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## The self-reported learning needs of primary care doctors in South Africa: a descriptive survey

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**Background:** Strengthening primary health care in South Africa is a prerequisite for the successful introduction of National Health Insurance. Primary care doctors from both the public and private sectors are an essential contributor to achieving this goal. In order to prepare these doctors for their future role, a national diploma training programme is being developed. This study aimed to evaluate the learning needs of primary care doctors and to assist with the design of the diploma.

**Methods:** A descriptive survey of 170 primary care doctors (80 medical officers and 90 private practitioners), from eight provinces in South Africa, in terms of their use of 30 key guidelines, performance of 85 clinical skills and confidence in 12 different roles.

**Results:** Doctors had read the majority of the guidelines (20/30), but few had been implemented in practice (6/30). All of the doctors had been trained in the clinical skills; however, none had taught these skills to others in the last year. Primary care doctors reported having performed the majority of the skills within the last year (70/85). Doctors had performed 7/12 roles in the last year, while 5/12 had not been engaged with. The weakest roles were those of change agent and community advocate, while the strongest roles were competent clinician, capability builder and collaborator. There were a number of significant differences ( $p < 0.05$ ) between the learning needs of medical officers and private practitioners.

**Conclusion:** These findings will help guide the development of a new Diploma in Family Medicine programme for South Africa.

**Keywords:** clinical skills, descriptive survey, family medicine, guidelines, learning needs, primary care, scope of practice, South Africa

### Introduction

Strengthening primary health care is a national priority in South Africa in order to improve equity, effectively address the burden of disease and prepare the country for the introduction of a national health insurance (NHI) scheme.<sup>1</sup> Currently primary care is mainly offered by nurses, with support from doctors.<sup>2</sup> The quality of primary care is not optimal with concerns existing regarding infrastructure, supply of essential medication, capability of nurses to offer holistic and comprehensive care, and acceptability of services.<sup>3</sup>

A number of strategies to accomplish this “re-engineering of primary health care”<sup>4</sup> have been planned and include the development of municipal ward-based outreach teams of community health workers supported by nurses and doctors, who will take responsibility for visiting specific groups of households.<sup>5</sup> In addition the plans include strengthening of school health services, promotion of the ideal clinic and introduction of District Clinical Specialist Teams (DCST).<sup>4,6</sup> DCSTs consist of a group of specialists dedicated to improving maternal and child health care within a district.

A further intervention to improve healthcare within the district health system has been the recognition of family medicine as a new discipline. Since 2008 family physicians have been trained as expert generalists in new four-year programmes that model the training of other specialists. This new cadre of family physicians have begun to enter the health system and have an impact, although each province has adopted a different approach to their utilisation.<sup>7</sup> In some provinces they have been employed at community health centres and district hospitals, while in others at the level of the sub-district, district or even regional hospital.

The numbers of family physicians are still relatively small and there is a need to create more internal policy cohesion within the Department of Health on their role and contribution. In time it is anticipated that all doctors pursuing a career in the district health services would train as a family physician.

Over the next 10–15 years, however, the pool of doctors currently working in primary care will be far larger than the number of family physicians and most are unlikely to train as family physicians, because this would mean reverting to a registrar post. The potential pool of primary care doctors includes medical officers in the public sector and general practitioners in the private sector. The Department of Health has begun to contract with general practitioners in the NHI pilot sites to bring them into the public sector primary care system. Primary care doctors will need to support all of the initiatives outlined above and in order to make their contribution will need to fulfil a number of new roles in primary health care. These future roles and competencies required of primary care doctors were identified in a national stakeholder workshop (Table 1) as part of a larger project entitled “Strengthening primary health care through primary care doctors and family physicians”<sup>8</sup>

This project plans to revise the current two-year Diploma in Family Medicine that is available in South Africa, so that its learning outcomes and curriculum are better aligned with the future needs of the country and primary care doctors. Currently four universities offer such a diploma, with very different and sometimes outdated learning outcomes. The project intends that all the programmes should align themselves with the same nationally agreed learning outcomes and that new programmes should be developed at other universities so that training can be

**Table 1:** Future roles and competencies of primary care doctors

Role	Competencies
Competent clinician	<p>The primary care doctor should be able to practise competently across the whole quadruple burden of disease. They should have the clinical and procedural skills to fulfil this role in primary care.</p> <p>They should be a role model for holistic patient-centred care with the accompanying communication and counselling skills.</p> <p>They should be able to offer care to the more complicated patients that primary care nurses refer to them.</p> <p>They should support continuity of care, integration of care and a family-orientated approach.</p> <p>They should be able to offer or support appropriate health-promotion and disease-prevention activities in primary care.</p>
Capability builder	<p>The primary care doctor should be able to engage in learning conversations with other primary care providers to mentor them and build their capability.</p> <p>They should be able to offer or support continuing professional development activities.</p> <p>They should help to foster a culture of inter-professional learning in the workplace.</p> <p>As part of a culture of learning they should attend to their own learning and development.</p>
Critical thinker	<p>The primary care doctor is one of the most highly educated/trained members of the primary care team and as such should be able to offer a level of critical thinking to the team that also sees the bigger picture.</p> <p>They should be able to help the team analyse and interpret data or evidence that has been collected from the community, facility or derived from research projects.</p> <p>They should be able to help the team with rational planning and action.</p> <p>They should have IT and data management skills and the ability to make use of basic statistics.</p>
Change agent	<p>The primary care doctor should be a champion for improving quality of care and performance of the local health system in line with policy and guidelines.</p> <p>They should be a role model for change – people need to see change in action.</p> <p>They should know how to conduct a quality improvement cycle and partake in other clinical governance activities.</p> <p>They should provide vision, leadership, innovation and critical thinking.</p> <p>They may need to support some aspects of corporate governance.</p> <p>They may need to assist with clinically related administration, e.g. occupational health issues, medical record keeping, medico-legal forms.</p>
Collaborator	<p>The primary care doctor should champion collaborative practice and teamwork.</p> <p>They should use their credibility and authority to assist the team with solving problems across levels of care (referrals up and down) or within the community network of resources and organisations.</p> <p>They should help develop a network of stakeholders and resources within the community.</p>
Community advocate	<p>The primary care doctor should exhibit a community-orientated mind-set that supports the ward-based outreach teams, understands the community's health needs and social determinants of health in the community and thinks about equity and the population at risk.</p> <p>They should be able to perform home visits in the community when necessary.</p>

offered at scale throughout the country. The College of Family Physicians also offers a diploma-level exam, which should be included in this revision process.

In order to re-design the diploma at a national level it was decided to survey the learning needs of existing primary care doctors relative to their anticipated future roles so that these results could help guide the process. The aim of this study, therefore, was to evaluate the learning needs of primary care doctors, in the private and public sectors, across the country, in terms of their awareness of essential guidelines, ability to perform the required clinical skills and confidence to engage with the envisaged scope of practice.

## Methods

### Study design

This was a descriptive survey of primary care doctors.

### Setting

General practitioners (GPs) were recruited from Gauteng (Tshwane District), Northern Cape (Pixley Ka Seme District), Free State (Thabo Mafutsanyana District), Limpopo (Vhembe District), Mpumalanga (Gert Sibande District), KwaZulu-Natal (Umzinyathi District), and North West (Dr Kenneth Kaunda District).

MOs were recruited from the Western Cape, Gauteng, KwaZulu-Natal, Limpopo and Free State provinces.

### Sample size and sampling

A sample size calculation suggested a minimum sample size of 220 primary care doctors would be sufficient to measure the desired variables in the questionnaire.

General practitioners were recruited from the induction and orientation workshops held by the Department of Health in each of the NHI pilot districts between April and June 2014. Each province has one NHI pilot district, although KwaZulu-Natal is unusual in having two pilot districts. It was anticipated that 120 GPs would be recruited. The workshops were held with general practitioners as a key pillar within the Department of Health's Primary Health Care Health Professional Support Framework. These GPs had either already contracted with or were considering contracting with the public sector to provide primary care and therefore were actively reflecting on their learning needs.

Medical officers (MOs) were recruited via the Departments of Family Medicine that were partners in the larger project (Stellenbosch University, Free State University, Pretoria University, University of Limpopo and University of KwaZulu-Natal). Each department was expected to contribute 20 medical officers giving a total of 100. Family physicians identified medical officers from facilities within the areas served by these university departments.

### Data-collection tool

The questionnaire was constructed in terms of awareness of key national primary care guidelines, clinical skills and scope of practice, in collaboration with the NDoH's technical task team on GP contracting and primary health care.

Primary care doctors' awareness and adoption of key national primary care guidelines across the burden of disease (e.g. HIV/AIDS, TB, emergency medicine, maternal care) was assessed. For each guideline respondents were asked to select one response on a Likert scale:

- I am not aware of/have not read the guideline.
- I have read the guideline.
- I am already implementing this guideline in my clinical practice.
- I am able to teach this guideline to other health workers.

Clinical skills relevant to primary care were extracted from the national list for the training of family physicians.<sup>9</sup> Primary care doctors were asked to assess their ability to perform these skills by selecting one answer for each skill from a Likert scale:

- I have not had training in this skill.
- I have been trained, but have not performed this skill in the last year.
- I have performed this skill in the last year.
- I have taught this skill to others in the last year.

The scope of practice as outlined in Table 1 was assessed by asking primary care doctors to rate their confidence with performing competencies related to the six roles.<sup>7</sup> Again they were asked to rate their confidence by selecting one answer from a Likert scale:

- Not confident, i.e. I have never taken on this role.
- Some confidence, i.e. I have taken on this role in the past, but not in the last year.
- Reasonably confident, i.e. I have taken on this role in the last year.
- Very confident, i.e. I could be a role model to the primary care team.

The questionnaire was validated in terms of its construct and content with an expert panel:

- the national DOH directorate for PHC and the national technical task team on GP contracting;
- Departments of Family Medicine and Primary Care at Witwatersrand, KwaZulu-Natal, Pretoria, Limpopo, Stellenbosch, Free State, Cape Town, and Walter Sisulu University;
- The national education and training committee of the SA Academy of Family Physicians.

Once the questionnaire was revised it was piloted with three GPs from Mpumalanga and three MOs in the Western Cape to ensure its functionality.

### Data collection

All GPs attending the induction and orientation workshops were asked to complete the questionnaire prior to engaging with the rest of the workshop. The questionnaire was administered by RC and his colleagues at all of the workshops from April to June 2014.

The MOs were invited by the family physicians connected to the departments of family medicine to complete the questionnaire. The questionnaire could be completed electronically and returned by email or completed in hardcopy and given to the family physician.

### Data analysis

The questionnaire produced quantitative data on an ordinal Likert scale (scored 1 to 4) for each item as well as some basic demographic details. The data were analysed using descriptive statistics with the help of the Centre for Statistical Consultation at Stellenbosch University. Categorical data were reported as numbers and frequencies. Ordinal data were reported as mean scores with 95% confidence intervals and statistically significant differences between GP and MO responses were tested for by use of the Mann-Whitney U-test.

### Ethical considerations

Ethical approval for the research was obtained from the Health Research Ethics Committee at Stellenbosch University (N/4/03/027) and the University of Witwatersrand (M140716). Information on the study was included with each questionnaire and consent implied by completing and returning the questionnaire.

### Results

A total sample of 170 primary care doctors was obtained, which included 90 GPs and 80 MOs. The primary care doctors were distributed between the provinces as shown in Table 2.

The mean age of primary care doctors was 41.1 years (SD 12.0) and the distribution is shown in Figure 1. The mean age of the primary care doctors differed significantly ( $p < 0.001$ ) between MOs (36.3 years (SD 10.0)) and GPs (45.6 years (SD 12.1)). This is also reflected in differences in the year of graduation with MOs having fewer years of experience than GPs, as shown in Figure 2. GPs were more likely to have another degree (MO 7 (9.0%) vs. GP 19 (22.6%)  $p = 0.018$ ), but not a diploma (MO 16 (20.5%) vs. GP 26 (31.0%)  $p = 0.13$ ).

Of the whole group 99/157 (58.0%) were male, 66/157 (42%) were female, and MOs (32/80 (42.1% male) and GPs (59/90 (72.8% male) differed significantly ( $p < 0.001$ ). The majority of MOs were therefore female, while GPs were mostly male.

**Table 2:** Distribution of respondents between provinces

Province	Total (n = 170) n (%)	GPs (n = 90) n (%)	MOs (n = 80) n (%)
Gauteng	27 (15.9)	15 (16.7)	12 (15.0)
Western Cape	15 (8.8)	0 (0.0)	15 (18.8)
Northern Cape	12 (7.1)	12 (13.3)	0 (0.0)
KwaZulu-Natal	32 (18.8)	14 (15.6)	18 (22.5)
Free State	32 (18.8)	12 (13.3)	20 (25.0)
Limpopo	26 (15.3)	11 (12.2)	15 (18.8)
North West	14 (8.2)	14 (15.6)	0 (0.0)
Mpumalanga	12 (7.1)	12 (13.3)	0 (0.0)

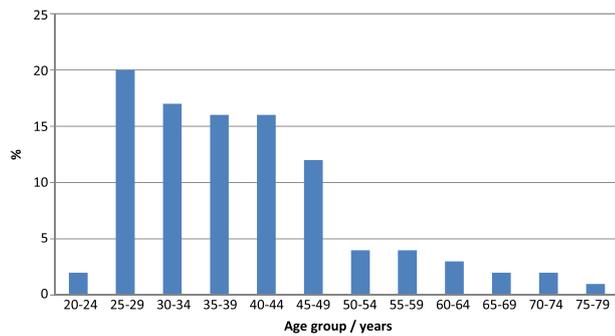


Figure 1: Age distribution of primary care doctors

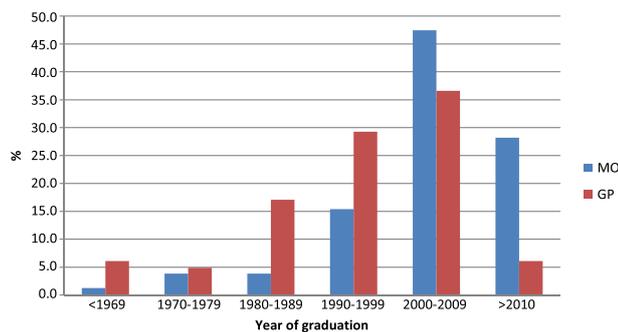


Figure 2: Distribution of medical officers (MOs) and general practitioners (GPs) by year of graduation

Table 3 shows the awareness of primary care doctors of key national primary care guidelines. Primary care doctors had only read the majority of the guidelines (20/30 scored 1.5–2.4), few were implemented in practice (6/30 scored between 2.5 and 3.4), and none felt able to teach others about any of the guidelines. Those that had been implemented included the national Standard Treatment Guidelines for PHC, the national TB management guidelines, the guidelines for STDs and the guidelines on HIV counselling, antiretroviral treatment and prevention of mother-to-child transmission. There was no awareness of the guidelines on paediatric advanced life support, advanced neonatal life support, managing patient complaints and primary health care facility supervision.

There were some significant differences between MOs and GPs. MOs were significantly more aware of the Standard Treatment Guidelines for PHC, guidelines on TB, Integrated Management of Childhood Illness guidelines, and emergency guidelines on basic, trauma and cardiovascular life support.

Table 4 shows the performance of key clinical skills by primary care doctors. All of the doctors had been trained in these clinical skills, but none of the doctors reported having taught these skills to others in the last year. Primary care doctors reported having performed the majority of the skills within the last year (70/85 score 2.50–3.49). Skills that had not been performed in the last year (15/85 score 1.50–2.49) included proctoscopy, performing a stress ECG, inserting an intra-uterine contraceptive device, performing obstetric ultrasound, assessing child abuse, inserting an intra-osseous line, injecting tennis elbow or the sub-acromial space, cricothyroidotomy, cryotherapy/cauterisation of skin lesions, trucut/punch biopsy of skin lesions, counselling a patient for a termination of pregnancy and using a genogram. Intrapartum skills were included as some primary care facilities have a midwife obstetric unit attached.

MOs were significantly more likely to have performed skills related to emergency care (e.g. femoral vein puncture, IV access in a child, insertion of an intra-osseous line, insert a urinary catheter, perform CPR, assess trauma, administer oxygen, insert a chest drain, measure the GCS), to have interpreted or performed their own investigations (e.g. radiographs, ECGs, pleural tap), to have used the Road To Health Card in children, to have certified a patient under the Mental Health Care Act, completed a Death Notification, shared bad news and used a genogram. GPs were significantly more likely to have injected a shoulder and repaired a third-degree tear during intra-partum care.

Table 5 shows the confidence of primary care doctors to perform the various roles. All of the doctors reported having taken on these roles at some time, although none felt confident enough to be a role-model in any of the areas for the PHC team. Doctors reported that they had performed 7/12 roles in the last year, while 5/12 had not been engaged with recently. The weakest roles were those of change agent and community advocate, while the strongest roles were competent clinician, capability builder and collaborator.

MOs and GPs showed very little difference in their confidence to perform these roles. The only role that showed a significant difference was that of making sense of information on the population served by the practice and sharing this with the PHC team, in which GPs felt significantly more confident.

## Discussion

Primary care doctors were aware of the majority of key national guidelines relevant to primary care, but reported that very few had actually been adopted by them in clinical practice. In terms of the burden of disease there was implementation of guidelines related to HIV, TB and STDs, but other areas such as maternal and child health, non-communicable chronic diseases, and trauma or emergency care were poorly adopted. Most of the doctors had performed the necessary clinical skills within the last year and there were few reported gaps in their capability. Doctors were confident in their roles as clinicians, capability builders and collaborators, indicating that they felt competent clinically, saw themselves as mentors to nurse practitioners and able to work in collaborative multi-professional teams. Doctors were less confident to perform the roles of clinical governor, critical thinker and community advocate.

There were some important differences between the learning needs of MOs and GPs. GPs were less aware of guidelines related to life support and emergencies and less likely to have performed clinical skills related to emergency care in the last year. Upskilling their capability in emergency care would be a priority. GPs were also less aware of national guidelines related to TB management, probably because almost all such patients are managed in the public sector TB programme. Not surprisingly GPs were less aware of guidelines used exclusively in the public sector, such as the National Standard Treatment Guidelines based on the Essential Drug List. There was also low awareness amongst GPs of the Integrated Management of Childhood Illness guideline and use of the Road To Health Card, both of which form the backbone of clinical care for children under five years and strategies to reduce under-five mortality. On the other hand GPs felt more confident to interpret and share information on the community served with their healthcare team.

Efforts to strengthen PHC at a national level are focused on the contribution of primary care doctors to providing and improving

**Table 3:** Awareness of key primary care guidelines amongst primary care doctors

Guideline	All mean score (CI)	GP's mean score (CI)	MO's mean score (CI)	p value
Standard Treatment Guidelines and Essential Medicine List for Primary Health Care in South Africa, 2012	2.67 (2.53–2.81)	2.44 (2.23–2.66)	2.92 (2.77–3.07)	<0.001
PC 101 (Primary Care Symptom Based Integrated Approach to the Adult in Primary Care) 2013/2014	1.72 (1.57–1.86)	1.76 (1.55–1.96)	1.67 (1.47–1.88)	0.66
South African COPD treatment guidelines 2011	1.82 (1.68–1.96)	1.77 (1.58–1.96)	1.87 (1.66–2.08)	0.56
South African Hypertension Society Guidelines 2012	2.34 (2.19–2.49)	2.28 (2.06–2.49)	2.41 (2.20–2.63)	0.37
Guidelines for the Management of Type 2 Diabetes. SEMDSA 2012 (Society for Endocrinology, Metabolism and Diabetes in South Africa)	2.27 (2.11–2.42)	2.22 (2.00–2.43)	2.32 (2.09–2.55)	0.51
Guidelines for the Management of Chronic Asthma in Adolescents and Adults 2007 (South African Thoracic Society)	2.26 (2.10–2.42)	2.30 (2.07–2.53)	2.22 (1.99–2.45)	0.65
Guidelines for the Prevention and Treatment of Malaria (NDOH 2009)	2.01 (1.85–2.16)	2.04 (1.84–2.25)	1.97(1.74–2.20)	0.50
SA National Tuberculosis Management Guidelines (NDOH 2009)	2.65 (2.51–2.79)	2.47 (2.26–2.68)	2.83 (2.65–3.01)	0.01
Management of Drug-resistant Tuberculosis: Policy Guidelines (NDOH 2011)	2.16 (2.01–2.31)	2.01 (1.80–2.21)	2.32 (2.11–2.53)	0.03
National Contraception Clinical Guidelines (NDOH 2013)	1.73 (1.58–1.88)	1.68 (1.47–1.88)	1.79 (1.57–2.01)	0.42
Sexually Transmitted Infections Clinical Guidelines (NDOH 2009)	2.69 (2.54–2.83)	2.67(2.47–2.87)	2.70 (2.49–2.92)	0.67
Guidelines for the Management of HIV in Children (NDOH 2010)	2.49 (2.34–2.64)	2.44 (2.23–2.64)	2.55 (2.33–2.78)	0.48
National HIV Counselling and Testing Policy Guidelines (NDOH 2010)	2.50 (2.35–2.66)	2.44 (2.23–2.65)	2.57 (2.35–2.79)	0.37
The South African Antiretroviral Treatment Guidelines (NDOH 2013)	2.82 (2.67–2.96)	2.68 (2.47–2.89)	2.96 (2.75–3.16)	0.07
Prevention of Mother to Child Transmission of HIV – PMTCT Clinical Guidelines (NDOH 2010)	2.78 (2.64–2.92)	2.68 (2.47–2.88)	2.89 (2.70–3.09)	0.13
IMCI – Guidelines for the Integrated Management of Childhood Illness (NDOH 2009)	2.36 (2.20–2.52)	2.18 (1.94–2.41)	2.54 (2.32–2.75)	0.02
Guidelines for Maternity Care in South Africa (NDOH 2007)	2.07 (1.91–2.23)	2.19 (1.95–2.43)	1.94 (1.73–2.16)	0.18
Guidelines for Basic Antenatal Care (BANC)	2.04 (1.89–2.20)	2.09 (1.86–2.33)	2.00 (1.77–2.22)	0.63
Guidelines for Post Natal Care (EPOC)	1.81 (1.65–1.97)	1.92 (1.69–2.15)	1.69 (1.47–1.91)	0.16
Guidelines for Basic Intra-partum Care (BIC)	1.85 (1.69–2.01)	1.90 (1.66–2.13)	1.80 (1.58–2.02)	0.67
Essential Steps to Manage Obstetric Emergencies (ESMOE) 2009	2.20 (2.03–2.37)	2.12 (1.86–2.37)	2.29 (2.07–2.51)	0.23
Immunisation Schedule for South Africa 2013 (EPI)	2.41 (2.25–2.56)	2.30 (2.08–2.53)	2.51 (2.31–2.72)	0.17
Ethical and professional rules of the Health Professions Council of South Africa 2008	2.04 (1.90–2.17)	2.13 (1.95–2.32)	1.93 (1.73–2.13)	0.16
National Complaints Management Protocol for the Public Health Sector of South Africa (NDOH 2013)	1.35 (1.24–1.46)	1.44 (1.27–1.61)	1.26 (1.13–1.39)	0.26
Primary Health Care Supervision Manual: A Guide to Primary Health Care Facility Supervision (NDOH 2009)	1.36 (1.24–1.48)	1.52 (1.33–1.72)	1.18 (1.05–1.30)	0.03
Guidelines for Basic Life Support (BLS) –(Academy of Advanced Life Support)	2.13 (2.00–2.25)	1.80 (1.63–1.96)	2.49 (2.32–2.65)	<0.001
ATLS – Advanced Trauma Life Support (Trauma Society of SA)	1.65 (1.53–1.77)	1.45 (1.32–1.58)	1.87 (1.67–2.06)	<0.001
ACLS – Advanced Cardiovascular Life Support (Academy of Advanced Life Support)	1.74 (1.61–1.87)	1.47 (1.32–1.61)	2.05 (1.84–2.25)	<0.001
PALS – Paediatric Advanced Life Support (Academy of Advanced Life support)	1.39 (1.29–1.50)	1.36 (1.22–1.49)	1.43 (1.26–1.60)	0.85
ANLS – Advanced Neonatal Life Support (Academy of Advanced Life Support)	1.20 (1.11–1.28)	1.19 (1.07–1.30)	1.21 (1.09–1.33)	0.86

the quality of clinical care. There is emphasis on their role of clinical governance, although this study suggests that this is an area in which there are significant learning needs. The introduction of municipal ward-based outreach teams also relies on an orientation to the community served rather than the patient attending primary care facilities.<sup>5</sup> Such community-orientated primary care is also an area with significant learning needs for primary care doctors, although the study suggests that GPs may be more orientated towards this than MOs. Several other studies have highlighted how COPC has largely been aspirational in African health systems.<sup>10,11</sup>

In order to make a difference to clinical practice, guidelines must not only be developed but also be contextualised, disseminated and actively implemented at the local level.<sup>12</sup> Simply publishing the guideline is not sufficient to ensure implementation and few guidelines complete the whole process outlined above. The integration of individual adult guidelines into a single tool such as the PC101 guideline,<sup>13</sup> which targets both nurses and doctors in the public sector, is an opportunity for more effective and efficient guideline implementation. Given the lack of active

implementation following the publication of many guidelines it is not surprising that they appear to have had little impact on clinical practice.

The study has a number of limitations. The sample size was lower than desired, although it was sufficiently powered to still detect significant differences between MOs and GPs. The scores are self-reported and doctors may have overestimated their competency, particularly with regard to clinical skills and scope of practice. The GPs were selected from those interested in contracting with the public sector in NHI pilot districts and therefore may not be representative of all GPs. They were targeted, however, because they were actively considering their learning needs in terms of engaging with the broader primary healthcare system and therefore were motivated to complete the questionnaire. It is possible that the low scores obtained for some guidelines might reflect the resistance of primary care doctors to adopt guidelines that they consider out of date or not consistent with their practice. The fact that a clinical skill has recently been performed does not necessarily imply that the skill was performed competently and this could only be assessed by direct observation.

**Table 4:** Performance of key clinical skills by primary care doctors

Skill	All: mean score (CI)	GP's mean score (CI)	MO's mean score (CI)	p value
<b>General</b>				
Femoral vein puncture	2.95 (2.80–3.10)	2.70 (2.48–2.92)	3.21 (3.02–3.40)	<0.001
Intra-dermal injection	3.03 (2.88–3.17)	3.04 (2.85–3.23)	3.01 (2.78–3.23)	0.95
Intra-muscular injection	3.41 (3.31–3.50)	3.37 (3.24–3.50)	3.45 (3.30–3.59)	0.39
Subcutaneous injection	3.32 (3.21–3.43)	3.36 (3.22–3.50)	3.28 (3.11–3.46)	0.79
Interpret chest X ray	3.42 (3.30–3.53)	3.27 (3.10–3.45)	3.57 (3.43–3.71)	0.02
Interpret abdominal X ray	3.26 (3.13–3.38)	3.08 (2.87–3.28)	3.45 (3.30–3.59)	0.02
<b>Abdomen</b>				
Proctoscopy	1.64 (1.51–1.77)	1.7 (1.51–1.89)	1.57 (1.40–1.74)	0.46
<b>Chest</b>				
Set up, record and interpret a stress ECG	2.30 (2.15–2.45)	2.36 (2.14–2.57)	2.24 (2.03–2.44)	0.44
Set up, record and interpret a resting ECG	2.92 (2.78–3.06)	2.64 (2.45–2.83)	3.22 (3.03–3.41)	<0.001
Pleural tap	3.12 (2.99–3.26)	2.90 (2.70–3.09)	3.36 (3.19–3.53)	<0.001
Measure PEF (peak expiratory flow)	2.73 (2.59–2.87)	2.74 (2.54–2.93)	2.73 (2.52–2.93)	0.85
Nebulise a patient	3.30 (3.18–3.41)	3.14 (2.97–3.31)	3.46 (3.32–3.61)	0.01
Demonstrate use of inhalers and spacers	3.28 (3.15–3.40)	3.11 (2.93–3.29)	3.46 (3.30–3.62)	<0.001
<b>Antenatal care</b>				
Plot and interpret antenatal growth chart	2.93 (2.80–3.07)	2.91 (2.72–3.11)	2.96 (2.76–3.15)	0.76
Assess foetal movement/well-being	2.87 (2.74–3.01)	2.91 (2.73–3.10)	2.83 (2.62–3.04)	0.62
Perform an obstetric ultrasound	2.43 (2.27–2.59)	2.55 (2.32–2.79)	2.30 (2.07–2.52)	0.13
<b>Intra-partum care</b>				
Examine progress during labour, plot and interpret partogram	2.70 (2.56–2.85)	2.62 (2.42–2.82)	2.79 (2.58–3.00)	0.26
Apply and interpret CTG (cardiotocograph)	2.68 (2.52–2.83)	2.52 (2.32–2.73)	2.84 (2.62–3.06)	0.05
Normal vaginal delivery	2.66 (2.52–2.79)	2.61 (2.42–2.80)	2.70 (2.51–2.89)	0.52
Assisted vaginal delivery	2.58 (2.45–2.71)	2.56 (2.37–2.75)	2.60 (2.42–2.78)	0.76
Episiotomy and suturing	2.53 (2.40–2.66)	2.55 (2.36–2.73)	2.51 (2.32–2.69)	0.78
Repair of third-degree tear	2.29 (2.14–2.43)	2.47 (2.27–2.67)	2.08 (1.90–2.27)	0.01
<b>Post-partum/new born care</b>				
Resuscitate a newborn	2.73 (2.59–2.87)	2.71 (2.49–2.93)	2.75 (2.57–2.93)	0.80
Teach a mother Kangaroo Care	2.44 (2.28–2.59)	2.34 (2.10–2.57)	2.54 (2.33–2.75)	0.21
Well newborn check	2.71 (2.56–2.86)	2.62 (2.40–2.83)	2.82 (2.60–3.03)	0.23
<b>Women's health</b>				
Insert IUCD (intra-uterine contraceptive device)	2.14 (1.99–2.30)	2.20 (1.97–2.42)	2.08 (1.88–2.29)	0.56
Cervical smear	3.00 (2.88–3.13)	2.92 (2.75–3.01)	3.08 (2.91–3.26)	0.26
Drain a Bartholin cyst	2.68 (2.54–2.82)	2.67 (2.48–2.85)	2.70 (2.49–2.92)	0.81
<b>Paediatrics</b>				
Plot and interpret Road To Health booklet	2.88 (2.74–3.03)	2.67 (2.46–2.89)	3.11 (2.92–3.30)	<0.001
Assess child abuse: sexual/non-sexual	2.47 (2.33–2.62)	2.39 (2.18–2.59)	2.57 (2.35–2.78)	0.28
Capillary blood sampling	2.63 (2.49–2.77)	2.55 (2.35–2.75)	2.72 (2.51–2.92)	0.35
Developmental assessment	2.71 (2.57–2.85)	2.62 (2.42–2.81)	2.80 (2.60–3.01)	0.24
IV access in a child	2.96 (2.83–3.10)	2.70 (2.51–2.90)	3.25 (3.09–3.41)	<0.001
Intra-osseous line	2.47 (2.31–2.63)	2.28 (2.06–2.50)	2.67 (2.45–2.89)	0.02
<b>Surgery/general adult health</b>				
Wound care dressings	3.04 (2.91–3.17)	2.97 (2.78–3.17)	3.11 (2.93–3.28)	0.39
Suturing of laceration	3.31 (3.20–3.41)	3.21 (3.05–3.37)	3.41 (3.27–3.56)	0.10
Insert urinary catheter	3.23 (3.11–3.34)	3.08 (2.91–3.24)	3.39 (3.25–3.54)	0.01
Debride wounds and burns	2.83 (2.69–2.97)	2.86 (2.66–3.05)	2.81 (2.60–3.01)	0.69
Perform a circumcision	2.69 (2.53–2.85)	2.77 (2.56–2.99)	2.60 (2.37–2.83)	0.28
Administer a ring block	2.91 (2.77–3.05)	2.77 (2.57–2.98)	3.06 (2.87–3.25)	0.08
Administer a regional block	2.59 (2.43–2.75)	2.65 (2.42–2.88)	2.52 (2.29–2.75)	0.38
Incise and drain an abscess	3.13 (3.00–3.26)	3.04 (2.86–3.23)	3.23 (3.04–3.41)	0.17

(Continued)

Table 4: (Continued)

Skill	All: mean score (CI)	GP's mean score (CI)	MO's mean score (CI)	p value
<b>Orthopaedics</b>				
Aspirate and inject a knee	2.59 (2.44–2.74)	2.55 (2.34–2.75)	2.64 (2.42–2.86)	0.56
Inject a tennis/golfer's elbow	2.03 (1.87–2.18)	2.15 (1.92–2.38)	1.89 (1.69–2.09)	0.14
Inject into the sub-acromial space	1.93 (1.78–2.09)	2.13 (1.91–2.35)	1.73 (1.52–1.93)	0.01
Apply finger and hand splints	2.70 (2.55–2.85)	2.60 (2.39–2.80)	2.81 (2.60–3.02)	0.18
Apply POP (plaster of Paris)	2.90 (2.76–3.05)	2.76 (2.55–2.97)	3.06 (2.87–3.25)	0.07
Reduce shoulder dislocation	2.78 (2.64–2.92)	2.73 (2.52–2.94)	2.84 (2.64–3.04)	0.54
Immobilise suspected fracture for transport	2.93 (2.80–3.07)	2.82 (2.62–3.02)	3.06 (2.87–3.25)	0.10
<b>Emergencies</b>				
CPR – adult/child (cardiopulmonary resuscitation)	2.95 (2.82–3.09)	2.66 (2.46–2.85)	3.27 (3.11–3.44)	<0.001
Manage choking	2.55 (2.42–2.69)	2.49 (2.29–2.68)	2.62 (2.44–2.81)	0.37
Primary/secondary survey	2.89 (2.73–3.04)	2.85 (2.36–2.81)	3.21 (3.01–3.40)	<0.001
Intubate and manage airway appropriately (LMG or ET tube)	2.81 (2.67–2.96)	2.51 (2.30–2.72)	3.14 (2.96–3.32)	<0.001
Cricothyroidotomy	2.12 (1.98–2.25)	2.04 (1.84–2.24)	2.20 (2.03–2.37)	0.13
Administer oxygen	3.16 (3.03–3.29)	2.86 (2.67–3.06)	3.48 (3.34–3.62)	<0.001
Insert a chest drain	2.89 (2.74–3.03)	2.67 (2.46–2.87)	3.12 (2.93–3.31)	<0.001
Relieve tension pneumothorax	2.55 (2.41–2.69)	2.45 (2.24–2.66)	2.65 (2.47–2.84)	0.17
Measure GCS (Glasgow Coma Scale)	3.18 (3.05–3.31)	2.96 (2.78–3.14)	3.41 (3.24–3.58)	<0.001
Insert naso-gastric tube	3.15 (3.02–3.28)	2.97 (2.78–3.16)	3.34 (3.16–3.52)	<0.001
Immobilise the spine	2.73 (2.58–2.89)	2.51 (2.29–2.72)	2.98 (2.78–3.19)	<0.001
Certify a patient under Mental Care Act	2.79 (2.64–2.94)	2.55 (2.34–2.76)	3.06 (2.86–3.26)	<0.001
<b>Ear nose and throat</b>				
Remove foreign body from the eye	2.68 (2.53–2.82)	2.58 (2.38–2.78)	2.78 (2.57–2.99)	0.20
Remove foreign body from the ear	2.93 (2.80–3.05)	2.88 (2.70–3.05)	2.98 (2.81–3.16)	0.54
Remove foreign body from the nose	2.82 (2.69–2.95)	2.76 (2.57–2.95)	2.88 (2.69–3.07)	0.50
Manage epistaxis – pack the nose	2.96 (2.83–3.09)	2.89 (2.71–3.07)	3.03 (2.85–3.22)	0.30
Wash out the eye	2.80 (2.66–2.93)	2.68 (2.50–2.86)	2.92 (2.70–3.13)	0.09
<b>Skin</b>				
Excise sebaceous cyst	2.52 (2.37–2.68)	2.55 (2.34–2.76)	2.50 (2.26–2.73)	0.64
Cryotherapy/cauterisation	2.41 (2.26–2.56)	2.47 (2.24–2.70)	2.35 (2.14–2.56)	0.42
Trucut/punch biopsy	2.38 (2.23–2.53)	2.37 (2.14–2.60)	2.39 (2.18–2.59)	0.79
Fine-needle aspiration biopsy (FNAB)	2.77 (2.63–2.91)	2.72 (2.53–2.92)	2.82 (2.61–3.02)	0.54
<b>Forensic</b>				
Assess/manage and document sexual assault	2.53 (2.38–2.69)	2.57 (2.35–2.80)	2.49 (2.27–2.70)	0.60
Assess, manage and document drunken driving	2.53 (2.38–2.68)	2.48 (2.26–2.70)	2.58 (2.36–2.80)	0.60
<b>Clinical administration skills</b>				
Complete a J88 form	3.12 (3.00–3.23)	3.02 (2.85–3.19)	3.22 (3.07–3.37)	0.13
Complete a Death Notification Form (BI 1663)	3.08 (2.97–3.19)	2.94 (2.77–3.11)	3.24 (3.10–3.38)	0.02
Complete a WCA form (injury on duty)	2.89 (2.76–3.02)	2.86 (2.69–3.04)	2.92 (2.72–3.12)	0.57
<b>Communication and consultation skills</b>				
Patient-centred consultation	3.17 (3.06–3.28)	3.09 (2.92–3.26)	3.25 (3.11–3.39)	0.29
Brief behaviour change counselling	2.98 (2.85–3.11)	2.91 (2.72–3.10)	3.06 (2.88–3.24)	0.30
Break bad news	3.17 (3.06–3.27)	3.02 (2.85–3.18)	3.32 (3.20–3.45)	0.02
Counsel for HIV prevention or test	3.15 (3.03–3.26)	3.06 (2.89–3.24)	3.24 (3.08–3.39)	0.25
Counsel patient after sexual assault	2.60 (2.46–2.75)	2.64 (2.44–2.85)	2.56 (2.35–2.78)	0.58
Counsel patient before and after termination of pregnancy	2.49 (2.34–2.63)	2.55 (2.35–2.75)	2.41 (2.20–2.62)	0.35
Mini-mental examination	2.76 (2.63–2.89)	2.66 (2.47–2.85)	2.87 (2.70–3.04)	0.14
Use a genogram	2.21 (2.05–2.36)	2.06 (1.84–2.28)	2.37 (2.15–2.58)	0.04
Work effectively with an interpreter to overcome language barriers	2.76 (2.62–2.90)	2.65 (2.44–2.86)	2.88 (2.70–3.06)	0.17
Include family members appropriately in the consultation	3.04 (2.94–3.14)	3.02 (2.87–3.17)	3.06 (2.92–3.20)	0.72

**Table 5:** Confidence of primary care doctors to perform roles across the full scope of practice

	All: mean score (CI)	GP's mean score (CI)	MO's mean score (CI)	p value
<b>Competent clinician</b>				
Using a bio-psycho-social approach to the assessment of the patient	2.89 (2.75–3.03)	2.84 (2.63–3.05)	2.94 (2.76–3.12)	0.78
Use a systematic, stepwise approach to solve ethical or professional dilemmas	2.71 (2.58–2.85)	2.79 (2.61–2.97)	2.63 (2.43–2.83)	0.27
<b>Clinical governance</b>				
Improving the organisation of your practice, e.g. patient's access to care	2.95 (2.82–3.07)	3.06 (2.87–3.24)	2.83 (2.64–3.01)	0.07
Leading a quality improvement cycle for your team of primary care providers	2.46 (2.30–2.63)	2.59 (2.35–2.82)	2.33(2.10–2.55)	0.13
Leading a meeting to critically reflect on deaths or significant adverse events in your practice	2.40 (2.23–2.57)	2.48 (2.23–2.73)	2.32 (2.10–2.53)	0.35
<b>Critical thinker:</b>				
Critically appraising and making recommendations for the incorporation of new evidence in your primary care practice	2.47 (2.31–2.62)	2.59 (2.36–2.81)	2.33 (2.11–2.55)	0.14
Helping staff in your team to interpret and use health indicators from your facility	2.74 (2.59–2.90)	2.84 (2.61–3.06)	2.64 (2.42–2.86)	0.20
<b>Capability builder</b>				
Using referrals from clinical nurse practitioners as an opportunity to give them feedback and provide supportive education	2.96 (2.83–3.10)	3 (2.81–3.18)	2.93 (2.73–3.12)	0.61
Providing continuing professional development or training to other primary care providers	2.77 (2.61–2.92)	2.78 (2.56–3)	2.76 (2.53–2.98)	0.84
<b>Community advocate</b>				
Helping community health workers to prioritise and respond appropriately to issues discovered during home visits	2.25 (2.09–2.41)	2.36 (2.13–2.58)	2.13 (1.90–2.35)	0.17
Make sense of information on the population served by your practice and share with others in the primary health care team	2.41 (2.25–2.58)	2.59 (2.36–2.82)	2.21 (1.98–2.44)	0.02
<b>Collaborator</b>				
Working collaboratively with other people in a multi-professional health care team	3.12 (2.99–3.26)	3.09 (2.88–3.30)	3.16 (2.99–3.32)	0.87

The findings of this study can help guide the curriculum development process for the Diploma in Family Medicine, which is aimed at helping primary care doctors to re-orientate and upskill themselves.<sup>14</sup> Key implications are listed below:

- The curriculum should have enough flexibility to adapt to prior learning and focus on individual learning needs.
- Learning activities should be included that encourage the contextualisation and implementation of key guidelines in clinical practice.
- It should be ensured that the curriculum updates knowledge and skills for life support and emergency care.
- It should be ensured that GPs have the opportunity to familiarise themselves with TB management.
- It should be ensured that GPs have the opportunity to improve their interpretation of key investigations such as radiographs and ECGs.
- There should be a focus on building capability in the area of clinical governance. For example primary care doctors should be confident to initiate and facilitate quality improvement cycles, facilitate meetings to reflect on morbidity and mortality, support the supervision of PHC facilities and manage complaints. They should be able to interpret health information and research evidence and make it accessible to the team. They need skills in critical thinking and supporting reflection in the team.
- There should be a focus on building capability around community-orientated primary care. It is envisaged that doctors would support the municipal WBOTs by assisting them to make sense of information and plan responses at the level of the household or community. Critical thinking is again important to fulfil this role.

## Conclusions

Primary care doctors reported that they are aware of key national primary care guidelines, but have not implemented

many of them in their clinical practice. Doctors report that they have performed most of the required clinical skills in the last year. Doctors are confident in their roles as clinicians, capacity builders and collaborators, but less confident in their roles as clinical governors, community advocates and critical thinkers. There are a number of significant differences between the learning needs of MOs and GPs. These findings will help guide the development of new and revision of existing Diplomas in Family Medicine.

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