving access to essential medicines.

Saade A and Gilbert B (2000) Public health guide for emergencies. The Johns hopkins and Red Cross / Red Crescent. First edition.

Takusei Umenai and Indermohan S Narula. (1998) World Bank reports. The Lancet, Volume 351, Issue 9098, 297-298.

Unpublished report of Revolving Drug Fund (RDF) in Sudan (2008).

Witter S., Achieving sustainability, quality and access: lessons from the world's largest revolving drug fund in Khartoum. East Mediterranean Health J. 2007 Nov-Dec;13(6):1476-85.

World Bank, 1994.

World Bank reports 1998.

World Health Organization (WHO) Essential Medicines and Pharmaceutical Policies (EMP).

World Health Organization (WHO) Operational Package for Monitoring and Assessing Countries.

Bibliography

Awadelkarim,M.A., et al (1996). Evaluation Report: Khartoum Comprehensive Child Care Programme (KCCCP). Ministry of Health, Khartoum State-Sudan (unpublished).

European policy for health for all declaration of Alma Ata. WHO regional Office for Europe ur1:http://www.whodk/.

Dumoulin,J.,et al(1998).Guide to drug financing mechanisms, World Health Organisation, Geneva.

Foster,S.(1991).Supply and Use of essential drugs in Sub-Saharan Africa: Some issues and possible solutions.Soc.Sic.Med. Vol.32,No.11,pp1201-1218.

Fundafunda,B.(1998). Evaluation Report on Revolving Drug Fund at the Khartoum State-Ministry of Health (unpublished).

Huff,M.A.(1983). Pricing strategy for revolving drug fund in Dominica. Management Sciences for Health,Boston,Mass.

Ministry of Health (1995), national List of Essential Drugs, Ministry of Health, Sudan.

Ministry of Health (1997), National Drug policy, Ministry of Health, Sudan.

Ministry of Health (1998), annual report, Ministry of Health, Khartoum State-Sudan (unpublished).

Ministry of Health (1998), RDF operational manual, Ministry of Health, Khartoum state-Sudan (unpublished).

Ministry of Health (1999), annual statistical report, Ministry of Health Khartoum State-Sudan (unpublished).

Ministry of Health (1999), RDF annual report, Ministry of Health, Khaartoum state-Sudan (unpublished).

Soucat,A.,et al(1997). Affordability, Cost-effectiveness and efficiency of primary health care: the Bamako Initiative Experience in Benun and Guinea.Int.Journal of Health Planning and Management. Vol.12, Supp.I, pp81-108.

Sudan (1992). National Comprehensive Strategy (1992-2000). Government of Sudan.

Umenai,T. and Narula,I.S.(1998).Revolving drug funds and district community health system development.Lancet. Vol.351,No.9098,pp 297 – 298.

Umenai,T. and Narula,I.S.(1999).revolving Drug Funds: A step towards health security.Bulletin of the World Health Orgnaisation. Vol.77,No.2,pp 167-170.

Waddington,C.,et al.(1991).Ten questions to ask about Revolving Drug Funds.Tropical Doctor. Vol21, pp50-53.
WHO 1995. Guidelines for developing national drug policies. Geneva: WHO

WHO 1998. Guidelines for implemmenting the Bamko Initiative, Regional Committee for Africa,thirty-eight sesion, Brazzaville, 7-4 September, AFR/ RC 38/18 Rev.I.

WHO/SHS (1995). Experience with organisational and financing reform in the health sector.Geneva: World Health Organisation. WHO/SHS/CC/94.3.

Data collection form No. 1

Survey to measure patients satisfaction with RDF Service

تاريخ جمع المعلومات: ---------- اسم جامع المعلومات : ----------

الولاية: ---------- اسم المؤسسة : ----------

هل هذه المؤسسة بها خدمة التأمين الصحي ؟ ☐ نعم ☐ لا

1. نوع الجنس: ☐ ذكر ☐ أنثي

2. المهنة: ----------

3. المستوى التعليمي: ☐ أمي ☐ خلوة / أساس ☐ ثانوي ☐ جامعي / فوق الجامعي

4. مكان سكن المريض: ----------

5. الدخل الشهري :(للمريض / العائل) ----------

6. عدد الأفراد المعالين من قبل العائل ----------

7. هل المريض مستفيد من خدمة التأمين الصحي : ☐ نعم ☐ لا

8 . هل سمعت بالدواء الدوار : ☐ نعم ☐ لا

9. عدد مرات التردد علي مؤسسات الدواء الدوار ☐ أول مرة ☐ نادرا ☐ عدة مرات

10. ما هو رأيك في توفر الأدوية بهذه المؤسسة؟ ☐ متوفرة ☐ متوفرة أحيانا ☐ غير متوفرة

11. ما هو رأيك في أسعار الدواء بهذه المؤسسة؟ ☐ غالية ☐ وسط ☐ رخيصة

12. الوصول إلي هذه المؤسسة الصحية ☐ سهل ☐ وسط ☐ صعب

13. ما هي الوسيلة المستخدمة للوصول لهذه المؤسسة الصحية ؟

☐ مركبة آلية ☐ الدوابب ☐ راجلا ☐ أخري (حدد) -------

14. كم استغرقت من الزمن للوصول إلي هنا ؟

☐ اقل من 30 دقيقة ☐ من 30 – 60 دقيقة

☐ أكثر من ساعة واحدة ☐ أكثر من ساعتين

15. كم تبلغ المسافة بالكيلومتر(بالتقريب) ؟ ----------

16. ماهي مقترحاتك لتطوير وتجويد الخدمة ؟ ----------

17. لماذا اخترت هذه المؤسسة الصحية بالتحديد ؟

☐ المسافة معقولة ويمكن الوصول إليها

☐ ساعات العمل هنا أطول وملائمة

☐ الخدمة متكاملة

☐ أخري ☐ حدد----------

18. الزمن المستهلك في الحصول على الدواء ☐ طويل ☐ مناسب ☐ قصير

19. أين أعتدت الحصول علي حاجتك من الأدوية ؟

☐ المستشفي

☐ المركز الصحي

☐ صيدلية خاصة

☐ أخري (حدد ماهي) .....

20. في اعتقادك، هل خدمات الأدوية أفضل الآن أم من قبل (مثلاً قبل 5 سنوات) فيما يختص بتوفيرها وأسعارها ؟

فيما يختص بتوفير الأدوية:

☐ أفضل الآن ☐ أفضل من قبل ☐ متساوي ☐ لا أدري

فيما يختص بأسعار الأدوية:

☐ أفضل الآن ☐ أفضل من قبل ☐ متساوي ☐ لا أدري

21. كم عدد الأدوية الموصوفة لك؟ ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ أكثر من 4

22. كم عدد الأدوية التي تحصل عليها (صرفت له) ؟ ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ أكثر من 4

23. الأدوية التي لم يتم صرفها، ما هي أسباب عدم صرفها ؟

- ☐ لا املك تكلفة شرائها
- ☐ غير مستعد لشرائها الآن
- ☐ لدي الدواء بالمنزل
- ☐ أتمكن من الحصول عليه من مكان آخر
- ☐ أخرى ☐ ماهو ----------

24. إذا كانت الإجابة بلا، فلماذا ؟

- ☐ يمكن العلاج بطرق أخرى غير الأدوية (مثلاً الطب البلدي)
- ☐ أتمكن من الحصول علي الدواء من مصدر آخر ☐ ما هو ؟ ----------
- ☐ لدي أولويات أخرى غير الأدوية
- ☐ ليست مسئوليتي ☐ مسئولية من ؟ ----------
- ☐ أخرى

25. هل لديك القدرة المالية لدفع قيمة علاجك أو جزء منها؟ ☐ نعم ☐ لا

26. كم تستطيع أن تدفع شهريا للعلاج؟ ----------

27. إذا كان لديك مال (دخل) كافي، هل لديك الرغبة أن تدفع ثمن أدويتك التي تحتاجها ؟

☐ نعم ☐ لا

Data collection form No. 2

Survey to measure availability of key drugs List in RDF main stores

Date of data collection: ---------- Investigator: ----------
State: ---------- RDF main store: ----------

Key drugs to treat common conditions [A]	**In stock Yes=1, No=0** [B]	**Expired drugs on shelves Yes=1, No=0** [C]
Chlorphineramine 10mg/1ml Ampule		
Cotrimoxazole (200 mg + 40 mg) Suspension		
Amoxicillin 250 mg Capsule		
Ferrous sulphate + Folic acid (60 mg + 0.4 mg) Capsule		
Mebendazole 100 mg Tablet		
Tetracycline eye ointment 0.1 mg Tube		
Clotrimazole skin ointment 1% Tube		
Diclofenac 25 mg Tablet		
Metronidazole 250 mg Tablet		
Paracetamol 120 mg Syrup		
Pyridoxine (Vit. B6) Ampule		
Atenolol 50 mg Tablet		
Benzyl Penicillin Vial 1.000.000 Unit		
Adrenaline 1 mg Ampule		
Salbutamol 4 mg Tablet		
Phenobarbitone 30 mg Tablet		

Data collection form No. 3

Survey to measure availability of key drugs list in health care facilities with RDF services

Date of data collection: ---------- Investigator: ----------
State: ---------- RDF health Facility: --------

Key medicines to treat common conditions [A]	**In stock Yes=1, No=0** [B]	**Expired drugs on shelves Yes=1, No=0** [C]
Chlorphineramine 10 mg/1 ml Ampule		
Cotrimoxazole (200 mg + 40 mg) Suspension		
Amoxicillin 250 mg Capsule		
Ferrous sulphate + Folic acid (60 mg + 0.4 mg) Capsule		
Mebendazole 100 mg Tablet		
Tetracycline eye ointment 0.1 mg Tube		
Clotrimazole skin ointment 1% Tube		
Diclofenac 25 mg Tablet		
Metronidazole 250 mg Tablet		
Paracetamol 120 mg Syrup		
Pyridoxine (Vit. B6) 50 mg / ml Ampule		
Atenolol 50 mg Tablet		
Benzyl Penicillin 1.000.000 Unit Vial		
Adrenaline 1 mg Ampule		
Salbutamol 4 mg Tablet		
Phenobarbitone 30 mg Tablet		

Data collection form No. 4

Survey to measure availability of key drugs list in private health care facilities

Date of data collection: ---------- Investigator: ----------
State: ---------- private health facility--------

Key drugs to treat common conditions [A]	**In stock** **Yes=1, No=0** [B]	**Expired drugs on shelves** **Yes=1, No=0** [C]
Chlorphenaramine 10 mg/1 ml Ampule		
Cotrimoxazole (200 mg + 40 mg) Suspension		
Amoxicillin 250 mg Capsule		
Ferrous sulphate + Folic acid (60 mg + 0.4 mg) Capsule		
Mebendazole 100 mg Tablet		
Tetracycline eye ointment 0.1 mg Tube		
Clotrimazole skin ointment 1% Tube		
Diclofenac 25 mg Tablet		
Metronidazole 250 mg Tablet		
Paracetamol 120 mg Syrup		
Pyridoxine (Vit. B6) 50 mg / ml Ampule		
Atenolol 50 mg Tablet		
Benzyl Penicillin 1.000.000 Unit Vial		
Adrenaline 1 mg Ampule		
Salbutamol 4 mg Tablet		
Phenobarbitone 30 mg Tablet		

Data collection form No. 5

Survey to measure accessibility to RDF Services (geographical access, physical access and affordability)

Date of data collection: ---------- Investigator: ----------
State: ---------- Health Facility: -------

1. Number of public hospitals in state …

2. Percentage of hospital coverage …..

3. Number of health centers in state …

4. Percentage of Health care facilities (PHC) centers coverage….

5. Number of private sector health care facilities in the state ……..

6. Do you supply private sector with any drugs or medical consumables
   Yes ☐ No ☐

7. If yes, what is the % of the private sector health care facilities compared to total number of care facilities?

   _____

8. Are there any RDF health care facilities in the state working for 24 hours?
   Yes ☐ No ☐

9. If Yes, how many? ----------

Data collection form No. 6

Date of data collection: ---------- Investigator: ----------
State: ---------- RDF store : ----------
Indicate the stock out duration and records of the drugs at RDF store in the following table during the period from 01/01/08 to 30/06/08.

Key drugs to treat common conditions [A]	**Records cover at least 6 months within the past 12 months Yes=1, No=0** [B]	**Only collect data for medicines with records covering at least 6 months within the past 12 months**		
		Number of days out of stock [C]	**Number of days covered by the review (at least 6 months)** [D]	**Equivalent number of days per year [E]= C*365/D** [E]
Chlorphineramine 10 mg/1 ml Ampule				
Cotrimoxazole (200 mg + 40 mg) Suspension				
Amoxicillin 250 mg Capsule				
Ferrous sulphate +Folic acid (60 mg + 0.4 mg) Capsule				
Mebendazole 100 mg Tablet				
Tetracycline eye ointment 0.1 mg Tube				
Clotrimazole skin ointment 1% Tube				
Diclofenac 25 mg Tablet				
Metronidazole 250 mg Tablet				
Paracetamol 120 mg Syrup				
Pyridoxine (Vit. B6) 50 mg / ml Ampule				
Atenolol 50 mg Tablet				
Benzyl Penicillin 1.000.000 Unit Vial				
Adrenaline 1 mg / ml Ampule				
Salbutamol 4 mg Tablet				
Phenobarbitone 30 mg Tablet				

Data collection form No. 7A

Survey to measure prices of key drugs list in health facilities with RDF service

Indicator: Affordability of key drugs list

Date of data collection: ----------
Investigator: ----------
State: ----------
RDF health facility: ------

Drugs/INN and Preparation [A]	**Dosage form**	**units (bottle, strip of 10 tab, vial, sachet, etc)** [B]	**Units Price at RDF (price for** B**)**	**Unit Price (Don't calculate)** (C)
Chlorphineramine	Ampule 10 mg/1 ml			
Cotrimoxazole	Suspension (200mg+40mg)			
Amoxicillin	Capsule 250 mg			
Ferrous sulphate + Folic Acid	Capsule (60mg+0.4mg)			
Mebendazole	Tablet 100 mg			
Tetracycline eye ointment	Tube 0.1 mg			
Clotrimazole skin ointment	Tube 1%			
Diclofenac	Tablet 25 mg			
Metronidazole	Tablet 250 mg			
Paracetamol	Syrup 120 mg			
Pyridoxine (Vit. B6)	Ampule			
Atenolol	Tablet 50 mg			
Benzyl penicillin	Vial 1.000.000 Unit			
Adrenaline	Ampule 1 mg			
Salbutamol	Tablet 4 mg			
Phenobarbitone	Tablet 30 mg			

Data collection form No. 7B

Survey to measure prices of key drugs list in private health care facilities
Indicator: Affordability of key drugs list
Date of data collection: ---------- Investigator: ----------
State: ---------- private sector facility: ------

Drug/INN and preparation [A]	**Dosage form**	**units (bottle, strip of 10 tab, vial, sachet, etc)** [B]	**Units Price at private (price for B)**	**Unit Price (Don't calculate)** [C]
Chlorphineramine	Ampule 10 mg/1 ml			
Cotrimoxazole	Suspension (200 mg+40 mg)			
Amoxicillin	Capsule 250 mg			
Ferrous sulphate + Folic Acid	Capsule (60 mg+0.4 mg)			
Mebendazole	Tablet 100 mg			
Tetracycline eye ointment	Tube 0.1 mg			
Clotrimazole skin ointment	Tube 1%			
Diclofenac	Tablet 25 mg			
Metronidazole	Tablet 250 mg			
Paracetamol	Syrup 120 mg			
Pyridoxine (Vit. B6)	Ampule			
Atenolol	Tablet 50 mg			
Benzyl penicillin	Vial 1.000.000 Unit			
Adrenaline	Ampule 1 mg			
Salbutamol	Tablet 4 mg			
Phenobarbitone	Tablet 30 mg)			

Data collection form No. 8A

Date of data collection: ---------- Investigator: ----------State: --------
---------- RDF health facility----------

Indicator: Affordability of supplementary drugs list

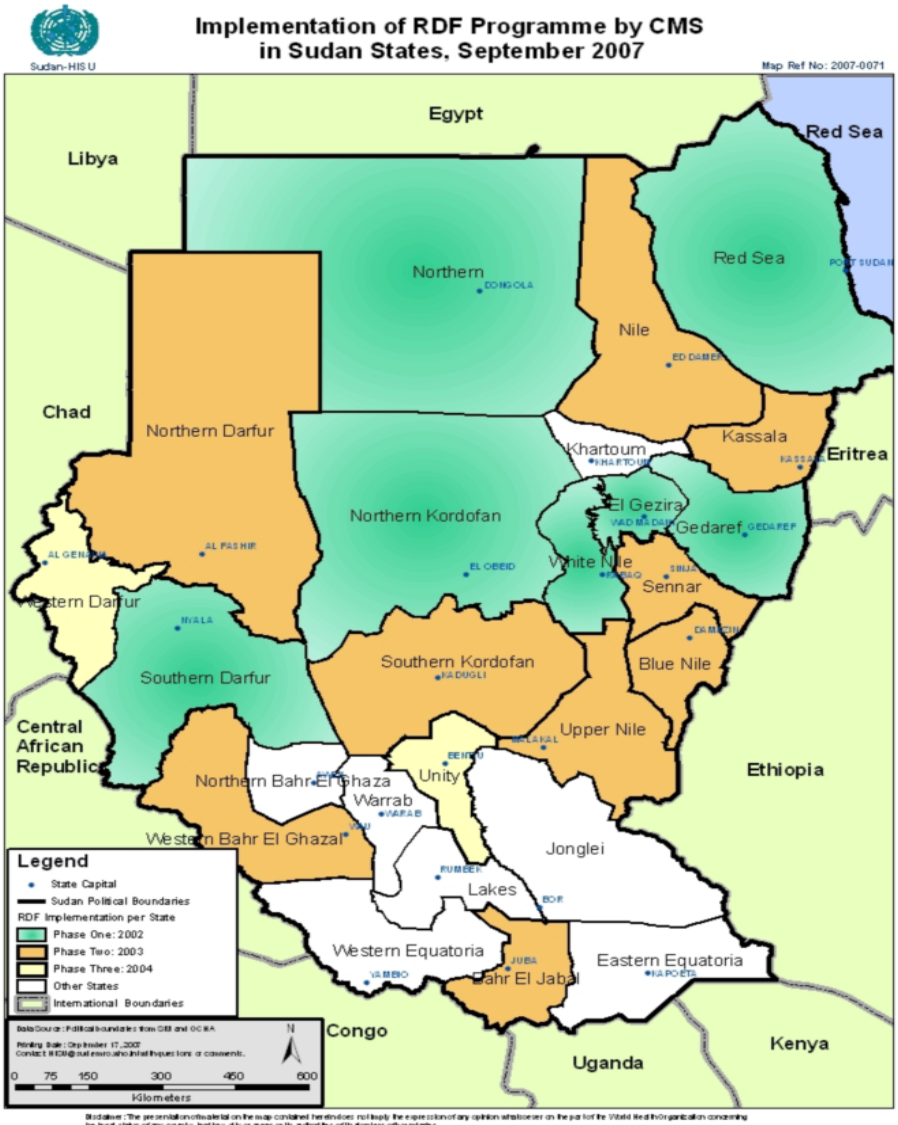
Supplementary drugs List [A]	**In stock Yes=1, No=0** [B]	**Expired drugs on shelves Yes=1, No=0** [C]
Insulin (soluble - regular - neutral)		
Chlorphineramine 4 mg Tablet		
Antitetanus (Toxoid)		
Glibencalmide 5 mg Tablet		
Dextrose normal saline Infusion		
Chloramphenicol eye drop		
Ciprofloxacin 250 mg or 500 mg Tablet		
Hydrocortisone 100 mg Injection		
Hyoscine 20 mg / ml Injection		
Frusemide 20 mg / ml Injection		
Gauze bandage		
Anti-scorpion		
Promethazine 25 mg / ml Injection		
Disposable syringe 5 ml		
Diazepam 10 mg / ml Injection		

Data collection form No. 8 B

Date of data collection: ---------- Investigator: ----------
State: ---------- Private health facility----------

Supplementary drugs List [A]	**In stock Yes=1, No=0** [B]	**Expired medicines on shelves Yes=1, No=0** [C]
Insulin (soluble - neutral - regular)		
Chlorphineramine 4 mg Tablet		
Antitetanus (Toxoid)		
Glibencalmide 5 mg Tablet		
Dextrose in normal saline Infusion		
Chloramphenicol eye drop		
Ciprofloxacin 250 mg or 500 mg Tablet		
Hydrocortisone 100 mg Injection		
Hyoscine 20 mg / ml Injection		
Frusemide 20 mg / ml Injection		
Gauze bandage		
Anti-scorpion		
Promethazine 25 mg / ml Injection		
Disposable syringe 5 ml		
Diazepam 10 mg / ml Injection		

The implementation of RDF program by CMS in Sudan states (September, 2007)



The Sudan international boarders and neighboring countries