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THE SHORTAGE OF MEDICAL DOCTORS IN SOUTH AFRICA

**Scarce and critical skills
Research Project**

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The shortage of medical doctors in South Africa

DRAFT case study report that forms part of the HSRC study entitled:

*A multiple source identification and verification of scarce and critical skills in the
South African labour market*

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CONTENTS

INTRODUCTION	5
INDICATIONS OF A SHORTAGE:	10
Registered medical practitioners.....	10
The Public Service vs Private Service	11
Doctors per 10 000 population.....	12
Medical practitioners by province.....	13
The human resources implications of HIV/AIDS.....	16
Emigration	18
The decrease in foreign doctors	23
Equity issues in the medical workforce	25
Vacancies.....	29
HSRC study of vacancy rates	29
An analysis of the DoL's job vacancy database.....	30
A survey of employers who have recently advertised vacancies in the Sunday Times.....	34
Conclusions	41
GOVERNMENT MEASURES TO ADDRESS THE SHORTAGE	42
Allowances	42
Community service doctors.....	42
The Cuban doctors.....	45
Legislation	47
Responses from the medical profession.....	48
Public sector administration	49
Conclusion.....	51
WILL THE SUPPLY MEET THE DEMAND?	53
Enrolments	53
Graduations.....	72
Will the DoH meet its target?	78
Specialists	79
The case of UCT	79
The feminisation of medical schools	84
Obstacles to the achievement of racial equity	87
New selection criteria	90
Conclusion.....	92
CONCLUSIONS & RECOMMENDATIONS	93

LIST OF TABLES

Table 1: Registered medical practitioners, 1999– 2006	10
Table 2: Medical practitioners per 10 000 population in South Africa and neighbouring countries, 2004	12
Table 3: Medical practitioners per 10 000 population in high, middle and low income countries.....	13
Table 4: Number of medical practitioners per 10 000 population, by province, 2004	14
Table 5: Medical practitioners per 10 000 uninsured population, 2000 to 2007*	14
Table 6: Number of practising medical practitioners per 10 000 population, OECD Countries, 2004	15
Table 7: Migration trends, doctors, nurses and other health related occupations, 1999 to 2003.....	19
Table 8: Doctors and nurses trained in South Africa working in OECD countries	20
Table 9: Work permits issued to South African doctors, 2000 to 2005	20
Table 10: South African-born ‘practitioners’ in certain OECD countries in 2001	21
Table 11: Registered medical practitioners, by gender, 1999– 2006.....	26
Table 12: Medical practitioners on the PERSAL and HPCSA registers, by race, 2005-2007	28
Table 14Table 13: Number and share of vacancies for Health Professionals, by year and by minor group	31
Table 15Table 14: Number and share of vacancies for Medical Practitioners, by year and by unit group	32
Table 16Table 15: Total job vacancies for Medical Practitioners.....	33
Table 16: Short questionnaire survey results for Health Professionals vacancies (minor group level).....	35
Table 17: Short questionnaire survey results for Medical Practitioners vacancies (minor group level).....	37
Table 18: In-depth questionnaire survey results for Medical Officers and Specialists (unit group level).....	38
Table 19: Numbers of graduates and community service doctors	44
Table 20: MBChB enrolments at individual SA medical schools by race and gender, 1999 and 2005, with percentage change	55
Table 21: MBChB enrolments at individual SA medical schools by gender,	

1999 and 2005	58
Table 22: MBChB enrolments at individual medical schools by race and gender in percentages, 1999 and 2005.....	71
Table 23: Graduates from SA medical schools by race and gender, 1999 and 2005	73
Table 24: Graduates from SA medical schools by race and gender, 1999 and 2005, in percentages	77
Table 25: MBChB graduates at individual SA medical schools by gender, 1999 and 2005	78
Table 26: University of Cape Town M Med enrolments by race and gender, in numbers and percentages, 1999 to 2005.....	81
Table 27. M Med enrolments at UCT by race and gender, 1999 and 2005...	81
Table 28: M Med enrolments for all surgical disciplines* by gender, in numbers and percentages, 1999 to 2005.....	83
Table 29: M Med enrolments for all surgical disciplines by race and gender in percentages only, 1999 to 2005	84
Table 30: Senior Certificate passes by race, 2006.....	89

INTRODUCTION

This study on medical doctors forms part of a broader study entitled *A multiple source identification and verification of scarce and critical skills in the South African labour market* which is, in turn, one of a number of Skills Development Research Projects, which the HSRC is undertaking for the Department of Labour (DoL). These projects were designed by the Education Science and Skills Development (ESSD) Programme of the HSRC, in consultation with the DoL and numerous other stakeholders. The research is being conducted by researchers from the ESSD, the Universities of Cape Town and Witwatersrand, as well as expert consultants.

The Scarce and Critical Skills Project comprises five phases including quantitative occupational profiling, case studies of occupations or occupational families, a survey of employers with vacancies, documentary research and, finally, development of a comprehensive synthesis report ‘providing evidence of the current availability, supply of and demand for intermediate and high levels skills in relation to the challenges posed by current growth and development strategies in South Africa’. (Erasmus, 2006:9). The report will explain the nature of the evidence collected and how it has been analysed to reach the findings and conclusions. It is intended to bring together material from a wide range of sources into a single document. Apart from addressing current and expected future skills problems, the report will also identify where there are gaps in the research and where future evidence is required.

The term ‘scarce skill’ is used, in accordance with the Department of Labour’s Draft Framework for Identifying and Monitoring Scarce Skills, to refer to those occupations in which there is a scarcity of qualified and experienced people – current and anticipated. Critical skills refer to particular skills needed within an occupation in keeping up with international trends (quoted in Erasmus, 2006:1). They include competences such as literacy, numeracy, general management skills, communication skills etc and although frequently mentioned by employers, are difficult to define or measure.

This study on medical doctors is one of 12 occupational case studies each considering a particular occupation or profession in terms of its scarcity of human resources. Although critical skills are beyond the scope of the studies, it is nonetheless recognized that they are important factors, which have bearing on issues of scarcity. In medicine, for example, there is a need for doctors who are not only prepared to work in the rural public sector but also have the critical skills (problem-solving, communication skills for example) that will enable them to survive the rigours of rural practice. It remains for further studies, however, to explore the question of critical skills in depth.

This study asks whether there is a shortage of doctors in South Africa and whether medical practice should be regarded as a scarce skill. It finds, after evaluating various forms of evidence, that there is indeed a shortage of medical doctors and argues that the profession should be recognized by the Department of Labour as a scarce skill. The reasons for the shortage are explored and possible measures to address it are proposed.

In considering the question of a shortage, the study bears in mind the distinction between absolute and relative scarcity which the DoL has drawn in its *Draft Framework for Identifying and Monitoring Scarce Skills* (quoted in Erasmus, 2006:3).

In a situation of absolute scarcity suitably skilled people are not available. The DoL presents three possible scenarios:

- A new or emerging occupation, where there are few, if any, people in the country with the requisite skills.
- Firms, sectors and even the country are unable to implement planned growth strategies and are experiencing productivity, service delivery and quality problems directly attributable to a lack of skilled people.
- Replacement demand reflects an absolute scarcity where there are no people enrolled or engaged in the process of acquiring skills that need to be replaced.

The concept of absolute scarcity relates closely to what the New Zealand Department of Labour defines as a 'genuine skill shortage' which occurs 'when employers have considerable difficulty filling job vacancies simply because there are insufficient job seekers with the required skills' (NZ DoL, 2006).

In a situation of relative scarcity, suitably skilled people are available but do not meet other employment criteria, for example:

- Geographical location, i.e. people are unwilling to work outside of urban areas.
- Equity considerations, i.e. there are few if any candidates with the requisite skills from specific groups available to meet the skills requirements of firms and enterprises.
- According to the New Zealand Department of Labour recruitment and retention difficulties occur when there is a considerable supply of individuals with the required skills in the potential labour market but they are unwilling to take up employment at current levels of remuneration and conditions of employment (NZ DoL, 2006). Retention problems are often a major contributor to this condition.
- Replacement demand would reflect a relative scarcity if there are people in education and training (formal and work-place) who are in the process of acquiring the necessary skills (qualification and experience) but where the lead time will mean that they are not available in the short term to meet replacement demand.

Erasmus (2006:3) argues that an understanding of the reasons for perceived skills shortages will help to determine the appropriate measures needed to alleviate these shortages.

For example, with regard to genuine skill shortages or absolute scarcity, supply side policy responses might include increases in education and training levels and adjustments to skilled migration targets and policies. As there is a

lag of at least three to four years between the start of new training and any addition to supply, immigration responses need to take precedence in the short term. Demand side measures to address some of the issues associated with recruitment and retention or relative scarcity include increasing pay scales or providing incentives e.g. to work in rural areas.

This report considers whether doctors should be included in the Department of Labour's Master List of Scarce and Critical Skills and the Department of Home Affairs' Quota List. The Master list is compiled by the DoL with input from the SETAS which are required to identify scarce skills in their Sector Skills Plans. A Skills Committee which includes representatives of the DoL, and Departments of Education, Trade and Industry and Foreign Affairs, among others, then develops a Quota List for immigration purposes which is published in the Government Gazette by the Department of Home Affairs. Interestingly, the Masters and Critical Skills List of 8 August 2006 does not mention doctors in general but does call for 35 Internal Medical Specialists and 5150 Radiologists and Radiographers (radiologists are medical specialists). However the Quota List of 25 April 2007 does not mention either of these categories. The only health professionals on the list are Research Development Pharmacologists. Apparently we need 300. Nurses are also not on the Quota list even though the Masters and Critical Skills list calls for nearly 15 000.

This report draws on statistics from a range of different sources to investigate the existence, nature and extent of shortage in the medical profession in South Africa. The sources include press reports, government policy documents and statements, world health data from the World Health Organisation (WHO) and Organisation for Economic Cooperation and Development (OECD) and statistics from the Health Professions Council of South Africa (HPCSA), the Health Systems Trust (HST) and Labour Force Survey (LFS). The study also draws on the survey of vacancies advertised in the Business Times, which was commissioned for the HSRC's DoL study and written up by Johan Erasmus, and the monograph on the medical profession by the author (Breier and Wildschut, 2006).

This report begins with a consideration of the many indications of a shortage of medical doctors in the country, and the particularly low levels of provision in the

public and rural sectors. The second part considers government measures to address the shortage and the third part the extent to which the eight medical schools in this country are able to meet this need. Here statistics on enrolments and graduations are analysed and the data is also disaggregated by race and gender in light of current equity policies.

The fourth and final part of the report draws conclusions as to the absolute and relative shortage of medical doctors in South Africa and suggests some measures to remedy the situation.

INDICATIONS OF A SHORTAGE:

There are many indicators of a shortage of doctors in South Africa. This section provides evidence from a range of different sources.

Registered medical practitioners

In 2006 a total of 33 220 medical practitioners were registered with the Health Professions Council and therefore able to practice in this country (Table 1). This represented a 14 per cent increase since 1999 and an annual average growth of (1.76 per cent) 1.9 per cent. The number of practicing doctors is lower than the total registered because the register does not distinguish between doctors who are actually practicing and those who are not. Therefore the total could include some who are retired, out of the country or just inactive. Data from the latest Labour Force Survey should help us to state the numbers who are actually working but unfortunately the data seems too inconsistent to be reliable.

Table 1: Registered medical practitioners, 1999– 2006

	Total <i>n</i>	Change <i>n</i>	% growth	% change 1999 to 2006	Av annual growth
1999	29108				
2000	29788	680	2.34%		
2001	29927	139	0.47%		
2002	30271	344	1.15%		
2003	30578	307	1.01%		
2004	31214	636	2.08%		
2005	32198	984	3.15%		
2006	33220	1022	3.17%	14%	1.91%

Source; HPCSA (2006)

The Public Service vs Private Service

It is difficult to state categorically how many doctors work in the public and private sectors because some doctors work across both sectors (many private doctors do sessions in public facilities and doctors employed in public facilities also do private work.).

The Health Systems Trust, in its annual Health and Related Indicators states that the PERSAL (Personnel Administration System) database remains the only source of data on public sector employment. According to this database there were 9 959 medical practitioners and 4 000 medical specialists in the public sector in 2007 (a total of 13 959) out of a total of 34 324 on the HPCSA roll (which includes medical specialists). This means that the public sector doctors were approximately 41 per cent of the total medical workforce, but possibly more, given that some of the doctors registered with the HPCSA will be retired, inactive or out of the country.

The Health Systems Trust, drawing PERSAL data, also states that 29.9 per cent of medical practitioner posts in the public service were vacant (this amounts to 4 083 posts) rising to 34.1 per cent (5103) in 2007.

How many people are served by the public and private sectors? The most recent report of the Council on Medical Schemes states that in 2006 there were 2 985 350 principal members and 7 127 343 beneficiaries of medical schemes. As most of the medical scheme members make use of the private service, these figures are some indication of the numbers of people in this country who are supported by private sector doctors. Given that the population for 2007 is around 48,5 million (StatsSA, 2007) this means that 15 per cent (14.7 per cent) of the population is served by approximately 59 per cent of the medical doctors or, conversely, 85 per cent of the population is served by about 41 per cent of the medical doctors.

The shortage of doctors in the rural public service has been exposed over and over again in the national media, with little result. (eg Bateman, 2006; Benjamin, 2006; Siqoko, 2005).

Doctors per 10 000 population

Analysis of figures for registered doctors in relation to the general population and international standards indicates that South Africa is substantially better supplied with doctors than its immediate neighbours but grossly undersupplied when compared with many developed countries. In addition there is a large disparity between provision in the private sector and provision in the public sector.

In the following analysis statistics are provided for the year 2004, the most recent year that was common to a number of data sources.

The following table compares South Africa with several neighbouring countries, drawing on statistics from the World Health Organisation (WHO). It should be noted that its figure for South Africa is substantially higher than the 6.7 per 10 000 or 1:1486 which was estimated in Breier and Wildschut (2006) drawing on numbers of registered doctors for that year and the mid-year population estimate. That figure could also be considered as considerably higher than reality given that many of the doctors on the HPCSA register are not actually practicing.

Table 2: Medical practitioners per 10 000 population in South Africa and neighbouring countries, 2004

South Africa	7.7 (6.7*)
Botswana	4.0
Kenya	1.4**
Lesotho	0.5 ***
Malawi	0.2
Mozambique	0.3
Namibia	3.0
Swaziland	1.6
Uganda	0.8
Zambia	1.2
Zimbabwe	1.6

Source: World Health Organisation (2007)

* Breier and Wildschut (2006)

**2002

***2003

In relation to high, or even to middle income countries as defined by the World Bank, South Africa ranks only slightly above those classified as low income, as table 3 below shows.

Table 3: Medical practitioners per 10 000 population in high, middle and low income countries

High income countries	28
Middle income countries	18
Low income countries	5
Sub-Saharan Africa	1

Source: World Bank, 2001, in Sanders and Meeus (2002)

When the figures are analysed further to show provincial breakdowns, the picture becomes more complicated.

Medical practitioners by province

In the Western Cape and Gauteng, there are 14.7 and 12.6 physicians per 10 000 people, ranking with middle-income countries. The inequity in relation to other provinces is compounded when one considers that most medical aid members are located in these provinces and each has two medical schools with associated tertiary teaching hospitals. In Limpopo there are only 2.1 doctors per 10 000, placing this province only slightly above the average for Sub-Saharan Africa.

Table 4: Number of medical practitioners per 10 000 population, by province, 2004

Region	Medical doctors per 10 000 population*
Western Cape	14.7
Gauteng	12.6
Free State	5.4
KZN	5.2
Northern Cape	4.2
Mpumulanga	3.0
Eastern Cape	2.7
North West	2.3
Limpopo	1.8
National average	6.7

* Based on HPCSA figures for registered medical practitioners and StatsSA population estimates for 2004.

The figures above reflect both public and private sector. The following table is for the public sector alone. It provides a sense of the shortage of doctors in the public service, in the rural provinces such as the Eastern Cape, Limpopo and North West in particular.

Table 5: Medical practitioners per 10 000 uninsured population, 2000 to 2007*

	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA
2000	1.23	2.43	3.66	2.40	1.25	1.64	2.89	1.19	3.97	2.19
2001	1.22	2.22	2.87	2.23	1.22	1.64	2.63	1.22	3.25	1.98
2002	1.13	2.34	2.91	2.24	0.91	1.66	2.42	1.18	3.31	1.93
2003	1.27	2.31	2.54	2.13	1.43	1.79	2.84	1.15	3.19	1.97
2005	1.58	2.07	2.59	2.42	1.43	2.15	3.65	1.36	3.61	2.19
2006	1.61	2.14	2.97	2.75	1.48	2.20	3.47	1.48	3.88	2.37
2007	1.70	2.28	2.95	3.01	1.74	2.09	4.12	1.49	3.38	2.24

Source: PERSAL, in Health Systems Trust (2004).

* 2004 figures not available.

Drawing on further figures supplied by the Health Systems Trust (2007) for number of uninsured population (40 824 000 in 2006), one can calculate that we need at least 20 410 public sector doctors if we are to achieve, in the public sector, a ratio of 5 doctors were uninsured population. This would bring our public sector supply to the level regarded by the World Bank as the norm for low income countries. As our medical workforce in the public sector is currently 13 959, we need an extra 6 451 doctors. This figure is even higher than the 5103 public sector vacancies which have been reported.

Although the Western Cape and Gauteng figures for public and private sector doctors combined (Table 4) are relatively high within South Africa, even these provinces are not on a par with many developed nations. The following figures are for practicing medical practitioners (in other words, they exclude those on the register who not actually working, therefore they are lower than they might be if they included all registered doctors).

Table 6: Number of practising medical practitioners per 10 000 population, OECD Countries, 2004

Australia	27
Austria	35
Belgium	40
Canada	21
Czech Republic	35
Denmark	36
Finland	24
France	34
Germany	34
Greece	49
Hungary	33
Iceland	36
Ireland	28

Italy	42
Japan	20
Korea	16
Luxembourg	24
Mexico	17
Netherlands	36
New Zealand	22
Norway	35
Poland	23
Portugal	33
Slovak Republic	31
Spain	34
Sweden	34
Switzerland	38
Turkey	15
United Kingdom	23
United States	24

Source: OECD Health Data (2007)

Three other countries are worth considering because of their growing links with South Africa. They are Brazil, which has 12 doctors per 10 000 population, China which has 11 and India which has 6 (WHO, 2007).

The human resources implications of HIV/AIDS

In 2005, the national Department of Health estimated that 5.5 million South Africans were living with HIV, an estimated prevalence of 10.8 per cent. An HSRC study found prevalence across all age groups was 13.3 per cent for women and 8.2 per cent among males (Shisana, 2005). TB is the most important opportunistic infection and South Africa has the fifth highest number of notified TB cases in the world (Grimwood, Almeleh, Hausler and Hassan (2006).

These are just some of the grim statistics available about the extent of disease in South Africa. The rollout of Anti-Retrovirals remains an enormous challenge that is thwarted by lack of human resources, mainly nurses but also doctors. The Health Systems Trust's 2005 SA Health Review states:

Human resource constraints continue to dominate as the single greatest impediment to the successful scaling up of ART services. The provision of ART in the absence substantial strengthening of the overall health system has the potential to increase existing inequities between well and poorly resourced areas. The current lack of human resource capacity within the South African public health system is therefore of great concern. This is particularly so since ART efforts by other countries within the region have been severely hampered by human resource constraints (Stewart and Loveday, 2005:233).

The Operational Plan for Comprehensive HIV/AIDS Care, Management and Treatment (DOH, 2003) noted that the roll-out of anti-retrovirals (ARVs) would require a substantial increase in health human resources. It estimated that a total of 21 824 new staff would have to be recruited between March 2004 and March 2008. Of these 975 would need to be doctors and 6 822 nurses. (The DoH National Strategic Plan predicted that by 2011 most people in need of anti-retroviral treatment will receive their treatment from nurses in primary health care clinics.)

The DoH has subsequently produced a National Human Resources for Health Planning Framework (DoH, 2006a) that makes no mention of the human resources required to deal with the HIV/AIDS pandemic. An international report has noted this omission:

Neither increased demand nor the direct impact of HIV/AIDS on the workforce is considered. (Medecins Sans Frontieres (MSF), 2007: 8).

Medicins Sans Frontieres (Medicine Without Borders) works in countries in Africa that are far more impoverished than South Africa and argues that the overall supply of health care workers in South Africa is not an acute problem. However:

... unequal distribution between the private and public sectors and between urban and rural areas – due to low salaries and working conditions – combines with the overwhelming need for treatment to create a crisis (2007:8).

Grimwood et al (2006) have noted that the various provincial health departments have resulted in large differences in ART coverage. In the SA Health Review they provide a table which explores the relationships between ART roll out and various other factors: HIV prevalence, the number of nurses and doctors per uninsured persons, GDP per capital and per capital government health spending (rands per capita uninsured population). The Western Cape with the lowest prevalence, highest doctor ratio, the second highest GDP per capita and the highest per capita spending on public health also has the highest percentage HAART coverage of 55.7%. Surprisingly, given the often stated importance of nurses in ARV rollout, the Western Cape's nurse to population ratio, at 106, is actually below the average of 109. It is difficult to find clear trends from the HST's figures, which suggests that there are many other factors affecting rollout. The authors also point to other factors that made Western Cape the leader in HAART coverage: political decisions to prioritise health, including ARV rollout, government support for NGOs and efficiency. The suggestion is that politics and management play as important a role in the management of HIV/AIDS as personnel per se. In the third part of this report it will also be argued that good management – at all levels of the health system – can play an important role in the recruitment and retention of doctors.

Emigration

It is difficult to quantify the extent of emigration because of underreporting. The official figures are based on the information provided by individuals when they leave the country. It is widely recognized that the data is largely incomplete and inaccurate and a severe undercount of emigration from South Africa. The completion of forms is not always enforced and not all individuals intending to emigrate indicate as such. Only individuals leaving from the major South African airports are captured. South Africans who leave to travel and then stay abroad permanently are not captured. The system only recently started capturing disaggregated occupation data and StatsSA

categories have changed over the years, making it difficult to formulate trend analyses. (Meyer, Brown and Kaplan, 2000, quoted in Wilson, Woolard and Lee, 2004: 28).

Nonetheless there is some merit in producing tables such as those below because they do give a sense of trends over time,. For example, in the period 1989 to 1994, we experienced a gain in physicians according to these figures, peaking at 296 in 1992. However, by 2002 we had begun to experience a net loss. This started at a loss of 33 doctors in 1996 and increased to a loss of 156 doctors in 2003. The trend could be a reflection of political and socio-economic conditions in the country – the surge of confidence as the country entered democracy and subsequently growing disillusionment due to a number of factors which were identified in studies by the OECD, ranging from increased use of public health services, HIV AIDS to crime and affirmative action.

Table 7: Migration trends, doctors, nurses and other health related occupations, 1999 to 2003.

	Immigration	Emigration	Net gain/loss
1988	68	73	-5
1989	69	36	33
1990	135	30	105
1991	229	23	206
1992	327	31	296
1993	248	37	217
1994	163	93	70
1995	74	71	3
1996	70	103	-33
1997	40	82	-42
1998	28	105	-77
1999	39	83	-44
2000	22	105	-83
2001	17	94	-77
2002	67	128	-61

2003	54	210	-156
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Source: CSS (1989-1998), StatsSA (1999 – 2003)

Other international sources of data suggest a far more serious problem than the StatsSA figures present. The World Health Report 2006 (WHO, 2006:100) provides the following figures for doctors and nurses trained in OECD (Organisation for Economic Cooperation and Development) countries. Out of 11 African countries listed, South Africa has the highest number of doctors abroad – 12 136, equivalent to one third its total workforce back home. Nigeria, which is the next highest, has about one third of that number (4 261).

Table 8: Doctors and nurses trained in South Africa working in OECD countries

	Total in home country	Number working in OECD countries	Percentage of home work force
Doctors	32 973	12 136 (8 countries)*	37%
Nurses & midwives	184 459	13 496 (7 countries)**	7%

Source: WHO (2006:100)

* Australia, Canada, Finland, France, Germany, Portugal, United Kingdom, USA

** Canada, Denmark, Finland, Ireland, Portugal, United Kingdom, USA

Note that the above table excludes New Zealand, a popular destination for South African doctors

Between 2000 and 2005 the Work Permits division of the UK Home Office issued a total of 1800 work permits to professionals categorised as ‘doctors’ or ‘medical practitioners’. The annual figures peaked in 2002, decreasing somewhat by 2005 (Home Office Work Permits Division, UK, 2005).

Table 9: Work permits issued to South African doctors, 2000 to 2005

	2000	2001	2002	2003	2004	2005	Total
Doctor	0	101	513	363	256	140	1373

	2000	2001	2002	2003	2004	2005	Total
Medical practitioner	63	150	95	81	30	8	427
Total	63	251	608	444	286	148	1800

Source: UK Home Office, 2006.

Another OECD study quoted repeatedly in South Africa (for example, in the DoH's Human Resources Plan) gives the following statistics for 'practitioners' (including doctors, dentists, veterinarians pharmacists and other diagnostic practitioners) in OECD countries.

Table 10: South African-born 'practitioners' in certain OECD countries in 2001

Australia	1 114
Canada	1 345
New Zealand	555
United Kingdom	3 625
United States	2 282
Total	8 921

Source: OECD (2004a)

In its references to this study, the National Human Resources for Health Planning Framework (DoH, 2006a) cites that part of the OECD report which states that pay was not the prime motive for health professionals leaving the country. They also left because of deteriorating work conditions, increase in workload due to wider access to healthcare, uneven distribution of resources between private and public, urban and rural, exposure to AIDS and other endemic infections diseases like TB, insecurity resulting from delinquency, the lack of suitable equipment and social and racial factors.

However, elsewhere in the OECD report is another set of reasons in which politically contentious issues such as crime and affirmative action feature

strongly. This list also placed higher rates of pay low on the list. The other factors were:

- Insecurity and crime
- Affirmative action
- Deteriorating public education
- Uncertainties about the future, especially for children.
- Perceived fragility of the South African economy
- The transferability of SA qualifications in OECD member countries
- Integration into a knowledge-based global economy with sharply increased competition for skills
- Foreign recruitment.
- Higher rates of pay abroad
- Deteriorating conditions in the public sector.

The report noted, however, that for some medical professionals, mobility is a temporary phenomenon and that they do eventually return to South Africa.

It is probably no consolation that South Africa is not the only country to experience this problem. The migration of health professionals is a world-wide phenomenon and other developing countries, including several African countries, are also losing doctors and nurses in this way. The reasons for emigration are not clear. A study by Awases, Gbary, Nyoni and Chatora (2003), quoted in Lehman and Sanders (2004) says social conflict and unrest are major reasons for emigrating from African countries and ranked above financial incentives and poor working conditions. However, the World Health Report 2006 quotes a report from sub-Saharan Africa that found the following main reasons for migration from four African countries (Cameroon, South Africa, Uganda and Zimbabwe). The top reason was better remuneration, followed by (in descending order of importance) safer environment, living conditions, lack of facilities, lack of promotion, no future, heavy workload, to save money, work tempo, declining health service, economic decline, poor management, to upgrade qualifications.

A study by researchers from University of Washington, Seattle, US, and University of Oxford, UK, (Hagopian, Thompson, Fordyce, Johnson and Hart, 2004) found that of the 77 491 doctors in America who had received their training outside of that country, a total of 5 334 were from sub-Saharan. This number included 1 943 from South Africa. The highest number were from Nigeria (2 158).

This study also found that only 10 medical schools produced 79.4 per cent of the sub-continent's graduates who are practising in the US. The University of the Witwatersrand was top of the list (1053 doctors) followed by the University of Cape Town (655). University of Pretoria was 10th on the list with 132 doctors in the US .

It should be noted that while South Africa is losing health professionals it has over the years, also benefited from the services of foreign doctors, some of whom were recruited by the Department of Health to work in under serviced areas. However, as discussed in the previous section, their numbers have dwindled and are due to decline further due to recent policies designed to prevent the inflow of doctors from other African countries.

The decrease in foreign doctors

At the most conservative estimate, approximately 9.4 per cent (3128) of the registrations on the HPCSA in 2006 were of foreign doctors (identified by their postal addresses). If one considers the numbers of foreign qualifications registered, then the figure rises to 13.6 per cent (or 4536). Unfortunately, the HPCSA is not able to provide more definitive figures so it is difficult to compare these figures with previous estimates – of up to 22 per cent (see Sanders and Lloyd, (2005). Nonetheless there does seem to have been a substantial decrease in the numbers of foreign doctors which is not surprising given the DoH's increasingly restrictive policies on the employment of foreigners.

In 2006 the Department of Health introduced a policy limiting the employment of foreign health professionals to three year contracts which are non-renewable. The

National Human Resources for Health Planning Framework proposes further that the total foreign workforce should not at any stage exceed 5 per cent of the total health workforce in each professional category taken on a broad basis. This means that the Department wishes to restrict the number of foreign doctors to no less than 5 per cent of the total number of medical practitioners. This means reducing the number of foreign doctors by between one half (1 467 doctors) and two thirds (2 875 doctors) to a total of about 1 661 (using 2006 figures). Given that most of these doctors work in the public service and many in rural areas, the effect on the rural public health service will be devastating. Against the total of 9 527 doctors in the public service in 2006, a cut of 1 467 represents a loss of 15 per cent and 2 875 a loss of 30 per cent.

The policy outlined above is designed to prevent an influx of doctors from elsewhere in Africa and is the result of a commitment to the governments of other African countries.

Whether it is a good idea or not is debatable. Firstly, the policy has the effect of preventing doctors from developed countries who wish to come to South Africa for a variety of reasons (including altruistic reasons and a desire to gain clinical experience).

Secondly, there is evidence(eg from Hagopian et al, 2004) that sizeable numbers of African doctors emigrate to other overseas countries including the UK and US, which means they are likely to leave the continent if they are not allowed into South Africa. In many cases they leave because the situations in their countries are intolerable for political or economic reasons or both.¹

South Africa is in a Catch 22 situation. If we allow them into our country, we will be helping to deplete their home country's meagre medical resources and we will antagonise its government. However, if these doctors leave the continent the chances are they will also lose touch with their African roots, with consequences for future generations. If they do not practise as doctors and lose their skills, then the education which they received at Africa's expense will be wasted entirely. This is less likely if

¹ Individuals who have acquired refugee status are permitted to apply to the HPCSA for registration and if this is granted they are permitted to work here, provided they do so in a public service, 'underserve' institution.

they stay in South Africa. By contributing to South Africa's health system they will also contribute, albeit indirectly, to South Africa's ability to support the rest of the continent in other respects. These are the issues for which there seems to be no ideal solution.

The government is not entirely averse to foreign doctors, however, as long as they enter the country in terms of a government-to-government agreement such as that which led to the arrival of Cubans in 1996. The Cuban doctors will be discussed in detail in the next part of this report. Suffice it to say at this stage, that they have never been more than about 400 and their numbers are dwindling. In another government-to-government agreement, 16 Iranian doctors were brought to North-West Province (Ntuane, 2006) and there have been announcements that at least 1000 doctors will come from Tunisia (Warby, 2007). So far, according to official reports, we have seen only Tunisian ophthalmologists.

Equity issues in the medical workforce

It is probably not necessary to state that all government policies since 1994 have been underpinned by a commitment to principles of equity and redress, primarily on grounds of race but also gender. Against this background it is important to consider the race and gender profile of the medical workforce and later, of the student population of the medical schools, particularly as entrance criteria are increasingly geared towards 'normalising' the student profile. It will be noted later in this report that women have come to outnumber men in medical school enrolments (the ratio was 56:44 in 2005). In the profession itself the increase is much slower.

Table 1 showed the increase in numbers of medical practitioners between 2000 and 2006: a 14 per cent growth in the seven year period with an annual average growth of around 1.8 per cent.

The gender breakdown in Table 11 reflects a higher than average growth in female numbers (24 per cent compared with 6 per cent for males) but the annual average growth for females, at 5.6 per cent, means that it will take about 22 years for females to begin to outnumber males, if males also continue to grow at current rate (1.5 per

cent). In 2006, males formed 70 per cent of the medical workforce and females 30 per cent.

Table 11: Registered medical practitioners, by gender, 1999– 2006

Year	Male		Female		Total	
	No	%	No	%	No	%
2002	21881	73%	8022	27%	29903	100%
2003	22066	72%	8512	28%	30578	100%
2004	22305	71.50%	8909	28.50%	31214	100%
2005	22750	71%	9447	29%	32198*	100%
2006	23250	70%	9966	30%	33220*	100%
%	6%		24%		11%	
change						
2002-						
2006						
Av.	1.5%		5.6%		2.7%	
Annual						
growth						

Source: HPCSA (2002 to 2006)

**One person did not disclose their gender*

PERSAL data (see Table 12) below shows that blacks (in the generic sense to include Africans, Coloureds and Indians) formed more than 60 per cent of the doctors in the public service in 2005. Nonetheless whites remained the majority of the specialists, although their proportions were decreasing (from 61.6 per cent in 2005 to 57.2 per cent in 2007).

Table 12 also shows that the HPCSA roll has not recorded the race of 26.4 per cent of the doctors registered. It is not compulsory for doctors to declare their race when

registering and so this gap is likely to have been caused by practitioners who were not willing to do so. A breakdown of the total that takes account of this gap provides proportions of Africans, Coloureds and Indians that are considerably lower than those for the public sector. When the number who did not declare race was excluded from the total then the proportion of whites was even higher. The indication is that whites were more likely to report their race than the other race groups and there are in any case more whites on the register than blacks. This would also indicate a higher proportion of whites in the private sector, as confirmed by the PERSAL breakdown. Whites formed 45.5.0 per cent of the public sector doctors in 2005, decreasing to 41.8 per cent in 2007.

Table 12: Medical practitioners on the PERSAL and HPCSA registers, by race, 2005-2007

Year	Sector	Category	African		Coloured		Indian		White		Other		Total	
			N	%	N	%	N	%	N	%	N	%	N	%
2005	Public (PERSAL)	MPs	3295	37.7%	386	4.4%	1651	18.9%	3415	39.0%	-	-	8747	
		Specialists	617	17.6%	110	3.1%	618	17.7%	2154	61.6%	-	-	3499	100%
		Total	3912	32.0%	496	4.1%	2269	18.5%	5569	45.5%	-	-	12246	100%
2006	Public (PERSAL)	MPs	3759	39.5%	455	4.78%	1854	19.5%	3459	36.3%	-	-	9527	
		Specialists	675	18.3%	127	3.4%	665	18.0%	2228	60.3%	-	-	3695	100%
		Total	4434	33.5%	582	4.4%	2519	19.1%	5687	43.0%	-	-	13222	100%
2007	Public (PERSAL)	MPs	4103	41.2%	453	4.5%	1861	18.7%	3542	35.6%	-	-	9959	
		Specialists	794	19.8%	172	4.3%	745	18.6%	2289	57.2%	-	-	4000	100%
		Total	4897	35.1%	625	4.5%	2606	18.7%	5831	41.8%	-	-	13959	100%
2007	All (HPCSA)	Total	5143	15.0	481	1.4%	4269	12.4%	15367	44.8%	9064	26.4	34324	
2007	All (HPCSA)	Total	5143	20.4%	481	1.9%	4269	16.9%	15367	60.8%	Excluded		25260	

Vacancies

The Health Systems Trust, drawing on PERSAL data, states that 29.9 per cent of medical practitioner posts in the public service were vacant (this amounts to 4083 posts) rising to 34.1 per cent (5103) in 2007. Nurses were even higher (31.5 per cent and 36.3 per cent respectively) and of health professional posts in general 29.0 per cent and 33.3 per cent respectively were vacant.

Hall and Erasmus (2003:530-531) considered replacement demand due to a range of different factors including retirement, death and migration. They calculated that if the overall ratio of physicians at that time (6.5 per 10 000) were to be maintained, then by 2011, 3815 medical practitioner positions would need to be filled because of retirement, 5038 positions because of death and 630 positions because of emigration.

Calculations for this report show we need 6450 more doctors in the public service to bring our public sector provision to world norms for low income countries (5 doctors per 10 000 population). See page 13.

HSRC study of vacancy rates

As part of its broader study on scarce and critical skills, the HSRC conducted a study of vacancy rates in a range of occupations. The study consisted of two parts: 1) an analysis of the DoL's job vacancy database, and 2) a survey of employers who had recently advertised vacancies in the Sunday Times. The study results are reported and analysed in full in Erasmus (2007). The following is a summary of the general methodology and those results which are directly relevant to the medical nursing profession.

An analysis of the DoL's job vacancy database

Since April 2004 the DoL's Labour Market Information Unit (LMIU) has been capturing job vacancies advertised in the Sunday Times Career supplement and analysing the data on a quarterly basis (DoL, 2006).² Occupation(s) are used as the unit of analysis. The DoL's data capturers classify and code the advertised job titles according to the South African Standard Classification of Occupations (SASCO) system. However, it was recently deemed appropriate to classify the job titles using the Organising Framework for Occupations (OFO) and recode accordingly. The OFO, which was developed by the DoL, is based on the SASCO but represents a significant enhancement in respect of providing a skill-based coded classification system, which encompasses all occupations in the South African context. Occupations are classified into eight *major groups*: 1 Managers; 2 Professionals; 3 Technicians and Trades Workers; 4 Community Workers and Personal Service Workers; 5 Clerical and Administrative Workers; 6 Sales Workers; 7 Machinery Operators and Drivers and 8 Elementary Workers. Occupations in each major group are classified into *sub-major groups* (2 digit level). Occupations in sub-major groups can be classified into *minor groups* (3 digit level) and then into *unit groups* (4 digit level). SETAS are required to use the OFO in identifying scarce and critical skills in their sector skills plans. Using the OFO to classify advertised vacancies also allows alignment with the scarce and critical skills list developed each year by the DoL as the basis for the immigration quotas published by the Department of Home Affairs.

² Erasmus (2007) examines the many limitations of the DoL's vacancy database. One of the limitations is that although the DoL's vacancy database also includes variables such as the *salary* offered (if stated by the employer in the advert), the DoL's data capturers did not capture salary data consistently and therefore no analysis of salaries is presented in this report. The remuneration variable is important because it can be used to determine whether employers are willing to offer a higher salary package currently paid in occupations of the same type and quality (or as opposed to a previous year). If so, it may confirm scarcity in an occupation.

For the purposes of this study the data captured every week over a period of three years – from April 2004 to March 2007 – was used as the basis for analysis and was also taken as the sample population for the survey. The analysis showed:

- There were a total of 112 828 vacancy adverts in this period.
- The largest share of job vacancy adverts were placed in search for Professionals (50,37 per cent) and for Managers (30,52 per cent).
- A total of 17 479 vacancies were for Health Professionals which accounted for 30,76 per cent of all professional vacancies over the three years under review.
- Across the three year period, the largest share of job vacancy adverts in the Health Professionals category were placed in search of Midwifery and Nursing Professionals (43,59 per cent), followed by vacancies for Medical Practitioners (35,87 per cent) and for Health Diagnostic and Promotion Professionals (16,04 per cent). Health Therapy Professionals accounted for 4,50 per cent of the advertised vacancies. (See Table 13 below).

Table 13: Number and share of vacancies for Health Professionals, by year and by minor group

	Number of vacancies published				Share of vacancies			
	04/05	05/06	06/07	3 years	04/05	05/06	06/07	3 years
25 Health Professionals								

Total ¹	4616	6955	5908	17479	32.72	34.98	25.87	30.76
251 Health Diagnostic and Promotion Professionals	566	1123	1115	2804	12.26	16.15	18.87	16.04
252 Health Therapy Professionals	183	234	370	787	3.96	3.36	6.26	4.50
253 Medical Practitioners	1963	2116	2190	6269	42.53	30.42	37.07	35.87
254 Midwifery and Nursing Professionals	1904	3482	2233	7619	41.25	50.06	37.80	43.59

¹ The 'total' number of advertised job vacancies relates to the total number appearing in the OFO recoded database, rather the total number of advertisements placed every year in the Sunday Times.

Of the 6269 advertised job vacancies for medical practitioners, the greatest proportion (3816 or 60.87 per cent) were for 'generalist medical practitioners', followed by internal medicine specialists (1487 or 23.72 per cent). Nearly all the vacancies (95 per cent) were for public service positions.

Table 14: Number and share of vacancies for Medical Practitioners, by year and by unit group

	Number of vacancies				Share of vacancies			
	published							
253 Medical Practitioners	04/05	05/06	06/07	3 years	04/05	05/06	06/07	3 years
Total ¹	1963	2116	2190	6269	42.53	30.42	37.07	35.87

2531 Generalist Medical Practitioners	1306	1345	1165	3816	66.50	45.56	46.18	51.30
2532 Anaesthetists	38	46	6	90	1.93	1.56	0.24	1.21
2533 Internal Medicine Specialists	363	320	804	1487	18.48	10.84	31.87	19.99
2534 Psychiatrists	22	27	8	57	1.12	0.91	0.32	0.77
2535 Surgeons	114	107	7	228	5.80	3.62	0.28	3.06
2539 Miscellaneous Medical Practitioners ²	120	271	200	591	6.11	12.81	9.13	9.43

¹ The 'total' number of advertised job vacancies relates to the total number appearing in the OFO recoded database, rather the total number of advertisements placed every year in the Sunday Times.

² This Unit Group covers Medical Practitioners not elsewhere classified. It includes Dermatologists, Emergency Medicine Specialists, Obstetricians and Gynaecologists, Ophthalmologists, Pathologists and Radiologists. Medical Registrars who are training as one of these specialists are included in this group.

Table 14 shows that the number of vacancies placed for Medical Practitioners has stayed relatively constant over the three years. However, the number of advertised vacancies within each unit group fluctuated to the extent that no deductions can be made. The erratic nature of the number of vacancies may be attributed to two factors: Firstly some vacancies could have been published repeatedly during that year and secondly there could have been incorrect classification and coding of advertised job titles.

Table 15: Total job vacancies for Medical Practitioners

OFO Occupational Group	Year 1	Year 2	Year 3	% Change	r ² -
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				y1-y3	y1-y2	y2-y3		
253 Medical Practitioners	1963	2116	2190	11.56	7.79	3.50	→→	0.9612
2531 Generalist Medical Practitioners	1306	1345	1165	-10.80	2.99	-13.38	→↘	0.5543
2532 Anaesthetists	38	46	6	-84.21	21.05	-86.96	↗↘	0.5714
2533 Internal Medicine Specialists	363	320	804	121.49	-11.85	151.25	↘↗	0.6775
2534 Psychiatrists	22	27	8	-63.64	22.73	-70.37	→↘	0.5052
2535 Surgeons	114	107	7	-93.86	-6.14	-93.46	→↘	0.7988
2539 Miscellaneous Medical Practitioners	120	271	200	66.67	125.83	-26.20	↗↘	0.2804

A survey of employers who have recently advertised vacancies in the Sunday Times

The second part of the study was a telephone survey of employers that had recently advertised vacancies in the Sunday Times. This part drew on the methodology of a New Zealand survey of employers (NZDoL, 2005). An important feature of the New Zealand study is that it regards the fill rate as a key indicator of skill shortage, with occupations with fill rates lower than 80 per cent regarded as being in shortage.

The HSRC survey consisted of two main parts:

- A large sample telephone survey of 2 000 employers that had recently advertised vacancies across all occupations, using a short questionnaire designed to collect information on whether advertised vacancies were being filled, and the number and suitability of applicants.
- A small sample in-depth interview survey of 200 employers in selected professional occupations. In addition to questions asked in the large sample survey, qualitative questions were included to cover issues such as the supply and demand forces that are contributing to shortages, the implications for the employer of their inability to fill vacancies, and their response to this.

As Table 17 shows, a total of 207 employers were interviewed for vacancies across the three minor occupational groups of Health Professionals, using the OFO. The respondents collectively stated 799 vacancies of which 457 (57,20 per cent) were filled.

A fill rate of below 80 per cent was recorded at every minor group level of occupations in the Health Professions. Health Therapy Professionals recorded the highest fill rate (72,97 per cent) and Medical Practitioners the lowest at 54,15 per cent. The fill rate for Midwifery and Nursing Professionals was 56.43 per cent. In terms of the New Zealand DoL study, this constitutes a shortage at every level.

Table 16: Short questionnaire survey results for Health Professionals vacancies (minor group level)

OFO Occupation (sub-major group)	Inter- viewed	Vacan- cies	Filled	Fill Rate	Appli- cants	Suit- able	Rate
25 Health Professionals	207	799	457	57.20	3048	968	31.76

OFO Occupation (sub-major group)	Inter-viewed	Vacancies	Filled	Fill Rate	Applicants	Suitable	Rate
251 Health Diagnostic and Promotion Professionals	59	142	87	61.27	584	163	27.91
252 Health Therapy Professionals	14	37	27	72.97	163	44	26.99
253 Medical Practitioners	91	301	163	54.15	1239	377	30.43
254 Midwifery and Nursing Professionals	43	319	180	56.43	1062	384	36.16

It should be noted that shortages were not necessarily across all occupations within a minor group (coded to 3 digits) such as “Medical Practitioners’ or ‘Midwifery and Nursing Professionals’. One needed to take account of unit groups (coded to 4 digits) to see the specific occupations with the lowest vacancy fill rates. In the case of Medical Practitioners it was ‘Generalist Medical Practitioners’ and ‘Internal Medicine Specialists’ which had the lowest vacancy fill rates and among Midwifery and Nursing Professionals it was Registered Nurses. Other professions with high vacancy fill rates were: Dieticians (2511), Medical Imaging Professionals (2512), Pharmacists (2515), Complementary Health Therapists (2522), Dental Practitioners (2523) and Speech Professionals and Audiologists (2527).

Table 17 shows the results of the short questionnaire survey conducted among 91 employers who advertised vacancies for Medical Practitioners in the Sunday Times. All or most of the vacancies for Anaesthetists (100 per cent), Psychiatrists (100 per cent) and Miscellaneous Medical Practitioners (99,68 per cent) were filled. Forty-six employers that had advertised 160 vacancies for Generalist Medical Practitioners had managed to fill 90 (56,25 per cent) of the vacancies. Thirty-four employers that had advertised vacancies for

Internal Medicine Specialists reported that they were able to fill only 43 (39,45 per cent) of the 109 advertised vacancies. None of the employers that had advertised vacancies for Surgeons were interviewed. This is a limitation of this study, given that a declining interest in surgery as a career has been widely reported (ASSA, 2006).

Table 17: Short questionnaire survey results for Medical Practitioners vacancies (minor group level)

OFO Occupational Group	Inter- viewed	Vacancies	Filled	Fill Rate	Applicants	Suitable	Rate
253 Medical Practitioners	91	301	163	54.15	1239	377	30.43
2531 Generalist Medical Practitioners	46	160	90	56.25	232	135	58.19
2532 Anaesthetists	2	3	3	100.00	5	4	80.00
2533 Internal Medicine Specialists	34	109	43	39.45	224	85	37.95
2534 Psychiatrists	1	1	1	100.00	1	1	100.00
2535 Surgeons	0	0	0	0.00	0	0	0.00
2539 Miscellaneous Medical Practitioners	8	28 ¹	26	99.68	777	152	19.56

¹ Includes vacancies for Forensic Analysts/Officers (27), Forensic Pathology Officer (not stated), and Chief Specialist: Radiology (1)

Eleven (of the 91) employers referred to above also responded to the in-depth questionnaire (Table 18). They had been looking to fill vacancies for Principal-, Chief-, or Senior- Medical Officers (28), Principal-, Chief-, or Senior- Specialists (3 of which 1 was for an Anaesthetist). All the positions were in the public sector.

Table 18: In-depth questionnaire survey results for Medical Officers and Specialists (unit group level)

OFO Occupational Group	Inter-viewed	Vacancies	Filled	Fill Rate	Applicants	Suitable	Rate
Medical Officers	8	28	13	46.43	31	29	93.55
Specialists	3	3	3	100.00	14	12	85.71

Although all the “Specialist” vacancies were filled, the three employers concerned were of the opinion that there is a shortage of “Specialists” in South Africa. They attributed the shortage to factors such as:

- the “brain drain” (“Specialists” are going overseas),
- higher salaries are offered in the private sector than in the public sector,
- there is a lack of statistics (in the public sector),
- “Specialists” do not want to become involved in medical research because they can earn more in private practice,
- although better qualified, “Senior Specialists” are earning the same salaries as “Chief Specialists”
- “very” poor working conditions.

The three employers were of the opinion that the quality of training for “Specialists” is good enough.

The eight employers that had advertised vacancies for “Medical Officers” had managed to fill only 13 (46,43 per cent) of the 28 vacancies. Three of the employers had managed to fill all (five) vacancies amongst them within three months of advertising. One respondent was able to fill two out of four vacancies within one month; another could fill four out of 10 vacancies within five months and a third managed to fill only two of six vacancies within seven months of advertising. Two employers could not fill any of the three vacancies among them.

Three employers pointed out the problems experienced in filling vacancies for “Medical Officers”. They reported that they had received a low number of applications and ascribed this to too much competition from other employers coupled with poor terms of conditions (e.g. pay) that were offered to the prospective incumbents. The three employers also indicated that (some) applicants lacked the qualifications the institution demanded of them. Two of the employers were of the opinion that the applicants did not have the required skills and the work experience the company demanded. According to these respondents, the applicants did not have the required attitude, motivation or personality for the job.

Five (of the eight) employers which had advertised vacancies for “Medical Officers” and had responded to the in-depth questionnaire, were of the opinion that there is a shortage of “Medical Officers” in the country. Reasons for shortages include:

- they (“Medical Officers”) are going overseas ... but
- there are not as many coming into the country – one respondent blamed the Department of Home Affairs for low immigration levels: “It's difficult to recruit any doctors ...we have a lot of foreign doctors seeking employment, but we are very restricted by the foreign work force office and I am just not able to employ them ...”

- working conditions (unusual hours of work, tough physical work, danger of injury and low wages), as summarized by one respondent: "... a medical aid company will employ a doctor and offer him a competitive salary as well as sociable hours ... we get affected because we offer the same salary with unsociable hours and a heavy workload due to HIV/Aids"

All the respondents indicated that they may have to increase overtime or may change the way in which existing staff do their jobs in order to cope with a staff shortage. Other strategies to cope with a shortage of "Medical Officers" include:

- five employers will increase advertising/recruitment spend, either through re-advertising or headhunting: "... the only thing we do is re-advertise for lower level posts ... the CEO of the institution was tasked to headhunt" and "... direct recruitment ... talking to various institutions like medical schools and headhunting." Four of these respondents will recruit from overseas.
- four employers will give more training to existing workforce in order to fill the vacancies
- four employers will increase salaries to make the job more attractive
- four employers will use technology as a substitute for labour
- three employers will use contractors
- one employer will outsource work

Five of the eight employers who were interviewed for "Medical Officer" vacancies have reacted to the question: "Would you say that the current quality of training for (occupation) is good enough?" Only one felt that the quality of training is not good enough.

CONCLUSIONS

Data from a variety of sources indicate that there is indeed a shortage of doctors in South Africa in comparison with most other countries in the world, even though we may seem to be well resourced in relation to our poverty-stricken neighbours in Africa. This is both an absolute shortage and a relative shortage. In other words, we are not only in short supply in terms of overall numbers but, to use the categories listed by the DoL, we also have shortages in terms of

- geographical considerations and, closely aligned to this, recruitment and retention difficulties (our shortages are most acute in the public sector and in rural areas). The PERSAL database indicates 5103 public sector vacancies. Calculations for this report indicate we need 6451 extra public service doctors to ensure that our ratio of public sector doctors per uninsured population is at least on a par with the internationally recognized norm for low income countries (5:10 000) whereas it is currently 2.24 per 10 000 across the country and well below 2 per 10 000 in the rural provinces of Eastern Cape, Limpopo and Northern Cape. Even when we take private sector as well as public sector doctors into account, and calculate according to entire population (including insured and uninsured) we have only four provinces with doctor population ratios that are above 5:10 000. They are Western Cape, Gauteng, Free State and KwaZulu Natal. The others range from 1.8 to 4.2 per 10 000 population.

Part Three of this report will show that we also have shortages in terms of:

- equity considerations (too slow a rate of increase in black and female graduates entering the profession)
- replacement demand (numbers of African medical enrolments are increasing but it will take time for them to reach graduation, leading to a shortage of African doctors in the interim. Numbers of female graduates have increased but it will take time for them to reach parity in the profession.)

GOVERNMENT MEASURES TO ADDRESS THE SHORTAGE

Government has introduced a number of measures to address the shortage of doctors, including a scarce skill allowance, a rural allowance, community service, government to government agreements for the importation of doctors and specific legislation designed to boost other forms of health care and to control the geographical distribution of newly registering doctors.

Allowances

The first and most significant measure, for the purposes of this report, is the Scarce Skills Allowance which was introduced in 2004. The introduction of this 15 per cent allowance for medical doctors and medical specialists, among other categories of health professionals, is important because it recognizes, quite clearly, that there is a shortage of doctors (and other health professionals) and tries to compensate accordingly. Indeed it states quite specifically: ‘The allowance shall be payable to the occupational groups that are designated as Scarce Skills’. (DoH, 2004:3) It is surprising in this context, that doctors are not listed in the Department of Labour’s master list of scarce skills. A former chairman of the Immigration Advisory Board of South Africa, Dr Wilmot James, and the secretary of the board, Lyndith Waller, have also argued strongly for the inclusion of doctors on this list, in an article in the Cape Times (James and Waller, 2006).

A further allowance of between 18 per cent and 22 per cent was also introduced in 2004 for doctors and specialists (and other selected health professionals) who work in rural and other ‘inhospitable’ areas within the public service.

Community service doctors

Since 1998, newly graduated medical practitioners, pharmacists and dentists who have completed their internship are required to undergo a year's paid community service. Nurses will also be required to do so from next year. The system was put in place as a measure to alleviate staff shortages in rural and underserved areas. Whether it encourages young doctors to remain in such areas after completion of community service is a moot point (see Reid 2002). However, there is no doubt that the rural service has come to rely on an annual intake of comserve doctors. This is why there is considerable concern as to what will happen next year (2008) when the number drops dramatically as a result of the new policy on internship. Since last year, graduates have been required to complete two rather than one year's internship. The stated reason is that they need more practical training, but there are many who believe this is just another attempt to deal with the shortages in the public sector. The second year of internship will come into effect for the first time next year, with the result that doctors who would have been entering comserve will no longer be doing so. They will only enter comserve in 2009. According to newspaper reports, the Department of Health is pinning its hopes on foreign doctors from Tunisia, Poland and Russia to fill the gap. It is also planning to ask private doctors to do sessions in the public service and community service doctors to stay on at their postings. (Bateman, 2007: Anonymous, 2007a,b).

There has also been some concern as to whether the comserve year is a deterrent to entering the profession and the figures below show that there was a fairly sizeable fall-off in the years 2002 and 2003. However this had improved considerably by 2006 when the number of comserve doctors was only 5 per cent less than the graduates of one year before. However, the 2007 figure shows a fall off of 287 graduates.

Table 19: Numbers of graduates and community service doctors

Year	A= Number of Graduates	B= Number of Community service doctors	A – B
1998	N/A		
1999	1195	1192	
2000	1131	1115	
2001	1229	1194	1
2002	1212	1005	126
2003	1296	1092	137
2004	1399	1128	84
2005	1511	1233	63
2006	N/A	1324	75
2007		1224	287
2008		??	
2009			

Source: DoE HEMIS (2006); HST, 2007.

* The difference between the graduates of year x and the number of comserve doctors in year x+1.

The Cuban doctors

The 'importation' of doctors from Cuba is one of the strategies employed by the Department of Health to increase the staffing of health services in rural areas. With 65 000 doctors for a population of around 11 million, Cuba has the highest doctor-to-population rate in the world (about 59 to 10 000 compared with our 6.7) and has sent thousands of doctors and other professionals to more than 40 countries around the world to assist in their health care programmes.

Professor J A Aguirre, head of the Cuban medical doctors at WSU, said in an interview with the author that the first group of 92 Cuban doctors arrived in February 1996, at the request of President Nelson Mandela, who brokered the government-to-government agreement for South Africa. A further request by President Mandela led to the arrival of 11 Cuban medical academics in February 1997 with Professor Aguirre as their leader. In the years that followed, the number of doctors on the government-to-government programme swelled at one point to over four hundred and the number of medical lecturers to about 35, but numbers are now dwindling. At the time of the interview (June 2005), there were only 168 doctors and 26 lecturers on the programme. When asked why this was so, Prof Aguirre explained that some of the doctors had decided to return to Cuba and had not been replaced. Furthermore, the Cuban government had begun supporting countries which it perceived as having a greater need than South Africa, particularly countries in South America but also other countries in Africa, including Lesotho, Zimbabwe, Namibia, Botswana, Mali and Nigeria. There are currently around 20 000 doctors in Venezuela alone.

However, if numerous media reports are anything to go by, it is likely that the Cuban government is displeased by the number of Cuban doctors who have opted out of the programme to stay in South Africa, some after marrying local women, and feels that Cuba's political and economic interests are better served by sending doctors elsewhere.

Doctors who come to South Africa as part of this agreement have gone through a strict selection process, first by the Cuban Department of Health and then by expert representatives of the HPCSA. As part of the deal, they get immediate registration with the HPCSA without having to go through the usual examination procedures for foreign doctors, and an immediate work permit. They are paid the same rates as local doctors, while their normal salary continues to be paid into their personal accounts in Cuba. Although they have to send a large portion of their South African salaries back to Cuba (30 per cent to the Cuban government and 27 per cent to a personal account), they still find it financially advantageous to work in this country as doctors in Cuba are paid very low salaries (OECD 2004a). A condition of employment is that they will vacate their post if a South African happens to apply for it. If they decide to stay in South Africa, they have to quit the programme, return to Cuba and apply from there to work here, following the rules that apply to all other foreign doctors.

Cuba has also assisted South Africa by offering 60 scholarships a year to South Africans to study medicine in Cuba, Prof Aguirre said, and there are currently about 300 medical students who are being trained or were trained in this way. They study one year of Spanish and then five years of medicine before returning to South Africa to do their final clinical rotations and community service. They are required to remain in the public service for five years after completion of their studies and they are deployed by their respective provinces to hospitals where their services are needed most. By July 2007 a total of 470 South Africans had been enrolled in this programme of whom 91 had qualified as doctors (Department of Health, 2006b).

The South African Government has also brought 16 doctors from Iran and is currently negotiating for a thousand-odd doctors from Tunisia, according to reports in its official BuaNews (2006).

Legislation

Among the many acts and regulations emanating from the DoH since 1994 are a number designed specifically to correct the imbalance between rural/urban public/private provision.

- The Pharmacy Amendment Act of 1997 extended ownership of pharmacies to people other than pharmacists to ensure adequate distribution in rural and under-served areas.
- The National Health Act of 2003, promulgated in 2004, specified that private practitioners must obtain a ‘certificate of need’ to practice in a particular area. Before such a certificate is issued or renewed the Director General of Health must consider a number of factors including ‘the need to promote an equitable distribution and rationalization of health services and health care resources’ and ‘an appropriate mix of public and private health services’ (DoH 2003:44).
- The Traditional Health Practitioners’ Act of 2004 promulgated in 2005, provides for the establishment of an Interim Traditional Health Practitioners Council and for the registration, training and practices of traditional health practitioners with the aim of serving and protecting the interests of those who use these services. It has been estimated that there are 200 000 traditional healers practicing in South Africa and that they are consulted by 80 per cent of the population, before or instead of consulting biomedical practitioners (Padarath et al, 2003).

Responses from the medical profession

In February 2004 an estimated 2000 doctors took the unprecedented step (in South Africa) of marching through Cape Town in protest against a wide range of issues, mostly about conditions in the public sector but also about the certificate of need.

In their memorandum, presented to a representative of the minister of health, the doctors listed a wide range of complaints that covered both the private and public sectors.

In relation to the public health system, they complained of :

- poor working conditions;
- lack of adequate career pathing;
- the inability of doctors to negotiate directly with their employers;
- lack of action from the health department in response to a reasonable proposal on restructuring doctors' pay packages submitted two years ago;
- that the new R500 million scarce skills allowance was non-pensionable;
- the abolition of tax exemption for public sector health care professionals for the annual mandatory fees for various professional bodies;
- recurring difficulties around community service placements;
- the proposed two year internship;
- and attrition of staff from academic and tertiary institutions.

In relation to the private sector, they complained about the Certificate of Need and the requirement that dispensing doctors would need to apply for licences from the director general of the Department of Health, ‘depriving many destitute South Africans of these basic benefits’. In addition, SAMA asked for increased budget allocation for health care, a separate bargaining chamber for health care professionals and the inclusion of the profession in meaningful consultations on key health policy decision-making (Cape Argus, 5 February, 2004)

There have also been huge controversies around the Government’s stance on HIV/AIDS and the role of the current Minister of Health in particular. She has become a divisive rather than rallying force in the health sector and is very likely contributing to the professional disillusionment that our emigration and other figures indicate. Unfortunately, there have been no studies to quantify these effects. (See Breier and Wildschut, 2006, for a detailed discussion of the issues).³

Public sector administration

The memorandum which doctors presented to the Department of Health after their protest march and the many banners they displayed at the march reflect a number of concerns with the administration of the health system. In interviews with the author, doctors in the Mthatha area complained about the inefficiency of the Provincial Administration and some hospital managers. They said they were often not paid on time (particularly community service doctors) and there were often long delays between the ordering of equipment and its delivery. They had intolerably heavy workloads, in part because of the shortages of staff but also because of the pressures

³ The following are just a few of the countless articles containing criticisms of the minister which have been published by Independent Newspapers alone. See Independent Online for many more. ‘Mbeki still HIV and AIDS dissident –Guardian’ (Anonymous,a, 2007); ARV Rollout a shambles – report (Green, 2004); SA lagging behind WHO targets for Aids care (Roelf, 2005); Scientists call for Manto’s Removal (Blandy, 2006); AIDS Scientists were laughing at SA (Smetherham, 2004); Manto’s diet now includes beetroot and lemons (Terreblance, 2004); Deputy health minister fired (Anonymous,b, 2007). Newspaper reveals more ‘revelations’ (Anonymous,c, 2007); Manto Motion due in Parliament (Quintal, 2007).

associated with HIV/AIDS. Their salaries were too low and they had no clear career paths. At the same time, they were living in a town with a decaying infrastructure and few amenities. In brief, there was little to keep them in the town if they had other options. (Not surprisingly, there are very few South African doctors working in Mthatha on a permanent basis. The medical school is staffed almost entirely by foreign doctors who, although aware of the issues, are not allowed to work elsewhere.)

The role of good management in the provision of quality public health care was highlighted recently when the Kimberley Health Centre received a prestigious Impumelelo award for being a 'model in hospital management', (Nicol, 2004). The CEO appointed in 1999, Dr D D Madyo, (now promoted to a provincial administration post) led a concerted push to revitalize health services in the province. According to the Impumelelo evaluation report, (Strebel, 2003) the reforms included

- significant savings on budget allocation so that funds were available to upgrade the physical environment and procure specialized medical equipment
- The introduction of private beds which generated additional funds for the hospital.
- A reduction in patient waiting time
- Attention to conditions of employment and career pathing among all levels of staff
- Quality assurance measures.

The evaluation report says a key component of the whole revitalization process has been to shift attitudes and motivation of staff. The CEO has clearly played a major role - from strategic planning to donning overalls to help paint the wards in a hospital 'paint in'.

For the purposes of this report for the DoL, which is concerned with shortages of doctors, particularly in the public service, it is significant that the various measures taken at KHC not only improved service delivery but also attracted new specialist staff to the

hospital. The total number of doctors employed by the KHC grew from 33 in 2000 to 138 in 2003 and the number of specialists from 2 in 2000 to 16 in 2003.

Conclusion

The various measures taken by Government to address the shortage of doctors in the public service have done little to dampen the groundswell of grievances that erupted in the march of February 2004 and continue to emerge, daily, in the South African media. The grievances range from concern about public service conditions – physical and human resources and rates of pay – to anger about the Government’s policies on HIV/AIDS. For several years now, the centre of the critique has been the Minister of Health, with her controversial theories on HIV/AIDS and increasingly controversial personal behaviour.

The discussion in this section shows the importance of governance – at central, provincial and hospital level – for the recruitment and retention of doctors. The chapter also shows clearly that Government is well aware that there is a shortage of doctors in the country - in the public service in general and in the rural service in particular - and has taken a number of steps to combat the shortage. These include the introduction in 2004 of a ‘scarce skills’ allowance, which recognizes quite clearly that there is a general shortage of doctors in the public service, and a rural allowance which recognizes that this shortage is particularly acute in rural and some ‘inhospitable’ areas. With this in mind, it is surprising that doctors are not included in the DoL’s scarce skills list.

A further measure to deal with the shortage has been suggested by the DoH in its NHRH plan. This is the proposal that there should be a large scale increase in medical school output. The following section considers the context in which such a proposal has been made, and whether it is feasible.

WILL THE SUPPLY MEET THE DEMAND?

The Department of Health (DoH) in its 'A National Human Resources for Health Planning Framework' (DoH, 2006a) says 'significant shortages and extreme mobility of medical doctors necessitate that production is increased' and proposes that production of medical doctors should increase from approximately 1200 a year (sic) to 2400 a year by 2014. In other words, the department hopes to double the number of graduates in eight years.

The following section of this report considers the feasibility of this ambition by analyzing enrolment and graduation trends at the eight medical schools.

Enrolments

Table 20 shows the number of enrolments in the years 1999 and 2005, with percentage change and annual average growth. The table reflects the following major trends:

- Overall, the numbers of enrolments at the eight medical schools together increased by only 4 per cent in the seven year period with an average annual growth of 0.6 per cent. In 1999 there were a total of 8 180 enrolments. In 2005 there were 8 483.
- There was a decline in numbers and negative annual growth at University of Free State (-3 per cent and -0.5 per cent respectively) and Medunsa (-19 per cent and -3.4 per cent). There was virtually no change at University of Witwatersrand – a

0.3 per cent increase in numbers and a negative growth rate of 0.1 per cent.

- The greatest increases in numbers were at the historically black institutions University of KwaZulu Natal and Walter Sisulu University. UKZN's enrolments grew 35 per cent with an annual average growth of 5.1 per cent while WSU's enrolments grew 54 per cent with an average annual growth of 7.4 per cent. It should be noted that WSU was also the smallest medical school. Its enrolments increased from 310 to 476.
- Of the historically white institutions, Stellenbosch recorded the highest increase in enrolments – 12 per cent with an annual average growth of 1.9 per cent, followed by UCT and Pretoria which both increased their enrolments by 3 per cent, and both achieved average annual growth rates of 0.4 per cent.
- In 2005, UL was the biggest medical school (1399) followed by UP (1285), Wits (1284), KZN (1184), UCT (1107), US(1082), UFS (666) and WSU (476).

Table 20: MBChB enrolments at individual SA medical schools by race and gender, 1999 and 2005, with percentage change

Institution	Year	Male					Female					Grand Total
		Afn	Col	Indian	White	Total Male	Afn	Col	Indian	White	Total Female	
Cape Town	1999	151	69	85	165	470	162	104	81	263	610	1080
	2005	152	52	73	129	408*	232	142	94	227	699**	1107
	Percentage change	1%	-25%	-14%	-22%	-13%	43%	37%	16%	-14%	15%	3%
	Avg annual growth	0.1%	-4.6%	-2.5%	-4.0%	-2.3%	6.2%	5.3%	2.5%	-2.4%	2.3%	0.4%
Free State	1999	58	30	8	263	359	38	12	4	273	327	686
	2005	112	18	13	168	311	98	24	7	226	355	666
	Percentage change	93%	-40%	63%	-36%	-13%	158%	100%	75%	-17%	9%	-3%
	Avg annual growth	11.6%	-8.2%	8.4%	-7.2%	-2.4%	17.1%	12.2%	9.8%	-3.1%	1.4%	-0.5%
Limpopo (Medunsa)	1999	783	13	242	5	1043	545	8	121	2	676	1719
	2005	702	7	52	30	791	536	9	42	21	608	1399
	Percentage change	-10%	-46%	-79%	500%	-24%	-2%	13%	-65%	950%	-10%	-19%
	Avg annual growth	-1.8%	-9.8%	-22.6%	34.8%	-4.5%	-0.3%	2.0%	-16.2%	48.0%	-1.8%	-3.4%

Institution	Year	Male					Female					Grand Total
		Afn	Col	Indian	White	Total Male	Afn	Col	Indian	White	Total Female	
Kwazulu Natal (Natal)	1999	228	10	160	24	422	190	21	228	19	458	880
	2005	341	23	108	11	483	405	45	217	34	701	1184
	Percentage change	50%	130%	-33%	-54%	14%	113%	114%	-5%	79%	53%	35%
	Avg annual growth	6.9%	14.9%	-6.3%	-12.2%	2.3%	13.4%	13.5%	-0.8%	10.2%	7.4%	5.1%
Pretoria	1999	57	20	38	500	615	65	10	41	522	638	1253
	2005	117	17	53	322	509	212	34	62	468	776	1285
	Percentage change	105%	-15%	39%	-36%	-17%	226%	240%	51%	-10%	22%	3%
	Avg annual growth	12.7%	-2.7%	5.7%	-7.1%	-3.1%	21.8%	22.6%	7.1%	-1.8%	3.3%	0.4%
Stellenbosch	1999	8	78	28	367	481	7	67	26	383	483	964
	2005	34	101	37	279	451	54	184	79	314	631	1082
	Percentage change	325%	29%	32%	-24%	-6%	671%	175%	204%	-18%	31%	12%
	Avg annual growth	27.3%	4.4%	4.8%	-4.5%	1.1%	40.6%	18.3%	20.3%	-3.3%	4.6%	1.9%
Walter Sisulu (Transkei)	1999	104	2	34	4	144	126	1	38	1	166	310
	2005	188	10	27	2	227	206	2	41	0	249	476

Institution	Year	Male					Female					Grand Total
		Afn	Col	Indian	White	Total Male	Afn	Col	Indian	White	Total Female	
	Percentage change	81%	400%	-21%	-50%	58%	63%	100%	8%	-100%	50%	54%
	Avg annual growth	10.4%	30.8%	-3.8%	-10.9%	7.9%	8.5%	12.2%	1.3%	-100.0%	7.0%	7.4%
Witwatersrand	1999	84	17	236	247	584	74	12	286	332	704	1288
	2005	239	7	133	164	543	204	17	226	294	741	1284
	Percentage change	185%	-59%	-44%	-34%	-7%	176%	42%	-21%	-11%	5%	0%
	Avg annual growth	19.0%	13.7%	-9.1%	-6.6%	1.2%	18.4%	6.0%	-3.8%	-2.0%	0.9%	-0.1%
Totals	1999	1473	239	831	1575	4118	1207	235	825	1795	4062	8180
	% of total	18%	3%	10%	19%	50%	15%	3%	10%	22%	50%	100%
	2005	1885	235	496	1105	3723	1947	457	768	1584	4760	8483
	% of total	22%	3%	6%	13%	46%	23%	5%	9%	19%	56%	100%
	Percentage change in numbers	28%	-2%	-40%	-30%	-10%	61%	95%	-7%	-12%	17%	4%
	Avg annual growth	4.2%	-0.3%	-8.2%	-5.7%	1.7%	8.3%	11.7%	-1.2%	-2.1%	2.7%	0.6%

**Total includes 2 male students whose race was not known/disclosed.*

***Total includes 4 female students whose race was not known/disclosed.*

Source: Department of Education HEMIS, 2007.

Percentages might not add up to 100 per cent due to rounding

Table 21 highlights the race and gender trends in enrolments. In 1999 the male female proportion was 50:50. By 2005 women formed 56 per cent of the total. UCT had the highest proportion of females in both years.

Table 21: MBChB enrolments at individual SA medical schools by gender, 1999 and 2005

Institution	Male (%)		Female(%)	
	1999	2005	1999	2005
Cape Town	44%	37%	56%	63%
Free State	52%	47%	48%	53%
Limpopo (Medunsa)	61%	57%	39%	43%
Kwazulu Natal (Natal)	48%	41%	52%	59%
Pretoria	49%	40%	51%	60%

Stellenbosch	50%	42%	50%	58%
Walter Sisulu (Transkei)	46%	48%	54%	52%
Witwatersrand	45%	42%	55%	58%
All medical schools	50%	44%	50%	56%

Source: Department of Education HEMIS, 2007.

Percentages might not add up to 100% due to rounding

Table 22 highlights racial proportions at the eight medical schools. Africans formed 33 per cent of the total in 1999 and 46 per cent in 2005 while whites decreased from 41 per cent to 32 per cent and Indians from 20 per cent to 15 per cent. Coloureds increased very slightly from 6 per cent to 8 per cent. In 1999 white women formed the largest single grouping (22 per cent) followed by white males (19 per cent). In 2005 African women formed the largest single grouping (23 per cent) followed by African males (22 per cent).

Table 22: MBChB enrolments at individual medical schools by race and gender in percentages, 1999 and 2005

Institution	Yea	African			Coloured			Indian			White			Total		
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Cape Town	1999	14%	15%	29%	6%	10%	16%	8%	8%	15%	15%	24%	40%	44%	56%	100%
	2005	14%	21%	35%	5%	13%	18%	7%	8%	15%	12%	21%	32%	37%	63%	100%
Free State	1999	8%	6%	14%	4%	2%	6%	1%	1%	2%	38%	40%	78%	52%	48%	100%
	2005	17%	15%	32%	3%	4%	6%	2%	1%	3%	25%	34%	59%	47%	53%	100%
Limpopo (Medunsa)	1999	46%	32%	77%	1%	0%	1%	14%	7%	21%	0%	0%	0%	61%	39%	100%
	2005	50%	38%	88%	1%	1%	1%	4%	3%	7%	2%	2%	4%	57%	43%	100%
UKZN (Natal)	1999	26%	22%	48%	1%	2%	4%	18%	26%	44%	3%	2%	5%	48%	52%	100%
	2005	29%	34%	63%	2%	4%	6%	9%	18%	27%	1%	3%	4%	41%	59%	100%
Pretoria	1999	5%	5%	10%	2%	1%	2%	3%	3%	6%	40%	42%	82%	49%	51%	100%
	2005	9%	16%	26%	1%	3%	4%	4%	5%	9%	25%	36%	61%	40%	60%	100%
Stellenbosch	1999	1%	1%	2%	8%	7%	15%	3%	3%	6%	38%	40%	78%	50%	50%	100%
	2005	3%	5%	8%	9%	17%	26%	3%	7%	11%	26%	29%	55%	42%	58%	100%
Walter Sisulu (Transkei)	1999	34%	41%	74%	1%	0%	1%	11%	12%	23%	1%	0%	2%	46%	54%	100%
	2005	39%	43%	83%	2%	0%	3%	6%	9%	14%	0%	0%	0%	48%	52%	100%
Witwatersrand	1999	7%	6%	12%	1%	1%	2%	18%	22%	41%	19%	26%	45%	45%	55%	100%
	2005	19%	16%	35%	1%	1%	2%	10%	18%	28%	13%	23%	36%	42%	58%	100%
Totals	1999	18%	15%	33%	3%	3%	6%	10%	10%	20%	19%	22%	41%	50%	50%	100%
	2005	22%	23%	45%	3%	5%	8%	6%	9%	15%	13%	19%	32%	44%	56%	100%

Source: Department of Education HEMIS, 2007. Percentages might not add up to 100% due to rounding

Graduations

The graduation trends are reflected in the following three tables. Table 24 shows a 52 per cent increase in the numbers of graduates and an annual average growth of 4 per cent. The increase of more than one quarter in the seven year period is particularly interesting when one considers that during this time enrolments increased by only 4 per cent.

Without figures going back to the early nineties (which are beyond the scope of this study) it is difficult to say whether the increase in graduations is a sign of a long lead time or a sign of lowered standards. The highest increases were at the historically (and currently still) black institutions: UKZN (which nearly tripled its output) and WSU which nearly doubled it). These institutions also increased their enrolments, but not to the same extent. In the seven year period, enrolments increased by 35 per cent at UKZN and 54 per cent at WSU.⁴

⁴ Recently a controversy over exam marking at UKZN Medical School was reported in the press (Beharie, 2006). Academic staff claimed that a directive from the Dean that final year students should be retested after one in five failed their exams, 'erodes the standard of the MVChB degree'.

Table 23: Graduates from SA medical schools by race and gender, 1999 and 2005

Institution	Year	Male				Female						Grand Total	
		Afn	Col	Indian	White	Total Male	Afn	Col	Indian	White	Total Female		
Cape Town	1999		21	17	12	40	90	19	12	11	50	92	182
	2005		15	2	10	21	48	34	17	11	40	102	150
	Percentage change		-28.6%	-88.2%	-16.7%	47.5%	-42.0%	78.9%	41.7%	0	-20%	11.0%	-17.6%
	Avg annual growth		-5.5%	-30.0%	-3.0%	-10.2%	-9.9%	10.2%	6.0%	0.0%	-3.7%	1.7%	-3.2%
Free State	1999		0	1	0	46	47	0	3	0	60	63	110
	2005		8	2	2	30	42	11	4	1	48	64	106
	Percentage change		/	100%	/	-34.8%	-10.6%	/	33%	/	-46.7%	1.6%	-3.6%
	Avg annual growth		/	12.2%	/	-6.9%	-1.9%	/	4.9%	/	-3.7%	0.3%	-0.6%
Limpopo (Medunsa)	1999		148	2	54	0	204	77	2	23	0	102	306
	2005		151	3	14	6	174	109	2	5	4	120	294
	Percentage change		2.0%	50%	-74.1%	/	-14.7%	41.6%	0%	-78.3%	/	17.6%	-3.9%
	Avg annual growth		0.3%	7.0%	-20.1%	/	-2.6%	6.0%	0.0%	-22.5%	/	2.7%	-0.7%
Kwazulu Natal (Natal)	1999		36	1	28	0	65	21	2	26	0	49	114
	2005		59	7	40	4	110	79	12	89	8	188	298
	Percentage change		64.0%	600%	42.9%	/	69.2%	113.7%	500%	242.3%	/	283.7%	161.4%

	Avg annual growth	8.6%	38.3%	6.1%	/	9.2%	24.7%	34.8%	22.8%	/	25.1%	17.4%
Pretoria	1999	1	3	9	93	106	1	0	4	86	91	197
	2005	12	4	8	60	84	18	5	11	79	113	197
	Percentage change	1100.0%	33.3%	-11.1%	-29.0%	-20.8%	1700.0%	/	175%	8.1%	24.2%	0.0%
	Avg annual growth	51.3%	4.9%	-1.9%	-7.0%	-3.8%	61.9%	/	18.4%	-1.4%	3.7%	0.0%
Stellenbosch	1999	0	5	1	73	79	1	5	0	61	67	146
	2005	1	7	8	52	68	2	15	9	56	82	150
	Percentage change	/	40.0%	700%	-28.8%	-13.9%	100%	200.0%	/	8.2%	22.4%	2.7%
	Avg annual growth	/	5.8%	41.4%	-5.5%	-2.5%	12.2%	20.1%	/	-1.4%	3.4%	0.5%
Walter Sisulu (Transkei)	1999	15	1	1	0	17	17	1	3	0	21	38
	2005	24	3	7	1	35	30	1	3	0	34	69
	Percentage change	60.0%	200.0%	600.0%	/	100.0%	76.5%	0.0%	0.0%	/	61.9%	81.6%
	Avg annual growth	8.1%	20.1%	38.3%	/	12.8%	9.9%	0.0%	0.0%	/	8.4%	10.5%
Witwatersrand	1999	11	6	25	49	91	11	3	47	64	125	216
	2005	29	1	35	37	102	16	3	56	70	145	247
	Percentage change	63.6%	-83.3%	40.0%	-24.5%	12.1%	45.5%	0.0%	19.2%	9.4%	16.0%	14.4%
	Avg annual growth	17.5%	-25.8%	5.8%	-4.6%	1.9%	6.4%	0.0%	3.0%	1.5%	2.5%	2.3%
Totals	1999	196	35	102	301	634	126	26	88	321	561	1195
	% of total	16.4%	2.9%	8.5%	25.2%	53.1%	10.5%	2.2%	7.4%	26.9%	46.9%	100.0%

	2005	299	29	124	211	663	299	59	185	305	848	1511
	<i>% of total</i>	19.8%	1.9%	8.2%	14.0%	43.9%	19.8%	3.9%	12.2%	20.2%	56.1%	100%
	Percentage change	52.5%	-40.0%	21.6%	-29.9%	4.6%	137.3%	126.9%	110.2%	-5.0%	51.2%	26.4%
	Avg annual growth	7.3%	-3.1%	3.3%	-5.7%	0.7%	15.5%	14.6%	13.2%	-0.8%	7.1%	4.0%

Other trends which emerge from the above table:

- Graduation figures dropped at UCT (-17.6 per cent), UFS (-3.6 per cent), UL (-3.9 per cent) and stayed the same at UP. Wits saw an increase in graduates of 14.4 per cent and US 2.7 per cent.
- The proportion of African graduates grew from 26.9 per cent in 1999 to 39.6 per cent in 2005, of Coloured graduates from 5.1 per cent to 5.8 per cent and of Indian graduates from 15.9 per cent to 20.4. The proportion of Whites declined from 52.1 per cent to 34.2 per cent.
- In 1999 male graduates outnumbered women (53 per cent compared with 47 per cent) but by 2005 women graduates were in the majority forming 56 per cent of graduates that year compared with males 44 per cent. The highest proportion of female graduates was at UCT (68 per cent in 2005).

The following two tables provide an overview of race and gender proportions across the full seven years.

Table 24: Graduates from SA medical schools by race and gender, 1999 and 2005, in percentages

Institution	Year	Male				Total Male	Female				Total Female	Total
		Afn	Col	Indian	White		Afn	Col	Indian	White		
Cape Town	1999	11.54%	9.34%	6.59%	21.98%	49.45%	10.44%	6.59%	6.04%	27.47%	50.55%	100.00%
	2005	10.00%	1.33%	6.67%	14.00%	32.00%	22.67%	11.33%	7.33%	26.67%	68.00%	100.00%
Free State	1999	0.00%	0.91%	0.00%	41.82%	42.73%	0.00%	2.73%	0.00%	54.55%	57.27%	100.00%
	2005	7.55%	1.89%	1.89%	28.30%	39.62%	10.38%	3.77%	0.94%	45.28%	60.38%	100.00%
Medunsa	1999	48.37%	0.65%	17.65%	0.00%	66.67%	25.16%	0.65%	7.52%	0.00%	33.33%	100.00%
	2005	51.36%	1.02%	4.76%	2.04%	59.18%	37.07%	0.68%	1.70%	1.36%	40.82%	100.00%
UKZN	1999	31.58%	0.88%	24.56%	0.00%	57.02%	18.42%	1.75%	22.81%	0.00%	42.98%	100.00%
	2005	19.80%	2.35%	13.42%	1.34%	36.91%	26.51%	4.03%	29.87%	2.68%	63.09%	100.00%
Pretoria	1999	0.51%	1.52%	4.57%	47.21%	53.81%	0.51%	0.00%	2.03%	43.65%	46.19%	100.00%
	2005	6.09%	2.03%	4.06%	30.46%	42.64%	9.14%	2.54%	5.58%	40.10%	57.36%	100.00%
Stellenbosch	1999	0.00%	3.42%	0.68%	50.00%	54.11%	0.68%	3.42%	0.00%	41.78%	45.89%	100.00%
	2005	0.67%	4.67%	5.33%	34.67%	45.33%	1.33%	10.00%	6.00%	37.33%	54.67%	100.00%
Transkei	1999	39.47%	2.63%	2.63%	0.00%	44.74%	44.74%	2.63%	7.89%	0.00%	55.26%	100.00%
	2005	34.78%	4.35%	10.14%	1.45%	50.72%	43.48%	1.45%	4.35%	0.00%	49.28%	100.00%
Witwatersrand	1999	5.09%	2.78%	11.57%	22.69%	42.13%	5.09%	1.39%	21.76%	29.63%	57.87%	100.00%
	2005	11.74%	0.40%	14.17%	14.98%	41.30%	6.48%	1.21%	22.67%	28.34%	58.70%	100.00%
Totals	1999	16.40%	2.93%	8.54%	25.19%	53.05%	10.54%	2.18%	7.36%	26.86%	46.95%	100.00%
	2005	19.79%	1.92%	8.21%	13.96%	43.88%	19.79%	3.90%	12.24%	20.19%	56.12%	100.00%

Table 25: MBChB graduates at individual SA medical schools by gender, 1999 and 2005

Institution	Male (%)		Female(%)	
	1999	2005	1999	2005
Cape Town	49.5%	32.0%	50.5%	68.0%
Free State	42.7	39.6	57.3	60.4
Limpopo (Medunsa)	66.7	59.2	33.3	40.8
Kwazulu Natal (Natal)	57.0	36.9	43.0	63.1
Pretoria	53.8	42.6	46.2	57.4
Stellenbosch	54.1	45.3	45.9	54.7
Walter Sisulu (Transkei)	44.7	50.7	55.3	49.3
Witwatersrand	42.1	41.3	57.9	58.7
All medical schools	53.1	43.9	46.9	56.1

Source: Department of Education HEMIS, 2007.

Percentages might not add up to 100% due to rounding

Will the DoH meet its target?

The target of 2 400 doctors by 2014 is unrealistic. Firstly, if the current growth rate of 4 per cent continues unchanged, this total of doctors will only be reached in 2018.

Secondly, there is the serious question of infrastructure and human resources to be considered.

It will be noted that the institution with the fastest growing student numbers is Walter Sisulu University which more than doubled its enrolments from 310 to 476 between 1999 and 2005 and achieved a 82 per cent increase in graduates from 38 to 69. This medical school relies almost entirely on foreign doctors to teach its students as shown in Breier and Wildschut (2006). However the DoH is also planning to cut back on foreign doctors allowing them only contracts of three years maximum and cutting their numbers to no more than 5 per cent of the total medical workforce. (Discussed in part 1 of this report.

See DoH, 2006a:68 for details of the new policy and Breier, 2006 for a critique of these developments.)

Specialists

The DoH's national plan also expresses concern about the numbers of black and women graduates who opt for specialist training. A target is to increase the number of female professions enrolling for specialist training by 10 per cent by 2008. Another is to develop, by January 2007, a programme to promote entry of aspirant young black graduates to academic.

The case of UCT

Here the department's concern is echoed in HSRC Research. A case study of specialist training at University of Cape Town (UCT) medical school found that proportions of women students were far lower at postgraduate level than at undergraduate level, although their numbers were increasing quite rapidly thanks to a concerted transformation programme (Breier and Wildschut, 2006). Furthermore, women were concentrating in certain disciplines such as psychiatry and paediatrics while others, surgery in particular, were attracting very few women at all.

Between 1999 and 2005 women students increased from 28 per cent to 42 per cent of MMed enrolments and male students declined from 73 per cent to 58 per cent. African male MMed enrolments increased by 43 per cent (from 37 to 53 students, although they peaked at 61 in 2002). African females increased steadily from 9 to 34 (278 per cent). There were the same number of coloured males in 2005 as in 1999 (17) but the numbers fluctuated from year to year with a peak of 26 in 2000. Coloured females increased fairly steadily from 9 to 19 (111 per cent). Indian males decreased from 31 to 27 (minus 13 per cent) while Indian females increased by 80 per cent from 10 to 18. White males dropped 37 per cent from 227 to 143 and white females increased by 11 per cent from 91 to 101.

Overall student numbers also dropped – from a total of 431 in 1999 to 415 in 2005 (a decrease of 4 per cent).

Although female numbers at MMed level increased by nearly one half in the seven year period, the increase was not spread evenly across all of the 28 specialist disciplines.

Table 26: University of Cape Town M Med enrolments by race and gender, in numbers and percentages, 1999 to 2005

	African		Coloured				Indian		White				TOTAL									
	M		F		M		F		M		F		M		F		T					
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%				
1999	37	9%	9	2%	17	4%	9	2%	31	7%	10	2%	227	53%	91	21%	312	72%	119	28%	431	100%
2000	45	10%	15	3%	26	6%	11	3%	28	6%	8	2%	210	49%	85	20%	309	72%	119	28%	428	100%
2001	50	12%	19	4%	24	6%	12	3%	23	5%	9	2%	195	46%	94	22%	292	68%	134	31%	426	100%
2002	61	14%	31	7%	23	5%	12	3%	18	4%	8	2%	163	39%	105	25%	265	63%	156	37%	421	100%
2003	55	13%	35	8%	21	5%	15	4%	23	5%	14	3%	166	39%	91	22%	265	63%	155	37%	420	100%
2004	59	13%	34	7%	20	4%	20	4%	26	6%	13	3%	177	39%	106	23%	282	62%	173	38%	455	100%
2005	53	13%	37	9%	17	4%	19	5%	27	6%	18	4%	143	34%	101	24%	240	58%	175	42%	415	100%
% change			311						111													
1999 to 2005	43%		%		0%		%		-13%		80%		-37%		11%		-23%		47%		-4%	

Source: University of Cape Town Faculty of Health Sciences (2005)

Percentages might not add up to 100% due to rounding

In 1999 the top five choices for women MMed students were psychiatry and paediatrics (which each had 18 female students), anaesthesiology and medicine (which each had 13) and obstetrics and gynaecology (12). These disciplines together accounted for 62 per cent of the total female enrolments at MMed level. In 2005, there were not only a greater number of women doing postgraduate study they were also spread more widely. Nonetheless, the top five choices still included paediatrics (23), anaesthesiology (22), obstetrics and gynaecology (21) and psychiatry (21). Public health was the fifth most popular choice (13). Together these five disciplines accounted for 57 per cent of the total female enrolments.

Table 27. M Med enrolments at UCT by race and gender, 1999 and 2005

	1999					2005				
	Male		Female		Total	Male		Female		Total
	N	%	N	%	N	N	%	N	%	N
ANAESTHESIOLOGY	45	78%	13	22%	58	20	48%	22	52%	42
CARDIO-THORACIC SURGERY	6	75%	2	25%	8	8	89%	1	11%	9
CLINICAL PHARMACOLOGY	0		0		0	1	25%	3	75%	4
DERMATOLOGY	1	25%	3	75%	4	3	33%	6	67%	9
DIAGNOSTIC RADIOLOGY	11	65%	6	35%	17	13	52%	12	48%	25
EMERGENCY MEDICINE	0		0		0	6	40%	9	60%	15
MEDICINE	52	80%	13	20%	65	41	77%	12	23%	53
NEUROLOGY (MED)	2	67%	1	33%	3	2	40%	3	60%	5
NEUROSURGERY	10	63%	6	38%	16	7	100%	0	0%	7
NUCLEAR MEDICINE	2	100%	0	0%	2	0	0%	1	100%	1
OBS & GYNAE	16	57%	12	43%	28	14	40%	21	60%	35
OPHTHALMOLOGY	8	80%	2	20%	10	5	56%	4	44%	9
ORTHOPAEDIC SURGERY	23	100%	0	0%	23	19	95%	1	5%	20
OTORHINOLARYNGOLOGY	11	100%	0	0%	11	8	89%	1	11%	9
PAEDIATRICS	26	59%	18	41%	44	13	36%	23	64%	36
PATHOLOGY (ANAT)	6	75%	2	25%	8	3	43%	4	57%	7
PATHOLOGY (CHEM)	0	0%	2	100%	2	2	67%	1	33%	3
PATHOLOGY (CLIN)	0		0		0	1	100%	0	0%	1
PATHOLOGY (FORENSIC)	1	33%	2	67%	3	0	0%	1	100%	1

	1999					2005				
	Male		Female		Total	Male		Female		Total
PATHOLOGY (HAEM)	1	33%	2	67%	3	1	20%	4	80%	5
PATHOLOGY (MED MICRO)	1	25%	3	75%	4	0	0%	2	100%	2
PATHOLOGY (VIROLOGY)	1	100%	0	0%	1	2	100%	0	0%	2
PLASTIC SURGERY	6	100%	0	0%	6	5	100%	0	0%	5
PSYCHIATRY	17	49%	18	51%	35	10	32%	21	68%	31
PUBLIC HEALTH	7	54%	6	46%	13	1	7%	13	93%	14
RADIATION ONCOLOGY	9	64%	5	36%	14	9	56%	7	44%	16
SURGERY	45	94%	3	6%	48	36	92%	3	8%	39
UROLOGY	5	100%	0	0%	5	10	100%	0	0%	10
TOTAL	312	72%	119	28%	431	240	58%	175	42%	415

Source: University of Cape Town Faculty of Health Sciences (2005)

Percentages might not add up to 100% due to rounding

Significantly, surgery drew very few female students in the seven year period. Declining interest in surgery as a speciality, in general (Spector 2004; Cockerham, Cofer, Biderman, Lewis and Roe, 2003; Risburg, Hamberg and Johannson, 2003; Riska, 1988), and low numbers of female surgical students, in particular, (Allen, 2005; Risberg et al, 2003; Riska, 1988)) are international phenomena and UCT is no exception. Enrolments in the surgical disciplines (cardio-thoracic surgery, neurosurgery, orthopaedic surgery, plastic surgery and general surgery) declined from 101 in 1999 to 80 in 2005, decreasing to as few as 73 in 2003. Women formed no more than 11 per cent of enrolments in any of the seven years reviewed and some surgical disciplines had no women students at all.

The greatest number of female enrolments was in 1999 when out of a total of 101 surgical enrolments, 11 were women (Table 28). In the remaining years, female students have ranged from 3 to 6 per year or, in percentage terms, from 4 per cent to 8 per cent. White males have dominated the surgical disciplines, followed by African males and white women. There were no African or Indian women in any of the surgical disciplines between 1999 and 2005. There were very few coloured women, not more than one per year, and even white women were few and far between.

The trend at UCT has been confirmed at national level by the Association of Surgeons in South Africa (ASSA) which found that across the country female doctors formed only one tenth of the numbers specializing in surgery. The ASSA Chairperson, Dr Sath Pillay, is quoted in the *Medical Chronicle* as saying that women were deterred from choosing general surgery because of its ‘chauvinistic image’ relative to other specialities (Anonymous, 2006). The shortage of surgeons in the public service generally has also been reported (eg Nofemele, 2006). In some areas surgical departments find it difficult to operate, in all senses of the word. The head of surgery at Nelson Mandela Academic Hospital in Mthatha told the author in 2006 that his department had only 40 per cent of the specialists, 50 per cent of the medical officers, 30 per cent of the surgical nursing staff and 50 percent of the nurses that it needs. Furthermore it could use only six of the 12 intensive care beds because of understaffing. (See Breier and Wildschut, 2006).

Table 28: M Med enrolments for all surgical disciplines* by gender, in numbers and percentages, 1999 to 2005

Year	Male		Female		Total	
	No	%	No	%	No	%
1999	90	89%	11	11%	101	100%
2000	89	96%	4	4%	93	100%
2001	81	96%	3	4%	84	100%
2002	71	95%	4	5%	75	100%
2003	67	92%	6	8%	73	100%
2004	72	92%	6	8%	78	100%
2005	75	94%	5	6%	80	100%

Source: University of Cape Town Faculty of Health Sciences (2005)

Percentages might not add up to 100% due to rounding

* Includes cardio-thoracic surgery, neurosurgery, orthopaedic surgery, plastic surgery and general surgery

Table 29: M Med enrolments for all surgical disciplines by race and gender in percentages only, 1999 to 2005

Year	African		Coloured		Indian		White	
	M	F	M	F	M	F	M	F
1999	12%	0%	2%	1%	9%	0%	65%	10%
2000	14%	0%	3%	1%	9%	0%	70%	3%
2001	14%	0%	4%	1%	8%	0%	70%	2%
2002	13%	0%	4%	0%	8%	0%	70%	5%
2003	14%	0%	7%	1%	7%	0%	64%	7%
2004	17%	0%	5%	1%	6%	0%	64%	6%
2005	20%	0%	5%	1%	6%	0%	62%	5%
Total	15%	0%	4%	1%	8%	0%	67%	6%

Source: University of Cape Town Faculty of Health Sciences (2005)

Percentages might not add up to 100% due to rounding

** Includes cardio-thoracic surgery, neurosurgery, orthopaedic surgery, plastic surgery and general surgery*

The feminisation of medical schools

In South Africa men still dominate the profession, forming nearly three-quarters of registered practitioners. Women's numbers are increasing but far more slowly than the increase in medical student enrolments would seem to warrant. Similar trends have been noted in the UK and US.

In the UK, according to the British Medical Association (BMA) (2004), over 60 percent of all accepted applicants to medical schools in 2003 were female. Here, there has been an interesting debate about the effects on the profession of increasing numbers of women prompted by a statement by Professor Carol Black, president of the Royal College of Physicians, in an interview with the UK Independent on 2 August 2004. Professor Black warned that the medical profession was in danger of losing power and influence because

it was becoming dominated by women. Women doctors were less prepared to sacrifice their personal lives to take on the enormous commitments required to lead the medical profession. They were happier than male colleagues to stay in lower status jobs and less interested in the kind of extra-curricular activities – research, leading professional organisations, chairing committees and so on - that ensured the continuation of the profession. Women tended to be drawn to specialist areas such as geriatrics and palliative care and avoided specialities such as cardiology and gastro-enterology where they would be required to work long hours. She said she would like to see equal numbers of men and women in the profession.⁵

The long-term effect of the feminisation of medical schools is also a concern in the BMA report mentioned above which notes that gender is now a concern in the context of workforce planning.

Concerns have been raised... that the growing proportion of women students in medical school will result in a future health service that is understaffed due to part-time working and career breaks. This is an issue of critical importance. Among the medical graduates of 1977, almost half the women worked part time in the NHS 18 years after qualifying. (BMA 2004: 64)

Other studies have found that a large proportion of women doctors have considered working part-time. It has been suggested that there is a case for biasing entry to medicine towards men on the grounds of women's career choices and the relatively constrained capacity of medical schools, but the author of the report rejects these suggestions as being 'founded on a very questionable basis'. Both men and women are increasingly aiming for flexible training and practice.

⁵ Unable to access the original article, we have made use of the summary by Frayn (2004) and the follow up article in the Independent of 3 August 2004.

Another concern is that fewer women currently choose a career in hospital medicine. At present only one quarter of consultants and 4 per cent of consultant surgeons are women. The relatively small number of women choosing careers in hospital medicine has been attributed partly to the design of postgraduate training for hospital specialities which ‘is based on an “obstacle course” concept and the need to provide 24-hour cover’. Furthermore, the Department of Health found that 37 per cent of female survey respondents were deterred from working in specialities because of inflexible working opportunities (MBA, 2004: 65)

The MBA report aroused a number of heated responses in the British media which are available on the internet. (Frayn, 2004; Hall 2004; Philips, 2004; Hilton, 2004 and *Health News*, 3 August 2004). The gist of their argument is that the medical profession traditionally demands 24 hours service seven days a week from its doctors. When men perform this role, they are usually supported in the background by women, but women doctors do not have that support because society still expects them to bear the brunt of child and home care. They simply cannot work these long hours and therefore choose to work part-time. However it is not only women who would prefer more time for family and leisure. Male doctors would like this too. The answer to the problem lies in the sharing of unpaid labour and in humane conditions for all.

In South Africa, a prominent woman doctor, Professor Jocelyn Kane-Berman, has listed a number of difficulties faced by South African women medical doctors, based on a literature review conducted with the support of the Health Systems Trust. One of the concerns is that doctors are expected to work more than 72 hours per week and to go for 24 hours or longer without sleep. Other difficulties that were identified were:

- discriminatory practices which limit advancement and lead to lower earnings;
- the culture of some surgical disciplines which is inimical to women;
- lack of part-time training opportunities and rewarding jobs;
- no provision for locums for pregnant doctors;
- lack of mentoring and career guidance;

- lack of childcare facilities at the workplace;
- and the predominance of men in positions of power in the medical political hierarchy and in academia (Health Systems Trust, 1998).

In South Africa there have been warnings across nearly three decades that the profession needs to make it easier for women to work and specialise. (See Saxe and Van Niekerk (1979) and Hudson, Kane-Berman and Hickman (1997)). There are also frequent articles in the press exposing the intolerably long hours which public service doctors, particularly interns, are expected to work. If these issues are not addressed there will continue to be attrition between graduation and the profession, with the medical register increasing far slower than the numbers of graduates.

Obstacles to the achievement of racial equity

The figures on enrolments and graduations that have been presented in this section show that the medical schools have made important advances towards the racial equity which is the major principle of higher education policy since 1994. This section considers the pool of matriculants from which their selections must be made and gives some indication why the achievement of racial proportions that reflect those in the country as a whole, are going to be difficult to achieve.

The following table provides a racial breakdown of senior certificate passes in 2006 and shows clearly that the legacy of apartheid, which provided Africans with the cheapest and worst quality education, persists. African students are still not fulfilling their potential. They achieved a pass rate of only 62 per cent, compared with 81 per cent for Coloureds, 92 per cent for Indians and 99 per cent for Whites. Furthermore they formed only 59 per cent of the total that passed with endorsement (against 83 per cent of those that wrote) while Indians formed 7 per cent against 2 per cent and Whites 26 per cent against 8 per cent while Coloured students formed the same proportion of passes with endorsement as they did of those that wrote (6 per cent). A pass with endorsement is usually the minimum requirement for entry to a university. Medical schools, because of the academic

demands of the MBChB programme and the high numbers of applicants, also impose further criteria, which have traditionally been academic.

Table 30: Senior Certificate passes by race, 2006

Race	Number that wrote SC	% of total that wrote	Number of population group that passed	% of total that passed	% of population group that passed	Number of population group that passed with endorsement	% of total that passed with endorsement	% of population group that passed with endorsement
African	442282	83%	272827	77%	62%	51070	59%	12%
Coloured	32977	6%	26864	8%	81%	5465	6%	17%
Indian/Asian	10815	2%	9978	3%	92%	5955	7%	55%
White	42501	8%	41950	12%	99%	22597	26%	53%
Other	2579	1%	2252	1%	87%	1077	1%	42%
Total	531154	100%	353871	100%	67%	86164	100%	16%

Department of Education: figures supplied on request. (2007)

Percentages might not add up to 100% due to rounding

The medical schools' dilemma is exacerbated even further by the relatively low numbers of African students who pass higher grade mathematics and physical science, both requirements for entry to a MBChB programme.

In 2005, of the 43 342 senior certificate candidates who wrote HG Mathematics, 59 per cent were African, 5 per cent Coloured, 9 per cent Indian, 28 per cent white.. There was a 60 per cent pass rate. Of the 26 192 who passed HG Physical Science, 38 per cent were African, 6 per cent Coloured, 13 per cent Indian and 43 per cent White.

In 2005, of the 60 907 senior certificate candidates who wrote HG Physical Science, 69 per cent were African, 3 per cent Coloured, 7 per cent Indian and 20 per cent white. The pass rate was 49 per cent. Of the 29 694 who passed, 45 per cent were African, 5 per cent Coloured, 13 per cent Indian, 37 per cent white.

With these figures in mind, one can see the difficulty in achieving enrolments and graduations that reflect the national population distribution which according to StatsSA (2007) is 79.0 per cent African, 9 per cent Coloured, 2.6 per cent Indian and 9.5 per cent white. It is for this reason that medical schools like UCT have introduced differential entrance criteria which require white and Indian applicants to have achieved much higher senior certificate results than Africans and Coloureds and also show evidence of community service and personal achievement before they will be considered for placement.

New selection criteria

One of the recommendations of the National Human Resources for Health Planning Framework is 'an affirmative action approach to address capacity in rural areas'. The overall objective is to provide human resources 'to render adequate, accessible and appropriate services in an equitable manner in all areas of the country'. It recommends that recruitment criteria for health science students should be revisited to earmark

students from rural and under-serviced areas. Students from such areas should be offered state bursaries and there should be intervention at school level ('targeted preparation of students to enroll in health sciences'.

The suggested policy appears to be based on the premise that students from such backgrounds will be willing to go back to their communities to work but the indications are that this is not necessarily so. Prof Ralph Kirsch, formerly professor of medicine at UCT, has been quoted as saying that the assumption, made in the late 1980s and 1990s that changing the racial and gender profile of students from white male to mostly black and female would mean that students would be less inclined to migrate has 'turned out to be false'.

Poor students have been just as inclined to migrate, perhaps even more so, given the large debts they have to pay (Kirsch, quoted in Financial Mail, Anonymous, 2007d).

Existing research about medical students from disadvantaged backgrounds does not provide a clear picture of their career choices. There have been studies that indicate that rural students are more likely to return to rural areas (de Vries and Reid, 2003). On the other hand, research from WSU Medical School presents a more complex scenario. Most of their students are black (75 per cent African, 22 per cent Indian, 2 per cent coloured and less than one percent white in 2003) and many come from the rural Eastern Cape. The curriculum is entirely problem- and community- based. If any medical school should be producing doctors who are prepared (in all senses of the word) to work in rural areas, it is WSU. But this is not necessarily so.

Dambisya (2003) surveyed 415 students at WSU Medical School in 2002. Out of 347 students who stated their preferred sector of work, 82 per cent chose public hospitals. Out of 376 students who stated place of work preferences, only 7 per cent wanted to work abroad but 50 per cent wanted to work in urban areas and only 27 per cent in rural areas. Fifteen per cent had no preference. Females were

even less inclined to working in rural areas than males. Dambisya also found interest in rural and community work declines as the students progress through their training. Because most of the students at WSU are black, he concluded that his study supports the view that black students are more likely to stay in South Africa than their white counterparts.

Igumbor and Kwizera (2005) reported last year that 36 per cent of graduates from WSU medical school since 1985 were practising in smaller towns and rural settings, while 53 per cent were working in urban areas. Four per cent were overseas (mainly Canada and New Zealand but also Australia, India and the USA) and 7 per cent had died (a startlingly high figure given that even the earliest entrants would have only been around 39 years today). Their research finds in favour of the problem- and community-based curriculum which was introduced in the early 1990s, showing that a greater percentage of graduates from the new curriculum were in rural areas than graduates from the traditional curriculum (66 per cent as opposed to 41 per cent).

Conclusion

Data on medical school enrolments and graduations make it clear that the NHRH Plan's target of doubling the number of graduates by 2014 is unrealistic. It does not take account of the current growth rate and ignores issues of infrastructure and human resources. However, as the figures in the previous section in this report make clear, we certainly need to produce more doctors. We have few medical schools per population compared with other countries and they are understaffed. Dr Kgosi Letlape, chairman of the South African Medical Association (SAMA) has warned that South Africa is not producing enough doctors. He says US has 1 medical school per 2 million population against our 1 per 6 million (Sookha, 2007).

Any plans to expand medical training will not only have to create more medical schools or expand the existing ones, they will also have to secure the academic staff that will be needed to teach in them. This will require attention to salaries and working conditions and the nurturing of a future generation of postgraduates who want to be academics. If the private sector establishes its own medical schools, as has been proposed, then existing schools stand to be further depleted of academic staff.

Although the profile of medical school enrolments and graduates is considerably closer than before to the demographic profile of the country at large, Africans continue to be underrepresented. The results for the Senior Certificate examination show why: although their numbers are improving there are still too few higher grade maths and science passes among African candidates.

CONCLUSIONS & RECOMMENDATIONS

From the statistics available for analysis and bearing in mind the DoL's definitions of scarcity, it is clear that there is a shortage of doctors in South Africa in both absolute and relative terms.

Nowhere in the country do we find the doctors per population norms of even middle income countries internationally. We might compare favourably with our African neighbours but they are the most underserved countries in the world. In World Bank terms we are, overall, are only slightly better than countries defined as 'low income'.

Our shortage is particularly high in the public sector and in rural areas. Figures on vacancy rates make this clear. In the public sector in general, nearly one third of the medical practitioner posts (a total of 5103) are vacant. To bring the number of doctors in the public sector to the international norm for low income countries we would have to raise that vacancy figure to 6450. The DoL's database of vacancies advertised in the Business Times shows that in the three years 2004 to 2007, vacancies for health professionals formed nearly one third of all vacancies for professionals advertised. Of these more than one third (36 per cent) were for medical practitioners. The HSRC survey found a fill rate of 57 per cent for health professionals in general and 54 per cent for medical practitioners. In international terms this is a clear indication of shortage (the New Zealand DoL regards fill rates of less than 80 per cent as signs of shortage.)

In some rural provinces such as the Eastern Cape we have hardly more doctors per population than some of our poorest neighbouring countries. The fact that we have been relying on foreign doctors and community service doctors to prop up the rural services confirms this. At the same time, our commitment to the governments of other African countries that we will not encourage their doctors to come to South Africa, means we are sending back or turning away doctors who would be more than willing to serve in these areas. In generalising the policy to all foreign doctors, including those from developed nations, we are also barring many who come from countries that have more than enough doctors to serve their needs and who wish to work in this country either for various, often altruistic, reasons. The Department of Health is pinning its hopes on government- to-

government agreements but so far these have failed to secure more than a few hundred doctors, mainly Cubans, and their numbers are dwindling.

The DoH's HRH Plan has set a target of doubling the number of medical graduates by 2014. Our research shows this is unrealistic, given existing growth rates and the fact that the plan presents no concomitant plans to expand the existing medical schools or start new schools or, most important of all, to increase numbers of academic staff. There has been very little growth in the numbers of enrolments recently (4 per cent increase between 1999 and 2005) although our numbers of graduates increased by 51 per cent, largely due to very high percentage increases at UKZN and WSU. Whether these increases are due to catch up (from earlier increases in enrolments) or a decline in standards for graduating needs to be investigated.

Our research also indicates two worrying points of attrition: those graduates who do not enter community service straight after completing their internship and the slow rate of increase in the numbers of female registrations (at current rates it will take 21 years for women doctors to reach a 50:50 ratio with male doctors even though they already outnumber males at university where the ratio is 56:44 women to men).

Recommendations

1. The Department of Health accords doctors 'scarce skill' status and provides them with a special allowance because of this. For this, and numerous other reasons documented in this report which confirm the absolute and relative scarcity of doctors, the Department of Labour should act accordingly and place doctors on the scarce skills list for immigration quota purposes. The DoL's Vacancy Survey suggests that we need generalist medical practitioners the most, followed by internal medicine specialists. Qualitative research indicates that we could also experience a shortage of surgeons in the near future due to

declining interest in studying surgery. In all cases we need doctors who are prepared to work in the public sector and preferably in rural or 'inhospitable' areas.

2. The regulations governing the employment of foreign doctors should be revised to draw a distinction between doctors from countries that have fewer doctors per population (as do many African countries) and those from developed countries or countries with sufficient or oversupply. The latter category ought to be welcomed into the country with particular incentives to work in the rural and public service. Contracts should be as long and as renewable as need demands.

3. The failure of the HIV & AIDS and STI Strategic Plan to take account of human resources issues and of the Human Resources for Health Plan to take account of HIV AIDS demands is a serious mistake that needs to be addressed immediately. The DoH needs to arrive at a co-ordinated Human Resources Plan.

4. There should also be urgent measures to recruit doctors and other health professionals back to South Africa, bearing in mind that if any part of the health service becomes depleted all other parts also suffer. So the emigration of nurses or radiographers or physiotherapists is also of great concern to medical practitioners.

5. The slow rate of increase of women doctors in the profession itself as opposed to medical schools and the fall off of community service doctors needs to be investigated. Qualitative research indicates a number of possible reasons for attrition between completion of medical training and entry into the profession, either before or after community service. These include the harsh conditions in the public service which graduates experience in their internship and community service years, the exceptionally long hours which interns are expected to work and the gender-related difficulties which women doctors experience in the profession.

6. The Global Commission on International Migration (2005) has advised developing country institutions that are losing staff to be 'good employers'. The National and Provincial Departments of Health would do well to bear this in mind. Complaints about

public sector administration featured prominently in the memorandum presented to the government after the doctors' protest march in 2004, and in interviews with the HSRC. These are over and above the difficulties experienced by public sector doctors particularly in rural areas. They face long hours, intolerably heavy workloads, in part because of shortages of other staff but also because of the pressures associated with HIV/AIDS. They live in areas with inadequate infrastructure and few amenities. In the country at large, according to an international study, health professionals are experiencing all the discomforts that drive other South Africans to emigrate: insecurity and crime, affirmative action, the deteriorating state of public education and uncertainties about the future.

The dilemma for those who wish to improve conditions for professionals in South Africa is that one needs professionals to do so. How does one improve conditions in South African hospitals, for example, when they are continually bleeding staff, the lack of staff is a major feature of dissatisfaction and there are insufficient trained managers to help turn the situation around. The national and provincial departments would do well to sharpen their efforts to recruit good managers. The turnaround of the Kimberley Hospital Complex, which is described in this report, presents a model for the regeneration of public facilities through effective and committed management, spearheaded by a single individual. The KHC has demonstrated that a well run public facility can attract good doctors. The same principle might well be applied at higher levels within the Department of Health.

REFERENCES

Anonymous. (2006) Too many female doctors could impact negatively on health service delivery. *Medical Chronicle*. (27 July 2006) <http://www.wilbury.co.za>

Anonymous (2007a) 'Mbeki still HIV and AIDS dissident –Guardian' . *SAPA*. 5 November 2007. www.iol.co.za

Anonymous (2007b) Deputy health minister fired. *Reuters*. 8 August 2007. www.iol.co.za

Anonymous (2007c) Newspaper reveals more 'revelations'. *SAPA*. 19 August 2007. www.iol.co.za

Anonymous (2007d) Terminally ill. Public doctors are missing a third of the doctors they need. *Financial Mail*. 14 April 2006.

Awases M, Gbary A, Nyoni J, Chatora R (2003) *Migration of Health Professionals in Six Countries. a synthesis report*. Brazzaville: WHO/Afro.

Bateman C (2007) Rural health care time-bomb as doctors shortage looms. Cape Times. 20 December 2006.

Benjamin C (2006) Sickening shortage of state doctors in Gauteng. *Business Day*. 8 November 2006.

Beharie S (2006) Exam Row Hits UKZN. The Sunday Tribune. 24 December 2006.

www.iol.co.za

Blandy F (2006) Scientists call for Manto's Removal. 6 September 2006.

www.iol.co.za

Breier M, with Wildschut A (2006) *Doctors in a Divided Society: the profession and education of medical practitioners in South Africa*. Cape Town, South Africa: HSRC Press.

British Medical Association (BMA) (2004) *The demography of medical schools: A discussion paper*. BMA Publications Unit

Council for Medical Schemes (2006) Annual Report 2005/6.

www.medicalschemes.com

Dambisya YM (2003) Career intentions of Unitra Medical students and their perceptions about the future, *Education for Health* 16(3):286-297.

Department of Health (2004) Recruitment and employment of foreign health professionals in the Republic of South Africa. Policy document 1 April 2004.

www.doh.gov.za

Department of Health, South Africa (2003) *Operational Plan for Comprehensive HIV and AIDS care, management and treatment for South Africa*. <http://www.info.gov.za/whitepapers/1997/health.htm>

Department of Health (2006a) A National Human Resources for Health Planning Framework. Pretoria: Department of Health.

www.doh.gov.za

Department of Health (2006b) Recruitment and employment of foreign health professionals in the Republic of South Africa. Policy document 1 April 2006

www.doh.gov.za

Department of Health (2006c) Government programme to train doctors in Cuba yields results. News report on SA Government Information website.

www.info.gov.za/speeches/2006/06071109151001.htm

Department of Home Affairs (2007) Quotas for specific professional categories or specific occupational classes. Government Notice 362. *Government Gazette No 29826*. 25 April 2007.

De Vries E and Reid S (2003) Do South African medical students of rural origin return to rural practice?. *South African Medical Journal* 93 (10): 789-793.

Dovlo D (2004) The Brain Drain in Africa: An emerging challenge to Health Professionals' Education. *JHEA/RESA Vol 2, (3) :1-18*.

Erasmus J (2006) Project 4.1 A multiple source identification and verification of scarce and critical skills in the South African labour market. Research proposal prepared for the Department of Labour.

Erasmus J C (2007) Vacancy Analysis Report. Report on HSRC survey commissioned by the Department of Labour.

Frayn L (2004) Who's feminizing medicine? *Spiked-Health*. 6 August 2004
<http://www.spiked-online.com/Printable/0000000CA652.htm>

Global Commission on International Migration (2005). *Migration in an interconnected world: New directions for action*. www.gcim.org

Green J (2004) ARV Rollout a shambles – report. 5 July 2004.
www.iol.co.za

Grimwood A, Almeleh C, Hausler H, Hassan F (2006) HIV and Tuberculosis Treatment Update. In SA Health Review 2006. Durban: Health Systems Trust.
www.hsr.org.za

Hagopian A, Thompson M J, Fordyce M, Johnson K E and Hart L G (2004) The migration of physicians from sub-Saharan Africa to the United States of America: measures of the African brain drain. *Human Resources for Health* 2 (7).
<http://www.human-resources-health.com/content/2/1/17>

Hall C (2004) Influx of women doctors 'will harm medicine'. *news.telegraph* 1 November 2004
<http://www.property.telegraph.co.uk/news/main.jhtml?xml=/news/2004/08/03/nhs03.xml>

Hall E and Erasmus J (2003) Medical Practitioners and Nurses in *Human Resources Development: Education Employment and Skills in South Africa*, Pretoria: HSRC Publishers

Health Systems Trust (1998) Women in health, *HST Update*, 31: February 1998

Health Systems Trust (2004) *South African Health Review 2003*.

Health Systems Trust (2005) *South African Health Review 2004*.

Health Systems Trust (2006) *South African Health Review 2004*.

Health Systems Trust (2007) *South African Health Review 2004*.

Hilton I. (2004) Only half a revolution. *The Guardian*. 10 August 2004
<http://www.guardian.co.uk/print/0,3858,4989497-110592,00.html>

Hudson, C.P., Kane-Berman, J. & Hickman, R. Women in medicine: A literature review 1985-1996. *SAMJ* 87 (11): 1512-1517. 1997.

Igumbor E and Kwizera E (2005) The positive impact of rural medical schools on rural intern choices. *Rural and Remote Health* 5 (online), 2005: 417.
<http://rrh.deakin.edu.au/articles/subviewnew.asp?ArticleID=417>

James W and Waller L (2006). Faltering start in luring skills. *Cape Times*. 18 April 2006.

Lehmann U & Sanders D (2002) Human resource development. *South African Health Review 2002*: chapter 7

Lehmann U & Sanders D (2004) *Human resources for health in South Africa*.
Background Paper for JLI National Consultation, Cape Town, 3 - 4 September 2004

Nofemele Nwabisa (2006) State hospitals in crisis as surgeon shortage hits. *The Herald*.
14 July 2006.

Ntuane L (2006) North West welcomes 16 Iranian doctors. 20 August 2006. BuaNews Online. www.buanews.gov.za

NZ DoL (New Zealand Department of Labour). 2005. *Skills shortages in New Zealand: key findings from the Survey of Employers who have Recently Advertised 2005*. [Web:] <http://www.dol.govt.nz/PDFs/lmr-skills-may2006.pdf> [Date of access: 23 Aug. 2006].

OECD (Organisation for Economic Co-operation and Development) (2004a) The international mobility of health professionals: An evaluation and analysis based on the case of South Africa. *Trends in International Migration*, Paris: OECD

OECD (2004b) Health data 2004

<<http://www.oecd.org/>>

Pindus N, Tilly J and Weinstein S (2002) Skill Shortages and Mismatches in Nursing Related Health Care Employment. Report prepared for the US Department of Labour. Washington: The Urban Institute.

Polk, H.C. (1999) The declining interest in surgical careers, the Primary Care mirage and concerns about contemporary undergraduate surgical education. *American Journal of Surgery* 178: 177 – 179.

Quintal A (2007) Manto Motion due in Parliament. *The Cape Times*. 16 October 2006.

Reid S (2002) Community service for health professionals, *South African Health Review 2002*: chapter 8

Reid S J and Ross A J (2005) Strategies for facilitating the return of health science graduates to rural and underserved areas. Paper presented to the conference of the South African Association of Research and Development in Higher Education (SAARDHE) in Durban, 27-29 June 2005

Risberg, G., Hamberg, K. & Johansson, E.E. (2003) Gender awareness among physicians – the effect of specialty and gender: A study of teachers at a Swedish medical school. *BMC Medical Education* 3:8.

Riska, E. (1988) The professional status of Physicians in the Nordic Countries. *The Milbank Quarterly* 66(2): 133 – 147).

Allen, I. (2005) Women doctors: moving on up. *British Medical Journal* 331 (7516): 569 – 571.

Roelf W (2005) SA lagging behind WHO targets for Aids care. *The Cape Times*. 6 April 2005.

www.iol.co.za

Sanders D and Lloyd, B (2005) Human Resources. SA Health Review. Durban: Health Systems Trust.

www.hst.org.za

Sanders D and Meeus W (2002) *A critique on NEPAD's health sector plan of action*. Bellville: University of the Western Cape, School of Public Health.

Saxe N & Van Niekerk J. P. De V. Women doctors wasted. *SAMJ*:760-762. 1979.

Shisana O & Simbaya L (2002) *Nelson Mandela/HSRC study of HIV/AIDS: South African national HIV prevalence, behavioural risks and mass media household survey of 2002*. Pretoria: HSRC Publishers

Shisana O, Rehle T, Simbayi L C, Parker W, Zuma K, Bhana A, Connolly C, Jooste S & Pillay V (2005) *South African national HIV prevalence, HIV incidence, behaviour and communication survey, 2005*. Cape Town: HSRC Publishers

Siqoko B (2005) Critical shortage of doctors in E Cape. Daily Dispatch. 28 September 2005.

Smetherham, J (2004) AIDS Scientists were laughing at SA. *The Cape Times*. 28 July 2004. www.iol.co.za

Sookha B (2007) 'SA has too few medical schools'. Pretoria News. 1 February 2007.

South African National Aids Council (2007) *HIV and AIDS and STI National Strategic Plan 2007-2011*.

Spector, R. (2004) Surgery career lifestyle unappealing to medical students, research reveals. *Stanford Report* June 16.

StatsSA (2007) Community Survey, 2007. Statistical release P0301. www.statssa.gov.za

Strebel A (2003) Kimberley Hospital Complex –Re-engineering. Impumelelo Evaluation Report.

Terreblanche C (2004) Manto's diet now includes beetroot and lemons. *The Star* 10 February 2004. www.iol.co.za

Thom, A (2007) Rural hospitals to face critical doctor shortage. *Star*. 16 May 2007.

United Kingdom Home Office Work Permits Division (2005). UK Work Permits issued to South Africans 2000 –2005. Freedom of Information Dataset. FreedomofInformation.workpermits@ind.homeoffice.gsi.gov.uk
Information received November 2005.

Warby V (2007) Govt on recruitment drive for health professionals. BuaNews. 4 July 2007. www.buanews.gov.za

Wilson R, Woolard I and Lee D (2004) Developing a National Skills Forecasting Tool for South Africa. Coventry: Institute for Employment Research, University of Warwick, and Pretoria: HSRC.

World Health Organisation (2006) Working together for health. The World Health Report 2006. www.who.org