PHARMACY HUMAN RESOURCES IN SOUTH AFRICA

2011

South African Pharmacy Council

PHARMACY HUMAN RESOURCES IN SOUTH AFRICA
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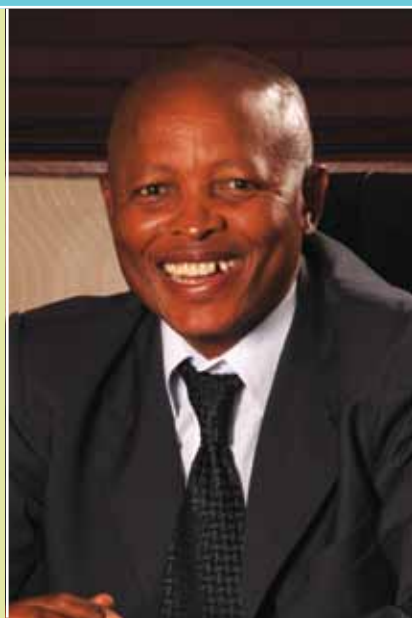


TA MASANGO
REGISTRAR/CEO

> FOREWORD

When the previous Council commenced developing a human resources strategy for pharmacy in South Africa in 2006, the process was hampered by the many challenges facing the profession e.g. services for which a pharmacist may levy a fee(s) and guidelines for levying such a fee(s), among others. Although these had to take precedence over the human resources plan, it in no way lessened its importance. When the 2008–2013 Council assumed office an important part of its strategic goal was to finalise the document. This document has become a milestone in the achievements of pharmacy.

A structured and evidence-based appraisal of the pharmacy situation in South Africa principally informed the development of this plan. Many factors, including migration of pharmacy professionals, both within and outside the country, and international trends played a vital role in developing the plan.

The aim of the plan is to provide a national guideline for pharmacy human resources to assist the Minister of Health (in terms of the Pharmacy Act, 53 of 1974) in putting together an integrated plan for the country's entire health system. A human resources plan is important in any organisation to ensure its human resources are able to meet its operational objectives and requirements. This document provides a snapshot of the situation, and includes production, practice and various other factors that influence the movement of professionals within the health system. It provides a foundation upon which the country will be able to formulate an appropriate pharmacy human resources design that dovetails with the overall human resources for health plan.

TA MASANGO
REGISTRAR/CEO

OMB PHARASI
PRESIDENT: SAPC

> MESSAGE FROM THE SAPC PRESIDENT

The Human Resources for Pharmacy Plan is arguably the one document that all pharmacy sectors and formations in the country can lay claim to having contributed to in one way or the other, so wide was the consultation. As satisfying was the enthusiastic response from members of the profession whose invaluable input has ensured a product with which we are proud to be associated.

A lot of thought and hard work has gone into producing this document. It is possibly the most comprehensive piece of work on pharmacy human resources ever produced in South Africa.

This is only the first part of a mammoth task, though. It is to be hoped that the rather gloomy state of affairs of pharmacy human resources in the country as reflected in the report, will galvanize all of us and spur us into joining the battle to resolve our pharmacy human resources. Council will be communicating with members of the profession from time to time to give updates on how the situation is progressing.

Allow me to express a profound word of gratitude to all of you who have made the publication of this document possible.

OMB PHARASI
PRESIDENT: SAPC

> ACKNOWLEDGEMENTS

We would like to thank everyone that participated in the compilation and formulation of the Pharmacy Human Resources in South Africa plan, in particular the Office of the Registrar, members of Council, and stakeholders such as organised pharmacy, pharmacy schools, further education and training providers, heads of pharmaceutical services in various provinces, metropolitan areas and non-governmental organisations involved in pharmacy. Special thanks are extended to Strengthening Pharmaceutical Systems (SPS) for their input and technical support. Council is particularly grateful to the President, Mr Bada Pharasi, for his leadership in ensuring that this document was finally completed. The previous Council members, to whom we are extremely grateful, were responsible for initiating the plan in 2006.

The aim of the document is to guide planning for the production of pharmacy human resources. For a long time production has been taking place without considering the needs of the country. This document will assist everyone involved in human resources for pharmacy, including employers, to plan appropriately.

> ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ARV	Antiretroviral
CHE	Council for Higher Education
CPD	Continuing Professional Development
CSP	Community Service Pharmacist
DBE	Department of Basic Education
DHET	Department of Higher Education and Training
DST	Department of Science and Technology
DTI	Department of Trade and Industry
ETQA	Education, Training and Quality Assurance Bodies
FIP	International Pharmaceutical Federation
FPE	Foundation for Pharmaceutical Education
FS	Free State
GDP	Gross Domestic Product
GP	Gauteng Province
GPP	Good Pharmacy Practice
HIV	Human Immunodeficiency Virus
HoPS	Heads of Pharmaceutical Services
HR	Human Resources
HST	Health Systems Trust
HWSETA	Health & Welfare Sector Education and Training Authority
KZN	KwaZulu-Natal
LP	Limpopo Province
MP	Mpumalanga Province
NC	Northern Cape
NDoH	National Department of Health
NHI	National Health Insurance
NMMU	Nelson Mandela Metropolitan University
NW	North West
NWU	North West University
NQF	National Qualifications Framework

> ACRONYMS (continued)

OSD	Occupation Specific Dispensation
PAB	Pharmacist's Assistant (Basic)
PAPB	Pharmacist's Assistant (Post-Basic)
PCDT	Primary Care Drug Therapy
PHC	Primary Healthcare
PPI	Public-Private Initiative
PPP	Public-Private Partnership
QA	Quality Assurance
QC	Quality Council
QCTO	Quality Council for Trades and Occupations
RPL	Recognition of Prior Learning
RSA	Republic of South Africa
RU	Rhodes University
S/NVQ	Scottish/National Vocational Qualification
SADC	Southern African Development Community
SAHR	South African Health Review
SAPC	South African Pharmacy Council
SAQA	South African Qualifications Authority
SOP	Standard Operating Procedure
UK	United Kingdom
UKZN	University of KwaZulu-Natal
UL	University of Limpopo
USA	Unites States of America
UWC	University of the Western Cape
WC	Western Cape
WHO	World Health Organisation
Wits	University of the Witwatersrand

> EXECUTIVE SUMMARY

In an effort to assist the Minister of Health in addressing pharmacy human resources challenges within the Republic of South Africa (RSA), the South African Pharmacy Council (SAPC) resolved to prepare a human resources (HR) plan for the profession. The document provides a comprehensive analysis of the state of the pharmacy profession with regard to production of personnel, professional practice as well as a comparison with international trends.

As of April 2010 there were 12,813 pharmacists and 9,071 pharmacist's assistants registered with the SAPC. Of the registered pharmacists the majority (63%) was recorded as practising in the private sector, compared with 29% in the public sector, while 8% had undefined sectors of practice. A significant shift in the proportion of pharmacists working in the public sector, from 12% in 2004 to 29% in 2010, was observed. Community and institutional practice dominate the pharmacy workforce accounting for 43% and 35% of pharmacists respectively.

Gauteng, Western Cape and KwaZulu-Natal had the highest number of registered pharmacists, accounting for 4,508, 2,076 and 1,800 of the profession respectively. The distribution of pharmacist's assistants follows a similar trend with 34% practising in Gauteng and 16% in both the Western Cape and KwaZulu-Natal.

South Africa has eight pharmacy schools that produce on average 476 pharmacy graduates per annum from an annual intake of approximately 700 students. The percentage of foreign students studying pharmacy at pharmacy schools in South Africa has increased from 14% to 18% over the period 2006-2009.

As of 2010 there were 4,281 pharmacies registered in South Africa. The overall number of registered pharmacies has increased by 17.2%, from 3,712 in 2001. The majority of pharmacies on the SAPC's register were community pharmacies (67%), followed by public institutional pharmacies (15%). Manufacturing, wholesale and private institutional pharmacies each constituted 6% of the pharmacies, and consultant pharmacies constituted 0.3%.

Key trends and factors affecting pharmacy human resources

Staff shortages and pharmacist production rates

The shortage of pharmacists and other healthcare professionals is a well-documented phenomenon. A shortage of pharmacists is being experienced, with the reported average vacancy rates ranging from 36% to 76% in certain regions. In keeping with this trend, South Africa currently has one pharmacist per 3,849 population which is considerably below the World Health Organisation's (WHO) recommendation of one per 2,300 population. In order for South Africa to meet the recommended target by 2030, it needs to register an average of 1,200 pharmacists per year. This equates to registering an additional 750 persons per year.

Legislative and policy changes

Several changes have occurred within the sphere of the pharmacy profession, the impact of which is yet to be determined on pharmaceutical human resources trends.

These include:

- introduction of the occupation specific dispensation (OSD) within the public sector in 2009/2010
- changes in the regulations relating to the ownership and licensing of pharmacies
- introduction of the dispensing fee in 2006.

Extensive research is required in order to gain insight into the impact of the respective changes in order to inform further planning for the development of pharmacy human resources.

Trends in South Africa's pharmacy human resources that are echoed in other parts of the world include migration of staff from areas of low to high socioeconomic status as well as the shift in the gender proportions of pharmacists. The proportion of females has increased significantly, from 17% in 1970s to 59% in 2010. A similar trend is echoed in other parts of the world.

Priorities for implementation plan

Based on the presented situational analysis several priority actions have been identified to address challenges facing human resources in South Africa.

Increase production of pharmacy human resources

It is evident that the current level of production does not meet demand. In order for South Africa to produce 1,200 graduates per year the capacity of pharmacy schools, in terms of infrastructure, libraries, laboratories, human resources, financial resources, etc. should be reviewed. Three additional schools of pharmacy would need to be opened in addition to increased production from existing schools for South Africa to double its current rate of producing pharmacy graduates as suggested.

In addition to increased production of entry-level pharmacists, existing professionals' skills need to be developed to address gaps in the provision of healthcare. The production of authorised pharmacist prescribers could enhance the provision of primary health services. Specialties in industrial and clinical pharmacy, as well as pharmaceutical services in public health, are recommended.

The introduction of a new cadre of mid-level healthcare worker in pharmacy is expected to enable support personnel to carry out a broader scope of activities than the current pharmacist's assistants. The scopes of practice for pharmacy technicians and pharmacy technical support are currently being developed.

Recruitment of foreign qualified pharmacists for public sector

In order to address the shortage of public sector pharmacists in the short to medium term timeframe, recruitment of foreign qualified pharmacists should be considered.

Use of existing workforce

Different models of pharmaceutical service delivery should be considered, such as public private models, to optimise the existing workforce.

Licensing of pharmacies

It is recommended that a moratorium be placed on the issuing of pharmacy licences for a period of 12 months to allow both the SAPC and the National Department of Health (NDoH) to perform country-wide geo-mapping of pharmacy licences issued. This would indicate provinces and local municipalities where new licences are required by category and sector.

Comprehensive monitoring and evaluation of pharmacy human resources is required in order to inform policies and planning for the profession. In addition, many challenges that require further research have been identified in the report.

Conclusion

The document presents a detailed representation of the status of pharmacy human resources in the country as well as priorities for the implementation of recommended priority action. The SAPC would need to establish a committee to implement the pharmacy's human resources plan.

> INTRODUCTION

Pharmacists represent the third largest group of healthcare professionals in the world with the majority of pharmacists practising in community pharmacies, hospitals and other medical facilities (Chan X, 2006). Smaller numbers of pharmacists are employed in the pharmaceutical industry, in administrative/managerial positions and in academia. The size of the labour force depends on a number of issues, including the number in the labour market of working age, participation rate of those who are working, and availability of those no longer working but who may return to pharmacy employment.

Several challenges face the pharmaceutical sector in South Africa. These include the shortage and inequitable distribution of existing pharmacists and pharmacy support personnel, the slow increase in the number of registered pharmacists, underuse of pharmacy support personnel and the increasing demand for pharmaceutical services.

In an effort to assist the National Department of Health in addressing pharmacy human resources challenges, the SAPC resolved to prepare a human resources plan for the pharmacy profession. A joint task team was appointed, consisting of education and practice committee members, stakeholders such as organised pharmacy, pharmacy schools, further education and training providers, heads of pharmaceutical services of provinces and metropolitan areas, and non-governmental organisations involved in pharmacy.

A structured and evidence-based approach was used to address challenges facing human resources. A situation analysis was required to determine the main issues affecting the optimal provision of pharmaceutical services in the country.

Subsequent to the situation analysis, a plan was to be developed to address the challenges identified. The aim of the situation analysis was to:

(a) complete a comprehensive analysis of the short, medium and long term human resources challenges facing the pharmacy profession; and

(b) coordinate a plan of action, involving all relevant stakeholders, that would prevent or minimise the potential negative consequences associated with the human resources challenges currently facing the pharmacy sector in South Africa.

The situation analysis focused on pharmacy education and training, and pharmacy practice. Factors affecting the practice of pharmacy in South Africa that had a bearing on these two themes, were also considered.

Data on the total number of pharmacists and pharmacy support personnel, sectors and branches in which they are employed, as well as their distribution, was obtained from the SAPC's register system. Furthermore, the report represents a desk review since no surveys were undertaken to validate the data.

There were some challenges in extracting data due to changes made to the SAPC register system in 2003 and 2010. Further changes are still underway with a view to improving accessibility, availability and quality of data.

Although there are limitations with the data used, the analysis does provide a basis and a call-to-action for decision makers and stakeholders to address challenges facing pharmacy human resources in South Africa.

Pharmacists represent the third largest group of healthcare professionals in the world

1. SITUATION ANALYSIS OF PHARMACY HUMAN RESOURCES IN SOUTH AFRICA

This chapter presents findings of the situation analysis of pharmacy human resources in South Africa. The SAPC registers and information databases were used to determine the state of the profession regarding personnel and infrastructure for pharmacy education and practice. Overarching themes addressed are education, pharmacy practice, continuing professional development and other factors affecting the profession in South Africa.

1.1 PHARMACY EDUCATION AND TRAINING

The Regulations relating to pharmacy education and training published in terms of the Pharmacy Act 53 of 1974 stipulate the requirements and procedures for the training of pharmacists and pharmacy support personnel. The Act also provides regulations relating to the registration of pharmacists and pharmacy support personnel.

1.1.1 Training and registration of pharmacists

In South Africa the undergraduate training of pharmacists consists of a four year course leading to a Bachelor of Pharmacy (BPharm) qualification. Thereafter graduates are required to complete an additional internship year prior to registration as a pharmacist.

Currently, there are eight pharmacy schools approved by the SAPC to train pharmacists in South Africa. The SAPC maintains a register of pharmacy students from the second year of training onwards. Candidates who have been awarded a BPharm qualification may register as a pharmacist intern for a period of one year. Pharmacist interns are required to sign a contract, approved and provided by SAPC for the undertaking of an internship, at an approved facility under the mentorship of an approved tutor.

On completion of the internship, all persons registering for the first time as pharmacists in South Africa must complete one year of pharmaceutical community service in a public sector (government) facility.

1.1.2 Supplementary training of pharmacists

Pharmacists may register supplementary training or additional qualifications approved by the SAPC. The requirements for registration include submission of acceptable evidence that the person is entitled to register such qualification. Supplementary training in two areas is recognised, namely primary care drug therapy (PCDT) and family planning. Pharmacists who have registered supplementary training are permitted to provide additional services in these areas, providing that permits are obtained from the Department of Health. These permits which may be issued in terms of Section 22A(15) of the Medicines and Related Substances Act 101 of 1965 allow pharmacists to issue certain medicines which are classified in Schedule 3 and above without the prescription of an authorised prescriber. Two institutions are approved to offer primary care drug therapy and family planning training.

1.1.3 Specialist pharmacists

There are currently only two specialities recognised by the SAPC, the clinical pharmacokineticist and the radio-pharmacist. Requirements for registration are, however, stipulated in the *Regulations relating to the registration of the specialities of pharmacists* published in terms of the Act.

1.1.4 Training and registration of pharmacy support personnel

There are two main categories of pharmacy support personnel, namely pharmacist's assistant (basic) (PAB) and pharmacist's assistant (post-basic) (PAPB). Pharmacist's assistants undergoing training are classified as either learner basic or learner post-basic.

For a person to register as a pharmacist's assistant (basic), he/she must complete the course for pharmacist's assistant (basic) and undergo at least 12 months of in-service training under the supervision of a tutor in a pharmacy approved for training.

For anyone to register as a pharmacist's assistant (post-basic) he/she must have completed the basic course as well as the post-basic course and undergo an additional 12 months of in-service training. In-service training must take place in an approved facility under the supervision of an approved tutor.

The pharmacist's assistant qualification is categorised into manufacturing, wholesale, community and institutional pharmacy. Courses are structured for the different sectors and in-service training must be conducted in the applicable category of pharmacy. A person who intends to transfer from one sector to another must complete four months additional practical training as well as any additional modules pertaining to the category of pharmacy to which he/she is transferring. There are seven institutions approved to deliver courses for basic and post-basic pharmacist's assistants.

In 2008 the SAPC took a decision to phase out the current pharmacy support personnel (PAB and PAPB) and replace them with the new mid-level workers, i.e. pharmacy technical assistants and pharmacy technicians. The new cadres of pharmacy support personnel will be trained at higher education and training institutions. The first intake of these students is expected in 2013. The duration of training for pharmacy technical assistants will be a year and students will be awarded a higher education certificate that will allow them to register with the SAPC and perform duties within their scope of practice under the supervision of a pharmacist. Students who choose to continue with their studies for another year will, on completion receive an advanced certificate as pharmacy technician. The candidates will then be required to perform six months internship. On completion of the internship they will be able to work under direct supervision of a pharmacist in any category of pharmacy. They will also be able to work under the indirect supervision of a pharmacist in primary healthcare clinics. The existing cadres will be phased out by 2015. Persons who are currently registered as pharmacist's assistants and who chose not to study towards the new qualification(s) will be translated to the new category of pharmacist's assistant.

1.1.5 Pharmacy personnel training institutions

The successful development and retention of suitably qualified personnel hinges on adequate capacity to consistently train new personnel and upgrade existing capacity. South Africa currently has eight pharmacy schools (Table 1) which produced an average of 476 pharmacy graduates per year between 2001 and 2009 (Table 3).

1.1.5.1 Pharmacy schools

Province	Pharmacy schools per province
Eastern Cape	2
Gauteng	2
KwaZulu-Natal	1
Limpopo	1
North West	1
Western Cape	1
Total	**8**

Table 1: Pharmacy schools in RSA

Source: SAPC, April 2010

1.1.5.2 Pharmacy schools intake

University	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average
Rhodes University (RU)	76	69	94	108	94	80	85	100	158	128	99
University of Western Cape (UWC)	50	80	124	126	95	110	136	109	94	133	116
Nelson Mandela Metropolitan University (NMMU)	67	67	70	69	55	40	60	54	53	112	65
North West University (Potchefstroom Campus) (NWU)	163	168	167	184	91	84	92	123	165	205	144
University of KwaZulu-Natal (UKZN)	69	57	47	69	76	74	75	84	92	94	74
University of Limpopo (Medunsa Campus) in collaboration with TUT	46	57	40	52	54	54	53	55	70	48	53
University of Limpopo (Turfloop Campus)	100	80	60	61	58	61	60	61	61	60	66
University of the Witwatersrand (Wits)	65	90	93	97	65	78	131	108	97	132	96
Total	**636**	**668**	**695**	**766**	**588**	**581**	**692**	**694**	**790**	**912**	**702**

Table 2: Pharmacy schools student intake: 2001 - 2010

Source: Pharmacy school records

The average annual intake of pharmacy students between 2001 and 2010 was 702 (Table 2). The national growth rate year-on-year during the same period was 7.1%. There was a significant drop in intake between 2005 and 2006 (Figure 1) which could be attributed to the legislative changes which took place at the time, e.g. changes in legislation relating to pharmacy ownership as well as the implementation of the dispensing fee. It would appear that for a while these changes had an impact on the attractiveness of pharmacy as a career.

RU, NMMU, Wits and UWC showed a year-on-year growth rate higher than the national figure. Over the past ten years the annual intake at the University of Limpopo (Turfloop Campus) has decreased by approximately 5% which is significantly lower than the national average. Over the same period, the growth rate for NWU was below the national average although there were some fluctuations in intake. Although the intake at UKZN has grown steadily, the rate of growth is not very high.

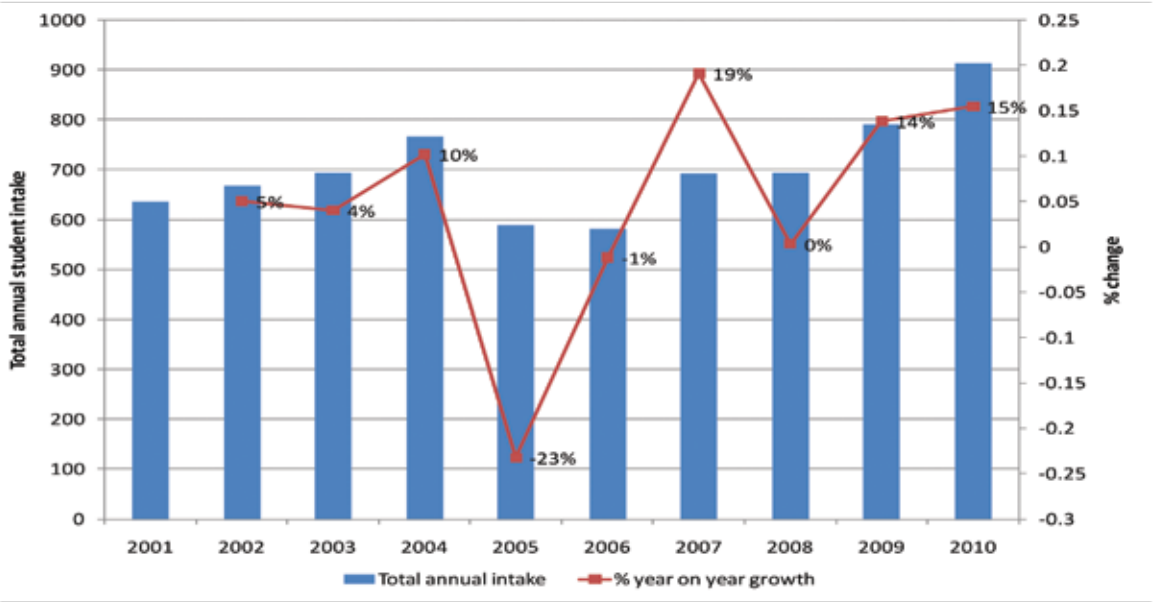


Figure 1: Annual pharmacy student intake: 2001 - 2010

Another factor to bear in mind when considering the change in overall student intake is the proportion of students from foreign countries who are less likely to register as pharmacists in South Africa. Figure 2 shows that in 2009, 18% of pharmacy students in South Africa were from foreign countries. This figure is 4% more than was the case in 2006.

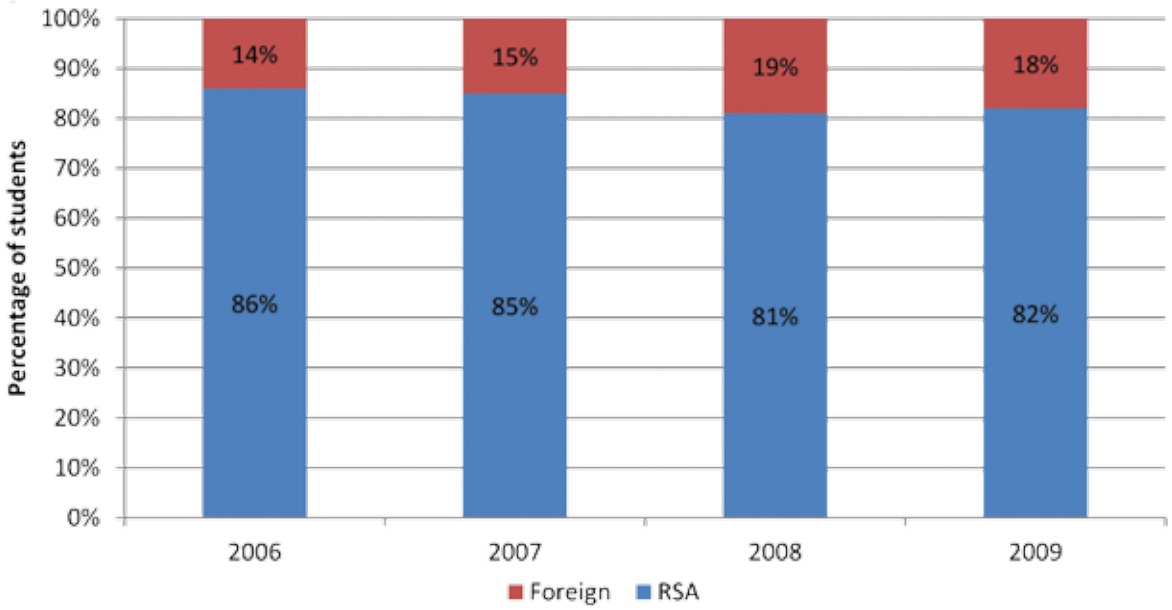


Figure 2: Proportion of SA vs foreign students: 2006 - 2009

1.1.5.3 Pharmacy graduates per school

University	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Rhodes University	62	44	36	47	43	69	70	74	57	56
University of Western Cape	43	43	32	63	79	71	65	61	67	58
Nelson Mandela Metropolitan University	36	46	40	49	56	63	43	57	45	48
North West University (Potchefstroom Campus)	121	129	148	178	136	144	157	71	58	127
University of KwaZulu-Natal	40	51	55	69	62	74	63	61	63	60
University of Limpopo (Medunsa Campus) in collaboration with TUT[1]	-	28	30	35	53	38	40	38	53	39
University of Limpopo (Turfloop Campus)	38	46	37	51	59	40	70	55	56	50
University of the Witwatersrand	24	39	37	43	47	59	49	40	41	42
Total	**364**	**426**	**415**	**535**	**535**	**558**	**557**	**457**	**440**	**476**

Table 3: Bachelor of Pharmacy graduates: 2001 - 2009 Source: Pharmacy school records

[1] The University of Limpopo (Medunsa Campus) had no output in 2001 as it was a new training programme for pharmacists with its first group of pharmacy students graduating in 2002.

1.1.5.4 Pharmacy graduates

The average number of pharmacy graduates completing the BPharm degree between 2001 and 2009 was 476, as depicted in Table 3. There was a significant drop in the number of graduates between 2008 and 2009, which could be due to the drop in intake of pharmacy students in 2005 and 2006 as shown in Table 2.

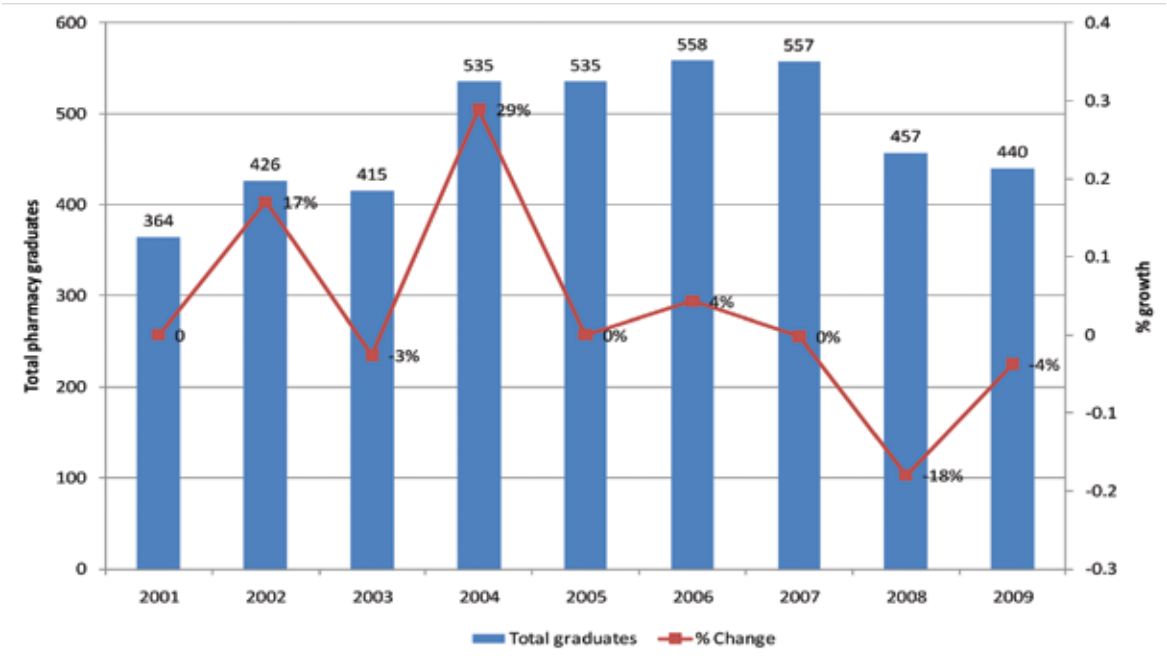


Figure 3: Bachelor of Pharmacy graduates: 2001 - 2009

1.1.6 Pharmacist interns

The average number of pharmacist interns registered with the SAPC between 2001 and 2010 was 449, as depicted in Figure 4. There was a significant drop in the number of interns from 2009, which could be due to the drop in the number of graduates in 2008 as shown in Figure 3 above.

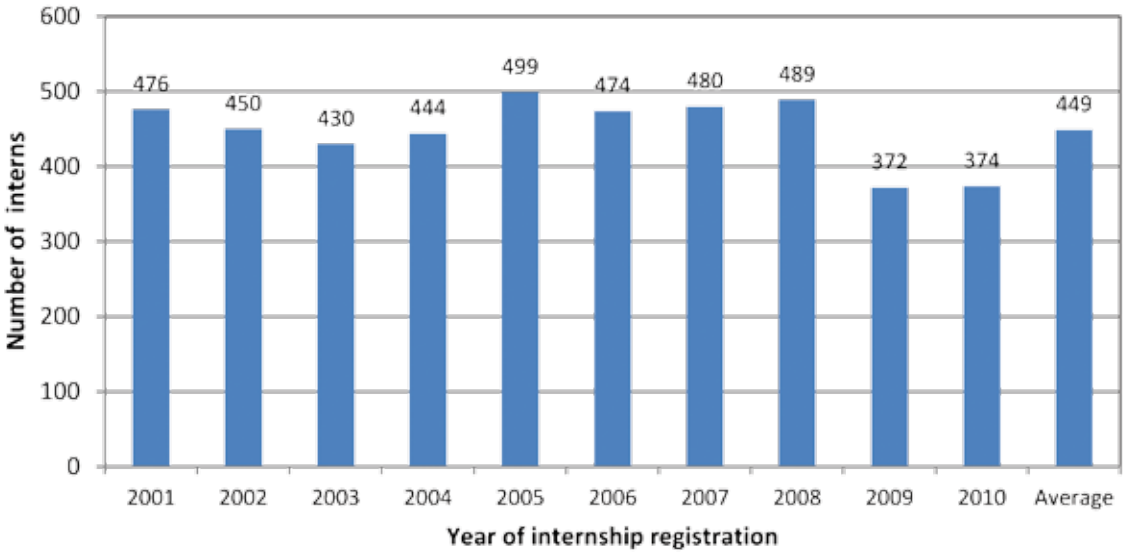


Figure 4: Pharmacist interns: 2001 - 2010

Source: SAPC Register, April 2010

In SA, a pharmacist registering for the first time must perform pharmaceutical community service

Figure 4 refers to the number of persons registering as interns in a particular year regardless of the date of completion of their qualification. It is important to note that the number of interns in a given year does not necessarily correlate with the number of graduates from the previous year. This may be that some graduates choose not to register to undertake an internship immediately after obtaining a pharmacy degree. Other graduates are from foreign countries and may be required to perform an internship in their own country, but some do undertake an internship in South Africa.

1.1.7 Community service pharmacists

In South Africa, a pharmacist registering for the first time must perform pharmaceutical community service, which is a year of employment in the public sector. The average number of pharmacists registering for the first time between 2001 and 2010 was 479 (Figure 5). This number is more than the average number registered for internship during the same period (449). This discrepancy is due to the fact that, for some years, persons with foreign qualifications, who were limited to working in the public sector, were retained on the register as community service pharmacists (CSPs). They now appear on the register as pharmacists with limitations on their area of practice.

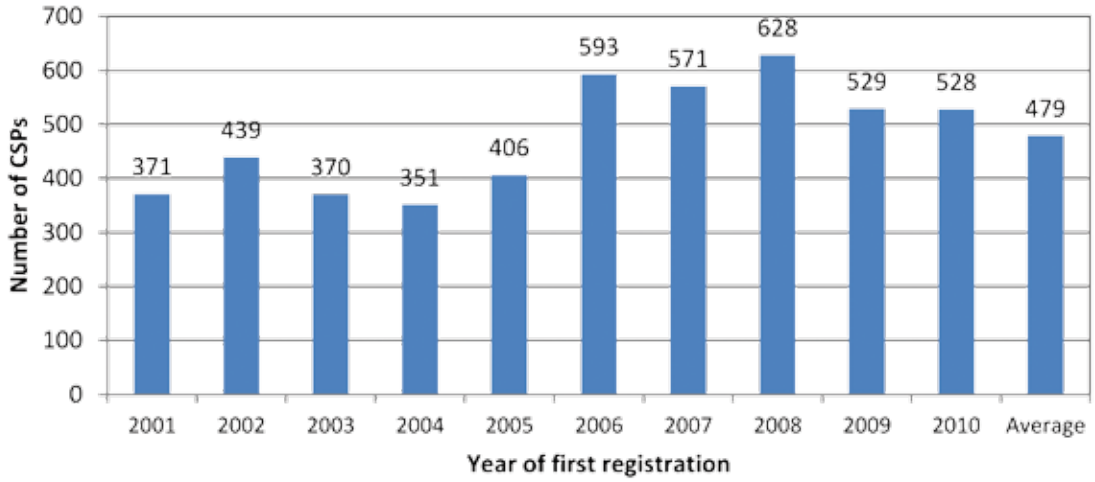


Figure 5: Community service pharmacists: 2001 - 2010

Source: SAPC Register, April 2010

1.1.8 Certificates of good standing

The information in Figure 6 relates to registered persons who requested a certificate of good standing for purposes of registering in another country. It does not, however, indicate that the person who requested the certificate left South Africa to practise in another country. The number of letters of good standing issued per year could be considered a proxy for the number of personnel seeking employment in other countries. It is interesting to note that the number of letters of good standing dropped from 272 in 2001 to 20 in 2006. For the last two years, the number of letters issued per year has remained below 70.

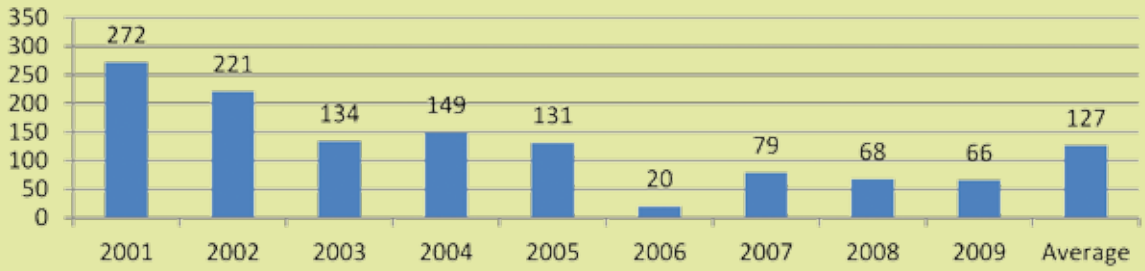


Figure 6: Certificates of good standing: 2001 - 2009

Source: SAPC Register, April 2010

1.1.9 Recognition of foreign qualifications and professionals

1.1.9.1 Registration of foreign nationals

According to government policy, all foreign nationals requesting registration with statutory health councils within South Africa must obtain approval from the NDoH. Once the NDoH has approved the application, candidates are required to register with the SAPC. These pharmacists may only practise in the public sector.

1.1.9.2 Recognition of qualifications obtained outside South Africa

Holders of foreign qualifications (both South Africans and foreign nationals) are required to complete professional examinations successfully and may be required to complete a period of practical training (internship).

1.1.10 Standard setting and quality assurance of learning programmes

The Pharmacy Act 53 of 1974 gives the SAPC the mandate to set standards for pharmacy education and training and to quality assure these programmes. Government recently passed new legislation which gives three quality councils, namely the Council for Higher Education (CHE), Umalusi and the Quality Council for Trades and Occupations (QCTO), the responsibility for developing standards of education and quality assuring such standards. Qualifications are accredited by a specific quality council (QC) depending on the national qualifications framework (NQF) levels shown in Table 4.

Quality Council	NQF levels	NQF levels for pharmacy qualifications
Umalusi	1 to 4	PAB level 3 PAPB level 4
CHE	5 to 10	BPharm level 8 MPham level 9 PhD level 10
QCTO	1 to 10	None

Table 4: NQF levels for pharmacy qualifications

The pharmacist's assistant qualification falls under Umalusi. Prior to the establishment of the QCTO, all qualifications were accredited by either Umalusi or the CHE. Currently there is an option that allows occupational qualifications to be accredited by the QCTO, which is expected to be fully functional by April 2011.

In order for an institution to offer a pharmacy degree it must be registered with the Department of Higher Education and Training (DHET), accredited by the CHE and approved by the SAPC.

The details as to how quality councils will work with the professional health councils regarding standards development and quality assurance has not yet been finalised. The new National Qualifications Framework Act, 67 of 2008, states that there must be cooperation between statutory councils and the relevant QCs in respect of qualifications and quality assurance in each occupational field. The SAPC sets standards and quality assures learning programmes relating to pharmacy.

Prior to offering any pharmacy-related learning programme to learners, both the course and institution offering the course must be accredited/approved by the SAPC. This is to ensure that institutions have the capacity to train learners on programmes that meet the required standards.

Adherence to quality assurance measures is required to ensure that premises, as well as tutors that provide in-service training to pharmacist interns and pharmacy support personnel, are of an acceptable standard.

The SAPC conducts monitoring visits to each pharmacy school every four years. The aim of these visits is to ensure adherence to the prescribed minimum standards. Challenges faced by the SAPC and the schools are addressed during these visits. The providers that offer training for pharmacy support personnel are visited annually since this form of training is relatively new compared with the training of pharmacists.

1.2 CONTINUING PROFESSIONAL DEVELOPMENT

In 2004 the concept of continuing professional development (CPD) was introduced in South Africa as a means of ensuring persons registered with the SAPC enhance competence throughout their professional careers. In 2008 a web-based system was implemented whereby pharmacists and pharmacist's assistants were encouraged to record their CPD activities online on a monthly basis. CPD guidelines and regulations were also developed.

1.2.1 Proposed continuing professional development requirements

According to the proposed CPD requirements, a registered person is required to record a minimum of 12 activities online, on a CPD online programme approved by the SAPC, and keep a portfolio of evidence, which the SAPC may request at any time. The recording of these activities follows a CPD cycle that involves four steps:

Step 1: Reflection on practice (What should I know? What should I be able to do?)
Step 2: Planning (How can I learn?)

Step 3: Implementation (Describes the action taken)
Step 4: Evaluation or reflection on learning (What have I learnt? and How is it benefiting my practice?).

Depending on the activity, entry to the CPD cycle may be initiated at any step of the cycle, with the exception of Step 4. Once an activity has been initiated, information must be provided on each step that follows until Step 4 of the cycle. A guidance document has been developed to assist registered persons.

The SAPC will monitor compliance to ensure that registered persons continue participating in activities that improve their knowledge and skills and, consequently, the quality of service provided to the public. A review of CPD activity records will be done to ensure compliance with the proposed requirements.

1.3 PHARMACY PRACTICE IN SOUTH AFRICA

The SAPC determines and advises the Minister of Health on the scope of practice and the competences required at entry level for all pharmacy personnel. In addition to pharmacists, pharmaceutical services in South Africa are currently staffed by two categories of pharmacy support personnel, namely PAB and PAPB. Each of these has a regulated scope of practice.

1.3.1 Pharmacists and support personnel

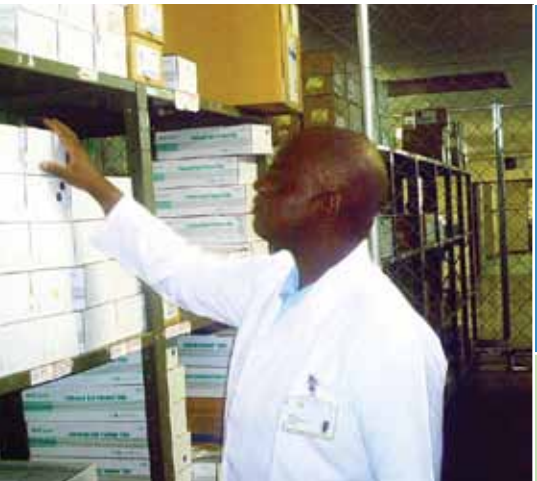
1.3.1.1 Categories of pharmacy personnel

Pharmacists

The *Regulations relating to the practice of pharmacy* published in terms of the Pharmacy Act 53 of 1974 lay down the scope of practice of a pharmacist, which includes acts specially pertaining to the profession. The regulations prescribe the scope of practice of the pharmacist as follows:

(a) the provision of pharmaceutical care by taking responsibility for the patient's medicine-related needs and being accountable for meeting these needs, which shall include but not be limited to the following functions:
  (i) evaluation of a patient's medicine-related needs by determining the indication, safety and effectiveness of the therapy
  (ii) dispensing of any medicine or scheduled substance on the prescription of a person authorised to prescribe medicine
  (iii) furnishing of information and advice to any person with regard to the use of medicine
  (iv) determining patient compliance with the therapy and follow-up to ensure that the patient's medicine-related needs are being met
  (v) the provision of pharmacist-initiated therapy.

(b) the compounding, manipulation, preparation or packaging of any medicine or scheduled substance or the supervision thereof
(c) the manufacturing of any medicine or scheduled substance or the supervision thereof
(d) the purchasing, acquiring, importing, keeping, possessing, using, releasing, storage, packaging, repackaging, supplying or selling of any medicine or scheduled substance or the supervision thereof
(e) the application for the registration of a medicine in accordance with the Medicines Act
(f) the formulation of any medicine for the purposes of registration as a medicine
(g) the distribution of any medicine or scheduled substance
(h) the repackaging of medicines
(i) the initiation and conducting of pharmaceutical research and development
(j) the promotion of public health.



The SAPC determines and advises the Minister of Health on the scope of practice and the competencies required at entry level for all pharmacy personnel

Pharmacist support personnel

The two cadres of pharmacy support personnel have different scopes of practice and perform certain acts pertaining to the practice of pharmacy to differing degrees. The PAPB has a broader scope of practice and can perform some functions under the indirect supervision of a pharmacist.

Pharmacist's assistants (basic)

The regulations list the scope of practice of the pharmacist's assistant (basic) (PAB) as follows:

(a) the sale of Schedule 1 medicines or scheduled substances
(b) assist with the compounding, manipulation or preparation of a non-sterile medicine or scheduled substance according to a formula and standard operating procedures approved by the responsible pharmacist
(c) assist with the manufacturing of a non-sterile medicine or scheduled substance according to a formula and standard operating procedures approved by the responsible pharmacist
(d) the re-packaging of medicine
(e) the distribution and control of stock of Schedule 1 to Schedule 6 medicines or scheduled substances
(f) the provision of information to individuals in order to promote health.

Pharmacist's assistant (post-basic)

The regulations describe the scope of practice of the pharmacist's assistant (post-basic) (PAPB) as follows:

(a) the sale of Schedule 1 and Schedule 2 medicines or scheduled substances
(b) assist with the compounding, manipulation or preparation of a non-sterile or sterile medicine or scheduled substance according to a formula and standard operating procedures approved by the responsible pharmacist
(c) assist with the manufacturing of a non-sterile or sterile medicine or scheduled substance according to a formula and standard operating procedures approved by the responsible pharmacist
(d) the re-packaging of medicine
(e) the distribution and control of stock of Schedule 1 to Schedule 7 (*sic*) medicines or scheduled substances
(f) the ordering of medicine and scheduled substances up to and including Schedule 7 (*sic*) according to an instruction of a person authorised in terms of the Medicines Act to purchase or obtain such medicine or scheduled substance
(g) the reading and preparation of a prescription, the selection, manipulation or compounding of the medicine, the labelling and supply of the medicine in an appropriate container following the interpretation and evaluation of the prescription by a pharmacist
(h) the provision of instructions regarding the correct use of medicine supplied
(i) the provision of information to individuals in order to promote health.

The SAPC is in the process of phasing out the PAB and PAPB cadres in favour of new types of mid-level workers as required by the NDoH. The new developments are aimed at improving career path options for pharmacy support personnel. Further details on these new cadres is provided in section 1.4.4.

The Act also describes the scope of practice of pharmacist interns and pharmacy students allowing them to perform certain functions falling into the scope of practice of pharmacists and pharmacist's assistants under the direct supervision of a pharmacist. In a similar manner, pharmacist's assistants registered in the categories learner basic and learner post-basic can perform the functions of qualified support personnel under direct supervision of a pharmacist.

1.3.1.1.1 Distribution of pharmacists and pharmacy support personnel

As of April 2010 there were 12,813 pharmacists registered with the SAPC. Currently, 12,369 of these pharmacists appear on the SAPC register as being active in practice and include pharmacists who may not be in full-time pharmacy practice in RSA. This leaves a further 444 pharmacists whose status is either unknown or who may have left the country.

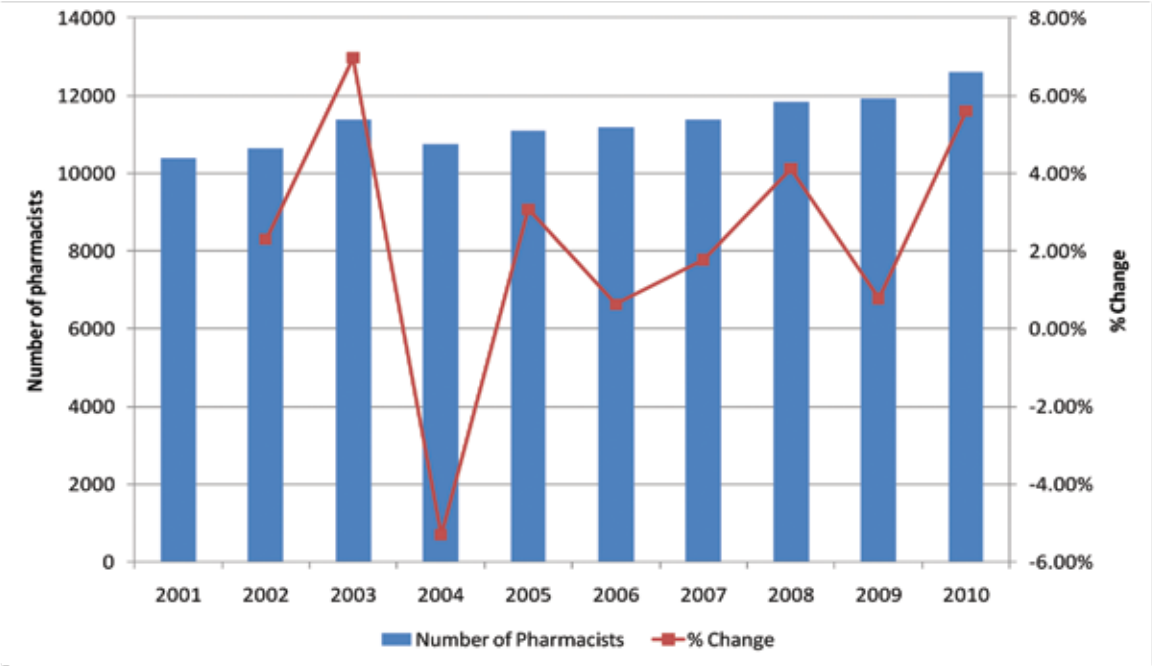


Figure 7: Registered pharmacists: 2001 - 2010

There are 9,071 pharmacist's assistants registered with the SAPC of which 1,971 are currently in training. The calculated ratio of pharmacists to pharmacist's assistants in South Africa is 1:4. Figure 7 shows the steady increase in the number of registered pharmacist's assistants between 2006 and 2010. Figure 8 below shows the distribution of registered pharmacy support personnel between the different categories.

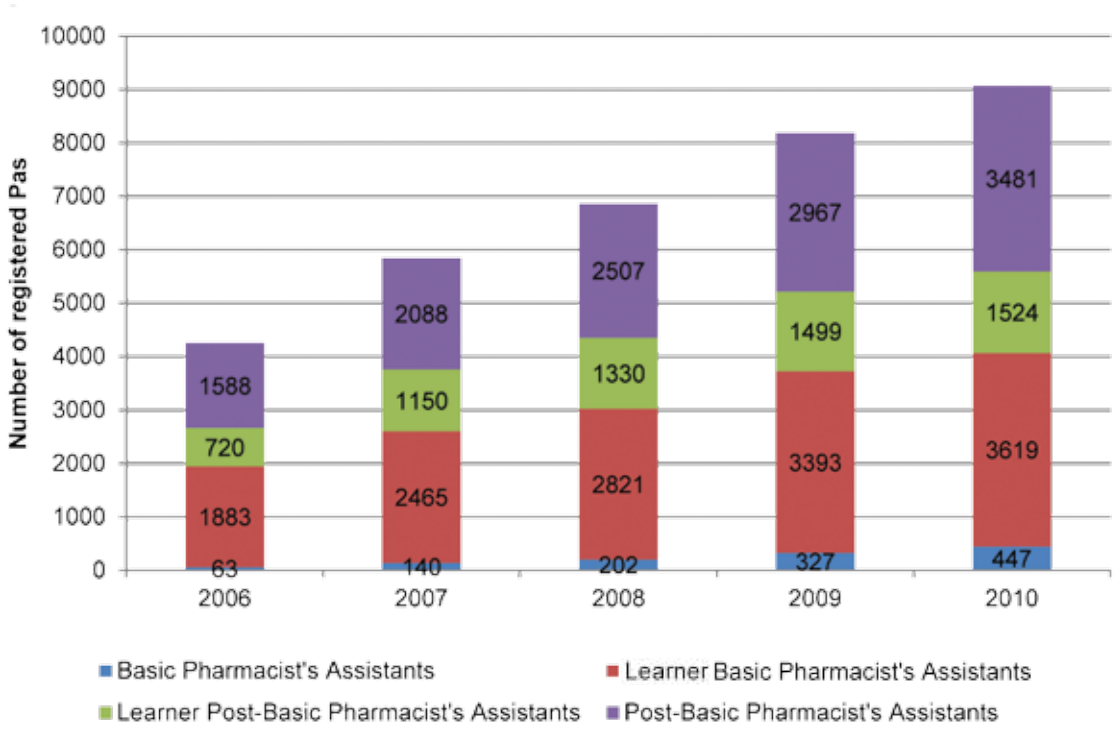


Figure 8: Registered pharmacist's assistants: 2006 - 2010

The fact that the number of pharmacy support personnel registered in South Africa is less than the number of pharmacists implies that pharmacists still have to spend considerable portions of their time performing tasks that could be done by assistants (SAPC Staffing norms, 2010).

1.3.1.1.2 Distribution by sector

According to the SAPC's register of active personnel, 63% of pharmacists practise in the private sector, 29% in the public sector, with the remainder being unknown (see Figure 9).

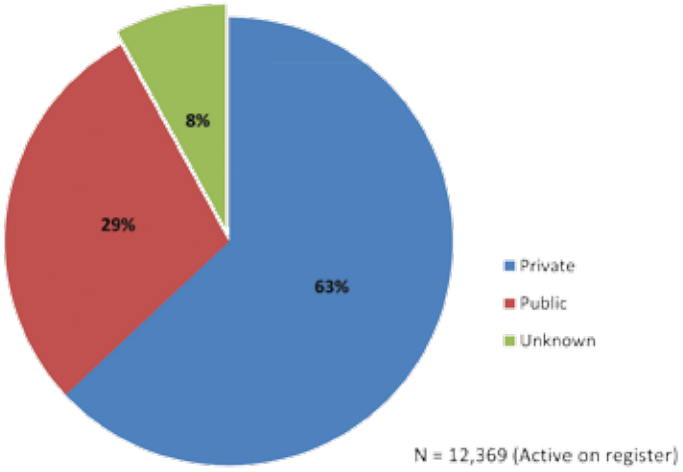


Figure 9: Pharmacists distribution by sector

Source: SAPC Register, April 2010

There has been a significant shift in the proportion of pharmacists working in the public sector from 12% in 2004 to 29% in 2010 (Figure 10). This could be attributed to several factors such as:

- implementation of public sector scarce skills and rural allowance
- implementation of the OSD in 2009/2010
- creation of new posts for pharmacists to support the ARV roll out
- applicability of the legislation to the public sector which has required the appointment of pharmacists in all hospital pharmacies.

The data presented shows that almost two-thirds of pharmacists (63%) are employed in the private sector, which serves an estimated 16% of the population (Council for Medical Schemes, 2009). A considerable proportion of the 80% of the population who receives healthcare in the public sector do, however, use private pharmacies on a cash basis in addition to care received from public health facilities.

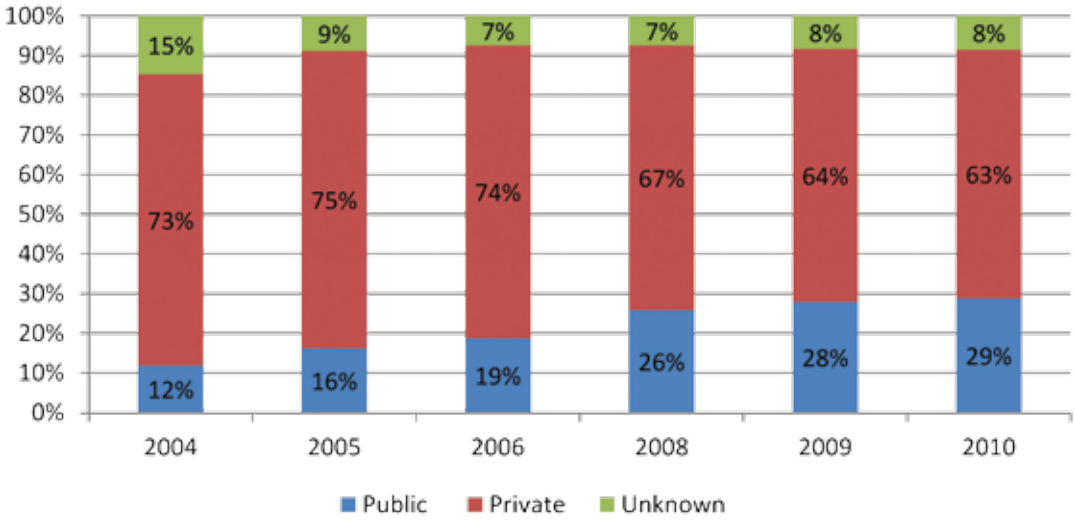


Figure 10: Pharmacists distribution per sector: 2004 - 2010

Source: SAPC Register, June 2010

Note: 2007 data was unavailable

1.3.1.1.3 Geographical distribution

In general, the more affluent provinces attract more pharmacists, as is the case in Gauteng, Western Cape and KwaZulu-Natal. Gauteng has the highest number of pharmacists with a total of 4,508 which is considerably higher than the provincial average of 1,280. As shown in Figure 11 below, the majority of pharmacists in each province practise in the private sector with the exception of Limpopo, where approximately 55% of the 427 pharmacists are employed by government.

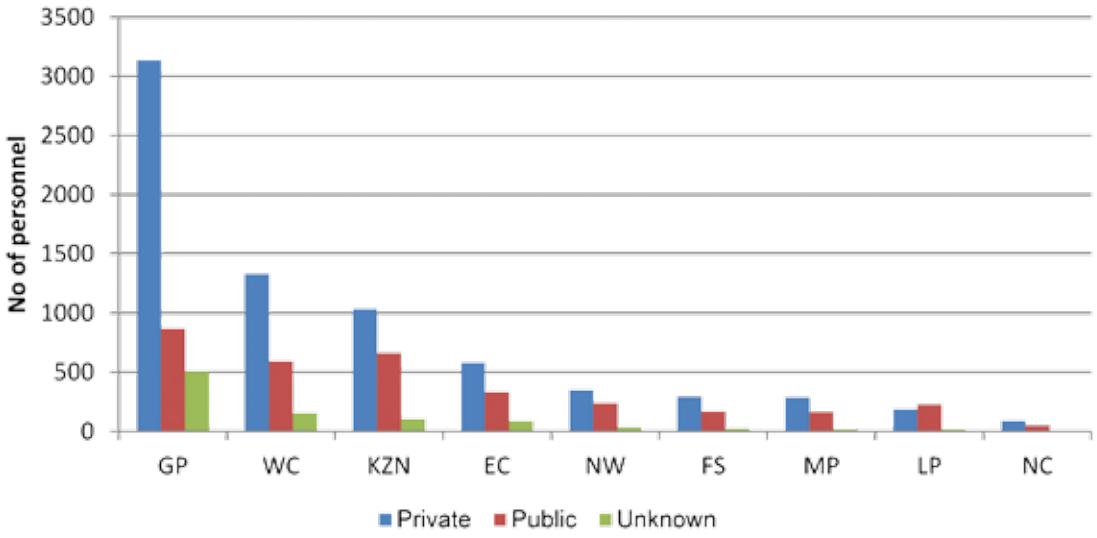


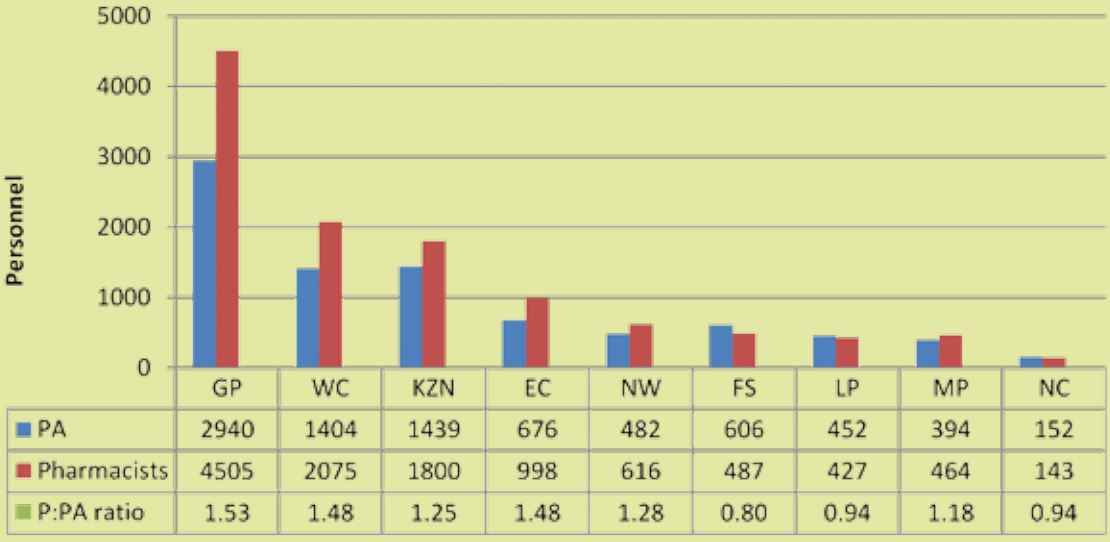
Figure 11: Pharmacists by sector per province

There are indications that the current cadres of pharmacy support personnel are underused thus leading to a perceived overstaffing of pharmacist's assistants (SAPC Staffing norms, 2010). Figure 11 suggests that there is an uneven distribution of pharmacists across the provinces in favour of the more economically active provinces. For instance, Gauteng, Western Cape and KwaZulu-Natal have the highest number of pharmacists and pharmacist's assistants and are the three largest contributors to the country's GDP (Table 5). The ratios of pharmacists to pharmacist's assistants, if learner assistants are included, ranges from 0.9 to 1.5 across the provinces (Figure 12), suggesting that there is roughly one pharmacist for each pharmacist's assistant per province. This ratio increases significantly if the number of assistants excludes those who are still learners (Figure 13).

	GP	WC	KZN	EC	NW	FS	LP	MP	NC
% of GDP	33.30	14.40	16.70	8.10	6.30	5.50	6.70	6.80	2.20

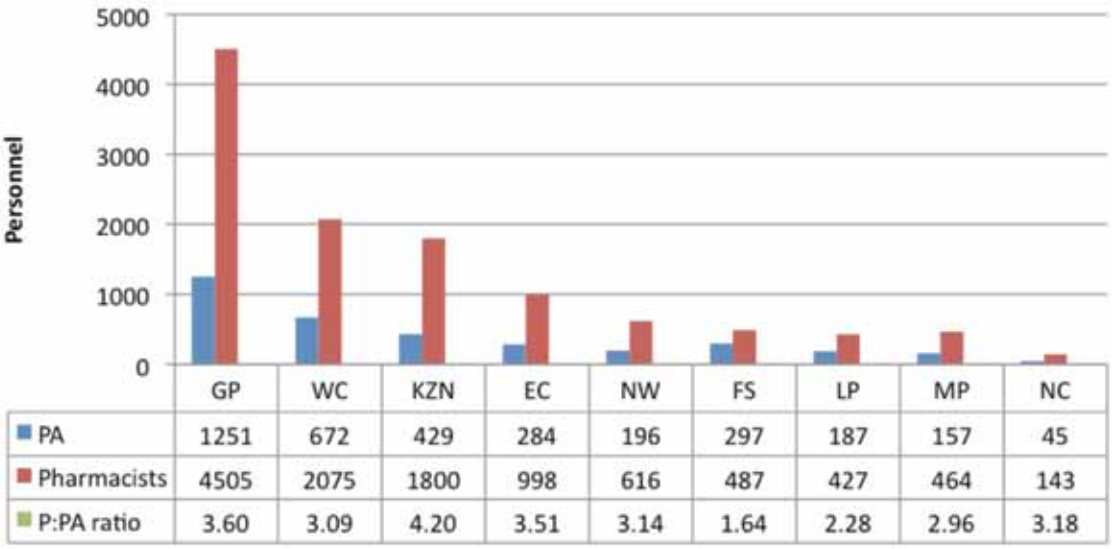
Table 5: Provincial contribution to national domestic product

Source: Stats SA, 2009



	GP	WC	KZN	EC	NW	FS	LP	MP	NC
PA	2940	1404	1439	676	482	606	452	394	152
Pharmacists	4505	2075	1800	998	616	487	427	464	143
P:PA ratio	1.53	1.48	1.25	1.48	1.28	0.80	0.94	1.18	0.94

Figure 12: Pharmacists and pharmacist's assistants per province (including learners) Source: SAPC Register, April 2009



	GP	WC	KZN	EC	NW	FS	LP	MP	NC
PA	1251	672	429	284	196	297	187	157	45
Pharmacists	4505	2075	1800	998	616	487	427	464	143
P:PA ratio	3.60	3.09	4.20	3.51	3.14	1.64	2.28	2.96	3.18

Figure 13: Pharmacists and pharmacist's assistants per province (excluding learners) Source: SAPC Register, April 2009

1.3.1.1.4 Distribution of pharmacists by area of practice

Community and institutional practice dominate the pharmacy workforce accounting for 43% and 35% of pharmacists respectively. Of the remaining 22%, 6% practise in the pharmaceutical industry, 1% in research, 2% in academia, 3% in professional administrative and regulatory positions with another 3% in other areas of practice (refer Figure 14).

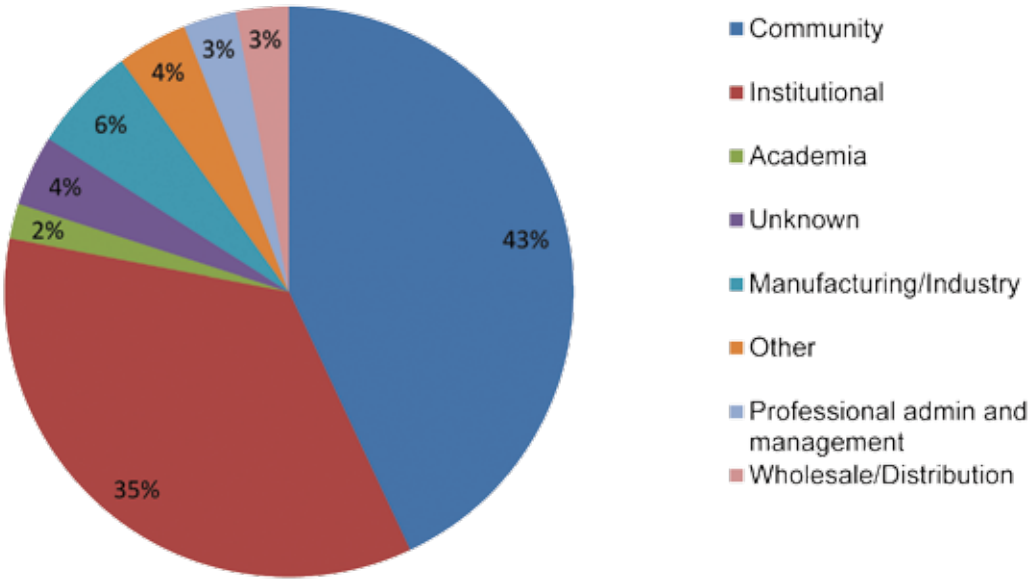


Figure 14: Pharmacists distribution by area of practice

Source: SAPC Register, April 2010

1.3.1.1.5 Pharmacy workforce distribution by age, gender and race

As is the case in most industries in South Africa, the sustainable development and maintenance of the pharmacy workforce is influenced by population demographics. The sections below provide an overview of the distribution of personnel in terms of age, gender and race.

1.3.1.1.6 Distribution by age

The majority of pharmacists in South Africa are younger than 55 years, with most falling below the age of 35 (Figure 15). Limpopo and the Free State have more than 60% pharmacists below the age of 35 suggesting mostly newly qualified personnel. Gauteng and Western Cape have the inverse with less than 30% of the workforce below the age of 35. The majority of pharmacists in Gauteng and Western Cape fall in the age band 35-55 years.

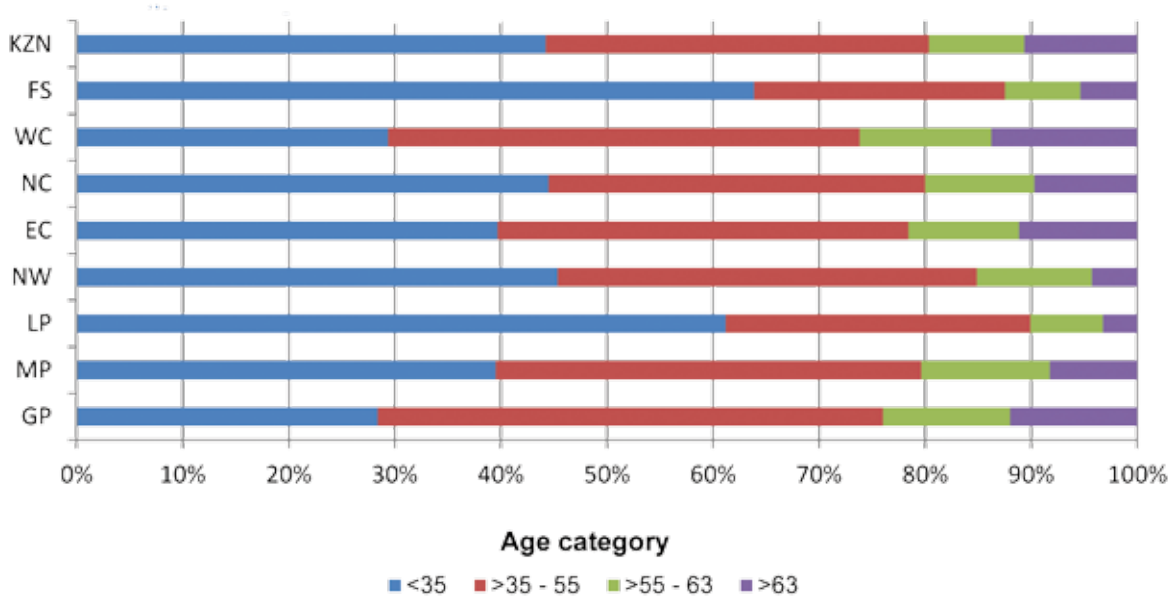


Figure 15: Pharmacist age distribution by province

Source: SAPC Register, April 2010

Although the trend mentioned in figure 15 holds true for both genders, there are some notable differences in gender ratios for the reported age categories. Figure 16 shows that there are more male pharmacists over the age of 55 years, while females dominate the age group 55 and below. A transition in gender ratios has thus occurred with more of the newly qualified professionals being female. For every male pharmacist below age 55, there are approximately three female pharmacists.

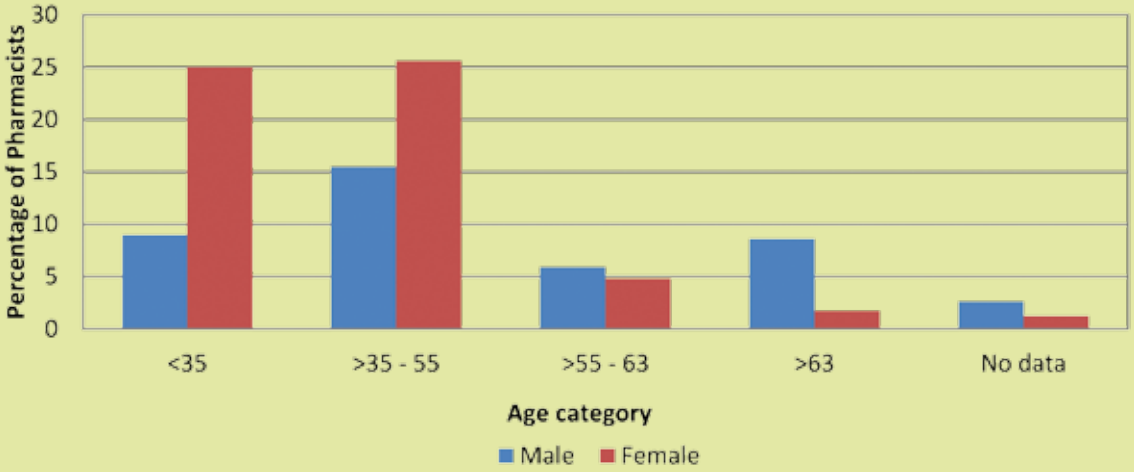


Figure 16: Age distibution of pharmacists by gender

Source: SAPC Register, April 2010

1.3.1.1.7 Distribution by gender

As mentioned in the previous sections, there is a general shift from male to female dominance in the pharmacy workforce in all provinces. The shift in focus to provision of pharmaceutical care and greater flexibility with regard to part-time work may be among the reasons why pharmacy has become more attractive for women. Currently, 59% of the pharmacy workforce comprises women (Figure 17). This change follows a trend that has been established over the years, as mentioned in The Production and Distribution of Human Resources in Pharmacy, A Technical Report to Chapter 10 of the 1998 South African Health Review (SAHR), (Health Systems Trust 1998).

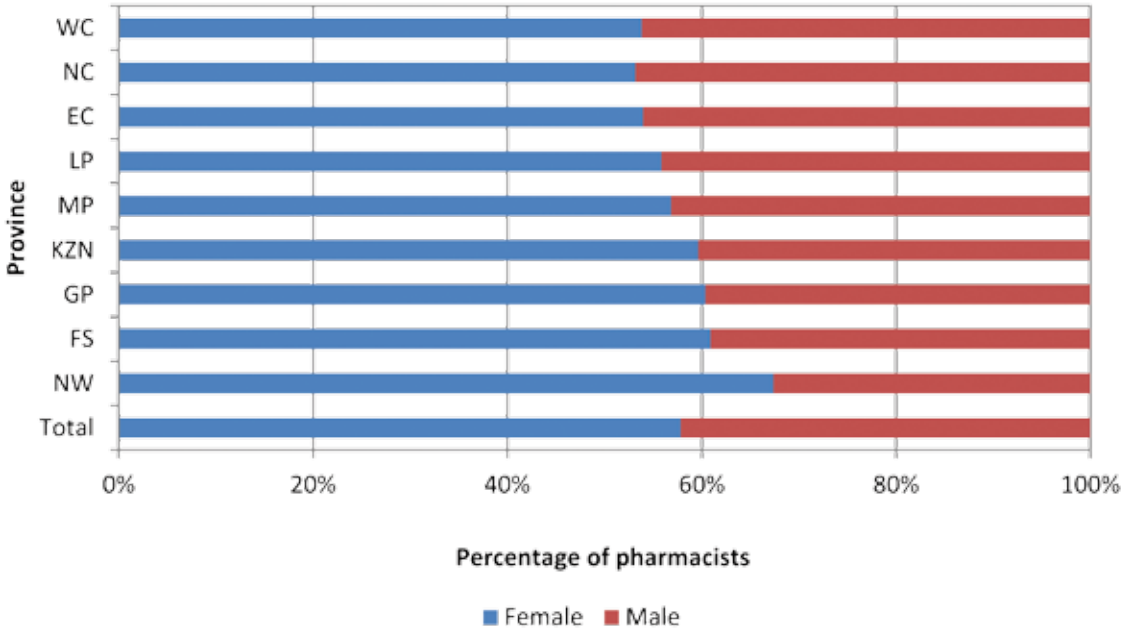


Figure 17: Pharmacists gender distribution by province

Source: SAPC Register, April 2010

Over the last two decades a worldwide trend of gender equality has been achieved in the workplace. This is true of the pharmacy profession in South Africa. The severely imbalanced 83:17 ratio of male to female of the 1970s (Figure 18) has been corrected steadily. A 60:40 ratio of male to female pharmacists was achieved by the 1980s, and in 1998 a 51:49 ratio of males to females was reported in the SAHR, with a 40:60 male to female ratio being achieved by 2010.

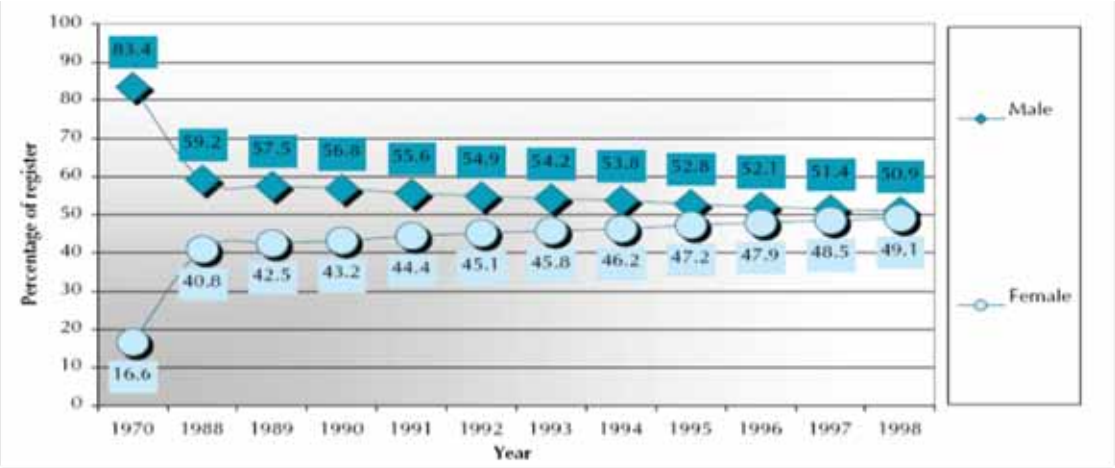


Figure 18: Gender distribution of pharmacists 1970 and 1988 - 1998

Source: Production and Distribution of Human Resoures in Pharmacy, SAHR 1998

The Production and Distribution of Human Resources in Pharmacy Report stated that the steady change in the male to female ratio, although a welcome worldwide trend towards gender equality in the workplace, could have negative implications in that, should this trend continue, the profession would again find itself in a position of an unequal distribution of the sexes – only reversed. Figure 19 shows a continuation of the trend presented in the 1998 report with women accounting for an increasingly larger proportion of pharmacists in South Africa.

Over the last two decades a worldwide trend of gender equality has been achieved in the workplace. This is true of the pharmacy profession in South Africa

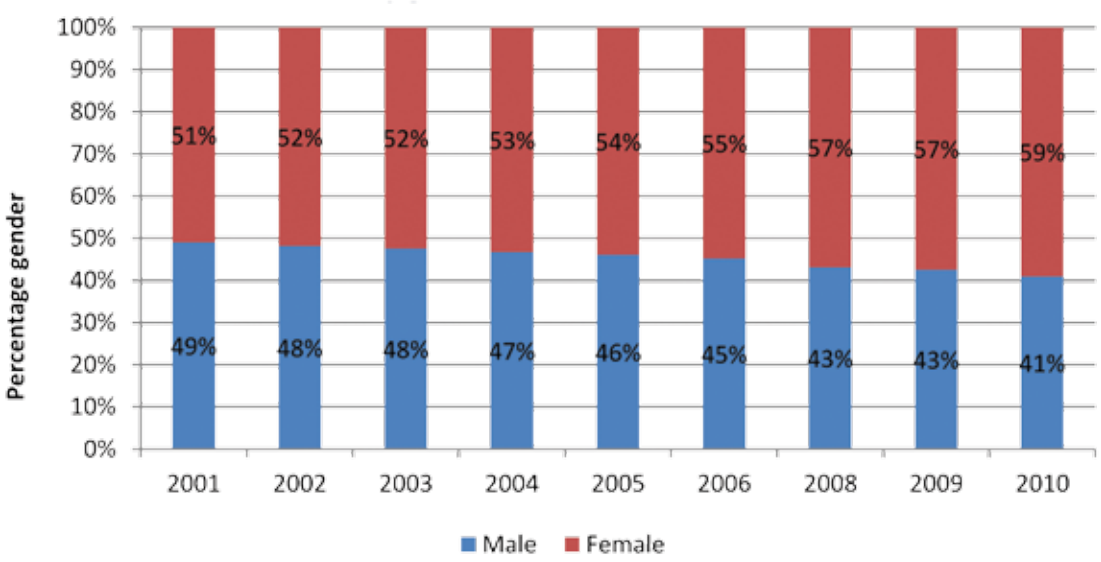


Figure 19: Pharmacists distibution by gender

Source: SAPC Register, April 2010

Note: Information on pharmacists' distribution by gender was unavailable for 2007

It has been suggested that an increase in the proportion of female pharmacists could result in a decline in available pharmacy human resources. This viewpoint is based on the assumption that a decrease in the number of pharmacists practising full-time would arise due to the fact that more female pharmacists would be likely to work part-time, or not practise at all, compared with their male counterparts. The assumption is supported by the 1994 TPS Drug Information Centre survey that found that 85% of males and 56% of females were working full-time. There is therefore a need for an in-depth assessment of South Africa's current and future workforce requirements taking ratios and differential work time capacity between the genders into account.

1.3.1.1.8 Distribution by race

The pharmacy profession in South Africa is still predominantly White, with 63% of actively practising pharmacists being White compared with 17% Asian and 14% Black, as shown in Figure 20. Figure 21 shows the distribution of pharmacist by race over a period of ten years (2001-2010). Given that the majority of South Africa's population is Black, especially in the rural areas, this racial imbalance affects the availability and accessibility of pharmaceutical personnel and therefore pharmaceutical services. This situation suggests a need to ensure that the training of pharmacists is in line with the country's demographics.

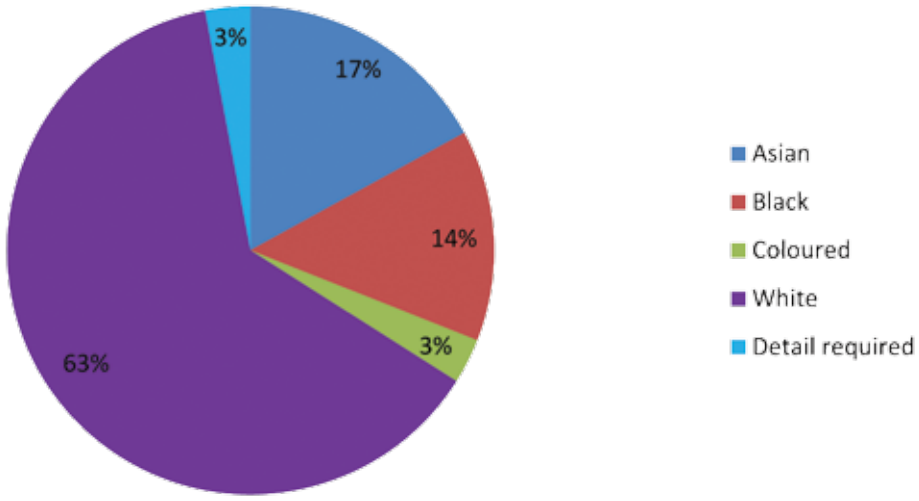


Figure 20: Pharmacist race distribution

Source: SAPC Register, April 2010

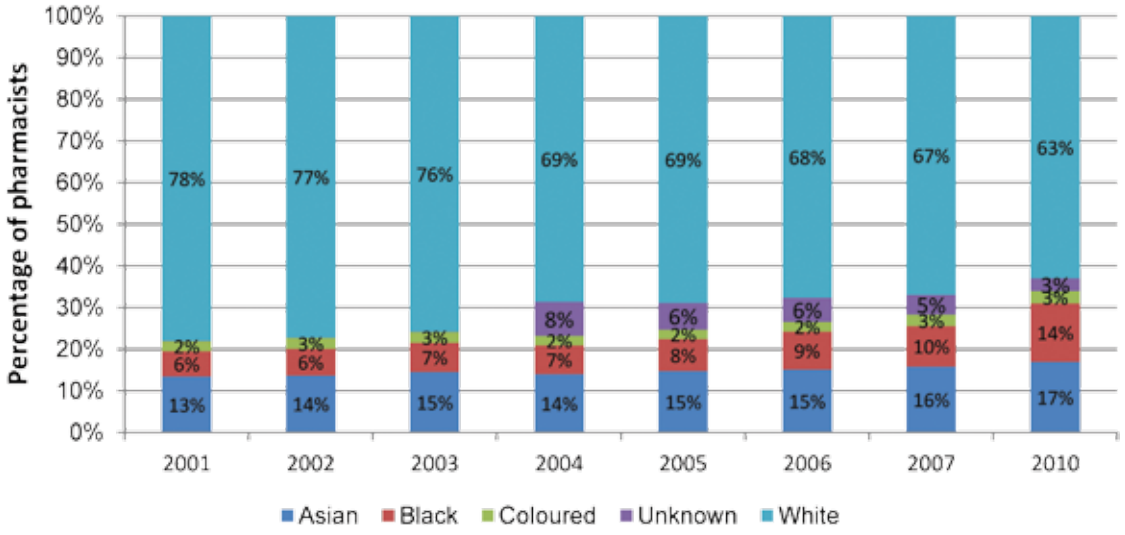


Figure 21: Pharmacists distribution by race: 2001-2010

Source: SAPC Register, April 2010

1.3.2 Registered categories of pharmacies

Any person who wishes to provide pharmaceutical services may only do so once they have obtained the necessary licence from the National Department of Health. Once issued, the license must be recorded with the SAPC within 30 days of its date of issue. The pharmaceutical sector in South Africa comprises five categories of pharmacies, namely manufacturing, wholesale, community, institutional (public and private) and consultant. The SAPC maintains a register of all categories of pharmacies where the name, the trading title, address, registration number, the licence number, and the date of registration of such pharmacies are recorded. Each category of pharmacy can only provide the prescribed services as detailed below.

1.3.2.1 Manufacturing pharmacy

The following acts which fall within the scope of practice of a pharmacist may be performed in a manufacturing pharmacy:

(a) the manufacturing of any medicine or scheduled substance
(b) the purchasing, acquiring, keeping, possessing, using, supplying or selling of any medicine or scheduled substance
(c) the furnishing of information and advice to any person with regard to medicine manufactured by him, her or it
(d) the application for the registration of a medicine or medical device
(e) the formulation of medicine for the purposes of registration as a medicine
(f) the distribution of medicine or scheduled substances
(g) the repackaging of medicine in accordance with the Medicines Act
(h) the initiation and conducting of pharmaceutical research and development
(i) any other health service as may be approved by the SAPC from time to time.

1.3.2.2 Wholesale pharmacy

The following acts which fall within the scope of practice of a pharmacist may be performed in a wholesale pharmacy:

(a) the wholesale distribution of any medicine or scheduled substance through the purchasing, acquiring, keeping, possessing, using, supplying or selling of any medicine or scheduled substance
(b) the furnishing of information and advice to any person with regard to medicine distributed by him, her or it
(c) the application for the registration of a medicine or medical device
(d) the initiation and conducting of pharmaceutical research and development
(e) any other health service as may be approved by council from time to time

(f) the repackaging of medicine in wholesale pharmacies owned or controlled by an organ of the state in accordance with the Medicines Act.

1.3.2.3 Community and institutional pharmacy

The following acts which fall within the scope of practice of a pharmacist may be performed in a community or institutional pharmacy:

(a) the provision of pharmaceutical care by taking responsibility for the patient's medicine-related needs and being accountable for meeting these needs, which shall include but not be limited to the following functions:
  (i) evaluation of a patient's medicine-related needs by determining the indication, safety and effectiveness of the therapy
  (ii) dispensing of any medicine or scheduled substance on the prescription of an authorised prescriber
  (iii) furnishing of information and advice to any person with regard to medicine
  (iv) determining patient compliance with the therapy and follow-up to ensure that the patient's needs are being met
  (v) provision of pharmacist-initiated therapy.
(b) the compounding, manipulation or preparation of any medicine or scheduled substance
(c) the purchasing, acquiring, keeping, possessing, using, supplying or selling of any medicine or scheduled substance
(d) the application for the registration of a medicine or medical device
(e) the re-packaging of medicine
(f) the promotion of public health in accordance with guidelines and standards as determined by a competent authority which includes but shall not be limited to:
  (i) the provision of information and education regarding the promotion of human health
  (ii) the provision of immunisation, mother and child care, blood pressure monitoring; health education; blood-glucose monitoring; screening tests for pregnancy; family planning; cholesterol screening tests; HIV screening tests; urine analysis; and visiometric and audiometric screening tests
  (iii) the provision of animal healthcare services which includes, e.g:
    (aa) the compounding and dispensing of prescriptions written by veterinarians and ensuring the optimal use of veterinary medicines
    (bb) the immunisation of animals
    (cc) the handling of minor and/or self-limiting ailments in animals
    (dd) the provision of information and education regarding the promotion of animal health
(g) the initiation and conducting of pharmaceutical research and development
(h) the provision of primary care drug therapy with prior authorisation from the SAPC
(i) any other health service as may be approved by the SAPC from time to time.

1.3.2.4 Consultant pharmacy

The regulations list the following acts which fall within the scope of practice of a pharmacist which may be performed in a consultant pharmacy:

(a) the provision of pharmaceutical care with the goal of improving compliance with medicine therapy and which shall be limited to the following functions:
  (i) evaluation of a patient's medicine regimen with respect to the indications, safety and effectiveness of therapy
  (ii) the provision of information and advice to any person with regard to the use of medicine
  (iii) determining patient compliance with the therapy and follow-up to ensure that the patient's medicine-related needs are being met.
(b) the initiation and conducting of pharmaceutical research and development
(c) the application for the registration of a medicine or medical device
(d) the promotion of public health
(e) any other health service as may be approved by the SAPC from time to time.

1.3.3 Distribution of pharmacies

As of 2010 there were 4,281 pharmacies registered in South Africa. The overall number of registered pharmacies has increased by 17.2% from 3,712 in 2001 (Figure 22). The majority of pharmacies on the register were community pharmacies at 67%, followed by public institutional pharmacies at 15%. Manufacturing, wholesale and private institutional pharmacies each constituted 6% of the pharmacies, with consultant pharmacies constituting 0.3%.

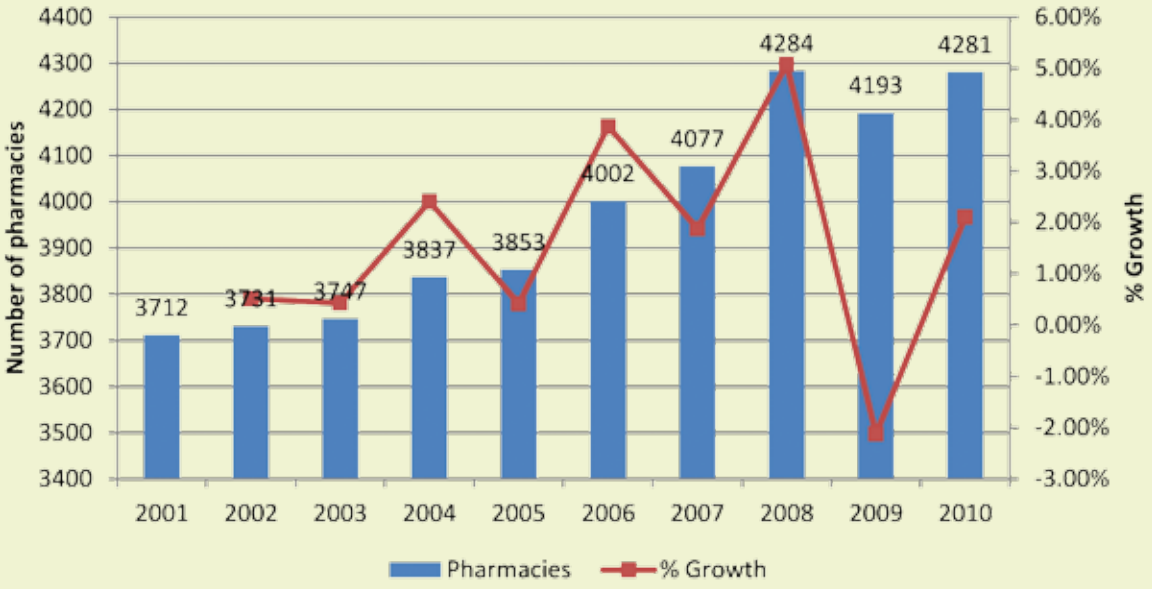


Figure 22: Registered pharmacies: 2001-2010

Source: SAPC Register, April 2010

Although growth in the period has been characterised by several peaks and troughs, the number of registered community pharmacies has increased by an average of 2% annually since 2001 (Figure 23).

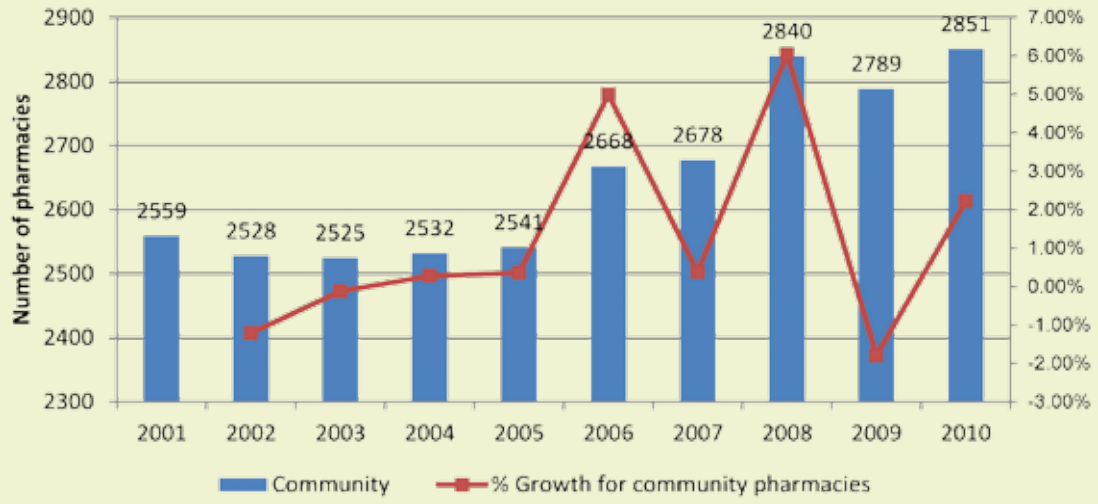


Figure 23: Community pharmacies: 2001-2010

Source: SAPC Register, 2010

Figure 24 shows the number of community pharmacies by province over the last decade (2001-2010). Three provinces show a substantial percentage growth in the number of community pharmacies compared with national growth (17.2%), i.e. Limpopo (58%), North West (38%) and Mpumalanga (29%).

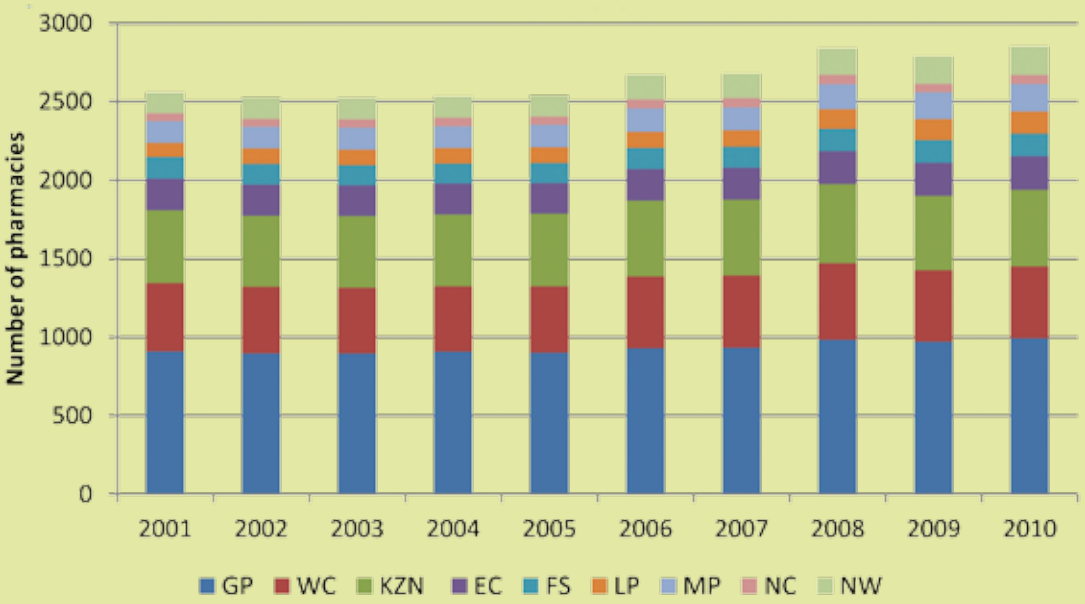


Figure 24: Community pharmacies by province: 2001-2010

Source: SAPC Register, 2010

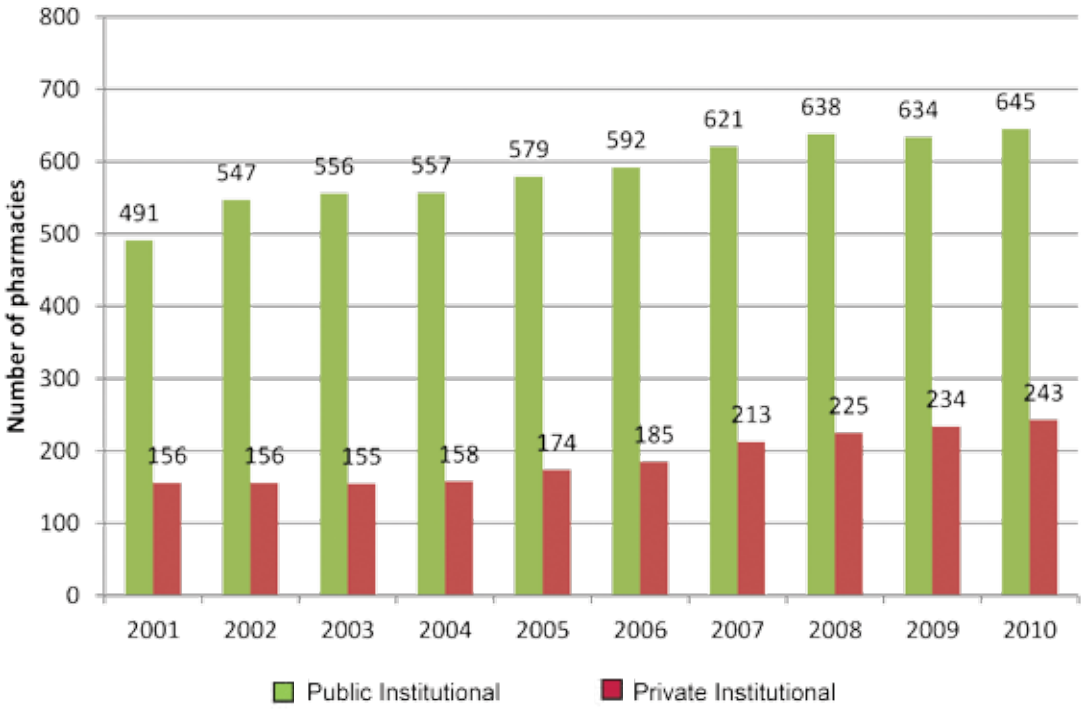


Figure 25: Public and private institutional pharmacies: 2001-2010

Source: SAPC Register, 2010

Figure 25 depicts the overall change in the number of registered public and private institutional pharmacies in South Africa over the last decade, while Figures 26 and 27 depict the change in the number of registered public and private institutional pharmacies by province between 2001 and 2010. Public and private institutional pharmacies have increased steadily over the past decade. Five provinces had a substantial percentage growth in the number of private institutional pharmacies compared with the average national growth (68%), i.e. Mpumalanga (75%), Eastern Cape (91%), Western Cape (77%), Northern Cape (100%) and North West (90%).

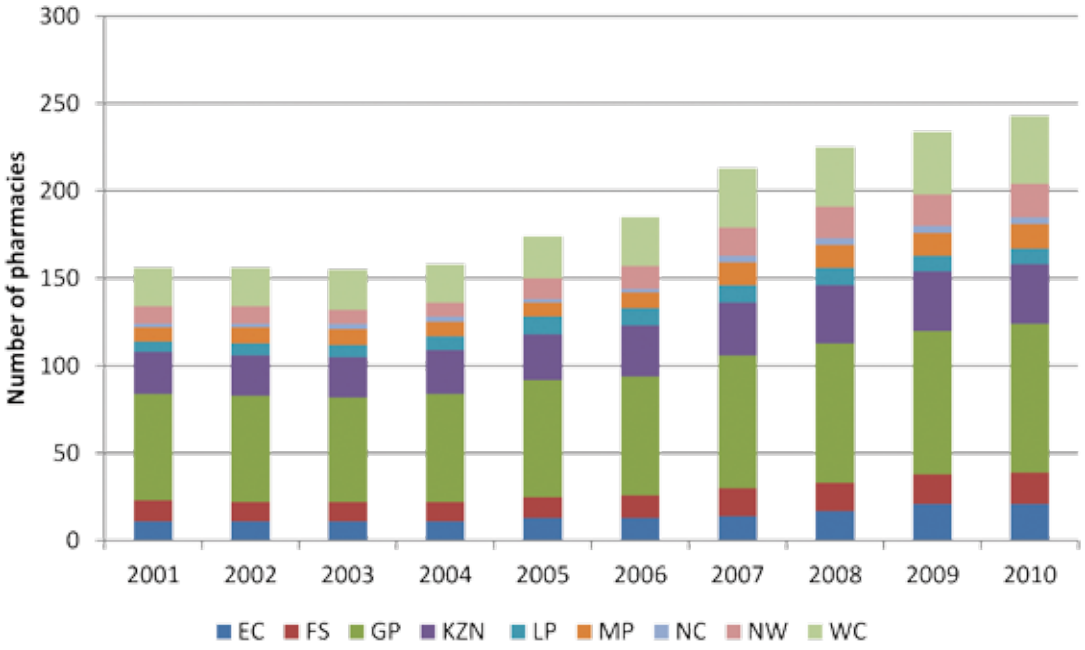


Figure 26: Private institutional pharmacies by province: 2001-2010

Source: SAPC Register, 2010

Three provinces had a substantial percentage growth in the number of public institutional pharmacies compared with the average national growth (36%), i.e. Limpopo (63%), Eastern Cape (147%) and KwaZulu-Natal (57%).

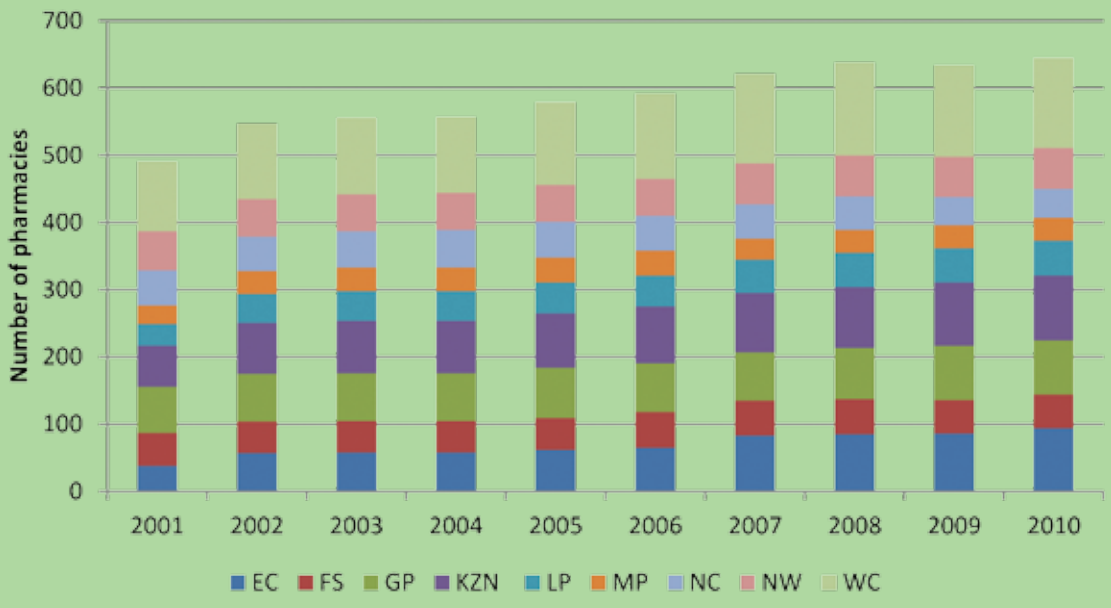


Figure 27: Public institutional pharmacies by province: 2001-2010

Source: SAPC Register, 2010

Figure 28 depicts the change in the number of registered manufacturing and wholesale pharmacies between 2001 and 2010. The number of manufacturing pharmacies has nearly doubled while wholesale pharmacies has declined by 31%. This trend is explained in part by the reconciliation of the SAPC's registration criteria with those of the Medicines Control Council, which saw a significant number of wholesale pharmacies being re-categorised as manufacturing pharmacies.

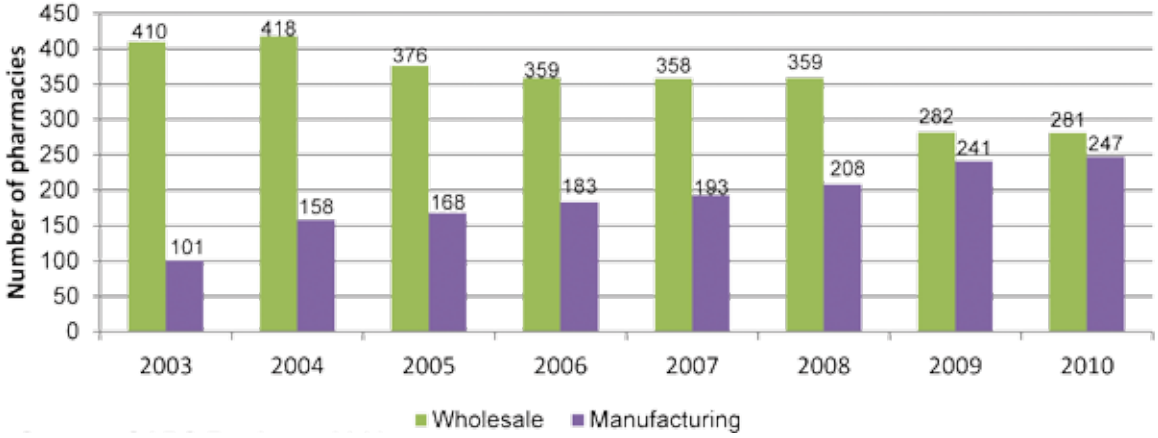


Figure 28: Wholesale and manufacturing pharmacies: 2001-2010

Source: SAPC Register, 2010

Figure 29 depicts the change in the number of registered manufacturing pharmacies by province between 2001 and 2010. Only two provinces had a substantial percentage growth in the number of manufacturing pharmacies, i.e. Gauteng (185%) and Western Cape (125%). It is important to note that Northern Cape does not have a manufacturing pharmacy, and in Limpopo there is only one manufacturing pharmacy. The Free State has had no change in the number of manufacturing pharmacies over the past decade.

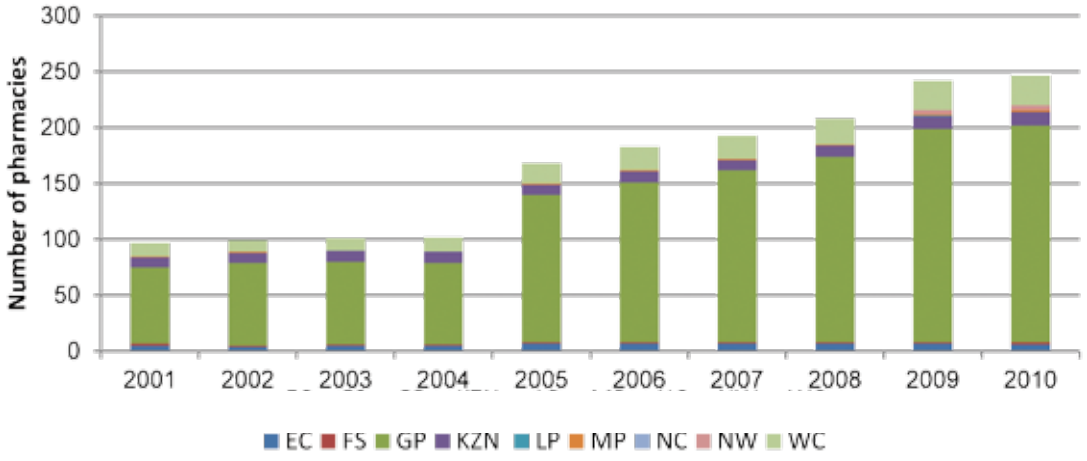


Figure 29: Manufacturing pharmacies by province: 2001-2010

Source: SAPC Register, 2010

Figure 30 depicts the change in the number of registered wholesale pharmacies by province between 2001 and 2010. While there has been a growth in other categories of pharmacies by province, there has been a decline in the number of wholesale pharmacies across seven provinces, with the exception of Limpopo which had an increase of 75%. The figures recorded in Mpumalanga in 2001 and 2010 are similar.

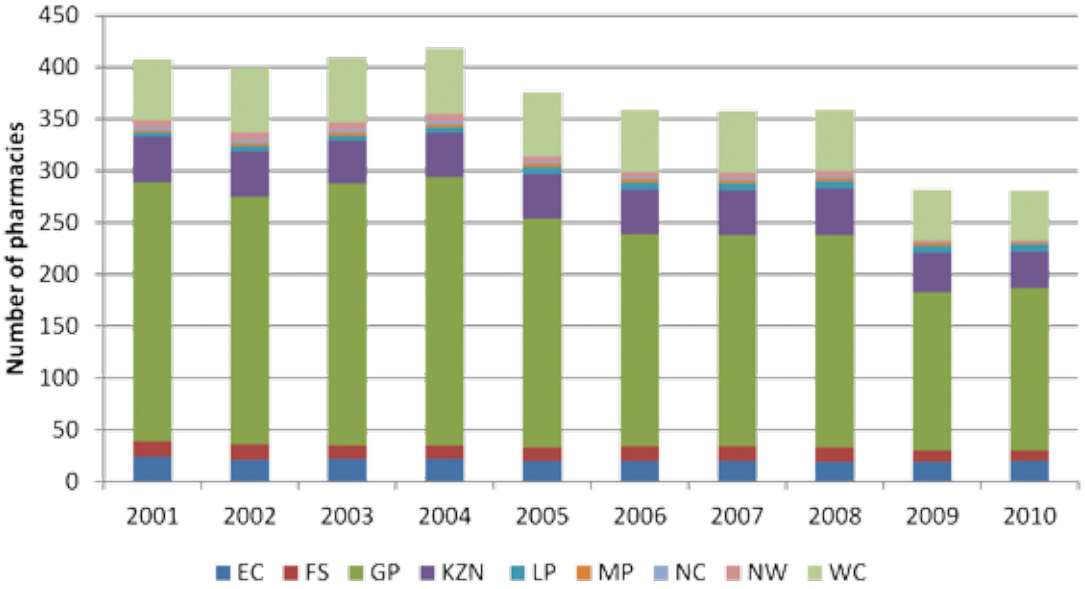
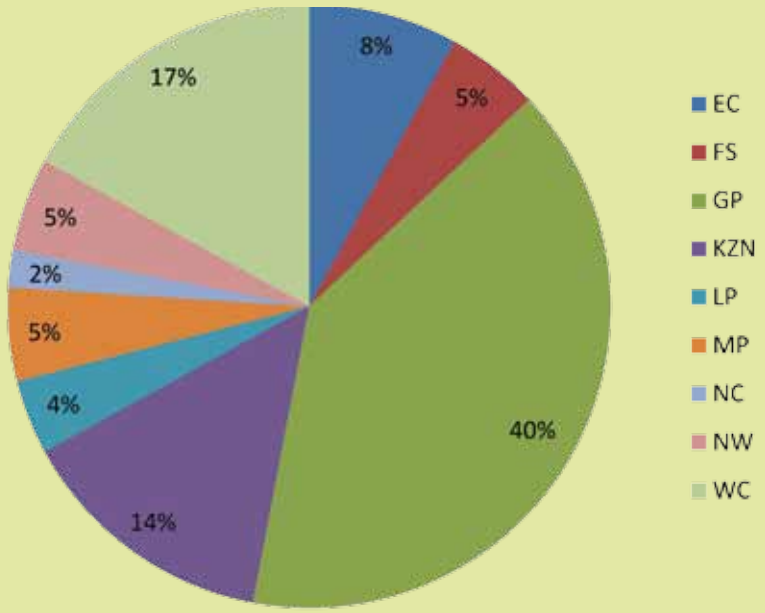


Figure 30: Wholesale pharmacies by province: 2001-2010

Source: SAPC Register, 2010

Figure 31 depicts the distribution of pharmacies across all provinces. There is a clear bias in the distribution of pharmacies where it is observed that the majority of pharmacies are in the more economically active areas of Gauteng (40%), Western Cape (17%) and KwaZulu-Natal (14%).

This trend is further evidenced by the inequitable distribution of community pharmacies, most of which are in Gauteng (27%), KwaZulu-Natal (10%) and Western Cape (10%), indicating an imbalance in the provision of pharmaceutical services. The number of pharmacies in relation to population density is discussed in further detail in section 2.1.3.



Source: SAPC Register, 20 April 2010

Figure 31: Distribution of pharmacies per province

Quality assurance measures are required to ensure that premises where practical training takes place meet the necessary standards of practice as well as being suitable training sites

1.3.4 Quality assurance of pharmacy practice

Practical training is an integral part of both the pharmacy qualification and the qualifications for pharmacy support personnel. Quality assurance measures are required to ensure that premises where practical training takes place meet the necessary standards of practice as well as being suitable training sites. The Pharmacy Act lays down rules for the maintenance of good pharmacy practice (GPP). All pharmacies are inspected and graded according to GPP.

1.3.4.1 Pharmacy inspections

In maintaining standards of practice, the SAPC conducts frequent inspections of all its registered pharmacies. By the end of 2009 there were 4,242 pharmacies registered with the SAPC.

For the year 2009, the SAPC conducted 966 inspections of the 2,418 pharmacies that were due for inspection in the two-year cycle 2009-2010 (Figure 32). Of those inspected, 68% were community pharmacies, 14.9% public institutional pharmacies, 6% wholesale pharmacies, 6% private institutional pharmacies and 5.1% manufacturing pharmacies.

The inspections take the form of an audit where pharmacies are assessed on compliance with GPP, which covers the following elements:

(a) professional standards for premises
(b) professional standards for services
(c) professional standards for pharmacy human resources
(d) professional standards for pharmacy management.

These standards are derived and informed by GPP requirements which are summarized as follows:

(a) A pharmacist's first concern in all settings is the welfare of patients.
(b) The core of the pharmacy activity is the supply of medication and other healthcare products of assured quality, appropriate information and advice for the patient, and monitoring of the effects of use.
(c) An integral part of the pharmacist's contribution is the promotion of rational and economic prescribing and of appropriate use of medicines.
(d) The objective of each element of pharmacy service is relevant to the patient, is clearly defined and is effectively communicated to all those involved.

It is therefore the responsibility of every pharmacist registered with the SAPC to ensure that in the interest of public safety, they adhere to these standards.

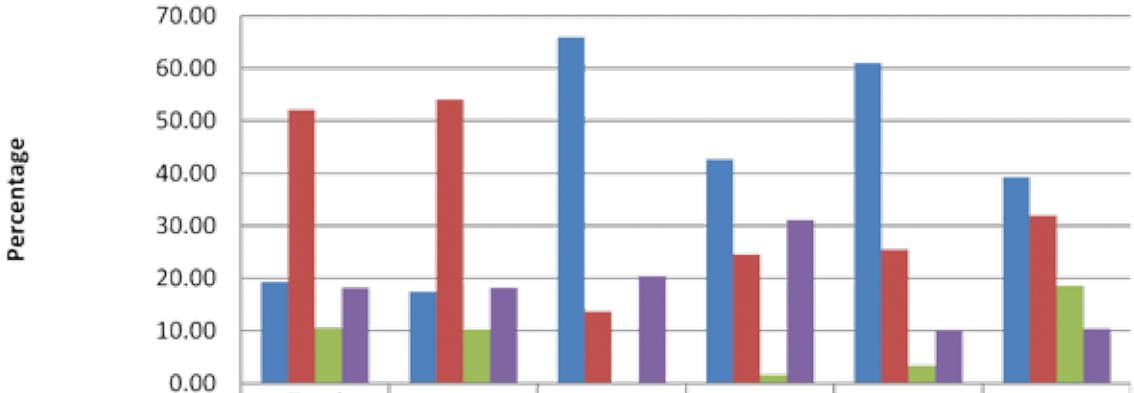
The compliance levels are measured on a percentage scale that classifies pharmacies as follows:

Compliant:	90 to 100 (no or very few shortcomings)
Partially compliant:	80 to 90 (minor shortcomings)
Non-compliant:	0 to 89 (major shortcomings)

The criteria to measure compliance have been approved by the SAPC and pharmacies will be graded on three compliance levels, namely: Grade A (fully compliant), Grade B (minor shortcomings) and Grade C (major shortcomings).

For 2009, only 20% of pharmacies were compliant, with the majority (60%) partially complaint and the balance non-compliant.

The fact that over 50% of all pharmacies are only partially compliant and only 20% are compliant, is a major concern. It was found that non-compliance cuts across all the branches and sectors.



	Total Inspections conducted (n=966)	Community (n=653)	Manufacturing (n=44)	Wholesale (n=61)	Private institutional (n=59)	Public institutional (n=145)
Compliant	19.36	17.46	65.91	42.62	61.02	39.31
Partial	52.07	54.06	13.64	24.59	25.42	31.94
Non-compliant	10.46	10.26	0.00	1.64	3.39	18.62
Closed/Referred	18.12	18.22	20.45	31.15	10.17	10.34

Figure 32: Compliance levels – pharmacies inspected in 2009

Source: SAPC Register, 2009

Major non-compliance areas

The shortcomings observed have various degrees of seriousness and thus require different levels of intervention. Some factors if left uncorrected could jeopardize the health and safety of the public. Non-compliance in layout and structure of premises, registration details, storage of medicines, handling of thermolabile substances, and absence of reference materials are the most prevalent. Figure 33 provides more detail on the areas in which most pharmacies were non-compliant in the 2009 inspection.

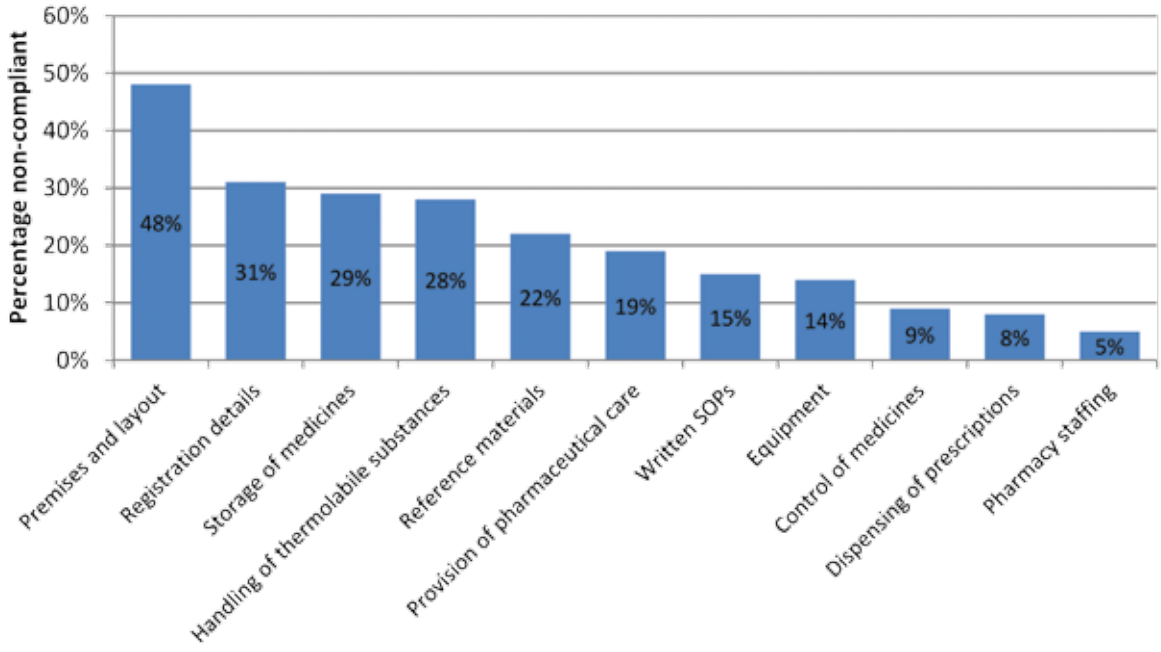


Figure 33: Areas of non-compliance in pharmacies 2009

Source: SAPC Register, 2009

These findings show that most pharmacies may have the capacity to provide quality pharmaceutical services and the ability to guarantee the supply of safe and efficacious products.

The SAPC's standard way of dealing with non-compliance issues as informed by the inspections is to inform the responsible pharmacist of the shortcomings and advise corrective measures to institute. Failure on the part of the pharmacist to comply with requirements is dealt with in terms of the disciplinary processes in terms of Chapters II, III and V of the *Regulations relating to the conduct of inquiries held in terms of Chapter V of the Pharmacy Act, 1974.*

Remedial and disciplinary processes

The SAPC takes disciplinary action against persons who are found to have contravened the requirements of the legislation relating to pharmacy. These interventions seek to address the non-compliance issues and ensure that pharmaceutical services offered are of an appropriate standard.

1.4 FACTORS AFFECTING PHARMACY PRACTICE IN SOUTH AFRICA

There are several factors that affect the provision of pharmaceutical services in South Africa. These range from regulatory processes to the rate of training and registration of new pharmacists. They are described in more detail below.

1.4.1 Legislative changes

Ownership and licensing of pharmacies: The introduction of lay ownership of pharmacies has had unintended consequences on the attraction of students to the pharmacy degree and the retention of existing resources. The National Drug Policy intended to satisfy the requirements of access, availability and cost-effective delivery of pharmaceutical services. Evidence has, however, shown that since the opening of the ownership of pharmacies, the intended outcomes of the policy have not been achieved.

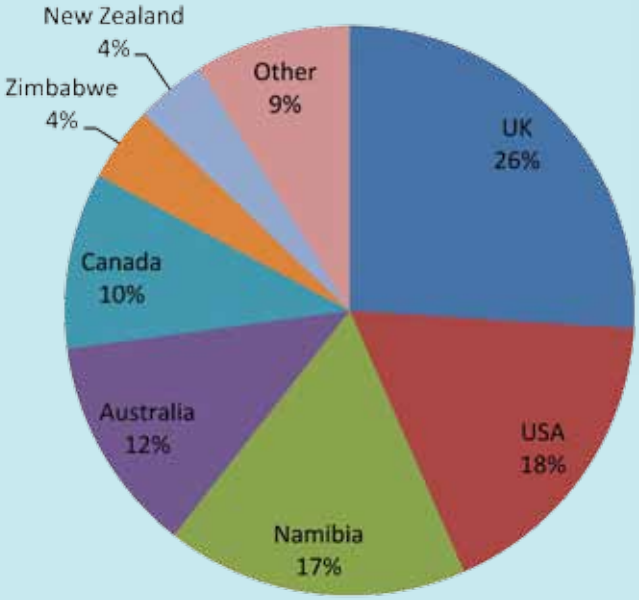
Skills development: The Skills Development Act 97 of 1998 was passed in order to increase the skills required in South Africa, especially scarce skills. This legislation avails funds for the training of persons for the required skills. Programmes for training pharmacist's assistants (both basic and post-basic) are funded through this process.

1.4.2 Migration of health professionals

Despite the gap between the demand and supply of pharmacists, there is also an exodus of skilled, experienced and competent pharmacists to first world countries. In addition, there is an imbalance in distribution of scarce skills between the private and the public sector. Within the small pool of pharmacists in the public sector, there is an imbalance between provinces as well as between rural and urban areas.

A total of 439 (including 60 in Namibia) pharmacists registered with the SAPC is practising outside the country. Most South African pharmacists emigrate to developed countries, with a few moving to developing countries (Uganda, Tanzania, Zimbabwe, etc.). The number of registered personnel practising outside South Africa, Figure 34, is based on addresses provided in the register.

The SAPC takes disciplinary action against persons who are found to have contravened the requirements of the legislation relating to pharmacy



Source: SAPC Register, April 2010

Figure 34: Pharmacists outside South Africa

Of the South African pharmacists outside the country, 26% are in the United Kingdom, 18% in the United States of America, 12% in Australia, and 10% in Canada. Other countries where South African pharmacists practise include New Zealand, Zimbabwe, Abu Dhabi, Belgium, China, Portugal, Qatar, Saudi Arabia, Singapore, Israel, Botswana, Switzerland and Germany.

1.4.3 Working conditions

Salary disparities exist between the private and public sectors as well as between provinces in the latter sector. The introduction of the OSD in 2009/2010 is likely to have contributed positively to correcting these disparities, especially for junior pharmacists in the public sector. Evidence to that effect is, however, not yet available.

Remuneration increases that are insufficient to cover changes in the cost of living due to inflation result in pharmacists leaving either the profession or the country. Inadequate infrastructure and shortage of medicines and other resources in the public sector adds to migration of pharmacists from the public sector to the private sector.

Poor working conditions in rural areas, such as shortage of accommodation and lack of amenities, discourage long-term service in these areas.

1.4.4 Recent developments in the pharmacy sector

There have been significant developments recently in the way that pharmaceutical personnel are structured and in different fields of practice.

The SAPC has approved two new cadres in the pharmacy profession, namely pharmacy technical assistants (PTA) and pharmacy technicians (PT). PTAs will undergo one year of training and obtain a qualification at NQF level 5. A candidate has to complete a PTA course followed by a further one-year course (NQF level 6) and six months practical training (internship) to qualify as a PT.

The SAPC has also reviewed the qualification for pharmacists who have completed the primary care drug therapy course (PCDT). The authorised pharmacist prescribers course will be launched to replace PCDT once the necessary requirements are in place. The SAPC is also in the process of reviewing all specialties in pharmacy.

Other developments that will affect pharmacy practice include:

(a) increased use of technology in the medicines supply process
(b) advancement of biotechnology and personalised medicine

(c) changing business models, for example the changes to legislation governing pharmacy ownership in South Africa, which is an emerging phenomenon
(d) changing roles and career patterns of pharmacists
(e) growing proportion of women in the profession who are more likely to work part-time at some point during the course of their careers
(f) antiretroviral scale up
(g) proposals around the national health insurance (NHI).

1.4.5 Staffing norms

In terms of the SAPC mandate to make rules and recommendations regarding the numbers and types of staff pharmacists may employ, the SAPC embarked upon a project to, in addition to determining fees for those services for which a pharmacist may levy a fee, develop a model through which reasonable staffing norms for different types of pharmacies may be determined. Staffing norms guidelines for pharmaceutical services in South Africa are being derived following this groundbreaking research exercise (SAPC Staffing Norms, 2010), which had the following objectives:

(a) assign unit values to the procedures (services) described in the *Rules relating to the services for which a pharmacist may levy a fee and guidelines for levying such a fee or fees* published in terms of Section 35A of the Pharmacy Act, 1974. The units are based on the activity times for each procedure.
(b) determine the cost of providing the services described in the *Rules relating to the services for which a pharmacist may levy a fee and guidelines for levying such a fee or fees* published in terms of Section 35A of the Pharmacy Act, 1974, and a profit component (based on return on investment on operating expenses) for the provision of services in a pharmacy.
(c) establish norms for the staffing of institutional and community pharmacies based on the volume of services provided per pharmacy.

The following factors are being considered in developing the staffing norms:

(a) the nature of the work that is currently being done by pharmacists and pharmacist's assistants
(b) the degree to which the available working hours of the pharmacist and pharmacist's assistants can be optimised
(c) The degree to which the current workload in pharmacies corresponds to available manpower.

The results of the analyses were used to develop and populate a model through which the adequacy of the existing staff levels could be calculated and compared with a desired staff complement. Although the staffing norms report is still in the draft phase, there are several notable observations from the exercise:

(a) there is an estimated 60% under-provision of pharmacists
(b) this under-provision is currently being accommodated by a combination of longer working hours and sub-optimal clinical care
(c) there seems to be underuse of pharmacist's assistants in that at best 76% of their productive capacity is used. In theory, it would be possible to relieve some of the workload of pharmacists by using the productive capacity of pharmacist's assistants more effectively.

Once completed, the staffing norms research will shed more light on the desired number and type of personnel required for different sectors of pharmaceutical services.

SAPC embarked upon a project to, in addition to determining fees for those services for which a pharmacist may levy a fee, develop a model through which reasonable staffing norms for different types of pharmacies may be determined

2. INTERNATIONAL AND REGIONAL PHARMACY HUMAN RESOURCES, A COMPARISON WITH THE SOUTH AFRICAN SITUATION

A shortage of pharmacy personnel and an inequitable distribution of available resources is not restricted to the South African setting. The following chapter aims to provide an overview of the South Africa situation in a global context with an emphasis on availability and distribution of pharmacy human resources.

2.1 PHARMACISTS AND PHARMACY SUPPORT PERSONNEL

The concept of pharmacists as the key provider of pharmaceutical services with supporting personnel such as pharmacy technicians and/or pharmacist's assistants is relatively uniform across the globe. Differences exist, however, in the scope of practice as well as registration requirements for the different cadres of pharmacy support personnel.

2.1.1 Pharmacists

There are similar trends with respect to training and registration of pharmacists across the globe. In the United Kingdom (UK), candidates need to complete a four year degree in order to obtain an MPharm which supersedes the BPharm as the prerequisite for registration as a pharmacist. A year of pre-registration practical training is required for candidates to register as pharmacists with the Royal Pharmaceutical Society of Great Britain and the Pharmaceutical Society of Northern Ireland.

Candidates in the United States of America (USA) are required to complete a four-year professional course to qualify as a Doctor of Pharmacy (PharmD). Candidates enrolling for this course must have completed an associate or Bachelors degree to qualify. Once a candidate has been awarded the PharmD, he/she must complete a year of pre-registration training prior to registering as a pharmacist with a state pharmacy board. Successful completion of the North American Pharmacist Licensure Examination (or its equivalent in some states) is a pre-requisite for obtaining a licence from the board.

Training and registration requirements are similar in most African states such as Kenya and Namibia. In both of these countries, candidates are required to obtain a BPharm degree, which is a four year course, and complete a year of internship in order to be registered as pharmacists with the relevant pharmacy regulatory bodies. Pre-registration examinations are a pre-requisite in both countries.

2.1.2 Pharmacy support personnel

The scope of practice as well as registration requirements of pharmacy support personnel differ across countries. In the USA for instance, pharmacy technicians assist pharmacists to provide medication and other health products to patients. They perform routine tasks such as the counting of tablets and the labelling of bottles. Questions relating to prescriptions and other health matters are referred to the pharmacist. Pharmacy technicians have varying responsibilities depending on the state in which they are practising. Most technicians receive informal on-the-job training although formal training and certification is available.

The National Pharmacy Technician Certification Examination is administered by the Pharmacy Technician Certification Board. Although this examination is voluntary in most states in the USA, more employers require certification as the role of the technician becomes more important. Re-certification must take place every two years with technicians having to complete 20 contact hours of pharmacy-related topics. Most states have also legislated the maximum number of technicians who are allowed to work under the control of a pharmacist.

Pharmacy technicians are assuming more dispensing duties as pharmacists focus more on patient care. Another cadre of health worker, namely the pharmacy aide, plays a role in the provision of pharmaceutical services. Pharmacy aides are involved in the clerical duties, the packing of shelves and the handling of money in retail pharmacies.

The situation in the UK is similar with some differences in the qualifications required. There are, however, three levels of pharmacy support personnel as opposed to two.

The Royal Pharmaceutical Society recognises three levels of support personnel in the pharmacy sector in the UK: pharmacy technicians, dispensers/dispensing assistants and medicines counter assistants. Each of these cadres requires formal training and work experience before they can be registered with the society.

Pharmacy technicians are required to attain the Scottish/ National Vocational Qualification (S/NVQ) level 3 qualification (or an equivalent qualification), and have completed the required hours of service before being registered. Dispensing assistants require S/NVQ level 2 training while medicines counter assistants are only required to complete two units within the level 2 qualification. All three cadres of support personnel are expected to function under the supervision of a pharmacist with varying degrees of practice.

Most countries in the developing world have legislation that provides for the practice of various cadres of support personnel working under the supervision of pharmacists. Empirical evidence shows, however, that most of these support personnel are used to provide pharmaceutical services in public sector facilities due to the shortage of pharmacists.

In Namibia, the Pharmacy Act 9 of 2004 provides for the registration of pharmacist's assistants and pharmaceutical technicians. While the Pharmacy Act lists the acts pertaining to the profession of pharmacy with references to pharmacists and pharmacist interns, it does not do so where pharmaceutical technicians and pharmacist's assistants are mentioned. The Act empowers the Minister of Health to prescribe the acts pertaining to the practice of pharmaceutical technicians and pharmacist's assistants. There are, however, no specific regulations in place detailing this scope. In practice, assistants and technicians fulfil similar roles to those applicable in South African. They also practise under the supervision of a pharmacist.

In Kenya, pharmacy support personnel comprise pharmacy technicians and pharmacy aides. Pharmacy technicians perform varying functions depending on the area of practice. In a retail setting, technicians receive, interpret and fill prescriptions. Once this is done the prescription is checked by a pharmacist before medicines are dispensed to patients. Pharmacy aides work closely with technicians. In most cases, they provide clerical support.

2.1.3 Global pharmacy workforce

In 2009, the International Pharmaceutical Federation (FIP) published the Global Pharmacy Workforce Report in order to highlight factors that are "constantly changing the profile of pharmacy human resources around the world" (FIP 2009). Several key messages are derived from this report;

(a) Healthcare facilities cannot operate without medicines. The availability of both medicines and a pharmacy workforce in adequate numbers with appropriate competencies is crucial to ensuring a well functioning pharmaceutical system.

(b) There is a general trend towards pharmaceutical care and patient focused roles for pharmacists which has spurred reforms in pharmacy education and practice. Changing roles have also driven an increase in pharmacy workforce demand.

(c) The capacity to provide pharmaceutical services in South Africa is dependent upon having a competent workforce and a similarly integrated academic workforce to train sufficient numbers of new pharmacists and other support staff at both basic and advanced levels.

(d) Fifty-seven countries, 36 of which are in sub-Saharan Africa, have a health workforce crisis. The human resources for health crisis is a threat to the delivery of health services and the attainment of the Millennium Development Goals.

(e) Many countries, including South Africa, continue to experience shortages and urban-rural maldistribution of pharmacists regardless of general increases in the number of personnel achieved over time.

(f) The density of pharmacists tends to be significantly higher in more economically developed regions. The same trend is observed for both pharmacists and pharmacies in countries in Africa. In South Africa, the workforce density also varies considerably between cities and rural areas.

(g) Pharmacy technicians form an important component of the pharmacy workforce, comprising up to 75% of the pharmacy workforce in some countries. The development of the pharmacy technician workforce and roles may serve as an important strategy to support the changing roles of pharmacists. South Africa is in the process of developing this cadre of pharmacy personnel.

(h) Ensuring mechanisms for assured practitioner competence (and ultimately performance) is now a key goal for pharmacy education policy. Systems and CPD support should be oriented to enable competence-based lifelong development for all practitioners.

(i) Pharmacy workforce planning should aim towards self-sufficiency and be integrated into broader health workforce planning. Plans should encompass all cadres providing pharmaceutical services and be aligned to local needs. The planning process should be informed by reliable workforce data, evidence on factors and issues affecting the workforce, and comprehensive workforce modelling.

(j) Strategic partnerships with stakeholders such as the Ministry of Health, the Ministry of Education, training institutions, professional bodies, regional and international organisations, amongst others, have shown to be valuable in enabling progress in pharmacy workforce planning and development, regulation, and reform in education and practice.

Figure 35 depicts the inequalities in the distribution of the pharmacy workforce worldwide highlighting regions most affected such as in sub-Saharan Africa. In this cartogram, countries that have a smaller share of the pharmacy workforce have a smaller geographical representation and vice versa. South Africa is no exception to this observed global phenomenon.

Figure 35: Geographical representation of the share of the world's pharmacy workforce (pharmacists, technicians, assistants)

Source: FIP Global Pharmacy Workforce Report, 2009

The quality of a country's health worker is, in general, linked directly to the health status of its citizens. Health system resources, including medicines, will not be used effectively and efficiently if they are not managed by adequately skilled and motivated health workers. South Africa is not immune to this phenomenon resulting in mismanagement of resources that affects the whole spectrum of issues from HR shortages to wasteful expenditure.

Populations in urban settings generally have more pharmacists and other health workers than those in rural and remote areas. A similar disparity is observed in favour of private sector facilities as opposed to those in the public sector especially in developing countries. The burden of HIV/AIDS has increased the workload in developing countries and exacerbated the shortage of healthcare workers.

2.1.4 Shortage of pharmacists and pharmacy support personnel

The scarcity of pharmacists is by no means an unusual phenomenon, since pharmacists are a part of human resources in health. Most countries, particularly in southern Africa, face numerous challenges relating to human resources in health. Availability of human resources in health is worse in Africa than in other regions of the world and contributes to challenges in the provision of healthcare on the continent.

The Global Atlas of the Health Workforce (WHO 2006) revealed an estimated shortage of 4.3 million doctors, midwives, nurses and support workers worldwide. The shortage is most severe in the poorest countries, especially in sub-Saharan Africa where health workers are most needed. A similar picture is presented in South Africa (Table 7) where only two of the country's nine provinces have one pharmacist per 2,300 population as recommended by the WHO. These estimates are based on the total number of registered pharmacists and do not take into account those that are retired, working part-time or working outside the country or the industry. As such, the level of compliance with WHO standards is overestimated.

WHO Region[1]	Total health workforce		Health service providers		Health management and support workers	
	Number	Density (per 1000 population)	Number	Percentage of total health workforce	Number	Percentage of total health workforce
Africa	1,640,000	2.3	1,360,000	83	280,000	17
Eastern Mediterranean	2,100,000	4	1,580,000	75	520,000	25
South-East Asia	7,040,000	4.3	4,370,000	67	2,300,000	33
Western Pacific	10,070,000	5.8	7,810,000	78	2,260,000	23
Europe	16,630,000	18.9	11,540,000	69	5,090,000	31
Americas	21,740,000	24.8	12,460,000	57	9,280,000	43
World	**59,220,000**	**9.3**	**39,120,000**	**67**	**19,730,000**	**33**

Table 6: Global health workforce density

Source: WHO, Global Atlas of the Health Workforce 2007

[1] Note: All data for latest available year. For countries where data on the number of health management and support were not available, estimates have been made based on regional averages for countries with complete data.

Province	Population estimate[1]	Percentage share of the total population (%)	Ratio of pharmacists to inhabitants	Compliance with WHO standard (for industrialised countries) 1:2300
Eastern Cape	6,648,600	13.48	6:272	Non-Compliant
Free State	2,902,400	5.88	5:507	Non-Compliant
Gauteng	10,531,300	21.35	2:226	Compliant
KwaZulu-Natal	10,449,300	21.19	5:383	Non-Compliant
Limpopo	5,227,200	10.60	9:770	Non-Compliant
Mpumalanga	3,606,800	7.31	6:883	Non-Compliant
Northern Cape	1,147,600	2.33	7:263	Non-Compliant
North West	3,450,400	7.00	4:979	Non-Compliant
Western Cape	5,356,900	10.86	2:436	Compliant
Total	**49,320,500**		**3:849**	**Non-Compliant**

Table 7: Pharmacist to population ratios

Source: Stats SA, 2009; SAPC Registers, April 2010

[1] Note: Ratios of pharmacists to population are derived from population figures from Stats SA and SAPC register on number of pharmacists

2.1.5 Pharmacists production rate

South Africa currently has 12,813 registered pharmacists which translates to 25.5 pharmacists per 100,000 population (Figure 36). This is considerably lower than the WHO recommended pharmacist population ratio of 1:2,300 which translates to approximately 45 pharmacists per 100,000 population.

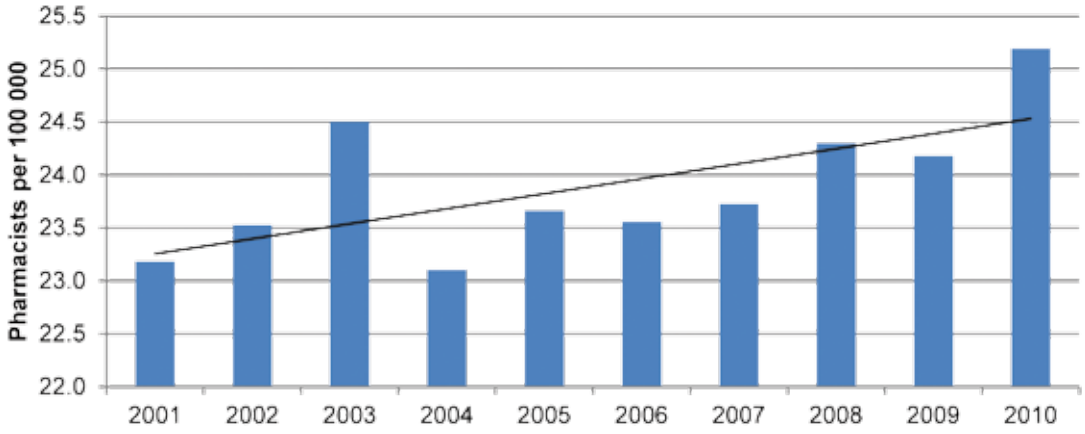


Figure 36: Pharmacists per 100 000 population: 2001-2010

2.1.6 Density of pharmacists and support personnel

According to the 2009 FIP Global Pharmacy Workforce Report, the density of pharmacists per 10,000 population varies greatly between countries ranging from 0.04 (Chad) to 18.88 (Malta).

In a similar manner, the density of pharmacy technicians per 10,000 population ranged from 0.005 (Chad) to 9.4 (Turkey). Technicians account for up to 75% of the pharmacy workforce in Pakistan. On the other hand, there are some countries, Japan and Brazil, that do not have equivalent cadres of pharmacy support personnel. Figures 37 and 38 depict the pharmacy workforce composition (skills mix) of the 26 countries and South Africa's position.

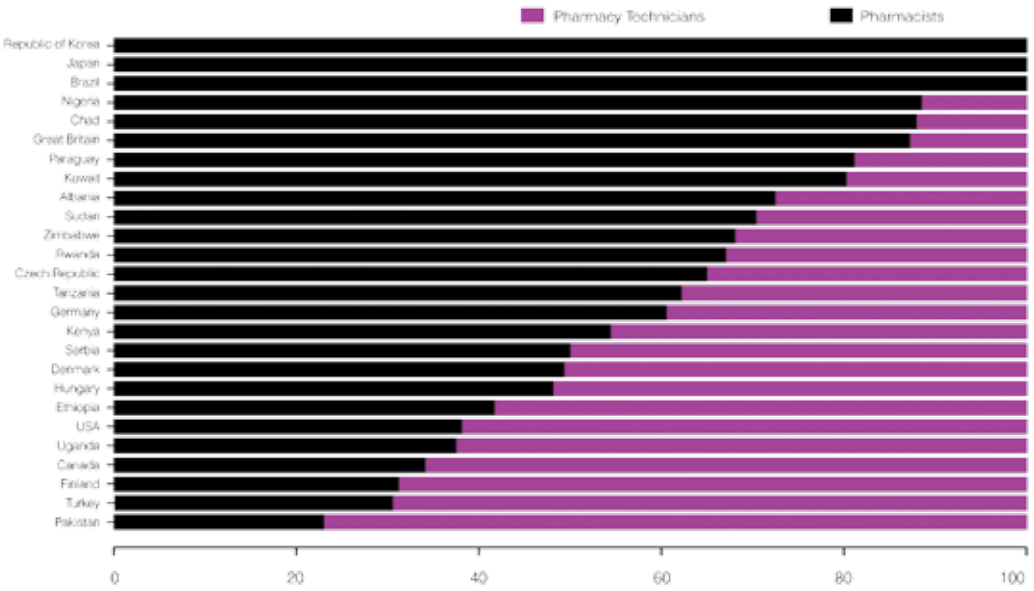


Figure 37: Pharmacy workforce composition (%) by country

Source: FIP Global Pharmacy Workforce Report, 2009

Pharmacists and Support Personnel

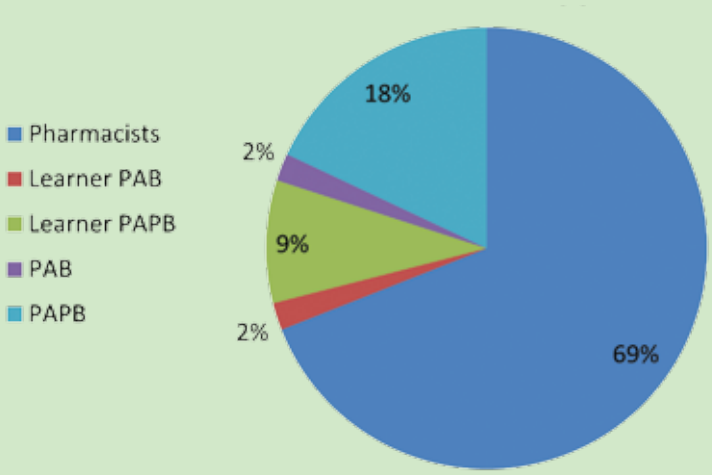


Figure 38: Pharmacy workforce composition (skills mix)

Source: SAPC Register, April 2010

Figures 39 and 40 present the density of pharmacists and pharmacies (total including community, hospital, etc) per 10,000 population.

There is a correlation between the number of pharmacists and pharmacies per 10,000 population (Figure 39) in that countries with higher densities of pharmacists tend to have higher densities of pharmacies (R2 = 0.239, p < 0.001). Most pharmacies are in the retail community pharmacy sector with an estimated 10% of pharmacies in hospitals. Most countries in Africa, including South Africa, do not have sufficient numbers of both pharmacies and pharmacists. This is likely to have a negative impact on the availability of quality pharmaceutical services in the region

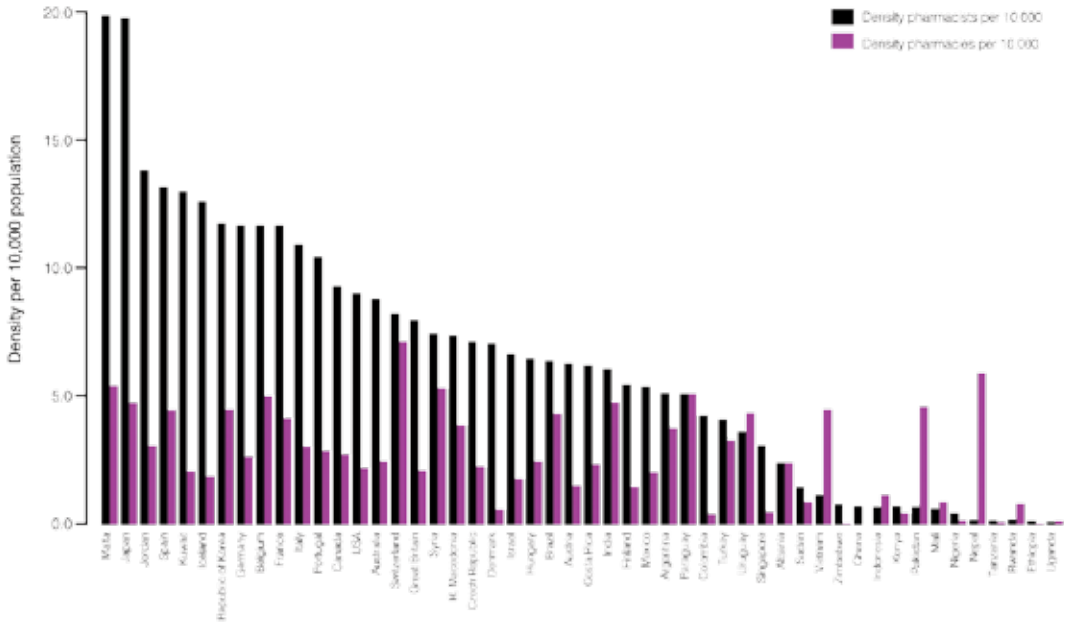


Figure 39: Density of pharmacists and pharmacies (50 countries)

Source: FIP Global Pharmacy Workforce Report, 2009

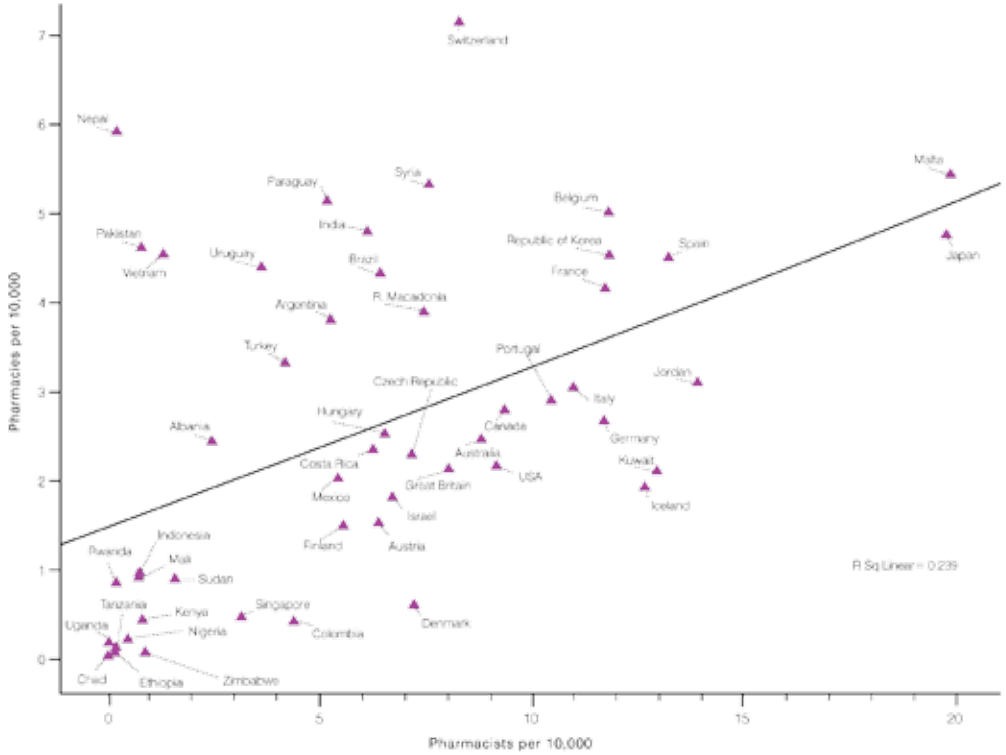


Figure 40: Density of pharmacists and pharmacies (50 countries)

Source: FIP Global Pharmacy Workforce Report, 2009

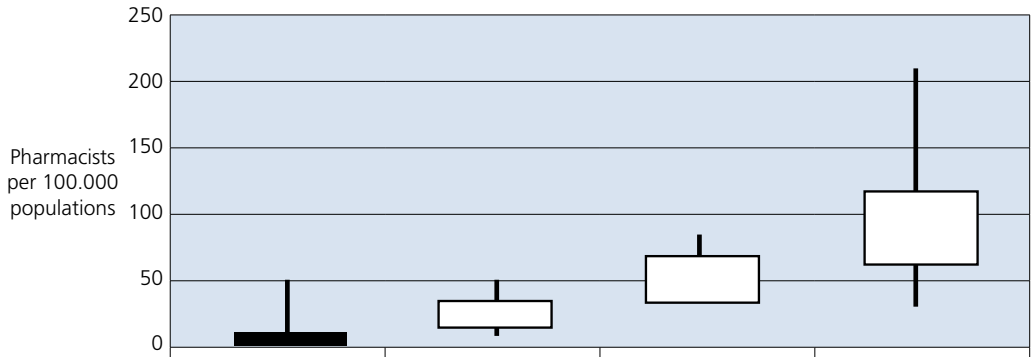
The pharmacist/population ratio correlates with economic status such that low-income countries have the lowest ratios and high-income countries the highest ratios

2.1.7 Geographical and socioeconomic distribution and density of pharmacy personnel

The scarcity of human resources is exacerbated by the inequitable distribution of personnel along geographical and socioeconomic lines. The pharmacist/population ratio correlates with economic status such that low-income countries have the lowest ratios and high-income countries the highest ratios. The average ratio in the Western Pacific countries, which had the highest measure overall, is about 25 times more than those of countries in the Africa region (Figure 41).

There are more than 59 million health workers in the world, distributed unequally between and within countries. They are found predominantly in richer areas where health needs are less severe. Countries with a relatively low burden of disease benefit from the largest proportion of the health workforce. The Americas region contains only 10% of the global burden of disease, yet accounts for approximately 37% of the world's health workers and spends more than 50% of the world's financial resources for health. In contrast, the Africa region carries 24% of the global burden of disease cared for with only 3% of health workers and less than 1% of the world's financial resources (FIP 2007).

Given the fact that Africa has the highest burden of disease compared with the rest of the world (see Figure 42), the fact that Africa's share of health workers is only 1.3% is of great concern.



	Low-income economies	Lower-middle income economies	Upper-middle income economies	High-income economies
Highest	45.31	49.19	77.14	206.67
75th Percentile	6.98	34.10	63.15	117.20
25th Percentile	4.05	18.61	32.89	67.71
Lowest	1.46	6.76	32.17	28.77

Figure 41: Pharmacists density by country income economies (World Bank Classification[1])

Source: FIP Global Pharmacy Workforce and Migration Report, 2007

[1] South Africa is classified as an upper-middle income country according to the World Bank (2010)

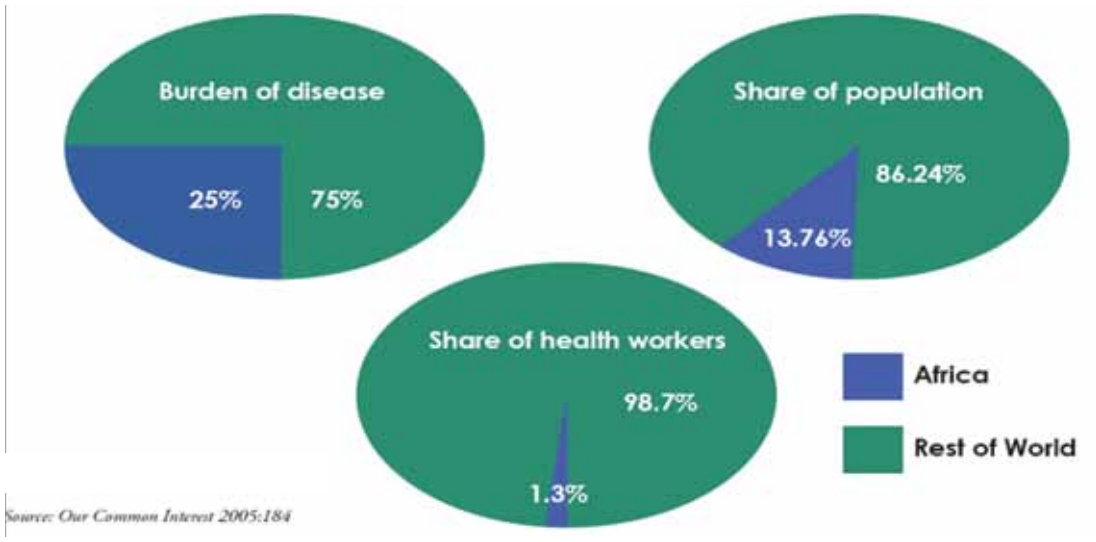


Figure 42: Africa's unequal burden and shares

Source: Globalisation and health worker crisis, August 2007

South Africa is no different from other developing countries when it comes to the distribution of pharmacists across its provinces taking into account the vast differences in economic conditions in areas. In line with the FIP finding as depicted in Figure 41, the South African low-income populations have the least number of pharmacists and, by implication, the least pharmaceutical services. This is corroborated by the findings of the paper by the WHO Commission on Social Determinants of Health: Globalisation and health worker crisis (WHO, 2007). Figure 43 below shows the pharmacist to population ratios for all South African provinces. The economically disadvantaged provinces consistently report a lower pharmacist to population ratio.

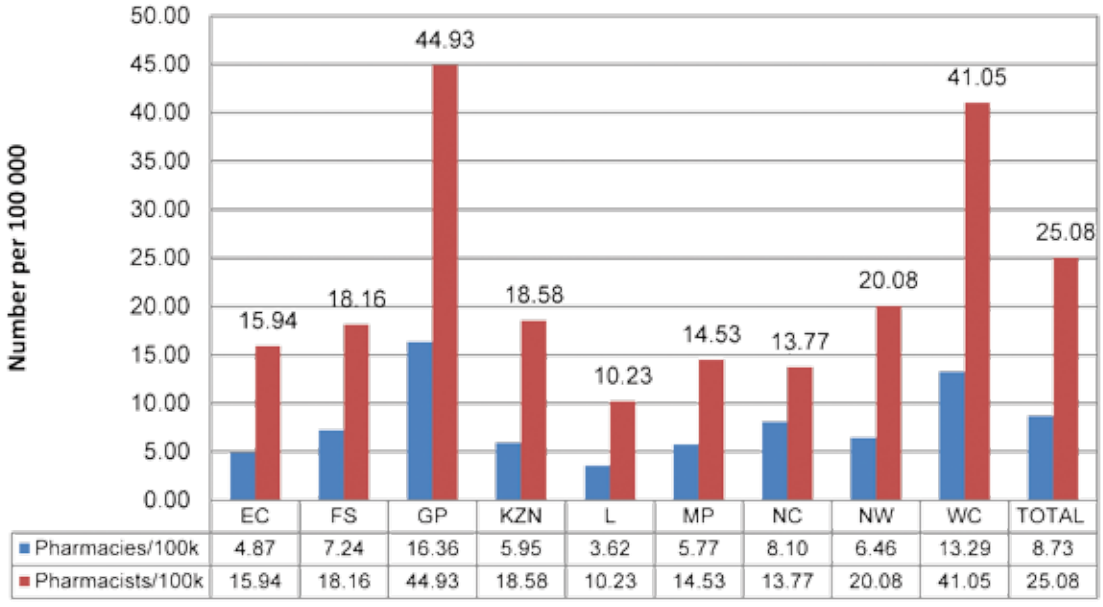
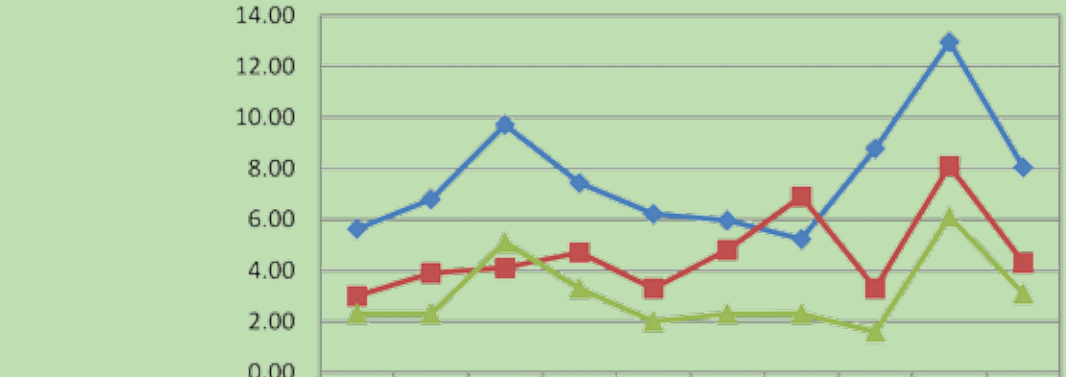


Figure 43: Pharmacies and pharmacists per 100 000 population for all provinces

Source:Stats SA, 2009; SAPC Register, April 2010



	EC	FS	GP	KZN	L	MP	NC	NW	WC	Total
Pharmacists/100k (2010)	5.63	6.79	9.71	7.44	6.22	5.96	5.23	8.78	12.96	8.05
Pharmacists/100k (2006)	3	3.9	4.1	4.7	3.3	4.8	6.9	3.3	8.1	4.3
Pharmacists/100k (2000)	2.3	2.3	5.1	3.3	2	2.3	2.3	1.6	6.1	3.1

Figure 44: Pharmacists per 100 000 population – public sector

Source: SAPC, April 2010

Figure 44 depicts the number of pharmacists per 100,000 population in the public sector in the years 2000, 2006 and 2010. Compared with the situation in 2006, the 2010 provincial ratios, albeit insufficient, show some improvement.

Community pharmacies and both private and public institutional pharmacies are the majority contributors to the provision of pharmaceutical care. It is these pharmacies that need the biggest possible injection of pharmacists and pharmacies. An indicator of the shortage of pharmacists and the imbalance between the provinces is the pharmacists to population ratio. There are currently 12,813 pharmacists registered with the SAPC of whom approximately 96% are actively practising. The pharmacist/population ratio indicates that there is one pharmacist for every 3,849 people in South Africa, compared with the WHO average for industrialised countries of one pharmacist for 2,300 people. Although the number of pharmacists has been increasing at a faster rate (6% p.a.) than the population (4% p.a.) in the 38 years preceding 1997, the current ratio of pharmacists to population still does not compare favourably with developed countries. The ratio has not improved much since 1997 when it was one pharmacist to 3,752 population as reported in the SAHR 1998.

The ratio is particularly problematic in Limpopo with one pharmacist per 9,770 population. Concerted efforts need to be applied to improving this situation.

2.1.8 Distribution of pharmacists by gender

Unlike the extreme trends observed in other countries (Figure 45), for instance in Uganda where only 20% of pharmacy personnel are female and the Czech Republic where females constitute almost 80% of the workforce, South Africa has a balanced male to female ratio. This is a result of an acknowledgment and acceptance of gender equality in the workplace. In this regard, South Africa boasts a 40/60 male to female ratio. As mentioned earlier, it is important that efforts are directed at ensuring a sustained equal distribution between males and females in terms of development and retention of personnel.

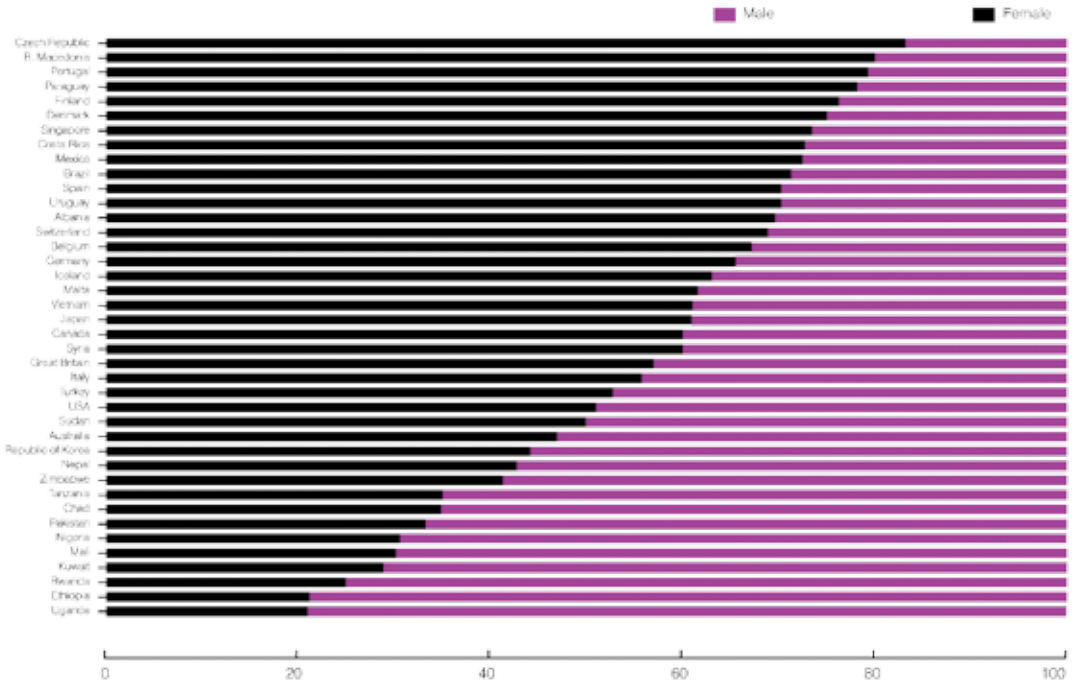


Figure 45: Pharmacists gender distribution (%) by country (40 countries)

Source: FIP Global Pharmacy Workforce Report, 2009

2.1.9 Distribution of pharmacists by field of practice

The FIP Global Workforce report found that, on average, 58% of pharmacists practised in retail community pharmacy, 12% in hospital, 12% in industry, 4% in research and academia and 4% in regulation.

In comparison, South Africa has 43% of its pharmacists practising in retail community pharmacy, 35% in hospital or institutional pharmacies, 6% in manufacturing, 3% each in professional administration and management and wholesale, and 2% academia. For the most part, the setting is similar in that the majority of pharmacists practise in community and hospital/institutional pharmacy (Figure 46).

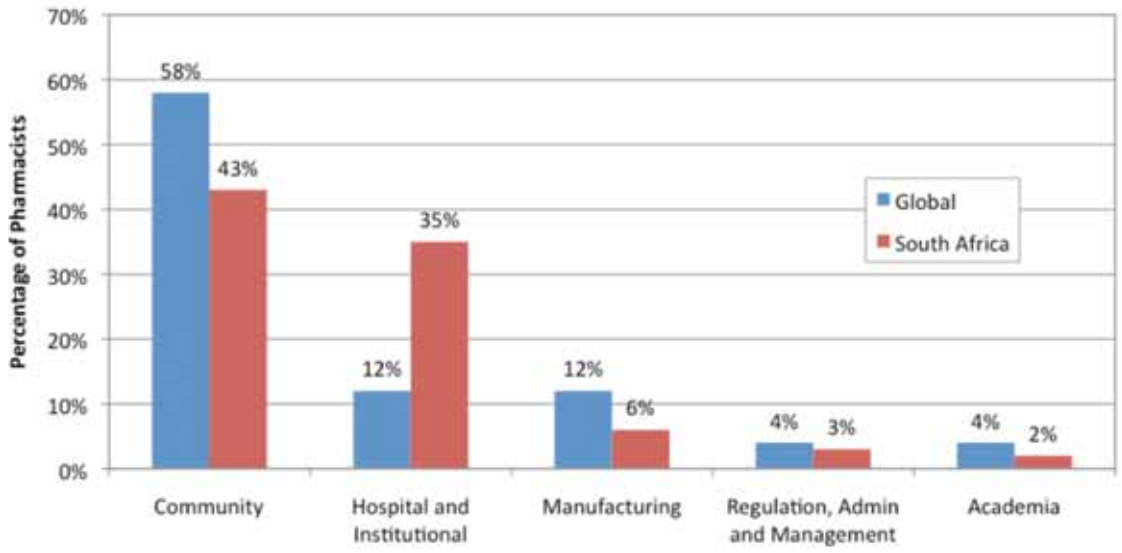


Figure 46: Distribution of pharmacists by area of practice

Source: SAPC Register, 2010; FIP Global Pharmacy Workforce Report, 2009

2.2 FACTORS AFFECTING PHARMACY PRACTICE GLOBALLY

2.2.1 Migration of pharmacy personnel

Migration of healthcare personnel including pharmacy personnel takes place from areas of low socioeconomic development to more developed areas, from rural to urban areas, between the public and the private sector, and from developing countries to more developed countries.

Within the Southern African region there is a tendency for migration of personnel from other countries in the region to South Africa, as well as from African countries to industrialised countries.

There are a variety of push and pull factors which influence the movement of healthcare workers including pharmacists. Push factors include:

(a) low levels of remuneration
(b) unsatisfactory working conditions
(c) high levels of crime
(d) lack of recognition of the role of healthcare professionals
(e) deteriorating standards of care.

Pull factors include:

(a) massive recruitment drives undertaken by recruiting agencies from developed countries
(b) offers of improved quality of life
(c) opportunities to study further.

2.2.2 Production of pharmacy personnel

According to the FIP report "The capacity to provide pharmaceutical services in each country is dependent upon having an assured competent workforce and a similarly integrated academic workforce to train sufficient numbers of new pharmacists and other support staff at both basic and enhanced levels" (FIP 2007).

A Global Pharmacy Workforce Survey was conducted by FIP in 2005 as a means of improving the availability of useful data on human resources capacity. Fifty-six countries responded.

WHO region	Medical	Nursing and Midwifery	Dental	Public Health	Pharmacy
Africa	66	288	34	50	57
Americas	441	947	252	112	272
South-East Asia	295	1145	133	12	118
Europe	412	1338	247	81	219
Eastern Mediterranean	137	225	35	8	46
Western Pacific	340	1549	72	112	202
Total	**1691**	**5492**	**773**	**375**	**914**

Table 8: Health professionals training institutions by WHO region

Source: Mercer H, Dal POZ MR: Global health professional training capacity, 2006

Brazil, Japan, Egypt and the USA were the only countries observed that graduated more that 8,000 pharmacy candidates each year. In comparison, South African universities have produced an average of 476 graduates a year between 2001 and 2009.

In South Africa, with a population of 49.32 million, there are eight pharmacy schools and 12,813 pharmacists. There is one pharmacy school for 6.17 million people. The average number of pharmacists produced by the pharmacy schools in the past ten years is 476 per year. This translates to one new graduate for 97,086.61 people (hence an estimate of one graduate for 10,000 people).

According to FIP, "One key barrier to academic faculty workforce retention and quality needs-based education, particularly in developing countries, is poor physical institutional infrastructure where basic facilities as well as learning and teaching resources may be insufficient" for academic workforce capacity and institutional infrastructure development. This statement is likely true for certain institutions providing pharmacy training. Detailed infrastructure information could not be presented at the time of developing this document, but should be investigated.

2.2.3 Quality assurance

Most countries have, to some extent, implemented measures to assure the quality of education although fewer countries have such measures specific to pharmacy. Accreditation of pharmacy schools and learning programmes is paramount in ensuring the development of suitably trained staff for respective country health systems. In September 2008, the first version of the Global Framework for Quality Assurance of Pharmacy Education was officially launched at the Third Global Pharmacy Education Consultation in Basel, Switzerland.

This FIP framework provides the basic principles that should be in place for a national pharmacy education QA system. The framework should ideally be used as a basis for countries to develop quality assurance standards and procedures that are suitable for their respective settings.

The South African National Qualifications Framework (NQF) provides a set of principles and guidelines by which records of learner achievement are registered to enable national recognition of acquired skills and knowledge. This applies to all spheres of education in South Africa. Pharmacy education quality assurance is further governed by both the SAPC as well as the QCs. In addition, quality assurance measures are in place for accreditation and monitoring of pharmacy practice in general.

2.2.4 Competency development

In order for patients to receive quality care, healthcare professionals need to maintain acceptable levels of competency in their fields of practice. This requires a work environment that values as well as promotes periodic performance reviews as well as continuing professional development.

The need to develop a broad, simple and functional global competency framework that could be adapted and customised for individual country purposes was identified during the workforce survey (FIP 2007). Reviewing existing frameworks (internal and external to pharmacy) was suggested as the next step towards satisfying this need.

Several developing countries have implemented CPD programmes, e.g. the UK and USA. South Africa is one of the first countries in Africa to follow suite with this concept.

2.2.5 Linking workforce development and workforce planning

Healthcare workforce production and development programmes should be linked to the needs of each region's community and health system needs. Assessments need to be carried out to determine the specific needs in order to produce a workforce relevant to needs.

3. CHALLENGES AND POTENTIAL SOLUTIONS

The analysis presented in the previous chapter highlighted several issues that need to be addressed in order to develop and retain an effective pharmacy workforce in South Africa. There are six major pillars identified that support a functional and effective healthcare workforce in South Africa. These pillars are used as a basis for drafting plans towards addressing the short-, medium- and long-term challenges facing pharmacy human resources. Chapters 3 and 4 present work done by workgroups appointed by the SAPC and tasked with addressing issues under each of the pillars.

3.1 HR POLICY PLANNING AND GOVERNANCE

This pillar is linked to and addresses health systems priorities with specific reference to policy and planning of human resources for the pharmacy profession. Issues that will be covered by this pillar include the role and scope of practice of the pharmacist and pharmacy support personnel, policies relating to remuneration and options for effective use of resources within pharmaceutical services. Table 9 provides a summary of challenges and suggested solutions relating to policy and planning.

Issue	Challenges	Potential Solutions	Activities	Partners
Vision	Lack of a common vision for the pharmacy profession	A strategic vision for the pharmacy profession	Convene a pharmacy summit to develop a strategic vision for the pharmacy profession	SAPC, NDoH, heads of pharmacy services (HoPS), heads of schools, professional organisations
Legislation	Provisions of the legislation (restrictions and anomalies) can have a negative impact on the contribution of pharmacists to ensuring positive health outcomes	Amendments to the Pharmacy Act and the Medicines and Related Substances Act and other relevant legislation	Identify sections of acts and regulations that need urgent amendment, e.g. Section 22A of the Medicines and Related Substances Act 101 of 1965	SAPC, NDoH, Medicines Control Council, South African Nursing Council, Health Professions Council of South Africa
			Review and suggest revisions of appropriate legislation	
Scope of practice	Lack of certainty as to whether the current role and scope of practice of pharmacists is suitable for the South African context	The role and scope of practice of pharmacists is reviewed	Revise the role and scope of practice of pharmacists	SAPC, NDoH, HoPS, heads of schools, professional organisations
			Revise the BPharm qualification	
			Develop new qualifications as required	
	The current scope of practice of pharmacy support personnel does not meet needs of the South African health system	The role and scope of practice of different levels of pharmacy support personnel is reviewed	Publish new scopes of practice for mid-level workers in regulation	SAPC, NDoH, HoPS, professional organisations
	Inadequate/ inappropriate qualification of support personnel to perform within their scope of practice	The existing qualification is revised and a new cadre of support personnel (mid-level worker) is developed	Develop the qualification for the new cadres of mid-level workers able to take on more responsibilities than the current pharmacist's assistants	SAPC, NDoH, HoPS, heads of schools, professional organisations
Remuneration for professional services rendered	The absence of a remuneration policy for professional services rendered, makes it difficult for the entrepreneurial ventures in the profession to be economically viable	A remuneration policy for services rendered is developed and implemented	Facilitate implementation of *Rules relating to services for which pharmacists may levy a fee and guidelines for levying such a fee*	SAPC and professional organisations
Structure for national decision making	Lack of a formal structure for pharmacy stakeholders to address HR issues	A structure representing all relevant stakeholders is established to address pharmacy HR issues	Convene an annual pharmacy lekgotla (forum) to discuss issues relating to pharmacy	SAPC, NDoH, HoPS, heads of schools, professional organisations

Issue	Challenges	Potential Solutions	Activities	Partners
Management of resources	Lack of recognition of pharmacy professionals in organisational structures	Create culture of valuing pharmacists and pharmacist support personnel	Promote participation of pharmacy personnel in health systems policy development and management	SAPC, NDoH, HoPS, heads of schools, professional organisations
		Management and leadership skills and development opportunities provided for practising pharmacists	Develop courses and qualifications to improve management and leadership skills	SAPC, employers, providers of education and training
Utilisation of resources	Under-utilisation of support personnel in the provision of pharmaceutical services	Pharmacists are encouraged to use support personnel optimally and appropriately	Promote utilisation of pharmacy support personnel across the sectors and in all categories of pharmacy	SAPC, NDoH, HoPS, providers of education and training, professional organisations
	Lack of focus on development of pharmaceutical services at primary care level in both the public and private sectors	Input on strengthening pharmaceutical services at primary care level is provided to policy makers	Participate in the development and formulation of policies for primary healthcare level	SAPC, NDoH, HoPS, heads of schools, professional organisations
	Under-utilisation of private sector resources to provide care for "public sector" patients	Increased access to pharmaceutical services and optimal utilisation of available pharmaceutical personnel by making use of PPIs and Public Private Partnerships (PPPs)	Create an enabling policy and legislative environment to facilitate the establishment of PPPs and PPIs	SAPC, NDoH and professional organisations
			Optimise use of authorised pharmacists prescribers to provide primary healthcare services	SAPC, NDoH and professional organisations
		Pharmaceutical services positioned as an integral part of the NHI system	Provide input in the development of legislature governing the NHI regarding the role of pharmacy	SAPC and professional organisations
	Under-utilisation of non-South African pharmacists residing in the country	Policies with respect to re-registration and workplace limitations of pharmacists from non-SADC countries are developed	Provide input into the revision of policies that restrict the registration of foreign pharmacists (SADC and non-SADC) as well as South African pharmacists with a foreign qualification	SAPC and NDoH
	Lack of reciprocity arrangements between countries in the SADC region	Reciprocity agreements are established	Investigate reciprocity arrangements between SADC countries	SAPC and NDoH

Issue	Challenges	Potential Solutions	Activities	Partners
Utilisation of resources	Lack of clarity surrounding the employment of foreign pharmacists	Publication of a clear policy on the employment of foreign pharmacists	Review/develop clear policies and procedures on recruitment and employment of foreign pharmacists	SAPC and NDoH
			Provide technical expertise and support bilateral relationships at ministerial level	SAPC and NDoH
	Lack of collaboration with international institutions on pharmacy HR	Improved collaboration with international institutions	Interact with international health systems for new trends in production, distribution and management of HR for health	SAPC and NDoH

Table 9: Challenges relating to policy planning and governance

HR policy planning and governance is linked to and addresses health systems priorities with specific reference to policy and planning of human resources for the pharmacy profession

3.2 HR PRODUCTION – EDUCATION AND TRAINING

This pillar addresses factors affecting the rate and quality of production of pharmacists and support personnel as well as channels for development and specialisation for those already in practise.

The sustainable production of pharmacists and support personnel is paramount in endeavours to reach adequate staffing levels in the sector. Capacity, in terms of infrastructure and human resources, needs development to enable increased intake of undergraduate pharmacy students in South Africa's pharmacy schools. This process should, however, be focused on ensuring that pharmacy schools are properly equipped to train pharmacists in accordance with South African health system needs with respect to volumes and competency.

Table 10 provides a summary of challenges and potential solutions relating to human resources production and development.

Issue	Challenges	Potential Solutions	Activities	Role players
Planning	Inadequate number of pharmacy support personnel	Pharmacy support services promoted as an attractive career option	Develop and implement an appropriate strategy to attract new entrants into the profession	SAPC, Health and Welfare Sector Education and Training Authority (HWSETA), media, Department of Basic Education (DBE), DHET
	Inadequate number of facilities that meet the requirements for in-service training of pharmacy support personnel	Increased availability of suitable in-service training facilities	Develop strategies to increase the quality and capacity of pharmacies to provide in-service training for support personnel	SAPC, employers, providers of education and training
	Inequitable production of pharmacists and support personnel by race	Pharmacy students and support services learners are recruited from previously disadvantaged backgrounds	Develop and implement strategies to attract students from previously disadvantaged backgrounds	SAPC, NDoH, provincial health departments, further education and training providers, heads of pharmacy schools
	Restrictions on the migration of pharmacy support personnel between community and hospital pharmacies	No restriction is placed on the movement of pharmacy support personnel between community and hospital pharmacies	Restrictions on the migration of pharmacy support personnel between sectors of practice are revisited	SAPC
	Inadequate number of pharmacy students enrolled annually	The pharmacy profession promoted as an attractive career option for students in high schools	Develop and implement a strategy to recruit students into the profession	SAPC, heads of schools, NDoH, DBE, media
		Address resource inadequacies at pharmacy schools	See resources section	SAPC, heads of schools, NDoH, DHET
	Concern regarding the availability of funds for bursaries for pharmacy students	Increased awareness of pharmacy bursaries for matriculants	Provide information about bursaries through the media	SAPC, sponsors and donors, media
		Increased availability and value of bursaries for undergraduate and postgraduate pharmacy students	Explore alternative mechanisms and sources for financing undergraduate and postgraduate studies	SAPC, sponsors and donors, Foundation for Pharmaceutical Education (FPE)
	Concerns regarding compliance with contractual obligations of bursary holders	Improved management of contracts of bursary holders	Facilitate discussion with donors about the availability and management of bursaries	Sponsors and donors, SAPC, FPE
			Encourage recipients of bursaries to serve underserviced and rural communities	

Issue	Challenges	Potential Solutions	Activities	Role players
Planning	Perceived inadequacy of the undergraduate pharmacy education programme to meet health system needs	Pharmacy education and training are aligned to health system needs	Review the pharmacy qualification and the intern training model taking health system needs into account	SAPC, heads of pharmacy schools, NDoH, public and private sector HoPS
			Determine the optimal number of pharmacy graduates required for the health system	
	International changes in pharmacy education	Ensure the pharmacy degree is comparable with other equivalent international qualifications	Review the pharmacy qualification and the intern training model taking health system needs and international developments into consideration	SAPC, heads of pharmacy schools, NDoH
			Investigate and benchmark international developments in undergraduate pharmacy training	
			Investigate the establishment of reciprocity agreements with other countries	
	Existing specialties for pharmacists do not adequately meet health system needs	Pharmacy specialties are aligned to health system needs	Identify the different categories of specialties	SAPC, heads of pharmacy schools, public and private sector HoPS, NDoH
			Develop scopes of practice for defined categories	
			Develop qualifications for defined specialties	
			Develop a pre-registration assessment process	
		The number of registered specialists is adequate to cater for the health system needs	Investigate international collaborations for production of specialists (India, Brazil, USA)	SAPC, NDoH, Department of Trade and Industry (DTI)
			Accredit training facilities for specialties	SAPC, schools of pharmacy, NDoH
			Develop a process for the recognition of prior learning	SAPC, heads of pharmacy schools

Issue	Challenges	Potential Solutions	Activities	Role players
Resources	Limited interest in academic careers by pharmacists	Structures and strategies are in place to attract and retain suitably qualified academic staff	Review policy to enable establishment of a limited number of CSP posts in pharmacy schools with the intention of retaining them as part of academic staff	SAPC, NDoH, heads of pharmacy schools
			Develop strategies to retain postgraduate students as academic staff	SAPC, heads of pharmacy schools
			Investigate the subvention of salaries for academic staff	SAPC, donors and sponsors, heads of pharmacy schools, DHET
	Limited capacity of pharmacy schools to enrol increased numbers of pharmacy students	Capacity of pharmacy schools is developed to enable increased intake of undergraduate students	Develop infrastructural and human resources capacity of pharmacy schools to enable appropriate increased intake of undergraduate students	SAPC, heads of pharmacy schools, DHET, NDoH
	Perceived low levels of intake of post-graduate pharmacy students	The enrolment rate of post-graduate students is increased	Develop infrastructural and human resources capacity of pharmacy schools to enable appropriate increased intake of post graduate students	SAPC, pharmacy schools, sponsors and donors
			Introduction and implementation of specialties learning programmes	SAPC, pharmacy schools, employers, DHET
Trends	Inequitable production of pharmacists and support personnel by race	Recruit pharmacy personnel from previously disadvantaged backgrounds	Promote pharmacy in the previously disadvantaged communities	SAPC, pharmacy schools and professional organisations
	Increasing proportion of female pharmacists	Recruit more males into the pharmacy profession	Encourage male students/ learners to enrol for pharmacy degree	SAPC, pharmacy schools and professional organisations
	The number of pharmacy graduates has remained constant between 2001 and 2009 despite the population growth	Double the number of graduates produced annually	Open new pharmacy schools and encourage the existing schools to double the current intake and production	SAPC, pharmacy schools, NDoH, DHET

Issue	Challenges	Potential Solutions	Activities	Role players
Quality and outcomes	Lack of rigour in existing quality assurance procedures for training institutions and programmes	Quality assurance systems and processes are reviewed	Align QA processes with those of relevant quality councils and benchmark with international trends	SAPC and providers of education and training
	Limited availability and suitability of pharmacies and tutors capable of training pharmacist interns	Revised training model for pharmacist interns	Revise the current Regulations Relating to Pharmacy Training and Education	SAPC, NDoH and stakeholders
			Revise current criteria for approval of pharmacy premises and tutors for training purposes	SAPC
	Administrative challenges in the pre-registration assessment of pharmacist interns	Revised pre-registration assessment process	Review the assessment process for pre-registration of pharmacist interns	SAPC
	Limited collaboration between local and international educational institutions	Improved collaboration between local and international educational institutions	Use international benchmarking and collaboration with international institutions to maintain quality education standards	SAPC and providers of education and training
Access to training	Low quality of grade 12 graduates in particular mathematics and sciences	Bridging courses implemented for pharmacy	Encourage the pharmacy schools to implement bridging course	Providers of education and training
	Limited resources for pharmacy schools (HR, financial, infrastructure)	Alternative resource allocation mechanisms are explored to increase capacity within pharmacy schools	Develop resource allocation strategy that encourages pharmacy schools to produce more graduates	SAPC, pharmacy schools, NDoH, DHET
Enrolment and graduation rates	Lack of information regarding pharmacy graduate throughput	Information on attrition and throughput is obtained from pharmacy schools	Encourage pharmacy schools to annually report to SAPC on attrition and throughput of pharmacy students	SAPC, pharmacy schools, NDoH, DHET
Student support (finance etc.)	Perceived lack of financial and mentoring support for pharmacy students	Information on support provided to pharmacy students is obtained	Improve the financial and mentoring support for pharmacy students	SAPC, pharmacy schools, NDoH, DHET

Table 10: Challenges and suggested solutions relating to HR production and development

3.3 HR MANAGEMENT – RECRUITMENT, RETENTION AND DEVELOPMENT

Apart from effective recruitment and retention strategies that encompass good working conditions and competitive remuneration packages, there is a need to create and facilitate opportunities for pharmacists to gain and develop management skills. This pillar focuses on nurturing and promoting good quality leadership and managerial capacity of pharmacy personnel in the health system while maintaining structures and working environments conducive to effective service delivery.

Table 11 provides a summary of challenges and potential solutions relating to the management of pharmaceutical personnel.

	Challenges	Potential Solutions	Activities	Partners
Planning	Lack of clearly defined staffing norms to inform personnel deployment and development planning	Staffing norms for determining absolute numbers of personnel required to provide pharmaceutical services at different levels are developed and utilised	Develop suitable norms and standards for staffing of facilities by pharmacists and pharmacy support personnel at all levels of care – in line with other initiatives or policies aimed at facilitating service delivery to the population	SAPC and NDoH
Resources	Limited partnerships between academia and the different pharmacy sectors, e.g. community, wholesale, manufacturing, public & private institutional sectors	Increased partnerships between academic institutions and different pharmacy sectors	Develop and implement policies that will encourage the establishment of partnerships between different sectors of pharmacy and academia	SAPC, pharmacy schools, NDoH, sponsors and donors
			Encourage the establishment of joint staff posts between the schools of pharmacy and the provinces	SAPC, pharmacy schools, NDoH, sponsors and donors

	Challenges	Potential Solutions	Activities	Partners
Trends	Maldistribution of pharmacy personnel between the public and private sector	Conditions which have led to this maldistribution are identified and addressed	Improve conditions of employment across all sectors and categories of pharmacies	Employers and NDoH
		Retention strategies including various career paths and appropriate remuneration for pharmacy personnel	Development and implementation of retention strategies including various career paths and appropriate remuneration for pharmacy personnel	Employers and NDoH
	Retention of pharmacist and pharmacy support personnel in public sector	Retention strategies for CSPs and other pharmacists including support personnel are developed and implemented	Develop and implement financial and non-financial incentives for public sector pharmacy personnel	NDoH
			Identify and optimise channels to communicate success stories showcasing benefits of practising in underserviced areas	NDoH
	Lack of dedicated funds for CSP posts	A separate central ring-fenced budget is allocated for CSP posts	Develop strategies for the development of a dedicated CSP budget	NDoH
	Inequitable geographical distribution of pharmacists	Incentive provided for pharmacists to practice in rural and remote areas	Develop and implement financial and non-financial incentives for pharmacists	Employers and NDoH
CPD	Limited emphasis on maintaining competency levels of pharmacy personnel in practice	Pharmacists CPD programme implemented	Publish regulations and guidelines relating to CPD	SAPC and NDoH
	Limited opportunities for practising pharmacists to develop leadership and managerial skills	Formal leadership and management training	Learnerships and exchange programmes for pharmacists	SAPC, pharmacy schools, NDoH, DHET, sponsors and donors
	Lack of recognition by employers of additional qualifications	Employer recognition of additional qualifications	Implement financial and non-financial incentives for pharmacists with additional qualifications	Employers and NDoH

	Challenges	Potential Solutions	Activities	Partners
QA infrastructure and processes	Sub-standard infrastructure for providing effective pharmaceutical services	Existing infrastructure is developed to support service delivery and improve working conditions	Develop and Implement minimum standards for good pharmacy practice to support service delivery and improve working conditions	SAPC
			Improve infrastructure to support service delivery and improve working conditions	Employers and NDoH
	Lack of a system that recognises excellence in pharmacy practice for pharmacists and pharmacies	A system that recognises and acknowledges best practices and rewards excellence in practice	Review and revise current systems and processes for acknowledging excellence in practice	SAPC, NDoH, professional organisations, sponsors and donors
Management and use of different categories	Lack of focus on development of pharmaceutical services at primary care level in both the public and private sectors	Input provided to policy makers on strengthening pharmaceutical services at primary care level	Establish and recruit for pharmacy support personnel posts to render pharmaceutical services at PHC level	Employers and NDoH

Table 11: Challenges and suggested solutions relating to HR management

Although the introduction of the OSD is believed to address some of these issues, work is still needed on the other areas. Leadership and guidance geared towards creating a good working environment is required from provincial and national departments as well as the SAPC and pharmacists' associations.

Leadership and guidance geared towards creating a good working environment is required from provincial and national departments as well as the SAPC and pharmacists' associations

3.4 HR INFORMATION SYSTEM – INFRASTRUCTURE AND TECHNOLOGY

A comprehensive human resources information system is an essential pillar of a health system. It enables management to use the data for future planning in conjunction with its use as a management tool. The complexity of health systems requires information systems be developed and managed appropriately to become a standard for good health management.

The SAPC currently maintains a database on pharmacists and pharmacist's assistants in the country. Although functional, there is room for improvement with regard to ensuring that the data contained therein is updated regularly and is accurate. It is imperative that accurate data be available for managing deployment of personnel to highlight underserviced areas across the country.

Challenge	Potential Solution	Activities	Partners
Limited baseline information on pharmacy HR	Maintain a regularly updated and accurate database for pharmacy HR at national and provincial level	Establish a comprehensive monitoring and evaluation system (refer to M&E section)	SAPC, NDoH
HR information used for planning at national and provincial level is either not available or out of date		Use accurate and up to date information to inform pharmacy HR planning	
Lack of integration between existing SAPC and employer pharmacy HR information systems	Interfaces between existing SAPC and employer pharmacy HR systems	Investigate the possibility of an interface between the SAPC and employer pharmacy HR databases	SAPC, employers
Lack of information on pharmacists with additional qualifications	Database established for monitoring the number of pharmacists with additional qualifications	Pharmacy schools required to submit information on pharmacists registered for additional qualification	SAPC, pharmacy schools,
		Encourage pharmacists to register additional qualifications	SAPC, the profession
		Investigate using information from the National Learner Record Database (NLRD)	SAPC, SAQA

Table 12: HR Information system challenges and suggested solutions

3.5 HR RESEARCH

The use of evidence-based best practice in the management of human resources is dependent on the production of relevant and reliable research outputs. To that effect, this pillar focuses on identifying several aspects of research that influence the planning for pharmacy human resources. Table 13 highlights potential focus areas for pharmacy human resources research in the South African context.

Issue	Challenges	Potential Solutions	Activities	Partners
Policy impact	Migration of pharmacy personnel between the public and private sectors	The rate and impact of migration of pharmacy personnel between the public and private sectors is determined	Establish and facilitate implementation of the research agenda	SAPC, NDoH, pharmacy schools, sponsors and donors, DST
	Uncertainties regarding the perceived value of the pharmacy profession	Determine the perception of stakeholders of the value of the pharmacy profession		
	Lack of information on the impact of changes in pharmacy ownership legislation on pharmacy HR	The effect of legislation of pharmacy ownership on pharmacy HR trends is determined		
	Lack of information on the impact of changes in pharmacy ownership legislation on the professional image, HR distribution and trends	The effect of pharmacy ownership legislation on the professional image, HR distribution and trends is determined		
	Lack of information on the impact of remuneration issues	The impact of the OSD on the pharmacy HR trends is established		
		The impact of implementing the dispensing and professional services fees on pharmacy HR trends is established		
	Perceived low pharmacy workforce morale	The pharmacists' levels of morale are determined		
	Lack of information on the value and practicality of the pre-registration process for pharmacist interns	The value and practicality of the pre-registration process are determined		

Issue	Challenges	Potential Solutions	Activities	Partners
Career persistence	Lack of information regarding factors affecting the production and retention of academic staff	Factors affecting the recruitment and retention of staff in pharmacy training institutions are identified and addressed where necessary	Establish and facilitate implementation of the research agenda	SAPC, NDoH, pharmacy schools, sponsors and donors, DST
	The effects of CPD on pharmacy practice are yet to be determined	The impact of implementing CPD in South Africa is evaluated		
Teaching service and academia	Limited information on the trends, needs and value proposition for staffing of pharmacy schools	Investigate the trends, needs and value proposition for staffing of pharmacy schools		
Rest of pharmacy workforce	Explore the perceived loss of professional pride and motivation and determine strategies to enhance the self-esteem of pharmacists and pharmacy support personnel.	Improved self-esteem of pharmacists and pharmacy support personnel		
	Lack of information on factors affecting selection of career paths by newly qualified pharmacists	Factors affecting selection of career paths are identified and understood		
Career choices	Lack of information regarding the availability and suitability of existing postgraduate learning programmes for the health system	Suitable postgraduate learning programmes for the health system		

Table 13: Potential topics for research to inform pharmacy HR planning

3.6 HR MONITORING AND EVALUATION

The production, deployment and retention of health personnel are costly and it is imperative that good monitoring and evaluation systems are in place. This pillar relates to development of a system to monitor the availability of suitably qualified pharmacists and support personnel in different fields of practice and facilities across the country. Table 14 highlights several aspects of pharmacy human resources that require more effective monitoring and evaluation.

Monitoring and Evaluation			
	Potential Solutions	**Activities**	**Partners**
Inadequate routine monitoring of pharmacy HR	Routine monitoring and evaluation system for the production, registration and distribution of personnel and premises	Develop monitoring and evaluation plan including develop indicators, data elements and reporting schedules for pharmacy HR	SAPC, NDoH, SAQA, pharmacy schools, HoPS, providers of pharmacist's assistants training
	Routine monitoring of the CPD system		
	Routine monitoring of the registration, licensing and distribution of premises		
	Routine monitoring of the production, registration and distribution of pharmacy personnel		
	Routine monitoring of the immigration and emigration of pharmacy personnel		
Inadequate systems for periodic evaluation of impact of policies implemented	Mechanisms in place for regular evaluation of impact of policy changes	Incorporate evaluation schedule in the comprehensive monitoring and evaluation plan	SAPC, NDoH, sponsors and donors, pharmacy schools

Table 14: Monitoring and evaluation of pharmacy HR

4. PRIORITIES FOR IMPLEMENTATION PLAN

4.1 INCREASED PRODUCTION OF PHARMACY HUMAN RESOURCES

Over the last 10 years South Africa has produced, on average, 476 pharmacists a year. The 2006 National Human Resources Plan for Health proposed an annual production of 600 pharmacists, which was a 50% increase from the average rate of pr oduction at the time the report was published. This proposed increase was, however, expected to be revised, depending on the results of the study into the Production Capacity of Health Science Institutions (NDoH 2006).

A shortage of pharmacists is being experienced with the average reported vacancy rates ranging from 36% (George G, 2009) to 76% (Naicker H, 2011) in certain regions. Although most markedly high vacancy estimates are within the public sector, staff shortages are also being experienced in the private sector.

In order to get a more precise estimate on the actual number of pharmacists and support personnel required in South Africa, a comprehensive model needs to be developed and applied. The research currently underway into staffing norms for pharmacy in South Africa is likely to assist in providing this information. Although there are variations in the estimates of absolute number of pharmacists needed, it is evident that the current level of production of pharmacists does not meet the country's needs.

WHO has recommended a ratio of one pharmacist per 2,300 population in industrialised countries. In South Africa the pharmacist/population ratio indicates that there is one pharmacist for every 3,849 people. In order for South Africa to reach the WHO recommended number of pharmacists per population, the level of production and retention would have to increase significantly. Figure 47 depicts the gap between South Africa's current production rate and

that required to meet the WHO recommended ratio by 2030. In order to meet the WHO target South Africa would need to produce an additional 750 pharmacists per year. Thus a minimum of 1,200 pharmacists would have to be produced annually to reach this target by 2030.

It must be noted, however, that the ratio recommended by the WHO does not take into consideration the availability of different types of pharmacy support personnel or the different health system structures and models of healthcare delivery. As such, the estimated 1,200 pharmacists per year may be an over- or an under-estimation of the number of pharmacists needed.

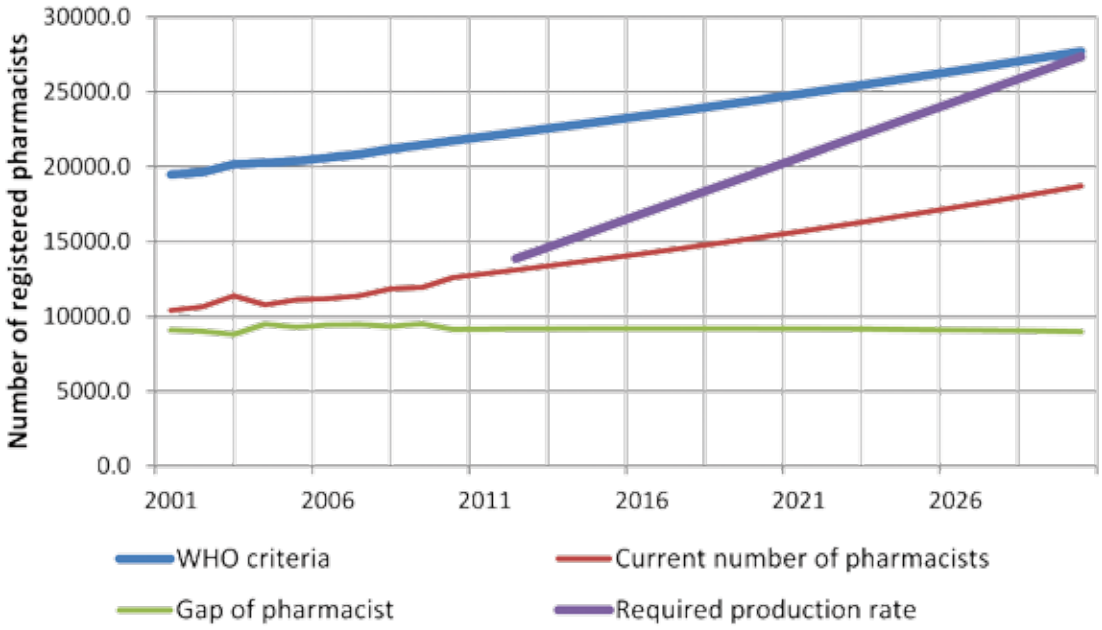


Figure 47: Required pharmacist production rate

In terms of the *Regulations relating to the practice of pharmacy* published in terms of the Pharmacy Act, the prescribed ratio of pharmacists to pharmacy support personnel is 1:3. In order to reach the legislated ratio based on the current number of 12,000 registered pharmacists, approximately 36,000 pharmacy support personnel are needed. If South Africa is to meet the WHO target of 1:2,300 by 2030 (which implies 24,000 pharmacists), 72,000 pharmacy support personnel would need to be registered by 2030. Currently South Africa is producing an average of 1,000 pharmacy support personnel annually. In order to meet the target of 1:3 by 2030, a total of 2,500 pharmacy support personnel should be added to this register annually (refer Figure 48).

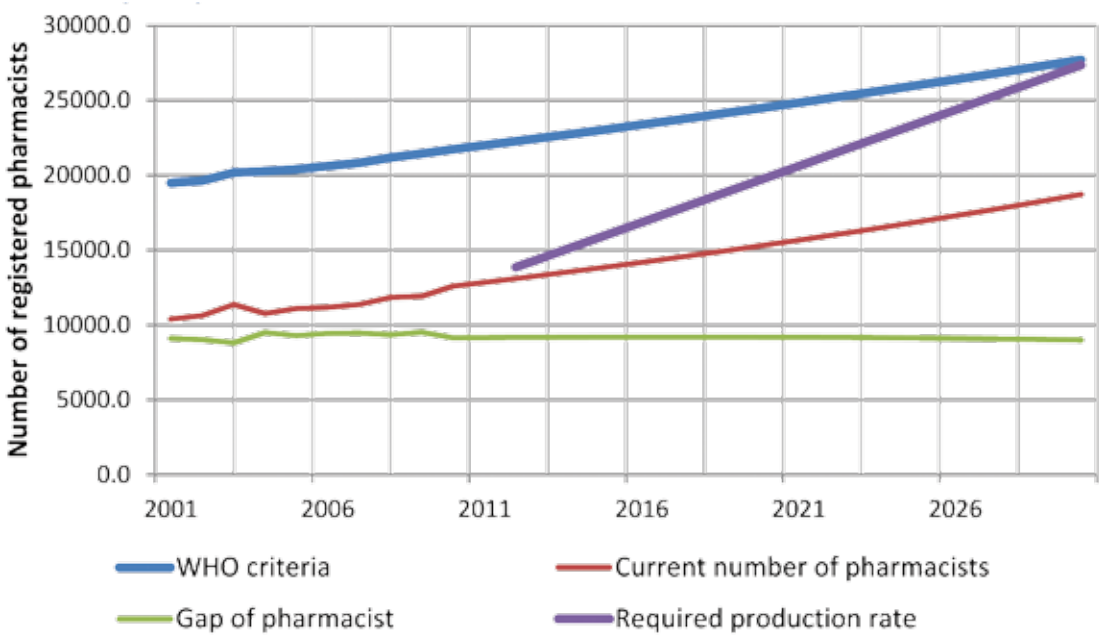


Figure 48: Required pharmacy support personnel production rate

Source: SAPC Registers, 2010

4.1.1 Production of pharmacists

4.1.1.1 Production of pharmacy graduates

Table 15 depicts the average number of graduates produced by pharmacy schools and the proposed increase in annual production of pharmacy graduates in order to reach the WHO standard of 1:2,300. In order to reach this target, pharmacy schools would need to double their current annual production, and three additional pharmacy schools would need to be operational by 2014.

One option would be for the SAPC, NDoH and DHET to approach institutions that previously offered a pharmacy programme, e.g. University of Pretoria and Stellenbosch University, and discuss the possibility of re-introducing an undergraduate course in pharmacy.

Tshwane University of Technology has shown an interest in establishing a pharmacy school and should be assisted to fast track accreditation. Other institutions that currently offer other health science qualifications, such as Free State University and the University of Johannesburg, could be approached to assist in the production of pharmacy human resources.

University	Current annual production of pharmacy graduates	Proposed annual production of pharmacy g raduates
Rhodes University	56	120
University of Western Cape	58	120
Nelson Mandela Metropolitan University	48	90
North West University (Potchefstroom Campus)	127	260
University of KwaZulu-Natal	60	120
University of Limpopo (Medunsa Campus) in collaboration with TUT	39	80
University of Limpopo (Turfloop Campus)	50	100
University of the Witwatersrand	42	90
Total	**476**	**980**

Table 15: Proposition: current vs proposed annual production of pharmacy graduates Source: SAPC Registers, 2010

Note: All institutions offer four-year BPharm degrees at NQF level 8

4.1.1.2 Foreign pharmacy graduates

Table 16 and Figure 49 depict the number of foreign students in comparison with the South African students. The percentage of foreign students studying pharmacy at pharmacy schools in South Africa has increased from 14% to 18% over the period 2006 to 2009. Based on this information, 86 of the average 476 pharmacy graduates produced annually will not be able to practise in South Africa and will either return to their country of origin or relocate to other countries. This leaves approximately 390 graduates eligible to register as pharmacists in South Africa after completing their year of internship.

2006		2007		2008		2009	
SA	Foreigners	SA	Foreigners	SA	Foreigners	SA	Foreigners
1703	281	1501	273	1357	326	1640	351

Table 16: Foreign vs South African pharmacy students: 2006-2009

It is important that policies on admission, training and registration of foreign pharmacy students be reviewed to ensure that South Africa gets maximum return on investment for the training of pharmacists.

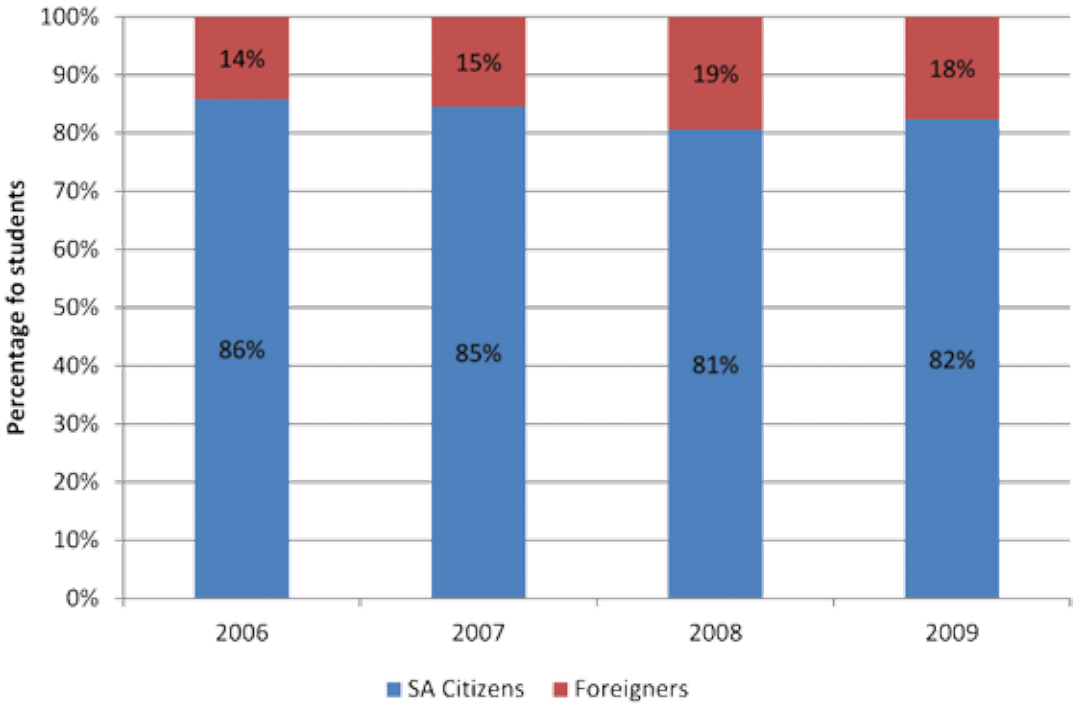


Figure 49: Foreign vs South African pharmacy students: 2006-2009

In order for South Africa to produce 1,200 graduates per year the capacity of pharmacy schools in terms of infrastructure, libraries, laboratories, human resources, financial resources, etc. should be reviewed.

4.1.1.3 Capacity of pharmacy schools to deliver the required number of graduates

In order for South Africa to produce 1,200 graduates per year the capacity of pharmacy schools in terms of infrastructure, libraries, laboratories, human resources, financial resources, etc. should be reviewed. The DHET, together with the NDoH and all other relevant stakeholders, should review the funding model to enable schools to increase the production of pharmacists to the required number.

The SAPC should investigate the cost involved in improving the capacity of the schools to deliver the required number of pharmacy graduates. This information should be used to source funding from alternative potential sources, e.g. the pharmaceutical industry and other role players both within and outside the pharmacy profession.

4.1.1.4 Pharmacist interns

The situation analysis as captured in this report indicates that not all pharmacy graduates undertake a pharmacy internship in South Africa. This situation could be attributed to the fact that some graduates are from foreign countries and are unable to complete an internship in this country, meaning that South Africa is providing training for other countries. It is recommended that the NDoH review its policy in this regard to enable pharmacy graduates who qualified in South Africa to at least do an internship and community service before returning to their country of origin.

The SADC agreements need reviewing to allow pharmacists and pharmacy support personnel who qualified in any of the SADC countries to work freely in any of the countries in the SADC community, thus enabling pharmacy personnel to be retained in the region as well as providing opportunities for the transfer of skills and experience throughout the region.

4.1.1.5 Production of authorised pharmacist prescribers

The Health Sector Strategic Framework (the 10 Point Plan of the NDoH) has identified primary healthcare as the cornerstone for the provision of healthcare services in South Africa. Pharmacy has a major role to play in the realisation of these goals, as a community pharmacy is often the first point of call for a patient seeking primary healthcare services. The SAPC has developed the scope of practice, together with the qualification, for an authorised pharmacist prescriber (APP). The next steps are the publication of the proposed scope and qualification for public comment and the development of learning programmes by the different providers. It is anticipated that the first group of APPs should qualify and be able to commence practising in 2014. It is envisaged that APPs will assist with preventive healthcare services including immunisation of children, screening of patients for lifestyle diseases, management of patients with chronic conditions/diseases and treatment of acute minor ailments/diseases in line with the Primary Healthcare Essential Medicine List and Standard Treatment Guidelines of the NDoH.

It must be noted that amendments are required to Section 22A of the Medicines Act in order to enable this group of practitioners to function within the proposed scope of practice.

4.1.2 Production of specialist pharmacists

There are currently two categories of specialist pharmacists that may register in terms of the Pharmacy Act, namely the radio pharmacist and the pharmacokineticist. The SAPC has identified three broad areas for the further development of specialities in pharmacy - clinical pharmacy (which will include the two existing categories of specialists), pharmaceutical services in public health, and industrial pharmacy. It is envisaged that the training of specialist pharmacists will assist government in the implementation of the national industrial policy framework. The DTI has identified the following key opportunities in the pharmaceutical sector, namely domestic production of pharmaceutical active ingredients, local production of reagents for HIV/AIDs diagnostics, domestic production of vaccines and domestic production of biological medicines. In order for the aforementioned to be realised there is a dire need for South Africa to produce industrial pharmacists, which would require investment in pharmacy human resources.

In order to take the process forward, the scopes of practice for the three proposed specialities must be finalised and plans put in place for the introduction of the specialities. A group of pharmacists should be identified that can be sent overseas for specialist training in these areas. After successful completion of training, it is envisaged that they will return to South Africa to assist in the training of other pharmacists who are interested in pursuing these specialities. This approach would require government (DHET and NDoH) and the SAPC to secure funding to ensure realisation of the above. A task team consisting of the NDoH, DHET, DTI, SAPC and heads of schools should be appointed to oversee/facilitate the development of policy in this regard as well as implementation of the approach.

4.1.3 Production of pharmacy technician and pharmacy technical support

In response to the NDoH policy on mid-level workers, the SAPC has developed the scope of practice and qualifications for pharmacy technicians and pharmacy technical assistants. These two cadres of personnel will be trained at higher education institutions and will have a broader scope of practice than the current cadres of pharmacy support personnel. Provision has been made for pharmacist assistants who will have a scope of practice similar to that of the current pharmacist's assistant (basic). Pharmacy technicians will assist in the provision of primary healthcare services as they will be able to function under the indirect supervision of a pharmacist in a primary healthcare clinic and will be able to dispense medicines listed in the Primary Health Care Essential Medicine Lists/Standard Treatment Guidelines. There is, however, a need for changes to the Medicines Act to enable these cadres to practise in terms of the proposed scopes of practice.

It is anticipated that the first groups of trainee pharmacy technicians and pharmacy technical assistants will enrol in the envisaged programmes in January 2013. All efforts are needed to fast track introduction of the new cadres of pharmacy personnel.

Another alternative to fast track the training of pharmacy technicians is to send students to countries such as India, Lesotho and Zimbabwe where there are existing pharmacy technician programmes, on government-to-government agreements. This would have to be preceded by an assessment of the appropriateness of the facilities and the courses provided in relation to the South African requirements. Legislative amendments to the Pharmacy Act would, however, be needed to enable such persons to practise in South Africa. Provincial health departments could be requested to identify potential candidates who could be sent to these countries. This approach would accelerate and facilitate the training and employment of mid-level workers in the public sector. Students who successfully complete the two-year diploma in one of these countries would be required to do six months practical training in South Africa before being registered as a pharmacy technician.

4.1.4 Management and leadership courses

In order to nourish talent and train new leaders in pharmacy for implementation of the national industrial policy framework and implementation of other government projects and policies, there is a need to establish a fully-fledged national institute of pharmacy management and leadership for postgraduate students. The institution could be used as a centre of excellence for advanced studies and research in pharmacy. An example of such an institution is in India where government, in an effort to produce world-class leaders in pharmaceutical sciences, established the National Institute of Pharmaceutical Education and Research (NIPER).

The main objectives of establishing such an institute would be:

(a) to develop and train leaders in pharmacy education and research
(b) to produce future teachers, research scientists and managers for the industry and profession
(c) collaboration with pharmaceutical industries to meet the global challenges
(d) creation of national centres of excellence that cater to the needs of all sectors and/or categories in pharmacy
(e) national/international collaborative research
(f) study of sociological aspects of drug use and abuse, and rural pharmacy
(g) conducting programmes on drug surveillance, community pharmacy and pharmaceutical management.

4.1.5 Teaching posts in academic institutions

In order to address the challenge of the ageing workforce in pharmacy academia, universities and government should consider importing academics as a short-term solution. One of the long-term solutions is to designate pharmacy schools as institutions where pharmaceutical community service can be performed. This approach would facilitate academic interns continuing in employment in academic institutions.

In order to address the shortage of healthcare professionals and retain those currently employed in the public service, the NDoH introduced the occupational specific dispensation (OSD). Consideration could be given to similar remuneration for pharmacists employed in academic institutions to facilitate retention of personnel.

Another option could be for the pharmacy schools and provincial health departments to consider joint appointments for pharmacists between academia and the various provinces.

4.2 RECRUITMENT OF FOREIGN QUALIFIED PHARMACISTS FOR PUBLIC SECTOR

The report indicates that there is a definite shortage of pharmacists. Consideration should be given to the recruitment of pharmacists from other countries. The NDoH should review policies with regard to recruiting healthcare professionals from SADC.

There is a need to consider government-to-government agreements in order to solve the problem of the shortage of pharmacists in the short to medium term. This approach should be used as a temporary measure while South Africa is increasing its capacity to produce pharmacists.

4.3 UTILISATION OF THE EXISTING WORKFORCE

Reports indicate that the current number of registered pharmacists and pharmacy support personnel is insufficient to provide adequate pharmaceutical services to the people of the country. Different models of pharmaceutical service delivery should be considered, such as public private models to use the existing workforce efficiently. Cognisance needs to be taken of the current process of re-engineering the provision of primary healthcare.

4.4 MONITORING AND EVALUATION OF PHARMACY HUMAN RESOURCES

It is recommended that a monitoring and evaluation plan for pharmacy human resources be put in place to ensure ongoing routine monitoring of the situation.

4.5 RESEARCH IN PHARMACY PRACTICE

Many challenges have been identified in the report and they require further research. These include migration of pharmacy personnel between the public and private sectors, uncertainties regarding the perceived value of the pharmacy profession, and lack of information on the impact of legislative changes. There is a need for the SAPC to establish a research and development task team to assist in the planning and conducting of the research required.

4.6 LICENSING OF PHARMACIES

The Pharmacy Act prescribes that a pharmacy must be operated under the personal supervision of the responsible pharmacist at all times. In issuing the licence to own the pharmacy and the recording thereof, both the NDoH and the SAPC must take into account the fact that South Africa is experiencing a severe shortage of pharmacy human resources.

It is recommended that a moratorium be placed on the issuing of pharmacy licences for a period of 12 months to allow both the SAPC and NDoH to do geo-mapping of pharmacy licences issued across the country. This would indicate provinces and local municipalities where new licences are required by category and sector.

The SAPC should review its GPP criteria for recommending that a pharmacy be issued with a licence. The pharmacy owner must prove to the SAPC that the responsible pharmacist has the necessary years of experience as a pharmacist in the relevant category of pharmacy to which he/she is appointed, e.g. in order to recommend that a licence be issued, the experience for a responsible pharmacist should be set at a minimum of three years.

4.7 ESTABLISHMENT OF COMMITTEE FOR HUMAN RESOURCES IN PHARMACY

In order to implement the Human Resources Plan for Pharmacy there is need for the SAPC to establish a committee on human resources for pharmacy. The main focus of the committee will be on:

(a) policy planning and governance including the establishment of a vision for pharmacy
(b) planning and production of pharmacy human resources
(c) pharmacy human resources management - recruitment, retention and development including effective use of existing pharmacy human resources
(d) pharmacy human resources information system – infrastructure and technology
(e) pharmacy human resources monitoring and evaluation
(f) pharmacy human resources research.

5. CONCLUSION

A functional and effective pharmacy workforce is a cornerstone in the provision of pharmaceutical services in South Africa. The country's pharmacy profession is currently facing challenges that impede optimised practice of pharmacy as well as the production and retention of sufficient and appropriately trained pharmacists and pharmacy support personnel.

Development of scopes of practices, staffing norms, quality assurance and distribution of existing resources are among the issues affecting the practice of pharmacy in South Africa. There is a need to increase the production of pharmacy personnel while optimising the use of existing personnel in order to provide suitable pharmaceutical services to the people in South Africa. Furthermore, efforts need to be directed towards addressing the inequitable distribution of personnel across sectors.

The proposed pharmacy human resources plan provides short- and medium-term activities aimed at addressing challenges in the profession. The plan should be aligned with the National Human Resources Plan for Health to ensure a level of integration with plans to develop other healthcare professions in the country.

Several of the objectives and activities presented in the plan have been, or are in the process of being, addressed. A comprehensive monitoring and evaluation plan needs to be developed in order to track progress towards fulfilling objectives set in this document.

The Pharmacy human resources plan should be aligned with the National Human Resources Plan for Health to ensure a level of integration with plans to develop other healthcare professions in the country

> APPENDICES

APPENDIX 1:
Pharmacies and pharmacists distribution per province – ratio of pharmacists per 10 000 population

PHARMACISTS AND PHARMACY DISTRIBUTION PER PROVINCE						COMMUNITY PHARMACIES		INSTITUTIONAL PHARMACIES	
PROVINCE	Population	Pharmacies	Pharmacists	Pharmacies /100k	Pharmacist /100k	Pharmacies/ 100k	Pharmacists /100k	Pharmacies/ 100k	Pharmacists/ 100k
EC	6,648,600	324	1060	4.87	15.94	2.83	29.90	1.67	19.16
FS	2,902,400	210	527	7.24	18.16	4.44	9.13	2.34	7.48
GP	10,531,300	1723	4732	16.36	44.93	11.18	1.59	1.63	3.16
KZN	10,449,300	622	1941	5.95	18.58	4.23	2.78	1.29	2.88
L	5,227,200	189	535	3.62	10.23	2.45	7.71	1.05	7.44
MP	3,606,800	208	524	5.77	14.53	4.24	0.00	1.41	1.75
NC	1,147,600	93	158	8.10	13.77	3.92	88.18	4.10	65.62
NW	3,450,400	223	693	6.46	20.08	4.03	7.01	2.29	6.46
WC	5,356,900	712	2199	13.29	41.05	8.59	15.29	3.25	14.06
TOTAL	49,320,500	4304	12369	8.73	25.08	5.65	11.05	1.76	9.10

APPENDIX 2:
Provincial occupational ratios: 2006
(Source: WP integrated country report, March 2007)

Medical practitioners per 100 000 population in public sector										
Province	EC	FS	GP	KZN	LP	MP	NC	NW	WC	*Total*
2000	12.3	24.3	36.6	24.0	12.5	16.4	28.9	11.9	39.7	*21.9*
2006	16.1	21.4	29.7	27.5	14.8	22.0	34.7	14.8	38.8	*23.7*
Dental practitioners per 100 000 population in public sector										
Province	EC	FS	GP	KZN	LP	MP	NC	NW	WC	*Total*
2000	0.80	1.10	4.90	0.80	0.60	1.80	1.60	1.40	3.80	*1.70*
2006	0.99	2.12	3.16	0.73	1.15	2.51	2.94	1.35	3.48	*1.78*
Enrolled nurses per 100 000 population in public sector										
Province	EC	FS	GP	KZN	LP	MP	NC	NW	WC	*Total*
2000	59.2	36.1	46.6	85.0	63.6	42.7	44.0	46.1	60.0	*59.7*
2006	34.5	16.0	45.1	94.1	49.7	43.3	31.2	30.3	50.5	*51.7*
Occupational therapists per 100 000 population in public sector										
Province	EC	FS	GP	KZN	LP	MP	NC	NW	WC	*Total*
2000	0.2	1.4	2.5	0.9	1.1	0.8	0.7	0.6	2.9	*1.2*
2006	0.6	2.5	2.1	1.2	1.9	2.3	2.3	1.1	2.9	*1.7*
Pharmacists per 100 000 population in public sector										
Province	EC	FS	GP	KZN	LP	MP	NC	NW	WC	*Total*
2000	2.3	2.3	5.1	3.3	2.0	2.3	2.3	1.6	6.1	*3.1*
2006	3.0	3.9	4.1	4.7	3.3	4.8	6.9	3.3	8.1	*4.3*
Physiotherapists per 100 000 population in public sector										
Province	EC	FS	GP	KZN	LP	MP	NC	NW	WC	*Total*
2000	0.60	1.20	2.60	1.50	0.90	0.50	0.60	0.40	2.90	*1.30*
2006	0.96	2.32	2.28	2.22	1.23	2.30	4.22	1.09	3.30	*1.94*
Professional nurses per 100 000 population in public sector										
Province	EC	FS	GP	KZN	LP	MP	NC	NW	WC	Total
2000	106.1	128.9	172.5	119.8	104.6	90.5	122.3	94.3	139.9	*120.3*
2006	102.3	139.4	113.1	111.4	110.3	96.4	126.9	88.9	114.7	*109.5*
Radiographers per 100 000 population in public sector										
Province	EC	FS	GP	KZN	LP	MP	NC	NW	WC	Total
2000	3.9	8.5	13.7	4.7	1.7	1.7	3.1	2.1	16.3	*6.1*
2006	*4.1*	*6.7*	*7.8*	*4.7*	*2.4*	*3.1*	*6.1*	*2.3*	*11.3*	*5.2*

(Source: Health Systems Trust, available: http://www.hst.org.za/healthstats/index.php)
EC=Eastern Cape, FS=Free State, GP=Gauteng Province, KZN=Kwa-Zulu Natal, LP=Limpopo Province, MP=Mpumulanga, NC=Northern Cape, NW=North West, WC=Western Cape

> REFERENCES

1. Buchan J. and O'May F. (1999), Globalisation and health care labour markets: A case study from the UK.

2. Chan X. and Wuliji T. (2006), International Pharmaceutical Federation, Global pharmacy workforce and migration report.

3. Council for Medical Schemes (2009), Annual Report.

4. International Pharmaceutical Federation (2007), Global Pharmacy Workforce and Migration Report.

5. International Pharmaceutical Federation (2009), Global Pharmacy Workforce Report.

6. George G., Quinlan T., and Reardon C. (2009), Human resources for health: A needs and gaps analysis of HRH in South Africa, Health Economics and HIV and AIDS Research Division (HEARD), University of KwaZulu-Natal.

7. Hassel K., Fisher R., Nichols L., and Shann P. (2002), Contemporary workforce patterns and historical trends: The pharmacy labour market over the past 40 years, the Pharmaceutical Journal (Vol. 269).

8. Health Systems Trust (1998), The production and distribution of human resources, presented as a contribution to Chapter 10 of the South African Health Review.

9. Naicker H. (2011), Defining a retention strategy for pharmacists in the public sector in KwaZulu-Natal, University of KwaZulu-Natal.

10. NDoH (2006): National Department of Health, National Human Resources Plan for Health.

11. Regional Network for Equity in Health in Southern Africa (EQUINET), Health Systems Trust (South Africa), and MEDACT (UK) (2003), Health Personnel in Southern Africa: Confronting the maldistribution and brain drain.

12. South African Pharmacy Council (2010), Staffing norms calculations.

13. South African Pharmacy Council (2010), Services for which a pharmacist may levy a fee and guidelines for levying such fee(s), Report.

14. Stats SA (2009), Statistics South Africa: Mid-year population estimates.

15. Stillwell B., Khassoum D., Zurn P., Vujiciv M., Adams O., and Poz M. (2004), Migration of health-care workers from developing countries: strategic approaches to its management, WHO Bulletin.

16. World Health Organisation (2006), Global Atlas of the Health Workforce http://www.who.int.globalatlas/default.asp

17. World Health Organisation (2006), Working together for health, World Health Report.

18. World Health Organisation (2007), Globalisation and health worker crisis, Commission on Social Determinants of Health.

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