The Republic of the Sudan

Federal Ministry of Health

Directorate General of Pharmacy

Assessment of Human Resources at the Pharmaceutical Sector

June - July 2009

Republic of the Sudan

Federal Ministry of Health

Directorate General of Pharmacy

Department of Human Resources Development

In collaboration with

World Health Organization

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Dr. Hiba Yassin Abuturkey

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Dr. Hiba Yassin Abuturkey

Head of Human Resources Development Department – DGoP - FMoH

Survey National Co-ordinator - Sudan

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List of Abbreviations:

CHWs	Community Health Workers
CMS	Central Medical Supplies
CPD	Continuous Professional Development
DGoP	Directorate General of Pharmacy
EML	Essential Medicines List
FIP	International Pharmaceutical Federation
FMoH	Federal Ministry of Health
FPPB	Federal Pharmacy and Poisons Board
MoH	Ministry of Health
MoHE	Ministry of Higher Education
MSM	Medicines Supply Management
Mgment	Management
NDP	National Drug Policy
NGOs	Non-Governmental Organizations
NHI	National Health Insurance
PHC	Primary Health Care
RUM	Rational Use of Medicines
SG	Sudanese Pound
SMC	Sudan Medical Council
STGs	Standard Treatment Guidelines
WHO	World Health Organization

1. EXECUTIVE SUMMARY

The assessment of human resources in the pharmaceutical sector in Sudan was carried between mid-June to mid-July 2009 by the Human Resources Development Department – Directorate General of Pharmacy (DGoP) - Federal Ministry of Health (FMoH), Sudan in collaboration with WHO. The main objective of the assessment was to determine human resources availability in the pharmaceutical sector in Sudan. Data from Ministry of Health (MOH), Pharmacy Education Providers, Public Health Facilities, Private Retail Pharmacies, Local Agencies and Pharmaceutical Manufacturers were obtained using proforma questionnaires.

The assessment was carried out in six states (Red Sea State, Khartoum State, Northern State, Algadarif State, White Nile State and Southern Darfur State) and the sample included:

- Ministry of Health and its agencies (DGoP, FPPB, CMS and NHI)
- 8 out of 12 Pharmacy Education Providers
- 86 Public Health Facilities
- 88 Private Retail Pharmacies
- 9 pharmaceutical manufacturers
- 13 local agencies (pharmaceutical companies)

The assessment indicated that there were more than 7000 registered pharmacists with the Sudan Medical Council (SMC). The number of actively practicing pharmacists was not known. Although, it was found that more than 66% of the working pharmacists are employed at the private retail pharmacies whereas the remaining were distributed among the public facilities, manufacturers, pharmaceutical companies, education and ministries of health (Reference: The Pharmaceutical Statistical Report 2007).

The assessment showed that the density of pharmacists per 10,000 population does not exceed one pharmacist in total and 0.2 public sector pharmacist at the national level. Also, the availability of pharmacies per

10,000 population was found to be less than one pharmacy in total and less than 0.4 public sector pharmacies at the national level.

Pharmacists' responsibilities differ and depend upon the type of facility he/she was employed in. These responsibilities include dispensing, stock management, quantification of needs, compounding, and promotion for the pharmaceuticals, production and quality control.

2. INTRODUCTION

As known, the most important of the health system inputs, the performance and the benefits the system can deliver depend largely upon the knowledge, skills and motivation of those individuals responsible for delivering health services.

The World Health Organization's World Health Report 2006 underlined that human resources are "the most important of the health system's inputs" and according to the International Pharmaceutical Federation, pharmacists represent the third largest healthcare professional group in the world [1,2]. The availability of trained pharmaceutical personnel is of critical importance in meeting national and global health goals, and thus requires special consideration. The development, production, distribution and appropriate utilization of medicines, as well as the attendant functions of regulation, operational research, training, etc., are of central importance in maintaining a healthy population. The absence of pharmacists and pharmaceutical personnel therefore has implications on the functioning of a health system.

The lack of reliable data on personnel working at the pharmaceutical sector makes difficult to develop policies for workforce development. The need emerged for assessment tools with which to estimate the number, skills, and distribution of pharmaceutical personnel in the pharmaceutical sector in Sudan.

2.1. Country Profile

Sudan is the largest country in Africa with a surface area of 2.7 million square Km and total population of 39.15 million (Sudan census 2008). Sudan is divided into 25 states with Khartoum as the capital. Population annual growth rate is 2.53% with a crude birth rate of 37.8% and crude death rate of 11.5% per 1000 of population (Data obtained from the Annual Heath Statistical Report 2007). Table 2.1 provides basic information on Sudan.

TABLE 2.1: COUNTRY PROFILE

	Data	Data source	Year
Total population (million)	39.4	Sudan Census Report	2009
GDP per capita (US$)	756	FMOH statistical report	2006
Annual growth of the GDP (US$)	3.8	World Bank	2007
Life expectancy at birth males (years)	56.0	WHO/ EMRO	2006
Life expectancy at birth females (years)	60.0	WHO/ EMRO	2006
Total expenditure on health as a percentage of the GDP	4.3	WHO/ EMRO	2003
Per capita expenditure on health in US$	9	WHO/ EMRO	2003
Population below 1 US$ per day	~60%	World Bank	2007
Percentage of population using private sector health provision	19%	FMOH/ Utilization of Health Services Survey	2006
Literacy rate	50	WHO/ EMRO	2007
Total number of doctors in the country (public sector only)	9573	FMOH statistical report	2007
Density of doctors in the country (per 10,000 population)	2.43	FMOH statistical report	2007
Total number of nurses in the country (public sector only)	18083	FMOH statistical report	2007
Density of nurses in the country (per 10,000 population)	4.58	FMOH statistical report	2007
Total number of dentists in the country (public sector only)	504	FMOH statistical report	2007
Density of laboratory technicians in the country (per 10,000 population)	0.13	FMOH statistical report	2007
Total number of laboratory technicians in the country (public sector only)	1478	FMOH statistical report	2007

2.2. Structure of National Health and Pharmaceutical System

Since the mid -1990s, the Sudan's health system financing and management has been devolved to the states and localities (services have been decentralized to states and localities). The FMoH is joined by 25 State Ministries of Health (15 of which are in northern part of the country). The FMoH is responsible for national policies and legislation, overall supervision and evaluation of the health system, international relations, management of skilled cadres, control of epidemics and management of several tertiary hospitals. The State Ministries are responsible for administration and financing of the health system at each state, and management of higher-level facilities (health centres and hospitals). Within each State there are a number of localities (134 in total) where Health Area Systems are responsible for management of lower-level facilities. In addition to the Ministry of Health structure, some hospitals are managed by the Ministry of Higher Education and the military. Outside the governmental system are privately-run clinics and hospitals.

The Sudan's Government health system is a three-tiered network. Primary services are composed of (in ascending order of level of care) primary health care (PHC) units, dressing stations, dispensaries, and health centres. PHC units are staffed by Community Health Workers (CHWs), dressing stations are staffed by a nurse or "uncertified dresser," and dispensaries are staffed by a medical assistant, a nurse, and a midwife. These facilities are under the responsibility of the locality. The health centre is the referral point for the lower-level facilities and, in principal, is staffed by a two physicians (medical officers), medical assistants, and nurses. Health centres should be equipped with a laboratory and x-ray, but have no inpatient facilities. In addition, vertical programs, in particular TB and EPI, work through the primary-level facilities but also sometimes establish independent posts in peripheral areas. Health centres are managed at the state level, along with first-referral level (or secondary) hospitals. These rural hospitals are located in the bigger towns and have bed capacities of 50 to 100. Tertiary

hospitals, including teaching, specialized, and general hospitals, are located in State capitals and are operated by the State governments. In addition, the FMoH operates 17 tertiary-level hospitals.

In northern Sudan, the private (for-profit) sector plays an increasing role in health service provision, especially in cities, towns, and better-off rural areas. Since the mid-1990s, cuts in funding, and therefore quality, of government health services, combined with the introduction of user fees, have contributed to growth of the private sector. Patients who are able to pay seek higher quality in the private sector. Private sector providers focus on curative services, and have little role in preventive interventions such as immunization. In Khartoum, an increasing number of hospitals and clinics are run by the private sector, leaving lower-level primary care facilities to the public sector.

The Pharmaceutical sector in Sudan is regulated by Pharmacy and Poisons Act (first developed in 1963) which was superseded by the Pharmacy and Poisons Act- 2009. The sector is guided by the 25 Year National Pharmaceutical Strategy (2005 – 2029), from which, the National Drug Policy (NDP) (2005- 2009) has been developed. There is a specific NDP implementation plan (divided into biennium).

The governmental pharmaceutical sector is divided into three bodies: The Planning and Policy body which is represented by the Directorate General of Pharmacy – Federal Ministry of Health. It is responsible for setting plans for the pharmaceutical Sector, setting of the National Drug policy and monitoring its implementation, setting of the Essential Medicines List, setting of training polices and national training programs for pharmacist working at the public sector.

The second body is the regulatory one which is represented by the Federal Pharmacy and Poisons Board. It is responsible for setting legislations and guidelines which regulate registration, importation and quality control of medicines.

The third body is the Central Medical Supplies (CMS) that provides the pharmaceutical supply for the governmental or public health system in northern Sudan.

Pharmaceuticals are provided by both public and private sector under the approved governmental regulations. Local pharmaceutical production also contributes in providing pharmaceuticals for both public and private sector.

TABLE 2.2: KEY PHARMACEUTICAL INDICATORS

Key pharmaceutical indicators	Data
Pharmacy and Poisons Act	2009
Date of 25year National Pharmaceutical Strategy	2005 - 2029
Date of National Drug Policy	2005 - 2009
Date of Essential Drug List	2005
Pharmaceutical sector market (2007)	350 million USD
Pharmacist per 100,000 of population (2007)	1.9
Number of registered pharmacists	7685
Number of Pharmacy Assistants (2007)	842

3. STUDY DESIGN AND METHODOLOGY

3.1. Purpose

3.1.1. General Purpose:

- To determine human resources availability in the pharmaceutical sector in Sudan.

3.1.2. Specific Purpose:

- To determine the number of health workers currently providing pharmaceutical services in both private and public sectors.
- To determine the distribution of pharmaceutical personnel in both public and private sectors.
- To determine types of pharmaceutical training programs offered in the country.
- To determine current production capacity for pharmaceutical personnel in the country
- To determine what categories of health workers other than pharmaceutical personnel provide pharmaceutical services.
- To determine the job satisfaction of pharmacists in the public and private sector.

3.2. Methodology

The data collection was carried out concurrently using proforma questionnaires targeted to specific respondents including Ministry of Health (MOH), Pharmacy Education Providers, Public Health Facilities, Private Retail Pharmacies, Local Agencies and Pharmaceutical Manufacturers (Table 3.1).

TABLE 3.1: QUESTIONNAIRE TOOLS

Questionnaire tool	Respondents
1	Ministry of Health
2	Pharmacy council and/or professional body
3	Pharmacy education providers
4	Public health facilities, private retail pharmacies, local agencies and manufacturers
5	Pharmacists and pharmacy assistants

The Survey was carried out at six states (Red Sea State, Khartoum State, Northern State, Algadarif State, White Nile State and Southern Darfur State).

Table describes the sampling frame and sample size of the study.

TABLE 3.2: SAMPLING AND SAMPLE SIZE

Questionnaire tool	Respondents	Sample size	Sampling
1	Ministry of Health	1	No Sampling
2	Pharmacy council and/or professional body	-	-
3	Pharmacy education providers	8	All pharmacy education providers were invited to participate in this survey, only 8 responded.
4	Public health facilities	90 (15 per state)	The main (biggest) public hospital in the area was selected. For the other fourteen, the number is divided between the tertiary hospitals and health centers and military facilities.
4	Private retail pharmacies	90 (15 per state)	They were selected randomly from the list of the state directorate of pharmacy.
4	local agencies	10	10 out of the 406 local agencies (wholesalers) were selected randomly.
4	Manufacturers	10	10 out of the 21 pharmaceutical manufacturers were selected randomly.
5	Pharmacists and pharmacy assistants	449	All pharmacists and pharmacy assistants working at the selected facility filled a form

3.3. Data Collection and coordination of the Survey

The national coordinator was selected and worked under guidance of the MoH. Six data collection teams were formed (i.e. one team per survey region) and each team was composed of two pharmacists officially assigned

by the National Survey Coordinator. The activity was centrally coordinated by the National Survey coordinator from the Directorate General of Pharmacy, FMoH. Before the survey started, the data collectors were trained for one day. At the end of the training, field-testing of the survey tools was undertaken. The survey was then carried out between mid-June up to the beginning of July and data collected from each region were assembled and sent to the national survey coordinator.

Six States from the country were selected to obtain a mix of economic development and geographic areas. In the selection, one state was the largest, one was the lowest income-generating state, and the other four states represented the four different geographical zones of Sudan.

Appointments for the interviews were determined before the start of data collection. Data collection was carried out concurrently instead of over three stages due to time constraints.

3.4. Data entry and analysis

Data collected from all the survey regions using the standard data collection forms were coded, checked for accuracy, consistency, omissions and irregularities. They were then entered into a predesigned excel data sheet through which all required analysis were done.

3.5. Scope and limitation of the survey

The questionnaires used were not applicable for all fields of pharmaceutical practice in Sudan. Some major fields were not mentioned. Also, sampling of six regions does not reflect the actual picture in the country. In addition, the time was too short to complete the stated number from each category. Also, that time of the year was the annual holiday for most pharmacists working at hospitals and for pharmacy faculties. Again, this short period minimize the ability to adopt software program to analyze special indicators such as those of the challenges facing pharmacy faculties and the form of the job satisfaction.

4. Results and Analysis

4.1. General Information about the Pharmaceutical Sector in Sudan

4.1.1. Regulation of Pharmacy Practice in Sudan

The Sudan Medical Council (SMC) is the national body that regulates the practice of doctors, dentists and pharmacists in Sudan. This council is responsible for the temporary registration of pharmacists after graduation and before finishing their internship period. To become permanently registered with the SMC, pharmacists must work for one year in the public sector after graduation and pass the registration exam. In 2009, this period of public sector service was reduced to 3 months. After passing the exam, the pharmacists will be given a permanent license which allows them to practice in different pharmaceutical sectors. At the present time, no license renewal is required.

In Sudan, pharmacists are generally responsible for the dispensing, quantification of need, ordering, stock management, compounding (if any), marketing, and manufacturing of medicines.

For the pharmaceutical premises, operating licenses are issued for public sector pharmacies private retail pharmacies, local agencies, medicines depots and pharmaceutical manufacturers. For the first four, the license is issued by the regional pharmacy authority (State Directorate of Pharmacy). For the pharmaceutical manufacturers, the license is issued by the Federal Pharmacy and Poisons Board.

4.1.2. Number of pharmacies in the country

In Sudan, there are 5950 health facility including 378 hospitals, 1379 health centers, 1224 dispensers, 207 dressing stations and 2744 primary health units.

The term “wholesale pharmacy” is not applicable in Sudan. Also, there are no known Faith-based facilities. So, Pharmacies are either public pharmacies (pharmacies at public hospitals or those belongs to the governmental supply system) or private retail pharmacies. Therefore, there are approximately

more than 3519 pharmacies in total. About 1456 of which are public pharmacies which represent about 41% of the total number of pharmacies. Regarding NGO's, there are 57 registered NGO in Sudan. None of them have a pharmacy.

The pharmaceutical premises that are responsible for wholesaling of medicines for both public and private sector are called 'Pharmaceutical Companies". They are local agencies for either multinational and/or generic medicines companies. In Sudan, the total number of companies that import medicines and/or paramedical, cosmetics is around 406.

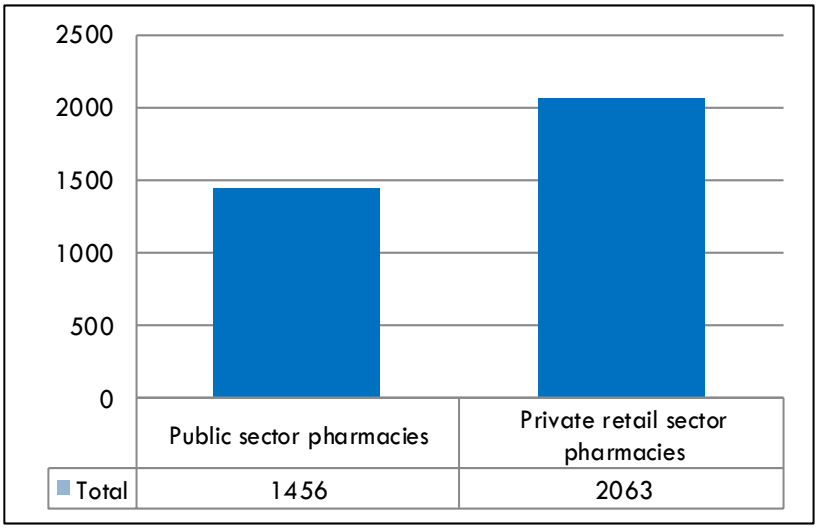


FIGURE 4.1: PHARMACIES IN SUDAN

4.1.3. Number of Pharmacists and Pharmacy Assistants in the country

According to the Sudan Medical Council, there were total of 7685 registered pharmacists. Figure 4.2 illustrates the total number of pharmacists registered with the SMC over different years. The number of newly registered pharmacists per each year is illustrated in Figure 4.3. Data on the number of male and female registered pharmacists was not available. The number of foreign registered pharmacists is about 40. Data on the newly registered pharmacy assistants was only available for only 2007 (83 pharmacy

assistants) as the school of pharmacy assistants has not graduated any since 2007. There is no pharmacy technician cadre in Sudan as of yet although a school recently started to train pharmacy technologists but there have not yet been any graduates.

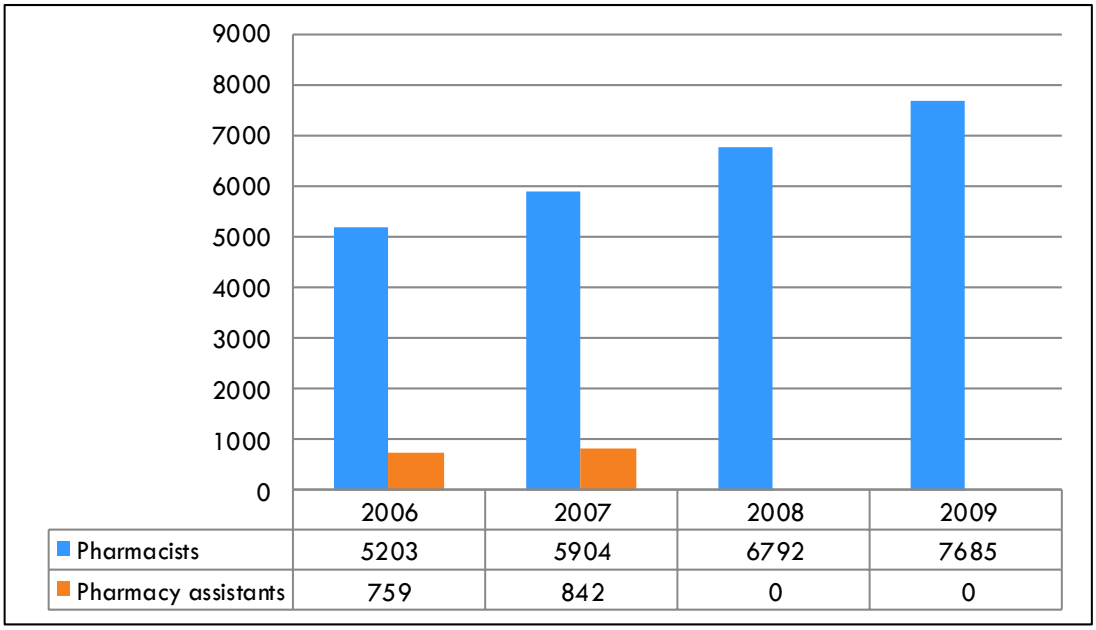


FIGURE 4.2: NUMBER OF REGISTERED PHARMACISTS AND PHARMACY ASSISTANTS PER YEAR

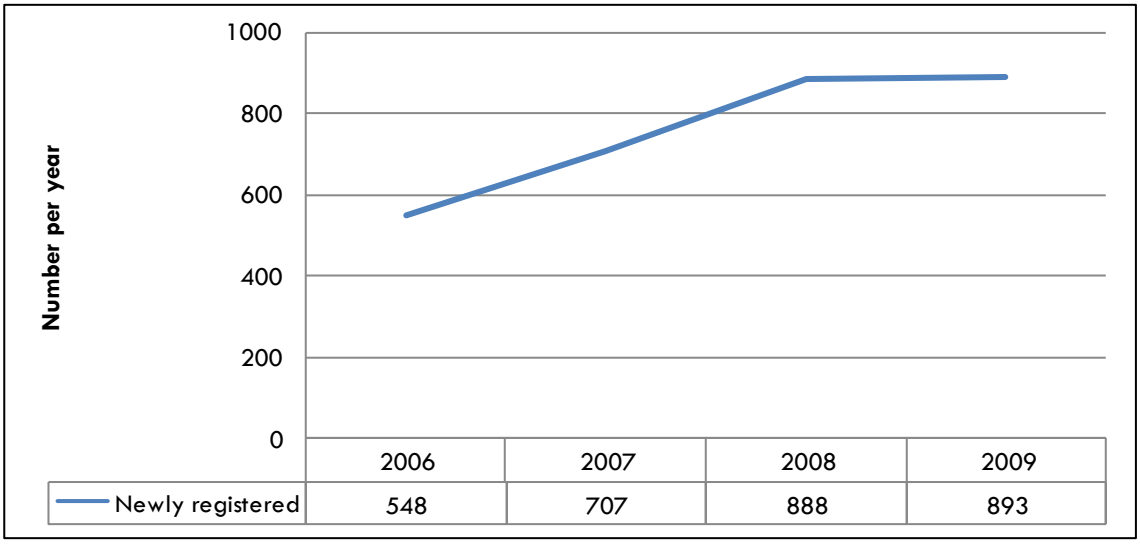


FIGURE 4.3: NUMBER OF NEWLY REGISTERED PHARMACISTS PER YEAR

4.1.4. Distribution of pharmacists and pharmacies:

The total number of actively employed pharmacists is now estimated to be 4710. They are generally concentrated in the private sector (67.9%). The proportions of the workforce employed in each sector are illustrated in Figure 7.4. There was no data on the number of registered pharmacists that are not working (unemployed and inactive workforce).

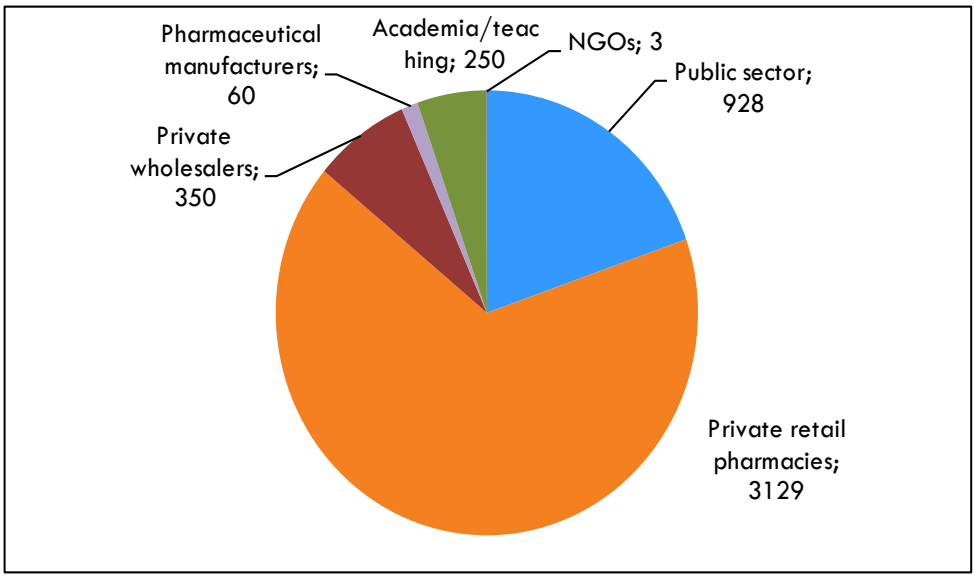
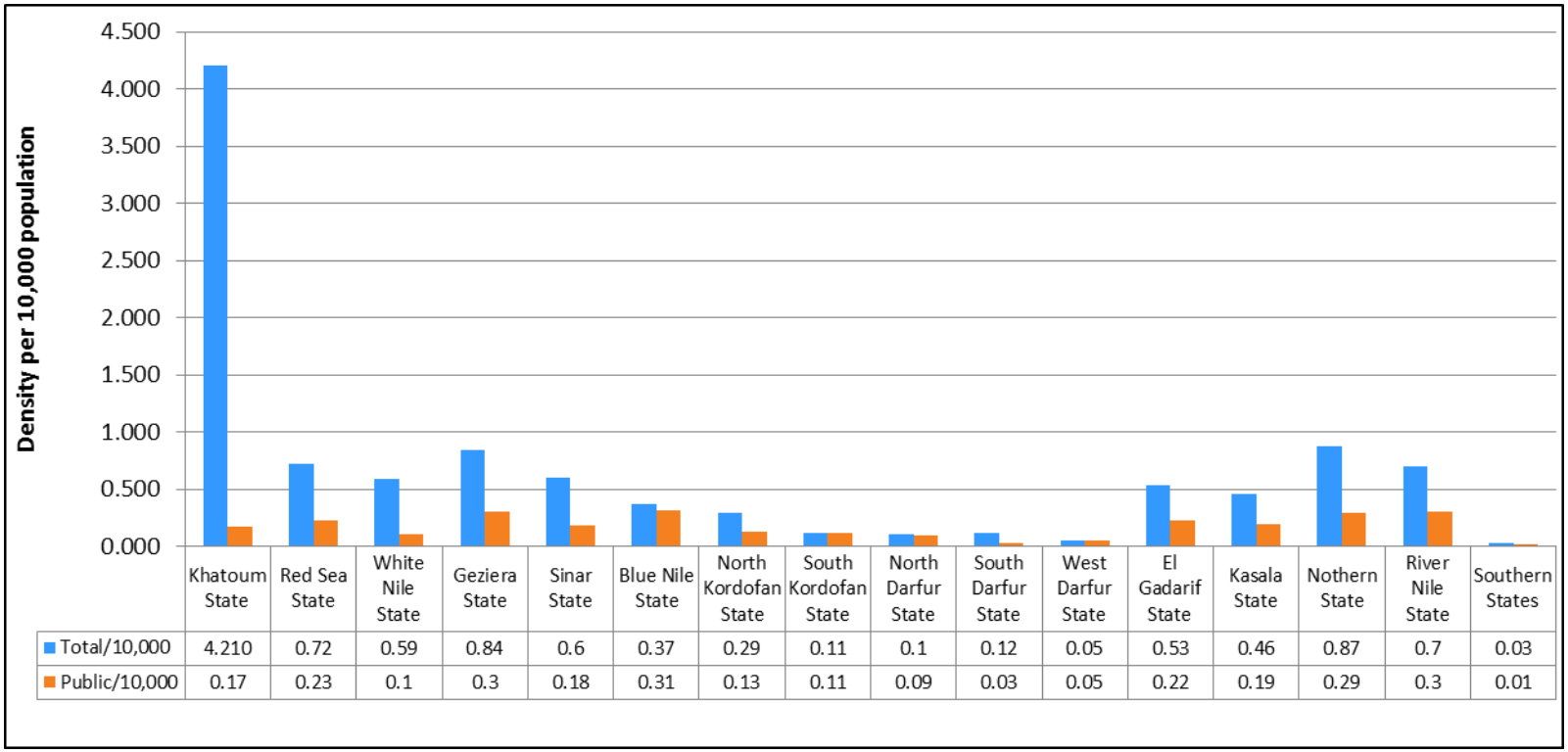


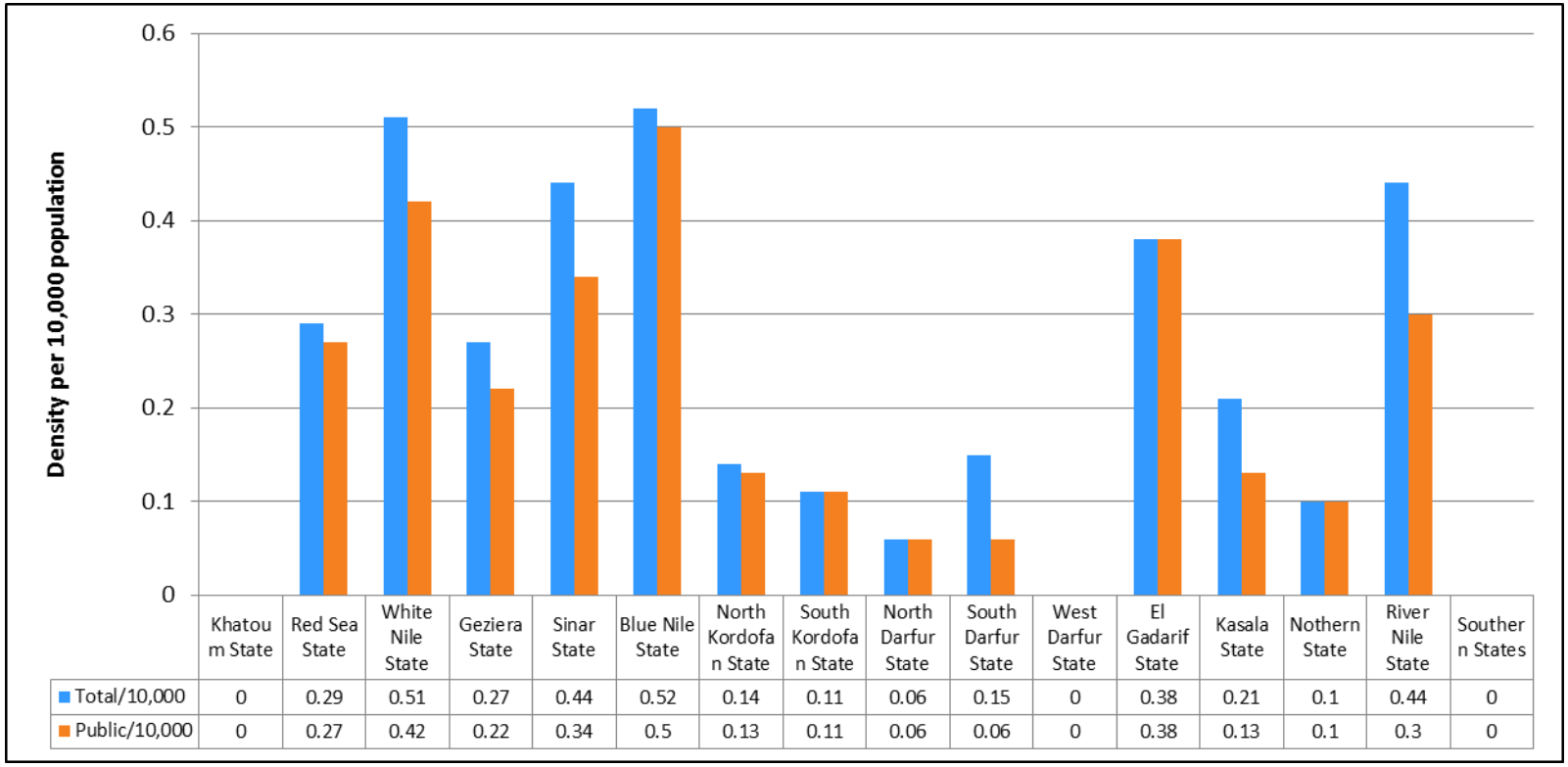
FIGURE 4.4: DISTRIBUTION OF PHARMACIST WORKFORCE BY EMPLOYMENT SECTOR

Sudan is divided into 15 Northern states and 10 Southern states. Density of pharmacists per 10,000 population among different states in Sudan is shown in Figure 4.5. As mentioned above, there were no pharmacy technicians.
The density of pharmacy assistants per 10,000 population is shown in Figure 4.6. Data from Khartoum State and the Southern States was not available.



	Khatoum State	Red Sea State	White Nile State	Geziera State	Sinar State	Blue Nile State	North Kordofan State	South Kordofan State	North Darfur State	South Darfur State	West Darfur State	El Gadarif State	Kasala State	Nothern State	River Nile State	Southern States
Total/10,000	4.210	0.72	0.59	0.84	0.6	0.37	0.29	0.11	0.1	0.12	0.05	0.53	0.46	0.87	0.7	0.03
Public/10,000	0.17	0.23	0.1	0.3	0.18	0.31	0.13	0.11	0.09	0.03	0.05	0.22	0.19	0.29	0.3	0.01

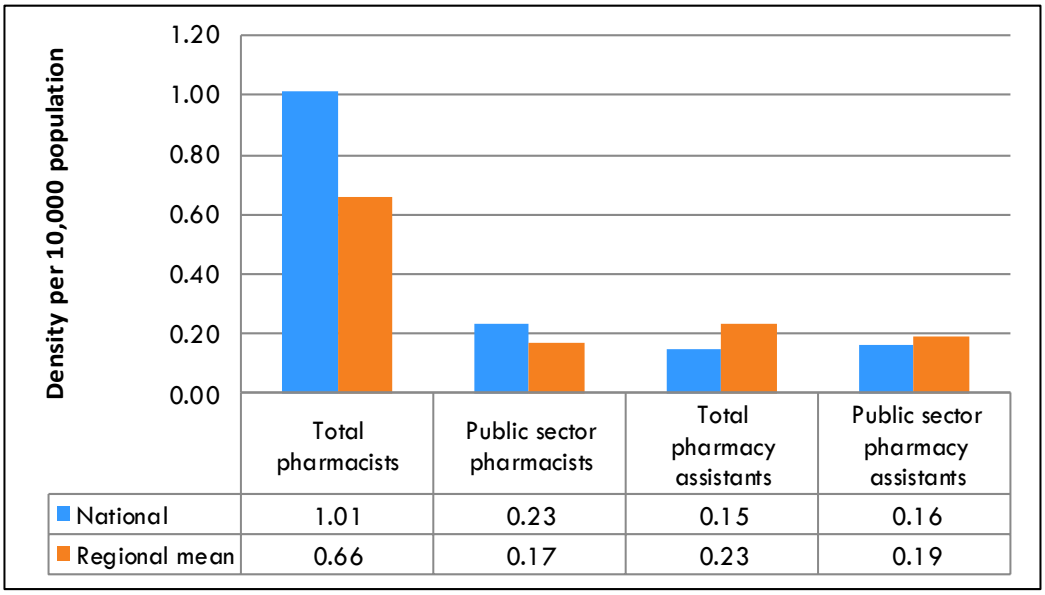
FIGURE 4.5: DENSITY OF PHARMACISTS PER 10,000 POPULATION AT DIFFERENT STATES



	Khatoum State	Red Sea State	White Nile State	Geziera State	Sinar State	Blue Nile State	North Kordofan State	South Kordofan State	North Darfur State	South Darfur State	West Darfur State	El Gadarif State	Kasala State	Nothern State	River Nile State	Southern States
Total/10,000	0	0.29	0.51	0.27	0.44	0.52	0.14	0.11	0.06	0.15	0	0.38	0.21	0.1	0.44	0
Public/10,000	0	0.27	0.42	0.22	0.34	0.5	0.13	0.11	0.06	0.06	0	0.38	0.13	0.1	0.3	0

FIGURE 4.6: DENSITY OF PHARMACY ASSISSTANTS PER 10,000 POPULATION AT DIFFERENT STATES

The density of pharmacists and pharmacy assistants per 10,000 population at the national level is shown in Figure 4.7.



	Total pharmacists	Public sector pharmacists	Total pharmacy assistants	Public sector pharmacy assistants
National	1.01	0.23	0.15	0.16
Regional mean	0.66	0.17	0.23	0.19

FIGURE 4.7: DENSITY OF PHARMACISTS AND PHARMACY ASSISTANTS PER 10,000 POPULATION

Availability of pharmacies per 10,000 of the population among different states in Sudan is shown in Figure 4.8.

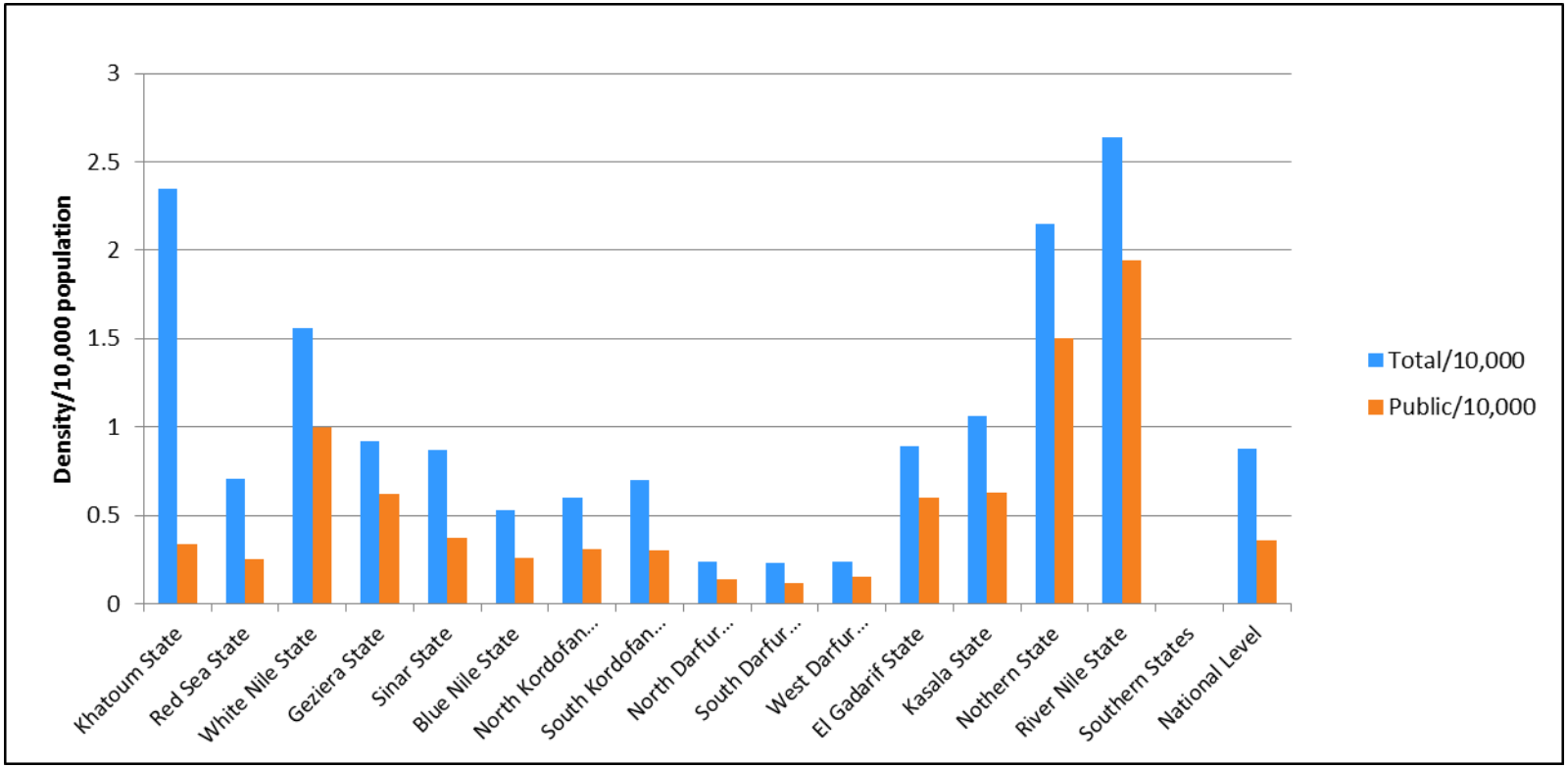


FIGURE 4.8: DENSITY OF PHARMACIES PER 10,000 POPULATION

4.1.5. Public Sector Pharmaceutical Personnel

The total number of pharmacists working at the FMoH and its agencies is around 147 divided between Directorate General of Pharmacy, Federal Pharmacy and Poisons Board, Central Medical Supplies and the National Health Insurance. There was no estimation of the required staffing level for the FMoH. Instead, the required staffing level of pharmacists for the whole country is estimated as 2431 pharmacists for the public sector (according to the Ten-year Human Resources Development Plan 2004 – 2013). Table 4.1 illustrates the required and existing staff and deficits.

TABLE 4.1: PUBLIC SECTOR PHARMACY WORKFORCE NEEDS VERSUS CURRENT LEVELS

Category	Need	Existing	Deficit
Pharmacist	2431	928	1503
Pharmacy Specialist*	410	32	378

* Pharmacy specialist is the pharmacist who had a certificate higher than BSc, whether master or PhD.
Source: Human Resources Development Plan, Ministry of Health, 2004 - 2013

There was no available data on the number of pharmacists that had left the public sector for the past 24 months.

4.1.6. Labor market for pharmacist:

The annual salary for pharmacist ranges from 6,000 SG (minimum) up to 246,000 SG (maximum). Figure 4.9 shows the differences in the annual salaries between pharmacists working in different sectors whereas figure 4.10 illustrates the difference between different health care providers at the public sector

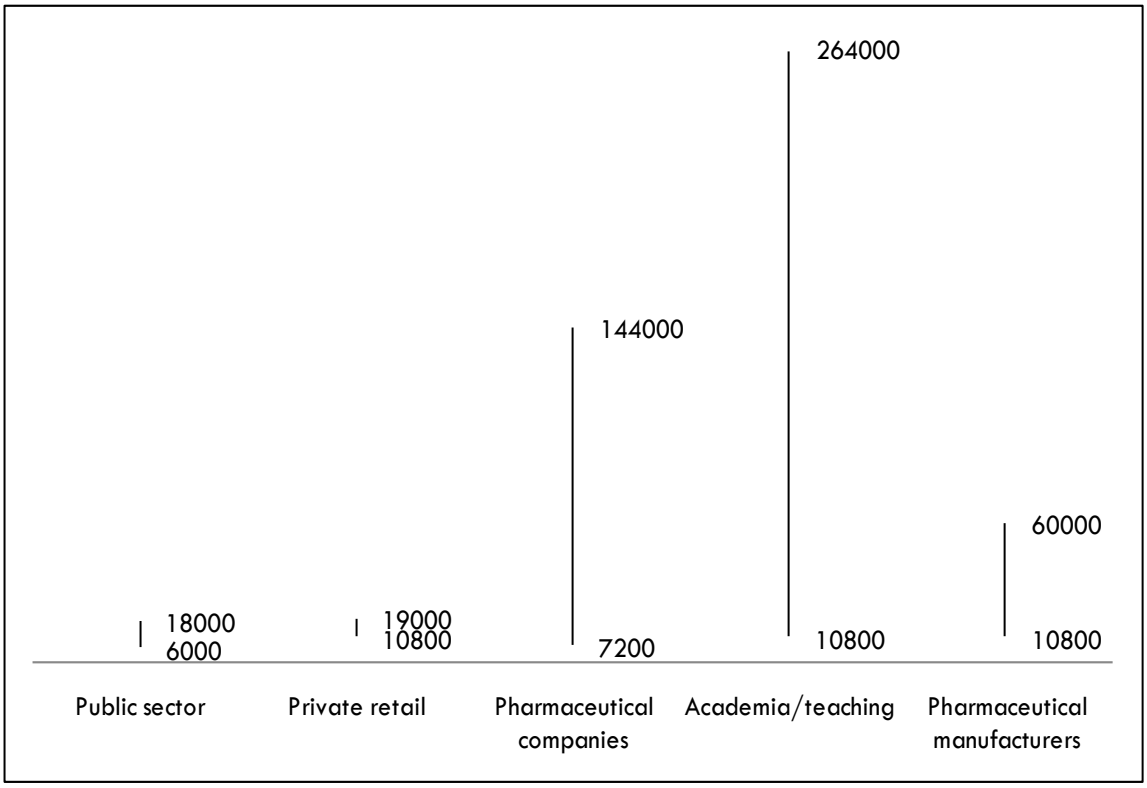
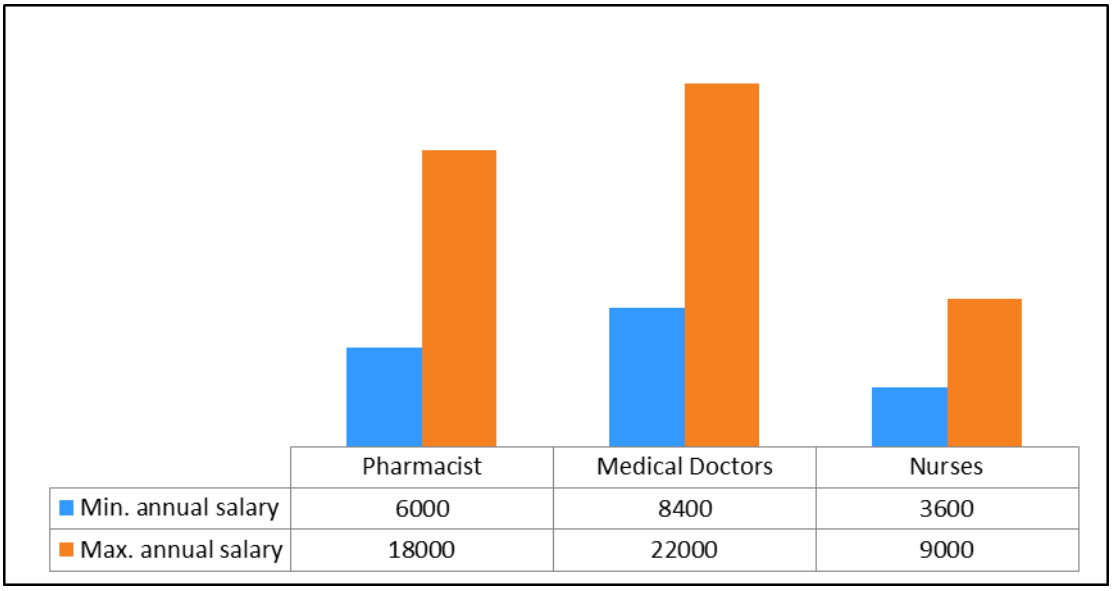


FIGURE 4.9: ANNUAL PHARMACIST SALARY RANGES BY EMPLOYMENT SECTOR (SG)



	Pharmacist	Medical Doctors	Nurses
Min. annual salary	6000	8400	3600
Max. annual salary	18000	22000	9000

FIGURE 4.10: DIFFERENCE BETWEEN SALARIES OF DIFFERENT HEALTH CARE PROVIDER AT PUBLIC SECTOR (SG)

4.1.7. Sudanese Pharmaceutical Industries

In Sudan, the pharmaceutical industry started since the 1950s by the Sudanese chemical plant industries, and until the end of the 1980s, the number did not exceed 7 plants. A breakthrough occurred after the revolution of Salvation, where the number of licensed factories increased to 24.

Now, there are 24 pharmaceutical manufacturing factories that produce medicines, cosmetics, paramedicals and medical gases. From these 24 manufacturers, 5 produce cosmetics, paramedicals and medical gases and the other 19 produce medicines in various forms. Some manufacturers export to neighboring countries.

4.1.8. Chain Pharmacies

The establishment of chain pharmacies is allowed in Sudan. Chain pharmacies can be owned either by individuals or companies. There is no maximum limit number per company or individual. The proportion of the total number of pharmacies that are chain pharmacies was not available.

4.2. Pharmacy Education in Sudan

Pharmacy Education Starts in 1964 by the establishment of Faculty of Pharmacy – University of Khartoum. Presently, there are 12 pharmacy faculties with another two under construction. From these 12, 6 faculties are governmental and 6 are private. Only 8 faculties contributed in this survey. That is because this period of the year represents either the exam or the summer holiday period for all faculties thus, four faculties were not able to respond to the survey. The data presented in this section is only for 8 faculties.

As mentioned above, the first faculty of pharmacy was established in 1964 and from 1996 up to 2005, 10 other faculties were established. This expansion is in line with the reform in higher education throughout the Arab world.

The full time teaching staff is estimated to be 250 in total for all 12 faculties. For the 8 faculties included in this survey, the total number of full time teaching staff was 217 (27.1+13.9) and the total part time staff was 137 (17.1+15.7).

Seventy five percent of these faculties have free internet access for students. Around 50% have subscription to online and printed pharmaceutical journals and12.5% have subscriptions to database libraries. The mean number of reference books available per school is about 448.3% (SD 411.1).

All faculties offer the BSc degree in Pharmacy. The length of the program was 45 months (5 years). The mean annual tuition fee is 9,741 SG (SD 3,952). The total maximum enrolment capacity was found to be 1080 per year with mean of 135 (SD 62.8). Table 4.2 illustrates the number of teachers, their classification, number of students enrolled and graduated through three different years and the ownership for the 8 pharmacy faculties involved in this survey.

TABLE 4.2: DATA FROM PHARMACY FACULTIES

		PF*1	PF2	PF3	PF4	PF5	PF6	PF7	PF8
Year Started		1964	1996	1999	2001	2001	2001	2005	1999
Number of Teachers	Full Time	49	46	32	12	21	19	15	23
	Part Time	3	49	12	14	10	8	8	33
Number of Students Enrolled	2006	130	279	50	40	200	122	41	92
	2007	131	340	47	40	200	96	54	97
	2008	131	259	41	40	200	100	81	98
Number of BPharm students graduated	2006	175	113	32	0	120	32	0	55
	2007	165	213	37	7	140	65	0	62
	2008	180	269	24	22	140	86	0	61
Ownership		Government	Government	Private	Private	Government	Private	Government	Private

*PF stands for pharmacy faculty

Three of these faculties offer MSc degree in Pharmacy. The mean program length for MSc is about 30 months (SD = 6) with mean annual tuition fee of 11,500 SG (SD 5,268). The maximum annual enrolment and graduated student is not limited for research MSc programs but limited taught MSc programs.

Only two of these faculties offer the PhD degree in Pharmacy. The number enrolled or graduated is not limited.

Only one faculty offers the Pharmacy Technologist Diploma. It has started to graduate students but this cadre has no clear job descriptions for either the public or private sector. The Pharmacy Assistant Certificate is no longer offered.

The mean rankings of the most important challenges facing these faculties is shown in Table 4.3 and the mean for the most critical need to increase the production capacity by 20% is illustrated in Table 4.4.

TABLE 4.3: MEAN IMPORTANCE RANKING OF CHALLENGES FACING FACULTIES

Challenge	Mean rank (1 = most important, 5= least important)
Budget	1.6
Number of qualified teachers	1.8
Physical infrastructure	3
Low demand from students	3.9
Other	5

One faculty stated that there is no need to increase their training production capacity. It is important to note that increases in training is determined by national higher education policy rather than by individual faculties.

TABLE 4.4: MEAN IMPORTANCE RANKING OF BARRIERS TO SCALE UP OF TRAINING BY 20%

Challenge	Mean rank (1 = most important, 5= least important)
Budget	1.6
Physical infrastructure	2.3
Number of qualified teachers	2.4
Low demand from students	3.7
Other	5

4.3. Pharmacy Personnel and Services offered at Surveyed Health Facilities

In this survey, the total number of health facilities included was 196 (Figure 4.11).

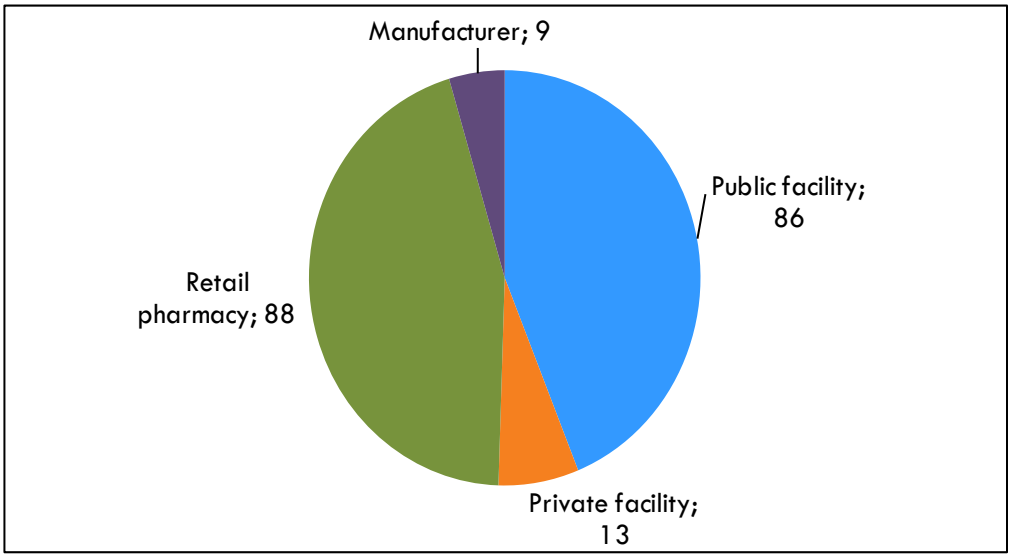


FIGURE 4.11: CLASSIFICATIONOF FACILITIES SURVEYED

The pharmaceutical services offered by these facilities are shown in Table 4.5. Note that services offered by pharmacists at Federal Ministry of Health and its agencies were not included.

TABLE 4.5: PHARMACEUTICAL SERVICES OFFERED BY SURVEYED FACILITIES

Service	Procurement	Dispensing	Prescribing	Compounding	Wholesaling	Manufacturing
Public facility	0	84	2	12	0	0
Pharmaceutical Companies	10	0	0	0	10	0
Retailer	0	88	0	41	2	0
Manufacturer	0	0	0	9	9	9
Total	10	172	2	62	21	9

4.3.1. Pharmacists at surveyed health facilities:

Comparisons of gender, age and jobs of pharmacists at the surveyed health facilities are shown in figure 4.12, figure 4.13 and figure 4.14, whereas table 4.6 demonstrates the distribution of pharmacists at health facilities.

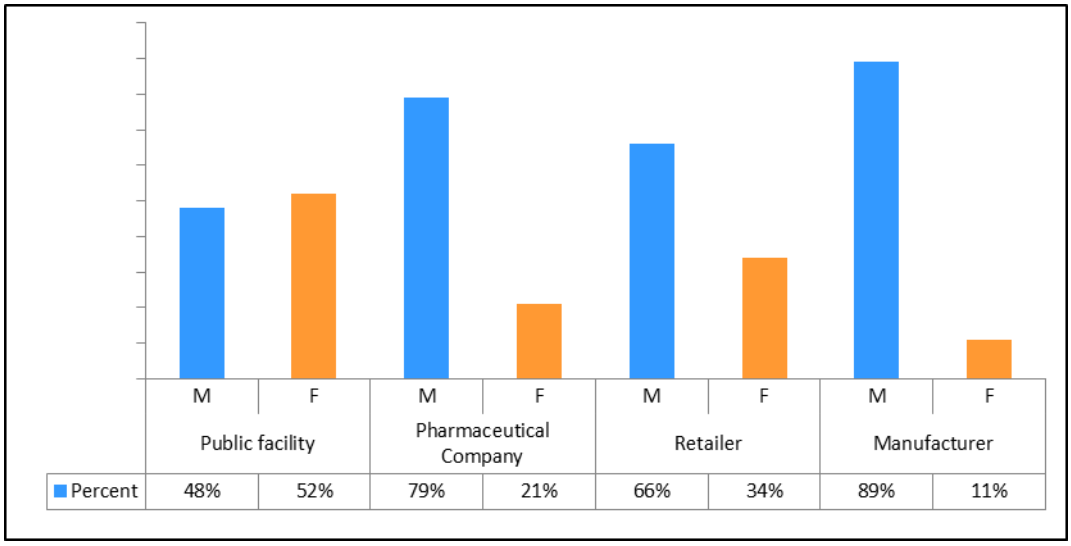


FIGURE 4.12: GENDER DISTRIBUTION OF PHARMACISTS AMONG THE SURVEYED HEALTH FACILITIES

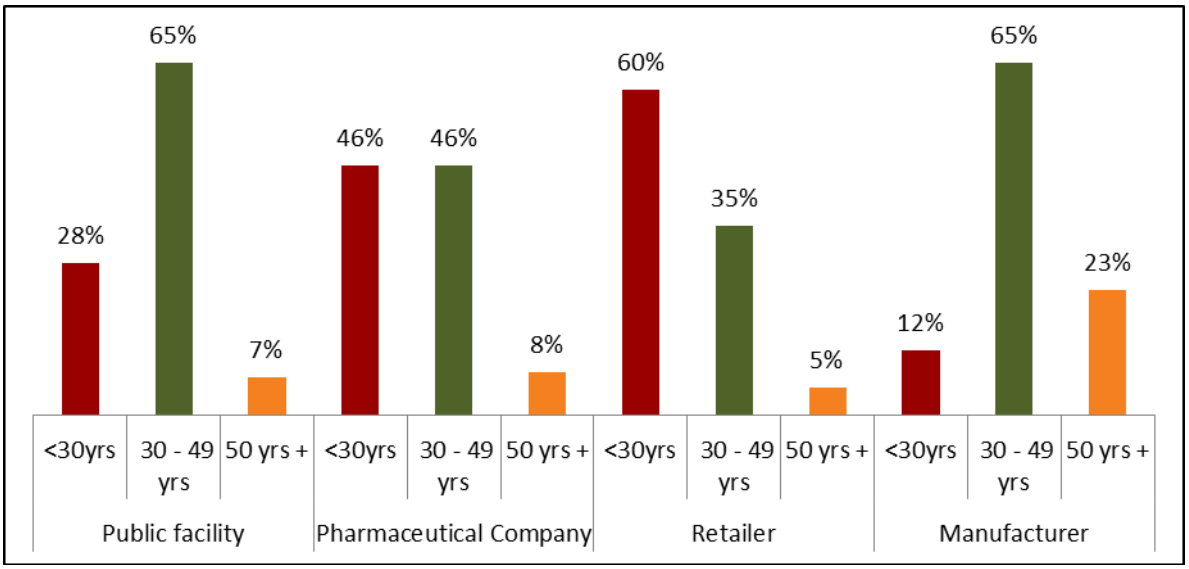


FIGURE 4.13: AGE DISTRIBUTION OF PHARMACISTS AMONG THE SURVEYED HEALTH FACILITIES

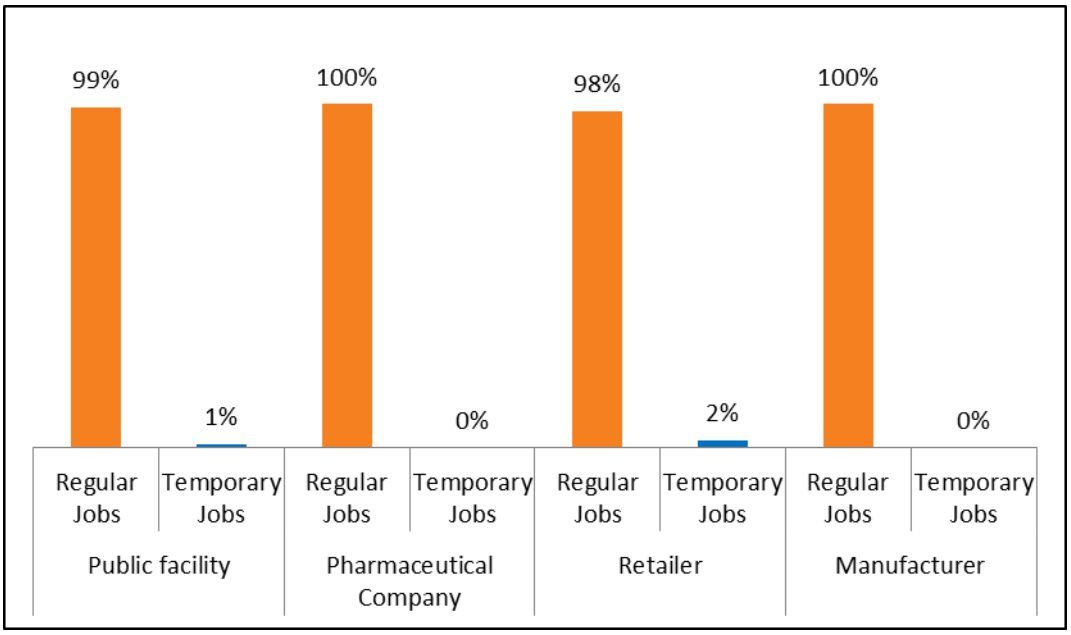


FIGURE 4.14: JOBS OF PHARMACISTS AMONG THE SURVEYED HEALTH FACILITIES

TABLE 4.6: DISTRIBUTION OF PHARMACISTS AT THE SURVEYED HEALTH FACILITIES

Setting	Data	Total
Public facility	Total number	231
	Sum of Male	112
	Sum of Female	119
	Sum of <30yrs	65
	Sum of 30 - 49 yrs	151
	Sum of 50 yrs +	15
	Sum of Regular	228
	Sum of Temporary	2
Pharmaceutical Company	Total number	85
	Sum of Male	67
	Sum of Female	17
	Sum of <30yrs	39
	Sum of 30 - 49 yrs	39
	Sum of 50 yrs +	7

	Sum of Regular	85
	Sum of Temporary	0
Retailer	Total number	124
	Sum of Male	69
	Sum of Female	55
	Sum of <30yrs	74
	Sum of 30 - 49 yrs	43
	Sum of 50 yrs +	7
	Sum of Regular	122
	Sum of Temporary	2
Manufacturer	Total number	49
	Sum of Male	43
	Sum of Female	6
	Sum of <30yrs	6
	Sum of 30 - 49 yrs	32
	Sum of 50 yrs +	11
	Sum of Regular	49
	Sum of Temporary	0
Total No. of Total number		489
Total No. of Male		291
Total No. of Female		197
Total No. of <30yrs		184
Total No. of 30 - 49 yrs		265
Total No. of 50 yrs +		40
Total No. of Regular		484
Total No. of Temporary		4

4.3.2. Pharmacy Assistants and other Health Workers at surveyed Health Facilities:

Distribution of pharmacy assistants at these facilities is shown in table 4.7. There were no assistants working at neither a pharmaceutical company nor a manufacture.

TABLE 4.7: DISTRIBUTION OF PHARMACY ASSISTANTS AT THE SURVEYED HEALTH FACILITIES

Setting	Data	Total
Public facility	Total number	241
	Sum of Male	163
	Sum of Female	78
	Sum of <30yrs	39
	Sum of 30 - 49 yrs	162
	Sum of 50 yrs +	40
	Sum of Regular	239
	Sum of Temporary	2
Retailer	Total number	82
	Sum of Male	74
	Sum of Female	8
	Sum of <30yrs	10
	Sum of 30 - 49 yrs	62
	Sum of 50 yrs +	10
	Sum of Regular	82
	Sum of Temporary	0
Total No. of Total number		323
Total No. of Male		237
Total No. of Female		86
Total No. of <30yrs		49
Total No. of 30 - 49 yrs		224
Total No. of 50 yrs +		50
Total No. of Regular		321
Total No. of Temporary		2

Table 4.8 shows the distribution of other health workers at the surveyed health facilities. Health workers other than pharmacists and pharmacy assistants are concentrated at the public health facilities. The term “pharmacy attendants” is not used in Sudan.

TABLE 4.8: DISTRIBUTION OF OTHER HEALTH WORKERS AT THE SURVEYED HEALTH FACILITIES

Setting	Data	Total
Public facility	Doctors	1076
	Nurses/midwives	2458
	CHWs	317
	Lab techs	458
	Clinical	138
	Others	1869
Pharmaceutical Company	Doctors	0
	Nurses/midwives	0
	CHWs	0
	Lab techs	40
	Clinical	32
	Others	147
Retailer	Doctors	0
	Nurses/midwives	3
	CHWs	0
	Lab techs	0
	Clinical	10
	Others	70
Manufacturer	Doctors	2
	Nurses/midwives	0
	CHWs	0
	Lab techs	29
	Clinical	0
	Others	551
Total No. of Doctors		1078
Total No. of Nurses/midwives		2461
Total No. of CHWs		317
Total No. of Lab techs		527
Total No. of Clinical		180
Total No. of Others		2637

4.3.3. Pharmaceutical Services Offered:

The pharmaceutical services offered by different health workers at different health facilities are shown in table 4.9.

TABLE 4.9: SERVECES OFFERED BY DIFFERENT HEALTH FACILITIES SURVEYED

Services	Dispensing	Prescribing	Stock management	Quantification	Lab work	Compounding
Pharmacists	135	3	136	142	31	59
Pharm assts	128	2	60	63	4	4
Doctors	0	70	5	7	0	0
Nurses/midwives	10	0	2	4	0	0
CHWs	0	0	0	0	0	0
Other	7	0	4	6	2	0

Pharmaceutical services offered by pharmacists at health facilities are shown in table 4.10, those offered pharmacy assistants are shown in table 4.11 and those offered by medical doctors' and nurses are shown in table 4.12.

TABLE 4.10: PHARMACEUTICAL SERVICES OFFERED BY PHARMACISTS AMONG DIFFERENT FACILITIES

Setting	Service	Total
Public facility Total no. of facilities = 86	Dispensing	47
	Prescribing	1
	Stock management	44
	Quantification	49
	Lab work	6
	Compounding	9
Private facility Total no. of facilities = 13	Dispensing	0
	Prescribing	0
	Stock management	6
	Quantification	8
	Lab work	2
	Compounding	2
Retailer Total no. of facilities	Dispensing	88
	Prescribing	2

=88	Stock management	77
	Quantification	76
	Lab work	14
	Compounding	39
Manufacturer Total no. of facilities = 9	Dispensing	0
	Prescribing	0
	Stock management	9
	Quantification	9
	Lab work	9
	Compounding	9

TABLE 4.11: PHARMACEUTICAL SERVICES OFFERED BY PHARMACIST ASSISTANTS AMONG DIFFERENT FACILITIES:

Setting	Service	Total
Public facility Total no. of facilities = 86	Dispensing	75
	Prescribing	0
	Stock management	43
	Quantification	42
	Lab work	3
	Compounding	2
Retailer Total no. of facilities =88	Dispensing	53
	Prescribing	2
	Stock management	17
	Quantification	21
	Lab work	1
	Compounding	2

From the data obtained, it was found that pharmaceutical services such as dispensing, stock management and quantification of need are carried mainly by pharmacists. Medical doctors and nurses are concerned mainly by prescribing. At rural areas where pharmacists were not available, medical doctors can carry the responsibilities of some pharmaceutical services but this is at very limited cases.

4.3.4. Working Conditions of pharmacists at facility level

The result of this survey shows that more than 85% of the private retail pharmacies and all manufacturers and pharmaceutical companies have the authority to recruit pharmaceutical personnel. In contrast, only 7% of public health facilities have this authority.

The availability of job description for pharmaceutical personnel at health facilities is shown in figure 4.15.

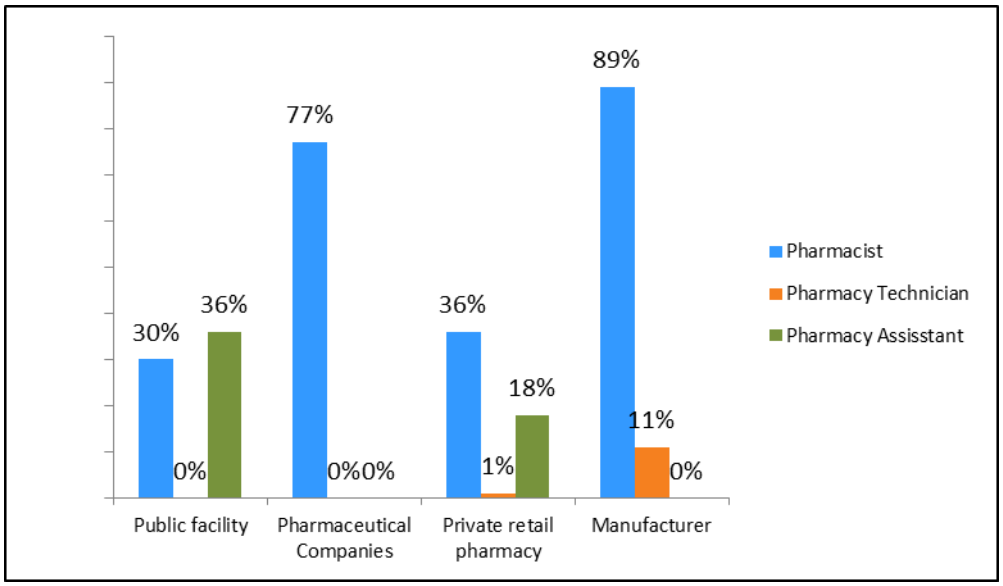


FIGURE 4.15: FACILITIES WITH CLEAR JOB DESCRIPTION

Average of min and max annual salaries for pharmacist at different surveyed health facilities is shown in figure 4.16 and those of the pharmacy assistant are shown in fig. 4.17. Data of medical doctor and nurse salary were not sufficient to estimate the annual salaries.

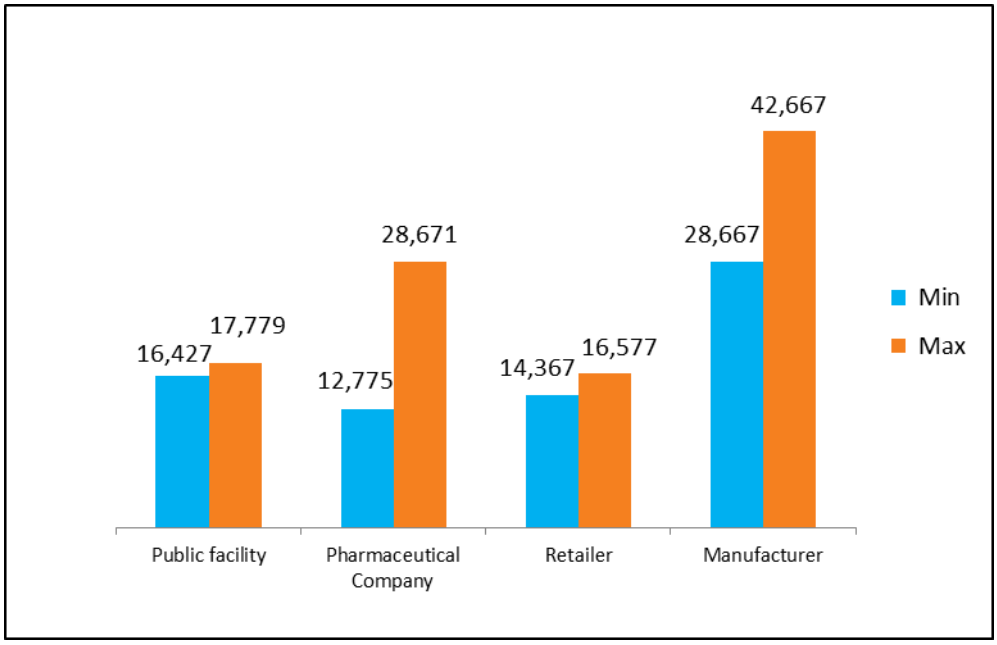


FIGURE 4.16: AVERAGE MIN AND MAX ANNUAL PHARMACISTS SALARIES IN (SG)

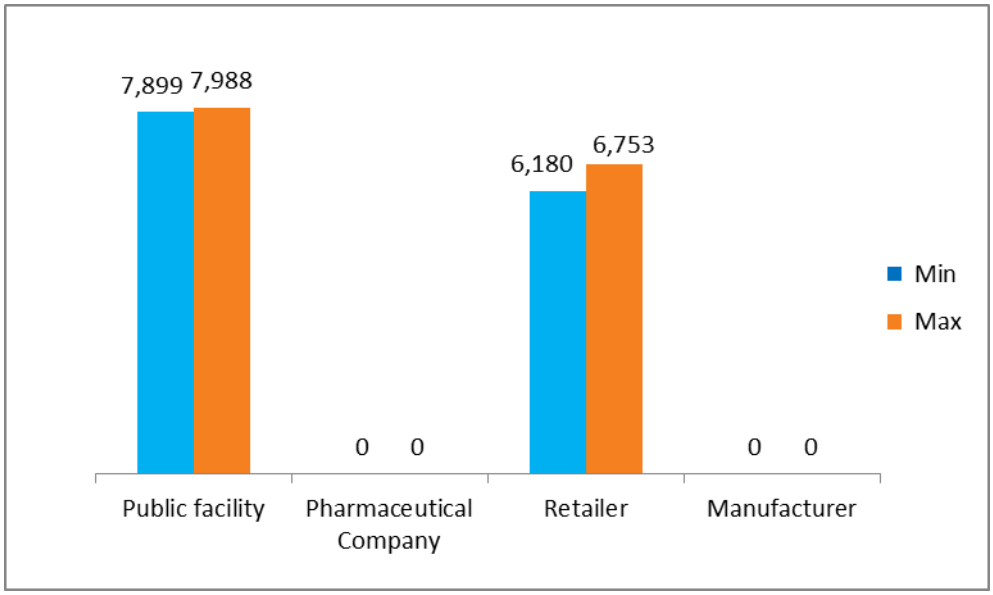


FIGURE 4.17: AVERAGE MIN AND MAX ANNUAL PHARMACY ASSISTANTS SALARIES IN (SG)

The average working hours for pharmacist at each health facility is shown in fig. 4.18.

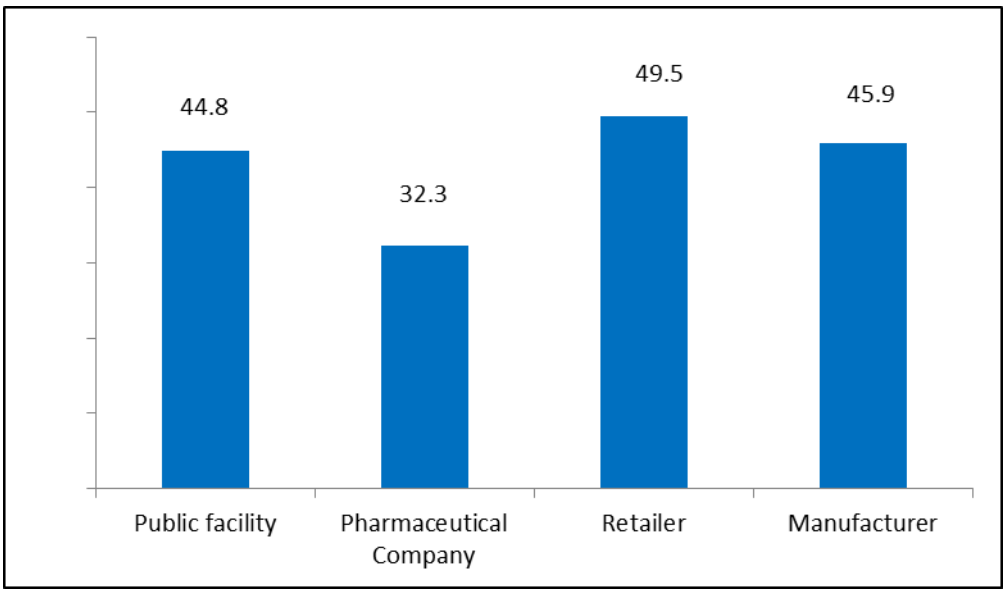
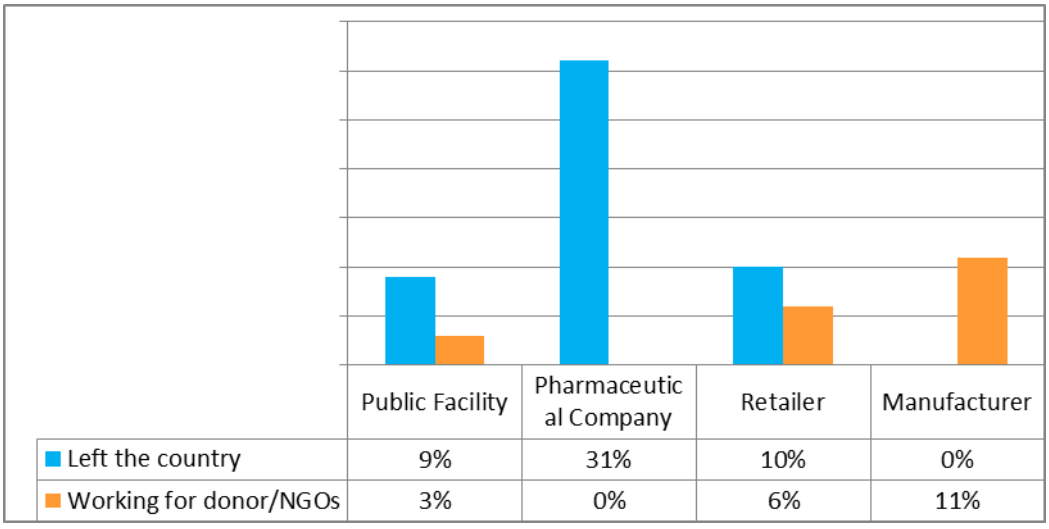


FIGURE 4.18: AVERAGE WORKING HOURS FOR PHARMACISTS

4.3.5. Attrition

The percent of facilities that had pharmacists resigned due to migration or working in NGOs is shown in figure 4.19.



	Public Facility	Pharmaceutical Company	Retailer	Manufacturer
Left the country	9%	31%	10%	0%
Working for donor/NGOs	3%	0%	6%	11%

FIGURE 4.19: FACILITIES HAD PHARMACISTS LEFT WORK

4.3.6. Problems in filling Pharmacist position

The percent of facilities that had problems in filling a pharmacist position over the last 24 months and the percent of facilities that had unfilled pharmacist position are shown in figure 4.20 whereas table 4.21 shows the filled, vacant and vacancy rate among different surveyed facilities. It was found that public facilities are suffering from the existence of vacant posts. This is due to either embargo, no application.

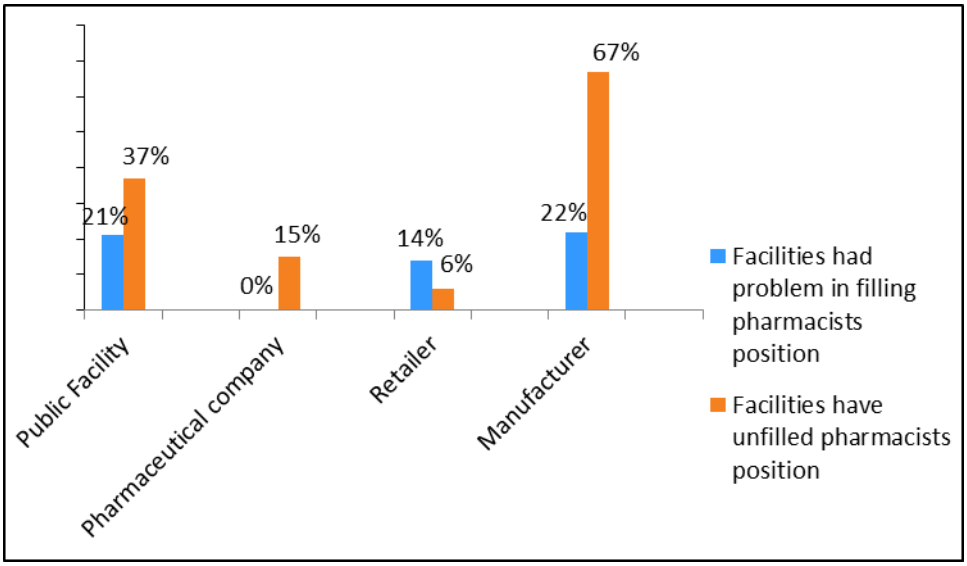


FIGURE 4.20: FACILITIES WITH VACANCIES

TABLE 4.12: FILLED, VACANT AND VACANCY RATE AMONG DIFFERENT SURVEYED FACILITIES

Facility type	Pharmacist			Technician			Assistant		
	Filled	Vacant	Vacancy rate (%)	Filled	Vacant	Vacancy rate (%)	Filled	Vacant	Vacancy rate (%)
Public (N=86)	231	46	17	0	0	0	241	74	24
Private facility (N=13)	85	9	10	0	2	100	0	1	100
Private retail (N= 88)	124	3	1	0	1	1	82	2	2
Manufacturer (N= 9)	49	11	18	2	0	0	0	0	0
Total	489	69	12	2	3	60	323	77	20

4.4. Job satisfaction

Job satisfaction was measured for pharmacists and pharmacy assistants working at the facilities included in this survey. There are a total of 449 respondents.

4.4.1. Respondent demographics

The distribution of this form between the different health facilities is shown in table 4.13. Ninety nine percent of these respondents have regular jobs at the facility they work at.

Distribution of age between different facilities is also shown in table 4.13. 48% of the respondents have ages between 31 and 49 whereas only 9% were above 50 years old.

Thirty eight percent of the respondents were female. The gender distribution between the facilities is illustrated in table 4.13

TABLE 4.13: DEMOGRAPHIC DATA FOR PHARMACEUTICAL PERSONNEL FILLED JOB SATISFACTION FORM

Facility	Total	Male	Female	Regular job	Temp job	Under 30yrs	From 31-49yrs	50yrs+
Ministry	56 (12%)	34 (61%)	22	53	3	19 (34%)	31 (55%)	6 (11%)
Educator	41 (9%)	22 (54%)	19	41	0	19 (46%)	15 (37%)	7 (17%)
Manufacturer	28 (6%)	25 (89%)	3	28	0	8 (29%)	16 (57%)	4 (14%)
Public facility	173 (39%)	94 (54%)	79	173	0	59 (32%)	99 (57%)	15 (21%)
Private facility	34 (8%)	24 (71%)	10	33	1	19 (56%)	12 (35%)	3 (9%)
Retailer	117 (26%)	80 (68%)	37	116	1	70 (60%)	43 (37%)	4 (3%)
Total	449	279 (62%)	170	444	5	194 (43%)	216 (48%)	39 (9%)

The highest level of education obtained by the pharmacist and pharmacy assistants at each type of facilities and the number of pharmaceutical personnel obtained each pharmaceutical degree is shown in table 4.14.

TABLE 4.14: EDUCATIONAL LEVEL OBTAINED BY RESPONDANTS

Setting	Diploma	BS Pharm	PharmD	MSc	PhD	Grand Total
Ministry	0	32	1	22	1	56
Council	0	0	0	0	0	0
Educator	0	19	1	9	12	41
Manufacturer	1	19	3	4	1	28
Public facility	77	75	1	19	1	173
Private facility	0	29	0	5	0	34
Retailer	24	87	1	5	0	117
Grand Total	102	261	7	64	15	449

Three quarters of respondents obtained their qualifications over the last ten years. Eighty-four percent of these degrees were attained from Sudan and the remaining were from 12 other countries. The mean total number of educational years that they completed to get these degrees is 17.5 (SD 1.1).

4.4.2. Working Tasks

The normal working tasks of the respondents was found to be the same as mentioned in table 4.9. The mean of working hours per week was found to be 45hs (SD 15.6).

4.4.3. Learning Programs

The structured learning programs that pharmaceutical personnel have participated in over the last 12 months are shown in figure 4.21. The percent of personnel from each facility type that attended each program is shown in figure 4.22.

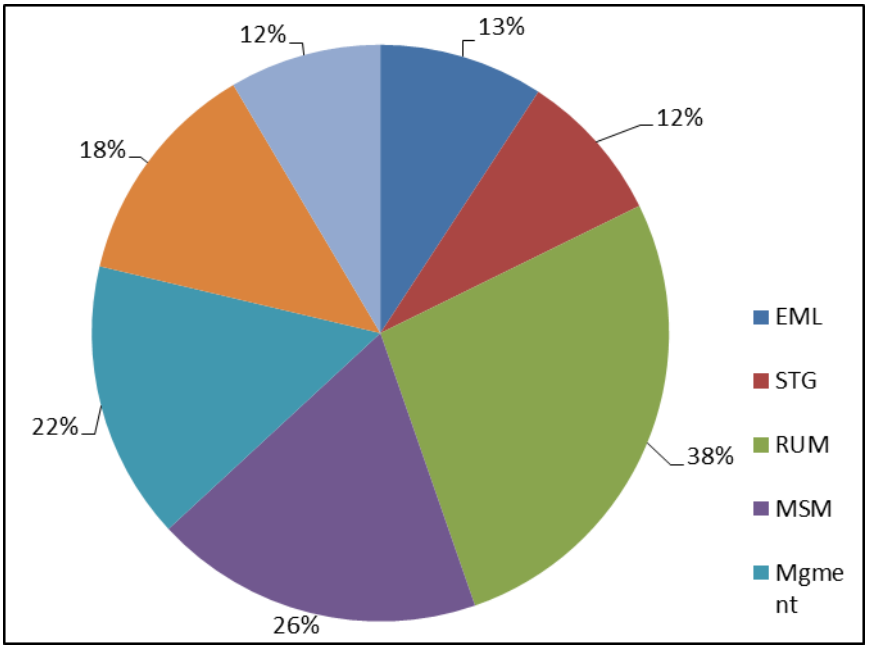


FIGURE 4.21: LEARNING PROGRAMS ATTENDED BY PHARMACEUTICAL PERSONNEL

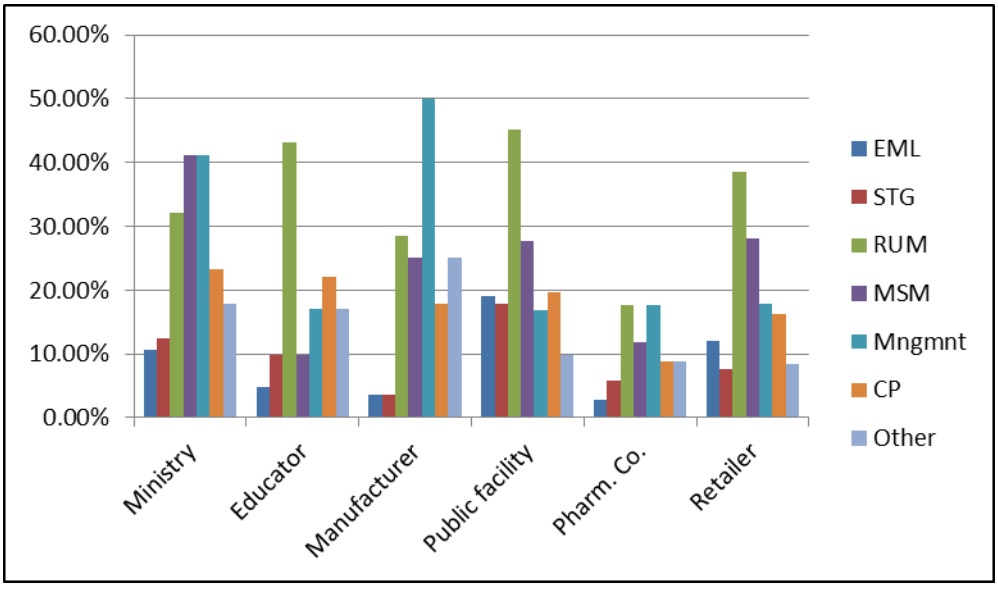


FIGURE 4.22: PERCENT OF PERSONNEL ATTENDED EDUCATIONAL PROGRAMS

4.4.4. Personal Fulfillment:

Personal fulfilment of the respondent was measured and illustrated in table 4.15.

TABLE 4.15: PERCENTAGES OF PHARMACUTICAL PERSONNEL WHO DISAGREED TO STATEMENTS (N =449)

Statement	% disagree
I am given opportunities to improve my professional skills	31
I believe that my career aspirations can be achieved at this organization.	27
My job is challenging and interesting	13
I receive training in the skills that are critical for me to succeed.	40
Opportunities to receive training are distributed fairly.	45
I understand the career path in my organization, and promotions are granted fairly.	33
Suggestions made by workers on how to improve the work are usually taken into consideration	42
This organization pays me fairly for the work I do	41
My job offers adequate pay compared with similar jobs	45
Rates of pay and pay raises are decided fairly.	49
With this job I have no worries about how to support myself and my family	49
I am provided with regular feedback (quality and quantity) of my performance	33
My work is rarely disrupted by bureaucratic processes	28
I have the resources I need to do my work (e.g. equipment and supplies)	26
There is genuine management concern for the problems employees face	29

4.4.5. Safety and Harassment at work

Safety and harassment at work is measured during this survey. It is clear from the result of the analysis that more than 70% of pharmacists working at each sector are confident that if someone harassed them, it would be punished, less than 25% have experienced some harassment from a supervisor or another employee of the opposite sex whereas more than 75% feel safe travelling daily from home to work place.

TABLE 4.16: PERCENTAGE AGREEMENT WITH STATEMENTS ON HARASSMENT AND PERSONAL SAFETY (N=449)

Statement	% disagree
I am confident that if someone harassed me, they would be punished.	21
I have experienced some harassment from a supervisor (for example bullying or threatening behaviour)	78
I have experienced some harassment from another employee of the opposite sex	80
I feel safe travelling daily from my home to my work place	12

4.4.6. Benefits at work

Benefits that are offered by the different facilities for pharmaceutical personnel are shown in table 4.17.

TABLE 4.17: BENEFITS OFFERED BY DIFFERENT FACILITIES FOR PHARMACEUTICAL PERSONNEL

	Free medical coverage %	Partial medical coverage %	Housing allowance %	Risk allowance %	Food allowance %	Travel allowance %	School fee allowance %
Ministry	10.70	35.70	12.50	17.90	37.50	33.90	0
Educator	9.80	29.30	24.40	2.40	7.30	19.50	2.40
Manufacturer	39.20	35.70	50	28.60	60.70	89.30	7.10
Public facility	16.80	52	32.40	43.40	51.40	40.50	5.20
Pharm. Co.	11.80	14.70	8.80	11.80	20.60	44.10	2.90
Retailer	17.90	23.90	14.50	12.80	41	22.20	3.40

For about 19% of respondents, pay increase were performance-based and for 29%, pay increases were dependent upon the level of qualification. The results for each facility are shown in table 4.18.

TABLE 4.18: BENEFITS OFFERED BY DIFFERENT FACILITIES FOR PHARMACEUTICAL PERSONNEL

Setting	Performance pay increase	Education pay increase
Ministry	25%	23%
Educator	15%	63%
Manufacturer	61%	36%
Public facility	10%	31%
Private facility	4%	18%
Retailer	20%	18%

Around 18% of respondents had experienced a delay in receiving their salary at the scheduled time with mean delay days of 16.3 (SD 24.7). The percent of personnel that experienced this delay at each facility type is shown in figure 4.23.

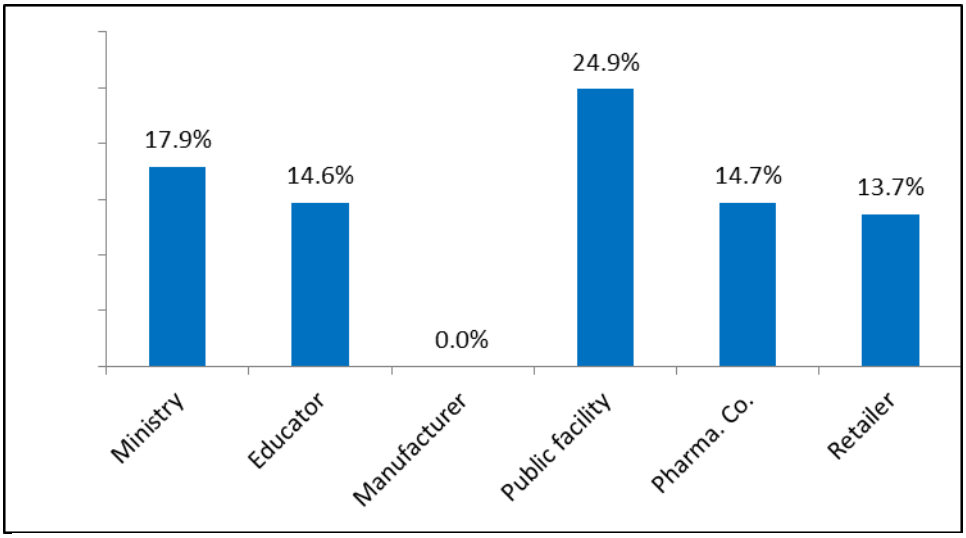


FIGURE 4.23: RESPONDENT EXPERIENCED DELAY IN RECEIVING SALARY

4.4.7. Job Changing

Thirty-two percent of the respondents considered changing their job over the last five years. The percent from each facility type is shown in table 4.19.

TABLE 4.19: PERCENT OF PHARMACEUTICAL PERSONNEL CONSIDERING CHANGING JOB

Setting	Considered changing job (5 yrs)
Ministry	32%
Educator	27%
Manufacturer	32%
Public facility	37%
Private facility	41%
Retailer	23%

From the total respondents, 9% consider to leave to the public sector, 20 % to private health facility, 26% to private retail pharmacy, 2% to manufacturer, 2% to faith-based-organization, 34% to donor/NGOs whereas 75% consider to leave abroad. The percents of respondents who consider leaving to specific sector are shown in fig. 60.

TABLE 4.20: PERCENTS OF RESPONDENTS WHO CONSIDER LEAVING TO SPECIFIC SECTOR

Setting	Public sector	Private health facility	Private retail	Manufacturer	Faith-based organization	Donor/NGO	Abroad	Other
Ministry	5%	0%	2%	0%	4%	5%	23%	0%
Educator	0%	5%	5%	0%	0%	5%	24%	0%
Manufacturer	0%	0%	4%	4%	4%	4%	29%	4%
Public facility	1%	14%	17%	1%	0%	21%	26%	0%
Pharma. Co.	0%	3%	9%	0%	0%	12%	38%	0%
Retailer	4%	2%	1%	1%	0%	3%	16%	0%

5. DISCUSSION

In Sudan, three bodies are working collaboratively to regulate pharmacy practice, the SMC, Directorate General of Pharmacy (DGoP) and the Federal Pharmacy and Poisons Board (FPPB). The SMC is responsible for issuing the license for pharmacist to practice and also ensuring ethical practice. The DGoP is responsible for setting plans and policies for the whole pharmaceutical sector, and the training of pharmacists in the public sector. Finally, the FPPB is responsible for setting legislations and guidelines which regulate registration, importation and the quality control of medicines.

According to the SMC in 2009, more than 7500 pharmacist are registered. The actual number of actively practicing pharmacists is not known. This figure includes pharmacists who have died, migrated abroad, changed jobs or retired. There is no system for registration renewal or updating information in the register. Also, the percentage of females from this number was not calculated as the existing data needs to be updated and validated.

As mentioned before, pharmacy education in Sudan started in 1964 with the establishment of the Faculty of Pharmacy – University of Khartoum. Since that time, and up to 2003, the number of registered pharmacists with the SMC did not exceed 3000. From 2004 until 2009, this number doubled to exceed 7000 registered pharmacists. This was due to the reform in higher education which led to the expansion of pharmacy education and the opening of more than 10 new pharmacy faculties that started to graduate students at this period. Half of these faculties are public sector while the rest are operated by the private sector.

The maximum total enrolment capacity of the eight faculties included in this survey was found to be more than 1000 students per year with an average per faculty enrolment of 135 (SD = 62.8). The Pharmaceutical Annual Statistical Report 2007 showed that in 2006, the total enrolment capacity of the 12 faculties was actually greater than 1600 students. This expansion in the number enrolled adversely affected the quality of the education process in Sudan as it was found that all faculties, except two, were below the UNESCO indicator of the availability of the teaching cadre/students. This high level of enrolment number was not accompanied with increases in the number of teaching staff as there has been no clear policy for the recruitment of academic staff.

Only 38% of the faculties included in this survey offer MSc degree as most of them have only been recently established and some have not yet even started to graduate BSc students. Also, only two of them offer PhD degree for the same reason. As mentioned above, only one faculty offers the Pharmacy Technologist Diploma as there is no clear job description of the graduates in the neither public nor private sector. There are special schools that offer Pharmacy Assistant certificates. In Sudan, there were five schools; however none of them have graduated any students since 2007. It was found that the budget is the important challenge and greatest constraint to increasing production capacity facing these faculties. It was observed that the number of students enrolled each year was determined by the policies of the Ministry of higher Education and it is not allowed for the faculties to increase their enrolment by their own accord.

Despite the increase in the number of graduates, it was found that the density of pharmacists per 10,000 of the population in the public sector was far below what was stated by the Ten-year Human Resources Development Plan 2004 – 2013. This reflects the poor coordination between the outputs of higher education and the actual need of the public and private sectors.

It was found that there is one pharmacist per 10,000 (total) of the population and 0.2 pharmacists per 10,000 of the population (public sector) at the national level. From the data shown above, it was clear that the Blue Nile state has the highest density (0.31 pharmacists in the public sector per10,000 population). This is mainly due to the lower population compared to other states. Also, it was clear that due to the conflict, West Darfur and the Southern States have the lowest pharmacist densities.

From the data shown above, pharmacy assistants showed higher density in states with lower numbers of pharmacists as they carry some of pharmacists' responsibilities. Data on pharmacy assistants in Khartoum state was not available.

Regarding the density of pharmacies , the assessment showed that River Nile State also had the highest density (2.6 pharmacies per10,000 population) despite the fact that Khartoum State alone has nearly half of the number of pharmacies in Sudan (availability at Khartoum State is 2.3 pharmacies per10,000 of population). It is again clear from the data that West and South Darfur have the lowest densities and again for the same reason of war.

The data on density shed light on another fact that the number of pharmacists in public sector is far lower than that of the private sector. This is also shown in the distribution of pharmacists between different sectors, for example, 66.3% of all pharmacists are working in private retail pharmacies. This may be due to various reasons. Firstly, it is shown from the data that the private sector offer better salaries than the public sector. Secondly, the number of private pharmacies is more than that of the public pharmacies. Lastly, at the private sector, this is a clear policy to recruit pharmacist whereas the public sector in general lack this policy.

In this assessment, in addition to the DGoP, FPPB and CMS; around 196 health facilities were surveyed. These facilities included representatives from public pharmacies, private retail pharmacies, manufacturers and pharmaceutical companies. It was clear that public and private retail pharmacies were mostly concerned with dispensing medicines and compounding, manufacturers with pharmaceutical manufacturing whereas the pharmaceutical companies were mainly concerned with procurement and wholesaling of pharmaceuticals.

From the figures 4.12 and 4.13, it was observed that females constitute the majority of pharmacists in the public facilities with majority of pharmacists falling into the 30 – 49years age range, whereas males form the majority in pharmaceutical companies with age of 25- 49 yrs. The majority of pharmacists employed in private retail pharmacies were less than 30 yrs and manufacturers with age from 30 – 49yrs.

Pharmacists in private retail pharmacies and public facilities are responsible for providing different services including dispensing, stock management, quantification of need and compounding. In the pharmaceutical companies, they are responsible for stock management, quantification of needs and promotion for the pharmaceuticals whereas in pharmaceutical manufacturers, they are mainly responsible for production, quality control, stock management and quantification of needs. Manufacturers also offer the highest salary for pharmacists whereas the private retail pharmacies offer the lowest. This may explain the attrition of pharmacists from the private retail pharmacies (especially recent graduates) to the pharmaceutical companies and manufacturers which offer other benefits beside the high salaries. The second explanation for this is the lesser working hours at pharmaceutical companies and manufacturers than that at the public or private retail pharmacies. Another explanation is that 89% of manufacturers

and 77% of the pharmaceutical companies have clear job description for pharmacists which facilitates their work and determine clearly their duties and responsibilities and preserve their rights.

Pharmacy assistants were found to concentrate in public facilities and to some extent in the private retail pharmacies. There are no pharmacy assistants working in pharmaceutical companies or manufacturers. Most pharmacy assistants are between 30 and 49 years of age.

At private retail pharmacy and public facilities, pharmacy assistants are responsible for providing different services including dispensing, stock management, quantification of need and rarely, compounding. These services are offered under the supervision of the pharmacist except in the areas where pharmacists are not available.

One reason that may contribute in the concentration of pharmacy assistants in the public sector is that this sector offers better salaries than the private sector. Also, in some states where there is a scarcity of pharmacists, the pharmacy assistants are employed by the government to handle some of the responsibilities of the pharmacist and some localities entirely depends on pharmacy assistants to provide the pharmaceutical services. Another possible reason may be the availability of the clear job description in the public facilities.

All private retail pharmacies, manufacturers and pharmaceutical companies have the authority to recruit pharmaceutical personnel. In contrast, public health facilities have no authority to recruit personnel. Only the Federal Ministry of Health, the Regional or district health authority or the Head of the Revolving Drug Fund at each state have the authority to recruit for the public sector.

In spite of the all benefits that the pharmaceutical companies offer, it appeared that this sector has the highest percent of pharmacists who left and migrated abroad. This may be due to working for the same company at another country (especially for the multinational companies) or may be due to the temptations that are offered by foreign companies, especially in the Arab Gulf region. On the other hand, manufacturers have the highest percent of facilities that have problem in filling pharmacist position. This is often due to the scarcity of specialized personnel in the field of pharmaceutical manufacturing and technology because, as mentioned earlier, it is a recent area of investment in Sudan.

Some pharmaceutical services are offered by health workers other than pharmacists and pharmacy assistants. In some areas where there is a dressing station or dispensary, the medical assistant, midwife or even the doctor can carry the responsibility of dispensing, quantification and even stock management of medicines but all of this is done under the supervision of the district health authority.

From figure 4.21 and 4.22, it was clear the highest continuing education program that was attended by the pharmaceutical personnel was on the rational use of Medicines (RUD). This is mainly because there was an active RUD unit at the DGoP – FMoH which offered continuous in job training courses and workshops especially for the pharmacist working at the public sector. The attended continuing education program depends upon the type of facility the personnel is working at and the nature of tasks he/she is responsible for.

At each type of facility, the proportion of employee who were either harassed by the supervisor or college of opposite sex was measured. These percents were found to be less than 20% at nearly all type of facilities. Also, it was found that the percent of employee who were sure that any person that may harass them will be punished and who feel safe upon travelling to work was more than 80%.

Table 4.17 shows the benefits that are offered by each facility type. It was clear the manufacturers are almost offering all type of benefits and provide the most benefits compared to other employment sectors. Also, manufacturers were more likely to base salary increases on performance. On the other hand, educators (pharmacy education providers) were the highest in increasing the pay upon the level of qualifications. This is a natural process as the manufacturers are concerned with increasing production and educators are concerned with increasing the quality of teaching. To the contrary of that, employees of public sector facilities were most likely to experience delays in their salary.

Despite the benefits offered by specific type of facilities and the difficulties that employee face at another type, the results obtained upon assessing the consideration of changing job were found to be similar and ranging between 23% in the private retail pharmacy and up to 41% in the pharmaceutical companies. Of the total respondents who considered changing job, 75% had considered migrating abroad. This may be due to the benefits offered when working abroad.

This survey was carried out in only six states from the total of the 25 states and covered 196 health facility including 9 manufacturers, 13 pharmaceutical companies, 86 public health facilities and 88 private retail pharmacy. In addition, it included the DGoP, FPPB, CMS, and 8 pharmacy faculties. The total number of individual respondents to the questionnaire on job satisfaction was 449.

6. Key recommendations arising from this assessment

1. Developing a mechanism by which the MOH can calculate the active pharmaceutical workforce.
2. Developing a policy to attract and retain pharmacists at public sector.
3. To create a coordination system between the MOH and the Ministry of higher education to estimate the actual need of pharmacists according to the total population.
4. Redistribute pharmacists between the centre and states.
5. Develop a policy to encourage pharmacists to have post graduate studies.
6. Recruit pharmacists to work at the academic sector as full time staff.
7. Encourage more pharmacists to work at the manufacturing sector.
8. Set a clear and stated policy for CPD of pharmacists.
9. Increase the budget allocated by the government for pharmacy faculties as it appears as the major challenge.
10. Encourage the presence of clear job description for pharmacists and pharmacy assistants at each facility /each sector.
11. Assess the causes that lead pharmacists to migrate abroad.
12. Create a system of motivations upon performance and education upgrade.

7. Suggested Policies For Implementation

Issue	Recommendation	Responsible for implementation
Data Sources	Strengthening statistical units that are responsible for providing data	FMoH
	Developing policy for renewal of registration for pharmacists	SMC
Availability of HR	Developing strategies for attraction and retention of pharmacists at different sectors (public sector at state level) and better use of highly qualified ones at relevant sectors.	FMoH
Training	Setting strategies for pharmacy education according to country need (acceptance, CPD and post graduate studies).	FMoH, MoHE

8. Suggested Additional Indicators

Description	Indicator
Pharmacies/pharmacists distribution	% gap in pharmacist needed for national public sector
	Percentage of male/female at each sector
Remuneration	Ranges of pharmacist annual salaries at each sector
	Ranges of pharmacists and other health workers salary at public sector
Training institutions	Enrollment capacity rather than production capacity
	No. Of teaching staff needed vs existing
	tuition fees differences between public and private faculties
	% of faculties offering continuing education

9. Recommendation For Assessment Tools Improvement

9.1. Form 1

- In the excel sheet, cell 62 C is not working. (Part 4, Q 26 number of pharmacists working at the NGOs).
- In the excel sheet, Part 3, Q 16 & 17: it may be better if there is a column to indicate the unavailability of data.
- I the excel sheet, Part 5: Data for pharmacy assistants distribution was entered at the column of pharmacy tech. just to make use of the sheet in analyzing it as there were no pharmacy tech. in Sudan and the data sheet gives no choice to change cell title.
- No data available for the distribution of pharmacies in Southern Sudan (Part 5).
- In Part 8, Q 37b: the explanation of the cell is to leave it blank if not allowed, how we could differentiate between "not allowed" and "there is no max. Number"?

9.2. Form 2

Suggestion: It will be better

- If there is choice of (N/A) to differentiate between what (Zero 0) indicates.
- Some terms are irrelevant to the country, not to appear at the chart at summary sheet as this may miss-interpretated as zero rather than N/A.
- If extra space is added to enter data for required staffing level of pharmacists at national public sector (Part 6, Q 26).
- If an extra space for the local currency name and exchange rate is added (Part 8).
- The number of pharmaceutical manufacturers that exports medicines is entered rather than just answering with yes/no (Part 8, Q 36a).
- In summary 1 & 2 sheets, it will be better to compare the salaries of pharmacists with that of other health worker at public sector.
- If the data sheet gives directly the distribution of pharmacies/pharmacists per 10,000 of the population.

9.3. Form 3:

Suggestions: It may be better:

- In Q 16, challenges not to be ranked but given numbers from 1 – 5 according to importance.

9.4. Form 4:

In Summary 4+ sheet: It may be better:

- Q1, % from each facility type offering each pharmaceutical service may be calculated rather than numbers.
- % of male, female, age distribution, regular & temporary from each cadre at each facility may be calculated rather than numbers.
- Also, % of each cadre providing each service/ each facility may be calculated rather than numbers.
- Q 13 "Who is in charge" is better to be presented in %.
- If an extra space for the local currency name and exchange rate is added.
- If there is a table directly compare salaries of pharmacists and other different cadres at the same time.
- If the unfilled positions are given in percentages per each facility.
- If the causes of unfilled positions are analyzed as percentages per each facility.
- It is better to analyze the data of each state alone to enable comparing the differences between states or zones of each country.

9.5. Form 5:

In Summary 5+ sheet:

- The table of Q 1 is not working.
- In Q 2, there are additional 4 age groups which are not found in form.
- In Q 3 & 4, additional column to calculate the % may be added.
- In Q 6, percent of each degree/facility may be added.
- Q 10, table is not working.
- In Q 11, unified software may be provided to give comparable results.
- In Q 12, 13, 14 and 15, percent may be used in analyses rather than numbers.

- In Q 16.1, number of days may be categorized by facilities.
- In Q 17, percent of yes per each facility may be calculated.
- In Q 19, unified software to compare results between settings may be provided to give comparable results.
- It is better to analyze the data of each state alone to enable comparing the differences between individuals' job satisfaction at each state and zones/each country.

10. General difficulties

- The survey was carried in short notice and the period allowed to carry out the assessment was very short.
- The timing of the assessment was unsuitable as it was vacation for most faculties.
- All elements of the assessment was conducted concurrently rather than in stages as per the methods protocol
- Some terms and questions in the assessment were not applicable to Sudan.
- The questionnaire tools changed after data collection had already commenced.
- Form 5 used to assess job satisfaction was too long.
- There were major problems with data analysis sheet especially related to form 4 and 5.
- Unrepresentative indicators.

11. References

a) World Health Organization. The world health report 2006: working together for health. 2006.

b) Chan XH, Wuliji T. Global Pharmacy Workforce and Migration Report. 2006. International Pharmaceutical Federation (FIP).

c) Pharmaceutical Statistical Report 2007 - DGoP - FMoH - Sudan.

d) The 25 year National Pharmaceutical Strategy 2005 - 2029 - DGoP - FMoH - Sudan

e) Annual Statistical health Report 2007 - FMoH - Sudan.

Annex 1: Form to collect data from MOH

Survey Form 1

Ministry of Health

Name of investigator
Date of interview
Name and position of first respondent
Name and position of second respondent
Name and position of third respondent

PART 1: GENERAL INFORMATION ON THE PHARMACEUTICAL SECTOR

1 Is it compulsory to be licensed to practice pharmacy in your country?

☐ Yes ☐ No

If the answer is no please skip to question 2

1. a If yes, how often is renewal required? ……....years

☐ No renewal is required

2 Are operating licenses issued for the following premises? If yes, by whom?

2. a Public Service pharmacy ☐ Yes ☐ No

Issued by: Ministry of Health ☐

Pharmacy Council ☐

Other ☐

2. b Private retail pharmacy ☐ Yes ☐ No

Issued by: Ministry of Health ☐

Pharmacy Council ☐

Other ☐

2. c Private wholesale pharmacy (Imports and distributes) ☐ Yes ☐ No

Issued by: Ministry of Health ☐

Pharmacy Council ☐

Other ☐

2. d Manufacturer of pharmaceuticals and supplies ☐ Yes ☐ No

Issued by: Ministry of Health ☐

Pharmacy Council ☐

Other ☐

2. e Medicines Depot ☐ Yes ☐ No

Issued by:	Ministry of Health	☐
	Pharmacy Council	☐
	Other	☐

MEDICINES DEPOT: Community pharmacies in rural areas serving a limit authorized over-the-counter pharmaceuticals.

3. Indicate the legal scope of practice of each cadre in providing pharmaceutical services by putting an 'X' in the boxes that applies.

Cadre	Dispensing	Prescribing	Storage and Stock management	Quantification of medicines needs	Laboratory work	Compounding
3.1 Pharmacist						
3.2. Pharmacy Technician/Technologist						
3.3. Pharmacy Assistant						
3.4. Pharmacy Attendant						
3.5. Medical Doctor						
3.6. Nurse/midwife						
3.7. Community Health Worker						
3.8. Other…….						

Definitions

Pharmacists: Contribute to research and preparing medicinal products, store, preserve, compound, test and dispense medicinal products and counsel on their proper use and monitor adverse effects following prescriptions issued by medical doctors and other health professionals. Must have completed a university program of at least 4 years duration.

Pharmacy Technologists/Technicians: those that have achieved a National Health Diploma of Pharmacy technician/technologist (duration 3 years).

Pharmacy Assistants: those that have achieved a Certificate of pharmacy assistant and work under the supervision of a pharmacist. Duration varies from 6 months to 1 year.

Pharmacy Attendants: personnel that has no formal education in pharmacy work and perform simple and routine tasks such as labelling medicines, chemicals and other pharmaceutical preparations and replenishing stock on shelves.

Community Health Workers: are lay members of communities who work either for pay or as volunteers in association with the local *health* care team.

Medical Doctor: a practitioner of medicine, as one graduated from a college of medicine, osteopathy, chiropractic, optometry, or podiatry, and licensed to practice.

Nurses/midwifes: a highly trained and skilled professional who cares for the sick and infirm.

PART 2- TOTAL NUMBER OF PHARMACIES

	Number	Year of data	Data sources
4. What is the total number of public health facilities?			
5. What is the total number of pharmacies in public health facilities?			
6. What is the total number of pharmacies in private for-profit health facilities?			
7. What is the number of pharmacies in NGOs health facilities?			
8. What is the number of pharmacies in Faith-based health facilities?			
9. What is the total number of wholesale pharmacies in the country?			
10. What is the total number of private retail pharmacies in the country?			

Pharmacies: Premises which in accordance to the local legal provisions and definitions may operate as a facility in the provision of pharmacy services in the community or health facility setting.

PART 3: TOTAL NUMBERS OF PHARMACEUTICAL PERSONNEL IN THE COUNTRY

Please complete the two tables below

	2009	2008	2007	2006	Data source
11. **TOTAL number** of pharmacists[1]					
12. Number of **newly licensed** pharmacists in..					
13. **TOTAL number** of Pharmacy Technologist/Technicians[1]					
14. Number of **newly authorized** Pharmacy Technologist/Technicians in…					
15. **TOTAL** number of Pharmacy Assistants[1]					

	Number	Year of data	Data source
16. Number of **male** pharmacists in the country			
17. Number of **female** pharmacists in the country			
18. Number of **foreign (expatriate)**[2] pharmacists in the country			

[1] If more than one figure is available for each year, give the one for the latest calendar month of each year.

[2] Foreign/expatriate: non-citizens or non-nationals of the country

PART 4: SECTOR of PRACTICE of PHARMACISTS

PLEASE ENTER LATEST AVAILABLE DATA

Practice sector	Number	Year of data	Data sources
19.How many pharmacists are working in the public sector?[3]			
20. How many pharmacists are working for private for-profit health facilities?			
21. How many pharmacists are working in private retail pharmacies?			
22 How many pharmacists are working for private wholesalers?			
23. How many pharmacists are working for pharmaceutical manufactures?			
24. How many pharmacists are working in academia/teaching?			
25. How many pharmacists are working in Faith-based health facilities?			
26. How many pharmacists are working for Multilateral/, Bilaterals/NGOs?			
27. How many pharmacists are not currently working?			

[3] Public sector refers to those in MOH, all those in government health facilities and those in agencies like drug regulatory bodies etc.
Public Universities are not to be counted under public sector, they should be counted under academia/teaching.

PART 5- Distribution of PHARMACIES and Pharmacists in the REGION

Please provide in the table below information on the distribution of pharmacies and pharmacists in all the regions of your country.

PLEASE ADD UNDER BRAKETS YEAR OF DATA for each entry provided

Name of REGION/DISTRICTS	Population	PHARMACISTS		PHARMACY TECHNICIANS		PHARMACIES	
		Total number of pharmacists	Number of public sector pharmacists	Total number of pharmacy technologists/ technicians	Number of public sector pharmacy technologists/ technicians	Total number of pharmacies	Number of public pharmacies

PART. 6 PHARMACEUTICAL PERSONNEL WORKING AT THE MOH and Agencies

28. What is the number of pharmacists that are currently working for the MoH and its agencies (central level)? ……..

29. What is, according to the Human Resource Planning, the required number of pharmacists for the MoH and its agencies?.....

30. What is the number of pharmacy technicians/technologists currently working for the MoH and its agencies?.....

PART 7: ATTRITION of PHARMACISTS

31. How many pharmacists left the MOH/Agencies during the past 24 months? ……..

If none left, please skip questions 31a to 31i

31.a. Were they all replaced? ☐ Yes ☐ No

31.b. If not, for which reason?

Embargo on employment ☐

Non availability of qualified pharmacists ☐

Others reasons (specify)…… ☐

31.c. How many of them left due to migration abroad?.....

31.d. How many of them left due to retirement?.....

31.e. How many of them left due to working for NGO or multilateral/bilateral donors?.....

31.f. How many of them left due to working for the private sector? .....

31.g. How many of them left due to further education/training? .....

31.h How many of them left due to illness or death?.....

31.i How many left due to other reasons or to unknown reasons? .....

32.a. How many pharmacists left the public sector4 in 2008? .....

32.b How many pharmacists left the public sector in 2007?.....

33.a How many pharmacists left the country in 2008?.....

33.b How many pharmacists left the country in 2007?.....

[4] Public sector refers to those in MOH, all those in government health facilities and those in agencies like drug regulatory bodies etc.
Public Universities are <u>not</u> to be counted under public sector.

PART 8- LABOUR MARKET for PHARMACISTS

34. Provide details on the annual salary range (pre-tax) for pharmacists in each sector. Indicate year and source of information. Indicate data source as 'estimates' if actual data is unavailable.

Sector of employment	Minimum annual salary (local currency)	Maximum annual salary (local currency)	Year of data	Source of data
34.1 Public Sector				
34.2 Private retail pharmacy				
34.3 Faith-based organizations				
34.4 Pharmaceutical wholesalers and manufactures				
34.5 Multilateral/bilateral Donors or NGOs				
34.6 Academia/Teaching				

35. Provide details on the annual salary range (pre-tax) for the following professions. Indicate year and source of information. Indicate data source as 'estimates' if actual data is unavailable.

Sector of employment	Minimum annual salary (local currency)	Maximum annual salary (local currency)	Year of data	Source of data
35.1 Medical doctor (Public sector)				
35.2 Medical doctor (Private sector)				
35.3 Nurse (Public sector)				

36. What is the total number of pharmaceutical manufacturers in the country? …….

If there are no manufactures, please skip to question 37

36.b If there are any, do they export finished pharmaceutical products abroad? □ Yes □ No

37. Are chain pharmacies5 allowed in the country? □ Yes □ No

If no, please skip questions 37.a to 37.c

37.a If yes, is there a maximum number of pharmacies a company can own? □ Yes □ No

37.b If yes, what is the maximum number of pharmacies a company can own? .....

37.c What proportion of private retail pharmacies is made up of chain pharmacies? .....

PART 9: PHARMACEUTICAL HUMAN RESOURCE PLANNING

38. Is there a national strategic plan on pharmaceutical human resource development? □ Yes □ No

If yes attach a copy of the plan

[5] Chain pharmacies are when a company owns several pharmacies where pharmacists work as salaried

Annex 2: Form to collect data from Pharmacy Education Provider

Survey Form 3
Providers of Pharmacy Education

Name of investigator:
Date of interview:
Name of Institution:
Region of Institution:
Name and position of first respondent
Name and position of second respondent
Name and position of third respondent

GENERAL INFORMATION

1. Institution is operated by

a. Government ☐
b. Private/for-profit organization ☐
c. Faith-based/not-for-profit organization ☐

2 Sources of funding: Please indicate what **proportions** (%) of your budget come from the following sources:

2.1 Government……
2.2 Tuition Fees……..
2.3 Grants and donations from pharmaceutical industry……
2.4 Grants and donations from not-for-profit organizations……
2.5 Other- SOURCE……%

3. In what year was the school/program/college started? ……..

4. How many qualified teaching staff in pharmacy studies are on the faculty:

4.1 Full time……
4.2 Part time……

5. Is there free internet access for students? ☐ Yes ☐ No

6. Number of medical and pharmaceutical journals to which the school has been subscribed for:

6.1 on-line access……

6.2 printed copies……..

7. Number of medical and pharmaceutical libraries/databases to which the school has subscribed for on-line access ……

8. Total number of medical or pharmaceutical reference books available in the library……

9. Does this institution offer continuing education programs for pharmacists that are currently working in the private or public sector? □ Yes □ No

10. BASIC DEGREE in PHARMACY (BSc, B. Pharm, Pharm D, etc.)

10.1. Does your institution offer a basic degree in pharmacy? □ Yes □ No □ currently being discussed

If no or currently being discussed, please skip to question 11

10.2 If yes, what are the entry requirements in terms of years of schooling? .....

If yes, please complete the table below:

Program name (a)	Length of program in months (b)	Annual tuition Fees for program local currency[6] (c)	Maximum enrolment capacity per year (d)	No of applicants for entry in			No newly enrolled in			No graduated in		
				2006 (e)	2007 (f)	2008 (g)	2006 (h)	2007 (i)	2008 (j)	2006 (k)	2007 (l)	2008 (m)
10.3												
10.4												
10.5												
10.6												
10.7												

[6] IF NO TUITION FEES ARE CHARGED, PLEASE ENTER 0 (zero)

11. MSc degree in pharmaceutical disciplines

11.1 Does your institution offer an MSc in Pharmaceutical disciplines? □ Yes □ No □ currently being discussed

If no or currently being discussed, please skip to question 12

If yes, please complete the table below:

Program name (a)	Length of program in months (b)	Annual tuition Fees for program local currency[7] (c)	Maximum enrolment capacity per year (d)	No of applicants for entry in			No newly enrolled in			No graduated in		
				2006 (e)	2007 (f)	2008 (g)	2006 (h)	2007 (i)	2008 (j)	2006 (k)	2007 (l)	2008 (m)
11.2												
11.3												
11.4												
11.5												
11.6												
11.7												
11.8												
11.9												

[7] IF NO TUITION FEES ARE CHARGED, PLEASE ENTER 0 (zero)

12. Doctor of Philosophy (PhD) in pharmaceutical disciplines

12.1. Does your institution offer a PhD in pharmaceutical disciplines? □ Yes □ No □ currently being discussed

If no or currently being discussed, please skip to question 13

If yes, please complete the table below:

Program name (a)	Length of program in months (b)	Annual tuition Fees for program local currency[8] (c)	Maximum enrolment capacity per year (d)	No of applicants for entry in			No newly enrolled in			No graduated in		
				2006 (e)	2007 (f)	2008 (g)	2006 (h)	2007 (i)	2008 (j)	2006 (k)	2007 (l)	2008 (m)
12.2												
12.3												
12.4												
12.5												
12.6												
12.7												
12.8												
12.9												
12.10												

[8] IF NO TUITION FEES ARE CHARGED, PLEASE ENTER 0 (zero)

13. Pharmacy Technologist Diploma

13.1. Does your institution offer a certificate/diploma for pharmacy technicians/technologist?

□ Yes □ No □ currently being discussed

If no or currently being discussed, please skip to question 14

If yes, please complete the table below:

Program name (a)	Length of program in months (b)	Annual tuition Fees for program local currency[9] (c)	Maximum enrolment capacity per year (d)	No of applicants for entry in			No newly enrolled in			No graduated in		
				2006 (e)	2007 (f)	2008 (g)	2006 (h)	2007 (i)	2008 (j)	2006 (k)	2007 (l)	2008 (m)
13.2												
13.3												
13.4												
13.5												
13.6												
13.7												
13.8												

[9] IF NO TUITION FEES ARE CHARGED, PLEASE ENTER 0 (zero)

14. Pharmacy Assistant Certificate

14.1. Does your institution offer a certificate for pharmacy assistants? ☐ Yes ☐ No ☐ currently being discussed

If no or currently being discussed, please skip to question 15

If yes, please complete the table below:

Program name (a)	Length of program in months (b)	Annual tuition Fees for program local currency[10] (c)	Maximum enrolment capacity per year (d)	No of applicants for entry in			No newly enrolled in			No graduated in		
				2006 (e)	2007 (f)	2008 (g)	2006 (h)	2007 (i)	2008 (j)	2006 (k)	2007 (l)	2008 (m)
14.2												
14.3												
14.4												
14.5												
14.6												
14.7												
14.8												
14.9												

[10] IF NO TUITION FEES ARE CHARGED, PLEASE ENTER 0 (zero)

15. What are the main challenges this institution faces? (rank in order of importance, 1 most important, 5 least important)

a. Budget/Finance ☐

b. Physical infrastructure ☐

c. Number of qualified teachers in pharmacy ☐

d. Not enough demand from potential students ☐

e. Other (please specify)…… ☐

16. If required to increase by 20% production of graduates within 5 years, what is the most critical need for it? (Please rank in order of priorities from 1, most important, to 5, least important)

a. Budget/Finance ☐

b. Physical infrastructure ☐

c. Number of qualified teachers in pharmacy ☐

d. Increase demand from potential students ☐

e. Other (specify)…… ……..

Annex 3: Form to collect data from Public/ Private Health Facility/Manufacturer

Survey Form 4
PUBLIC/PRIVATE HEALTH FACILITY/ MANUFACTURER

Name of investigator	
Date of Interview	
SETTING of Interview	**a. Public Health Facilities** ☐ **b. Private Health Facilities** ☐ **c. Private Retailer** ☐ **d. Manufacturer** ☐
Region	
Name and position of respondent	

1. What pharmaceutical services are currently offered by this institution?

1.1 Procurement & Distribution to public health facilities ☐ Yes ☐ No

1.2 Dispensing/retailing ☐ Yes ☐ No

1.3 Prescribing ☐ Yes ☐ No

1.4 Compounding ☐ Yes ☐ No

1.5 Wholesaling ☐ Yes ☐ No

1.6 Manufacturing ☐ Yes ☐ No

2- Categories of health staff employed
Please provide in the table below the number of each category of staff currently employed at the health facility. Columns on gender, age and employment status are only to be filled for pharmaceutical personnel

	Total number (a)	Male (b)	Female (c)	Below age of 30 (d)	Aged 30 to 49 (e)	Aged 50 or above (f)	Regular[11] staff (g)	Temporary staff[12] (h)
Pharmacists								
Pharmacy technicians/technologists								
Pharmacy assistants								
Pharmacy Attendants								
Medical Doctors								
nurses/midwives								
Community health workers								
Laboratory Technicians								
Other Clinical Staff								
Others								

[11] Regular staff has a contract of more than one year, is on the payroll of the health facility and has rights to pension benefits
[12] Temporary staff is every one who does not fit into the above definition of Regular Staff

DEFINITIONS

Pharmacists: Contribute to research and preparing medicinal products, store, preserve, compound, test and dispense medicinal products and counsel on their proper use and monitor adverse effects following prescriptions issued by medical doctors and other health professionals. Must have completed a university program of at least 4 years duration
Pharmacy Technologist/Technician: those that have achieved a National Health Diploma of Pharmacy technician/technologist (duration 3 years)
Pharmacy Assistant: those that have achieved a Certificate of pharmacy assistant and work under the supervision of a pharmacist. Duration varies from 6 months to 1 year
Pharmacy Attendant: personnel that has no formal education in pharmacy work and perform simple and routine tasks such as labelling medicines, chemicals and other pharmaceutical preparations and replenishing stock on shelves.
Community Health Workers: are lay members of communities who work either for pay or as volunteers in association with the local *health* care team
Medical Doctor**:** a practitioner of medicine, as one graduated from a college of medicine, osteopathy, chiropractic, optometry, or podiatry, and licensed to practice.
Nurses/midwifes**:** a highly trained and skilled professional who cares for the sick and infirm.

3. Who is actually providing pharmaceutical services at this facility? Please thick the cells where it is applicable

Cadre	Dispensing (a)	Prescribing (b)	Storage and Stock management (c)	Quantification of medicines needs (d)	Laboratory work (e)	Compounding (f)
3.1 Pharmacist						
3.2 Pharmacy Technician/Technologist						
3.3 Pharmacy Assistant						
3.4 Pharmacy Attendant						
3.5 Medical Doctor						
3.6 Nurse/midwife						
3.7 Community Health Worker						
3.8 Other…….						

4. Is your facility in charge of recruitment of regular pharmaceutical personnel? □ Yes □ No

If not, which of the following is in charge?

a. Ministry of Health…… ☐
b. Regional Health Authority…… ☐
c. District Health Authority…… ☐
d. Other (Please specify)…….. ☐

5. Are there clear job descriptions for the following pharmaceutical personnel?

5.1 Pharmacists? □ Yes □ No □ N/A

5.2 Pharmacy Technologists/Technicians? □ Yes □ No □ N/A

5.3 Pharmacy Assistants? □ Yes □ No □ N/A

6. If available, are these job descriptions used to evaluate performance of pharmaceutical staff? □ Yes □ No

7. Please provide in the table below the minimum and maximum annual salary (pre-tax) for each category of staff currently working at this facility

	a. Annual Minimum salary (local currency)	**b. Annual Maximum salary (local currency)**
7.1 Pharmacists		
7.2 Pharmacy technologists)technicians		
7.3 Pharmacy Assistants		
7.4 Pharmacy Attendants		
7.5 Medical Doctors		
7.6 Nurses/midwives		
7.7 Laboratory Technicians		
7.8 Other……..		
7.9 Other……		

8. What is the statutory number of working hours per week of a pharmacist? .....

9. What is the statutory number of working hours per week of a pharmacy technologist/technician?

   .....

10. Have you in the past 24 months had to replace pharmacists that have left the country? □ Yes □ No

11. Have you in the past 24 months had to replace pharmacists that went to work for a multilateral/bilateral agency or NGOs based in this country? □ Yes □ No

12. Have you in the past 24 months had problems in filling a pharmaceutical position in the organization? □ Yes □ No

13. Do you at the moment have any unfilled pharmaceutical position in the organization? □ Yes □ No

If no skip to question 14

13.1. If yes, can you provide number of vacant positions for the categories stated below?

13.2 Pharmacist (number of vacant positions) ……

13.3 Pharmacy technologist/technician (number of vacant positions) ……

13.4 Pharmacy Assistant (number of vacant positions) ……

14. Can you provide the reason for the unfilled positions (please select one. If more than one applies, select the most common)

a. No applications were received for the advertised positions ☐

b. The government has embargoed recruitment of personnel ☐

c. Others (specify)…… ☐

Annex 4: Form to collect data of Job Satisfaction

Survey Form 5
Pharmacist Job satisfaction

NAME of investigator	
DATE of INTERVIEW	
SETTING of INTERVIEW	**a. Ministry of Health…….** ☐ **b. Pharmacy Council/Association….** ☐ **c. Provider of Education……** ☐ **d. Manufacturer……** ☐ **e. Public Health Facility……..** ☐ **f. Private Health Facility…….** ☐ **g. Private Retailer……** ☐
REGION of INTERVIEW	

You have been randomly selected to be part of a survey on pharmaceutical human resources, and this is why we would like to interview you. This survey is conducted by the Ministry of Health and World Health Organization and is being carried out by professional interviewers from the Ministry of Health. The survey is currently taking place in several countries around the world.

The interview will take approximately 15 minutes. I will ask you some questions about your job satisfaction. The information you provide will be used only to understand about the types of activities, payments and general working conditions of pharmaceutical workers in different countries.

The information you provide is totally confidential and will not be disclosed to anyone. It will be used only for research purposes. Your name, and the name and location of this facility, will be removed from the questionnaire, and only a code will be used to connect your answers with the facility without identifying you. Your participation is voluntary and you are free to refuse to answer any question in the questionnaire. If you have any questions about this survey you may ask me or contact *(**INSERT contact details**)*.

1 Which of the following applies to your normal working tasks?

1.1 Procurement and distribution to public health facilitie ☐ Yes ☐ No

1.2 Dispensing ☐ Yes ☐ No

1.3 Prescribing ☐ Yes ☐ No

1.4 Stock Management ☐ Yes ☐ No

1.5 Quantification of medicines needs ☐ Yes ☐ No

1.6 Compounding ☐ Yes ☐ No

1.7 Laboratory work ☐ Yes ☐ No

1.8 Management ☐ Yes ☐ No

1.9 Other (please specify)…… ☐ Yes ☐ No

2. What is your age?

a. Below 30 years ☐

b. Between 30 and 49 ☐

c. 50 and above ☐

3. What is your gender?

a. Male ☐

b. Female ☐

4. What is status in this organization?

a. Regular Staff[13] ☐

b. Temporary Staff[14] ☐

5. What is the highest grade (or total number of years of education in primary, secondary and post-secondary school) that you have completed? _____ years

[13] Regular staff has a contract of more than one year, is on the payroll of the health facility and has rights to pension benefits

[14] Temporary staff is everyone who does not fit into the above definition of Regular Staff

6. What is the highest **educational qualification** that you have acquired in pharmaceutical studies? Please choose one of the following options

   a. Diploma/Certificate ☐
   b. BSc or B.Pharm ☐
   c. Pharm D ☐
   d. MSc ☐
   e. Ph D ☐

7. In which year did you acquire the qualification mentioned above? (year) .....

8. In which country did you study to attain the qualification stated above? ……

9. How many hours do you usually work per week (excluding on-calls)? .....

10. Did you participate in any structured learning programme in the last 12 months on the following topics?

    10.1: Essential Medicines List concepts? ☐ Yes ☐ No
    10.2: Standard Treatment Guidelines principles? ☐ Yes ☐ No
    10.3: Rational use of medicines? ☐ Yes ☐ No
    10.4: Medicines supply management ☐ Yes ☐ No
    10.5: Management ☐ Yes ☐ No
    10.6: Clinical Pharmacy ☐ Yes ☐ No
    10.7: Other (Please specify)…… ☐ Yes ☐ No

11. Personal fulfilment

In the table below, please circle the number that most appropriately applies to each of the statements below

	To what extent do you agree with statement?
	Strongly disagree -1 **Disagree -2** **Neutral - 3** **Agree -4** **Strongly Agree -5**
11.1 I am given opportunities to improve my professional skills	**1 2 3 4 5**
11.2 I believe my career aspirations can be achieved at this organization.	**1 2 3 4 5**
11.3. My job is challenging and interesting	**1 2 3 4 5**
11.4. I receive training in the skills that are critical for me to succeed.	**1 2 3 4 5**
11.5. Opportunities to receive training are distributed fairly.	**1 2 3 4 5**
11.6. I understand the career path in my organization, and promotions are granted fairly.	**1 2 3 4 5**
11.7. Suggestions made by workers on how to improve the work are usually taken into consideration	**1 2 3 4 5**
11.8. This organization pays me fairly for the work I do	**1 2 3 4 5**
11.9. My job offers adequate pay compared with similar jobs	**1 2 3 4 5**
11.10. Rates of pay and pay raises are decided fairly.	**1 2 3 4 5**
11.11. With this job I have no worries about how to support myself and my family	**1 2 3 4 5**
11.12. I am provided with regular feedback (quality and quantity) of my performance	**1 2 3 4 5**
11.13. My work is rarely disrupted by bureaucratic processes.	**1 2 3 4 5**
11.14. I have the resources I need to do my work (e.g. equipment and supplies)	**1 2 3 4 5**
11.15. There is genuine management concern for the problems employees face	**1 2 3 4 5**

12. Safety and harassment on the work-place

Which of the following applies to you?

	Yes	No
12.1 I am confident that if someone harassed me, they would be punished.		
12.2 I have experienced some harassment from a supervisor (For example bullying or threatening behavior)		
12.3. I have experienced some harassment from another employee of the opposite sex		
12.4 I feel safe traveling daily from my home to my work place		

13. Benefits at work

Which of the following is applicable to you?

I receive this benefit from my employer	Yes	No
13.1. Medical Coverage (Free)		
13.2. Medical Coverage (Co-payment/partial payment)		
13.3. Housing or housing allowance		
13.4. Risk Allowance		
13.5. Food Allowance or free meals		
13.6. Car allowance or public transportation allowance		
13.7. School Fees Allowance for children		

14. Does you contract includes an increase in pay according to performance? □ Yes □ No

15. Does you contract includes an increase in pay based on upgraded education or specialty training? □ Yes □ No

16 Have you in the past 12 months experienced a delay in receiving your salary as scheduled by your employer? □ Yes □ No

If no, please skip to question 17

16.1 If yes, how long has the delay lasted on average? (in days)……..

17. Have you in the past five 5 years considered changing your job?

□ Yes □ No

If no, you have finished this questionnaire.

18 If yes, can you please state to which destination you were planning to move:

a. Public Sector ☐
b. Private health facilities ☐
c. Private Retailer ☐
d. Pharmaceutical Manufacturer ☐
e. Faith-Based organization ☐
f. Multilateral/Bilateral Donor or NGO ☐
g. Moving Abroad ☐
h. Other, please specify…… ☐

19. Can you please state the 3 main motivations that led you to consider changing your job?

a. Safety concerns at work ☐
b. General safety concerns in the country ☐
c. To earn a more generous salary ☐
d. To have greater possibilities of professional learning ☐
e. Lack of career opportunities in my organization ☐
f. Excessive corruption in the country ☐
g. Excessive corruption in my organization ☐
h. Excessive workload ☐
i. Lack of supplies/necessary instruments ☐
j. Other, please specify……..

Copies may be obtained from:
Directorate General of Pharmacy
Federal Ministry of Health - Sudan

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