CAREER ASPIRATIONS OF AND PERCEPTIONS OF FAMILY MEDICINE AS A SPECIALTY BY NEWLY QUALIFIED DOCTORS (INTERNS AND COMMUNITY SERVICE DOCTORS) IN SOUTHERN GAUTENG PROVINCE

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DECLARATION

I, Samuel Ozioma Ubabukoh, declare that this research report is my own work. It is being submitted for the degree of Master of Medicine in Family Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

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Samuel Ozioma Ubabukoh

24th day of May 2016

DEDICATION

To every young medical doctor struggling to settle in a career specialty of his or her choice with all the uncertainties involved

To every individual who has committed himself or herself in many different ways to improving primary healthcare

To those who work to create better Family Medicine training programmes in Africa

ABSTRACT

Introduction: As many recently qualified South African doctors pursue specialisation and sub-specialisation, projections indicate that the critical mass of medical practitioners required to support primary healthcare will continue to dwindle, with wholly inadequate numbers to sustain the country's proposed National Health Insurance plan. Little is known, however, about what newly qualified doctors on the verge of making career choices think of the speciality of Family Medicine (FM) and how these young doctors actually decide on what career options to pursue.

Objectives: This study describes the career intentions of newly qualified doctors working in the four southern districts of Gauteng Province, the factors that influence their career aspirations, and their views on FM as a specialty.

Methods: This is a descriptive cross sectional study using a self-administered questionnaire, which targeted 502 participants (interns N=396 and community service doctors N=106) in 2013.

Results: Out of 368 questionnaires returned, 342 were eligible for analysis. More than two thirds (68%) of the respondents graduated from medical schools located in Gauteng Province. Only 5.3% were working in primary healthcare (PHC) facilities. The most chosen specialties were: surgical (32.2%), internal medicine (14.3%), and paediatrics (12.9%). FM was the least chosen specialty by only eight respondents (2.3%). Only 44% had ever considered FM as a career. Of these, 77% agreed that they were not well enough informed about the FM registrar-training programme to select this discipline. Only 16.8% thought they would be job satisfied working in a PHC facility, while 53.4% believed that FM would not be financially rewarding.

Conclusions: A serious human resource shortage looms large in primary healthcare if most newly qualified doctors have no desire to enter general medical practice or work in PHC settings. This study highlights the need to urgently address current undergraduate, internship and registrar training programmes in South Africa with a view to marketing FM and making generalism attractive.

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DEFINITIONS

Community service doctors: Following a two-year internship, every South African medical graduate is assigned to work for one year of paid community service in any government health facility. This became a requirement from July 1997, with the passage of the Health Professions Amendment Bill (1996). These are those doctors.

Family physician: A medical doctor who has completed postgraduate training in Family Medicine, and is registered as a specialist with the Health Professions Council of South Africa.

General practitioner: While similar to a medical officer, this is a doctor without a formal specialist qualification and whom works primarily in private practice, either solo or group.

Health Professions Council of South Africa (HPCSA): This is a statutory body established in terms of the Health Professions Act 56 of 1974 to regulate and register health professionals, through 12 distinct Professional Boards. The council is "committed to promoting the health of the population, determining standards of professional education and training, and setting and maintaining excellent standards of ethical and professional practice."[1]

Medical internship: In South Africa, the medical internship is a statutory two-year additional training requirement whereby recently qualified doctors work in designated hospitals (primarily central hospitals affiliated to university-based medical schools) under specialist supervision for two years—rotating through six domains, including three months in Family Medicine. Doctors completing this requirement are called "interns" and are noted to be either first- or second-year. The domains covered in the six core rotations include: surgery, internal medicine, paediatrics, obstetrics & gynaecology, family medicine and psychiatry, anaesthetics and orthopaedics. To be a second year intern, one must have completed at least three of the six rotations in no particular order.

Medical officer: South African medical doctor working in any public health sector facility without a formal specialist qualification. There are also 'career' medical officers, many of whom have developed experience/expertise in a particular discipline over many years, either with or without advanced training, such as a higher diploma earned through the Colleges of Medicine of South Africa examinations.

Newly qualified doctors: Used in this study to mean interns and community service doctors, these doctors have qualified with an undergraduate medical degree (MBChB/MBBS) within the past three years and are working in public health sector facilities.

Non-primary care specialties: All medical and surgical specialties that are not primary based in a primary healthcare setting. These specialities are found within secondary, tertiary or central hospital settings.

Primary care specialties: Primary care specialties fulfilling the general medical needs of specific patient populations include: Family Medicine, and any other general specialty needed to manage a range of undifferentiated problems at the level of primary healthcare.

Primary healthcare: (definition from the Declaration of Alma-Ata - (1978) "Primary healthcare is defined as essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination."[2]

Registrar: A doctor who is enrolled in postgraduate training and working at a health facility to become a specialist in a particular medical or surgical field.

ACRONYMS AND ABBREVIATIONS

ANOVA	analysis of variance
CHC	community health centre
CMSA	Colleges of Medicine of South Africa
COPC	community oriented primary care
DHS	district health system
FM	Family Medicine
FP	family physician / practitioner
GP	general practitioner
HREC	Human Research Ethics Committee
HIV	Human Immunodeficiency Virus
HPCSA	Health Professional Council of South Africa
HRH	Human Resources for Health
KZN	KwaZulu-Natal (Province)
Medunsa	Medical University of South Africa – formerly the University of Limpopo; renamed the Sefako Makgatho Health Sciences University (SMU) IN 2015
NDP	National Development Plan
NHI	National Health Insurance
NQDs	newly qualified doctors
NPPHCN	National Progressive Primary Health Care Network
PHC	primary healthcare
SA	South Africa(n)
SADC	Southern African Development Community
SPSS	Statistical Package for the Social Sciences
Wits	University of the Witwatersrand, Johannesburg
WHO	World Health Organisation
UCT	University of Cape Town
UK	United Kingdom
UKZN	University of KwaZulu-Natal
US(A)	United States (of America)

CHAPTER ONE

INTRODUCTION

1.1 Background to specialisation and primary healthcare (PHC) in South Africa

"Specialization appears in many ways to be a self-evident necessity of medical science whose existence requires little explanation."[3]

The present modern system of specialisation all began to take shape from the nineteenth century. Since then, the criteria for classification and extent of specialisation still vary according to country[3]. Medical specialisation became popular in South Africa due to the potential of acquiring certain rewards such as: prestige; academic exposure, or prowess; higher income or better working hours[4]. Over time, the numbers of specialties in South Africa have expanded from the traditional specialties of surgery and internal medicine to 30 specialties and 18 subspecialties currently recognised by the Health Professions Council of South Africa (HPCSA)[5].

The Colleges of Medicine of South Africa (CMSA) registered in 1955 was mandated to conduct fellowship, certificate and diploma examinations[6]. It currently has 28 constituent colleges, which represent all the disciplines of medicine and dentistry. The relationship between the CMSA and HPCSA involves the CMSA conducting specialist exams with subsequent registration by the HPCSA[6].

Specialist training in South Africa involves four bodies or stakeholders namely the: CMSA; HPCSA; universities whose medical schools or faculties of health sciences offer accredited postgraduate academic programmes that lead to the award of the relevant degree (MMed or Mphil); and lastly, all of the provincial departments of health that fund these registrar training posts[7].

All four stakeholders mentioned above may have different effects on specialisation for different disciplines. For example, well established specialties with more 'fellows' who are graduates are more likely to be popular than the newly inaugurated specialties. There could also be other external factors like criterion established by government or institutions for choosing prospective trainees into a particular specialty[4].

With all the advances in specialisation in the last forty years, and irrespective of a global commitment to primary healthcare, South Africa still grapples with ineffective healthcare delivery at district level[8]. Some of the challenges to achieving effective primary healthcare in contemporary South Africa can be explained by looking at a timeline of key historical events:

Pre-apartheid primary healthcare: 1910-1948[8,9]

- Establishment of the Union of South Africa; health services were fragmented among the existing four ex-colonial provinces. Development of the Pholela Health Centre model in 1940 from which community oriented primary care (COPC) derives. By 1945, under Dr Henry Gluckman as Minister of Health, a network of community health centres became the forerunners of community-based primary healthcare.

The apartheid period: 1948–1993[8,9]

- This period saw the disintegration of primary healthcare in South Africa as health services were provided differentially according to 'race' or population group through an elaborate structure of 'own affairs' health ministries. There was so much disparity in health expenditure according to 'race' that health outcomes between white and black South Africans varied greatly.
- The PHC nurse model was introduced: nurses were trained in a post-basic course to diagnose and treat common ailments. This expanded role was born of necessity following the Soweto student uprisings, which caused mass congestion in the tertiary hospitals. The use of nurses to run primary healthcare facilities also became popular to address the dearth of doctors in South Africa.
- The introduction of PHC principles outlined in the Declaration of Alma Ata (1978)[2] directly challenged the apartheid health system but met with little success. The National Progressive Primary Health Care Network (NPPHCN) was an example of such an organisation that stood against apartheid government policies. It was founded in the early1980s and was initially funded by the Henry J. Kaiser Family Foundation[10].

Democracy period: 1994 - present

- The National Health Plan launched in 1994 with advent of democracy changed the landscape of the national health system, which became genuinely grounded in the

PHC approach[8]. All health services were 'rationalised' and integrated under a single Ministry of Health instead of the duplication of services that existed under apartheid[8-11]. Three notable changes helped create a more comprehensive primary healthcare system: i) then-president Nelson Mandela offered free primary healthcare to all pregnant women and children under six years of age; ii) the decentralisation of the health system in the nine provinces led to the adoption of the District Health System (DHS) by 1997; and, iii) the up scaling of the budget for health to 8% of the Gross Domestic Product (GDP), close to the World Health Organisation (WHO) mark for developing countries in Africa where the burden of disease is far greater[9]. South Africa would have seen the positive impact of these major changes had it not been for the explosion of the HIV/AIDS pandemic[8].

- Introducing a District Health System, which included developing a package of primary healthcare services to be delivered at this level, was one strategy of improving access to quality health care for the population of South Africa, the majority of who were deprived of such services prior to 1994[12].

1.2 Primary healthcare and Family Medicine

Primary care programmes and specialties have been evaluated as the most effective vehicles to drive primary healthcare forward especially in low and middle -income countries[13]. It has been proven that countries with better -developed and -resourced primary care specialties, in contrast to the non-primary care specialties, had a direct positive health outcome as regards population mortality and morbidity[14,15]. These studies further argue that increasing the ratio of primary healthcare specialists (especially family physicians) to non-primary healthcare specialists, counts towards a better health outcomes and corrects health inequities[16]. Such inequities in South Africa transcend sex, race, political and geographical boundaries, created by the apartheid rule, and still exists 20 years after democracy[9]. South Africa therefore needs primary healthcare, which has been lacking, to be entrenched into the health care system to ensure better population health outcomes.

The appropriate training of the family physician is central to the realisation of accessible, quality health care[17]. If primary care is embedded in future reforms of the heath care system, countries embarking on these renewals (such as South Africa) will need sufficient numbers of family physicians joining the workforce[18].

Traditionally in Africa, the career pathway for doctors has been 'either to specialise or not to specialise' in one of the traditional core medical or surgical specialties or sub-specialties. This simple bi-furcation into the medical officer / general practitioner track or specialist track offered no opportunity for specialisation in generalism. Primary healthcare has not excelled in most of sub-Saharan Africa thereby making it even more difficult to specialise in Family Medicine in that part of the African continent[19]. The situation is made worse by poverty, population growth and the inverse care law, which is explained as the fewest health care professionals located where they are needed the most[19]. Until the advent of postgraduate training in Family Medicine in South Africa, those who did not specialise had no further postgraduate training and so continued in general practice as general practitioners (GPs). Primary care became the domain of GPs who worked either in private establishments known as 'surgeries' or as medical officers in public hospital outpatient departments or community health centres. This trend began to change as the African continent started to establish training programmes in Family Medicine for doctors intending to work in primary healthcare[19].

In South Africa, the University of Pretoria was the first to start formal Family Medicine postgraduate training in 1968; however, it was not until 1997 that all medical schools had standardised Masters and/or diploma degrees in Family Medicine, completed as part-time vocational training programmes[19]. National postgraduate training in Family Medicine changed again in 2007, when legislation made Family Medicine a specialty with equal standing to all other specialties, with its own College of Family Practice that was created at the Colleges of Medicine of South Africa (CMSA)[20]. Consequently, from 2008, a four-year full-time Family Medicine registrar-training programme was introduced at all eight medical schools. In 2011, a mandatory research requirement (MMed) and a common exit fellowship examination administered by the Colleges of Medicine of South Africa were introduced. The core competencies and the types of training already determined by the chairs of Family Medicine were evaluated based on set common outcomes and exit standards[21]. Family Medicine registrar training was stipulated to take place primarily at Level I district hospitals, community health centres and clinics[20].

1.3 The Family Physician: definitions, terminology and roles in the current South African context

The definition and role of family physicians vary in different countries. Family Medicine (FM) is the medical specialty of generalism devoted to providing comprehensive health care to individuals regardless of age or sex[22]; the specialist is called a family physician, family doctor, or family practitioner. In this study, a family physician is a medical doctor who has completed part-time postgraduate vocational training resulting in a university degree or attended a full-time registrar-training programme in Family Medicine, and is registered as a specialist with the Health Professional Council of South Africa (HPCSA).

The term 'family physician' is used interchangeably with family practitioner in South Africa, which means the same as General Practitioner (GP) in the United Kingdom (UK). This is a bit confusing since the South African term 'GP' is understood differently as a medical doctor who has not undergone formal postgraduate specialist training, irrespective of years of experience in primary healthcare[23]. Also, the roles of family physicians vary to a large extent in different countries as highlighted below.

"In Great Britain [UK], the Netherlands and the Scandinavian countries, for example, family physicians play a central role in the health care system, treating the majority of ailments and caring for more than 90% of health care problems presenting to their practice. They [also] function as gatekeepers for other medical specialists and hospital admissions. In some other countries like Germany, France... where there are no gate keeping systems, patients may elect to consult any family physician or specialist at their own discretion."[24]

There are major challenges in the present health system as regards the role of the family physician / practitioner in primary healthcare settings in South Africa. The 'uncomfortable fit' of the so-called "African Family Physician"[23] can be explained by an undergraduate medical curriculum that falls short of explaining what it means to be a family physician. According to de Villiers and de Villiers[25], this gap gets carried into postgraduate training so that the biomedical model predominates over the holistic approach as practised in Family Medicine. In other words, a medical officer that reasons within a disease-oriented paradigm of health care, instead of a patient-centred one, may find it difficult to distinguish between him and the trained family physician when they see the same profile of patients. The current primary healthcare system, which is nurse-driven and doctor-supported,[9] is battling to clearly understand and define the role of the family physician, who is perceived as being the same as any other public sector doctor or medical officer. Also, it has been postulated that the weak bargaining powers due to multiple standpoints within this group of primary care doctors has not helped the cause of FM with the government, funding and academic institutions[25].

According to the Green Paper on the proposed National Health Insurance (NHI) plan in South Africa, the primary healthcare approach takes centre stage[26]. This is also in line with the recently released White Paper on NHI[27]. The current view by policy makers regarding the role of the family physician is reflected in a document prepared for strengthening PHC through on-going re-engineering[28]. One of the three strategies of PHC re-engineering is the composition of the district clinical specialist teams, which include the following categories of health care worker: an obstetrician and gynaecologist; a paediatrician; a family physician; an anaesthetist; a principal midwife and a primary healthcare professional nurse[28]. These are viewed as cadres in the primary healthcare specialist team rather than hospitalists. The problem with this sharing of the primary healthcare role is that the family physician that is supposed to be at the centre of its development is side tracked to the extent that such a role has in certain cases been undermined at the set-up phase[29]. Three key roles of family physicians in PHC have been identified by South African stakeholders: "providing expert generalist care to patients referred from nurses and junior doctors at clinics and community health centres, and thus reducing referrals to secondary or tertiary hospitals; taking responsibility for clinical governance and improving the quality of care; and providing support to community oriented care"[30] Involvement in community-oriented primary care (COPC) is noted to be one of the major ways to measure the impact of a family physician[23].

1.4 Rationale for this study

Newly qualified doctors [NQDs] have to make choices about their career pursuits as they discover that the euphoria of becoming a medical doctor is short-lived and they must now become gainfully employed. The career choices these doctors make and the reason for their choices in South Africa have not yet been explored. There is a paucity of family physicians in the country, in part because the full-time four-year speciality training programme in Family Medicine is relatively new (introduced in 2008). There is also the inability to attract talented local South African medical graduates into this nascent discipline, having relied mostly on regional migration to establish the discipline.

Proportion of primary care specialists to non-primary care specialists

The Canadian healthcare system, with its historic 50:50 split between family physicians and the rest of specialists, was seen as a role model. However, by the early part of the twenty-first century, cracks were appearing. A 2003 editorial by Mackean and Gutkin bemoaned the shortage of family doctors in Canada and the difficulties the population experienced in accessing primary healthcare[31]. The percentage of graduates choosing Family Medicine as their first choice in the annual Canadian residency (registrar) matching service fell from 40% in the 1990s to 24% in 2003. Presently, Canada has been able to improve selection of Family Medicine training with 34% of medical school graduates making Family Medicine their first choice for residency during the 2011 match[32]. In the US, there is slow but steady increase of interest in Family Medicine, although this seems due to the recruitment of a high percentage of international medical graduates, citizens or non-citizens, into FM training programmes[33].

The ratio of specialists to generalists that fits Africa in general and South Africa in particular has not been determined for certain. However, one expects a higher proportion of primary care specialists due to high disease burden and poor resource settings. From the 2014 Health Professions Council of South Africa (HPCSA) medical doctor registration statistics[34], the number of specialists to non-specialists is 14,547 to 26, 585. Most of the non-specialists are GPs who work in the private sector, while among the specialists Family Physicians are in hundreds. This human resource discrepancy indicates how overburdened and dependent the public primary healthcare system is on a very small proportion of doctors, the majority of who do not have further training in Family Medicine or primary healthcare.

General practitioners, family physicians and other primary care doctors should unequivocally form the cornerstone of a health system that aims to achieve the best mix of quality, satisfaction (public and individual) and cost-effectiveness[35]. However, despite the desired trend for health systems to be more equitable and socially accountable, medical schools continue to produce excessive numbers of other specialists and sub specialists rather than primary care specialists. Even the few primary care or family physicians produced are enticed to enter the lucrative private sector or migrate to where they perceive greener pastures, such as the United States, United Kingdom, Canada and Australia. This maldistribution of doctors entering traditional specialties and the exodus of highly skilled doctors results in a substantial human resources shortfall in the critical area of PHC[35]. This is important because the NHI intends to cover mostly primary healthcare at its onset; hence the government's plan to enlist general practitioners more than specialists with the planned accreditation and recruitment of 3000 GPs by 2016 and 6000 GPs by 2021[36]. The reality, however, is that due to ageing and the lack of intake into FM registrar training programmes; these general practitioners on whom the entire NHI scheme is dependent are dwindling in numbers.

<u>Personal motivation</u>

The researcher's interest in the career aspirations of recently qualified doctors was sparked during clinical rotations in specialties other than Family Medicine. Prior to the onset of this research, the researcher was aware of the following:

- During the apartheid era, specialist training posts were reserved largely for whites, with the exception of Family Medicine. This 'racial' biasing may still affect the psyche of present day doctors. They might prefer the long-established traditional specialties, which are seen to be more prestigious than Family Medicine. This may further explain the reason for the entry of high numbers of foreign medical graduates into Family Medicine registrar training programmes all over the country, as it is "...the only specialist programme that is not based on a supernumerary (without remuneration) employment arrangement. All the registrars [whether foreigners or not] are paid as registrars or medical officers if they are already employed in the SA Public Service [and have obtained permission from Foreign Workforce Management and possess a valid work permit]. It is different for foreigners who want to specialise in other clinical areas. They need to obtain a supernumerary appointment from a province and they must provide proof of financial support, etc."[37]
- FM registrar training seems set at an impossibly high standard to achieve, as very few registrars graduate when compared to the number admitted. An example of this is the researcher's own University of the Witwatersrand (Wits) class of 2010, which started with 22 registrars. After attrition, there were only eight individuals making it to the end.
- The perception of Family Medicine in the academy and amongst other doctors has not been studied. This factor is believed to have a profound effect on those considering entering the full-time registrar training programme and those already in the programme.
- Lastly, Wits has been unsuccessful until recently in attracting its own graduates or graduates from other South African medical schools into its Family Medicine

specialisation programme. This has implications for both the programme and the future of primary care in the districts that provide the training platform in Southern Gauteng Province.

To promote the future growth of Family Medicine in South Africa, it is therefore imperative to understand the factors for and against a career in Family Medicine among young doctors at that critical watershed period, when they are planning their longer-term career paths. Information from such a study would potentially inform how to attract young locally trained doctors into Family Medicine postgraduate training programmes both at Wits and elsewhere.

CHAPTER TWO

LITERATURE REVIEW

2.1 What are the career choices of young doctors and medical students in the literature?

Career choice studies that examine similar populations as this research (i.e. within three years of basic medical qualification) are few and were mainly done outside the South African context. In a 2003 UK study of medical graduates one-year post qualification, 23.7% indicated general practice (the British equivalent of Family Medicine) as their choice of speciality, while 22.7% selected specialisation in internal medicine and 20% the surgical specialties[38]. In comparison with a 1999 study,[39] the authors established that there had been a decline amongst current graduates in choosing general practice. They indicated that the increasing preference for surgical specialties came at the expense of general practice, but noted that this was mainly inflated by women, whose numbers rose significantly, intending to enter surgery[38].

In an Iranian medical university hospital, 51% of 137 interns had yet to make up their minds about specific career specialty. Among the remaining 49% who had a definitive choice, they went mainly for surgery and 'other' specialties that were not specified and none indicated general practice as their choice of specialty[40].

A 2001 Nigerian study of 'house officers' (same as interns) working in two major hospitals in the mega–city of Lagos yielded similar results in relation to the choice of surgery as a specialty[41]. Amongst those who decided on specialisation, 18.1%, 18.1%, and 9.5% chose surgery, obstetrics and paediatrics respectively; while 17.1% stated that they would not specialise, thus accounting for would-be general practice doctors. Interestingly, internal medicine as a specialty choice was only 7.6%; and, Family Medicine was non-existent in the selected sample.

Most studies on medical student career choices tend to examine the population of one university at a time. However, both Greece and South Africa have conducted national surveys on final year medical students across all of the country's training institutions. In a landmark study, 876 final year South African medical students in 2007 and 2008 indicated their first choice for specialisation[42]. Internal medicine (22%), surgery (21%) and paediatrics

(11%) came out as the highest-ranking specialties of first choice. Interestingly, 9% indicated Family Medicine as their first choice of specialty, while another 12% made it their second choice[42]. The stability of these choices following graduation, internship and community service is unknown.

In Greece, out of 1021 final year medical students only 44 (4.3%) of respondents stated that general practice is or could be among their choices for specialisation[43]. Only seven students (0.7%) indicated that they were sure of choosing general practice as a specialty while another 12 students (1.9%) might make it a first choice[43]. In that study, the most popular medical specialty was general surgery (10.9%), followed by cardiology (9.6%), endocrinology (8.7%) and obstetrics-gynaecology (8.3%).

2.2 How timing influences or changes decisions about career choices: medical graduates versus medical students as study populations

Research on the choice of career specialty has been conducted among doctors across the spectrum of their training. This ranges from newly matriculated medical students to medical students just before graduation and has been extended to qualified medical doctors with a varying number of years post-qualification. These different populations represent a career timeline from entering the university to graduating, to the first few years as a medical doctor before the ultimate choice to enter a particular specialty. It has been suggested that while students have strong career preferences from early on in their training, their choices undergo several transitions before finally deciding on a chosen career[44]. This means that studies done on medical students may not reflect their actual choice after graduation from medical school. Although interesting from a developmental perspective, this instability may not be useful in planning for a country's human resources needs. Consequently, the authors of a qualitative study in Malawi conclude that graduates are better (and more reliable) than medical students in their ultimate choice of career, because the former were closer to the real life situations and circumstances that ultimately affect career choice[45]. Bearing in mind that timeframes between qualifying as a medical doctor and entering postgraduate specialty training vary for different countries, it would be helpful to determine the 'best time' to survey medical doctors that would yield the closest approximation to their final career pathing in order to accurately plan human resource requirements. Only a minority of Australian and British medical students have a definitive career choice at graduation, with it taking one or two years after graduation before the majority have committed to a discipline[46]. In contrast, most students nearing graduation from Canadian and United States medical schools have already chosen their career path. This may reflect both the fact that medical studies are postgraduate qualifications in North America as well as the necessity to aspire to a career pathway in medical school in preparation to begin residency training immediately; hence they make their minds up earlier because they have to[47].

Despite increased impetus to specialise in South Africa, due to pressure on some posts,[4] newly qualified doctors are not pressured to make their choice of specialty immediately. This could be attributed to the following factors:

- Upon completion of community service for South African citizens and permanent residents, registration as an independent practitioner with the HPCSA is guaranteed, thus allowing doctors to practise as GPs with no further training or specialisation (in contrast, for example, with Canada, which requires completion of specialty training in Family Medicine before registration to practice even as a generalist).
- Spaces for postgraduate specialist training at South African medical schools, as well as provincially funded training posts are limited. This increases competition and effectively serves to restrict access to many specialities.

2.3 What demographic, individual and social factors affect the choice of specialisation among young doctors?

Factors that affect the choice of specialty have been researched and hotly debated[48]. Studies have classified these factors based on different models, with the intention to clarify the background from which these choices are made by students and graduates. Consensus has gradually been reached over the years as to the most important factors that influence career choices. The literature reveals three areas that impact the choice of specialisation, namely: demographic factors; social/societal/occupational factors; and, individual/personal-value factors. Demographic factors include: sex, age, city of residence and current university/university attended[49]. Findings from a study in Germany, for example, show that being both female and older are important demographic factors for those choosing general practice[49]. In the past, being female was positively related to the choice of Family Medicine as a specialty. However, this relationship may be changing, having been attributed to barriers that women encountered when they considered entering traditionally 'male' specialties. As more women overall enter the profession of medicine and are admitted into specialties historically dominated by men, such as the surgical disciplines, this prior association may be disappearing[50]. In a more recent study, the student's sex was not found to be a significant predictor of speciality choice, something the authors explain was due to the increasing numbers of women in medical school[18]. This leaves one to question if newly qualified South African doctors will follow the established trend of females having higher interest than males in Family Medicine.

The particular medical school/university at which one trained is considered to be another demographic factor that may influence choice of speciality, as some universities tend to contribute more registrars to the discipline of Family Medicine than others, particularly in the United States[33]. Such US medical schools were the ones whose departments of Family Medicine were better funded and which required a longer duration of clerkship in Family Medicine[33]. Although one would not expect representation in sufficient numbers from all of South Africa's eight medical schools in this study to draw conclusions about the effect of graduating from a particular medical school, the four southern districts of Gauteng Province have a sizeable number of medical graduates from the three medical schools in the province, namely: the University of Witwatersrand as well as the Universities of Pretoria and Medunsa (now SMU). These three medical schools do have strong departments of Family Medicine, however, the level of satisfaction with funding and the curriculum support for Family Medicine remain part of the debate.

Apart from demographics, seven other factors affecting choice of career were explored in a German study and classified into two categories, namely: occupational category ('Variety in job', 'Patient-orientation', 'Job-related ambition' and 'Image') and individual category ('Personal ambition', 'Future perspective' and 'Work-life-balance')[49]. Similarly, another comprehensive study on factors influencing career choice done in Canada classified these into two categories: 'attitudinal' and 'other attitudinal' (individual) factors[51]. The attitudinal factors included medical lifestyle, societal orientation, prestige, hospital orientation, varied scope of practice, and role models. The individual factors included 'dislike of uncertainty', 'focus on non-urgent care', 'interesting patient population', and 'research interests' among others.

The 2007-2008 South African medical student study by de Vries et al[42] followed the Canadian study[51] by selecting some of the social / attitudinal /occupational factors and mixing them with the individual / personal factors and asked the final year students to grade these on a four-point Likert scale. In this regard, the need for consistency and ability to compare results, as well as familiarity with this particular grouping of factors, would indicate the importance of opting for a classification of factors already researched in a South African context.

One of the factors studied by de Vries[42] that has also been researched extensively elsewhere is the medical school experience. A literature review by Senf et al[50] indicated that programmes aimed at marketing Family Medicine in the medical schools, Family Medicine postings especially at the higher classes, the informal culture created by side comments or views by other students and lecturers, and faculty role models all impact on students' ultimate choice to specialise in Family Medicine. Primary care role models, including consultants and registrars, have been confirmed as an important predictor of career choice in Family Medicine especially for newly qualified doctors[52,53].

Another factor to be considered in this study would be the influence of community service experience after internship on career choice especially as it relates to Family Medicine. A review performed in Australia about factors influencing career choice among doctors suggests that vocational training in Australia that is similar to community service in South Africa did influence career decisions[47,53].

Schafer et al[54] provided a summary of important individual or personal factors most associated with choosing a career in primary care as: being female, older, and married; having a broad undergraduate background; having non-physician parents; having relatively low income expectations; being interested in diverse patients and health problems; and, having less interest in prestige, high technology, and surgery. Other traits, such as value orientation, personality, or life situation are yet to be reliably measured and may actually be responsible for some of these associations[54].

Migration factors might also affect choice of specialty. Newly qualified doctors who choose to stay in their countries would most likely succeed in their intended area of specialisation compared to those who consider leaving their country. In a Nigerian study by Odusanya et al[41], 69% of respondents aspired to leave the country due to financial considerations; thus much is at stake as regards their final career pathway. In slight contrast, most Malawian graduates planned to emigrate for further studies and then return to their country in a study by Bailey et al[45].

2.4 Understanding and considering Family Medicine as a specialty of choice

Studies done in countries where Family Medicine already has a strong foothold, like the UK, Canada and USA, had enough respondents choosing Family Medicine to make significant inferences about those choices. This is not the case in other countries, mostly in Africa, where there may not be enough respondents selecting Family Medicine as a speciality of choice[41,42]. The de Vries study[42] carried out among final year medical students in South Africa in 2007-2008 indicated that Family Medicine is not a popular specialty, so there was a similar expectation that this study population may also not favour Family Medicine. Similarly, in Greece, where only 12 out of 1021 (1.9%) final year medical students choose Family Medicine, there was a need to know more about the respondents' views on Family Medicine, irrespective of their ultimate career choices[43]. That study posed questions about students' awareness of Family Medicine / general practice as a medical specialty, their interest in Family Medicine and their reasons for not considering Family Medicine[43]. The situation in Greece in 2005 demonstrated that 20 years after recognition of Family Medicine as a specialty, it still remained a low priority choice. This was due to the persistent view of the biomedical model (hospital and super-specialised medicine) as the superior one in comparison to primary healthcare[43]. Based on the presumed low desirability of Family Medicine, this study also needed to incorporate questions like: 'Have you ever considered Family Medicine as a specialty option?' and 'Do you understand Family Medicine registrar training programme (residency) enough?'

2.5 General perceptions of the importance of Family Medicine as a specialty

Most studies interpret 'interest in a specialty' to mean choice of the specialty. Hence such studies conclude that the percentage of respondents who choose Family Medicine reflects the level of interest in Family Medicine[18,38]. However, one can find a specialty interesting without necessarily making that specialty a lifetime career. This study aims to bring out the perception of the Family Medicine specialty as an interesting or not interesting specialty among the study population. It therefore becomes pertinent to ask for the level of perceived value of Family Medicine irrespective of chosen specialty to enable a true reflection of attitudes towards Family Medicine. A related study in Finland highlighted the perceptions of fifth year medical students on a GP's work[55]. The majority of the students (76%) viewed the versatility and challenging nature of the job as its most attractive feature, while the least attractive features were the pressures of the job and dealing with lots of non-medical problems. Reasons behind such perceived affection or disaffection for Family Medicine would also be important in further understanding of the respondents' views on primary healthcare and how to address them. One of the reasons for the lack of interest in Family Medicine, as reported among medical students in Canada, is the negative perception of remuneration in Family Medicine[56]

CHAPTER THREE

METHODS

3.1 Area under study

South Africa operates within a district health system enacted under the National Health Act (2003), which is the designated vehicle to deliver primary healthcare to the country's population. South Africa has nine provinces comprising 52 health districts, which correspond to district and metropolitan municipal boundaries. Of these provinces, Gauteng is the smallest geographically, but most densely populated province in South Africa with a total of five health districts. According to the 2011 census, 23.7% of the country's population lives in Gauteng, translating to 12.3 million people[57]. Southern Gauteng comprises of approximately 8.5 million people and is served by 24 hospitals and 307 clinics.

Southern Gauteng is the PHC training platform for The University of the Witwatersrand (Johannesburg) (Wits University) and comprises four out of the five health districts of the province, excluding only Tshwane Metro health district (**Appendix 1**). The four districts in Southern Gauteng are: Johannesburg Metro health district which covers the central part of Gauteng; Ekurhuleni health district which covers the eastern part of Gauteng; Sedibeng health district which covers the southern part of Gauteng; and The West Rand health district which covers the western part of Gauteng. The primary healthcare facilities in these four health districts (district hospitals, Community Health Centres (CHCs) and PHC clinics) are served mostly by the Family Medicine joint teaching staff, registrars, clinical associate and allied health students from the Wits University, under whose auspices this study was undertaken.

3.2 Study aim

To describe the career aspirations and perceptions of Family Medicine as a specialty among interns and community service doctors in Southern Gauteng Province.

3.3. Study objectives

- To identify the career plans and choices of specialty of interns and community service doctors in Southern Gauteng

- To describe the individual, social and occupational factors that influenced study participants' choice of specialty
- To describe the study participants' prior consideration to choose Family Medicine and their understanding of Family Medicine registrar programme
- To determine the demographic and career plan factors associated with the newly qualified doctors' prior consideration of Family Medicine specialty
- To ascertain whether the study participants find Family Medicine an interesting or not interesting specialty, and their reasons for such

3.4 Study design

The study is a quantitative descriptive cross-sectional study with a small qualitative component.

3.5 Study site

The study site included all of the hospitals and clinics where interns and community service doctors work within Southern Gauteng Province. The list of these health facilities is contained in **Appendix 2** and included 18 hospitals and 24 Community Health Centres (CHCs) where NQDs work. Throughout their two years, interns mainly rotate through the central, tertiary and regional hospitals. They are only placed in the district health services (district hospitals, Community Health Centres, and PHC clinics) when they do their three-month rotation in the domain of Family Medicine. Interns found rotating in primary healthcare facilities at the time of the study were classified under the tertiary or regional centres where they are based. In contrast, community service doctors traverse the entire health system but are placed preferentially in regional hospitals due to lack of adequate manpower to run those hospitals.

3.6 Study population

The number of newly qualified doctors (NQDs) allocated to work in Southern Gauteng in 2013 was 768 (613 interns and 155 community service doctors), which was used to calculate the sample size. See **Appendix 3** for the numbers and distribution of interns and community service doctors in Southern Gauteng Province. This list was obtained from the Gauteng Department of Health, Directorate on Human Resource – Community Service and Intern

Placements. However the number of NQDs who could be located on ground during the survey was 502, which became the established population for this study.

3.7 Study sample

Calculation of sample size: The study sample size was calculated using Epi Info 7. Given that a previous similar study in South Africa found that about 9% of NQDs chose to enter Family Medicine as a speciality[42], an effective sample size of 210 was required to detect a 5% difference with the previous finding at 5% level of significance and a power of 80%.

Since a 100% response rate was unlikely and similar studies designed to measure choice of specialty in other settings achieved response rates ranging from 50% to 78%,[38,40,42] the researcher thought it would be prudent to at least attempt to survey the entire NQD population to ensure that the desired sample size would be achieved. Thus, the 368 responses collected still exceed the calculated sample size for significance.

Inclusion criteria: Any doctor doing an internship (either first or second year) or completing community service in 2013 was classified as a newly qualified doctor (NQD) and thus eligible to be included as a study subject.

Exclusion criteria: Any doctor described above, but who was on extended sick or maternity leave at the time of survey distribution. Doctors who were absent on two or more occasions at the time of survey distribution were classified as being unreachable or never assumed duty in facility allocated, and then excluded from the study. This explained the discrepancy in number on paper compared to the actual study population of 502 mentioned above.

3.8 Survey instrument

The data collection tool for this study was a self-administered 16-question, 3-page questionnaire in English (**Appendix 4**). Questions 1-12 of this questionnaire were adapted with authors' permission (**Appendix 5**), from a questionnaire used previously in South Africa with final year medical students (**Appendix 6**)[42]. Questions 1-5 collected socio-demographic characteristics of the study population; questions 6-10 obtained background information to better understand the career aspirations of respondents; and, question 11 addressed the choice of specialty. Question 12 was a four-point Likert scale to grade the individual, social, occupational and factors that influence choice of specialty.

Questions 13-14 were added to elucidate participants' views on their consideration of Family Medicine and how interesting they find Family Medicine as a specialty. Question 15 was derived from relevant literature[43] to assess the reasons behind the participants' views of interest or disinterest in Family Medicine. Free responses and space for additional comments were included in questions 12, 15 and 16.

3.9 Questionnaire validation and pilot study

The questionnaire from which the survey instrument was adapted had been used in a 2007-2008 SA national study of medical students[42]. Piloting of this survey was necessary to validate the questionnaire because of the additional questions and different study population (graduate NQDs vs final year students). The aim of the pilot was to ensure that the questions asked were uniformly understood and had clarity in measuring the objectives outlined (internal validity) as well as elicited the same response if asked all over again at different times (external validity or reliability)[58]. The researcher could thus ensure that the survey instrument could measure what it was designed to measure. In addition, the researcher received feedback from experts (Senior Lecturers in Department of Family Medicine, University of Witwatersrand), which improved face and content validity. The piloting phase involved 20 NQDs working at two facilities in Tshwane Health District in Northern Gauteng (not part of the area under study): 15 interns from Steve Biko Academic Hospital and five community service doctors from Kalafong Hospital.

After the pilot, the following changes were made to the survey instrument:

- Clarification of the wording and sentence structure in the demographic section
- Specialty options were changed to an open-ended question to allow respondents to free-fill their choice of specialty (Question 11). The initial list was too detailed and onerous when answering.
- Question 15 that assesses possible reasons for NQDs' level of interest in/value of Family Medicine through 14 mutually exclusive options was re-written for clarity and to avoid giving opposing answers to the seven pairs of statements. Statements were also reshuffled to ensure that participants would not monotonously tick a 'yes' or 'no' response without reading for meaning.

Other aspects of questionnaire validation, such as principal component analysis and checking for internal consistency, were not carried on the final survey instrument.

3.10 Data collection

Attempts were made to locate all of the NQDs meant to be working in Southern Gauteng. Finally, the researcher distributed 502 self-administered questionnaires to NQDs during the data collection period of 1st April 2013 to 31st July 2013, corresponding to a four-month rotational block for interns. The researcher used each facility's departmental calendar to identify scheduled dates for academic meetings, presentations, and intern welfare meetings, during which he explained the research, distributed questionnaires and allowed for completion. Some departments, especially within the central hospitals, assisted with the circulation and collection of the questionnaires after the researcher addressed the interns collectively. Under such circumstances, departmental secretaries acted as points of distribution and collection as well. At the smaller hospitals, CHCs and PHC clinics where there was no such infrastructure, the researcher personally distributed the questionnaires, unless there was a willing intern curator. In areas where NQDs were sparsely distributed, such as in the CHCs and PHC clinics, the collection was mostly done by the researcher's assistant trained to assist only with the collection after accompanying the initial distribution. Usually during the distribution, one central point of collection was agreed upon with the respondents especially those who could not immediately finish with the filling of the questionnaires. Clearly marked collection boxes were placed within view of the collector, usually the departmental or hospital secretary. Since the expected number of interns/community service doctors was pre-determined from each health facility, the response rate could be easily calculated.

Challenges included visiting each health facility at least twice, with some up to six times, in an effort to improve the response rates from some centres. It was not always easy to obtain permission from the facility managers to involve their staff in the study, which required additional visits. Interns were more numerous and concentrated in fewer facilities, thus more readily accessible than community service doctors. Community service doctors placed in primary healthcare settings were sparsely distributed, so there was a need to track them down individually.

3.11 Bias

Information Bias - The questions on the survey instrument were simplified to minimise ambiguity and leading responses. Since respondents were asked about current career choices and not their previous aspirations during their secondary/tertiary education, recall bias was minimised. However, the question on prior thought of considering Family Medicine as a specialty choice involves recall and therefore could be an issue. The possibility of a social desirability bias, i.e. favouring responses toward Family Medicine due to the questionnaire being distributed by a known registrar in the field was minimal given that the method of collection was anonymous (dropped in a box or collected via the facility secretary) which was mostly in the absence of the researcher.

Selection Bias - There was a large difference between the supposed study population of NQDs on paper (768) and the actual study population reached in the field (502). The fact that community service doctors in the smaller clinics were difficult to track down surely introduced some bias especially with regards to the findings associated with primary healthcare. There was no sampling bias since the entire study population was given the opportunity to participate; but there could have been a non-response bias. Manually distributing the questionnaires improved response rates compared to more conventional methods of using surveys mailed through the postal service or e-mail. It was difficult to estimate the extent of non-responder bias since the profile of the non-respondents is unknown. In order to reduce this bias, there was an effort to ensure a widely representative sample, especially from areas that had a very low response yield, as the researcher and/or his assistant made multiple visits to improve the number of questionnaires collected.

3.12 Data analysis

Information from the questionnaires was entered directly into Epi-info 7 software and later exported into both the Statistical Package for the Social Sciences (SPSS) version 15.0 software and Stata 13 for analysis.

Covariates or predictors investigated in the study included:

- Demographic factors such as sex, age, medical institution trained, health facility, citizenship, and rotation/year of the interns.

- Career Plan factors included: Sector planned to practise; Country planned to practise; Plan to remain in medical practice; Hours of work planned to practise - full time (with or without over time) or part time; Plan to specialise within the next five years; and if the respondents have a definite career choice.
- Personal, social and occupational factors were listed in the questionnaire to be graded by the respondents in a four-point Likert scale format to show their level of agreement. The scale included 'strongly disagree', 'somewhat disagree', 'somewhat agree' and 'strongly agree'—which was later categorised for analysis into two groups; namely, 'Disagree' for the first two and 'Agree' for the latter two. The use of four-point Likert scale made the categorisation easier required for further simpler analysis as used in previous studies[42,59].
- Reasons for finding Family Medicine interesting or not interesting were provided as follows – (*Other reasons not listed below could be added as open responses*)

  A - Job satisfaction in Primary Care
  B - Undergraduate experience in FM
  C - Competence Level in FM
  D - Broad Content of FM program
  E - Time Demand of FM
  F - Popularity of FM
  G - FM being Financially Rewarding

Outcome or dependent variables included:

- Choice of career specialty (first and second options) – The free written choices were grouped into core specialties done during internship rotation namely surgical (including general surgery), medical (including internal medicine), paediatrics, obstetrics and gynaecology, anaesthesia, Family Medicine, psychiatry, 'other' specialties (like public health, radiology, pathology, etc.) – not included in any group, and none. This classification is identical to the study done on interns in Iran[40].
- Level of interest in / value of Family Medicine with responses in a four-point Likert scale as used previously in another study[60]. The categorization of responses was done into (i) *FM not so interesting* (to include FM is not interesting; and FM is a bit interesting and not worthwhile) and (ii) *FM interesting* (to include FM is interesting

and worthwhile; and FM is very interesting and important specialty). The categorisation of this outcome variable into a binary outcome made it easier to use tests of associations like the Pearson chi-square test.

- *Having ever considered choosing Family Medicine* was coded as either 'Yes' or 'No'.
- Some career factors were considered as outcome variables when compared to the demographic factors as explanatory/independent variables.

Since the age of the participants did not follow a normal distribution probably due to the two mixed groups, it was described using median and Inter quartile range (IQR). Consecutively, differences in ages with respect to categorical covariates of interest such as sex were tested using the Mann-Whitney test. Besides that, all the other categorical covariates were described using frequencies and percentages.

For most categorical variables, the Pearson chi-square test was used to test for association between the individual independent/explanatory variables and the outcome variables. The 2x2 tables that did not meet the criteria for the Pearson chi-square test, such as expected values in 20% of the cells having less than five, were analysed using the Fischer's exact test. To quantify the magnitude of the relationship between some predictors (age, health facility, etc.) and prior consideration on choosing FM, a simple logistic regression model was built using forward elimination approach for selecting significant covariates to be considered in the final model. The final model was refitted and lack of fit was investigated using the Hosmer-Lesmeshow test for goodness of fit. Marginal probabilities of the final model were used to support the interpretation of the model.

Finally, the open-ended or free response options for any extra reasons for not considering Family Medicine, and extra reasons for finding Family Medicine interesting or not interesting were analysed qualitatively. Such responses were analysed into themes, and any themes that were found to be different from the already listed choices were highlighted in the findings section.

3.13 Ethical considerations

Ethical approval to conduct this study was granted by the Human Research Ethics Committee (HREC) of the University of the Witwatersrand on 30 December 2012. The clearance certificate number is M121147 (**Appendix 7**). Additional permission to carry out the research

was obtained from the Gauteng Provincial Health Research Committee, since it involved multiple facilities in four separate health districts (**Appendix 8**).
Lastly, the facility managers were informed of the research and gave assent for their staff to participate voluntarily.

Anonymity: There were no names or specific identifying information traceable to respondents. The returned questionnaires were numbered for consistency within each facility in the study to ensure that the response rate was achieved. To further ensure anonymity, respondents were advised to drop the completed questionnaires in closed boxes at designated places. In the few primary healthcare centres where only one or two doctors work, respondents were instructed not to put the name of their clinics on the questionnaire. Also, the research assistant, who the respondents knew was not actively involved in the study analysis, mostly collected the questionnaires from these clinics.

Confidentiality: The participant information sheet, which was attached to the questionnaire, assured the respondent of the confidentiality of all information provided being used solely for the purposes of this research.

Consent: Consent to participate in the study was implied once the individual duly completed and deposited the questionnaire. The information sheet indicated that there was no benefit for participating in the research or penalty for refusal thereof. The researcher verbally reiterated this during the distribution of questionnaires. Incomplete questionnaires dropped into the collection boxes were deemed to have been those who refused consent.

3.14 Period of research and budget

The research took 24 months to complete. Data collection began in April 2013 and ended in July 2013. Data entry, rechecking and cleaning were effected from January 2014 to March 2014. The analysis of the data was done from May 2014 to August 2014 and revisited in April 2015 to May 2015. The initial write up took place from September 2014 to January 2015, with final submission in February 2016. The budget for the project was entirely borne by the researcher and would be produced on request. The researcher declares that there is no conflict of interest with this study, except that he was a Family Medicine registrar at the time that the study was conducted.

CHAPTER FOUR

RESULTS

4.1 STUDY POPULATION

Five hundred and two questionnaires were distributed to 396 interns and 106 community service doctors at three different types of workplace: central hospitals; tertiary, specialist and regional hospitals; and, primary healthcare facilities which included district hospitals and CHCs/PHC clinics. A total of 368 questionnaires were returned from 298 interns and 70 community service doctors. The overall response rate was 73.3%. Twenty-six of these questionnaires were excluded from analysis (22 completed by interns and 4 by community service doctors) due to missing vital information or illegible handwriting rendering them unanalysable. Hence the total number of questionnaires included for analysis was 342, achieving more than the calculated sample size required for this study. **Appendix 9** is a graphic representation of the entire process of questionnaire distribution and collection while **Appendix 10** describes the response rates by work place and occupation level.

The highest response rate was from participants working in central, tertiary, specialist, and regional hospitals (80.4%) and the lowest from those in district hospitals, CHCs, and PHC clinics (59.3%). Interns (75.6%) responded slightly better than community service doctors (64.8%), although more interns were excluded from the study compared to community service doctors due to incomplete questionnaires. This difference, however, was not significant.

4.2 DEMOGRAPHIC FACTORS OF THE PARTICIPANTS

The demographic characteristics of the study participants are laid out in table 4.1 below

4.2.1 Sex of the participants

Almost two thirds (63%) of the study participants were female.

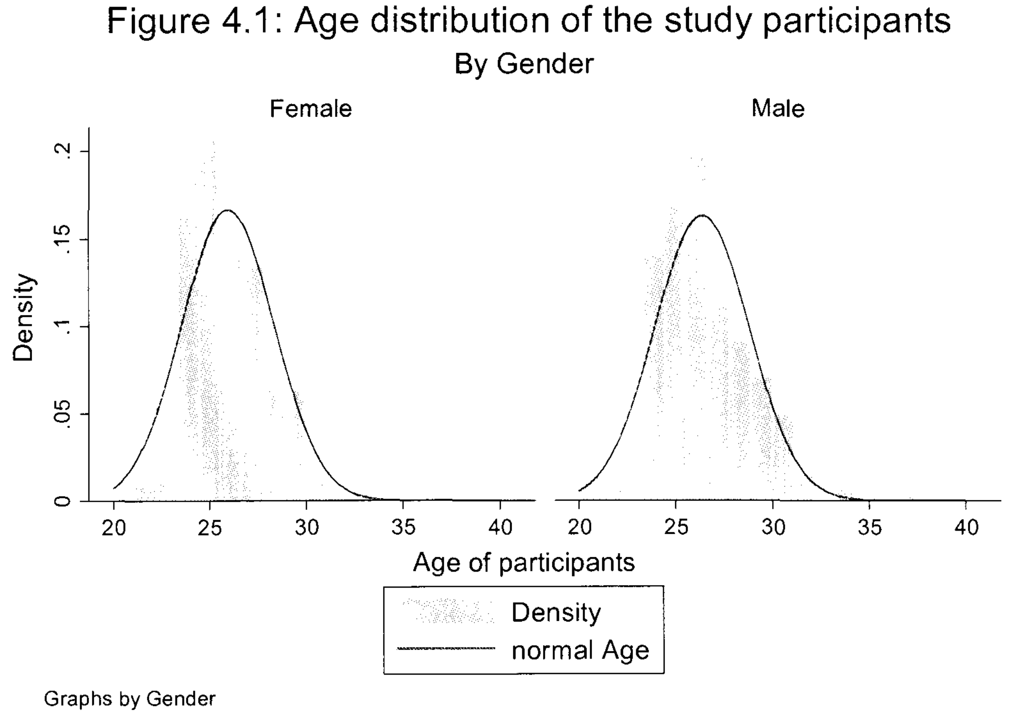
Table 4.1 Demographic characteristics of NQDs (N = 342)

Characteristics	Number	Percentage
Sex	**n = 342**	
Female	214	62.6%
Male	128	37.4%
Median age, (IQR)	26 (3)	
University medical school attended (n=340)		
Witwatersrand (Wits)	123	36.2%
Pretoria (UP)	66	19.4%
Limpopo (Medunsa)	42	12.4%
Cape Town (UCT)	39	11.5%
Non-South Africa	23	6.8%
Kwazulu-Natal (UKZN)	20	5.9%
Stellenbosch	14	4.1%
Walter Sisulu	11	3.2%
Free State	2	0.6%
University categorised in relation to Wits University		
Wits University	123	36.2%
Non Wits	194	57.1%
Non South African University	23	6.8%
Occupation Level	**n = 342**	
Interns	276	80.7%
Community Service	66	19.3%
Citizenship	**n = 342**	
SA Citizen	321	93.9%
Non SA Citizen	21	6.1%
Health Facility (Workplace)	**n = 342**	
Academic (central)	143	41.8%
Tertiary, specialist & regional	181	52.9%
District hospitals, CHCs & clinics (PHC)	18	5.3%
Internship year		
Year 1	165	59.8%
Year 2	111	40.2%
Number of rotations completed at the time of survey [Interns only]	**n = 276**	
1	111	40.22%
2	42	15.22%
3	12	4.35%
4	76	27.54%
5	28	10.14%
6	7	2.54%

4.2.2 Age of the participants

The mean age of the study participants was 26.1 years (interns 25.75 years) with a standard deviation (SD) of 2.4. However, since age was a non-normal distribution, the median and interquartile ranges were reported as shown in Table 4.1 above. Figure 4.1 below clearly portrays a non-normal distribution of age across sex. Thus, the median age for females was 25 years while that for males was 26 years. This difference in ages was investigated using the Mann-Whitney test for equality of the sum of ranks (since the t-test is used only for normal distribution), and it was found to be statistically significant with a p-value of 0.04.

Figure 4.1 Age distributions of the study participants



4.2.3 Participants' universities attended

Regarding undergraduate medical training as shown in Table 4.1, over one third of the respondents (36.2%) graduated from Wits University. Almost one fifth (19.4%) of the study participants attended University of Pretoria while Medunsa and UCT were attended by 12.4% and 11.5% respectively. The rest of the medical schools were each attended by less than 10% of the study participants.

For the purpose of further analysis, the medical schools attended were grouped into: Wits, attended by 123 participants (36.2%); Non Wits (in SA), attended by 194 participants (57%); and, Non SA (outside SA) by 23 participants (6.8%). The rationale for this grouping was based on the fact outlined in the first chapter that the University of Witwatersrand is the only medical school situated geographically in Southern Gauteng.

4.2.4 Occupational level of participants

From Table 4.1, the distribution by occupation of the study participants shows that interns formed four fifths (80.7%) of the study participants while community service doctors constituted 19.3%. Using the Pearson chi-square test, there was no statistical difference in sex proportions between the two occupational levels of being an intern or community service doctor (p-value 0.444).

4.2.5 Workplace of the participants

Table 4.1 shows that just above half of the respondents (52.9%) were based at tertiary, specialist and regional hospitals while 143 (41.8%) worked in central hospitals. There were numerous primary healthcare facilities where community service doctors were placed, although this category had the lowest number of respondents at 18 (5.3%).

4.2.6 Citizenship of participants

Most participants (93.9%) were South African citizens, while non-South African citizens were just 6.1%.

4.2.7 Rotations of the interns

Table 4.1 shows that out of the 276 interns who participated, 111 (40%) indicated that they were only in their first rotation. There was no statistical difference between males and females who participated in this study with respect to the rotations they were in during data collection. The two least-completed rotations by the participants at the time of the study were the combined Family Medicine / Psychiatry rotation and the Anaesthesia / Orthopaedics rotation.

4.3 CAREER PLAN FACTORS OF THE PARTICIPANTS

Table 4.2 below indicates the responses on career plans by the study participants. Tests of association were done to investigate associations between selected demographic characteristics and the career plans of the study participants. The *p*-values with asterisks were derived from the Fisher exact tests, while the others result from the Pearson chi-square tests. The *p*-values in bold are statistically significant

4.3.1 Sector planned to practise by the participants

As indicated in Table 4.2, 63.4% of participants planned to combine both public and private practice in their careers. One fifth (20.2%) stated they were interested in public practice alone while only 16.4% indicated they intend to do solely private practice.

Although these expectations differ by sex, age and occupational level with respect to sector intended to practice, these differences were not significant. However, within the 25-29 years age group, most planned to work either less in the private sector alone (13.6%) or more in public sector alone (23.8%) as compared to other age groups that are younger or older (*p*-value 0.066).

4.3.2 Country intending to practise in and plan to remain in medical practice by the participants

Table 4.2 below shows that most respondents (91.2%) planned to practice in South Africa. Using the Pearson chi-square test, although not significant but a finding worthy of note, is that among those who intended to emigrate from South Africa, the proportion of males (13.3%) was twice that of female participants (6.1%) (*p*-value 0.062).

Of all respondents, 89.8% planned to remain in active medical practice with one tenth still (9.7%) unsure. When investigating for the association between sex and plans to remain in the practise as a medical doctor, there was no statistical difference between the expectations of the two sexes (*p*-value 0.741).

Table 4.2 Career plans of NQDs cross tabulated by important demographic factors

	Sector planned to practice (n=341)			Country intending to practice (n=342)			Hours of work (n=342)			Plan to specialise in 5 years (n=341)		Definitive choice of speciality (n=342)			Plan to remain in medical practice (n=342)		
	Private (16.42%)	**Public (20.23%)**	**Priv & Pub (63.34%)**	**SA (91.23%)**	**SADC (5.26%)**	**Outside SADC (3.51%)**	**Full Time & Over Time (53.22%)**	**Full Time no Over Time (40.06%)**	**Part Time (6.73%)**	**Yes (89.74%)**	**No (10.26%)**	**Yes (40.64%)**	**No (15.79%)**	**Unsure (43.57%)**	**Yes (89.77%)**	**No (0.58%)**	**Unsure (9.65%)**
SEX		0.482			**0.062**			**0.006**		**0.027**			**0.054**			0.741*	
Female N (%)	32(15)	41 (19.2)	140 (65.7)	201 (93.9)	7 (3.3)	6 (2.8)	100 (46.7)	99 (46.3)	15 (7.0)	185 (86.8)	28 (13.2)	77 (36.0)	39 (18.2)	98 (45.8)	194 (90.6)	1 (0.5)	19 (8.9)
Male N (%)	24 (18.8)	28 (21.9)	76 (59.4)	111 (86.7)	11 (8.6)	6 (4.7)	82 (64.0)	38 (29.7)	8 (6.3)	121 (94.5)	7 (5.5)	62 (48.4)	15 (11.7)	51 (39.8)	113 (88.3)	1 (0.78)	14 (10.94)
AGE		**0.066**			0.242*			**0.001**		0.406			0.126			0.205 *	
< 25	19 (22.1)	10 (11.6)	57 (66.3)	82 (95.4)	2 (2.3)	2 (2.3)	38 (44.2)	40 (40.5)	8 (9.3)	74 (86.1)	12 (13.9)	26 (30.2)	18 (20.9)	42 (48.8)	75 (87.2)	0 (0.0)	11 (12.8)
25 – 29	32 (13.6)	56 (23.8)	147 (62.6)	213 (90.3)	15 (6.4)	8 (3.4)	133 (56.4)	93 (39.4)	10 (4.2)	214 (91.1))	21 (8.9)	109 (44.1)	35 (14.8)	97 (41.1)	216 (91.5)	2 (0.9)	18 (7.6)
>30	5 (25.0)	3 (15.0)	12(60.0)	17 (85.0)	1 (5.0)	2 (10.0)	11 (55.0)	4 (20.0)	5 (25.0)	18 (90.0)	2 (10.0)	9 (45.0)	1 (5.0)	10 (50.0)	16 (80.0)	0 (0.0)	4 (20.0)
Occupation LEVEL		0.726			0.076			0.627		0.580			**0.002**				
Intern	44 (16.0)	54 (19.6)	177 (64.4)	60 (90.9)	6 (9.1)	0 (0.0)	144 (52.2)	114 (41.3)	18 (6.5)	248 (90.2)	27 (9.8)	103 (37.3)	51 (18.8)	121 (33.8)	246 (89.1)	1 (0.4)	29 (10.5)
Comm. Serv	12 (18.2)	15 (22.7)	39 (59.1)	252 (91.3)	12 (4.4)	12 (4.4)	38 (57.6)	23 (34.8)	5 (7.6)	58 (87.9)	8 (12.1)	36 (54.5)	2 (3.0)	28 (42.5)	61 (92.4)	1 (1.5)	4 (6.1)
WORK PLACE		0.604			**0.052***			0.226*		0.645			0.345			0.705*	
Central	21 (15.3)	29(21.2)	87 (63.5)	124 (90.5)	4 (2.9)	9 (6.6)	74 (54.0)	55 (40.2)	8 (5.8)	123 (90.4)	13 (9.6)	58 (42.3)	21 (15.3)	58 (42.4)	120 (87.6)	1 (0.7)	16 (11.7)
Tertiary & Reg	34 (18.3)	33 (17.7)	119 (64.0)	172 (92.0)	12 (6.4)	3 (1.6)	94 (50.3)	79 (42.2)	14 (7.5)	168 (89.8)	19 (10.2)	70 (37.4)	32 (17.1)	85 (45.5)	171 (91.5)	1 (0.5)	15 (8.0)
PHC	6 (33.3)	2 (11.1)	10 (55.6)	16 (88.9)	2 (11.1)	0 (0.0)	14 (77.8)	3 (16.7)	1 (5.6)	15 (83.3)	3 (16.7)	11 (61.1)	1 (5.6)	6 (33.3)	16 (88.9)	0 (0.0)	2 (11.1)

*Fisher exact test

4.3.3 Hours of work planned by the participant

As shown in Table 4.2, when asked about how much time they plan to work, just over half of the participants (53.2%) stated that they would work full time (FT) with over time (OT), while 40% planned to work full time but with no over time. Only 23 participants (6.7%) planned to work part time.

Expectations about the hours of work differed significantly (p-value = 0.006) between the two sexes, with 46.7% of females choosing to work full time combined with over time as opposed to 64.1% of males. In contrast, more females (46.3%) planned to work full time with no over time against only 29.7% of males.

There was not much difference in age groups as regards the expected hours of work. Regarding part time work, however, a quarter of the participants aged 30 years or more considered it, compared to less than 10% for those 29 years and younger. There was no difference among interns and community service doctors regarding their plans on working hours.

4.3.4 Plan to specialise in next five years by the participants

As indicated in Table 4.2, nine out of ten participants (89.7%) were planning to specialise within the next five years. Males (94.5%) were slightly more likely to intend to specialise in the next five years than their female counterparts (86.9%) (p-value 0.027).

There were no significant differences in proportions of interns and community service doctors as regards their immediate five-year plan to specialise. Even with further stratification of the interns into first year and second year there was no significant difference (p-value 0.457).

4.3.5 Participants who have made a definitive choice of specialty

Table 4.2 shows the responses by the participants when asked if they had made a definitive choice of a specialty. Forty one percent of the study participants responded, 'Yes' while an almost equal proportion (43.6%) ticked 'Unsure'. Only 15.8% responded, 'No'; however, when combining both the 'Unsure' and 'No' categories, 59.4% of respondents were uncertain regarding their choice of specialty at the time of the survey.

As regards the influence of sex on this career plan factor, the differences in the proportions were minimal although statistically significant. Males (48.4%) tended to be more certain of their intended specialty than females (36.0%) (*p*-value 0.054). Concerning the occupational level, community service doctors (54.5%) were more certain of their choice of specialty compared to interns (37.3%). Only 3% of the community service doctors answered, 'No' to having a definite career choice of specialty as compared to 18% of the interns. Yet, almost equal proportions of interns (43.8%) and community service doctors (42.4%) reported they were unsure of which particular specialty they would pursue.

4.4 CHOICE OF SPECIALTY

4.4.1 Choice of specialty by the participants

Table 4.3 First and second choice of career specialty by NQDs

No	Specialty	1st Choice (%) (n=342)	2nd Choice (%) (n=342)
1	All Surgical specialties	110 (32.16)	93 (27.19)
	Surgery (General)	28 (8.20)	
	Surgery (Specialty)	82 (24.00)	
2	All Medical specialties	49 (14.33)	50 (14.62)
	Internal Medical (General)	37 (10.80)	
	Internal Medical (Specialty)	12 (3.50)	
3	Paediatrics	44 (12.87)	28 (8.19)
4	Anaesthetics	32 (9.36)	34 (9.94)
5	'Other' specialties	30 (8.77)	23 (6.73)
6	None	29 (8.48)	75 (21.93)
7	Obstetrics & Gynaecology	25 (7.31)	15 (4.39)
8	Psychiatry	15 (4.39)	5 (1.46)
9	Family Medicine	8 (2.34)	19 (5.56)

Participants were asked to freely write the career specialty of their choice with the option to give both first and second choices. The specialty choices were then categorised into nine groups, with the ninth group for those who left their spaces blank or wrote in 'none'. 'Other' specialty choices included public health, medical administration, radiology, anatomic and chemical pathology, forensic medicine, et cetera, that did not fit into the rest of the groups. Table 4.3 above indicates the percentages and frequencies of these nine groups of specialty choices.

Surgery ranked highest with 110 respondents (32.2%) choosing either general surgery or a surgical specialty that included urology, ophthalmology, orthopaedics, paediatric surgery, neurosurgery, otorhinolaryngology (ENT), trauma & emergency surgery, plastic surgery, cardiothoracic surgery and vascular surgery. Forty-nine respondents (14.3%) indicated internal medicine and its specialties, including dermatology, neurology, cardiology, gastroenterology, nephrology, endocrinology, etc. The third highest-ranking specialty of first choice was paediatrics chosen by 44 participants (12.9%). The remaining specialties were each chosen by less than 10% of respondents. Worthy of note is that Family Medicine was the least chosen specialty, with only eight participants (2.34%) indicating it as their first choice.

The second choice of specialty indicated a similar trend for the surgical (27.2%) and internal medicine (14.6%) specialties. However, 75 respondents (21.9%) listed no second choice. Family Medicine was given as second choice by 19 participants (5.6%), which is more than double the number who listed it as their first choice.

4.4.2 Factors affecting choice of specialty

Table 4.4 below documents associations between the aforementioned demographic variables and choice of specialties. The use of Pearson chi-square test of association was restricted by the preponderance of cells with expected cell counts of less than five. Apart from sex and occupation level, the rest of the factors all had more than twenty percent of their cells with frequencies less than five. Within Stata, the Fisher exact test could not be computed because of the multiple groups of specialties as the outcome variable. Instead, Pearson chi square was considered.

Significantly, 45.3% of males chose surgical specialties as their first choice compared to 24.3% of females. Conversely, choosing paediatrics was female dominated, with 18% making it their first choice as opposed to only 3% of their male counterparts. The choice of internal medicine specialties as a first choice was almost equally distributed among males (15.6%) and females (13.6%). Disciplines like Obstetrics and Gynaecology, Anaesthetics, and Psychiatry all had a slight preponderance of females as first choice. Although few chose Family Medicine as a first choice, the males and females were equal at 2.3%.

Although not significant (*p*-value 0.064), the proportion of interns choosing medical specialities was about twice as much as community service doctors. In contrast, the choice of obstetrics and psychiatry by interns was half that of community service doctors. However, almost equal proportions of both interns and community service doctors chose surgical specialties, paediatrics and anaesthetics.

Table 4.4 Demographic and career plan factors affecting first choice of specialty by the NQDs

	Surgical (n=110)	Medical (n=49)	Paediatrics (n=44)	Anaesthetics (n=32)	Non Clinical (n=30)	None (n=29)	Obs & Gynae (n=25)	Psychiatry (n=15)	Family Med (n=8)	*p*-value
Sex										
Female	52 (24.30)	29 (13.55)	40 (18.69)	23 (10.75)	16 (7.48)	19 (8.88)	19 (8.88)	11 (5.14)	5 (2.34)	**0.001**
Male	58 (45.31)	20 (15.63)	4 (3.13)	9 (7.03)	14 (10.94)	10 (7.81)	6 (4.69)	4 (3.13)	3 (2.34)	
Age										
< 25	28 (32.56)	16 (18.6)	11 (12.79)	6 (6.98)	8 (9.30)	8 (9.30	4 (4.65)	4 (4.65)	1 (1.16)	0.422
25 – 29	78 (33.05)	32 (13.56)	32 (13.56)	23 (9.75)	17 (7.20)	19 (8.05)	18 (7.63)	10 (4.24)	7 (2.97)	
>30	4 (20.00)	1 (5.00)	1 (5.00)	3 (15.00)	5 (25.00)	2 (10.00)	3 (15.00)	1 (5.00)	0 (0.00)	
University										
Wits	37 (30.08)	27 (21.95)	21 (17.07)	9 (7.32)	8 (6.50)	8 (6.50)	8 (6.50)	4 (3.25)	1 (0.18)	0.253
Non Wits	64 (32.99)	21 (10.82)	21 (10.82)	22 (11.34)	19 (9.79)	18 (9.28)	14 (7.22)	9 (4.64)	6 (3.09)	
Others	8 (34.78)	1 (4.35)	2 (8.70)	1 (4.350	3 (13.04)	3 (13.04)	2 (8.70)	2 (8.70)	1 (4.35)	
Level										
Internship	90 (32.61)	44 (15.94)	35 (12.68)	25 (9.06)	22 (7.97)	28 (10.01)	17 (6.16)	10 (3.62)	5 (1.81)	0.064
Comm Service	20 (30.30)	5 (7.58)	9 (13.640	7 (10.61)	8 (12.12)	1 (1.52)	8 (12.12)	5 (7.78)	3 (4.55)	
Facility										
Central	42 (30.66)	25 (18.25)	22 (16.06)	10 (7.30)	11 (8.03)	10 (7.30)	13 (9.49)	3 (2.19)	1 (0.73)	**0.001**
Tert & Reg	65 (34.76)	22 (11.76)	20 (10.70)	21 (11.230	18 (9.63)	19 (10.16)	12 (6.42)	5 (2.67)	5 (2.67)	
PHC	3 (16.67)	2 (11.11)	2 (11.11)	1 (5.56)	1 (5.56)	0 (0.00)	0 (0.00)	7 (38.99)	2 (11.11)	
Hours of work										
FT with OT	62 (34.07)	33 (18.13)	23 (12.09)	20 (10.99)	11 (6.04)	6 (3.30)	17 (9.34)	7 (3.850	4 (2.20)	**0.001**
FT no OT	44 (32.12)	14 (10.22)	21 (15.33)	11 (8.03)	15 (10.95)	16 (11.68)	5 (3.65)	7 (5.11)	4 (2.92)	
PT	4 (17.39)	2 (8.72)	1 (4.35)	1 (4.35)	4 (17.39)	7 (30.43)	3 (13.04)	1 (4.35)	0 (0.00)	
Definite choice										
Yes	45 (32.37)	21 (15.11)	18 (12.95)	13 (9.35)	14 (10.07)	2 (1.44)	14 (10.07)	7 (5.04)	5 (3.60)	**0.006**
No	13 (24.07)	8 (14.810	7 (12.95)	4 (7.41)	3 (5.56)	13 (24.07)	2 (3.70)	4 (7.41)	0 (0.00)	
Unsure	52 (34.90)	20 (13.42)	19 (12.75)	15 (10.07)	13 (8.72)	14 (9.40)	9 (6.04)	4 (2.68)	3 (2.01)	

4.4.3 Who chose Family Medicine?

Although the number of NQDs selecting Family Medicine as either a first or second choice was insufficient for statistical analysis, it is interesting to describe the characteristics of those individuals. All of the respondents who chose Family Medicine as either a first and second choice were South African citizens, except one. Nearly all of them (25 out of 27) stated that they intend to practice in South Africa. The majority of the participants that considered Family Medicine as either first choice (6 out of 8) or second choice (12 out of 19) stated they were not entirely sure about their intention to specialise in it.

4.4.4 Individual, social and occupational factors influencing how participants chose a specialty

The statements listed in Table 4.5 below reflect some of the individual, social and occupational factors that are known to influence choice of specialty. The study participants were asked to indicate their level of agreement with those factors on a four-point Likert scale. Those who ticked 'strongly disagree' and 'somewhat disagree' were categorised as *disagree* with the factor while those who ticked 'strongly agree' or 'somewhat agree' were categorised as *agree* with the factor. The factors listed in the table are arranged in the order of highest response by both male and female participants. These were then disaggregated by sex, which further highlighted the impact of the factors.

The highest-ranking factors agreed by the respondents as influential on their career decision were 'Acceptable hours of Practice' (85%), 'Plan to have family' (84%), 'Intellectual challenge of the Field' (83.4%), and 'Income potential ' (78%). Other factors listed in the table above also had a high ranking of agreement (by more than half of the respondents) on the four-point Likert scale, excepting 'Narrow variety of patient problems' with up to 56% who disagreed on it being an important factor. It might be important to note that only two thirds of the participants who responded agreed that medical school experience played a role in their career decision.

Table 4.5 Psychosocial and occupational factors influencing participants' choice of specialty				
	Agree		**Agree by Sex**	
FACTORS	**N**	**(%)**	**Female (%)**	**Male (%)**
Need acceptable hours of practice n = 336	286	85.1	184 (86.4)	102 (82.9)
Plan to have a family n = 339	285	84.1	187 (87.8)	98 (77.8)
Need intellectual challenge [of the field] n = 332	277	83.4	170 (81.3)	107 (87.0)
Income potential n = 336	262	78.0	156 (73.9)	106 (84.8)
Like working with new technology n = 334	241	72.2	138 (65.7)	103 (83.1)
Need to see immediate results [of intervention] n = 330	223	67.6	134 (64.7)	89 (72.4)
Experience in medical school n = 334	222	66.5	138 (66.0)	84 (67.2)
Variety of illnesses n = 327	216	66.1	141 (68.4)	75 (62.0)
Social commitment n = 328	212	64.6	145 (69.0)	67 (56.8)
Importance of health promotion [and prevention] n = 324	209	64.5	138 (67.0)	71 (60.2)
Importance of continuity of patients n = 332	211	63.6	139 (66.5)	72 (58.5)
Need to be part of community n = 326	192	58.9	131 (63.0)	61 (51.7)
Personal socio-economic status n = 333	194	58.3	116 (55.2)	78 (63.4)
Need narrow variety [of patient problems] n = 326	134	41.1	79 (38.7)	55 (45.1)

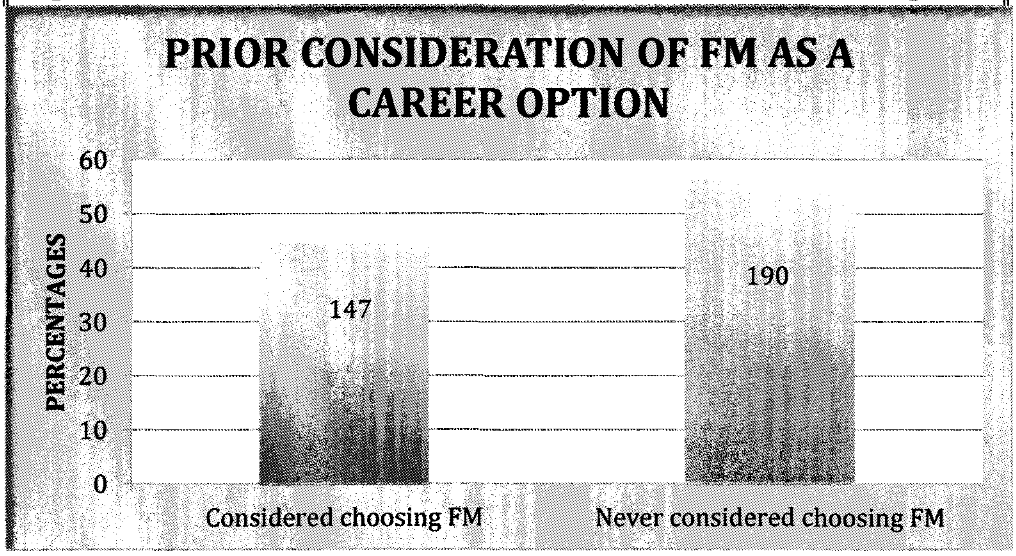
Twelve percent more females than males agreed that 'social commitment' was an important factor in their career choice; also, 11 percent more females saw the 'need to be part of community' as an important factor. Although most people agreed that 'plan to have family' is an important factor in choosing a career, ten percent more females agreed than males. Conversely, males thought that 'working with new technology' (17.4% more) and 'income potential' (11% more) were important factors when making choices. Other factors agreed to by the participants had less than 10% difference between the sexes of the participants and thus were deemed not significant enough to be reported.

4.5 PRIOR CONSIDERATION OF FAMILY MEDICINE AS A CAREER OPTION

4.5.1 Participants were asked, 'Have you ever thought of choosing Family Medicine as career option?'

The participants were asked the question above irrespective of whatever choice of specialty had already been made; and, their responses are shown in Figure 4.2 below. Slightly less than half of respondents (44%) had considered choosing Family Medicine as a career option.

Figure 4.2 – Prior consideration of Family Medicine as a career option



4.5.2 Demographic and career plan factors associated with prior consideration of Family Medicine by participants

Those who said that they had ever thought of choosing Family Medicine as a career were analysed according to their demographic and practice preferences. Table 4.6 below presents these results.

Table 4.6 below suggests that those who had once considered choosing Family Medicine were slightly but significantly older than those who did not (p-value 0.02). There was no significant difference among university, occupational level and citizenship. Although not significant at 5% level of significance in the Pearson chi-square test of association, sex was considered as one of the primary predictors while constructing the model.

Table 4.6 Comparison of different demographic characteristics and career plans of the participants who had considered choosing or not choosing FM as a career

Variables (N)	Considered choosing FM (n=337) 'Yes' n=147 (44%)	'No' n=190(56%)	*p*-value
Sex			
Females (210)	99 (47.1)	111 (52.9)	**0.094**
Males (127)	48 (37.8)	79 (62.2)	
Age mean, (SD)	26.45 (2.7)	25.83 (2.2)	**0.020*** (t-test)
University			
Wits (121)	53 (43.8)	68 (56.2)	0.646
Non-Wits (191)	86 (45.0)	105 (55.0)	
Other (23)	8 (34.8)	15 (65.2)	
Level			
Internship (272)	117 (43.0)	155(57.0)	0.647
Community service (65)	30 (46.2)	45(53.8)	
Citizenship			
SA (316)	137 (43.4)	179 (56.6)	0.703
Non-SA (21)	10 (47.6)	11 (52.4)	
Health facility			
Central (141)	60 (42.55)	81 (57.45)	**0.042**
Tert. & Reg. (178)	74 (41.57)	104 (58.43)	
PHC (18)	13 (72.22)	5 (27.78)	
Rotation 1st/2nd (Interns)			
1st year (162)	82 (50.6)	80 (49.4)	**0.002**
2nd year (110)	35 (31.8)	65 (68.2)	
Rotation in FM (Interns)			
Rotation done (69)	27 (39.1)	42 (60.9)	0.451
Rotation not done (203)	90 (44.3)	113 (55.7)	
Sector			
Public (68)	35 (51.5)	33 (48.5)	0.307
Private (56)	22 (39.3)	34 (60.7)	
Public & private (212)	89 (42.0)	123 (58.0)	
Country of practice			
SA (307)	134 (43.6)	173 (56.4)	0.988
SADC (18)	8 (44.4)	10 (55.6)	
Outside SADC (12)	5 (41.7)	7 (58.3)	
Medical Practice			
Continue (305)	134 (43.9)	171 (56.1)	0.458
Not continue (2)	2 (100.0)	0 (0.0)	
Unsure (30)	13 (43.3)	17 (56.7)	
Hours of Work			
FT with OT (179)	71 (39.7)	108 (60.3)	**0.031**
FT no OT (136)	70 (51.5)	66 (48.5)	
PT (22)	6 (27.3)	16 (72.7)	
Definite career choice			
Yes (137)	51 (37.2)	86 (62.8)	**0.003**
No (52)	30 (57.7)	22 (42.3)	
Unsure (148)	66 (44.6)	82 (55.4)	

However, the health facility in which participants were working may have had an influence, as up to 77.8% of the participants based in primary healthcare facilities had considered choosing Family Medicine compared to slightly above 40% for those working in central, tertiary, specialist and regional hospitals (p-value 0.042). There was a significant difference among interns in that half of first year interns compared to less than a third of second year interns had thought of choosing Family Medicine as a career specialty (p-value 0.002). There was no significant difference between interns who had completed rotations in Family Medicine and those who had not in terms of considering Family Medicine as a specialty option.

Insignificant factors in participants` prior consideration of Family Medicine as a specialty choice included: public versus private sector practice, country planned to practice and intention to remain in active medical practice. Planning to work part time was less likely (27.3%) to impact on considering Family Medicine in contrast to full time with no over time (51.5%). Less than two fifths (37.2%) of participants who had indicated a definite career choice had ever considered choosing Family Medicine compared to more than half (57.7%) of those who said they had no definite career option. With a p-value of 0.003, this was deemed significant in that having a definite career choice seemed a negative predictor of ever having considered Family Medicine as a career option.

Results of the bivariate model in Table 4.7 below suggest that age, health facility, hours of work and definite career choices were the only significant predictors of prior consideration of Family Medicine as a career option.

These four predictors remained significant in the final (multivariate) models even though some of the categories under certain predictors were not significant. Thus, in the final model, age remained a significant factor suggesting that increasing age was associated with a greater chance of having thought about choosing FM. For each incremental year, participants were 15% (OR: 1.15; 95% CI: 1.04 – 1.28) more likely to think about choosing FM. Working in a primary healthcare facility (OR: 5.25; 95% CI: 1.56 – 7.62) was found to be strongly associated with having thought about choosing FM compared to doctors currently working in central hospitals. For instance, doctors working in district health facilities were five times more likely to have considered choosing FM compared to their colleagues in central (academic) hospitals (OR: 5.25; 95% CI: 1.56 – 7.62).

Table 4.7: Bivariate and multivariate logistic models of sociodemographic and career plan factors explaining prior consideration of Family Medicine as a specialty

Characteristics	Odds Ratio & 95% C.I. Bivariate model	*p*-value	Odds Ratio & 95% C.I. Multivariate model	*p*-value
Sex				
Female	1		1	
Male	0.68 (0.43 – 1.07)	0.09	0.75 (0.47 – 1.22)	0.25
Age	1.11 (1.01 – 1.22)	**0.02**	1.15 (1.04 – 1.28)	**0.01**
Health Facility				
Central	1		1	
Regional	0.96 (0.61 – 1.51)	0.87	0.86 (0.54 – 1.38)	0.54
PHC	4.79 (1.50 – 15.32)	**0.01**	5.25 (1.56 – 7.62)	**0.01**
Hours of work				
FT & OT	1		1	
FT & no OT	1.61 (1.03 – 2.53)	**0.04**	1.70 (1.05 – 2.75)	**0.03**
PT	0.57 (0.21 – 1.53)	0.26	0.45 (0.16 – 1.27)	0.13
Definite career choice				
No	1		1	
Yes	0.43 (0.23 – 0.83)	**0.012**	0.35 (0.17 – 0.70)	**0.00**
Unsure	0.59 (0.31 – 1.12)	0.106	0.52 (0.27 – 1.02)	**0.06**

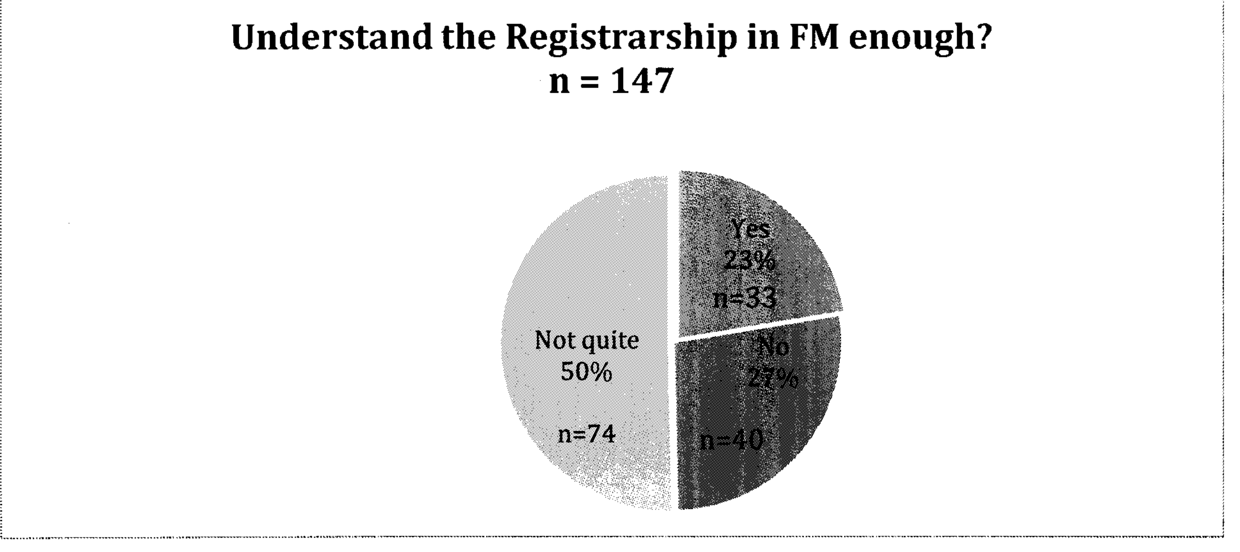
Participants who chose to work full time with no over time were almost two times (OR: 1.70; 95% CI: 1.05 – 2.75) more likely to have considered choosing Family Medicine compared to those who wanted over time (OR: 1.7; 95% CI: 1.05 – 2.75). Those working on part time basis were 55% less likely to consider choosing FM (OR: 0.45; 95% CI: 0.16 – 1.27) compared to those working full time with over time, although this was not a significant finding. Participants with a definite career choice were 65% less likely to consider choosing FM compared to those with no definite career choice (OR: 0.35; 95% CI: 0.17 – 0.70).

The overall final model including sex, age, health facility, hours of work and definite career choice was refitted and lack of fit was investigated using Hosmer-Lesmeshow goodness of fit. It showed no lack of fit (*p*-value: 0.343), which means that the model used fits the dataset analysed very well.

4.5.3 Sufficient understanding of the Family Medicine registrar training programme by participants who considered Family Medicine as a specialty option

The same 147 participants who had answered 'Yes' to having ever thought of Family Medicine as a career specialty were asked if they thought they understood enough about the registrar training programme in Family Medicine to inform their career choice. Figure 4.3 below indicates that less than 25% of these respondents actually understood enough about the registrar training programme to have it inform their career option.

Figure 4.3 –Understanding the Family Medicine registrar training programme by participants who considered Family Medicine as a specialty option



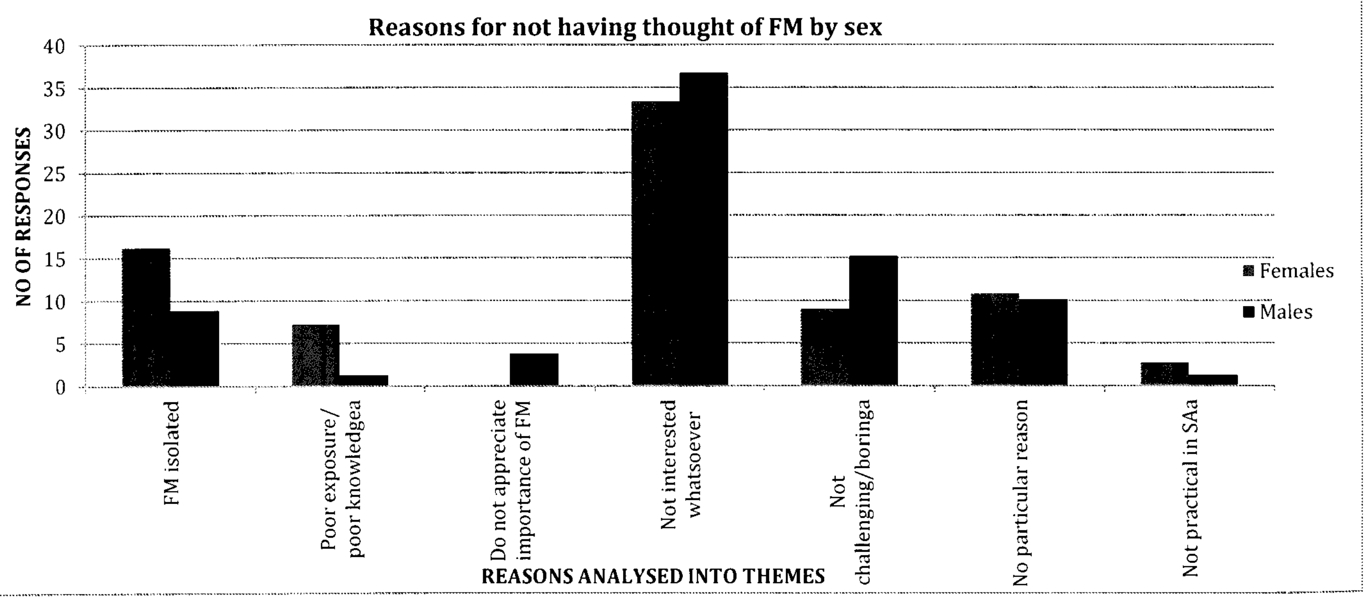
It was also found that almost equal proportions of both males and female participants responded, 'Yes', 'No', or 'Not quite'. While more community service doctors (43.3%) thought they understood the registrar-training programme in FM as compared to their intern counterparts (17.1%).

4.5.4 Participants who replied 'No' to considering FM as a specialty

Out of 337 respondents who answered the question, 'Have you ever thought of choosing FM as a career option?' 190 responded, 'No'. Significantly, 72.5% of those who chose a surgical specialty compared to any other specialty (48.7%) replied, 'No' (p-value 0.001). Those who replied 'No' (never thought of choosing FM as a specialty) were asked to provide reasons for their 'non choice' in their own words. Free-write reasons given for not thinking about FM as a specialty numbered 134. These were analysed and grouped into the following seven themes:

Common theme	Number of respondents
No interest whatsoever	66
FM is too isolated/ broad / complicated	25
FM is not challenging as a specialty (or boring)	22
Poor exposure to and/or lack of experience in Family Medicine during training	9
No particular reason	5
FM is not practical/suitable for South Africa	4
Don't see the importance or difference FM makes	3

Figure 4.4 - Proportion of study participants [male vs female] who provided reasons for NEVER having considered Family Medicine as a career option



In Figure 4.4 below, more females than males commented that Family Medicine is an isolated field and that they had a limited understanding of or exposure to Family Medicine. In contrast, males gave more reasons for not appreciating the importance of Family Medicine and finding Family Medicine boring or not challenging.

The greatest reason for never having considered Family Medicine as specialty, for both males and females, was because they had no interest whatsoever.

4.6 FINDING FAMILY MEDICINE AN INTERESTING OR NOT INTERESTING SPECIALTY

4.6.1 Degree of finding Family Medicine interesting or not interesting

Participants were asked to grade how interesting they found Family Medicine (FM), irrespective of their career choices, and were asked to choose responses from a four-point Likert scale of possible answers. Out of 323 responses, results were: FM is not interesting (17.65%); FM is a bit interesting but not worthwhile (36.84%); FM is interesting and worthwhile (31.58%); FM is a very interesting and important specialty (13.39%). The four degrees of responses were categorized into a two-response outcome variable for further analysis. The categorization of responses was either (i) *FM is not so interesting* (to include FM is not interesting and FM is a bit interesting and not worthwhile) for a total of 147 respondents (45.51%) and (ii) *FM is interesting* (to include FM is interesting and FM is very interesting) for a total of 176 respondents (54.49%). Based on this categorisation, demographically, just above half (52.2%) of the females found Family Medicine interesting compared to just above a third (34.4%) of males with a significant (p-value 0.002). There were no other significant differences in the demographic and career plans of those who found Family Medicine an interesting specialty.

4.6.2 Reasons for finding Family Medicine interesting or not interesting

Respondents were asked to select from a list of stated reasons for their rating of the value of the discipline of Family Medicine. Reasons provided were two mutually exclusive statements for each theme considered. This meant that only one of two statements for each theme could be selected. Respondents were invited to free write any additional theme that had not been included in the pre-set statements.

Table 4.8 below has seven themes with explanatory statements excerpted from the questionnaire: one FM-negative and the other FM-positive. It also shows how the participants chose in terms of each theme.

Table 4.8 Proportion of the respondents who chose either FM or non-FM related reasons for the value of FM				
Themes	**FM-Negative Statements**	N (%)	**FM-Positive Statements**	N (%)
Job satisfaction in Primary Care	I am a hospital/non-primary healthcare specialist kind of person	233 (83.3)	I will be more job-satisfied as a Family Medicine specialist or in primary healthcare	47 (16.8)
Undergraduate experience in FM	My undergraduate experience in FM was not good enough	94 (33.9)	My undergraduate training experience in FM was rich and enjoyable	183 (66.1)
Competence Level in FM	Level of competence of FPs is doubtful	96 (36.5)	The level of competence of FPs is adequate	167 (63.5)
Broad Content of FM program	Width/content of the FM programme is too broad for me	122 (43.7)	I do not mind the broad content of FM. I like diversity.	157 (56.3)
Time Demand of FM	FM is more time demanding compared to other specialties	71.0 (30.2)	FM is less time demanding compared to other specialties	164 (69.8)
Popularity of FM	FM is not popular amongst my colleagues	158 (59.0)	Popularity of FM is not an issue in recent times	110 (41.0)
FM being Financially Rewarding	FM is not rewarding financially	116 (53.5)	FM is rewarding financially.	101 (46.5)

From Table 4.8 above, only 16.8% of the respondents indicated they would be job-satisfied working in a primary healthcare setting. Two thirds thought they had a good undergraduate experience in Family Medicine. Close to two thirds (63.5%) did not have issues with the level of competence of family physicians, yet 36.5% still thought family physicians were not competent enough. More than 50% of the respondents did not mind the diversity of Family Medicine; and, nearly 70% perceived Family Medicine as less time demanding. The popularity of Family Medicine among colleagues was still an issue among three fifths of the respondents. The respondents' opinions were divided in two almost equal parts about whether Family Medicine was financially rewarding (46.5%) or not financially rewarding (53.5%).

Additional reasons provided in response to an open-ended question are grouped into the following themes:

Themes	Value of FM	Number of respondents
Personal encounter with GP	Was not good (negative)	1
Resources in FM	Not being enough (negative)	4
Holistic approach	Distinguishes FM (positive)	3
	Not seen in FM (negative)	5
Continuity of care	Seen in FM (positive)	3
	Not seen in FM (negative)	1

4.6.3 General comments made by respondents

General comments made by respondents to the question 'Any other comments?' came in the form of observations, complaints, suggestions or recommendations. These were grouped into themes in Table 4.9 below. The most frequently made comment was that working conditions needed improvement, especially for junior doctors. Other frequent comments included an admonition that newly qualified doctors should choose a specialty based on interest and should spend more time in the public sector to achieve their goals. There were a few comments on the need for more exposure to Family Medicine as well as the need to create more registrar posts in general.

Table 4.9 General comments made by respondents grouped into themes

Theme	**No of Respondents**
Improving the working conditions for junior doctors	9
NQDs should choose a career specialty based on interest	9
NQDs need to spend more time in public hospitals	8
There is a need for more explanation on/exposure to FM	4
Need more time before making a career choice	3
There is need to create more registrar posts	2
Improving the Health System	2
Junior doctors or registrars should not be overworked	1
Exposure in some fields are necessary before one makes a choice	1
Total no of comments	**39**

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter discusses and interprets some of the most important findings to emerge from the research. These are:

- Most NQDs, were South Africans, intend to remain in the medical workforce in South Africa, specialise within the next five years, and have a full-time public-private practice mix.
- Surgery and its sub-specialties are the most popular choice for both sexes and Family Medicine is the least chosen field of specialisation by NQDs. However, there appears to be a gender bias in this regard. Only 24% of female NQDs compared to 45% of male NQDs selected a surgical specialty.
- The majority of NQDs are not yet certain about their choice of specialty (especially females and interns). Also, most NQDs believe that the personal factors contributing to their decision are: 'Acceptable hours of practice'; 'Plan to have family'; 'Intellectual challenge of the field'; and, 'Income potential'.
- Although slightly more than half of NQDs never even considered Family Medicine as a specialty, there are interesting changes that occur with age, independent of their level of training. For every incremental year of age, regardless of their sex or trainee status, participants were 15% more likely to consider choosing Family Medicine. It is also important to note that there was no association between having completed the internship rotation requirement of three months in Family Medicine and considering Family Medicine as a specialty. This may mean that considering Family Medicine as a specialty is directly as a result of maturity in age instead of exposure in the field.
- Only one in every six NQDs would be satisfied working in a PHC setting compared to the familiar academic training platform of secondary or tertiary levels of healthcare. It was also found that working in a PHC facility increases the chances of considering to choose Family Medicine specialty by five times, so exposure may play a role here.

This chapter expands on these findings as well as addresses their limitations. It is structured against the backdrop of the research objectives. The first part deals with the first and second objectives, which are about the decision to specialise in any field as well as factors affecting the choice of a particular specialty; while the second part deals with the perceptions of NQDs about Family Medicine, whether or not they intend to specialise. The last part identifies and addresses the limitations of the study, which may hinder broader applicability.

5.2 Specialisation – factors and the possible impact on government human resources planning

This section deals with the issues that surround specialisation and centres on the choice of specialty, factors influencing specialisation and the government position on human resources for health (HRH).

It is encouraging to note that more than nine out of every ten participants plan to practice medicine in South Africa, which at this stage seems to be a reversal of the 'brain drain' of African doctors to the 'Global North'[61]. The brain drain was pegged at annual rate of 25%, seen as a conservative figure in the HRH strategy for health document[36]. An attrition rate of 23% for community service doctors in 2009 was quoted in the same document, although actually six percent self- reported that they would emigrate after their service[36]. In the de Vries et al study, more than 50% of final year medical students planned to leave, but only seven percent saw their emigration as permanent[42]. One should interpret these findings based on the reasons for leaving, which may be temporary / short term for travel or further study or permanent as in out-migration. For example, in Malawi, there seems to be a predisposition to emigrate, but the main reason for leaving was to seek further training and exposure[45]. This is in sharp contrast to Nigeria, where two thirds of interns are intent on leaving the shores of Africa for financial reasons[41]. Although this study did not enquire about the possible reasons for leaving (short-term travel or emigration), an attrition rate of nine percent by the NQDs is far from the benchmark of 25% set at the national level. However, it is possible that more NQDs may consider leaving as they spend more time in medical practice, or that they have family-related and other pressures, or that different regions of the country have different attrition rates.

We now know that nine out of every ten NQDs intend to specialise within five years of graduation, a finding similar to the 2009 study on final year medical students by de Vries et al[42]. This means that if their wishes were granted, we would gradually see the demise of general practitioners (GPs) and medical officers (MOs) who practice without any further training in South Africa. Such alarm has already been raised in Malawi[45]. This also challenges the HRH assumption that there would be enough unspecialised GPs, after the plan to get extra 1,053 graduates from medical schools, to fill the gap in primary health care by 2025[36]. Unless there is a well-regulated mechanism to either restrict specialisation or to channel such specialisation towards developing primary healthcare (or community) specialists, the entire health system plan for 2030 could be derailed. Currently, the cry from the Colleges of Medicine of South Africa to the government is about funding unfilled specialist registrar posts,[7] not the re-structuring of posts.

We still have a serious maldistribution of doctors in the private versus public sectors in South Africa,[62] with only 38% (4403 out of 11700) of South African medical graduates from 2002 to 2010 ever employed in the public service[63]. The National Health Insurance (NHI) White Paper and the HRH strategy document focus on correcting the private-public imbalance of the health care workforce, which accounts to some extent for the poor quality of care seen in the public sector[27,36]. So, it is welcome news from this study that more than four fifths of NQDs say they would either work in the public sector alone, or combine practice in both public and private settings. As the future human resources for NHI, these doctors with their views of increasingly preferring public work may change the landscape of public-private practice. Ways to incorporate private GPs into public primary healthcare settings have been studied by Moosa et al,[64]; but, exactly how such integration into public practice, if sustained, could impact the NHI initiative needs further research.

It would be interesting to know if there is an existing formula for allocation of both registrar and sub-specialist training posts across the medical schools in South Africa, according to disciplines. So far, due to lack of government funding, most disciplines are even battling to fill the existing created posts,[7] so the restructuring needed to strike a balance between specialisation at different levels of care (primary, secondary, tertiary) is still a mirage. The historic Canadian model ratio of 50% specialists to 50% family physicians (their equivalent of GPs or medical officers) served as a rough guide to assist the government to know where and when there are shortages[31].

There is a need to remind us of the government position on medical specialisation as defined in some policy documents. The South Africa National Development Plan (NDP) for 2030 stipulates that the government focus should not be on sub-specialisation, but rather on community specialisation in five main areas, namely: medicine, surgery, obstetrics, paediatrics and psychiatry[63]. Interestingly, there is no mention of Family Medicine, although these five are the core disciplines of this speciality in generalism. The recent NHI White Paper further states that services in district hospitals should be generalist in nature and limited to Obstetrics and Gynaecology, Paediatrics and Child Health, General Surgery, and Family Medicine[27]. Clearly, the aspirations to specialise at the secondary and tertiary levels by NQDs are not in line with the government plans for healthcare and the workforce. Regarding surgical specialties, for example, only a quarter of NQDs saw a future in general surgery, while the rest wanted to further sub-specialise. The facilities upgrade incentive across districts in Gauteng province that is supported by the National Department of Health means that general surgery can be practiced as part of primary healthcare in level one hospitals. The idea of making 'Community surgery' a disciplinary area of expertise, just like maternal and child health, sports medicine etc., of the Family Medicine specialty may be more appealing to the surgically oriented male NQD population. Family Medicine, which clearly is not a popular specialty among the respondents, is suggested to be the most encompassing and lead specialty of the five areas of community specialisation[63]. But this concept needs to be made a reality on the ground before such a cohort of doctors would be prepared to consider Family Medicine a specialty of choice.

Since three fifths of respondents remain uncertain about the specialty they chose, it seems that the majority of NQDs may yet change their minds, especially those who did not choose a surgical specialty and those doing internship. This information can be used to the advantage of future campaigns to persuade these undecided groups to reconsider a primary care specialty. Also, as these NQDs 'mature' with increasing age, they appear more likely to tolerate the 'uncertainty' that comes with specialising in primary care specialties like Family Medicine[65]. The mean age for interns in this study was 25.75 years, which was one year older than the mean age of 24.7 years of final year South African medical students in the de Vries et al study[42]. Interestingly, the Nigerian study found that interns there had a higher mean age of 26.5 years due to possible longer time in the medical school before internship, which could perhaps explain the interesting finding that most of them (82%) had already made up their minds about their career specialty with finality[41]. So, if specialisation is delayed in South

Africa or more graduate entry programme students are taken into 'undergraduate' medical training, there may be more 'mature' NQDs who would consider choosing Family Medicine as a specialty. Consequently, one can conclude that the 'early specialisation' fever observed in this study negatively impacts on considering Family Medicine.

The predominance of a particular specialty being chosen by a specific sex shows that gender stereotyping still persists with regards to career choice. Just as males dominate surgical specialties, females dominate the paediatric specialty in South Africa. Contrastingly, obstetrics and gynaecology, which was seen as the domain specialty for males in places like Nigeria,[41] in this study it was selected by double the proportion of females in relation to their male counterparts. This shows that different sex preponderance in some specialties is dependent on factors such as personal and cultural factors as well as differences in role modelling in different countries[38,42,49,66].

Having already established the predominant 'personal factors' that influenced career choice, women deemed 'social commitment' and 'plan to have family' more important while men valued 'working with new technology' and 'income potential' as the prime drivers of specialisation choice. Analysis of these responses to personal factors again underscores the gendered difference between work-time related factors for female versus career-related factors for male respondents. Although few NQDs chose Family Medicine, the reasons given by those who never even considered a Family Medicine specialty included the perceptions that FM 'is isolating' (by mostly females) and 'not challenging /boring' (by mostly males). This might be because women may look at the social engagement level of a specialty in choosing careers while male doctors are more likely to go for 'active' specialties like surgery[67]. Better understanding of these reasons will assist with gender-targeted recruitment strategies and perhaps sex-specific career messaging.

5.3 Understanding NQDs' perceptions about the discipline of Family Medicine and attitudes to working in PHC settings

This section addresses the research objectives to provide a clearer picture of how NQDs perceive the specialty of Family Medicine and considers the possible reasons for the low career choice of Family Medicine as compared to other disciplines. The findings indicate that:

- A large proportion (more than half) of the respondents did not choose Family Medicine because it was not even on their list of specialties to consider!
- The majority (more than three quarters) of those NQDs who included the Family Medicine specialty on their list, had either little or no information about the registrar-training programme to have chosen it.
- Lastly, only very few (one sixth) of this cohort of doctors would consider working in a primary healthcare setting.

Taken together, these three findings all point to inadequate information, poor marketing, insufficient or negative experiences during a posting / rotation, and even the absence of role modelling during FM training. All of these may have introduced significant negative biases in making life choices.

If an NQD did not even have FM on his or her list, then perhaps, the new specialty is yet to be placed on equal standing with the rest of the other specialties. Incidentally, it is not only South Africa that has difficulty with placing Family Medicine in its rightful place in Africa[29]. This study has found that one of the 'pull' factors to other specialties is choosing surgery. Interestingly, those who selected the surgical specialties were also those who were most likely to express having no interest whatsoever in the discipline of Family Medicine. In such cases, it may be difficult to try and change the commitment of these NQDs to surgery, but rather create an awareness of the links between primary care and secondary or tertiary levels, including the possibilities of surgery in PHC settings, or the development of a 'community specialist' in general surgery. There are many 'push' factors, which were raised by the participants as reasons for not considering FM. Most of these pointed to: the lack of or minimal information about the FM specialty (newly registered with the Colleges since 2008) or pre-existing biased views of the specialty, like 'boring', 'isolated' and 'not suitable for South Africa'. Others included inadequate or negative experiences during a posting / rotation, and even the absence of role modelling. Improved marketing strategies by the nine university faculties, HPCSA and CMSA as well as the government at both undergraduate and postgraduate levels can perhaps mitigate some of these negative views.

Marketing Family Medicine has been explored at undergraduate levels in Canada where the 'hidden curriculum' of misrepresentations about the specialty were debunked,[68] as well as after graduation. Their approach involves the 'selling' of incentives, which may attract young doctors to Family Medicine. Strachan et al[7] described such incentives as strong pull factors, which include better financial packages, better-resourced work environments, better work conditions, career opportunities, etc. We can borrow a leaf from the introduction of the Occupational Specific Dispensation (OSD) framework, used as a financial incentive since 2007 in South Africa, to stem the haemorrhage of doctors from both the public sector and the country[69]. Through competition, the OSD bridged the gap to some extent, slowing down the attrition rate of health professionals, and may have helped retain staff in the public sector. It is the opinion of the researcher that financial incentives may play a role in enticing those 'undecided' NQDs to consider a primary care specialty, especially Family Medicine.

Full-time registrar training in Family Medicine, introduced in 2008, has not been embraced as expected by the NQDs who participated in this study. If more that three quarters of the participants who considered Family Medicine did not sufficiently understand what the registrar-training programme entails in order to make an informed choice, then it is not surprising that they did not choose the specialty. Family Medicine training needs to be sold: firstly, to the government to create more posts; secondly, to the regulatory boards of HPCSA and CMSA who control the posts; and, finally, to the doctors on the verge of making a decision of specialty. The types of marketing strategies by the departments across different universities would depend on their unique situations and would require more research. such marketing campaigns may also need to focus more on the interns than the community service doctors.

Despite rotating through the domain, it seems that there is very little exposure to the Family Medicine registrar training programme during internship, as those who indicated they understood registrar training were the same (17%) irrespective of year or rotation, in comparison to 43% of community service doctors. We already know that due to the low numbers of family physicians in district hospitals and community health centres and in the context of high disease burden,[19] it is difficult for Family Medicine to provide the clinical governance needed to effect change in the quality of care. The meagre number of family physicians available is a situation that also affects the supervision of interns who work in primary care. These interns might then go through an entire clinical rotation in Family Medicine without understanding what the registrar-training programme is all about. One can also infer that the duration of training / rotation in both undergraduate and internship programmes does very little to demystify the registrar training programme. These interns are allocated three months for Family Medicine (in a shared block with psychiatry) while the other specialties get four months each in their 24-month internship programme. Interns end up not coming across registrars in Family Medicine whose ambassadorial role may help with the marketing to some extent. In contrast, some community service doctors who have done their service year in a primary healthcare facility are more likely to have been involved with either the trainees or trainers in Family Medicine. Further studies may be needed to qualitatively find out how interns understand and perceive their rotation through the Family Medicine domain.

Clearly, the most important reason given for varying degrees of interest in Family Medicine is the participants' perception of the level of health care they would be satisfied to work in. The fact that only one sixth of the respondents agreed they would be job satisfied if they worked in a primary healthcare facility compared to the hospital setting says it all. Our hierarchal form of academic medical training, which favours tertiary (or even central) hospital practice and discourages primary healthcare practice, has eaten deep into the fabric of the study population's consciousness[70]. In the current medical training curriculum, most of the students are exposed to a primary care posting for only few weeks compared to the months they spend in secondary and tertiary facilities. Another explanation for the gross lop-sidedness of choice not to work in primary care can be found from another study, which highlighted the poor working environments, difficult living experiences, and poor career pathing that characterise primary care facilities in Africa[71]. The association between these characteristics and the dearth of HRH in primary care settings, which does not exist to the same extent in the developed world, coined the term, 'inverse primary care law'[71]: the areas with greatest primary healthcare needs have the least access to those health resources needed to overcome the challenges. The fact that this study was conducted in Gauteng province, known for its highly developed urban infrastructure, may have influenced NQDs' decisions not to work in PHC settings, unlike those who trained in the rural areas in the Eastern Cape Province who largely wanted to remain there[70]. Even worse is the obviously wide gap in financing and funding, between public tertiary institutions versus primary care counterparts,[8] which leaves a lot to be desired. As the government seeks to improve the workplace environment by fast tracking the first three domains of the National Core Standards for health establishments, namely: patient rights, patient safety and clinical support services,[72] there is much still to be done. In addition, with the immediate focus of NHI on PHC, the domains on operational management and facilities and infrastructure at the primary care level will need attention.

5.4 Limitations of this research

The following are important limitations to either interpreting and/or overgeneralising the findings of this research:

- One third of the NQD population chose not to participate in the study. Although the calculated sample size was met, we might have derived different information from the non-responders.
- The findings of this study may not represent the opinion of the entire NQD population in South Africa, since it was conducted only in Southern Gauteng Province. As well, university graduates from all eight medical schools were not adequately represented. These findings from an urban setting will likely be different from those in the rural areas, where in SA those who are trained are likely to remain, and may have different views[70].
- Some factors that could have affected the choice of specialisation were not found to be statistically significant, probably due to type two error of not having enough sample size to possibly detect change.
- In hindsight, the researcher realised that there were some important missing areas of inquiry in the questionnaire which may have better explained our findings; such as: marital status, number of children, expressed preference for rural versus urban, migration status, medical school influence, race, socio-economic background, levels of parental education, medical doctors/specialists in the family, and the need for bursary support during medical student training that required paying off following graduation.
- Many of the factors about how and why NQDs consider and eventually choose to specialise are deeply personal, and would have been better explored through a qualitative methodological approach.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

We have always known that democratic South Africa has advanced policies that will continue to benefit healthcare in the future. Such national policies like the NDP, NHI, HRH Strategy, National Core Standards and PHC re-engineering all point towards a better health care delivery system to meet WHO, millennium / sustainable development goals and domestic targets. They are all designed with the good of the population in mind.

What this study has revealed or clarified is that these documents will need refining to direct South Africa even further to achieving its objectives. Although the healthcare work force is becoming more robust and seems to be responding to national imperatives, there are areas that could impact on human resource policies, which include the following -

- Newly qualified doctors are eager to stay and practice in South Africa, contrary to the opinion of the policy makers that at least a quarter would leave. So, if they leave later in their careers, clearly they were failed by the system not retaining them rather than by the 'pull' factors discussed earlier.
- It seems that there is a positive shift in the willingness of NQDs to practice in the public sector as found in this research, but not in public primary healthcare. The government can build on this enthusiasm if they improve the public health settings where young doctors work as envisaged by the National Core Standards and incentive strategies. In addition, government should train more doctors in rural and primary care settings, where they are expected to work, according to Bateman[70] and others. Positive exposure helps.
- Even though human resources for health are constantly in short supply, just like in most countries, the need for redistribution across specialties and localities cannot be overemphasised. With the drive to specialise on the increase, there is genuine concern that some specialties are receiving an attention boost in terms of choice such as surgical specialties, but to the detriment of the likes of Family Medicine. If we could enrich the number of Family Physicians by using the *Workload indicators of staff need* (WISN) method,[73] for example, in determining the health staff complement needed in our primary healthcare centres, then we can calculate the adequate number of registrars needed in each training institution.

- The government has not 'sold' primary care enough to the country. More support for Family Medicine is needed from leaders in government, and such support is lacking due to an incomplete understanding of the discipline as explored by Moosa et al[74]. Information that prioritises the categories and quantities of health staff needed to run an effective primary healthcare system, and how to achieve such numbers, would be helpful[73]. Currently, doctors do not control primary healthcare, our system of nurse-driven doctor-supported[9] provision of care may work for now, but may not improve health outcomes in the long run. The earlier we train and involve primary healthcare experts, the better prospects for South Africa's NHI plans. Since OSD helped us to stem brain drain, government should perhaps look at extending similar financial incentive into primary care specialisation.
- The marketing campaigns by underachieving departments of Family Medicine need to be geared up to the right pitch. Given that the full-time registrar-training programme is still relatively new in South Africa, we have to 'run', not 'walk', towards correcting the existing imbalance in resources, registrar posts, and training in Family Medicine, as compared with the other specialties. This need for balance must be agreed upon by all stakeholders and addressed through various mechanisms, such as restriction of posts in the more 'popular' specialties while creating incentives for posts in Family Medicine.
- The HRH strategy for health talked about developing and funding 'academic health complexes' for the sustainability of the NHI[36]. The fact is that most of these complexes, if not all, are situated in academic and tertiary hospitals hence cannot cater for primary healthcare. This fundamental flaw, which does not align with the targets of the NHI White Paper, need to be corrected in the coming HRH strategy document for 2016 to 2020. As far as primary healthcare is concerned, government needs to focus on the already existing 'academic health complexes' of Family Medicine, rural health and public health within the nine universities, in conjunction with the district hospitals and community health centres.

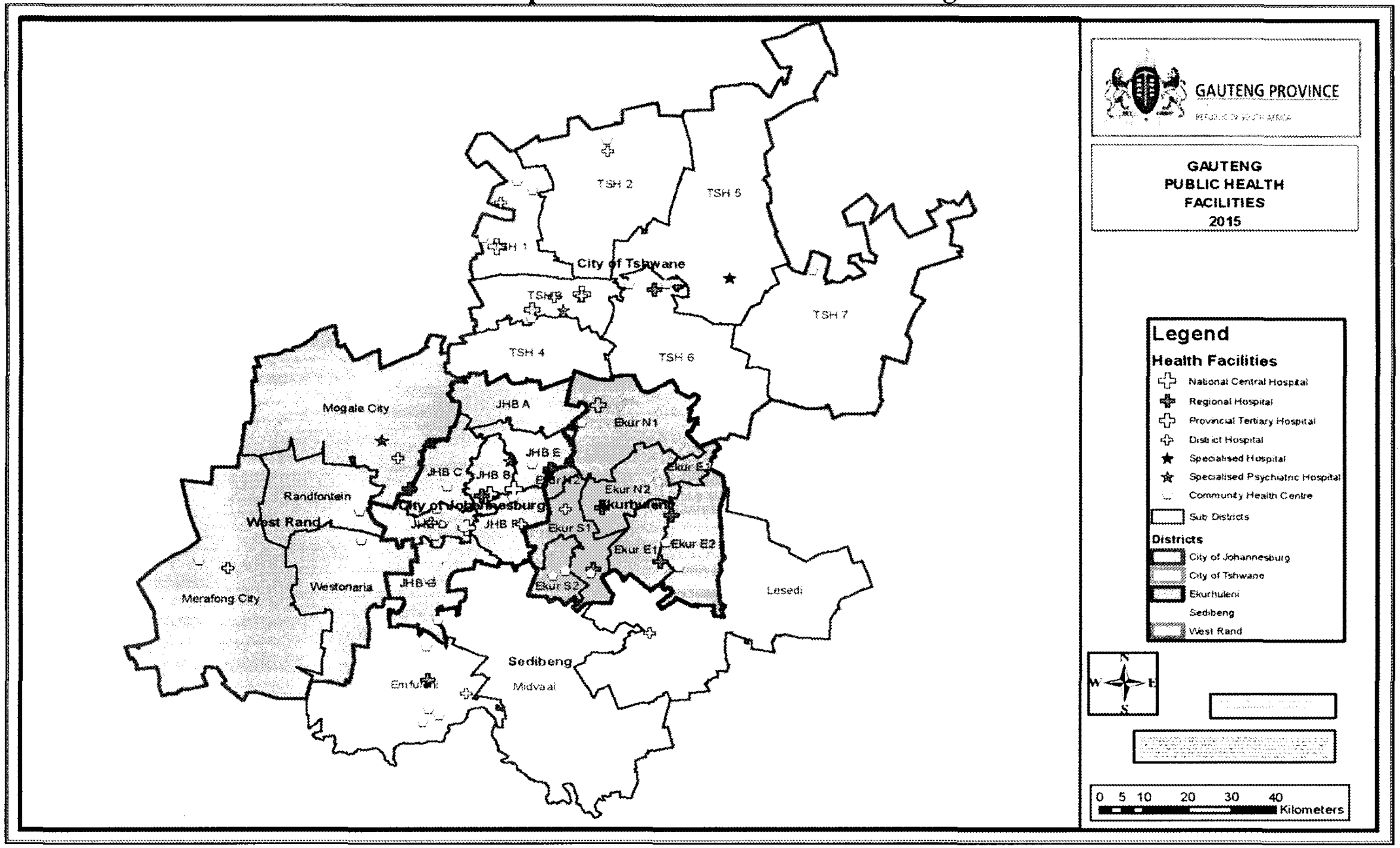
If the issues mentioned above are not followed up, we risk a clear dysfunction of the already ailing health system in South Africa. If we do not have enough primary healthcare specialists functioning at district level, the dichotomy between primary care and higher levels of care will only widen. This means that the existence of NHI will be potentially threatened, because fewer people will receive efficient and quality health care initially. It also means that healthcare would become more expensive yet less comprehensive, as more people will end up with minor ailments at the secondary and tertiary levels of care, as seen in other countries without adequate primary care infrastructures.

It has proved difficult to convince an already established obstetrician or anaesthetist to work in a primary healthcare setting, as noted in the latest report on the district clinical specialist teams, where posts were either unfilled or incumbents resigned, up until May 2015[75]. It is a whole lot easier to engage with a newly qualified doctor who is about to make a career choice. The literature on hidden curriculum suggests that it is necessary to start changing the bias against primary healthcare right from undergraduate education at the level of 'policy development', 'evaluation', 'resource allocation', and 'institutional slang'[76]. Apart from marketing campaigns, readapting policy documents and possibly incentives, there is a need to develop a mechanism for the regulation of registrar training posts, in such a way that career options are not restricted, but proportioned to suit the needs of the health system. This is currently used by the Canadian health system[51]. There is also the need to fast forward a plan to metamorphose the current GPs and medical officers in the system to primary care specialists of some kind, in order to make them feel not left behind in the 'moving train of specialisation'.

Historically, in most parts of Europe, specialisation initially aroused considerable opposition and was seen as "a break from traditional forms of systemic medical thinking."[3] Why should Africa in general, and South Africa in particular, encourage specialisation that cannot be sustained with astronomical health costs?[5] Consequently, the 'specialisation fever' deserves further research. It is time for our medical schools to change their borrowed culture of super-specialisation model seen as ideal and pursue generalism in the interests of nation building and meeting our population health targets.

APPENDICES

APPENDIX 1 – Five health districts and public health facilities in Gauteng Province



APPENDIX 2 – Location of NQDs in Southern Gauteng health facilities

DISTRIBUTION OF FACILITIES UNDER AREA OF STUDY

DISTRICT	SUB-DISTRICT	NAME OF FACILITY	FACILITY TYPE
City of Johannesburg Metropolitan Municipality	Johannesburg C Health sub-District	Discoverers CHC	Community Health Centre
City of Johannesburg Metropolitan Municipality	Johannesburg D Health sub-District	Chiawelo CHC	Community Health Centre
City of Johannesburg Metropolitan Municipality	Johannesburg D Health sub-District	Itireleng CHC	Community Health Centre
City of Johannesburg Metropolitan Municipality	Johannesburg D Health sub-District	Lillian Ngoyi CHC	Community Health Centre
City of Johannesburg Metropolitan Municipality	Johannesburg D Health sub-District	Mofolo CHC	Community Health Centre
City of Johannesburg Metropolitan Municipality	Johannesburg D Health sub-District	Zola CHC	Community Health Centre
City of Johannesburg Metropolitan Municipality	Johannesburg E Health sub-District	Alexandra CHC	Community Health Centre
City of Johannesburg Metropolitan Municipality	Johannesburg F Health sub-District	Hillbrow CHC	Community Health Centre
City of Johannesburg Metropolitan Municipality	Johannesburg G Health sub-District	Lenasia South CHC	Community Health Centre
City of Johannesburg Metropolitan Municipality	Johannesburg G Health sub-District	Stretford CHC	Community Health Centre
Ekurhuleni Metropolitan Municipality	Ekurhuleni East 1 Health sub-District	Phillip Moyo CHC	Community Health Centre
Ekurhuleni Metropolitan Municipality	Ekurhuleni East 2 Health sub-District	Kwa-Thema CHC	Community Health Centre
Ekurhuleni Metropolitan Municipality	Ekurhuleni East 2 Health sub-District	Nokuthela Ngwenya CHC	Community Health Centre
Ekurhuleni Metropolitan Municipality	Ekurhuleni North 2 Health sub-District	Esangweni CHC	Community Health Centre
Ekurhuleni Metropolitan Municipality	Ekurhuleni South 1 Health sub-District	Jabulane Dumane CHC	Community Health Centre
Ekurhuleni Metropolitan Municipality	Ekurhuleni South 2 Health sub-District	Phola Park CHC	Community Health Centre
Ekurhuleni Metropolitan Municipality	Ekurhuleni South 2 Health sub-District	Ramokonopi CHC	Community Health Centre
Sedibeng District Municipality	Emfuleni Local Municipality	Boipatong CHC	Community Health Centre
Sedibeng District Municipality	Emfuleni Local Municipality	Johan Heyns CHC	Community Health Centre
Sedibeng District Municipality	Emfuleni Local Municipality	Levai Mbatha CHC	Community Health Centre
Sedibeng District Municipality	Emfuleni Local Municipality	Sharpeville CHC	Community Health Centre
West Rand District Municipality	Merafong City Local Municipality	Khutsong CHC	Community Health Centre
West Rand District Municipality	Randfontein Local Municipality	Mohlakeng CHC	Community Health Centre
West Rand District Municipality	Westonaria Local Municipality	Bekkersdal West CHC	Community Health Centre

DISTRICT	SUB-DISTRICT	NAME OF FACILITY	FACILITY TYPE
City of Johannesburg Metropolitan Municipality	Johannesburg D Health sub-District	Zola Jabulani Hospital	District Hospital
City of Johannesburg Metropolitan Municipality	Johannesburg F Health sub-District	South Rand Hospital	District Hospital
Ekurhuleni Metropolitan Municipality	Ekurhuleni South 1 Health sub-District	Bertha Gxowa Hospital	District Hospital
Sedibeng District Municipality	Emfuleni Local Municipality	Kopanong Hospital	District Hospital
Sedibeng District Municipality	Lesedi Local Municipality	Heidelberg Hospital	District Hospital
West Rand District Municipality	Merafong City Local Municipality	Carletonville Hospital	District Hospital
West Rand District Municipality	Mogale City Local Municipality	Dr Yusuf Dadoo Hospital	District Hospital
City of Johannesburg Metropolitan Municipality	Johannesburg D Health sub-District	Chris Hani Baragwanath Hospital	National Central Hospital
City of Johannesburg Metropolitan Municipality	Johannesburg F Health sub-District	Charlotte Maxeke Hospital	National Central Hospital
City of Johannesburg Metropolitan Municipality	Johannesburg B Health sub-District	Helen Joseph Hospital	Provincial Tertiary Hospital
Ekurhuleni Metropolitan Municipality	Ekurhuleni North 1 Health sub-District	Tembisa Hospital	Provincial Tertiary Hospital
City of Johannesburg Metropolitan Municipality	Johannesburg B Health sub-District	Rahima Moosa Hospital	Regional Hospital
City of Johannesburg Metropolitan Municipality	Johannesburg E Health sub-District	Edenvale Hospital	Regional Hospital
Ekurhuleni Metropolitan Municipality	Ekurhuleni East 1 Health sub-District	Pholosong Hospital	Regional Hospital
Ekurhuleni Metropolitan Municipality	Ekurhuleni East 2 Health sub-District	Far East Rand Hospital	Regional Hospital
Ekurhuleni Metropolitan Municipality	Ekurhuleni North 2 Health sub-District	Tambo Memorial Hospital	Regional Hospital
Ekurhuleni Metropolitan Municipality	Ekurhuleni South 1 Health sub-District	Natalspruit Hospital	Regional Hospital
Sedibeng District Municipality	Emfuleni Local Municipality	Sebokeng Hospital	Regional Hospital
West Rand District Municipality	Mogale City Local Municipality	Leratong Hospital	Regional Hospital
City of Johannesburg Metropolitan Municipality	Johannesburg E Health sub-District	Sizwe Trop. Diseases Hospital	Specialised Hospital
City of Johannesburg Metropolitan Municipality	Johannesburg B Health sub-District	Tara H Moross Centre Hospital	Specialised Psychiatric Hospital
West Rand District Municipality	Mogale City Local Municipality	Sterkfontein Hospital	Specialised Psychiatric Hospital

*All the Facilities above were visited for data collection except for the specialised hospitals, which did not have the study population.
*Clinics, Satellite clinics and Health posts (not shown here) were not visited, as most of them did not have the study population permanently allocated.

APPENDIX 3 – Southern Gauteng allocation list for community service doctors and interns in 2013

COMMUNITY SERVICE DOCTORS ALLOCATION 2013

Institution/Facility	Number of Community Service Doctors placed
Ekurhuleni Metro & Sedibeng District	
Ekurhuleni Health District	11
Sedibeng Health District	3
Far East Rand Hospital	10
Pholosong Hospital	4
Tambo Memorial Hospital	11
Bertha Ngoxa (Germiston) Hospital	4
Tembisa Hospital	8
Natalspruit Hospital	8
Kopanong Hospital	3
Heidelberg Hospital	2
Sebokeng Hospital	5
Johannesburg Metro & West Rand District	
Johannesburg Metro Health District	20
West Rand Metro Health District	2
Charlotte Maxeke Johannesburg Acad. Hospital	25
Helen Joseph	7
Rahima Moosa Mother & C	5
Chris Hani Baragwanath Acad. Hospital	5
Sizwe Hospital	0
Sterkfontein Hospital	0
Tara Hospital	0
Leratong Hospital	7
Dr Yusuf Dadoo Hospital	3
South Rand Hospital	3
Edenvale Hospital	6
Carletonville Hospital	3
TOTAL	**155**

INTERN ALLOCATION (2013)

	FACILITY (Hospitals)	No of Allocated 2nd Yr Interns (started 2012)	No of Allocated 1st Yr Interns (started 2013)
1	Charlotte Maxeke Academic	42	42
2	Chris Hani Baragwanath	90	90
3	Dr Yusuf Dadoo & Leratong	18	17
4	Edenvale	3	6
5	Far East Rand	12	11
6	Helen Joseph & Rahima Moosa	47	48
7	Kopanong / Sebokeng	18	18
8	Natalspruit	21	23
9	Tambo Memorial	18	17
10	Tembisa	30	33
	TOTAL	**299**	**314**

APPENDIX 4 – Study questionnaire with participant information sheet

INFORMATION SHEET

Good Day

I am Dr Sam Ubabukoh of Department of Family Medicine, University of Witwatersrand. I would like to invite you to participate in this study to explore the career aspirations of interns and community service doctors as well as their level of interest in Family Medicine.

Attached is a three-paged anonymous questionnaire that will take approximately 10 minutes to complete. You may choose not to answer any question entirely or any part thereof. There is no incentive attached to participation, which is voluntary while non-participation is without any penalty whatsoever. Your name is not required and any other identifying information will not appear on the completed survey. Consequently your responses will be completely anonymous. Any personal demographic information (such as age, sex) provided will only be known to the researcher and his supervisor during the analysis phase of the study.

There are designated places where you can drop the questionnaire anonymously for later collection by a member of the research team

The findings from this research may potentially inform public policy on physician workforce requirements, potential career opportunities/paths for young physicians, and be of help when evaluating undergraduate medical programmes.

Completing this questionnaire implies that you understand and that you consent to be part of this study.

I appreciate you taking time out of your busy schedule to assist me in my research.

Dr Sam Ubabukoh
Contact- 0116812094: samozin@yahoo.com

QUESTIONNAIRE

Career Aspirations and level of interest in Family Medicine of Interns and Community Service doctors

Please tick the box on the right side of your appropriate choice as indicated ☑ and also fill in the line spaces.

1. Gender: Female ☐ Male ☐ 2. Age: ________

3a. At which University did you do your undergraduate training?

____

3b. In which year did you graduate? ______________

3c. Are you an intern ☐ or Community Service doctor ☐

4. Are you a South African [SA] citizen? Yes ☐ No ☐

5. At which health institution do you currently work?

____

6. For interns tick rotations completed so far including the present rotation while community service doctors move to the next question
(a) Internal Medicine ☐ (b) Surgery ☐ (c) Paediatrics ☐ (d) Family Medicine ☐
(e) Obstetrics and Gynaecology ☐ (f) Anaesthesiology /Orthopaedics ☐

7a. In which sector do you plan to practice? Public ☐ Private ☐ Public and private ☐ NGO ☐
7b. Where do you plan to practice? SA ☐ SADC ☐ Outside SADC ☐

8. Do you plan to remain in the medical field/health sector as a career? Yes☐ No ☐ Unsure ☐

9. For most of your career, do you plan to work?
Full time + overtime ☐ full time with no overtime ☐ part time ☐

10. Do you plan to specialise further in the next five years instead of working as a Medical Officer? Yes ☐ No ☐
10b. Have you made a definite career choice (in terms of the specialty you would like to specialise in)? Yes ☐ No ☐ Unsure ☐

11. Choice of specialty: Please write down your proposed area of specialty in the spaces below.

First choice ____

Second choice ____

12. Please rate the following factors that could influence your choice of specialty on the Likert scale with [1] indicating you strongly disagree [2] indicating you somewhat disagree [3] indicating you somewhat agree and [4] indicating you strongly agree

	1	2	3	4
Plan to have a family				
Acceptable hours of practice				
Intellectual challenge of the field				
Continuity of patient contact				
Variety of illnesses				
Narrow variety of patient problems				
Income potential				
Results of interventions immediately available				
Social commitment				
Health promotion and prevention is important				
Being part of a community				
Working with new technology				
Socio-economic Status				
Medical school experience				

12b. Are there any other important factors influencing your choice of specialty?

____

____

____

13. Have you ever thought of choosing Family Medicine as a career specialty? Yes □
No □

13b. If NO, why?

____

____

If YES, do you think you understand enough about a registrarship in Family Medicine specialty to inform your career choice? Yes □ No □ Not quite □

14. We would like to know how you feel about Family Medicine irrespective of your career choice. Which of the following statements match up with your level of interest in Family Medicine [FM] as a possible career pathway in South Africa? Circle your answer

i. FM is not interesting to me at all.
ii. FM is a bit interesting but not worth my while.
iii. FM is interesting and worthwhile.
iv. FM is a very interesting and important specialty.

15. Listed are possible reason/s for your level of interest in Family Medicine from A-G. Tick the boxes on the right side of either option 1 or 2 that applies to you.

A1	I am a hospital/non-Primary Health Care specialist-kind of person		A2	I will be more job-satisfied as a Family Medicine Specialist or in Primary Health Care.	
B1	My undergraduate training experience in FM was rich and enjoyable		B2	My undergraduate experience in FM was not good enough	
C1	Level of competence of FM specialists is doubtful		C2	Level of competence of FM specialists is adequate	
D1	Width/content of the FM program is too broad for me		D2	I do not mind the broad content of FM. I like diversity.	
E1	FM is more time demanding compared to other specialties		E2	FM is less time demanding compared to other specialties.	
F1	FM is not popular amongst my colleagues		F2	Popularity of FM is not an issue in recent times.	
G1	FM is rewarding financially		G2	FM is not rewarding financially.	

15b. Write any other reason/s personal to you but not outlined that can further explain your level of interest in Family Medicine

____
____
____
____

16. Any comments or advice you may wish to add on career aspirations for newly qualified doctors in South Africa?

____
____
____
____
____

APPENDIX 5 – Permission to adapt questionnaire from de Vries et al study[42]

Elma de Vries [illegible]
Re: Request for Research information
29 April 2012 at 8:30 PM
Samuel Ubabukoh [illegible]

Dear Samuel

Thank you for your interest. We had to shorten the article because of the SAMJ restriction on the word count. I attach the longer version as well as the questionnaire.

Best wishes for your research
Elma

---- Original Message ----
From: [illegible]
To: [illegible]
Sent: Friday, April 20, 2012 9:56 PM
Subject: Request for Research Information

Dear Dr de Vries

I am Samuel Ubabukoh, a registrar in Family medicine at Wits University

I am currently in my third year and as part of my requirement is the research which I am currently working on. My topic is **Career Aspirations and interest in Family medicine as a career option for newly qualified doctors [interns and community service doctors] in Southern Gauteng.**

I wish to acknowledge the fact that you have already done an excellent work in the field of career plans in South Africa as noted in my literature review.

I humbly request for a copy of the full research article and questionnaire used in your previous research titled - Career plans of final-year medical students in South Africa done in 2008
This will help me to improve the internal validity of my research questionnaire [which I am developing] in the aspect of career aspirations. Subsequent acknowledgements would be made in both my protocol and research when concluded.

I have already put in a notification request to one of the co-authors Prof Couper- who happens to be my HOD at present. However I saw from the article published in the SAMJ that you are the corresponding author so I am observing all protocols necessary.

Thanking You in Anticipation

Sincerely Yours

Samuel Ubabukoh

Questionnaire-career plans-2008.doc

Career plans paper for CHEER 10 09 Final.pdf

APPENDIX 6 – Original questionnaire from the de Vries et al study[42]

Questionnaire: Career plans of final year medical students

Introduction

The purpose of this study is to explore the career plans of final year medical students. Participation is voluntary. This is an anonymous questionnaire, and the researchers will not be able to identify individual students who participated. Informed consent is implied by completing the questionnaire. The researchers will give feedback to the class regarding the findings of this research project, before the end of the academic year.

Please circle the appropriate choice:

1. Gender: female / male

2. Age: ________

3. First language spoken when growing up: ________________________

4. Are you a South African citizen? Yes / No

5. Please indicate what is/was the main occupation of your

(a) father ____________________ (b) mother ________________

6.1 Origin: do you consider the place where you grew up: city / small town / rural
6.2 Postal code of the place where you grew up: ___________

7. Do you plan to remain in the medical field/health sector as a career? Yes / No / Unsure

8. For most of your career, do you plan to work:
full time + overtime / full time with no overtime / part time

9. Do you plan to take "time out" for a few years during your career? Yes / No / Unsure
(Maternity leave of 4 months is not considered "time out")

10. Have you made a definite career choice (in terms of whether you would like to specialise)? Yes / No / Unsure

11. Choice of specialty: which field would be your first and second choice? Please tick one field for each choice.

Specialist field	First choice	Second choice
None		
Anaesthetics		
Family medicine/general practice		
Forensic medicine		
Internal medicine (including subspecialties)		
Laboratory medicine (microbiology, pathology, etc)		
Obstetrics and Gynaecology		
Orthopaedics		
Paediatrics		
Public Health		
Psychiatry		
Radiology		
Surgery (including subspecialties)		

12. Do you plan to spend time working overseas? Yes / No / Unsure
If yes, do you plan to do it:
Short term (e.g. a year or two) / Long term / Relocate permanently

13. What period of time (after specialising) do you plan to spend working in:

	None	1-2 years	Several years	Most of career
Rural area				
Public sector				
Private sector				
Combined public/private				
Academic field (teaching/research)				

14. Please rate the following factors that could influence your choice of specialty on the Likert scale with 1 indicating not at all important and 4 indicating very important.

	1	2	3	4
Plan to have a family				
Acceptable hours of practice				
Intellectual challenge of the field				
Continuity of patient contact				
Variety of illnesses				
Narrow variety of patient problems				
Income potential				
Results of interventions immediately available				
Social commitment				
Health promotion and prevention is important				
Being part of a community				
Working with new technology				
Status				

15. Any other important factors influencing your choice of specialty? ____________________

____

16. Please rate the following factors that could influence the choice of where you would like to work on the Likert scale with 1 indicating not at all important and 4 indicating very important.

	1	2	3	4
Opportunities for children				
Opportunities for partner/spouse				
Rural lifestyle				
Community belonging				
Sense of being needed/making a difference				
Providing continuity of care				
Opportunities for own continuing education				
Adventure/recreational opportunities				
Access to social and family networks				
Availability of specialists				
Using a wide range of skills				
Sense of professional independence				
Crime and safety issues				

17. Any other important factors influencing your choice of where you would like to work?

____

18. Any comments?____

APPENDIX 7 – Human Research Ethics Committee (HREC) approval letter

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Dr Samuel Chabukoh

CLEARANCE CERTIFICATE	M121147
PROJECT	Career Aspirations and Interest in Family Medicine as a Career Option for New Qualified Doctors (Interns and Community Service Doctors) in Southern Gauteng Province
INVESTIGATORS	Dr Samuel Chabukoh.
DEPARTMENT	Department of Family Medicine
DATE CONSIDERED	30/[illegible]/2012
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 07/02/2013 **CHAIRPERSON** ....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Dr Eamon Armstrong

DECLARATION OF INVESTIGATOR(S)
To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

APPENDIX 8 – Gauteng Department of Health approval letter

GAUTENG PROVINCE

REPUBLIC OF SOUTH AFRICA

BANK OF LISBON BUILDING
37 SAUER STREET JHB
PRIVATE BAG X085
MARSHALLTOWN
Tel (011) 355 3134
Fax (011) 355 3675

GAUTENG DEPARTMENT OF HEALTH
RESEARCH PROPOSAL EVALUATION FORM

Researcher Name	Dr Samuel Ubabukoh
Researcher's contact details	Email samuelubabukoh@gmail.com
Institution	Department of Family Medicine
Research Topic	Career aspirations and interest in Family Medicine as a career option for newly qualified doctors in the Southern Gauteng Province
Date Received by the Directorate PPR	19/02/2013
Date Received Reviewer	20/03/2013
Final Review Date	23/03/2013
Date Submitted to Director of PPR	25/03/2013
Research Site(s)	All hospitals and clinics that have staff interns and / or community service doctors within the Southern Gauteng Province.
Type of research	Descriptive

	CRITERIA	YES	NO	COMMENTS
1	Is this research project within the scope of the Department of Health key policy priorities/directives?	X		
2	Content of Research • Original work	X		
	• New facts, ideas	X		
	• Confirmation of uncertain data	X		
	• Repetition of known data and consequently of limited importance		X	
	• Insufficient research information		X	
	• Confusion of topics/questions		X	
3	Is the title of the research project suitable?	X		
4	Are the objectives of the research project adequate?	X		
5	Could the objectives be limited to better focus on the project's main objective?		X	
6	Writing style			
	• The text of the proposal is clear	X		
	• The nomenclature used is correct	X		

1

	CRITERIA	YES	NO	COMMENTS
	• The references used are relevant, comprehensive and accurate	X		
	• The spelling and grammar are correct	X		
	• The language needs improvement		X	
	• The research proposal needs re-styling and re-writing		X	
7	Are the research methods appropriate to the study?	X		
8	Is data collection method in line with the study design?	X		
9	Does the study have ethical approval? If yes, name the ethics committee.	X		M121147
10	Is the definition and measurement of variables consistent with the scope of the proposal?	X		
11	Is the time frame of the proposal adequate to meet the objectives?	X		
12.	Is the method of dissemination of the results of the research project stated?		X	It is recommended that the researchers specify how the results will be shared / disseminated
13	Is any possible conflict of interests clarified?	n/a		
14	Are financial implications and financial support transparent?	x		

SUMMARY OF PROPOSAL

Background

Appropriate training of the Family Physician is central to the realization of the goal of accessible, quality health care. If primary care is going to be central to future reforms and renewals of health care systems, countries embarking on these renewals (such as SA) will need sufficient numbers of Family Physicians. There is paucity of Family Physicians in the country, in part because the four-year specialization program in Family Medicine is relatively new and in large part is due to the failure to attract talented local graduates into this nascent discipline. The reason for local medical graduates after their internship and community service years not entering post graduate training in Family Medicine have not yet been adequately elucidated. Any attempt to improve recruitment and retention of Family Medicine registrars needs to be underpinned by a clearer understanding of what factors influence young doctors in their choice of career and where applicable specialization. Information gleaned from such a study can potentially inform how best to attract young locally trained doctors into Family Medicine training programs by using a process akin to Force Field Analysis – augmenting attractors to the discipline and minimizing detractors. The aim of this study is therefore to describe aspirations and level of interest in Family Medicine as a career option among interns and community service doctors in the Southern Gauteng Province

Objectives

- To identify the career aspirations of interns and community service doctors in Southern Gauteng Province
- To describe the views of the study participants on factors that affects their choice of career specialty
- To describe levels of interest in considering Family Medicine as a career option among the study participants.
- To identify reasons for the varying levels of interest in Family Medicine among the study participants.

METHODS

A descriptive cross sectional study design will be used. The study will be conducted at all hospitals and clinics that have staff interns and / or community service doctors within the Southern Gauteng Province. All 421 doctors (267 interns and 154 community service doctors) will be included in the study. Self-administered questionnaires will be distributed in person to the participants and collected by the researcher or his trained assistant. One research assistant will be employed to assist with survey distribution, collection and data capture. Every questionnaire that comes from each hospital will be coded for that hospital to achieve the required response. The information on the coded variables will be entered directly into Epi – info software and later improved into STATA software for analysis. Demographics characteristics, career choices and the levels of interest in Family Medicine will be represented using descriptive statistics.

REVIEWER'S FINAL CONCLUSION

- The proposed study may contribute towards better recruitment strategies to attract young locally trained doctors into Family Medicine training programs and understanding of contributing factors for local medical graduates after their internship and community service years not entering post-graduate training in Family Medicine

Reviewed and recommended by

____
Bridget Ikalafeng, DD: Research and Epidemiology
Date: ______________________

____
S. le Roux, Director PPR
Date: 26/03/2013

Approved / ~~not approved~~

UNITY IN DIVERSITY

GAUTENG PROVINCE

REPUBLIC OF SOUTH AFRICA

POLICY, PLANNING AND RESEARCH (PPR)
Enquiries: Dr B Ikalafeng
Tel: +2711 355 3500
Fax: +2711 355 3675 Email:bridget.ikalafeng@gauteng.gov.za

CONTACT DETAILS OF THE RESEARCHER	
Date	27 March 2013
Contact number	
Email	samuelubabukoh@gmail.com
Researcher /Principal investigator (PI)	Dr Samuel Ubabukoh
Supervisor	
Institution	Department of Family Medicine
Research title	Career aspirations and interest in Family Medicine as a career option for newly qualified doctors in the Southern Gauteng Province

This approval is granted only for a research proposal submitted to GDH by Dr Samuel Ubabukoh "Career aspirations and interest in Family Medicine as a career option for newly qualified doctors in the Southern Gauteng Province."

Approval is hereby granted by the Gauteng Department of Health for the above mentioned research study proposal for a study to be conducted within GDH domain. Approval is limited to compliance with the following terms and conditions:

1. All principles and South African regulations pertaining to ethics of research are observed and adhered to by all involved in the research project. Ethics approval is only acceptable if it has been provided by a South African research ethics committee which is accredited by the National Health Research Ethics Council (NHREC) of South Africa; this is regardless of whether ethics approval has been granted elsewhere.

   Of key importance for all researchers is that they abide by of all research ethics principles and practice relating to human subjects as contained in the Declaration of Helsinki (1964, amended in 1983) and the constitution of the Republic of South Africa in its entirety. Declaration of Helsinki upholds the following principles when conducting research, respect for:

   - Human dignity;
   - Autonomy;
   - Informed consent;
   - Vulnerable persons;
   - Confidentiality;
   - Lack of harm;
   - Maximum benefit;
   - and justice

2. The GDH is indemnified from any form of liability arising from or as a consequence of the process or outcomes of any research approved by HOD and conducted within the GDH domain;
3. Researchers commit to providing the GDH with periodic progress and a final report; short term projects are expected to submit progress reports on a more frequent basis and all reports must be submitted to the Director: Policy, Planning and Research of the GDH;
4. The Principal Investigator shall promptly inform the above mentioned office of changes of contact details or physical address of the researching individual, organisation or team;
5. The Principal investigator shall inform the above office and make arrangements to discuss their findings with GDH prior to dissemination;
6. The Principal Investigator shall promptly inform the above mentioned office of any adverse situation which may be a health hazard to any of the participants;
7. The Principal Investigator shall request in writing authorization by the HOD via PPR for any intended changes of any form to the original and approved research proposal;
8. If for any reason the research is discontinued, the Principal Investigator must inform the above mentioned office of the reasons for such discontinuation;
9. A formal research report upon completion should be submitted to the Director: Policy, Planning and Research of the GDH with recommendations and implications for GDH, the Directorate will make this report available for the HOD.

This approval is granted only for a research proposal submitted to GDH by Dr Samuel Ubabukoh "Career aspirations and interest in Family Medicine as a career option for newly qualified doctors in the Southern Gauteng Province."

AGREEMENT BETWEEN THE GAUTENG DEPARTMENT OF HEALTH (GDH) AND THE RESEARCHER

Sue le Roux
Director: Policy Planning & Research

Date: 28/03/2013

Signature:

Name and surname of Principal Researcher

Research/Academic Institution

Date:

Signature:

This approval is granted only for a research proposal submitted to GDH by Dr Samuel Ubabukoh "Career aspirations and interest in Family Medicine as a career option for newly qualified doctors in the Southern Gauteng Province "

APPENDIX 9 – Questionnaire distribution and collection

DISTRIBUTION AND COLLECTION OF QUESTIONNAIRES AMONG THE STUDY POPULATION

Total study population of NQDs working in Southern Gauteng in 2013 (N = 768)

Source: Human Resource-Placements (Gauteng Department of Health)

NQDs met & questionnaires issued
N = 502

NQDs non-existent/on leave/not reachable
N = 266

Questionnaires returned
N =368

Questionnaires eligible for analysis N =342

Incomplete/illegible questionnaires excluded from analysis N = 26

APPENDIX 10 – Response rates of the study population

RESPONSE RATES BY WORKPLACE AND OCCUPATION

Response rate by workplace facility

Facility	Questionnaires issued	Questionnaires returned	Response rate
Academic (central) hospitals	229	155	67.7%
Tertiary and Regional hospitals	241	194	80.4%
District hospitals and CHCs/PHC clinics	32	19	59.3%
Total	502	368	73.3%

Response rate by occupation

Occupation	Questionnaires issued	Questionnaires returned	Response rate
Interns	394	298	75.6%
Community service doctors	108	70	64.8%
Total	502	368	73.3%

Occupation and workplace facility of those excluded from analysis

Facility	Interns	Community Service Doctors	
Academic (Central) hospitals	11	1	12
Tertiary and Regional hospitals	11	2	13
District Hospitals & CHCs/PHC clinics		1	1
TOTAL (percentage of the total questionnaires returned)	22 (7.4%)	4 (5.7%)	26

REFERENCES

[1] Health Professions Council of South Africa. 2013. About HPCSA – Overview. Available: http://www.hpcsa.co.za/About [Accessed 20.07.2015]

[2] World Health Organisation. International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978. Available: http://www.who.int/publications/almaata_declaration_en.pdf?ua=1 [Accessed 08.01.2015]

[3] Weisz, G. 2003. The emergence of medical specialization in the nineteenth century. *Bull Hist Med.,* 77(3):536-574. Available: https://muse.jhu.edu/ [Accessed 10.02.2016]

[4] Du Plessis, V., Andronikou, S. 2007. Is selection for a registrar post in South Africa defined by a preconceived social profile or are candidates selected on academic credentials and work experience? *SA J Radiol.,* 11(2):18–23.

[5] van Niekerk, J.P. 2013. Decisions, decisions – choosing a specialty. *Junior Doctor* 4(1): 10-11. Available: http://www.medicalprotection.org/docs/default-source/pdfs/sa-junior-doctor-pdfs/may-2013.pdf?sfvrsn=2 [Accessed 10.02.2016]

[6] Colleges of Medicine of South Africa. 2014. Memorandum of understanding between CMSA and HPCSA document. Available on CMSA website. http://www.collegemedsa.ac.za/force_download.aspx?documentid=60543&Name=SLA%20between%20CMSA%20and%20HPCSA [Accessed 10.02.2016]

[7] Strachan, B., Zabow, T., van der Spuy, Z.M. 2011. More doctors and dentists are needed in South Africa. *South African Med J.,* 101(8):523–8.

[8] Kautzky, K., Tollman, S.M. 2008. A perspective on primary health care in South Africa. *South African Heal Rev.*, 2008:17–30.

[9] Coovadia, H., Jewkes, R., Barron, P., *et al.* 2009. The health and health system of South Africa: Historical roots of current public health challenges. *Lancet* 374(9692):817–34. Available: http://dx.doi.org/10.1016/S0140-6736(09)60951-X [Accessed 10.11.2014]

[10] Tollman, S.M., Pick, W.M. 2002. Roots, shoots, but too little fruit: Assessing the contribution of COPC in South Africa. *Am J Public Health* 92(11): 1725–8.

[11] Baldwin-Ragaven, L., London, L., de Gruchy, J. An ambulance of the wrong colour: Health professionals, human rights and ethics in South Africa. Cape Town: University of Cape Town Press. 1999.

[12] National Department of Health. 2000. The PHC Package for South Africa –A set of norms and standards. National Department of Health Policy Document. Available: http://www.doh.gov.za/docs/index.html [Accessed 27.10.2010]

[13] Macinko, J., Starfield, B., Erinosho, T. 2009. The impact of primary healthcare on population health in low- and middle-income countries. *J Ambul Care Manage* 32(2): 150–71. Available: http://bit.ly/1s20BSh [Accessed 10.11.2014]

[14] Shi, L., Macinko, J., Starfield, B., *et al.* 2003. The relationship between primary care, income inequality, and mortality in US States, 1980-1995. *J Am Board Fam Pract.,* 16(5):412–22.

[15] Beasley, J.W., Starfield, B., van Weel, C., *et al.* 2007. Global health and primary care research. *J Am Board Fam Med.,* 20(6):518–26.

[16] Starfield, B. Primary care: Balancing health needs, services, and technology. USA: Oxford University Press, 1998.

[17] Starfield, B., Shi, L., Macinko, J. 2005. Contribution of primary care to health systems and health. *Milbank Q.,* 83(3):457–502. Available: http://www.ncbi.nlm.nih.gov/pubmed/16202000 [Accessed 21.03.2012]

[18] Scott, I., Gowans, M., Wright, B., *et al.* 2011. Determinants of choosing a career in family medicine. *CMAJ* 183:E1-8. doi: 10.1503/cmaj.091805.

[19] Flinkenflögel, M., Essuman, A., Chege, P., *et al.* 2014. Family medicine training in sub-Saharan Africa: South-South cooperation in the Primafamed project as strategy for development. *Fam Pract.,* 31(4):427–36. Available: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4106404&tool=pmcentrez&rendertype=abstract [Accessed 10.11.2014]

[20] Hellenberg, D., Gibbs, T. 2007. Developing family medicine in South Africa: A new and important step for medical education. *Med Teach.,* 29: 897-900.

[21] Couper, I., Mash, B., Smith, S., *et al.* 2012. Outcomes for family medicine postgraduate training in South Africa. *South African Fam Pract.,* 54(6):501–6. Available: http://www.tandfonline.com/doi/abs/10.1080/20786204.2012.10874283 [Accessed 20.07.2015]

[22] Dictionary.com. "family medicine". The American Heritage® Stedman's Medical Dictionary. Houghton Mifflin Company. Available: http://dictionary.reference.com/browse/family medicine [Accessed 20.07.2015]

[23] De Maeseneer, J., Flinkenflögel, M. 2010. Primary healthcare in Africa: Do family physicians fit in? *Br J Gen Pract.,* 60(573):286-292. doi:10.3399/bjgp10X483977.

[24] Buddeberg-Fischer, B., Stamm, M., Marty, F. 2007. Family medicine in Switzerland: training experiences in medical school and residency. *Fam Med.*, 39(9): 651-5.

[25] de Villiers, P.J., de Villiers, M.R. 1999. The current status and future needs of education and training in Family Medicine and primary care in South Africa. *Med Educ.*, 33(10):716–21. Available from: http://doi.wiley.com/10.1046/j.1365-2923.1999.00545.x [Accessed 10.11. 2014]

[26] South Africa. 2011. Department of Health Green Paper. National Health Insurance in South Africa. Available: http://www.hst.org.za/sites/default/files/2bcce61d2d1b8d972af41ab0e2c8a4ab.pdf [Accessed 10.11.2014]

[27] South Africa. 2015. Department of Health. National Health Insurance in South Africa - White paper. Available: http://www.bhfglobal.com/wp-content/uploads/2015/03/National_Health_Insurance_White_Paper_10Dec2015.pdf [Accessed 20.01.2016]

[28] Subedar, H. 2012. Provincial guidelines for the implementation of the three streams of the PHC re-engineering. Guideline. Pretoria: Department of Health. Available: http://www.phasa.org.za/the-implementation-of-phc-re-engineering-in-south-africa [Accessed 10.11.2014]

[29] Moosa, S., Downing, R., Mash, B., *et al.* 2013. Understanding of family medicine in Africa: A qualitative study of leaders' views. *Br J Gen Pract.,* 63(608):e209–16. Available: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3582980&tool=pmcentrez&rendertype=abstract [Accessed 18.11.2014]

[30] Moosa, S., Mash, B., Derese, A., *et al.* 2014. The views of key leaders in South Africa on implementation of family medicine: critical role in the district health system. *BMC Fam Pract.*, 15(1):125. Available: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4077579&tool=pmcentrez&rendertype=abstract [Accessed 18.11.2014]

[31] MacKean, P., Gutkin, C. 2003. Fewer medical students selecting family medicine: Can family practice survive? *Can Fam Physician* 49:408. Available: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2214214/pdf/12729233.pdf [Accessed 29.9.2010]

[32] Walkinshaw, E. 2011. Family medicine continues uptick during annual residency match. *CMAJ* 183(12): E775–6. Available:

http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3168651&tool=pmcentrez&rendertype=abstract [Accessed 01.05.2012]

[33] Biggs, W.S., Bieck, A.D., Pugno, P.A., *et al.* 2011. Results of the 2011 national resident matching program: Family Medicine. *Fam Med.*, 43(9):619.

[34] HPCSA Statistics. Available: http://www.indicators.hst.org.za/healthstats/281/data [Accessed 20.09.2013]

[35] Tandeter, H., Granek-Catarivas, M. 2001. (Educational notes) Choosing Primary Care? Influences of medical school curricula on career pathways. *IMAJ* 2001;3:969-972

[36] South Africa. 2011. Department of Health. Human Resources for Health South Africa: HRH Strategy for the Health Sector: 2012/13–2016/17. Available: http://www.hrhresourcecenter.org/node/3752 [Accessed 10.11.2014]

[37] Baldwin-Ragaven L. 2015. Personal Communication with Director: Workforce Management, Department of Health, Pretoria. E-mail on 2015 Jan 27. [Accessed 04.03.2015]

[38] Lambert, T.W., Goldacre, M.J., Turner, G. 2006. Career choices of United Kingdom medical graduates of 2002: Questionnaire survey. *Med Educ.*, 40(6):514–21. Available: http://www.ncbi.nlm.nih.gov/pubmed/16700766 [Accessed 01.05.2012]

[39] Goldacre, M.J., Davidson, J.M., Lambert, T.W. 1999. Career choices at the end of the pre-registration year of doctors who qualified in the United Kingdom in 1996. *Med Educ.*, 33:882

[40] Parsa, S., Aghazadeh, A., Nejatisafa, A.A. 2010. Freshmen versus interns' specialty interests. *Arch Iran Med.*, 13(6):509–16. Available: http://ams.ac.ir/AIM/010136/0011.pdf [Accessed 01.05.2012]

[41] Odusanya, O. 2001. Career aspirations of house officers in Lagos, Nigeria. *Med. Educ.*, 35:482–7. Available: http://onlinelibrary.wiley.com/doi/10.1046 [Accessed 01.05.2012]

[42] de Vries, E., Irlam, J., Couper, I., *et al.* 2010. Career plans of final-year medical students in South Africa. *SAMJ* 100(4):227–8. Available: http://www.scielo.org.za/scielo [Accessed 01.05.2012]

[43] Mariolis, A., Mihas, C., Alevizos, A., *et al.* 2007. General practice as a career choice among undergraduate medical students in Greece. *BMC Med Educ.*, 7(15). doi:10.1186/1472-6920-7-15.

[44] Petrides, K.V., McManus, I.C. 2004. Mapping medical careers: Questionnaire assessment of career preferences in medical school applicants and final-year students. *BMC Med Educ.*, 4:18. doi:10.1186/1472-6920-4-18.

[45] Bailey, N., Mandeville, K.L., Rhodes, T., *et al.* 2012. Postgraduate career intentions of medical students and recent graduates in Malawi: A qualitative interview study. *BMC Med Educ.,* 12(1):87. doi:10.1186/1472-6920-12-87.

[46] Laurence, C., Elliott, T. 2007. When, what and how South Australian pre-registration junior medical officers' career choices are made. *Med Educ.,* 41:467–75.

[47] Bunker, J., Shadbolt, N. 2009. Choosing general practice as a career - the influences of education and training. *Aust Fam Physician* 38(5):341-4.

[48] Bland, C.J., Meurer, L.N., Maldonado, G. 1995. Determinants of primary care specialty choice: A non-statistical meta-analysis of the literature. *Acad Med.,* 70 (7):620-41.

[49] Kiolbassa, K., Miksch, A., Hermann, K., Loh A, *et al.* 2011. Becoming a general practitioner which factors have most impact on career choice of medical students? *BMC Fam Pract.*, 12(1): 25. Available: http://www.biomedcentral.com/1471-2296/12/25 [Accessed 03.05.2012]

[50] Senf, J.H., Campos-Outcalt, D., Kutob, R. 2003. Factors related to the choice of family medicine: A reassessment and literature review. *J Am Board Fam Pract.,* 16:502-512.

[51] Scott, I., Gowans, M., Wright, B., *et al.* 2011. Determinants of choosing a career in family medicine. *CMAJ* 183(1): 1-8.

[52] Connelly, M.T., Sullivan, A.M., Peters, A.S., *et al.* 2003. Variation in predictors of primary care career choice by year and stage of training. *J Gen Intern Med.*, 18(3): 159–169.

[53] Laurence, C., Elliott, T. 2007. When, what and how South Australian pre-registration junior medical officers' career choices are made. *Med Educ.*, 41(5):467–75. Available: http://www.ncbi.nlm.nih.gov/pubmed/17470076 [Accessed 14.05.2012]

[54] Schafer, S., Shore, W., French, L., *et al.* 2000. Rejecting family practice: Why medical students switch to other specialties. *Fam Med.*, 32 (5):320-5.

[55] Kuikka, L., Nevalainen, M.K., Sjöberg, L., *et al.* 2012. The perceptions of a GP's work among fifth-year medical students in Helsinki, Finland. *Scand J Prim Health Care* 30(2):121-6. Available: http://www.ncbi.nlm.nih.gov/pubmed/22339369 [Accessed 01.05.2012]

[56] Morra, D.J., Regehr, G., Ginsburg, S. 2009. Medical students, money, and career selection: students' perception of financial factors and remuneration in family medicine. *Fam Med.*, 41(2):105–10.

[57] South Africa. Statistics SA. 2012. Census 2011 statistical release. Available: http://www.statssa.gov.za/publications/P03014/P030142011.pdf [Accessed 19.07.2015]

[58] Katzenellenbogen, J., Joubert, G. Data collection and measurement. In: Epidemiology: A Research Manual for South Africa, ed. by G. Joubert & R. Ehrlich. 2nd ed. Cape Town: OUP Southern Africa, 2008, pp. 293-294

[59] Smits, A., Walsh, E., Ross, R., *et al.* 2006. Residency applicants' perspectives on family medicine residency training length. *Fam Med.*, 38(3):172–6. Available: http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Residency+Applicants+'+Perspectives+on+Family+Medicine+Residency+Training+Length#0 [Accessed 01.05.2012]

[60] Rowsell, R., Morgan, M., Sarangi, J. 1995. General practitioner registrars' views about a career in general practice. *Br J Gen Pract.*, 45:601–4. Available: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1239436/ [Accessed 01.05.2012]

[61] Dovlo, D. 2004. The brain drain in Africa: an emerging challenge to health professions' education. *JHEA/ RESA* 2:1-18.

[62] Ashmore, J. 2013. "Going private": A qualitative comparison of medical specialists' job satisfaction in the public and private sectors of South Africa. *Hum Resour Health* 11:1–12. Available: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3557181&tool=pmcentrez&rendertype=abstract [Accessed 10.11.2014]

[63] National Planning Commission. 2011. National Development Plan: Vision for 2030. Pretoria: The Presidency. Available: http://www.npconline.co.za/medialib/downloads/home/NPC%20National%20Development%20Plan%20 ion%202030%20-lo-res.pdf [Accessed 20.01.2016]

[64] Moosa, S., Luiz, J., Carmichael, T. 2012. Introducing a national health insurance system in South Africa: A general practitioner's bottom-up approach to costing. *South African Med J.*, 102:794 –7.

[65] Pimlott, N. 2007. Managing uncertainty. *Can Fam Physician* 53(6):1001–3. Available: http://www.cfp.ca/content/53/6/1000.2.short [Accessed 20.01.2016]

[66] Price, M., Weiner, R. 2005. Where have all the doctors gone ? Career choices of Wits medical graduates. *S Afr Med J.*, 95(6):414 – 9.

[67] van der Horst, K., Siegrist, M., Orlow, P., *et al.* 2010. Residents' reasons for specialty choice: Influence of gender, time, patient and career. *Med Educ.*, 44(6):595–602. Available: http://www.ncbi.nlm.nih.gov/pubmed/20604856 [Accessed 07.04.2012]

[68] Ivers, N.M., Abdel-Galil, R. 2007. Marketing family medicine: Challenging misconceptions. *Can Fam Physician* 53(5):793–4. Available: http://www.cfp.ca/content/53/5/793.short [Accessed 20.01.2016]

[69] George, G., Rhodes, B. 2012. Is there really a pot of gold at the end of the rainbow? Has the Occupational Specific Dispensation, as a mechanism to attract and retain health workers in South Africa, leveled the playing field? *BMC Public Health* 12(1):613. Available: http://www.biomedcentral.com/1471-2458/12/613 [Accessed 20.01.2016]

[70] Bateman, C. 2011. Academics appeal to state: 'Help us train where the needs are'. *South African Med J.*, 101(8):496–500. doi:10.7196/SAMJ.5121

[71] Moosa, S., Wojczewski, S., Hoffmann, K., *et al.* 2013. Why there is an inverse primary-care law in Africa. *Lancet Glob Heal.*, 1(6):e332–3. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25104594 [Accessed 15.11.2014]

[72] South Africa. 2011. Department of Health. "Towards Quality Care for Patients" National Core Standards for Health Establishments in South Africa. Available: http://www.rhap.org.za/wp-content/uploads/2014/05/National-Core-Standards-2011-1.pdf [Accessed 20.01.2016]

[73] World Health Organization. 2010. Workload indicators of staff need (WISN): User's manual. WHO Press. ISBN 97892 41500197. Available: http://apps.who.int/iris/bitstream/10665/44414/1/9789241500197_users_eng.pdf [Accessed 20.01.2016]

[74] Moosa, S., Downing, R., Essuman, A., *et al.* 2014. African leaders' views on critical human resource issues for the implementation of family medicine in Africa. *Hum Resour Health* 12:2. Available: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3899624&tool=pmcentrez&rendertype [Accessed 30.11.2014]

[75] Oboirien, K.O., Eyles, J., Mcintyre, D., et al. 2015. Understanding roles, enablers and challenges of District Clinical Specialist Teams in strengthening primary health care in South Africa. In: Padarath, A., King, J., English, R., editors. *South African Health Review* 2014/15. Durban: Health Systems Trust. ISSN 1025-1715. Available: http://www.hst.org.za/publications/south-african-health-review-2014/15 [Accessed 10.02.2016]

[76] Hafferty, F.W. 1998. Beyond curriculum reform: Confronting medicine's hidden curriculum. *Acad Med.*, 73:403–7. Available: http://journals.lww.com/academicmedicine/Abstract/1998/04000/Beyond_curriculum_reform__confronting_medicine_s.13.aspx [Accessed 20.01.2016]

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Dr Samuel Ubabukoh

CLEARANCE CERTIFICATE **M121147**

PROJECT Career Aspirations and Interest in Family Medicine as a Career Option for New Qualified Doctors (Interns and Community Service

Doctors) in Southern Gauteng Province

INVESTIGATORS Dr Samuel Ubabukoh.

DEPARTMENT Department of Family Medicine

DATE CONSIDERED 30/12/2012

DECISION OF THE COMMITTEE* Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 07/02/2013 **CHAIRPERSON** ....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Dr Eamon Armstrong

DECLARATION OF INVESTIGATOR(S)
To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...