Reconceptualising Health Professions Education in South Africa

Consensus Study Report

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The Academy of Science of South Africa (ASSAf) was inaugurated in May 1996. It was formed in response to the need for an Academy of Science consonant with the dawn of democracy in South Africa: activist in its mission of using science and scholarship for the benefit of society, with a mandate encompassing all scholarly disciplines that use an open-minded and evidence-based approach to build knowledge. ASSAf thus adopted in its name the term 'science' in the singular as reflecting a common way of enquiring rather than an aggregation of different disciplines. Its Members are elected on the basis of a combination of two principal criteria, academic excellence and significant contributions to society.

The Parliament of South Africa passed the Academy of Science of South Africa Act (*No 67 of 2001*), which came into force on 15 May 2002. This made ASSAf the only academy of science in South Africa officially recognised by government and representing the country in the international community of science academies and elsewhere.

Reconceptualising Health Professions Education in South Africa

CONSENSUS STUDY REPORT

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FOREWORD

The Academy of Science of South Africa (ASSAf) has a mandate to provide evidence-based science advice to policymakers. This consensus report is in fulfilment of this mandate.

The training of healthcare professionals is a topic that impacts on us all. The findings and recommendations of this study are thus likely to be of interest to a wide-ranging audience, over and above policymakers and educators. The challenges facing the health education sector are enormous and are deeply embedded in our inequitable society. How we train our healthcare professionals to address these challenges is the topic under scrutiny in this report.

The ten-member consensus study panel, under the leadership of Prof Jimmy Volmink, is to be commended on their diligence and on vast amount of evidence that they have amassed to inform the recommendations, both pedagogic and systemic, that they have made. This report is a product of their volunteer commitment and I thank them for their dedication to the task and look forward to the debates that will ensue following the release of the report.

I thank all those who were involved in the preparation and production of this report, particularly the Academy staff who supported the panel in their work.

Professor Jonathan Jansen
President: Academy of Science of South Africa

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This report is the joint work of a ten-member study panel appointed by the Council of the Academy of Science of South Africa (ASSAf). Each panellist has agreed to the specific formulation of the report and to its conclusions and recommendations. I thank them all for their inputs and robust discussions during the course of this study.

The study panel members were: Prof Jimmy Volmink, Chairperson (Stellenbosch University), Prof Judith Bruce (University of the Witwatersrand), Prof Henry de Holanda Campos (Federal University of Ceara, Brazil), Prof Jan de Maeseneer (University of Gent, Belgium), Prof Sabiha Essack (University of KwaZulu-Natal), Prof Lionel Green-Thompson (University of the Witwatersrand), Prof Khaya Mfenyana (Walter Sisulu University), Prof Steve Reid (University of Cape Town), Prof Ben van Heerden (Stellenbosch University) and Dr Gustaaf Wolvaardt (Foundation for Professional Development).

The report was reviewed by three external reviewers: Prof Susan van Schalkwyk (South Africa) from Stellenbosch University; Dr Elsie Kiguli-Malwadde (Uganda) from the African Centre for Global Health and Social Transformation (ACHEST); and Dr Charles Boelen (France) who is the former Co-ordinator of the World Health Organisation Programme on Human Resources for Health. Their valuable inputs and critique have enriched the report.

Various researchers have contributed to the report through written submissions. Ms Michelle Galloway is thanked for overall editing, writing and literature searches. Others who have contributed and who are thanked include: Prof Juanita Bezuidenhout, Dr Mark Blecher, Prof Julia Blitz, Dr Terence Carter, Prof Ian Couper, Mr Saul Kornick, Ms Nokwazi Makanya, Dr Reno Morar, Dr Penny Orton, Prof Di Parker, Ms Elizabeth Pienaar, Dr Nandi Siegfried, Prof Ted Sommerville, Dr Stefanus Snyman, Mr Werner Swanepoel and Ms Mariette Volschenk.

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The panel met eight times between April 2014 and September 2016; they also held two consultative workshops on 31 July 2015 and on 12 September 2015 (as part of the South African Association of Health Educationalists (SAAHE) Conference), as

part of their information-gathering process. Speakers and facilitators at the 31 July 2015 Workshop were: Dr Stefanus Snyman, Dr Prinitha Pillay, Dr Margaret Matthews and Mr Vernon Solomon, who are acknowledged for their valuable contribution. Ms Heather Erasmus of Write Connection was the scribe at the SAAHE workshop and is acknowledged for her contribution.

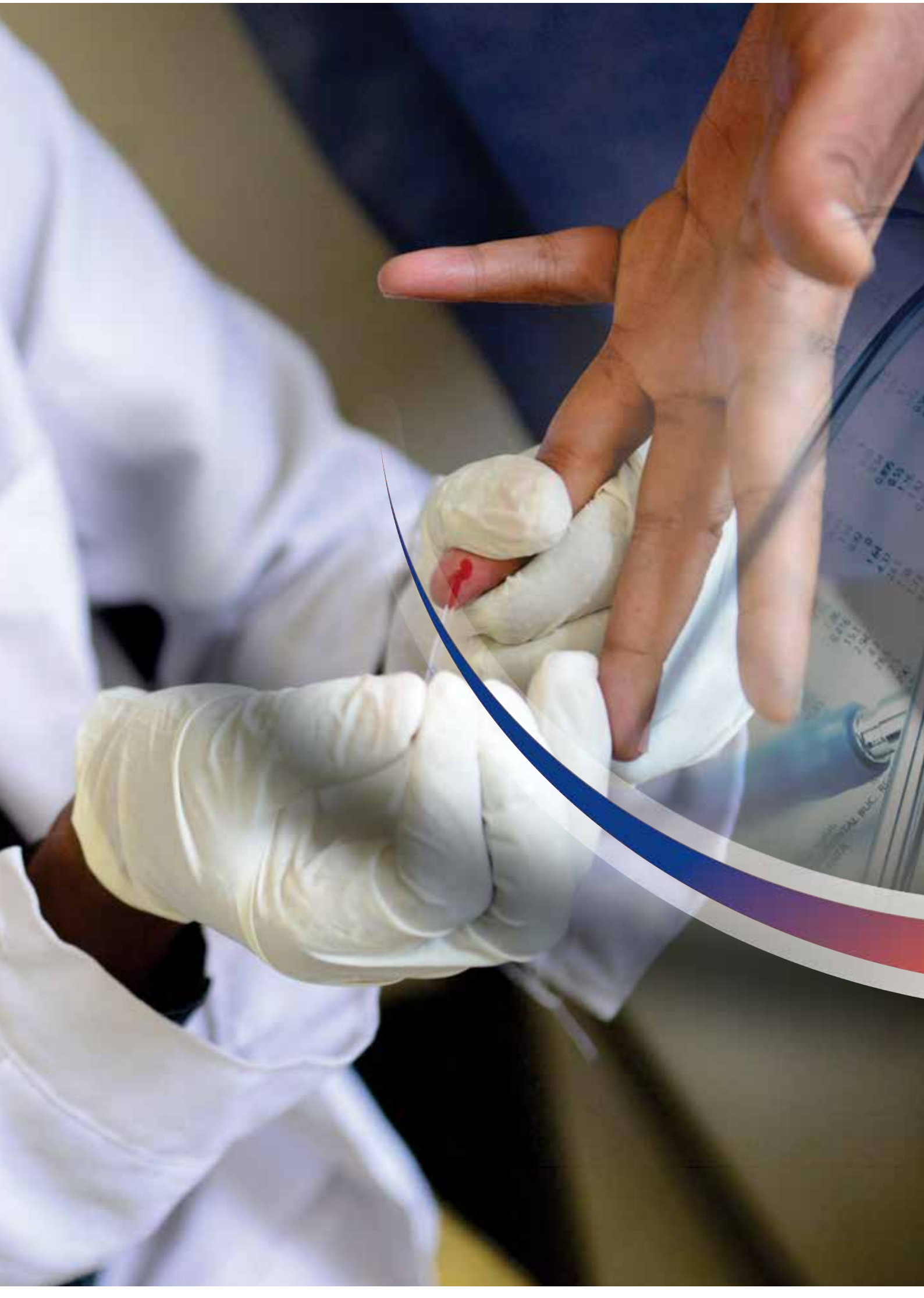
Professor Jimmy Volmink
Panel Chairperson

ACRONYMS

AAMC	Association of American Medical Colleges
ACGME	Accreditation Council for Graduate Medical Education
ACLS	Advanced Cardiovascular Life Support
AfIN	Africa Inter-professional Education and Collaborative Practice Network
APLS	Advanced Paediatric Life Support
ASSAf	Academy of Science of South Africa
ATLS	Advanced Trauma Life Support
BEME	Best Evidence Medical Education Collaborative
BOD	Burden of disease
BRICS	Brazil, Russia, India, China and South Africa
CanMEDS	Competency Framework of the College of Physicians and Surgeons of Canada
CBE	Competency-based education
CBME	Competency-based medical education
CCF	Country Coordination and Facilitation
CCFOs	Critical cross-field outcomes
CHE	Council on Higher Education
CHEER	Collaboration for Health Equity in Education and Research
CHW	Community health worker
CIHC	Canadian Inter-professional Health Collaborative
CMD	Committee of Medical Deans
COPC	Community-orientated primary care
CPI	Consumer price index
CPD	Continuing professional development
CPU	Conceptualisation – Production – Utilisation
CS	Community service
CSI	Corporate social investment
CSO	Community service officer
CTG	Clinical training grant
DCST	District Clinical Specialist Teams
DoH	Department of Health
DHET	Department of Higher Education and Training
DPME	Department of Planning, Monitoring and Evaluation
ECFMG	Educational Commission for Foreign Medical Graduates
EMS	Emergency medical services
EOF	Education Outcomes Framework (UK)
EPA	Entrustable Professional Activities
ESMOE	Essential Steps in the Management of Obstetrics Emergencies
FAIMER	Foundation for the Advancement of International Medical Education Research
FAS	Facility Accreditation System
FD	Faculty development
FET	Further education and training Institutions
FTE	Full-time equivalent

FUNDISA	Forum of University Nursing Deans of South Africa
GE	Graduate entry programmes
GHEC	Global Health Education Consortium
GPA	Grade point average
GDP	Gross domestic product
HC	Healthcare
HCE	Healthcare education
HCP	Healthcare professional
HDI	Historically disadvantaged institutions
HE	Health education
HEI	Health education institution
HEQF	Higher Education Qualification Framework
HIV/TB	Human immunodeficiency virus/tuberculosis
HOD	Heads of department
HPCSA	Health Professions Council of South Africa
HPE	Health professional education
HPSA	Health professional shortage areas
HPTDG	Health professional training and development grant
HRH	Human resources for health
HSE	Health sciences education
HSRC	Human Sciences Research Council
HSWETA	Health and Welfare Sector Education and Training Authority
ICAR	Inter-professional Collaborator Assessment Rubric
ICF	International Classification of Functioning, Disability and Health
ICT	Information and communications technology
I&E	Infrastructure and efficiency
IEPS	Interdisciplinary Education Perception Scale
IP	Inter-professional
IPC	Inter-professional collaboration
IPCP	Inter-professional collaborative practice
IPE	Inter-professional education
IPECP	Inter-professional education and collaborative practice
IPECEP	Inter-professional Education Collaborative Expert Panel
IPL	Inter-professional learning
ISHP	Integrated School Health Programme
JHSEC	Joint Health Science Education Committee
KIMEE	Korean Institute of Medical Education and Evaluation
LIC	Longitudinal integrated clerkships
MAAP	Minority Academic Advising Programme (Georgia, USA)
MTE	Medium-Term Expenditure
MRC	Medical Research Council
NBD	National burden of disease
NBT	National benchmark test
NDOH	National Department of Health
NDOH HRH	National Department of Health Human Resources for Health Strategy
NDP	National Development Plan
NEI	Nursing education institutions
NGO	Non-governmental organisation
NHI	National Health Insurance

NHS	National Health Service UK
NMU	Nelson Mandela University
NQF	National Qualification Framework
NSC	National senior certificate
NSFAS	National Student Financial Aid Scheme
NTSG	National tertiary services grant
OBE	Outcomes-based education
OSCE	Objective-structured clinical exams
OT	Occupational therapist
PA	Pharmacy assistant
PBL	Problem-based learning
PGVT	Postgraduate vocational training
PHC	Primary healthcare
PHEF	Public Health Enhancement Fund
PHEI	Private higher education institutions
PHS	Primary health services
PPP	Public-private partnership
PSSA	Pharmaceutical Society of South Africa
RCN	UK Royal College of Nurses
RIPLS	Readiness for Inter-professional Learning Scale
RN	Registered nurse
SAAHE	South African Association of Health Educationalists
SACP	South African Pharmacy Council
SADHS	South African Demographic and Health Surveys
SAFRI	Sub-Saharan Africa-FAIMER Regional Institute
SAMDC	South African Medical and Dental Council
SANC	South African Nursing Council
SANDP	South African National Development Plan
SAQA	South African Qualifications Authority
StatsSA	Statistics South Africa
SSMSS	Sub-Sahara Medical School Survey
SURMEPI	Stellenbosch University Rural Medical Education Partnership Initiative
TVET	Technical and vocational education and training colleges
UBC	University of British Columbia
UL	University of Limpopo
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WBA	Work-based assessments
WBPHCOTs	Ward-based primary healthcare outreach teams
WHO	World Health Organisation
WHO HRH	World Health Organisation Human Resources for Health Taskforce Strategy
WIRHE	Wits Institute for Rural Health Education
WISN	Workplace indicators of staffing need



EXECUTIVE SUMMARY

South Africa's quadruple burden of disease, shortage of trained health personnel, particularly in under-resourced and rural areas, and the ongoing higher education crisis places unique challenges on the health sciences education (HSE) sector. The goal of health professional education (HPE) is to produce a cadre of well-trained and appropriately skilled health workers at all levels of the healthcare system who are able to work together effectively to ensure universal healthcare coverage and advance health for all. Globally, HPE is changing dramatically in keeping with changing patient demands, healthcare systems and technologies.

This report reflects the consensus of a study panel, working under the auspices of the Academy of Science of South Africa (ASSAf), who were tasked with assessing HPE in South Africa with a view to providing evidence-based advice to decision-makers on how HPE might be transformed to improve the health of the nation. The report aims to address the full value chain in health sciences education from student selection, through pedagogical developments, unpacking of the current bottlenecks in the system and looking at how the future health sciences education system can be financed and regulated.

The introduction chapter places the uniquely South African and African challenges within the context of global developments before describing the project brief and study methodology.

Chapter 2 explains and outlines the conceptual framework used to guide the panel's deliberations. A cyclical process is envisaged, where population health and wellness needs determine the required health services which define the healthcare professional (HCP) skills mix and, in turn, drive the educational content, processes and outcomes. Embedded within this is the triangle of quantity, quality and relevance which is subject to iterative monitoring and evaluation within an overarching, collaborative leadership and governance mechanism.

Chapter 3 examines the topic of student selection and aims to identify the criteria that best predict student retention and success. While prior academic achievement appears to be the best indicator of success for both advantaged and disadvantaged students, clinical competency is not predicted purely by previous academic performance. There is a need to reconceptualise student selection with the aim of evaluating a broader set of criteria than those currently in use. This chapter also identifies barriers to selection and success requiring particular attention in the South African context. The panel recommends that universities conduct rigorous research to determine which selection criteria and support measures best correlate with student success and the attainment of desired graduate competencies in the South African setting. This is needed to inform and promote evidence-based interventions mostly likely to advance equity of student access and outcome.

Chapter 4 puts some figures to the crisis facing South Africa in terms of production and retention of skilled health workers and explores the best options for scaling up the

health workforce in the medium to long term. There is a need for improved human resources planning supported by a regulatory environment that tracks and reports on key indicators. The ability of public-sector academic institutions to scale up the production of HCPs needs to be strengthened by ensuring adequate infrastructure; expanding the clinical training platform; providing adequate numbers of clinical supervisors and teachers; and, funding operational costs related to training and efforts to support academic careers. Overall, production capacity should be increased by optimising the role of both public and private sectors and introducing international scholarship programmes.

Greater use of information and communications technology (ICT) to augment tuition can help facilitate increased production and reduce costs. ICT is particularly useful for supporting decentralised training and efforts to shift training to rural and underserved communities. The panel also recommends that strategies to improve retention during studies should be incorporated into all health-sector academic institutions as part of accreditation requirements within a policy environment that tracks retention rates and incentivises institutions to improve such rates. Higher education institutions (HEIs) should, furthermore, partner with health departments to provide professional support to HCPs, especially those working in rural or underserved areas, to reduce attrition.

Chapter 5 takes a more in-depth look at the challenges facing HCPs in rural and underserved areas. It aims to unpack and understand the factors likely to influence graduates to work and remain in rural communities. The panel believes that training should be orientated towards addressing inequity and meeting the needs of the most underserved, through supporting a primary care focus and increasing the supply of health professionals to rural areas. In their student-selection policies, HEIs should prioritise applicants from rural and remote areas who meet the minimum academic criteria, to address the urban-rural maldistribution of graduates. Faculties should also explore local adaptations of various models of rural education, with a stipulated minimum clinical time spent in rural areas for each curriculum. Whatever model is chosen, it should be accompanied by an implementation plan that builds on the strengths of rural medical education approaches while overcoming the challenges of training students in remote locations. Community members, health practitioners and other relevant service providers in rural and underserved settings must be trained and developed as the key teachers of students in these areas. Community-oriented primary care is recommended as a strategy for service and learning, as this approach meets all stakeholders' needs in underserved rural and urban settings. As evidence of their social accountability, health science faculties must demonstrate the impact they have on service delivery through the distribution of their graduates and the extent to which they are supporting primary healthcare in rural and underserved areas after completion of community service.

Chapters 6 to 8 investigate in more detail the changing demands on healthcare workers and how the education/academic system needs to adapt to produce the type of future HCP needed.

Chapter 6 looks at inter-professional education and collaborative practice (IPECP) outlining the key components of such a strategy; why it is a transformative

approach; the barriers and challenges; providing innovative ideas to empower role models through faculty development and capacity building in the service-delivery sector; and, exploring ways to ensure the sustainability of IPECP in South Africa. IPECP presents great potential for transformative learning and health-system transformation, and for improving health outcomes and the cost of healthcare. It also facilitates health equity and universal access by addressing the challenges posed by shortages of human resources.

To enable IPECP to become sustainably embedded in HPE in South Africa, the panel recommends the formation of a multi-stakeholder, national working group to develop and guide implementation of a strategic plan for IPECP. The plan should include a detailed stakeholder analysis and stakeholder engagement to ensure buy-in. It should also delineate an IPECP competency framework and an inter-professional education (IPE) curriculum, based on this competency framework, for undergraduate, postgraduate and continuous professional education of HCPs. The curriculum should provide comprehensive guidance to educators and students on teaching and learning activities to ensure that the required competencies are reached, as well as a detailed assessment strategy. It will have to take cognisance of the need for IPE to be integrated into existing curricula and modules on a continuum from early exposure to other professions through to collaborative practice in teams in the practice setting. It should also be easily adaptable to changing population needs. There should, furthermore, be a plan for ensuring the required educational capacity development of educators and service providers involved in the integration and implementation of IPE curricula. Other areas requiring attention are research to ensure that the implementation of IPECP in South Africa is based on evidence and will achieve impact; and the removal of instructional and institutional barriers.

Chapter 7 discusses the core competencies required for different categories of HCPs in the South African context and what pedagogical approaches would best facilitate acquisition of these competencies. An IPECP strategy should inform competency development. The panel recommends a hybrid competency-based education model that emphasises the process of learning and the achievement of learning outcomes. Transformation of learning among HCPs will require a meaningful combination of teaching, learning and assessment approaches.

Chapter 8, which discusses faculty development, introduces the concept of relationship-centred teaching and learning as fundamental to the achievement of transformative HPE. This is particularly important for IPEPC which depends on cooperation and consensus among educators from different professional backgrounds. The panel recommends an approach to faculty development which contributes to health professions educators becoming more responsive to their internal learning community, as well as to the community beyond the institution. This comprises a progressive process including: a supportive institutional climate which values teaching, recruitment and integration of faculty; competency for change agency; transformative educational strategies; adaptive education communities; and scholarship and reflection.

Chapter 9 shifts the focus to the transition from university to employment. It examines the internship and community-service obligations and explores options for transforming this part of HCP training to enhance health and educational outcomes. The panel recommends an approach in which universities take responsibility for education and professional development from undergraduate years through to internship and community service (CS). It concludes that this is likely to improve the alignment of undergraduate education and health-system outcomes through skills development, promotion of advocacy and collaboration. It suggests that medical internship be renamed 'Postgraduate Years 1 & 2' which would signal a shift from the mindset of interns as the lowest level of medical worker to the active development of young professionals better prepared for the public health service. Accordingly, community service could be renamed 'Postgraduate Year 3' and active support provided for preparation for specialty training. There needs to be greater grounding and support in primary and community-oriented care for interns and CS doctors to be able to tackle the broader challenges of healthcare in a given district, as opposed to being exclusively hospital-based. It is further recommended that earlier differentiation of postgraduates into specialties be considered, as the current nine years is long for the production of a generalist doctor.

Chapter 10 discusses the current financial costing of health sciences education in the country and how existing and potential new streams, government bodies and departments and institutional linkages can be enhanced. It is the view of the panel that transformation of HPE, as envisaged in this report, will be difficult to achieve in the absence of transformative funding arrangements.

Longstanding shortcomings in planning, organising and financing of health sciences education in South Africa are related to difficulties in aligning the interests of key stakeholders. There is a need for a coordinated, long-term analysis of human resource needs and an agreed plan by discipline for expansion of supply in the short, medium and long term. A more rational, systemic and integrated approach to demand and supply-side planning, with regular costing, better alignment of incentives and improved performance management, should be adopted. Strengthening governance structures at national and provincial level, and building a joint vision is the critical first step to ensure that detailed costing and planning activities produce their intended benefit. The establishment of the Joint Health Sciences Education Committee (JHSEC) was an important step towards joint planning. However, the approach to date has been uncoordinated and urgent action is required to strengthen the capacity and accelerate the momentum of the JHSEC. This needs to occur along with the ability to commission investigations, establish sub-committees and make recommendations to relevant Ministers. JHSEC needs to draw on deans of HEIs and provincial heads of department. It also needs to facilitate a framework for provincial committees that can undertake negotiations around issues such as joint agreements and training plans, and, where necessary, play a role in adjudicating disputes. The JHSEC membership needs to be strengthened to enhance governance and coordination. If the appropriate governance structures are in place and strong, the necessary planning and costing studies, and other investigations such as on the design of joint agreements would be facilitated.

At the institutional level, provinces have assumed responsibility and authority over health institutions, such as hospitals, and have generally moved to distance HEIs from this function. However, given the centrality of skills development in South Africa, the joint nature of the service-teaching-research platform and severe quality problems in many parts of the public health sector, strong consideration should be given to reviving the concept of the academic health-sciences complex with a joint governing board. This model, if properly supported, has the potential to radically improve skills development, institutional governance and quality, and could form a basis for strengthening alignment of interests and more effective service delivery, as well as health sciences education. The model also has relevance in the context of greater institutional decentralisation required for the purchaser-provider split under the proposed National Health Insurance.

In conclusion, this report provides a consensus view on transformative efforts needed with respect to the education and training of HCPs in South Africa to consolidate current and enhance new efforts to address the severe quantitative and qualitative shortfall in the health workforce and improve health. In fulfilling its brief the panel examined the most relevant and reliable evidence, where available, with the goal of making evidence-based recommendations that are appropriate and feasible in our setting. The panel hopes it will encourage ongoing debate and discussion on this vital topic.

CHAPTER 1

Introduction

1.1 Global context

Almost 70 years since the signing of the Universal Declaration of Human Rights, improving the health and well-being of populations, reducing health inequities and ensuring people-centred health systems persist around the globe (WHO Regional Office for Europe, 2014). The World Health Organisation (WHO) states that these "inequities in health are widespread, persistent, unnecessary and unjust, and tackling them should be a high priority at all levels of governance" (Marmot and WHO, 2013; WHO Regional Office for Europe, 2014).

The global health environment is constantly evolving due to changing disease patterns and profiles; new threats to health and security; health inequities within and between countries; shifting population demographics; developments in information communication and technology (ICT); and, peoples' changing understanding of their healthcare needs.

Meanwhile, healthcare provision has become more diversified and is being delivered in a broad range of settings focusing not only on individuals but also on communities and society. As a consequence of a constantly changing environment, the roles of healthcare professionals (HCPs) are rapidly evolving. It follows that the relationships between HCPs and patients, peers, healthcare teams, employers, health systems and professional regulators are also changing or may need to change. The rapid expansion of knowledge, and, in particular, the greater accessibility to evidence, will redefine how HCPs interact with patients and communities, challenging traditional views of professionalism. All of this points to major changes in the type of training required for HCPs at undergraduate and postgraduate levels through to continuing professional education.

Compounding the problem is the global crisis in human resources for health. As far back as 2006, the WHO identified a shortage of 4.3 million trained health workers and pointed out that traditional approaches to solving the challenge would no longer work (WHO, 2006). It is important to keep in mind, however, that improving health and well-being requires involvement of a wide range of sectors and stakeholders starting with the government and the healthcare system and continuing all the way downstream to individual practitioners and individuals seeking healthcare.

One of the most important components of this chain is the education sector which produces successive generations of HCPs. Understanding the needs and adaptations required in this sector to meet the changing health demands is the main focus of this report.

The Lancet Commission report on the future of HPE, to which the study panel has constantly referred during the course of its work, is one of the most influential

documents to have emerged in recent years (Frenk *et al.*, 2010). Twenty academic leaders reviewed the state of health professional education (HPE) with a view to formulating a shared vision and common strategy for transformation. The group highlighted some glaring problems facing HPE noting "By the beginning of the 21st century, however, all is not well. Glaring gaps and inequities exist both within and between countries, underscoring our collective failure to share the collective health advances equitably. At the same time fresh health challenges loom. New infectious, environmental, and behavioural risks at a time of rapid demographic and epidemiological transitions, threaten health security of all. Health systems worldwide are struggling to keep up, as they become more complex and costly, placing additional demands on health workers. Professional education has not kept pace with these challenges, largely because of fragmented, outdated, and static curricula that produce ill-equipped graduates" (Frenk *et al.*, 2010: 1923).

The report goes on to list the problems with "mismatch of competencies to patient and population needs" topping the list. Also highlighted are poor teamwork, persistence of gender stratifications, a narrow technical focus without contextual understanding, too much focus on hospital *versus* community-based care, professional 'tribalism', episodic rather than continuous care, imbalances in the labour market and lack of leadership (Frenk *et al.*, 2010).To achieve better health outcomes, HCPs need different competencies and "the professional education subsystem must design new instructional and institutional strategies" (Frenk *et al.*, 2010: 1923).

The Commission highlighted three generations of reform in the past century – starting with the first at the start of the 20th century which focused on science-based reform and a science-based curriculum; to around mid-century when the second wave of reform introduced problem-based instructional innovations; and, to the third generation which focuses on social accountability, the use of global knowledge and improvement in the performance of health systems through adapting core professional competencies to specific contexts. "The ultimate purpose is to assure universal coverage of the high-quality comprehensive services that are essential to advance opportunity for health equity within and between countries" (Frenk *et al.*, 2010: 1924).

"Realisation of this vision will require a series of instructional and institutional reforms, which should be guided by two proposed outcomes: transformative learning and interdependence in education. We regard transformative learning as the highest of three successive levels, moving from informative to formative to transformative learning. Informative learning is about acquiring knowledge and skills; its purpose is to produce experts. Formative learning is about socialising students around values; its purpose is to produce professionals. Transformative learning is about developing leadership attributes; its purpose is to produce enlightened change agents" (Frenk *et al.*, 2010: 1924).

The report highlights two key approaches to achieve equity, namely patient-centredness and integrated community-based care. To enable these approaches, HPE and health systems need to be transformed (Fig. 1.1).

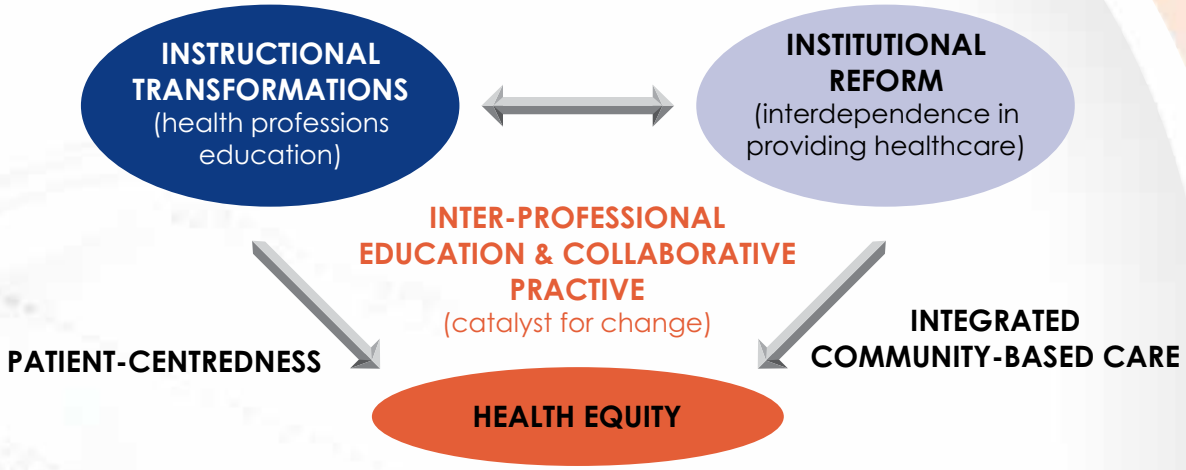


Figure 1.1 Pathway to health equity (Adapted from Frenk *et al.*, 2010)

One of the key conclusions of the Commission is the role of inter-professional education and collaborative practice (IPECP) as a catalyst for change in healthcare in the 21st century (Frenk *et al.*, 2010; WHO, 2010).

There is no question that delivering high-quality, effective healthcare that meets the changing needs of individuals and communities is dependent on training that develops both the right skills and appropriate values. This sentiment is reflected in the *Government Mandate to Health Education* report of the UK Department of Health: "Investment in our NHS workforce will therefore need to reflect the changing needs of patients, carers, and the local community with healthcare and public health providers taking greater responsibility and accountability for the training, skills and competencies of the workforce they employ. There is a responsibility on healthcare providers to deliver high-quality education and training not just for their students, but for all their staff in order to ensure high quality and safe patient care." (UK DoH, 2013: 3) The emphasis is on ensuring that education reflects service needs – in other words 'fit for purpose graduates' but also includes training the trainers and the ongoing development of the existing health workforce. It highlights two overarching themes:

a Partnership working to ensure that education is closely linked to service needs, health improvement and protection.

b Ensuring that education delivery reflects the multi-disciplinary delivery of healthcare services and public health (UK DoH, 2013: 17).

In 2013, WHO produced guidelines for transforming and scaling up health professionals' education and training, drawing on the findings and recommendations of the Lancet Commission report. The WHO vision for transformative education includes the following components:

a Greater alignment between educational institutions and health systems delivery.

b Country ownership of priorities and programming related to the education of HCPs with political commitment and partnerships to facilitate reform at national, regional and local levels.

c Promotion of social accountability and close collaboration with communities.

d Clinicians and public health workers who are competent and provide the highest quality of care for individuals and communities (WHO, 2013).

1.2 South African context

South Africa is ranked as one of the most unequal countries in the world. Persisting disparities in health, driven largely by social and economic factors, highlight the shortcomings of a reactive, biomedical approach to healthcare, centred on non-sustainable uni-professional or hierarchical multi-professional paradigms of care (Bradshaw, 2008; Lazarus *et al.*, 1998).

The South African National Development Plan (NDP) – 2030, published in 2011, has as its overall aim the elimination of poverty and reduction of inequality by 2030 which includes the provision of universal healthcare. The plan emphasises primary healthcare (PHC) and a patient-centred approach. "Health stakeholders are called on to collaborate with each other and with government, to be open to new ways of doing things, and to put patients first" (NDP, 2011: 330). The plan acknowledges that despite good policies and relatively high spending on healthcare, the performance of the healthcare system has been poor. Inconsistent management and lack of capacity are highlighted as major reasons.

The report outlines extensive goals for the health system including Goal 7: Primary healthcare teams provide care to families and communities; Goal 8: Universal healthcare coverage; and, Goal 9: Fill posts with skilled, committed and competent individuals, which speaks to training of HCPs to meet the requirements of a reinvigorated primary care system linked to the future disease burden (in particular non-communicable diseases). "A core component of re-engineering primary healthcare is to emphasise population-based health and health outcomes" (NPC, 2011: 345). The plan prioritises the strengthening of the health system and improving human resources and emphasises the increased use of community health workers, appropriately skilled nurses, family physicians linked to specialist support teams with training in medicine, surgery, including anaesthetics, obstetrics, paediatrics and psychiatry. It includes increased investment in health personnel development and equipping health professionals to lead intersectoral action.

1.2.1 Shortage of health professionals

Burch *et al.* (2011) and the Department of Health's *(DoH) Human Resources for Health (HRH) 2030 Draft Plan* (DoH, 2011) highlight the overall shortage of health workers (doctors in particular), maldistribution between the public and private sectors, drastic shortages in rural areas and emigration of trained health personnel. The *HRH Plan* also emphasises that the challenges to the health system arise not only from declining numbers of health practitioners, particularly in less-resourced areas but also from problems in human resource planning and management. "The general consensus is that the failure of health services to deliver is due to constraints and bottlenecks in human resources" (DoH, 2011: 18). The document similarly points to organisational and management arrangements as a constraint to education and training.

Breier *et al.* (2009) particularly highlight the shortage of nurses, the largest single category of health professionals who "are bearing the brunt of public healthcare" (p. 12) but whose training has been neglected due to the closure of public nursing colleges and the mushrooming of private-sector nursing colleges offering training of variable quality. They also point to the challenges of an increasing emphasis on university nursing degrees (which might be out of reach financially for many potential nurses), low salaries, fear of contracting HIV and a general perception of declining standards in healthcare provision as some reasons for high attrition rates.

Given the critical shortages in HCPs, logic would dictate that national policies and practice would be geared to optimising HCP production, retention and supplementation. However, production of doctors has largely been stagnant since the mid-1970s, when the population was half its current level. This situation is now receiving attention through a concerted drive that includes; establishing new medical schools, increasing the output of the existing medical schools and increasing the number of South African students sent to Cuba to study medicine. However, the private sector's potential to contribute to increased production remains muted, HCP retention receives limited attention and the regulatory environment makes supplementation from abroad complicated.

1.2.2 Collaboration between health and education sectors

DoH has recognised that education and training has not kept pace with health needs and system requirements. The *Human Resources for Health Strategy* (DoH, 2011) points to a lack of planning between the health and education sectors and inadequate funding for HCP development. The strategy acknowledges that the transformative role of the education sector in health system development requires "top level leadership commitment which DoH is now prioritising" (p. 40). The plan points to the problems of retrenchment and freezing of posts; limited growth in specialist and allied worker training; and, differing quality of graduates. Strategies to be adopted include: involving education and training stakeholders in planning and prioritisation processes for health professional development; and that faculties should plan curricula integrated into the re-engineered PHC model, that meet the burden of disease and incorporate team training and IPE. They highlight the need to standardise the quality of clinical training and develop twinning arrangements (local and international) to build capacity.

1.3 Recent developments

Equipping students and health workers with the necessary competencies to render patient-centred care and contribute to healthcare reform is already receiving significant attention in South Africa. However, this momentum will need to be sustained and advanced through bold political and professional leadership in the future.

In the *White Paper for the Transformation of the Health System in South Africa*, the role of health professions training institutions is stipulated as ensuring the delivery of "appropriate, multi-disciplinary community-problem and outcome-based education programmes . . . to support and enhance the PHC approach" (RSA, 1997). Furthermore, government has embarked on a process of re-engineering PHC,

focusing on community-orientation, community participation and community-based education (Kinkel *et al.*, 2013; Lazarus *et al.*, 1998; RSA, 2015).

The refocus on PHC and community engagement has served as a catalyst for offering new training programmes aimed at supplementing traditional healthcare approaches. With the emergence of community health workers, clinical associates and assistants in pharmacy, rehabilitation, counselling and nursing has come the need to re-examine professional identities and explore opportunities for task shifting and task sharing. The recognition of traditional healers has added another important element to this discourse (RSA, 2007). These developments have already spurred a number of changes in HPE programmes including problem-based learning, IPE, community-based education and service-learning.

The Lancet Commission report was seen as a game-changer for IPE in South Africa. This has been supplemented by the *Global Consensus for Social Accountability of Medical Schools* (Boelen, 2010) as well as THENet's Social Accountability Evaluation Framework (THENet, 2011), and reinforced by the WHO's Framework for Action on *Inter-professional Education and Collaborative Practice* (WHO, 2010). These reports led to a series of workshops by the Undergraduate Education and Training Subcommittee of the Medical and Dental Professions Board of the Health Professions Council of South Africa (HPCSA) to determine how to implement the report recommendations. Discussions focused on competency-driven instructional design, the ability of graduates to work optimally in inter-professional and trans-professional teams and graduates from various professions sharing tasks, where needed and appropriate (Van Heerden, 2013). Subsequently, an adapted Royal College of Physicians and Surgeons of Canada 2015 Milestones Guide (CanMEDS) Competency Framework was accepted for the training of medical doctors, dentists and clinical associates (physician assistants) (Frank, 2005; HPCSA, 2014).

Currently IPE strategies are being reassessed, developed and implemented with impetus from the South African Association of Health Educationalists (SAAHE). During the SAAHE's 2013 annual congress delegates identified ASSAf as a potential key role player in facilitating the advancement of IPE, especially as this requires overcoming barriers at both institutional and instructional levels.

Additionally, in 2014 the University of KwaZulu-Natal organised a symposium, Towards Inter-professional Education and Collaborative Practice in South Africa, gathering representatives from professional councils and training institutions. A declaration emerged acknowledging that IPECP can result in better health outcomes and strengthened health systems. Participants committed themselves to forming a national community of practice which will:

a Advocate for inclusion of inter-professional collaborative practice (IPCP) into scopes of practice and exit-level outcomes by all professional councils.

b Advocate for integration of IPE in HCP curricula at universities.

c Advocate for cultivating IPECP competencies among faculty, preceptors and service providers.

d Identify best practice IPECP models and share resources to adapt such models to the local context.

e Participate in international networks informing best-practice models.

f Utilise networks to create awareness of IPECP.

g Mobilise relevant stakeholders in health, social and educational sectors.

h Conduct collaborative research to inform IPECP in Africa.

1.4 Study information

With the foregoing challenges, uncertainties and national developments as the backdrop, ASSAf initiated a consensus study in 2014 entitled: *Reconceptualising Education and Training of an Appropriate Health Workforce for the Improved Health of the Nation.*

1.4.1 Problem statement

South Africa continues to experience a significant burden of disease which is largely carried by a public health system marked by inadequate resources – both human and material. To address the current challenges, government has proposed a National Health Insurance (NHI) scheme as a funding model to support improvements in service delivery and provide access to appropriate healthcare for all. At this time, there is no unifying framework for the collaborative development, innovation and sustainability of the education and training of HCPs to support efforts to improve the health system. There is therefore a need for a consensus view on the education and training of HCPs and other healthcare workers in South Africa in order to consolidate current efforts and enhance new efforts to address health service and system challenges.

1.4.2 Project brief

The brief of this study panel appointed by the ASSAf Council was to examine the most relevant and reliable evidence relating to the questions listed below, and to make evidence-based recommendations that are appropriate and feasible.

The consensus study aimed to:

a Reflect on the mix of personnel and the skills required to address the continuum of care from health promotion and prevention to therapeutic and curative care to rehabilitation and palliative care, specifically:

- How does one develop HCPs who are responsive to the needs of the communities in which they work?
- What types of personnel would advance equity in healthcare delivery?

b Adopt a statement of the broad competencies which HCPs should acquire through their education and training, with reference to the core competency framework for health professions training that was developed

by the Medical and Dental Professions Board, based on the CanMEDS 2005 core competency framework, specifically:

- What are the key competencies necessary to promote health and address the disease burden of the nation in a comprehensive manner?
- What graduate attributes including but not limited to health advocacy and leadership development would best serve the priority health needs of South African communities?

c Develop an appropriate health science education model for the continuum of education from further education and training through undergraduate and postgraduate education through to the maintenance of professional competence encompassing the development of educators, students and appropriate curricula, specifically:

- Engender the requisite competencies with respect to, *inter alia*, content, pedagogy, assessment, the teaching and learning process, the people (teachers, trainers, students) and places of learning (classroom, health facility and community training platform).
- Address equity of access to education and training which translates to equity of outcome, i.e. access for success.

d Confirm the benefits of the inter-professional team in the delivery of good health.

- Promote a multi-disciplinary approach to healthcare in training and practice.

e Propose an adaptable and flexible approach to the accreditation and regulatory framework for health professionals education and training.

- Identify and harness synergies between regulatory and statutory mandates of the Department of Higher Education and Training (DHET), the DoH and professional councils and boards, specifically related to quality assurance, accreditation and compliance with the Higher Education Qualifications Framework (HEQF).

The study was undertaken by a panel appointed by the ASSAf Council. The panel members are listed in Table 1.1 and their biographies are given in Appendix 1.

Table 1.1: List of panel members

Name	Affiliation
Prof Jimmy Volmink (Chairperson)	Stellenbosch University
Prof Judith Bruce	University of the Witwatersrand
Prof Sabiha Essack	University of Kwa-ZuluNatal
Prof Lionel Green-Thompson	University of the Witwatersrand
Prof Khaya Mfenyana	Walter Sisulu University

Name	Affiliation
Prof Steve Reid	University of Cape Town
Prof Ben van Heerden	Stellenbosch University
Dr Gustaaf Wolvaardt	Foundation for Professional Development
Prof Henry de Holanda Campos	Federal University of Ceara (Brazil)
Prof Jan de Maeseneer	University of Gent (Belgium)

1.4.3 Methodology

The Academy follows a standard methodology, adapted from the United States (US) Academies, when undertaking such a study. This includes drawing on the expertise of key experts in the field either as authors or key informants, and review of local and international academic publications, with particular emphasis on review articles, using search terms relevant to the matter and by focusing on institutions known to undertake systemic reviews.

The consensus study panel serves in a voluntary capacity to drive and implement the study. The panel, guided by its chairperson, selects from a range of methodologies in order to meet the brief provided by the ASSAf Council. For this particular consensus study the methodology included:

a holding a public workshop with invited speakers and/or panel discussions;

b holding panel workshops to debate and resolve particular questions and issues;

c delegating initial analysis of topics of the study to individual members or sub-groups of the panel;

d any other ways of working towards a proper understanding of the evidence and information that can help to complete the study.

The methodology ensured that each key question would engender responses that would be (1) evidence-based; (2) include local experiences/relevance (with examples of innovation); and, (3) make contextualised recommendations.

CHAPTER 2

Conceptual Framework

Key points

- The goal of HPE is to produce knowledgeable, competent, relevant, socially accountable HCPs.
- The conceptual framework for the reconceptualisation of HPE adopted by the panel involves a cyclical process where population health and wellness needs determine the required health services which define the health professional skills mix and which, in turn, drive the educational content, processes and outcomes. Embedded within this cyclical process is the triangle of quantity, quality and relevance which is subject to iterative monitoring and evaluation within an overarching, collaborative, leadership and governance mechanism.
- South Africa needs an integrated, flexible approach to HRH planning that encompasses supply and demand factors and takes into account burden of disease, health services utilisation, productivity and skills mix components.
- A results management framework/logic model should be employed to monitor and evaluate HPE.
- Collaborative oversight of HPE should ideally be coordinated by a government entity such as the Department of Planning, Monitoring and Evaluation (DPME).

2.1 Introduction

The ultimate goal of HPE is to produce knowledgeable, competent, relevant, socially accountable HCPs capable of confidently and collaboratively promoting health and addressing the country's burden of disease (BOD) across the continuum of healthcare in the context of quality universal health coverage.

2.2 Conceptual framework

Reconceptualisation of HPE for the improved health of the nation can be viewed as a cyclical process with embedded triangulation that is subject to iterative monitoring and evaluation within an overarching, collaborative, leadership and governance mechanism. The panel adopted the following conceptual framework[1] as a guide to its deliberations (Fig. 2.1).

1 Adapted from the needs-based professional education model by the WHO-UNESCO-FIP Education Initiative Development Team in International Pharmaceutical Federation Education Initiatives (FIP*Ed*, 2013).

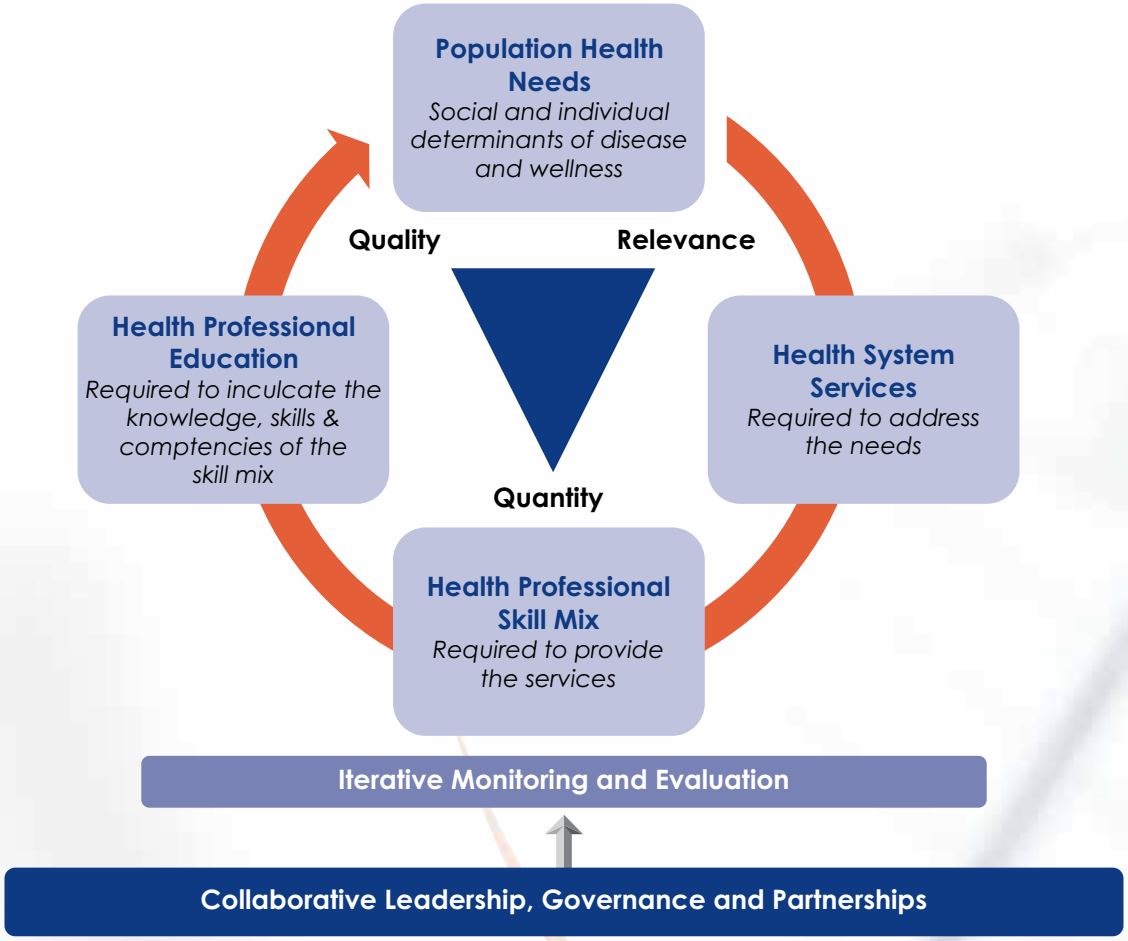


Figure 2.1: Proposed conceptual framework model

This conceptual framework unequivocally affirms the inter-connectedness of the health and higher education systems. The population health needs defined by the social and individual determinants of health and wellness, and the BOD dictate the health system services necessary to address these needs which, in turn, inform the health professional skills mix required to render these services. HPE inculcates the profession-specific knowledge and skills, as well as generic competencies and attributes required to effect the scopes of practice of the different health professionals as mandated and regulated by the professional councils.

Embedded in this cyclical, iterative process are the tenets of:

a quantity – the number and distribution of the health professionals skills mix;

b quality – the knowledge, skills, competencies, values, attitudes and behaviours of the health professionals that ensure the centrality of patients and populations; and,

c relevance – the ability of health professionals to address the social and individual determinants of health and resulting BOD across the health continuum from health promotion and disease prevention to therapeutic, curative, rehabilitative and palliative care in response to the country's health context, BOD and health system.

The health system components, iterative monitoring and evaluation and leadership and governance aspects are briefly discussed in this chapter. This will be followed by a comprehensive discussion of the role of HPE, with recommendations for the relevant South African role players in the ensuing chapters.

2.2.1 Population health needs

Given that "health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity" (WHO, 2015), the health needs of a population can be seen as an expression of the interplay between the social and individual determinants of health and wellness. Social determinants are the political, economic and social conditions in which people are born, grow, live, work and age, and their distribution in the population, which act both independently of, and in concert with, individual determinants (genetic and behavioural risk factors) to influence human well-being, risk of disease, or vulnerability to disease or injury.

While the social determinants of health represent an important driver of the BOD in South Africa, methodologies for accurately quantifying their impact on health and disease remain a challenge. Nonetheless, data derived from Statistics South Africa (StatsSA) and the South Africa Demographic and Health Surveys (SADHS) are illuminating in this regard. The direct health needs of the South African population can be ascertained from BOD studies conducted by the Burden of Disease Research Unit of the South African Medical Research Council (MRC) and the *District Health Barometer* published annually by the Health Systems Trust.

The national burden of disease (NBD) is defined as "a comprehensive demographic and epidemiological framework to estimate health gaps of a country for an extensive set of disease and injury causes, and for major risk factors, using all available mortality and health data, and methods to ensure internal consistency and comparability of estimates" (Pillay-Van Wyk *et al.,* 2014). Applying the methodology developed by the WHO, the *Second South African Burden of Disease Study* uses cause of death and years of life lost as indicators to rank the burden of disease nationally and provincially (Msemburi *et al.*, 2016). The study presents league tables of the leading cause of death by age group and province, as well as trend analyses of death rates by broad cause and disease category (Table 2.1 and Fig. 2.2).

Table 2.1: Top-ten single causes of death by age, 2012 (Msemburi *et al.*, 2016)

LEAGUE TABLE OF LEADING CAUSES OF DEATH BY AGE GROUP,2012

Rank	Age 0-4	Age 5-14	Age 15-44	Age 45-50	Age 60+	All ages
1	HIV/AIDS (20.1%)	HIV/AIDS (50.7%)	HIV/AIDS (51.9%)	HIV/AIDS (34.1%)	Carebro-vas-cular disease (15.4%)	HIV/AIDS (29.1%)
2	Diarrhoeal diseases (16.5%)	Road injuries (10.5%)	Interpersonal violence (8.5%)	Cerebrovas-culardisaeses (6.4%)	Ischaemic heart disease (9.2%)	Carebovascu-lar disease (7.5%)
3	Lower respiratory infections (13.1%)	Lower respiratory infections (4.1%)	Road injuries (6.4%)	Tuberculosis (6.3%)	HIV/AIDS (7.9%)	Lower respiratory infections (4.9%)
4	Preborn birth complications (11.2%)	Diarrhoeal diseases (3.7%)	Tuberculosis (5.3%)	Ischaemic heart disease (4.5%)	Hypertensive heart disease (7.7%)	Ischaemic heart disease (4.7%)
5	Birth asphyxia (6.0%)	Meningitis/ encephalitis (3.6%)	Sell-infected injuries (2.8%)	Diabetes mellitus (4.0%)	Diabetes mellitus (5.5%)	Tuberculosis (6.3%)
6	Protein-en-ergy malnutrition (4.9%)	Drowning (3.2%)	Lower respiratory infections (4.1%)	Lower respiratory infections (4.1%)	Lower respiratory infections (4.1%)	Diabetes mellitus (1.6%)
7	Sepsis/other newborn infection (3.2%)	Epilepsy (2.0%)	Meningitis/ encephalitis (2.0%)	Road injuries (2.9%)	COPD (3.8%)	Hypertensive heart disease (3.5%)
8	Road injuries (1.9%)	Interpersonal violence (8.5%)	Cerebrovas-cular disease (1.5%)	Renal disease (2.4%)	Renal disease (3.8%)	Interpersonal violence (3.5%)
9	Septicemia (1.8%)	Tuberculosis (1.9%)	Renal disease (1.5%)	Hypertensive heart disease (2.7%)	Tuberculosis (3.8%)	Road injuries (3.3%)
10	Congenital heart anom-alities (1.7%)	Asthma (1.6%)	Diarrhoeal diseases (1.2%)	Interpersonal violence (2.3%)	Diarrhoeal diseases (2.4%)	Diarrhoeal diseases (3.1%)

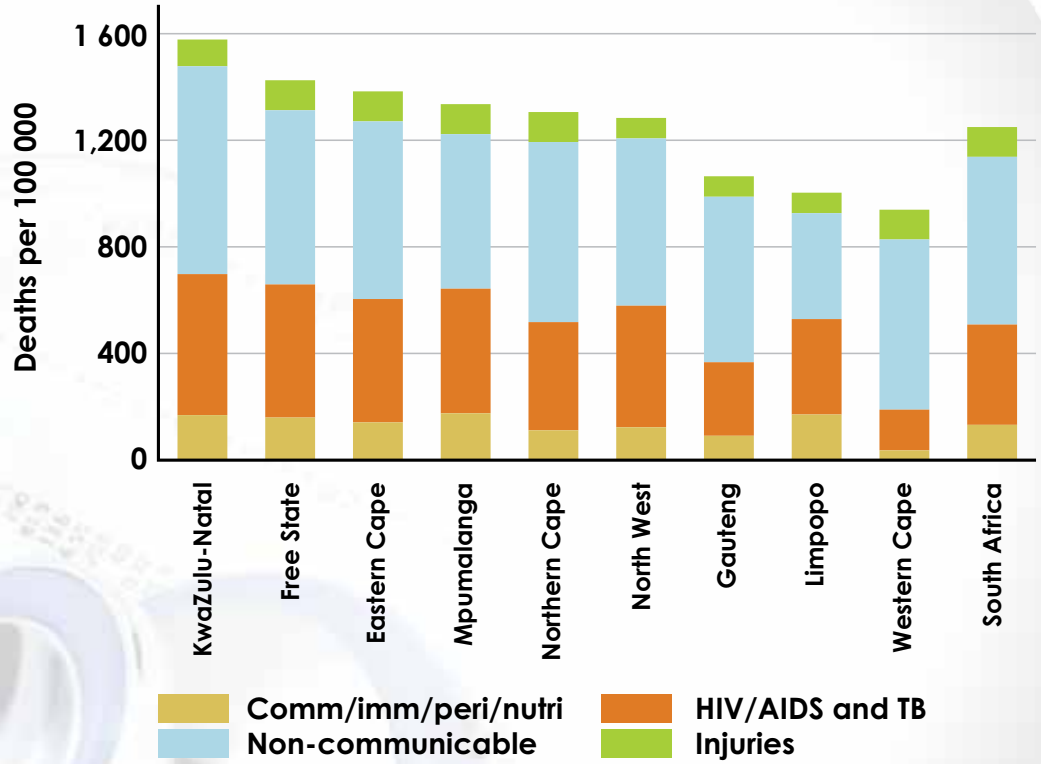


Figure 2.2: Provincial broad-cause age-standardised death rate, 2012 (Msemburi *et al.*, 2016)

The District Health Barometer measures public-sector health outcomes, health-resource allocations and the efficiency of health service delivery at primary healthcare (PHC) and district level in South Africa's 52 health districts using a set of indicators which include the BOD (death by broad cause) as above and districts are ranked in league tables (Massyn *et al.*, 2015).

Despite limitations related to data scope and quality, trend analysis from BOD studies together with trend analyses of indicators measured in the District Health Barometer are critical to health planning and decision-making specifically the proactive allocation of resources for the education, training and employment of HCPs to implement interventions to reduce the burden.

2.2.2 Health system services

This section briefly outlines health system services as they are envisaged when the South Africa's proposed National Health Insurance (NHI) is fully operationalised as outlined in the NHI White Paper (DoH, 2015). The NHI, which derives its mandate from the NDP, is a proposed health-financing system to support the provision of universal health coverage for South African citizens. It aims to provide access to quality, affordable personal health services for all South Africans based on their individual health needs and irrespective of their socioeconomic status across the continuum of care from health and wellness promotion and disease prevention to other levels of curative, specialised, rehabilitative and palliative care.

The envisaged comprehensive package of health services includes services related to (1) preventive, community outreach and promotion; (2) reproductive health; (3) maternal health; (4) paediatric and child health; (5) HIV and AIDS and tuberculosis; (6) health counselling and testing; (7) chronic disease management; (8) optometry; (9) speech and hearing; (10) mental health including substance abuse; (11) oral health; (12) emergency medical care; (13) prescription medicines; (14) rehabilitation care; (15) palliative care; and, (16) diagnostic radiology (DoH, 2015). The manner and extent to which these envisaged services will address the BOD remains to be explicated.

The NHI represents a radical policy shift, necessitating a substantive reorganisation of the existing public and private healthcare system and its service delivery, the latter organised into three areas, namely, (1) PHC services; (2) hospital and specialised services; and (3) emergency medical services (EMS). Premised on the re-engineering of PHC with equity, access and appropriate distribution of the heath workforce as central tenets, the NHI forefronts health promotion and disease prevention but includes curative (acute and chronic clinical) services, rehabilitation and palliative services. PHC will be delivered by four streams (Table 2.2) and requires a particular skills mix of entry-level HCPs, mid-level workers and community health workers (CHWs). At hospital level, five categories of service are envisaged (Table 2.2) with increasing levels of complexity, sophistication and technological requirements for health service delivery in keeping with the national referral plan.

Table 2.2: Health services delivery

	Primary Healthcare	Hospital and Specialised Services
Services	• Municipal Ward-based Primary Healthcare Outreach Teams • Integrated School Health Programme • District Clinical Specialist Teams • Contracting of Private Non-specialist HCPs	• District • Regional • Tertiary • Central • Specialised
Skills Mix	• Medical Practitioners • Dentists • Nursing Professionals • Pharmacists • Audiologists • Speech Therapists • Optometrists • Physiotherapists • Psychologists • Nutritionists • Oral Health Practitioners Supported by: • Community Health Workers and/or • Mid-level Workers	Regional Services Package aims for two full-time specialists per core specialty: • Medicine • Surgery • Psychiatry • Obstetrics and Gynaecology Orthopaedic Surgery, Paediatrics • Anaesthetics • Diagnostic Radiology • Emergency Medicine

All levels of care from primary care to specialised hospitals are expected to serve as training platforms for health professionals and undertake research, although only regional hospitals are explicitly mentioned in this context in the NHI White Paper (DoH, 2015).

2.2.3 Health professional skills mix

The NHI White Paper acknowledges that human resources for health are pivotal to the success of health services delivery and indicates that staffing requirements will be determined using the "roadmap for the planning, development, provisioning, distribution and management of human resources for health to meet the needs of the population" as articulated in the *2012 Human Resources for Health Strategy*, as well as the Work Place Indicators of Staffing Need (WISN) tool. It further explicitly mentions some categories of health professionals in the context of service delivery at PHC and regional levels (Table 2.2) (DoH, 2015). Categories/cadres and numbers of health professionals are not defined at district, tertiary, central and specialised hospital levels.

The 2012 HRH Strategy envisions "a workforce developed through innovative education and training strategies and fit for purpose to meet the needs of the re-engineered health system and measurably improve access to quality healthcare for all". Contextualised within the NBD, it acknowledges that the extensive and dynamic BOD requires that health professional training and development caters for a wide spectrum of conditions. The strategy is built on seven foundations of the South African HRH model, namely:

a community health workers with competencies in health promotion and disease prevention;

b enhanced nursing skills and capacity by identifying appropriate categories of nurses for re-engineered PHC, revising the scope of practice and increasing clinical competencies and numbers of professional nurses, with an emphasis on midwifery, and developing specialist nurses for PHC and hospital services;

c introducing new and expanding existing categories of mid-level workers, specifically clinical associates;

d increasing numbers of entry-level generalist medical doctors and other health professionals, such as pharmacists, physiotherapists and dieticians, at both PHC and hospital levels;

e increasing numbers of selected specialist medical practitioners and other health professionals;

f increasing the number and clarifying the role of public health specialists; and,

g developing academic clinicians in all health professional disciplines to ensure a platform for health professional development (DoH, 2012).

Inter-professional education and collaborative practice as well as core competencies are integral to this strategy.

The strategy acknowledges that HRH requirements to meet the staffing needs for NHI service delivery should ideally be forecast from a South African model that determines HRH requirements based on a well-researched and assessed service model. However, such a model is yet to be developed. The existing model uses

public-sector Service Transformation Plans, the Integrated Health Planning Framework and the South African Service Model as proxies and estimated targets as based on data from a range of peer countries and South African ratios (DoH, 2012). The recommendations of the HRH Strategy may thus not be an accurate reflection of the health professional skills mix required to deliver the health services to address the disease burden. It nonetheless provides projections for over 100 registered health professionals and includes the new and proposed categories of clinical associate, staff nurses and community health workers noting that the scope, role, responsibilities, job description, qualification requirements, employment mechanisms, remuneration and conditions of service are yet to be defined for the latter two (DoH, 2012).

The WISN method is a HRH management tool that calculates the number of health workers of a specific cadre required to deliver a particular service in a given health facility by assessing the workload pressure of the health workers in that facility. Results are provided as differences and ratios. The difference between the actual and required number of health workers indicates the shortage/surplus of a cadre/service in a particular facility/facility type, while the ratio of actual to required number is a measure of workload pressure. Results can be aggregated by facility type and health worker cadre for districts, provinces and at a national level (WHO, 2010). This method, however, measures existing services only and cannot make recommendations on the need for new services with their associated health workers.

The existing methods for calculating the skills mix required to deliver the necessary health services in South Africa are thus imperfect and present a best guess within the current data quality limitations. Explorations of future models for health workforce planning are needed. Such an exercise should draw on an existing review of more than 60 years of documented research which identified seven different, but widely used approaches, four based on supply and three on demand (See Appendix 3).

An integrated approach combining elements of supply and demand is proposed as the way forward as shown in Figure 2.3 (Amorim Lopes *et al.*, 2015).

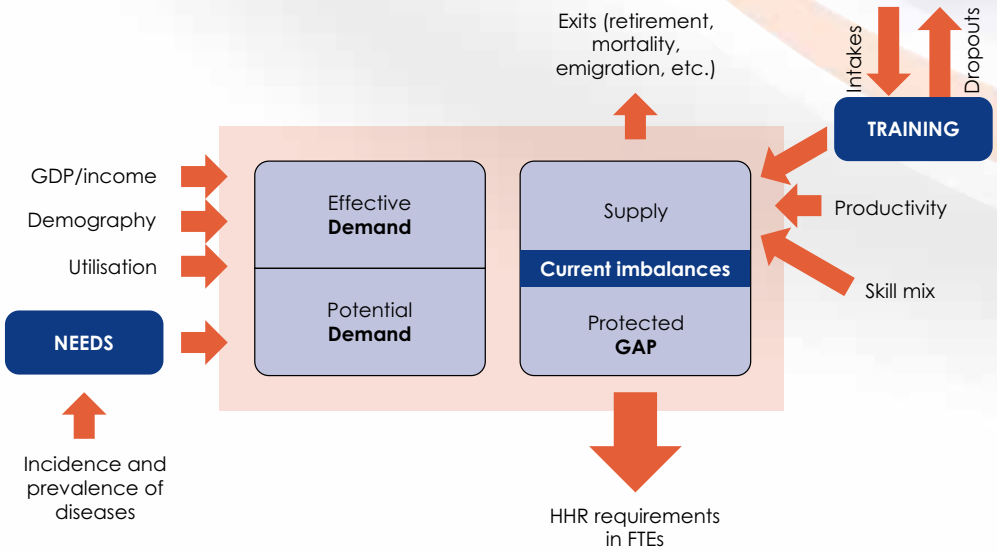
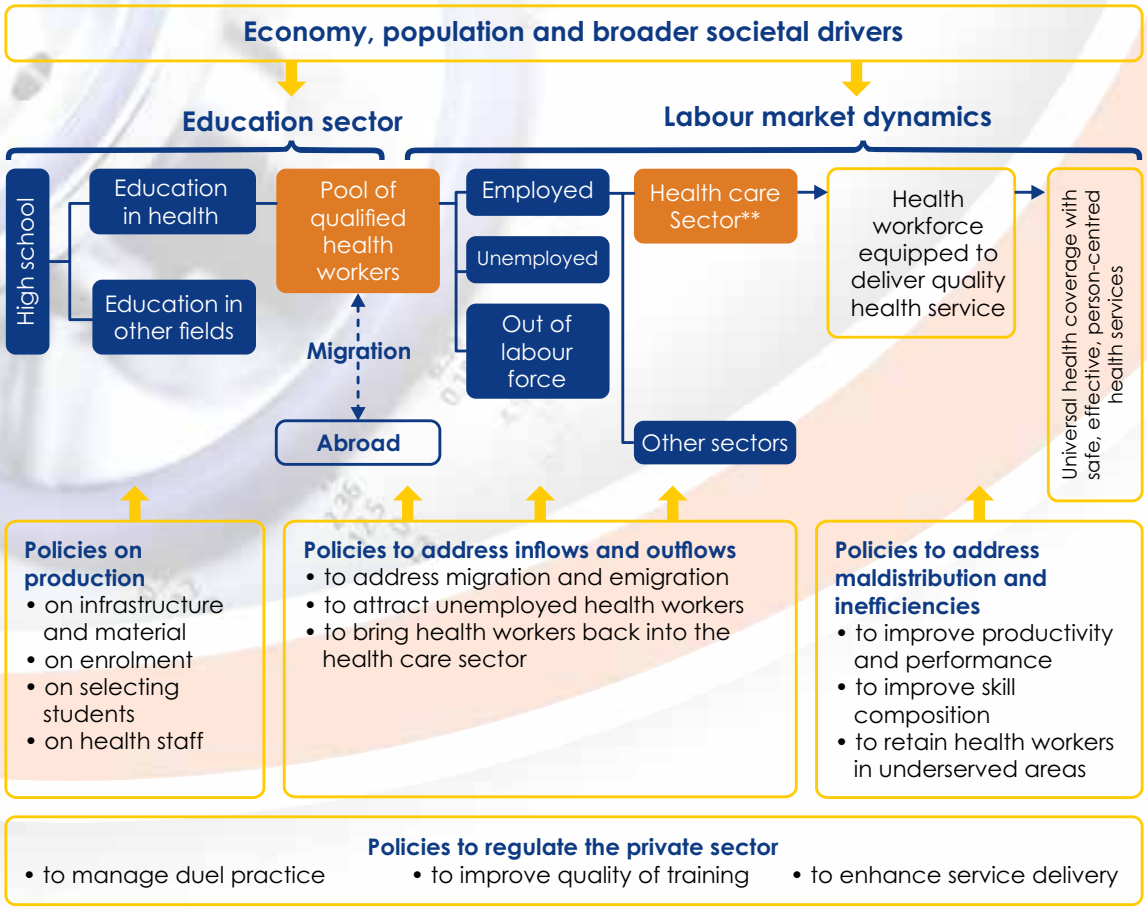


Figure 2.3: Integrated approach combining supply and demand elements

Figure 2.3 depicts the need for an integrated, flexible approach to HRH planning that encompasses supply and demand factors, and includes productivity and skills mix components. The supply side begins with a snapshot of the current workforce by adding the existing, practicing health workforce to the anticipated outputs of the training process. This current workforce may alter in number and composition by inflows and outflows but is, in the main, responsible for providing health services depending on their productivity and skill mix. The conversion of this headcount to full-time equivalents (FTEs) is essential for accurately assessing the health workforce as many health workers work part-time. Demand can be initially measured by analysing health service utilisation indicators and is affected by typical economic factors such as demography and the growth of income/gross domestic product. Potential needs can be assessed in tandem by incorporating the incidence and prevalence of diseases and then mapping a given disease to an estimate of FTE requirements (Amorim Lopes *et al.,* 2015). South Africa has the datasets to implement such an approach.

The WHO in its *Global Strategy on Human Resources for Health: Workforce 2030* has further expounded on the policy levers to shape health labour markets in terms of supply and demand as depicted in Figure 2.4 (WHO, 2016).



* *Supply of health workers = pool of qualified health workers willing to work in the health-care sector.*
** *Demand of health workers = public and private institutions that constitute the health-care sector.*
Source: Sousa A, Schaffer M R, Nyoni J, Boerma T "A comprehensive health labour market framework for universal health coverage" Bull World Health Organ 2013; 91: 890–894.

Figure 2.4: Policy levers to shape health labour markets

2.2 Iterative monitoring and evaluation

A 'results management framework' (Fig. 2.5) is recommended using the results chain which describes the causal relationship between components over time. Figure 2.5 illustrates the possible components of such a framework:

Figure 2.5: Results management framework

Outputs, outcomes and impact are defined as results achieved by a set of well-resourced activities. Outputs are generally quantitative results, i.e. short-term products or services from completed activities that can be regularly measured and are necessary for the attainment of outcomes. Outcomes are intended, intermediate effects of interventions on systems and/or people and represent the most important result level in results management. The impact is usually long-term improvements in society which are often challenging to measure as the causal relationship between outputs, outcomes and the changes that have taken place in society are often difficult to prove. Internal and external risks prevail at all levels of the results management framework and should consequently be pre-emptively identified and mitigated. Outcomes and outputs are measured quantitatively and/or qualitatively using indicators measured at baseline and monitored at various stages. The results management framework should be translated into an implementation plan against which status reports on activities, outputs and

outcomes are made periodically. The results framework should further be translated into a performance monitoring and evaluation tool linking outcomes and outputs to performance indicators with means of verification, data-collection methods, frequency of collection and the responsible persons (NORAD, 2008).

2.3 Collaborative leadership, governance and partnerships

Critical to the success of HPE is the mobilisation of stakeholders including, but not limited to the national Departments of Health and Higher Education, the Treasury, universities and professional councils around a common goal within their various mandates. This necessitates collaborative governance, committed, equal partnerships, consultative policy development and implementation, and joint planning, monitoring and evaluation by the national and provincial health, higher education and professional accreditation systems, in the main, supported by Treasury. The Country Coordination and Facilitation (CCF) approach of the Global Health Workforce Alliance should inform this collaborative governance. The CCF approach advances intersectoral coordination and collaboration to plan, implement and monitor health workforce development and retention at the country level by establishing and supporting the essential governance structures. The CCF approach further includes processes to ensure that sustainable, motivated and skilled health workers are available to meet healthcare needs and identifies partners, funding sources and technical expertise towards this end (WHO, 2011). Given the multi-stakeholder, multi-ministry nature of HPE, it is recommended that an enacted and regulated oversight mechanism be established under the auspices of DPME to provide the necessary leadership and stewardship. With its key responsibilities including national planning and outcomes monitoring and evaluation, this department[2] is well-placed to coordinate collaborative leadership and governance of HPE.

2.4 Conclusion

The point of departure of the conceptual framework outlined here is that the health and higher education systems are interconnected. The framework posits that population health needs and the burden of disease dictate the health system and services necessary which, in turn, inform the health professional skills mix required. HPE facilitates the acquisition of relevant knowledge, skills competencies and attributes needed to effect the scopes of practice of the different health professionals. In this chapter we have briefly described the health system components, iterative monitoring and evaluation and leadership and governance aspects of the framework. What follows is a comprehensive discussion of the role of HPE with specific recommendations for how its various components can be adapted and enhanced to more effectively address the health of the nation.

2 http://www.dpme.gov.za/about/Pages/Outcomes-Monitoring-and-Evaluation.aspx

CHAPTER 3

Student Selection

Key points

- Access to HPE is intricately linked to educational issues of student retention and success, as well as broader societal imperatives of equity and redress.
- While prior academic achievement appears to be the best indicator of success for both advantaged and disadvantaged students, clinical competency, is not predicted purely by previous academic performance.
- Student selection should be reconceptualised with the aim of evaluating a broader set of criteria than currently in use.
- Barriers to selection and success include variation in the quality of primary and high-school education; inequities in career guidance and access to information; availability of staff, finance and facilities at universities to conduct selection processes and academic monitoring, assistance and follow-up; resources and time to develop and test psychometrics to select students.
- Outreach to schools, ongoing social, academic and career guidance, and academic and social mentorship would increase health care graduate output.
- Programme success should include indicators, such as the number of practitioners remaining in the profession, and their professional competence.

3.1 Introduction

The challenges of student selection for retention and success are multiple: quantitative and qualitative, academic and equity-related, financial and human. Vastly more potential students apply than can be accommodated. While selection of those academically most worthy can be based on previous academic performance, this must be balanced against the need for redress of historical educational inequities in South Africa. Equity at selection necessitates follow-up to achieve retention in order to see equity at graduation and beyond. All of these competing, consequential imperatives require financial and personnel resources.

Issues of access and success are not unique to HPE or South Africa. Various countries have put measures in place to widen access to higher education (HE) (Altbach *et al.*, 2009). However, "Access is more than 'getting through the door'. True progress depends on levels of completion for all population groups" (Altbach *et al.*, 2009). Tuition costs and fear of debt are substantial obstacles, and 'selection on academic merit' tends to entrench long-standing privilege and exclude those with financial or other burdens, such as social disadvantage or ethnicity, even in developed countries (Altbach *et al.*, 2009; Astin and Oseguera, 2004; Bibbings, 2006; Bowden and Doughney, 2010; Yang, 2010).

Since the dawn of democracy in South Africa, entry to universities and their health science sectors has, in theory, been open to all on an equal footing. However, this narrow view of access ignores the fact that not all potential students have an equal

foundation of knowledge; they may have formal but not necessarily epistemic access (Morrow, 2007; Muller, 2012). Furthermore, they may not have the financial or social capital (Kreuter and Lezin, 2002) to realise their potential. Considerations of access are integrally linked to those of equity – in terms of drawing students into HE (Bowden and Doughney, 2010) – and of redress – in terms of selection and aid policies.

A South African study (Scott *et al.,* 2007) of the 2 000 student cohort (all faculties) noted low (30%) graduation and retention rates, and high attrition rates particularly in the first year. In almost every field the degree-completion rates of black students were less than half those of white students. Participation rates in HE were low overall, but especially for black and 'coloured' students; this was particularly exaggerated in science, engineering, technology, postgraduate and *professional degrees.* Thirteen years later, the HE White Paper (Pampallis *et al.,* 2013) observed similar low success (15%) rates, and a study of the national benchmark test (NBT) (Wilson-Strydom, 2012) highlighted the large numbers of students entering universities without the required proficiency in academic, mathematics and quantitative literacy.

More recently, a proposal to reform South African undergraduate education in general noted, that: "High attrition and low graduation rates have largely neutralised important gains in access" (CHE, 2013: 9). On a more positive note, these authors and others (Mabope and Meyer, 2015) have pointed out that overall graduation rates and success rates of particular ethnic groups, were better in the health sciences than in other fields.

3.2 Theoretical constructs

There is sparse literature on theories of selection – a field that arose during the Second World War and is still developing 70 years later. While various theoretical viewpoints have been employed as selection strategies, there is no overarching 'theory of selection'. The panel regards the field of selection of health sciences students as one of pragmatic technical application, particularly since, in the South African context, various different criteria must be reconciled. Accordingly, a specific theoretical stance is not adopted as the literature is reviewed and recommendations are made.

3.3 Concepts and definitions

Since concepts such as equity, redress, access and success are contested terms, it is relevant to explore some definitions.

3.3.1 Equity

According to the Glossary of Education Reform (edglossary.org/), equity refers to the principle of fairness. Inequities arise from biased or unfair policies, programmes or practices which contribute to unequal educational performance, results and outcomes. Interventions which aim to address these inequities, while considered fair, are not necessarily equal.

Machingambi (2011) presents a useful framework for assessing equity in higher education in terms of student demographics – in respect of, for instance, ethnicity, social disadvantage, gender, prior learning, and geographic origin:

a At entry – selection and admission of students to represent a geographical demographic profile.

b Within the programme – given that certain groups may proceed more slowly than others, they may appear to be over-represented within the student body.

c At graduation – the converse, because certain students may take longer to graduate, within a particular cohort they may be under-represented at the end of the standard programme time.

In each category, groups may be chosen and followed relative to the demographics and needs of:

a specific local communities;

b provinces;

c the nation as a whole.

3.3.2 Student selection

In this study, selection for entry to first year is examined, since, for most health science programmes, entry to subsequent years is not an option. The existence of graduate entry (GE) programmes shorter than the standard duration is noted; GE may be regarded as entry into the first year of such a curtailed programme.

It is also noted that selection is not synonymous with *admission*, which is sought, by students who make their own decisions based on personal choice, availability of funds, etc., once selected.

3.3.3 Retention

This term has been defined as the proportion of a student intake that remains enrolled in the year following their first entry (Crosling *et al.,* 2009), or as the converse of attrition (Ackerman and Schibrowsky, 2007-2008; Letseka, 2010). For simplicity, it is suggested that the number of students remaining in a programme after admission should define 'retention'. The likelihood of students transferring into later years is negligible, thus minimal distortion of the proportions of retained to admitted students is likely. The numbers of students in standard and GE programmes should be tracked separately.

The number of students excluded from a programme for academic or other reasons, as well as the number of students changing programmes, and the number leaving university altogether, influence retention statistics. Studies do not generally distinguish between these categories.

Students who fail and repeat portions of a programme may give a false sense of the magnitude of retention, but they are regarded as still within the programme.

3.3.4 Success

Bearing in mind the distorting effect of students who fall behind but remain in a programme, the different possible ways of defining student success are noted. The Council on Higher Education's (CHE) task team on undergraduate curriculum (CHE, 2013) mentions two alternative metrics: *graduation rate* as a percentage of enrolments in a given year, and *completion rate* as the percentage of a given student intake (cohort) that graduates. Here it is suggested that counting the number of graduates relative to admissions in a particular year is useful only if admission numbers are stable. In a period of increasing admissions, the number of graduates lags behind admissions; conversely, should admission numbers fall, the graduate numbers look relatively larger. The number from a particular entry cohort who graduate within the stipulated programme time is regarded as a more helpful statistic. Taking into account students who fall behind a cohort, but who eventually graduate, entails a more complex follow-up, but does provide an overall idea of how many entrants do attain a qualification.

Taking a longer view, the *quality* of a programme's graduates; the number remaining in the relevant profession for a specified time; and, their professional quality, are perhaps the ultimate indicators of programme success.

3.4 Key findings from the literature

3.4.1 Selection

3.4.1.1 Current SA health science student-selection criteria

It is accepted that a selection process is needed to fill the available student places from a larger pool of applicants (Reibnegger *et al.*, 2010).

A recent report provides the findings of a South African Committee of Medical Deans workshop on student selection held on 5 June 2014 (Van der Merwe *et al., 2016). The presentations made in that forum reflect current thinking and practice*, and while each of the eight medical schools has its own policy, common features are apparent (Table 3.1).

Table 3.1: Academic (National Senior Certificate [NSC] and NBT) selection requirements for undergraduate medical training at eight SA medical schools

University	Academic (weight)	APS (minimum required based on NSC)	NCS compulsory subjects + minimum achievement level	NBT requirements	NCS: NBT
SMU	100%	30	Level 5 (60-69%) Maths, Physical Science, Life Science	Not required	N/A
SUN	45% of selection factor (grade 11/ matric average)	N/A	Level 6 (70-79%) or higher Level 4 (50-59% or higher Maths, Physical Science, Life Science	Intermediate or proficient Minimum 38% per component Weight – 30% of selection factor	45:30
UCT	NSC score out of 600 and NBT score out of 300 + (for Medicine) an optional report out of 100	450 (APS=NSC)	Level 5 (60-69%) Compulsory: English, Maths, Physical Science, plus next 3 best subjects excluding LO	Intermediate or proficient	70:30
UFS	100 points (84.76%)	36	Level 5 (60-69%) Maths, Physical Science, Life Science	Must pass each component and average 50% overall	60:40
UKZN	Aggregate of 4 compulsory subjects + 2 best subjects, excluding Maths 3 and LO	N/A	Level 5 (60-69%) Maths, Physical Science, Life Science Avarage 65%	Not required	N/A
UP	100%	35 (excl. LO)	Level 5 (60-69%) Maths, Physical Science or Life Science	AL 20%, QL 20%, Maths 60%	60:40
Wits	Composite index: NCS: 40%, NBT 40%, BQ 20%	N/A	Level 5 (60-69%) Maths, Physical Science or Life Science, plus next 2 best subjects incl. LO	Required	50:50
WSU	Academic 50% Interview 50%	20 (4 subjects)	Level 5 (60-69%) Maths, Physical Science, Life Science	Not required	N/A

APS - Admission Point Score; LO - Life Orientation; AL - Academic Literacy, QL - Quantative Literacy; Maths - Mathematics; BQ - Biographical Questionnaire

Source: Van der Merwe et al. (2015)

Academic achievement – all medical schools require mathematics, physical science, English/Afrikaans with or without life science in the national senior certificate (NSC) examinations. Six also require NBT. Three institutions pre-select students on the basis of Grade 11 + NBT + Grade 12 year marks. One institution selects for its graduate-entry programme on the basis of the student's marks for the last two years of the completed degree. Various formulae are used to represent the academic merit of applicants.

Ethnicity – three medical schools have quotas specifying the desired percentages of apartheid-defined ethnic groups, and all eight have, or are about to institute, measures to facilitate the selection and admission of students identified as representing disadvantaged sectors of their community.

Prior degree (complete or partially complete) – almost all medical schools make provision for applicants with prior HE experience, some reserving a specific percentage of places for these students.

Additional criteria – the majority of medical schools make provision for students representing disadvantaged communities, whether identified geographically or by the socio-economic status of the high school of origin. Five medical schools make use of an interview or a report on students' extracurricular activities.

It is apparent that all the medical schools are attempting to balance the tension between selection based solely on academic merit to maintain a standard of excellence, and selection as a means of redress to achieve equity. This is fraught with difficulty, and decisions may be challenged, given the enormous competition for places. The variety in selection policies may be seen as a stage in progression from widely differing traditions towards a more uniform national selection process. In the meantime, as long as the inequities of apartheid education persist, redress in terms of 'race' classifications is likely to persist; regional differences in 'race' distributions will probably be reflected in local HSE selection policies.

That tensions experienced in medical student selection are not necessarily shared across the span of healthcare disciplines as evidenced by typical nursing student selection processes (Prof J Bruce, University of the Witwatersrand & Gauteng Department of Health, personal communication; Netcare 2015).

Academic achievement – University of the Witwatersrand: English and life science/ biology in Grade 11, confirmed in Senior Certificate exams, or a Public Health certificate from a further education and training (FET) College.

– *Private:* English, maths/maths literacy, computer literacy.

Ethnicity – no specific requirements, since the proportions of applicants approximate community demography.

Additional criteria – University of the Witwatersrand: Age 17-35; psychometric testing; interviews of a short list of suitable applicants, the panel including a community representative.

– *Private:* Age > 23 + internal selection criteria.
Previous auxiliary or enrolled nurse training.

To place the current South African selection criteria and processes into a broader context relevant global literature is examined.

3.4.1.2 Academic criteria

The view that school-leaving marks are predictive not only of first-year results, but also of results in later years, is supported by various reviews in HE generally (Kuncel *et al.,* 2010), in health science specifically (O'Neill, 2012; Salvatori, 2001), and in individual studies among: USA dental hygienists (Downey *et al*., 2002), UK veterinary students (Muzyamba *et al.,* 2012), German medical school applicants (Hissbach *et al.*, 2011), and South African medical students (Sommerville, 2012). However, academic achievement is only one of many factors, and may be a less useful predictor of subsequent clinical performance (Ferguson *et al.*, 2002; Sommerville, 2012). There is local and international evidence that graduate entrants do better than students directly out of school, HE experience perhaps outweighing students' age (Ferguson *et al*., 2002; O'Mara *et al.,* 2015; Sommerville, 2012). Patterson *et al.* (2016) voice the concern that, as greater numbers of applicants score increasingly high marks, the ability to discriminate on the basis of prior academic achievement may be diminished. They also note a lack of long-term follow-up studies to establish that applicants with higher marks ultimately become better practitioners.

3.4.1.3 Limitations of academic selection

Past academic performance does not necessarily predict future performance, especially clinical performance (O'Neill, 2012: 560). As health science personnel must be able to exhibit more than purely academic ability (AAMC, 2013; Frenk *et al.,* 2010; HPCSA, 2014), selection processes should assess a broader range of attributes and skills, some of which may be more difficult to quantify. It remains to be seen whether any of the instruments used thus far can reliably assess the non-academic attributes of would-be students. Current thinking is that combining a number of possible selection factors may constitute a more reliable approach (Ferguson *et al.,* 2002).

3.4.1.4 Non-academic criteria

It is possible that factors such as personality (Muzyamba et al., 2012) and other non-academic traits (Adam *et al.,* 2012) including interpersonal skills, values and self-appraisal may be important determinants of clinical performance and professional behaviour. Indeed, studies from various parts of the world across a range of health professions suggest that non-academic assessments may have useful predictive ability. Among the suggested benefits are: identification of students likely to excel or drop out (Powis *et al.,* 1988) or to remain committed to their programme (Worthington et al., 2013), identification of selection advantages for minority groups (Jerant *et al.,* 2015) and achievement of a diverse educational environment with increased numbers of traditionally underrepresented students (Glazer and Bankston, 2014; Terregino *et al.,* 2015) displaying more community engagement, more collegiality, and more openness to new ideas.

As to what instrument(s) should be used to assess non-academic factors, one study (Koenig *et al.,* 2013) proposes three modalities for further consideration: situational judgement tests (responses to dilemmas presented on paper, by video or animation), standardised performance evaluations (a referee's description of specific behaviours exhibited by the candidate), and accomplishment records (standardised autobiographical questionnaires). A systematic review (Patterson *et al.*, 2016) concludes that situational judgement tests, multiple mini-interviews, and selection centres are both more effective and fairer than traditional interviews, personal statements, and references. The authors add that aptitude tests have yielded mixed results with regards to their effectiveness and fairness.

3.4.1.5 Criteria relevant to redress

Powis *et al. (*1988) categorise selection criteria into cognitive and non-cognitive aspects, subdividing the latter into background – motivation, personality, interests, etc. – over which students themselves might have some influence, and 'political' factors – such as age, sex, schooling, etc., – over which students have no direct control but which the authorities might wish to use to differentiate for various purposes.

There is evidence from the US that physicians from minority groups are more likely to work in underserved communities, to exhibit greater linguistic ability, and to work in primary care (Grumbach *et al.*, 2008). Furthermore, research from a wide range of countries (Eley, 2012; Fortunato and Worley, 2012; Kotha *et al.,* 2012; Strasser *et al.*, 2013) including South Africa (De Vries and Reid, 2003; Wilson *et al.,* 2009) has shown that selection of students from rural areas, especially when accompanied by exposure to rural medicine, results in their being more likely to enter rural practice. Similarly, students selected from areas underserved in terms of ethnicity tend to serve in those areas (Thomson *et al.*, 2010).

Using a particular demographic marker, such as ethnic or geographic background, to guide student selection therefore appears to have direct benefits in terms of meeting community needs in the long term.

3.4.1.6 Challenges

It is well known that students from socio-economically disadvantaged backgrounds are less prepared for HE than their more affluent peers (Connor *et al.*, 2001). These students may have slower progression through HE and higher dropout rates, the causes of which are multi-factorial (Marks *et al.*, 2000). A recent South African study reflecting on recruitment from underserved ethnic groups or areas highlighted "academic, financial, emotional and social stressors'' experienced by students (Diab *et al.,* 2012).

3.4.2 Retention and success

After selection and admission, various forms of academic and non-academic support may be necessary for success particularly of students from under-represented communities.

Outreach to schools in addition to ongoing social, academic and career guidance, as well as academic and social mentorship, have been found to increase healthcare graduate output. A Cochrane review (Pariyo *et al.*, 2009) sought reliable evidence, especially from low and middle-income countries, that changes in training influenced the number of graduates entering healthcare work. The authors considered seven interventions to increase student numbers, six to reduce attrition, and two to increase recruitment from other countries. Only two studies were deemed eligible for inclusion in the review – investigating health and nursing students who were part of a Minority Academic Advising Programme (MAAP), implemented in Georgia in 1984. These studies assessed academic, vocational, personal and financial advice, skills development, mentoring, supplementary training and annual evaluations. Enrollment of black health science students increased 45%, and retention to graduation increased 11%. Enrollment of minority nursing students increased 11%, and retention to graduation increased 5.2%. The nursing students' grade point average (GPA) increased nearly a quarter of a grade, their persistence in the course increased 0.7 months, and their pass rate in the nursing board examination increased 15%. Similar interventions, also in nursing education, have been found to give rise to improvements in retention, GPA, and graduation rates (Hesser *et al.*, 1996; Lockie and Burke, 1999).

A programme in South Texas, aimed at areas with high Latino populations and low medical staffing, provides academic support, a rigorous pre-medical curriculum, enrichment, scholarships and acceptance to the supporting institution conditional on successful completion of an appropriate pre-med degree (Thomson *et al.*, 2010). Full financial support is offered, dependent upon demonstrable economic need. Support by faculty, peers and high-quality advisors is advocated to encourage retention. (Conversely, discrimination, lack of social support, self-doubt and financial burdens were hindrances to success.) The pre-med (basic science) degree was the major stumbling block, and a full-time advisor to monitor and arrange support increased retention and throughput. It is hoped that a requirement for community service will encourage eventual practice in these underserved areas. The results showed that, of students entering medical school from pre-med studies, over ten years the proportion of Latinos increased from 7% to 13%, and this increased the representation of this group in practice in the targeted areas.

A similar programme of mentoring and monitoring aimed at minority students in Colorado resulted in a 38% increase in graduation rates of those in the programme, and an overall graduation increase of "students of colour" of 45% and an institutional increase in graduations of 14% (Laden, 2004).

A South African initiative includes the sourcing of funding for scholarships to support healthcare students from rural areas, plus social and academic mentoring, vacation work in students' selected fields, and assisting students to recognise the merit of their achievements (Ross, 2014). This programme has recorded an annual pass rate over 85%, and greater than 60% retention in rural areas after completing a work-back obligation.

Furthermore, a project using state funding according to student enrolment and graduate output, employed academic development officers to tutor, monitor and

refer students for help. Senior students acted as mentors. The resultant 36% increase in student enrolment and 42% increase in state funding is ascribed to orientating and mentoring, proactive monitoring and professional counselling (Essack *et al.*, 2010).

There seems to be agreement that integrated curricula with pedagogies that actively engage students are more helpful academically than compartmentalised, lecture-based programmes. While assessment in terms of short-term recall of information tends to favour the traditional format, evidence from empirical studies supports the idea that students' understanding and retention of material, and their ability to apply it clinically, is improved by, for instance, problem-based learning (Pourshanazari *et al.*, 2013; Strobel and Barneveld, 2009).

In summary, there is a lack of rigorous evidence to establish causal relationships between interventions and outcomes as they relate to student selection and retention. It is unfortunate that the enthusiasts who document programme success, such as those referred to above, often do not provide details of the interventions, their costs and outcomes. Extra measures usually require extra funding, and both academic and broader social support are important in sustaining students selected with redress and transformation in mind. What is apparent from available literature is that student selection is a complex field, both in terms of the philosophies that guide selection, and the consequences arising from selection choices. What then are the implications of these complexities on HC student selection in South Africa?

3.5 Critique – adaptability and feasibility in the South African context; barriers and enablers

3.5.1 Constraints on student selection

In South Africa, selection based on demographic characteristics is constrained less by the size of the pool of school-leavers eligible for HE than by the distribution within that pool. The difficulty of identifying students who have the potential to succeed despite adverse schooling is a further challenge. Academic preparedness has been identified as one of seven areas that influence student retention in HE (Yorke and Thomas, 2003). A small South African study shows that the high school from which a student matriculated was the strongest influence on their academic achievements (Sommerville, 2014) and explains that disparity amongst schools is what accounts for disproportionately small pools of students of certain ethnicities. As schools become more equitable, the pools of students with equivalent academic performance will more nearly reflect the country's demographics (Sommerville, 2012). Thus eventually the selection dichotomy between academic merit and demographics will be resolved. It appears from the literature that in terms of ability to succeed academically, prior academic achievement is the best indicator, for both advantaged and disadvantaged students. Nonetheless, demographic and geographic representation, and clinical competency, are not best measured or predicted by purely academic criteria.

Consideration of selection criteria and processes must include attention to constraints on their use and whether or not these can be overcome. Important

constraints include the quality of SA school-leavers, and the subject mix to which they have been exposed. A recent study reported that: ''A worrying aspect….was the fact that all interviewees indicated that they had not had any career guidance at school'' (Mji, 2002: 175). Even in a developed country, potential students did not have sufficient information about what financial support was available (Connor *et al.,* 2001). Concerns about inherent bias in 'soft' selection criteria, and individual bias among those responsible for gauging these criteria across linguistic and cultural divides, are significant considerations. Given the present state of HE, pragmatic constraints on implementation, such as availability of finance, time, personnel, etc., for selection require attention. In this regard, South Africa's similarities to other resource-constrained counties and differences from relatively resource-rich developed counties become more pointed.

The spectrum of attributes and competencies that healthcare graduates should possess is increasingly being debated. While distaste for 'soft' (i.e. difficult to objectify) criteria is widespread, consensus is growing that 'making the important measurable' is at least as worthwhile as 'making the measurable important'. Different – or complementary – selection criteria/processes are being implemented, and South African training institutions could and should consider these as part of their armamentarium.

3.5.2 Success rates

The throughput rates of South African healthcare students (CHE, 2013) suggest that current selection criteria and academic support processes are relatively effective compared to those in other HE programmes. However, a 68% overall pass rate in five years for a four-year degree, with marked discrepancies between ethnic groups, is a low level for comparison. US figures (AAMC, 2012) of 90% pass rates (although the time period is unspecified), and a more even ethnic spread of graduation rates, imply that improvement is possible.

Even if current SA success rates were satisfactory, the pressure on healthcare training institutions to produce more practitioners with a better demographic match to the population, and a more even spread over disadvantaged communities, is likely to strain the system over time. Such pressures are universal, but more keenly felt in circumstances of strained resources.

Detailed longitudinal studies of health science students to determine the success rates of cohorts – percentages graduating in the standard time allotted for degrees – are sparse in the developing world. One small local study (Sommerville, 2012) followed a cohort of medical students through a five-year course. Of 202 in the first-year class, 147 (73%) passed in five years, another 43 (21%) passed eventually, and 12 (6%) dropped out or were excluded academically. The author notes that 22 students (11%) failed one year when the assessment format was changed at short notice. This illustrates the unstable platform on which improvements are based, and the need to interrogate the details of follow-up studies.

Throughput studies are impossible without identification of individual students to measure the time taken from admission to graduation. An alternative index of throughput is the graduation ratio – the percentage of all students registered for a degree who graduate in a given year. This assumes a steady intake over several years. Given this assumption, the graduation ratio for a three-year degree would ideally be 33.3% – i.e. all the third-year students complete their degree. Similarly, the ideal ratio for a six-year degree would be 16.7%. A constant failure rate each year would yield a constant number of graduates; this is why tracking each individual in an admission cohort to graduation is necessary for accurate evaluation.

3.5.3 Clinical success

Graduation numbers provide only a quantitative measure. They do not describe success in terms of the quality of the graduates' healthcare competencies. Here again, information is sparse. Completing the loop – relating selection criteria and student support measures to graduate outcomes – is a generally acknowledged shortcoming.

A thought-provoking study conducted in the US (Papadakis, 2005) traced back to their original medical schools doctors facing disciplinary action by their registering boards. Their undergraduate student records showed a higher incidence of 'unprofessional behaviour' or 'poor attitude'. (Poor academic performance was less strongly associated with future disciplinary action.) The authors suggest that the personal qualities of applicants for medical schools be assessed. The link between a student's interview score as an example, and behaviour during training and subsequent professional conduct may be tenuous, but limited evidence suggests that such links are discoverable and may be worth looking for.

More detailed follow-up of graduates into their fields of practice is needed, to attempt to match graduate attributes with input selection criteria. There is currently scant evidence that graduate attributes are influenced by identifiable characteristics at entry. This would require a long-term iterative process of prospectively following students through into practice, developing indices of 'appropriate', 'competent' or 'successful' practice, relating these to student characteristics at selection, adjusting criteria to select students with the desired characteristics, following them over a prolonged period, and refining the process. Desired graduate attributes that can be inculcated during the educational programme would also need to be fed back into the programme and followed up to assess the efficacy of the process. A start has been made on a long-term tracking process (Gillespie *et al.,* 2016); the number of studies arising from such a database is encouraging.

For South African HCE institutions, even the relatively straightforward selection of students on academic merit is fraught with difficulty, given the quality of the national senior certificate examinations. Taking ethnicity, social circumstances and geography into account adds further complexity. Attempting to discern which applicants might have the non-cognitive qualities that make for competent clinicians adds more imponderables. Interviews and similar 'soft' measures are viewed with some suspicion and their labour-intensive nature renders them difficult to implement.

Measurement of success rates is feasible but takes dedication and resources. Follow-up of graduates into the field of practice requires a tracking system, which raises considerations of ethics and feasibility.

In summary, it is apparent that additional input into selection and education processes is required to achieve equitable access and success. Once students have been selected and admitted, the important role of academic support has been established. The nature and extent of such support is not precisely quantified. However, extra input, whether by peers or staff and targeted to individuals or available universally, has been employed with documented success. Monitoring of individual progress is an essential part of support; here again, the detail of this monitoring, and of consequent interventions, requires further exploration.

These in-course provisions have implications for budgets and human resource requirements – although local experience (Essack *et al.*, 2010) suggests that the increased throughput justifies the increased expenditure. Given that many students take longer than the minimum time to complete their degrees (for example, CHE 2013; Pampallis, 2013; Scott, 2007; Sommerville, 2012), the financial and human resource implications of their delayed entry into the country's healthcare system are also noteworthy.

Barriers to selection and success include inequities that result in skewed demographics among school-leavers; variation in the quality of primary and high-school education; inequities in career guidance and basic information about access to HC degrees; availability of staff, finance and facilities at university level needed to conduct selection processes and academic monitoring, assistance and follow-up; and, resources and time to develop and test psychometrics to select students likely to become competent HC practitioners.

At first glance, enablers seem scarce. However, there are primary and secondary schools which, despite straightened circumstances, do provide quality education (Christie *et al.*, 2007). Umalusi (Ditaunyane, 2015) keeps watch over the integrity of South African senior certificate examinations, while some HCE institutions are attempting to elicit additional information to enable better selections, and a number have student monitoring and assistance programmes in place. The SA government acknowledges the need to address academic success in HE (Pampallis *et al.*, 2013); this includes the need for financial support; changes to undergraduate curricula with extended and foundation programmes; support for teaching staff development; use of educational technologies; mentoring; counselling; and improving student living conditions.

3.6 Reconceptualisation and implementation of HCE

There are two areas in which selection for HCE should be reconceptualised. One is the *quantitative* aspect of massification, which relates to the need for more HCPs, who should mirror the demographics of the population they serve. The other is the quality of the HCPs, relating to the service they provide and the communities they serve.

3.6.1 Quantity

Significantly increasing the number of graduates requires more training facilities. HCE is relatively expensive, due to its duration but also the high staff-student ratios needed to demonstrate and monitor clinical interventions. Greatly increasing admissions and throughput numbers necessitates corresponding increases in teaching and administrative staff numbers. The traditional arrangement of teaching hospitals in close proximity to HC education institutions is unable to cope with massification. Either constructing more facilities, or including peripheral hospitals, will be needed. Further construction would require input from the national fiscus – and/or setting up private institutions. Broadening the teaching platform would require increased cooperation between academic and provincial health departments, and reconceptualising the roles and responsibilities of employees. Selection of students attuned to learning and ultimately working in these community-based HC facilities will become increasingly important. (See also Chapters 5 and 9).

3.6.2 Quality

Benbassat and Baumal's (2007) extensive review on selection (for medical school) draws attention to the overlap between the numerical values obtained when correlating cognitive or non-cognitive attributes with performance in medical school. Even assuming that these attributes can be measured reliably, the question must be asked: whether the intention in measuring each attribute is, or should be, the same. Selection according to cognitive criteria (school-leaving or university entrance exam marks) appears more reliably to predict exam performance at medical school. Non-cognitive criteria may be expected to predict qualitative attributes, such as those of CanMEDS (HPCSA, 2014), which, while difficult to measure, are increasingly seen as important attributes of a 'good doctor'. This needs further research and the resources to pursue such selection criteria. Kreiter and Axelson (2013) in a review of 25 years of research on admissions, ask "who 'deserves' to be a physician?". From a South African perspective, we can assert that equity implies that all members of society deserve the opportunity. By contrast, the pursuit of academic excellence alone would imply that none deserve it but that each must earn their place, showing themselves academically worthy. We raise the question "who does society deserve to have serving it?".

Miller (1990) asserts:

> "It would be pointless to question the importance of knowledge, despite its transitory character. More important is that we demonstrate decisively through our testing procedures that knowledge alone will not be enough to succeed either in passing the examinations or in performing as a physician" (Miller, 1990: S67).

3.6.3 Selection logistics

Using diverse selection instruments is likely to increase demands on staff numbers, time and infrastructure. The basis on which selection is made will also need to be reviewed as the nature of disadvantage changes. The debate in South Africa on

what constitutes 'disadvantage' will no doubt continue. The rise of the black middle class and the growth of the white working class weaken the obvious link between ethnicity and disadvantage. Apart from public debates on the topic (Ncayiyana, 2012), there is already evidence that race-based and socioeconomically-based selection do not produce the same results (Waetjen, 2006). From what Powis *et al.* (1988) call the 'political' aspects of selection, one of the long-term effects of drawing in students from previously under-represented communities should be to increase their representation on the teaching staff and so provide role models. This entails commitment to review of selection policies at both student and staff level.

3.6.4 Throughput

In the shorter term, research is needed on the time course and academic performance of students currently passing through HCE programmes. Beyond the obvious planning considerations lie deeper deliberations. Efficiency of teaching and learning demands tracking each student so as to know in the aggregate how long students take to graduate.

3.6.5 Fitness for practice

To consider student selection from the viewpoint of excellence in practice is to take the long view. While cognitive skills are measurable and assessed at training institutions, the realm of practice is wider and more difficult to assess. What constitutes excellence in practice is often seen in qualitative rather than quantitative terms (GMC, 2015; Hitti, 2006; i-studentglobal.com, 2015; Jha, 2014; New Kids Centre, 2015). How to select students prior to admission to achieve the desired practitioner characteristics several years later is problematic (Simpson, 1978) – and largely under-researched (Kreiter and Axelson, 2013; Salvatori, 2001). Ferguson *et al*. (2002) found only two studies on this topic, which showed a weak correlation between admission scores and competence at intern level. To reiterate:

> "Although [grade point average] is the single best predictor of academic achievement, much of the variance in academic performance still remains unexplained. The relationship of GPA to clinical performance is even less clear. This means that other, perhaps non-cognitive variables such as work experience, interpersonal skills, motivation, maturity, empathy and ethical integrity are contributing to both academic and clinical performance outcomes" (Salvatori, 2001: 170).

South Africa is not alone in needing rigorous research on the long-term consequences of selection processes and criteria related to the qualities that society looks for in its HCPs. Not only alternative criteria, but alternative processes may be desired – for instance, enlisting community members to selection teams.

3.7 Recommendations

Universities should:

a Conduct rigorous research to determine what selection criteria and student support measures best predict student success and promote the attainment of the desired graduate competencies in the South African setting.

b Adopt evidence-based selection and admission criteria to ensure demographically and geographically representative student cohorts, taking due cognisance of the challenges within the secondary education sector.

c Institute academic and non-academic monitoring, development, support and mentoring programmes to translate access into retention and success.

Professional councils should:

a Introduce mandatory educational qualification, certification or professional development for health professional educators.

b Develop metrics of professional standards, and feed measurement results back into student selection.

The Department of Health should:

a Provide an expanded, appropriately staffed clinical training platform spanning rural and urban areas across all levels of healthcare.

The Department of Higher Education and Training should:

a Increase funding for academic development and support programmes at universities.

b Adequately fund students to ensure that access translates to retention and success.

According to the United Nations Educational, Scientific and Cultural Organisation (UNESCO) report:

"Universities are under a great deal of pressure to meet the complex and often contradictory expectations of the societies they serve. Prejudice, discrimination, and disadvantage did not begin within the university. Yet, the university is obliged to address these and other challenges embedded in diverse contemporary societies" (Altbach *et al.*, 2009: 39).

CHAPTER 4

Scaling up the Health Workforce

Key points

- Drastic action is needed to increase the production of HCPs by optimising production capacity in the public and private academic sectors and supplementation through international scholarship programmes.
- Professional bodies should ensure that their information systems reflect sufficient details around practice location and modalities to allow adequate health workforce planning.
- Greater use of ICT to reduce the need for classroom tuition could increase production and reduce costs.
- The clinical training platform needs to be expanded to include both public and private healthcare facilities.
- In the medium term, supplementation from abroad should be embraced and the process of recruitment and registration simplified.
- HRH policy and management should receive high priority with adequate resource commitment and systematic monitoring and evaluation of progress based on a key indicator set.
- Retention strategies for students and qualified HCPs should be incorporated into HRH policies and strategies.

4.1 Introduction

South Africa can no longer ignore its acute HRH crisis and applying the same thinking that precipitated this crisis will not solve the problem. To increase health workforce numbers in the short and medium term will require innovative solutions. Although this chapter focuses predominantly on strategies for scaling up health workforce *production*, it will also explore other relevant strategies such as improving health worker retention and supplementation from abroad. Medical practitioners, pharmacists and registered nurses receive most attention, although mid-level workers are briefly referred to in the context of task shifting. Dental practitioners are only mentioned briefly, as projections indicate that South Africa has enough dentists at present and will soon produce a surplus (DoH, 2011a).

The WHO HRH strategy (Crisp, 2008) to increase production of health workers comprises seven elements: building institutional capacity, reducing attrition rates, integrating pre-service and in-service education, developing common educational platforms for different types of healthcare workers, moving learning to the community, increasing the use of ICT and improving education through quality assurance systems. This chapter focuses on three of these elements – building institutional capacity; reducing attrition rates among students and faculty; and increasing the use of ICT. Other elements are dealt with elsewhere in this report.

4.2 Current South African situation

There is a lack of accurate data on the number of HCPs currently working in the various professions in South Africa. Professional councils provide absolute numbers of professionals registered to practise, but do not specify if they are in the country or active in their profession. Given that human resources-related costs make up 40.6 % of public sector expenditure in South Africa (Paton, 2015) and that salaries account for the highest percentage of operating costs (SHRM, 2008) the absence of quality data constitutes a major risk for strategic planning.

The 2006 World Health Report noted that a minimum threshold for workforce density exists, and that if this threshold is not achieved, the ability of a state to implement critical health programmes is seriously hampered. Flowing from this report, the WHO established the Global Health Force Alliance which recommended the establishment of the CCF mechanisms designed to bring together all stakeholders working in HRH at country level. This Alliance recommended the inclusion of numerous stakeholders in the CCF, including representatives from ministries of health, finance, education, labour, local government, public service commission/ agency, professional associations, training institutions, civil society (NGOs and faith-based organisations), private sector, development partners (multi-lateral and bilateral agencies working in budgetary support or project mode) and regulatory bodies (WHO, 2017). South Africa currently does not have a CCF that includes representation from all these stakeholders.

This limitation notwithstanding, the available data on the number of HCPs in South Africa indicate serious shortages across most healthcare professions when measured by the ratio of professionals per unit population or compared with statistics from the country's economic peers (See Chapter 10).

4.2.1 Production of HCPs

The DoH HRH Strategy 2012 to 2017 (DoH, 2011b) articulates the need for increased production of HCPs. It states that "health professional output from higher education institutions has been stagnant in most health science programmes for the past 15 years and planned growth has not taken place in relation to population growth and in relation to health need". Furthermore, the DoH Workforce Model developed in 2010 identified shortages in most categories of health professions (DoH, 2011a). The current numbers of dental practitioners, technicians and therapists were considered to be sufficient to meet current needs and forward projections showed a potential surplus. Enrolled nurses were the only category of HCP where current numbers substantially exceeded demand.

The DoH HRH Strategy 2012 to 2017 (DoH, 2011b) also benchmarked the availability of HCPs per 100 000 of the population against other middle-income countries, showing that South Africa lags far behind its peers. When benchmarked against Brazil, South Africa has a shortage of 60 000 medical practitioners (DoH, 2011b). In the period 1999 to 2006, there was an average of around 550 new doctors registering with the HPCSA annually. This means that if the population growth rates remains stable with the current in-country production capacity it would take more

than 100 years to achieve parity with Brazil in terms of the number of doctors/100 000 population (Breier, 2009). The percentage of GDP spent on healthcare also plays a major role in determining the professional mix of healthcare delivery. Most countries that spend an equivalent percentage of GDP on health compared to South Africa (8-10%) opt for doctor-driven primary healthcare systems, while those that spend less opt for nurse or mid-level worker-driven systems *(WHO, 2008)*.

South Africa has a two-track healthcare system – a private track, funded through voluntary health insurance and a public track funded from tax revenues. This two-track system is also reflected in how primary care services are organised in South Africa. The private sector is doctor-driven model, while the public sector has a nurse-driven model. Given the impact that healthcare system design has on production of HCPs there is an urgent need for South Africa to develop clarity on the future model for primary care provision, whether doctor or nurse-driven. This is particularly important in the context of the policy decision to move to an NHI funding model. Internationally, NHIs are often based on a doctor-driven primary care provision model and this may be the intention, given that the DoH since 2014 has been contracting general practitioners to provide services in public sector PHC clinics in NHI Pilot Districts (DoH, 2014).

Irrespective of whether the primary care services in future will be doctor or nurse-driven, South Africa, with 2.8/10 000 medical practitioners and 28.5/10 000 nurses (DoH 2011a) is under-resourced with regard to doctors, registered nurses and pharmacists when compared to middle-income countries (Tables 4.1 and 4.2).

Table 4.1: Ratios of core healthcare professionals by country income group and WHO regions

Density of health workforce (per 10 000 population)					
Income Category	**Physicians**	**Nursing and Midwifery Personnel**	**Dentistry Personnel**	**Pharmaceuti-cal Personnel**	**Psychiatrists**
Low income	2.4	5.4	0.3	0.5	<0.05
Lower-middle income	7.8	17.8	1.2	4.2	0.1
Upper-middle income	15.5	25.3	...	3.1	0.2
High income	29.4	86.9	5.8	8.4	1.0
Global	14.1	29.2	2.7	4.3	0.3

Source: Essack, 2012

Table 4.2: Average health worker statistics/100 000 population, 2011

	Medical Doctors	Nurses	Pharmacists
South Africa	28	293	8
Brazil	172	650	54
Russia	431	852	8
India	60	130	52
China	142	138	25
Argentina	316	48	50
Chile	109	63	-
Costa Rica	132	93	53
Colombia	135	55	-
Korea	197	53	12
Singapore	183	590	37
Thailand	30	152	12
Vietnam	122	101	32

Source: Essack, 2012

Although the total number of nurses per 100 000 population is in line with international comparisons for middle-income countries, the mix of nursing categories is not ideal, as there has been a steady decrease in the proportion of the more highly qualified registered nurses (RN) registering with the South African Nursing Council (SANC). Currently only 16% of new registrations are RNs and should this trend continue, RNs will fall from 50% of the profession in 2009 to 37% in 2020. The Strategic Plan for Nurse Education, Training and Practice 2012/13 to 2016/17 states, "RNs are older than the other categories with 43.7% being over 50 years old and retiring at a rate of 3 000 per year for the next 10 – 15 years. Training and retaining RNs needs urgent attention given the need to improve skills and improve healthcare access with the introduction of NHI and the re-engineering of PHC" (DoH, 2013).

Production is predominantly via public sector academic institutions. The private sector has, however, contributed substantially to the training of nurses (through bridging programmes) and pharmacy assistants.

Some of the key reasons for the inadequate production of HCPs in the clinical disciplines are (DoH, 2011b):

a Shortages of clinicians and therefore clinical teachers due to a freezing of posts. According to the HPCSA, 591 (30%) of the accredited academic posts for medical specialists were unfilled or unfunded in 2010 (DoH, 2011b). The appointment of clinicians at academic complexes relies on funding from provincial health departments.

b The clinical training platform is mainly hospital-based and subject to budget and infrastructure shortages that plague public-sector facilities. This limits the number of students that can be trained.

c Poor human resource management at academic health complexes also has an impact on staffing, for example, conflict between the chief executive officer of one of the larger academic hospitals and academic staff was blamed for an exodus of 20 senior teaching staff (Myburgh, 2014).

Current government strategies have set production targets aimed at increasing the health professional to population ratios. The National Strategy for Nursing Education, Training and Practice 2012/13-2016/17 sets a target of 560 registered nurses per 100 000 of the population by 2020. If these targets are met it will align South Africa with its economic peers. The DoH HRH Strategy 2012/13-2016/17 (DoH, 2011b) sets a less-ambitious target for 2015 of 387 registered nurses per 100 000 population. Both these targets are, however, higher than the ratios reported by the WHO for upper-middle-income countries and are closer to the high-income country average of 869 per 100 000. The ratios to be achieved for doctors by 2025, included in the DoH HRH Strategy, of 36.6 per 100 000 would be more in line with low-income countries and falls far short of the upper-middle-income country ratio of 155 per 100 000. Projections for medical specialists have set a target of 28.5/ 100 000.

4.2.1.1 Medical practitioners and medical specialists

Production of medical practitioners in South Africa takes place entirely in public-sector universities and includes a two-year practical internship after graduation. Table 4.3 shows medical school graduates for the period 2000 to 2014.

Table 4.3 Number of MBChB graduates, 2000-2014

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
UCT	134	162	167	155	159	150	185	160	164	170	188	170	184	181	171
UFS	110	115	109	88	167	106	105	129	109	99	108	115	99	113	137
UKZN	90	116	132	165	178	298	201	189	224	176	194	183	216	211	[b]28
UL	235	245	243	283	238	294	239	200	153	141	169	142	175	136	182
UP	203	212	203	184	180	197	207	198	200	208	202	209	222	227	239
SU	140	140	129	177	148	150	170	149	167	180	162	177	175	182	175
WSU	26	43	48	56	119	69	89	97	103	88	83	94	71	115	26
Wits	193	192	181	188	205	247	170	175	189	193	223	210	193	181	212
TOT	1131	1225	1212	1296	1394	1511	1366	1297	1309	1255	1329	1300	1335	1346	1170

Source: DHET (HEMIS Database, 19 November 2015: Mr Jacques Appelgryn)
Notes: The reason for the decline in 2014 at some of the universities is the move from the five-year to six-year programme

Until recently, South Africa had eight medical schools, with the last being established in 1977 when the population was 22 million (Bateman, 2013). Since then government attempts to increase the number of medical graduates have mainly comprised the introduction of the Mandela-Castro Programme. This initiative, which started in 2005, recruits students from disadvantaged communities who study for five years in Cuba and then return to South Africa where they complete 12 to 18 months of local orientation before sitting final year medical school exams at South African

medical schools. On completion of their internship, students are required to work in the public sector, in their district of recruitment, for a further five years. The number of students sent to Cuba for training has historically been around 100 per year but this number was increased several fold in the past few years. According to the DoH the intention is to reduce the number of students sent abroad in line with envisaged increases in intake at local universities. Additional measures taken by government to address the shortage of doctors have been the recent creation of a new medical school at the University of Limpopo (UL) and planning for a further medical school at the Nelson Mandela University (NMU).

As far as specialist and sub-specialist training is concerned the lack of funded HPCSA-approved training positions linked to academic complexes presents a significant challenge. HPCSA data from 2010 (Tables 4.4 and 4.5), show that 38% of registrar and 75% of sub-specialist training positions are unfilled (DoH, 2011b). While specialist training in the private sector is not allowed, up to one year of the four or five years' workplace experience a registrar must acquire can be spent in private practice. This time is usually used to gain access to technology not available in the public sector.

Table 4.4: Number of HPCSA-approved registrar training posts 2010

Faculty	UCT	SU	Wits	UP	UKZN	UFS	UL	WSU	Total
Vacant	148	63	210	126	433	56	148	169	1 353
Filled	299	287	568	260	436	214	159	6	2 229
Total	**447**	**350**	**778**	**386**	**872**	**270**	**307**	**175**	**3 582**
% Filled	67%	82%	73%	67%	50%	79%	52%	3%	62%

Source: HRH Strategy 2012/13 to 2016/17
Note: HPCSA sites visits were undertaken between 2008 and 2010

Table 4.5: Number of HPCSA-approved sub-specialist training posts vacant and filled by faculty, 2010

Faculty	UCT	SU	Wits	UP	UKZN	UFS	UL	WSU	Total
Vacant	49	62	59	69	42	29	43	27	380
Filled	29	24	53	0	8	2	0	0	116
Total	**78**	**86**	**112**	**69**	**50**	**31**	**43**	**27**	**496**
% Filled	37%	28%	53%	0%	16%	6%	0%	0%	25%

Source: HRH Strategy 2012/13 to 2016/17
Note: HPCSA sites visits were undertaken between 2008 and 2010

4.2.1.2 Nurses

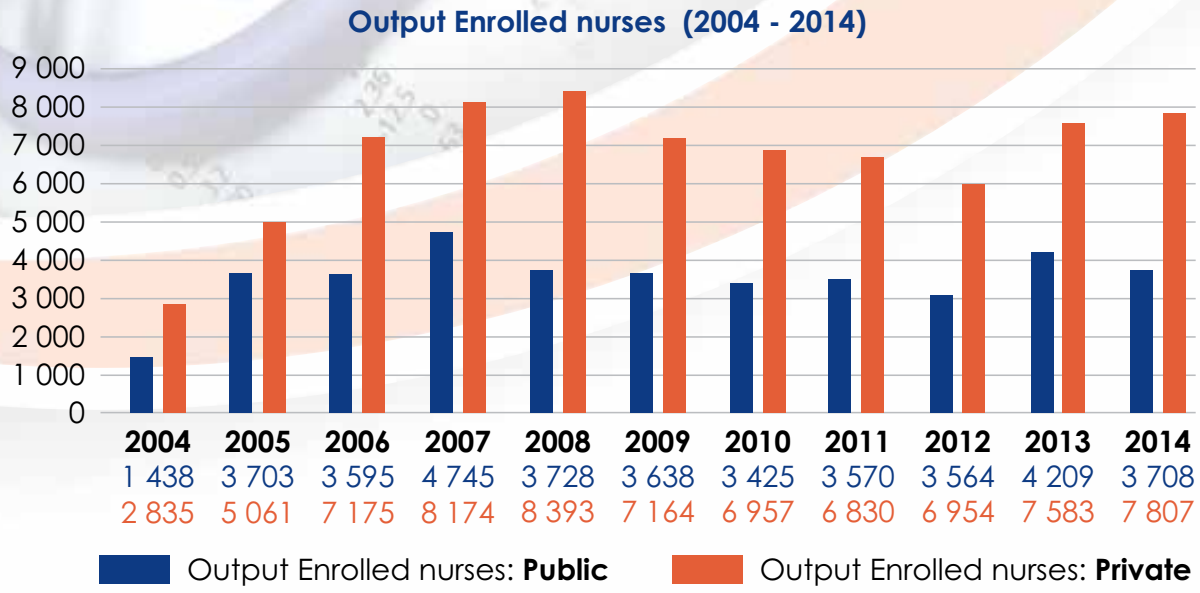
South Africa produces a number of categories of nurses, ranging from RNs, who have completed a four-year diploma or degree qualification either through a university or a nursing college, to enrolled nurses who have completed two years of study and enrolled nurse auxiliaries with one year of study. Two-year bridging programmes exist that allow enrolled nurses to upgrade their qualification to that of a general or psychiatric nurse. Although bridging programmes do not increase the total numbers of nurses, they convert a lesser-qualified category of nurse, of which

there is a surplus, to a higher-skilled professional, which is in short supply (Wildschut and Mgqolozana, 2009). These qualifications, referred to as legacy qualifications, are being phased out to be replaced by a four-year Bachelor's degree in nursing (professional nurse and midwife), a three-year diploma in nursing (staff nurse) and a one-year higher certificate in nursing (auxiliary nurse).

Figures 4.1 to 4.4 indicate the number of nurses across all categories that have completed training in recent years. Production of RNs through university degree programmes has steadily increased from 360 in 1996 to 629 in 2010. However, only 25% of professional RNs, completing a four-year qualification between 2004 and 2013, received their qualifications at universities (DoH, 2013).

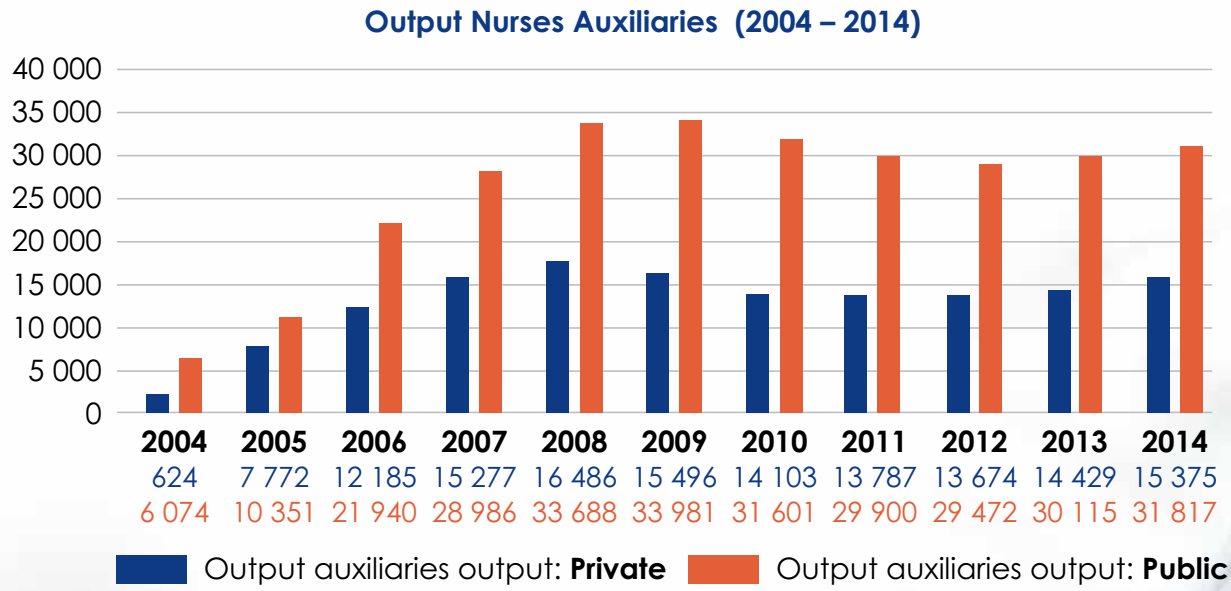
The total production of RNs declined between 2000 and 2006 due to the rationalisation and subsequent closure of state-owned nursing colleges in the late 1990s (DoH, 2013) This decision was overturned in 2005. The number of RNs produced by these colleges has since increased steadily, but has only recently returned to pre-2000 output levels.

Notably, the bulk of the increase in RNs between 2004 and 2013 has been through bridging programmes offered in public (15 591) and private (11 430) sector academic institutions. Although training within private academic institutions linked to hospitals is acknowledged to be of high quality, concerns have been raised about quality in a large number of small private nursing colleges. Nursing colleges and schools do not fall under the ambit of the Higher Education Act and are not subjected to the quality assurance framework. There are, however, a small number of private nurse training institutions that have accreditation with the Council on Higher Education that have been licensed to offer undergraduate nursing diplomas and, in one case, a postgraduate diploma (DoH, 2013). From 2020, all undergraduate and postgraduate nursing programmes must be aligned with the Higher Education Qualifications Framework and be accredited by the CHE.



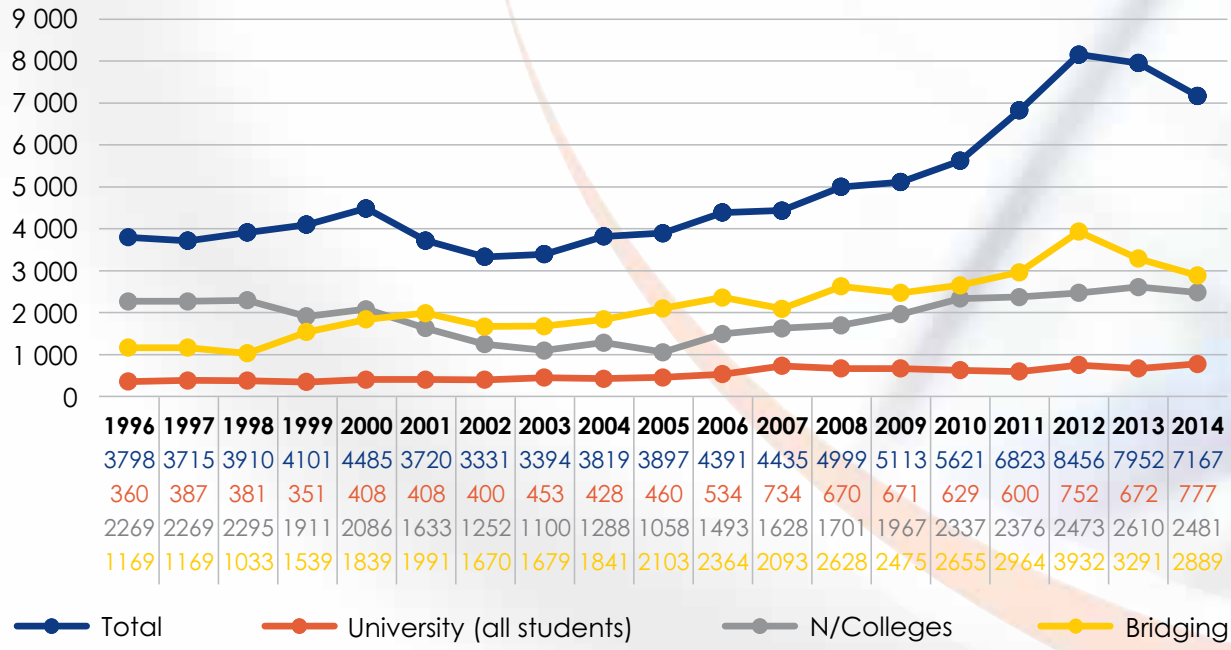
Source: SANC, 2015

Figure 4.1: Production of enrolled nurses in the public and private sector



Source: SANC, 2015

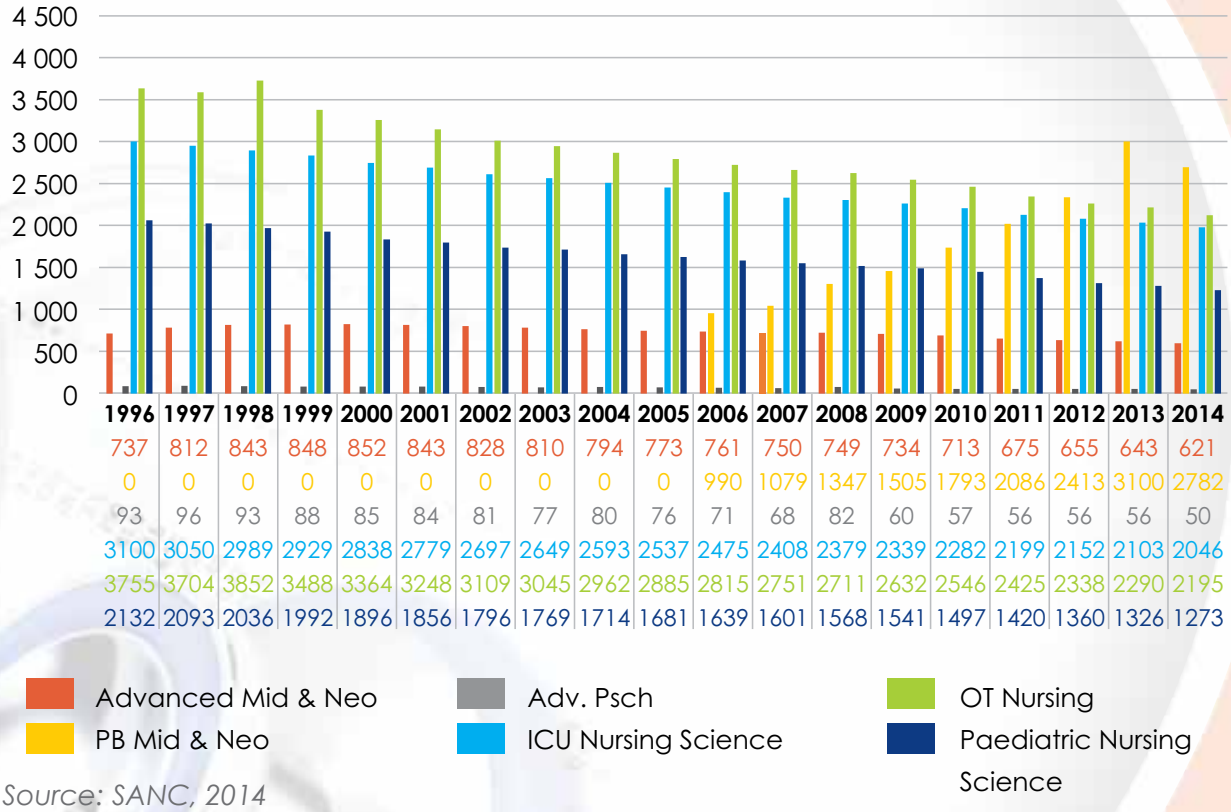
Figure 4.2: Production of auxiliary nurses in the public and private sector



Source: SANC, 2015

Figure 4.3: Production of registered nurses 2004 – 2014

Specialist nurses are trained mainly in public-sector academic institutions. The numbers appear to be in decline, except for midwifery and neonatal care. This is a serious concern as the NHI system and the re-engineering of PHC require nurses with specialisations in primary healthcare, school health and community health.



Source: SANC, 2014

Figure 4.4 : Nursing specialists qualifications 1999 to 2014

4.2.1.3 Pharmacists

Training of pharmacists is provided by eight pharmacy schools approved by the South African Pharmacy Council (SAPC). Their training consists of four years of full-time study, which leads to the BPharm degree, followed by a 12-month practical training as an intern in a SAPC-accredited pharmacy. During this year, the intern gains valuable practical experience and knowledge while working under the direct supervision of a qualified pharmacist (SAPC, 2014).

Following successful completion of internship and pre-registration evaluation, the intern is registered as a pharmacist by the SAPC. It is compulsory for all registered pharmacists to do one year of community service in a public-sector facility before they can practise independently. All the pharmacy schools, operating at full capacity, annually produce fewer than 400 pharmacists (SAPC, 2014). The number of pharmacists registered with the Pharmacy Council is shown in Figure 4.5 and Table 4.6. Only 43% of qualified pharmacists work in retail pharmacies, 35% work in private and state hospitals, while the remaining 22% work in wholesale, research, academia and professional administration.

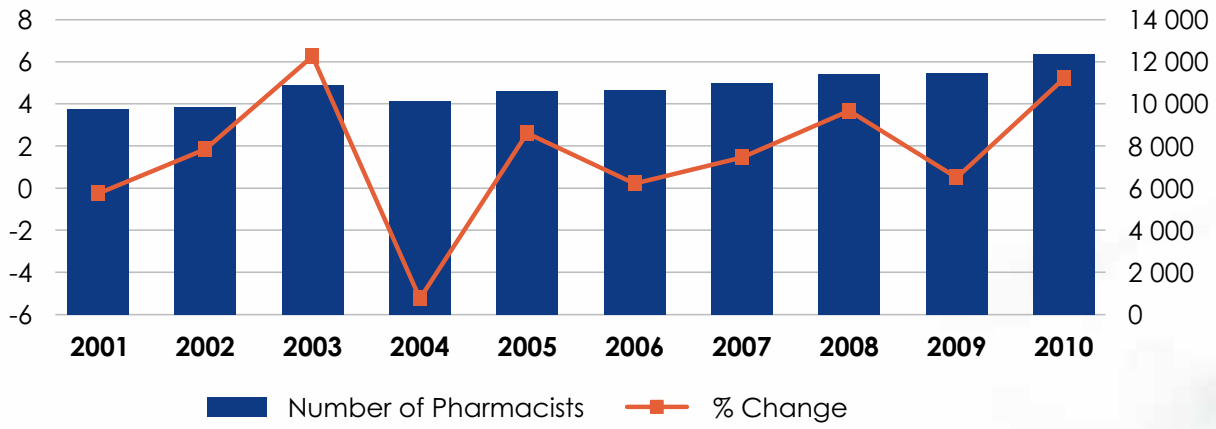


Figure 4.5: Increase in the number of registered pharmacists from 2001-2010

Table 4.6: Pharmacists registered with the Pharmacy Council in 2014

Province	Pharmacist Intern	Community-service Pharmacists	Pharmacist	Specialist Pharmacist	Total
Eastern Cape	90	94	1 551	0	**1 735**
Free State	19	44	440	0	**503**
Gauteng	263	125	4 704	5	**5 097**
KwaZulu-Natal	168	94	1 903	0	**2 165**
Limpopo	65	56	525	0	**646**
Mpumalanga	43	60	570	0	**673**
North West	101	51	628	1	**781**
Northern Cape	6	39	181	1	**227**
Unknown	6	3	795	3	**807**
Western Cape	113	46	2 198	2	**2 359**
Sub-totals	**874**	**612**	**13 495**	**12**	**14 993**

Source: SAPC (2015)

4.2.1.4 Pharmacy Assistants

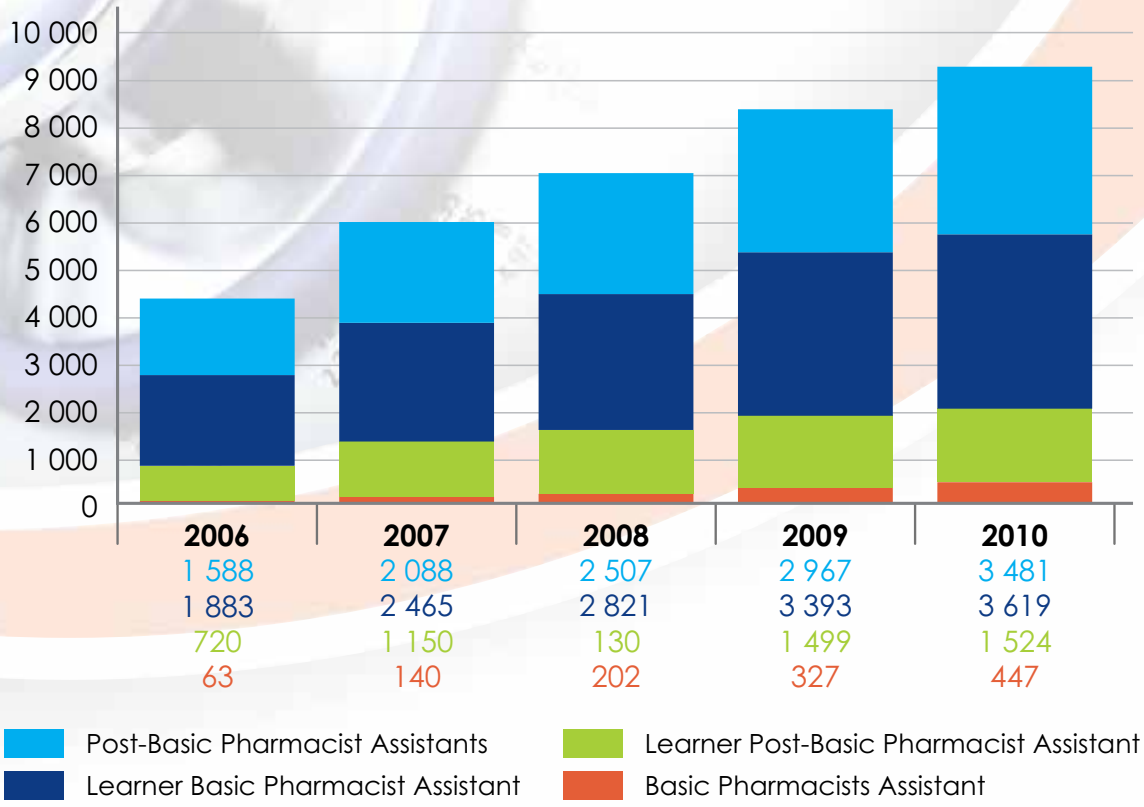
Pharmacy assistants (PAs) are mid-level workers who have become indispensable in the public sector, given the acute shortage of pharmacists. The numbers of registered PAs and PAs in training are shown in Figure 4.6.

The training of this cadre of health worker will be phased out with last date of enrolment being 30 June 2018. The PA qualification has two levels – Basic PA (National Qualifications Framework [NQF] level 3) and Post-Basic PA (NQF level 4). The qualification is provided in four sectors: i) community (retail pharmacies), ii) institutional (hospital pharmacies), iii) wholesale, and iv) manufacturing. Training takes 14 months with compulsory contact classes of 35 days (SAPC, 2014).

A new three-year higher education qualification of pharmacy technician is envisaged to replace the PA. The pharmacy technician will be able to operate more independently. Currently, pharmacy technicians are trained in a full-time course offered by only the NMU. These learners gain practical experience in an accredited pharmacy for six months as interns, prior to registration with the SAPC.

The advantage of the current PA training programmes is that both qualifications are taught as an apprenticeship and predominantly through distance education. This makes the course affordable and accessible for rural students, who from year one usually receive a stipend from the state. As these courses are not considered formal higher education qualifications they can be offered by FET institutions accredited by the Pharmacy Council, rather than higher education institutions, allowing a number of public and private sector entities to offer this qualification. The rapid growth in the number of PAs (Fig. 4.6) shows the appeal of this programme.

By contrast, the envisaged pharmacy technician programme will be longer, more expensive and will be offered at a much higher NQF level, as it is a formal higher education qualification. Although the Pharmacy Council has, in principle, agreed to a distance version of this course the most likely model will be as a resident course at mainly urban campuses. There is concern that the decision to replace the current PA programme with a university-based technical qualification may have adverse consequences similar to the decision to close nursing colleges in the late 1990s alluded to earlier in this chapter.



SAPC, 2014; HRH Strategy

Figure 4.6: Pharmacy assistants and learners (all categories) registered with the SAPC

4.2.2 Maldistribution in relation to modes and geographical location of practice

The preponderance of skilled HCPs based in the private sector compared to the public sector is a major challenge given that only 17% of the population have private medical insurance (CMS, 2014). However, simply comparing insured versus uninsured populations and then extrapolating access to HCPs on this basis, is probably incorrect because it does not take account of out-of-pocket payments for private care. It has been estimated that up to 35% of the population annually make use of private primary care doctors paying for this service either through their insurance or out-of-pocket payments.

There is a lack of data on the actual numbers of HCPs working in the public and private sectors. The HRH Strategy 2012 to 2017 found large discrepancies between the numbers of HCPs working in the public sector reported respectively by the DoH and Treasury (DoH, 2011b). Despite the unreliability of data it is generally assumed that there is a misdistribution of most categories of skilled HCPs between the public and private sector.

Analysis that compares the number of HCP graduates, over a given period, with the increase in the number of new appointments in the public sector indicates that retention in the public sector is relatively poor. The methodology has obvious weaknesses as it does not track individual graduates but merely compares graduate output with total new appointments in the public sector in a given year, irrespective of when such graduates qualified (Table 4.7).

Table 4.7: Retention of HCP graduates in the public sector, 2002-2010

2002 – 2010				
	Graduate Output	Public Sector Increase	Retention Gap	Retention Gap %
MBChB	11 700	4 403	7 297	62.4%
Dentistry	2 140	248	1 892	88.4%
Pharmacy	3 645	1 960	1 685	46.2%
Physiotherapy	2 934	497	2 437	83.1%
Occupational Therapy	1 827	410	1 417	77.6%
Speech-language Pathology and Audiology	1 413	265	1 148	81.2%
Dietetics	657	502	155	23.6%

Sources: DHET and National Treasury, 2010

Urban-rural maldistribution of HCPs is a further challenge (See Chapter 5). The WHO states that 46% of the South African population lives in rural areas, while only 12% of doctors and 19% nurses practise in a rural setting (Araújo and Maeda, 2013).

Regardless of the numbers of professionals trained, the shortages remain acute. Increasing numbers of HCPs may address national averages, but does not address the maldistribution that results from the internal migration pipeline: doctors, in par-

ticular, move from rural to urban areas, primary care to tertiary care, generalisation to specialisation, and public to private sector (Awases *et al.*, 2004; Joint Learning Initiative, 2004). The trickle-down concept, which involves training increasing numbers of HCPs with the hope that the pressure of employment opportunities will lead to HCPs moving into what are seen as less-attractive positions, is costly and inefficient and has failed, largely because of the capacity of the international market to absorb large numbers of graduates, and the numbers of HCPS leaving their professions. Specific retention strategies are needed.

4.2.3 Attrition

Loss of HCPs from the health system can occur from attrition at various points: i) during undergraduate studies, ii) on completion of studies prior to embarking on a career, iii) during career and, iv) through retirement.

Attrition during studies appears to be around 11% for medical students across all years of study, with higher percentages in the first two years. These data originate from a limited study at one medical school conducted between 1994 and 1999 (Lehmann and Sanders, 1999). For nursing students attrition appears to be substantially higher than for medical students, around 50% (DoH, 2013). The rate is in keeping with high attrition rates in general at universities in South Africa (CHE, 2013). Reasons for attrition include poor academic performance, dissatisfaction with the profession, personal problems, financial problems, health problems, dissatisfaction with the quality of training and pregnancy (Breier *et al.*, 2009; Pryjmachuk *et al.*, 2008). While there is no specific penalty for student attrition in South Africa, universities do forfeit the state output subsidy paid to the institution when students successfully graduate.

Attrition on completion of studies prior to commencing a career is limited for medical students, as most who complete studies go on to do their practical internship year. An analysis of the student graduation numbers from 2000 to 2008 shows that 11 745 students graduated and between 2001 and 2009 the number of registered interns was 11 738 (AHP, 2015). There is, however, significant attrition between completing internship and starting community service. Over the period 2000 to 2014, on average 11% of newly qualified doctors who completed their internship did not report for community service (AHP, 2015). Attrition among South African medical graduates occurs mainly through emigration and leaving the profession. The attrition rate among nurses completing studies and not registering as professional nurses with SANC is estimated at 40% (DoH, 2013).

Attrition during career occurs as a result of emigration, death and disability, retirement and career change, and is estimated to be about 25% per annum (DoH, 2011b). High HIV-prevalence rates in South Africa also have an effect on attrition. A Human Sciences Research Council (HSRC) study found that an estimated 15.7% of health workers employed in the public and private health facilities in four South African provinces were living with HIV/AIDS in 2002. The National Strategy for Nursing Education, Training and Practice 2012/13-2016/17 estimates that 18% of professional nurses on the SANC register are not actively working (DoH, 2013). Emigration seems to be a significant factor in attrition during career, however, there is a lack of reliable data.

4.2.4 Alternative strategies employed to address HRH shortages in the public sector, other than increasing production

A number of strategies have been launched by government to address shortages, especially in the public sector. These have included:

a **Community service:** The programme started with medical practitioners in 1998 and was progressively expanded to other HCPs. This programme which is discussed further in Chapter 9 has progressively increased the number of new graduates available to the public sector.

b **Expansion of mid-level worker categories** included the introduction in 2008 of a new mid-level worker training programme for clinical associates, with the first graduates joining the industry in 2011. Clinical associates are trained at the University of Pretoria, University of the Witwatersrand and Walter Sisulu University. Students graduate with a three-year Bachelor's degree and their scope of practice is designed to meet the needs of a district hospital (Clinical Associates, 2011). Clinical associates practise under the supervision of medical practitioners whom they assist in performing diagnostic and therapeutic procedures, in-patient and emergency care. They are also expected to have consultation, physical examination and counselling skills. They join a number of other mid-level workers including PAs and auxiliary social workers.

c **Supplementation with recruitment from abroad** includes strategies to recruit foreign doctors to work in underserved areas and the introduction of scarce skills and rural allowances. Country to country agreements to recruit foreign qualified doctors exist with Cuba, Tunisia and Iran. Data from 2015 (Table 4.8) showed that there were at least 5 535 foreign-qualified medical practitioners registered with the HPCSA, of whom the majority are assumed to be working in the public sector. Not included are possible foreign-qualified doctors who may form part of the 4 271 doctors with unknown nationality on the register. South Africa's rural healthcare system is heavily reliant on the few foreign-qualified doctors (Kornik, 2012).

Table 4.8: Nationality of all medical practitioners registered with the HPCSA, November 2015

Nationality	Total	Nationality	Total	Nationality	Total
American	62	French	3	Portuguese	7
Angolan	10	German	99	Republic of Congo	22
Arabian	18	Ghanaian	57	Romanian	5
Argentina	4	Greek	11	Russian	24
Australian	30	Hungarian	2	Rwandese	20
Austrian	14	Indian	169	Sierra Leona	17
Bangladeshi	61	Iranian	16	South African	33 676
Belarussian	1	Irish	19	Spanish	9
Belgian	77	Israeli	11	Sri Lankan	8

Nationality	Total	Nationality	Total	Nationality	Total
Botswana	82	Italian	10	Sudanese	12
British	424	Japanese	2	Swazi	36
Bulgarian	20	Jewish	1	Swedish	19
Burmese	7	Kenyan	68	Swiss	6
Burundi	5	Korean	4	Tanzanian	29
Cameroonian	22	Lesotho	67	Tunisian	38
Canadian	48	Liberian	66	Ugandan	107
Chinese	15	Malawian	42	Ukrainian	4
Congolese	182	Mauritius	55	Unknown	4 271
Cuban	314	Mozambican	5	Uruguayan	1
Czechoslovakian	2	Namibian	97	Zaire	170
DRC	288	Netherlands	33	Zambian	69
Danish	3	Nigerian	612	Zimbabwean	283
Dutch	88	Norwegian	5		
Egyptian	10	Pakistani	91		
Eritrean	8	Palestinian	2		
Ethiopian	17	Polish	65	Grand Total	42 257

Source: HPCSA Department of Statistics and Data Analysis (2015)

d **The certificate of need** as contained in the National Health Act gives the Director-General of Health the power to deny doctors operating licences depending on where in the country they wish to practise. Although this was signed into law in May 2015 it was rapidly withdrawn after strong opposition from professional associations (Gonzalez, 2014).

4.3 Key findings from the global literature

4.3.1 International experience with building institutional capacity and increasing production

According to the WHO Taskforce for Scaling Up Education and Training for Health Workforce 2006 (Crisp, 2008) there is an estimated shortage of around 4.3 million healthcare workers globally affecting the majority of countries including developing countries although some developing countries (e.g. India, China and the Philippines) over-produce HCPs to create a surplus that will move abroad and support the local economy through remittances (Henderson and Tulloch, 2008).

The WHO Taskforce proposed an approach to address the acute shortages in skilled HCPs that focuses on three areas:

a Production of ten-year national scale up plans to rapidly increase community and mid-level workers who will be trained, paid and supervised parallel to scaling up HCP cadres.

b Curricula that are focused on health needs of the country and are community and team-based *drawing on the resources of the public and the private sectors* and the skills of international partners and that use innovative means to increase training capacity such as ICT and regional approaches.

c Development partners and international organisations providing comprehensive and sustained support (Crisp, 2008).

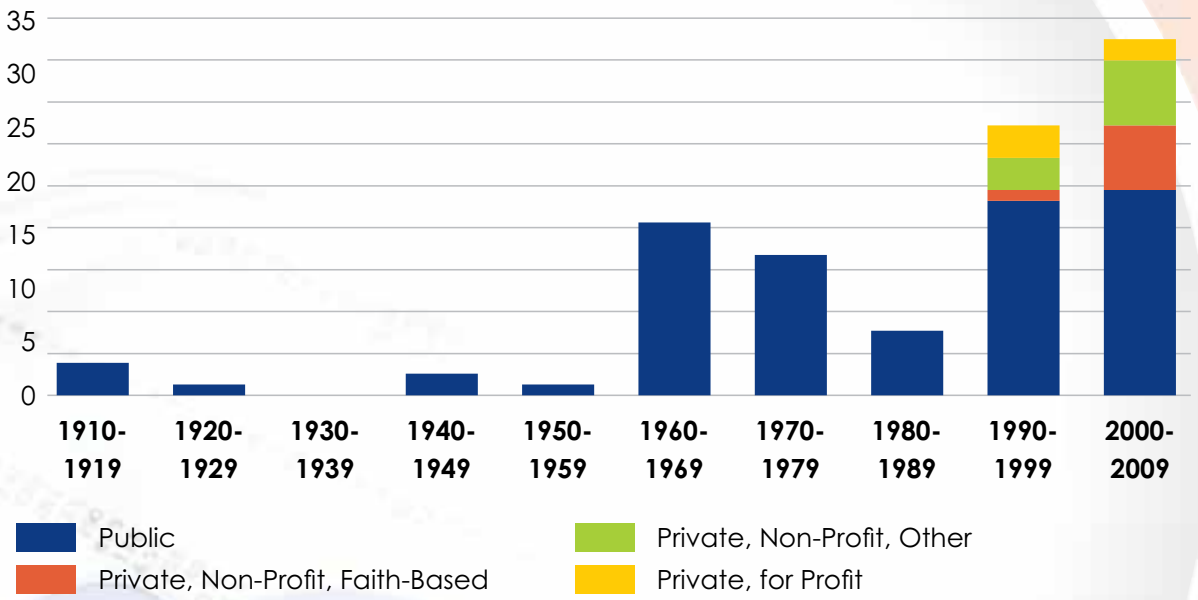
This approach argues for increased production linked to political leadership, collaboration between the public and the private sector, effective workforce planning, sensible policies around foreign recruitment and attention to retention and distribution. The health workforce also needs to be deployed in a system with *competent and trained managers* who use reliable information sources to monitor HRH needs and deployment (Crisp, 2008).

4.3.1.1 Increasing the number of academic institutions

A number of countries have scaled up production by establishing more academic institutions. The approaches used include establishing new government-funded institutions, encouraging the private sector to establish new institutions or a combination of both. Brazil has followed a combination of all these options and has increased access to tertiary education to 30% of the population, with a third of students studying through the private sector (Redden, 2015). Since the 1990s there has been increasing deregulation in the higher education market, allowing entry of private-sector providers and, as a result, in South America and Asia the majority of medical schools are now privately owned.

Private-sector models range from non-profit models, often linked to faith-based institutions, to purely for-profit models. In high-income countries the role of the private sector varies, with the USA having a long tradition of both private (for-profit and not-for-profit) and public academic institutions. Other developed countries with this combination include Austria, Australia, Belgium, France, Germany, Ireland, Italy, Japan and Spain (World Directory of Medical Schools, 2015). Based on the *World Directory of Medical Schools* at least 93 countries (50%) have privately owned medical schools.

The most comprehensive data from Africa comes from the Sub-Saharan Medical School Survey (SSMSS) from 2009 (SAMSS, 2014) which shows that both the total number of medical schools and the overall number of students enrolled have increased dramatically since 1990 (Fig. 4.7). This survey identified 149 medical schools in 40 countries with 44 privately owned. In the 20 years since 1990, 58 new medical schools were established all with doctor-training programmes. A number also train medical specialists and other HCPs with 46% being privately owned. The increase has been accelerating since 2000, with 33 new schools established, of which 14 are privately owned. The private ownership models included: seven medical schools owned by faith-based organisations (private non-profit), ten owned by NGOs (private non-profit) and seven for-profit.



Source: SAMSS, 2014

Figure 4.7: New medical schools by decade of being established and ownership

Based on the survey, the number of students enrolled in first-year medical studies remains relatively small, with 39% of respondents reporting first-year enrolment at or below 100 students. However, 45% were planning to increase intakes within the next five years and 58% reported having mandates for expansion, usually from ministries of education and health (Chen *et al.*, 2012).

In countries where universities have historically been state-run, the entry or possible entry of private institutions, often triggers debates and concerns about the quality of graduates, cost of tuition fees and fears that such institutions would recruit scarce academic faculty from public medical schools. In India, where 194 out of the 356 medical schools are privately owned and where 72% of the new intake slots created since 2000 have been in the private sector (Davey *et al.*, 2014), serious concerns have been raised about staffing norms, availability of infrastructure, tuition fees and quality of students produced (Chen *et al.*, 2012).

The quality of graduates produced is directly linked to the quality of regulatory oversight, including accreditation and quality assurance measures (SAMSS, 2009). The better these are, the better the quality of the graduate, irrespective of whether the institution is in the public or the private sector. South Korea, which has responded to the need to increase production by following a predominantly private-sector approach (31 out of 40 medical schools are private-sector based) (Kim and Kee, 2010) has a well-regulated system with no apparent difference in the quality of graduates. The curriculum is standardised across schools, and online learning resources are shared through the Consortium of e-Learning in Medical Education. Quality assurance is ensured by the Korean Institute of Medical Education and Evaluation (KIMEE) which evaluates (1) the school's administrative system, (2) educational objectives and the curriculum, (3) student support, (4) faculty, (5) educational facilities, and (6) postgraduate education (Kim and Kee, 2010).

To prevent poaching, India has introduced restrictions that prevent private medical schools from employing public-sector academics prior to them retiring (Davey *et al.*, 2014).

4.3.1.2 Increasing productivity of existing institutions

Globally, academic institutions are required to increase production in a reality of stagnant or decreasing funding (Cota *et al.*, 2011; Eley *et al.*, 2008; Moodie *et al.*, 2002). This can only be achieved through improving productivity, which implies increasing output (graduates) while curtailing costs.

A review of USA colleges with productivity rates 60% higher than average, found that they shared a number of organisational characteristics including: i) well-functioning operational management systems, ii) policies that encouraged ongoing improvement in efficiency; and, iii) management and academic staff who combined good academic practice with good management (Cota *et al.*, 2011).

Internationally, strategies to boost productivity include:

a *Creating a policy environment that requires academic institutions to track productivity indicators.* McKinsey argues that the best indicator of how effectively an academic institution uses its resources is the cost per degree, calculated by dividing total annual costs by the number of degrees awarded. This indicator tracks two important indicators of academic institution productivity: cost efficiency and completion rates.

b *Improving student completion rates.*

c *Using information technology to reduce cost* (Worthington and Lee, 2005). This includes library services, learning materials, online registration, distance education and online multi-campus teaching.

d *Centralising study material development.*

e *Revamping the academic calendar to increase teaching time* usually with increased salaries.

f *Improving efficiency in support services* through greater use of technology allowing an improvement in the ratio of students to support staff.

g *Using academic staff to teach across disciplines and faculties.*

h *Differentiation between academic institutions based on teaching and research.*

4.3.1.3 International scholarship programmes

Increasingly countries are supplementing local production capacity through large, government-operated scholarship programmes (British Council, 2014; David and Rosen, 2003). South Africa has actively pursued this option by sending students to Cuba (Kritz, 2013).

4.3.1.4 Deregulate the market for international competitors

Cross-border trade liberalisation of higher education has been a highly contested political issue across all international, regional and bilateral trade liberalisation negotiations, with proponents arguing for the economic growth benefits of open markets and opponents expressing fears about the local impact of competition from abroad. Globalisation of higher education services negotiations tend to focus on two major issues – market access, a subject often rigorously opposed by local academic entities who fear the disruptive potential of foreign competitors, and mutual recognition of professional qualifications, often less rigorously opposed (Barrett, 2015). Depending where countries fall in this political spectrum influences their willingness to embrace increased access to education by allowing international entrants to their market.

4.3.2 International experience with retention during studies and subsequent to qualification

4.3.2.1 Retention during studies

Attrition during studies is a global problem, mainly among nurses and allied health professionals and is described as either a delay in qualification or exiting a programme prior to completion.

The causes of attrition are divided into:

a Student characteristics, which include factors that would be difficult for the academic institution to change, such as school performance, ethnicity, gender, education level of parents, domestic partner status and financial status, and factors that are more amenable to influence by the institution such as motivation, locus of control, coping skills and ability to study.

b Programme characteristics including selection criteria; institutional resources; faculty; course scheduling; pace of tuition; quality of study material; faculty feedback and interaction between the students and faculty; and, disenchantment with study choice (Hirschy *et al.*, 2011).

Strategies to improve retention focus on mitigating these factors through:

a ensuring the availability, prior to enrolment, of realistic information regarding the profession;

b selection protocols that identify characteristics associated with successful completion;

c bridging programmes to address schooling weaknesses;

d orientation programmes designed to ensure integration;

e access to quality resources to support learning;

f faculty development programmes that improve the quality of teaching and develop mentoring support (See Chapter 8);

g socio-economic support such as bursaries and child-care facilities;

h establishing retention co-ordinator positions who institute early warning programmes to identify students at risk;

i increasing the interaction of first-year students with senior faculty and creation of academic advisor positions that can provide curricular advice and mentors who can provide life coaching;

j developing programmes that encourage students to socialise and develop peer-support mechanisms;

k undertaking research to understand reasons for attrition (College Board Advocacy, 2009).

4.3.2.2 Retention subsequent to qualification

Reasons why HCPs leave their profession or country are varied but predictable and include (Henderson and Tulloch, 2008): i) lack of adequate remuneration; ii) poor working conditions; iii) inadequate facilities; iv) transportation difficulties; v) weak support, supervision or management; vi) workload; vii) limited professional development opportunities; viii) limited scope to upgrade qualifications; ix) lack of opportunities for promotion; x) inadequate accommodation; xi) safety concerns; xii) political instability; xiii) family members living abroad; and, xiv) education prospects for children. Although remuneration-related concerns are important interventions such as rural allowances, in isolation, they seldom improve retention in the long term. Ideally retention strategies require structured financial and non-financial incentives that are geared towards the career stage of the professional and take gender into account. The literature focuses on rural retention which poses the greatest challenges to retention after qualification and forms a good basis from which to develop retention strategies. In 2010, WHO published Global Policy Recommendations for Increasing Access to Health Workers in Remote and Rural Areas through Improved Retention (WHO, 2015) (See also Chapter 5).

4.3.3 International experience with increased use of Information and Communications Technology

As ICT is potentially the biggest game changer offering opportunities for 'leapfrogging', substantial attention is devoted to its potential to increase health workforce production. "e-learning has an under-exploited potential to support health workforce capacity building in different contexts, and can empower health workers to take charge directly of their own competency development, to enable them to play a full role as change agents in addressing the challenges we will face in the 21st century (WHO, 2015)." ICT offers promising new modes for scaling up health workforce production, through either e-learning on its own, or blended learning.

In 2015, the WHO published a systematic review of the role of ICT in HCP education following the methods recommended by the Cochrane Collaboration (WHO, 2015). The findings of the 209 studies included in this review suggest that both computer-based and web-based e-learning is no better and no worse than traditional learning with regards to knowledge and skill acquisition (WHO, 2015).

The review further concludes that e-learning:

a helps reduce costs;

b facilitates the development and scalability of educational interventions;

c breaks down the geographical and temporal barriers that limit access to, and availability of, education;

d improves access to experts and novel curricula;

e allows for personalisation based on learner behaviour;

f facilitates 'immersive learning' through augmented reality and 3D learning environments, and 'ubiquitous learning' through mobile and cloud learning environments.

Learners usually reported the following advantages:

a ease of access to content and flexibility to access content;

b portability of content;

c improved student-teacher contact and peer discussions through forums.

The most common disadvantages reported by learners were:

a more time-consuming;

b lack of daily student-teacher interaction and tutor support;

c isolation;

d being unable to clarify doubts with a tutor directly;

e lack of in-depth group discussion, which could have been limited by the types of discussion forums used.

4.3.4 International experience with supplementation from abroad

The recruitment of health workers from the developing world is commonly cited as a major factor contributing to weak healthcare systems in low-income countries and a major threat to achieving global health goals (Scheffler *et al.*, 2008). For this reason the World Health Assembly unanimously adopted the WHO Global Code of Practice on the International Recruitment of Health Personnel (WHO, 2010). However, despite growing global consciousness around the ethics of cross-border recruitment, these skills remain highly mobile and scarce. Given that well-resourced countries are in a better position to compete by offering superior working and living conditions, it follows that there has been a brain drain of health workers from lower to higher-income countries.

Africa experiences 24% of the global disease burden, while being home to only 2% of the world's physicians, with a health system supported by less than 1% of global health expenditure (MSF, 2007). The brain drain out of Africa threatens to nullify efforts to increase the health workforce through strategies to increase training capacity. In a study of nine sub-Saharan African countries, including South Africa, the estimated lost investment of domestically educated doctors migrating

to Australia, Canada, the UK and the US alone amounted to $2.17 billion (Mills *et al.*, 2011). South Africa bore the major share at $1.41 billion. If New Zealand is added, an estimated 23 407 South African health workers (8 921 doctors) were working abroad in 2006 (DoH, 2011). This number would be sufficient to staff most of South Africa's public sector vacancies (George *et al,* 2009).

4.4 Applicability and feasibility of various international scaling up approaches in South Africa

4.4.1 Introduction

In essence all the strategies applied internationally are potentially feasible in South Africa. In the public sector, implementation is dependent on the ability of the state to fund rapid expansion such as increasing the number of state-funded academic institutions, expansion of intakes at existing institutions and international scholarship programmes. Additionally, the willingness of the state to grapple with the politics around expanding the role of the private sector in HPE, trade liberalisation and supplementation from abroad will determine whether these options can feasibly contribute to increasing the production of HCPs.

4.4.2 Building institutional capacity

All recent HRH policies have articulated the need for South Africa to urgently increase the production of most categories of HCPs. This would, however, only be feasible if there is an adequate supply of school-leavers interested in and able to pursue studies in the health sciences (Crisp, 2008). The South African Committee of Health Sciences Deans report to the Health Sciences Review Committee of the Department of Higher Education (Berman, 2001) indicated that applicants who meet the minimum admissions criteria exceed available slots two to ten-fold. This excess demand holds true for most HCPs, excluding nursing where interest is declining (DoH, 2013).

4.4.2.1 Scaling up public-sector production capacity

The intention of the state to increase the number of public-sector academic health institutions is on record and is slowly being realised. Two new medical schools are being established and some nursing colleges have been reopened; universities would require appropriate and adequate resource allocation to meet the new legislative requirements for RN production beyond 2019. The most substantive barrier to realising government's intention is financial (See Chapter 10). The current DoH HRH strategy assumed an economic growth rate of 3.5% which is unlikely in the medium term (Kumo *et al.*, 2015). Additionally, the highly publicised #Fees-must-fall campaign (Baloyi and Isaacs, 2015) and subsequent commitments made by government to freeze university fee increases will place further pressure on the fiscus, potentially hampering this option.

It is not so much the lack of qualified applicants but rather inadequate human, operational and infrastructural resources, including an expanded clinical training platform, that prevent universities from producing sufficient numbers of HCPs. There have been concerted efforts by government to increase funding to public-sector academic institutions (See Chapter 10) to address existing restrictions hampering scale up (Essack, 2010):

a **Inadequate infrastructure** for teaching and learning spaces, skills laboratories and residences, is being addressed through the infrastructure and efficiency (I&E) grant which needs to be continued and expanded.

b **Inadequate clinical teaching and training platform**, with respect to both student-placement sites, as well as the facilities at these sites for non-clinical teaching and learning. Given the large number of healthcare facilities in South Africa, both public and private, expanding the clinical training platform is theoretically feasible, but this will require ensuring that all facilities meet the standards set by the relevant statutory bodies. The DoH has initiated a number of projects to improve the quality of public sector facilities such as the Ideal Clinic Project (Steinhobel *et al.*, 2015), implementing quality standards through the Office for Standards Compliance (Jolson, 2011) that should increase the likelihood of facilities meeting the accreditation standards.

c **Shortage of clinical supervisors on the clinical teaching and training platform** due to high vacancy rates and high workloads within public-sector student-placement sites. This means that staff to student ratios, mandated by the professional councils, are increasingly difficult to maintain. The staffing component of the clinical training grant (CTG) should be continued in perpetuity to address the number of staff required to undertake clinical supervision in fulfilment of the experiential training component requirements mandated by the professional councils while potential partnership with the private sector can also help address this problem.

d **Limited and dwindling pool of credentialed HCPs pursuing careers in the academic health sciences**. Purely improving salary packages will not solve the problem and improving technology, resources and conditions of service would need to be addressed while supplementation from abroad should receive serious consideration.

e **Increased operational costs**, particularly transport costs linked to an expanded clinical teaching and training platform can be addressed through the operational component of the CTG that should become a permanent funding source to sustain these activities.

4.4.2.2 Building institutional capacity through the private sector

Given the oversubscription for intake slots for the majority of public-sector health sciences faculties and budget constraints linked to low economic growth, increasing the role of the private sector should be considered. The majority of middle-income countries and all of the BRICS (Brazil, Russia, India, China and South Africa) countries have embraced this option.

The statutory environment created through the Higher Education Act that established a single accreditation and quality assurance mechanism for both public and private higher education institutions (PHEIs) accords with international best practice (RSA, 1997). This should allay fears about the risk of discrepancies in the quality of private and public higher education. The Register of Private Higher Education Institutions (DHET, 2014) in 2014 indicated that there are 90 fully registered institutions and 26 provisionally registered institutions, enrolling around 94 000 students (DHET,

2014) annually. The level of qualifications offered has been steadily increasing up to Masters and PhD level. Regulatory oversight is deemed effective, with the DHET reporting more than 80 institutions that have either been discontinued or voluntarily deregistered. At present there are relatively few private higher education institutions involved in the training of HCPs.

A number of legitimate concerns exist, which unless addressed strategically, will not only create barriers to increased private sector participation but could also undermine other efforts to increase production. These are:

a That private HPE would be prohibitively expensive excluding poor students and hampering efforts to achieve demographic transformation. Concerns around the cost of private education are however not supported by comparing current tuition fees between private and public institutions of higher education although it should be noted that the limited role currently allowed for the private sector in health professions education limits such comparisons. A comparison in November 2015 of tuition fees charged for the training of pharmacy assistants showed a difference of less than 10% in tuition fees across four providers, with both the highest and lowest fees charged by private providers. To increase accessibility for poor students, the state could provide bursary assistance to deserving students who study in the private sector as in a model used in Brazil (Redden, 2015), and restrict the private educational provider from charging additional co-payments.

b That private academic institutions would siphon students away from public facilities. Given the demand versus supply mismatch, this is unlikely. Additionally, in Brazil where private sector expansion has been encouraged for two decades, two-thirds of students are still enrolled at public facilities which are still perceived as more prestigious.

c Fears around poaching academics from the public sector or reducing the ability of the public sector to fill vacancies could be mitigated by using a public-sector teaching platform, as this would reduce the need for the private provider to employ large numbers of academic specialists. Private educational providers are also much more likely to contract part time rather than full-time faculty and recruit academic staff from abroad or from retired academics.

4.4.2.3 Undergraduate production

A potential barrier to undergraduate production in the private sector is the suitability of the private practice clinical environment as a teaching platform. The willingness of private patients to be exposed to undergraduate students is untested, although anecdotal evidence from models where public-sector students do electives in the private sector and from private nursing schools seems to indicate that this will not be a major barrier. Teaching in a private hospital setting may also inadvertently increase costs due to longer hospital stays linked to academic ward rounds or examinations that medical insurers would be unwilling to cover, while the issue of potential medical litigation risks is unexplored. A potential win-win solution would entail PHEIs using a public-sector *clinical training platform* thereby creating an incentive for PHEIs to strengthen public sector facilities. This model would also address concerns about private HCPs not being prepared for practice in the public

sector and meeting internship and community service requirements. Should the proposed NHI reforms be fully implemented, the distinction between public and private sector facilities will blur, potentially negating these concerns.

4.4.2.4 Postgraduate production

Limited production of nursing specialists already takes place through PHEIs but considerable potential exists to rapidly increase the production of medical specialists using the private healthcare sector *as a clinical training platform* given that preparation for speciality and sub-speciality qualification is predominantly based on practical clinical experience which can be monitored through portfolios of evidence developed under the tutelage of qualified specialists. At present the majority of specialists practise in a private-sector environment and with minimal aligning of incentives the private sector could provide a clinical training platform at no cost to the state. Private practices with high patient volumes could fund registrar positions, removing the onus on the state to fund additional registrar posts. This model exists in Switzerland, where academic specialists run large private practices in academic hospitals and directly employ registrars against their practice income (Bauer, 2013). The existence of an independent examining body in the Colleges of Medicine further supports the feasibility of this. A current constraint is that the HPCSA does not approve of specialists employing generalists, however, exceptions have been made in the past for private specialists who have large clinical trial practices. At some medical schools, public sector employed registrars already do rotations at private practices to facilitate training in the use of techniques or equipment not available in the public sector.

4.4.3 Increasing productivity of existing institutions

The majority of the international strategies proposed can be implemented in the South African context. However, the absence of a policy framework that requires routine collection of productivity indicators and smart incentives to reward improved productivity serve as barriers. Grants introduced to increase productivity and output at public-sector institutions are enablers and should be maintained.

4.4.4 Increasing international scholarship programmes

South Africa has already embraced this approach through the Cuban medical students programme, although there are acknowledged barriers associated with training students in a different language, cultural and health system environment that requires intensive bridging programmes on their return. A similar programme with English-speaking countries could address these concerns.

4.4.5 Improving retention

4.4.5.1 Retention during studies

Many of the international strategies to improve retention are already implemented by South African academic institutions and the only real perceived barriers would be budgetary, especially linked to socioeconomic support initiatives such as

bursary schemes and child-care services and the absence of a mandated system to improve the quality of teaching, i.e. requiring clinical teaching staff to have formal training in health professions education. Strategies to improve retention should be incorporated into all health-sector academic institutions as part of accreditation requirements within a policy environment that tracks retention rates and incentivises institutions to improve such rates.

4.4.5.2 Retention after qualification

Simply hoping that increasing the number of graduates will address the shortage of HCPs is naïve; specific strategies are needed to prevent leakage through enhanced professional support and management. Of particular importance in the South African setting would be measures to accommodate the work requirements of women, improve accommodation at rural hospitals, address safety and security concerns, create clear career paths for rural practice including opportunities to rotate out of these settings, and ensure a functional clinical environment with regard to equipment, drugs and supervision. It is also essential to actively address the professional and social isolation linked to rural practice through education opportunities, increased leave allowances and recognition systems. Most importantly would be creating structures that include skilled professionals in district, hospital and clinic governance structures (Campbell *et al.,* 2012).

4.4.6 Increased use of information technology

ICT offers promising new modes for scaling up health workforce production, through either e-learning alone, or blended learning when used in combination with traditional educational methods.

A recent systematic review of e-learning for undergraduate health professional education commissioned by the WHO concluded that: "e-learning has an underexploited potential to support health workforce capacity building in different contexts, and can empower health workers to take charge directly of their own competency development, to enable them to play a full role as change agents in addressing the challenges we will face in the 21st century (WHO, 2015)". The review identified 209 studies which met the inclusion criteria and found that both computer-based and web-based e-learning is no better and no worse than traditional learning with regards to knowledge and skill acquisition (WHO, 2015).

This review examined; i) *Non-networked computer-based e-learning interventions* as stand-alone software applications, where internet/intranet connections are not required for the learning activities including comparing different e-learning technology (interactive computer-based module versus plain text computer-based module) and ii) *Internet and local area network-based e-learning interventions*: interventions that make use of the transmission control protocol (TCP) and the internet protocol (IP) as a standard. TCP/IP connection is essential in providing the full functionalities of web-based educational interventions. The absence of a network connection would result in the loss of both functionality and usability to such an extent that the original intended purpose is not provided where they compared

e-learning *versus* traditional learning including different e-learning technologies (interactive computer-based module *versus* plain text computer-based module).

The conclusion reached by the systematic review panel (WHO, 2015) was that e-learning:

a helps reduce the costs associated with delivering educational content;

b facilitates the development and scalability of educational interventions;

c breaks down the geographical and temporal barriers that limit the access to, and availability of, education;

d improves access to relevant experts and novel curricula;

e allows for personalisation of e-learning based on learner behaviour;

f facilitates "immersive learning" through augmented reality and 3D learning environments, and ubiquitous learning through mobile learning and cloud learning environments.

Learners usually reported the following advantages in relation to e-learning interventions:

a ease of access to content and flexibility to access content when convenient to them;

b portability of content due to the fact that the content was not restricted to presentation in a physical classroom environment;

c improved student-teacher contact and discussions through support forums;

d increased discussions with peers through discussion forums.

Among the most common disadvantages reported by learners were:

a that it was more time-consuming;

b lack of student-teacher interaction and tutor support due to not physically being in contact with teachers daily;

c feelings of isolation due to the lack of human interaction;

d being unable to clarify doubts with a tutor directly;

e lack of in-depth group discussion, which could have been limited by the types of discussion forums used.

Given the relatively good ICT infrastructure in South Africa, ICT should be viewed as an enabler and should be included in strategies to expand production, while keeping in mind that most of the research has focused on medical students. Barriers would predictably be factors such as resistance to change and vested interests of educators who favour classroom-based learning methodologies. ICT could substantially support decentralised teaching platforms and help underpin efforts to move teaching to rural and underserved communities. A number of South African public and private higher education institutions involved in HCP training already utilise these technologies. Fully embracing international trends to increase the

number of HCPs qualifying annually through ICT (WHO, 2015), would significantly reduce the costs of scale up. The challenge for any developing country is internet accessibility, reliability and speed, however, the rapid increase of the internet user base in South Africa from 2.4 million in 2000 to 12.3 million in 2012 resulted in South Africa achieving the highest internet penetration in sub-Saharan African and increases the feasibility of this approach.

4.5 Recommendations

4.5.1 General recommendations

a A minimum national dataset of key HRH information that will allow adequate strategic planning should be established and made available in the public domain supported by a regulatory environment that requires academic institutions and professional councils to track and report on key indicators.

b A multi-stakeholder forum should be established to track and advise on HRH issues in line with the Global Health Force Alliance recommendations on the composition for CCF mechanisms.

4.5.2 Recommendations related to increased production

a The ability of public-sector academic institutions to scale up the production of HCPs needs to be strengthened through ensuring adequate infrastructure, expanding the clinical training platform, providing adequate numbers of clinical supervisors and teachers, funding operational costs related to training and efforts to support academic careers.

b Overall production capacity should be increased by optimising the role that the private sector can play in addressing shortages across all cadres of healthcare professionals, and introducing international scholarship programmes.

c The clinical training platform should span both public and private practice environments in anticipation of the move to a NHI system.

d Greater use of ICT to augment classroom tuition could facilitate increased production and reduce costs. ICT can be particularly useful to support decentralised training and help underpin efforts to shift training to rural and underserved communities. The sharing of ICT resources between institutions should be promoted.

4.5.3 Recommendations around retention in the profession and in the country

a Strategies to improve retention during studies should be incorporated into all health-sector academic institutions as part of accreditation requirements within a policy environment that tracks student retention rates and incentivises institutions to improve such rates.

b HEIs should partner with health departments to provide professional support to HCPs, especially those working in rural or underserved areas to reduce attrition.

CHAPTER 5

Health Professionals' Education for Practice in Rural and Underserved Areas

Key points

- There is evidence that training students in rural areas increases the likelihood of them choosing rural practice.
- Faculties in South Africa should explore local adaptations of various rural models, keeping in mind practical considerations such as logistics and resources.
- A formal, permanent community-oriented primary care academic platform is needed in which service delivery, teaching and research take place. This requires full involvement of undergraduate and postgraduate students.
- Students should ideally engage the same communities and services over several years of their study to build up relationships with health workers, patients, families and communities over time.

5.1 Introduction

There is global recognition of the need to scale up health worker training to meet the enormous gaps in healthcare provision around the world (WHO, 2008). However, it is not enough to ensure that there are simply more health workers; health workers must also be appropriate to the needs and context of the country, and practise in areas where they are most needed. Tudor-Hart's Inverse Care Law draws attention to the latter issue:

> *"The availability of good medical care tends to vary inversely with the need for it in the population served. This inverse care law operates more completely where medical care is most exposed to market forces, and less so where such exposure is reduced"* (Tudor-Hart, 1971).

This mismatch between need and availability of healthcare is a global problem that affects almost all countries. Approximately half of the global population lives in rural areas, but these areas are served by only 38% of the total nursing workforce and by less than a quarter of all physicians. The situation is especially dire in 57 countries (including South Africa), where a critical shortage of trained health workers means an estimated one billion people have no access to essential healthcare services (*WHO*, 2006). In South Africa, 46% of the population lives in rural areas, but only 12% of doctors and 19% of nurses are working in rural areas (Hamilton and Yau, 2004).

In 2010, the WHO convened an expert group that produced a set of evidence-based Global Policy Recommendations on increasing access to health workers in remote and rural areas through improved retention (WHO, 2010). This expert group built on work that had already been done in human resources for health, including the *Joint Learning Initiative Report* (2004), the *World Health Report* (WHO, 2006),

and the report of the *Task Force on Scaling Up Education and Training of Health Workers*. The introduction of the report states:

> *"Skilled and motivated health workers in sufficient numbers at the right place and at the right time are critical to deliver effective health services and improve outcomes. A shortage of qualified health workers in remote and rural areas impedes access to healthcare services for a significant percentage of the population, slows progress towards attaining the Millennium Development Goals and challenges the aspirations of achieving health for all" (Task Force for Scaling Up Education and Training for Health Workers, 2008).*

Four broad categories of recommendations were proposed: educational, regulatory, financial, and personal and professional support Table 5.1.

Table 5.1: Categories of interventions used to improve attraction, recruitment and retention of health workers in remote and rural areas

Categories of Intervention	Examples
A Educational interventions	Recruit students with a rural background Health professional schools outside of major cities Clinical rotations in rural areas during studies Curricula that reflect rural health issues Continuous professional development for rural health workers
B Regulatory interventions	Enhanced scope of practice Different types of health workers Compulsory service Subsidised education for return of service
C Financial incentives	Appropriate financial incentives
D Professional and personal support	Better living conditions Safe and supportive working environment Outreach support Career development programmes Public recognition measures

Source: DoH (2011)

With regard to educational strategies, the focus of this chapter, five recommendations were made:

a **Get the 'right' students:** Use targeted admission policies to enrol students with a rural background in education programmes for various health disciplines, in order to increase the likelihood of graduates choosing to practice in rural areas.

b **Train students closer to rural communities:** Locate health professional schools, campuses and family medicine residency programmes outside of capitals and other major cities, as graduates of these schools and programmes are more likely to work in rural areas.

c **Bring students to rural communities:** Expose undergraduate students from different health disciplines to rural community experiences and clinical rotations as these can have a positive influence on attracting and recruiting health workers to rural areas.

d **Match curricula with rural health needs:** Revise undergraduate and postgraduate curricula to include rural health topics to enhance the competencies of health professionals working in rural areas, and thereby increase their job satisfaction and retention.

e **Facilitate professional development:** Design continuing education and professional development programmes that meet the needs of rural health workers and are accessible from where they live and work, so as to support their retention.

These recommendations were developed following a comprehensive review of relevant, available evidence related to health workforce attractiveness, recruitment and retention in remote and rural areas. Nonetheless, the review has its limitations as much of the evidence comes from observational, rather than experimental studies; it is possible that confounding variables may have influenced the observed outcomes of the complex interventions studied. The WHO expert group considered that in this field it is equally important to understand whether an intervention works or not (effectiveness), and why it works and how. Context is a key element that can be responsible for different outcomes or results from the same intervention and thus needs to be better captured in the research on these interventions.

In Africa, the Regional Office of the WHO published a Road Map for scaling up the human resources for health for improved service delivery in the African Region: 2012 – 2025. It identified the following six strategic areas for achieving its objectives:

a Strengthening health workforce **leadership and governance** capacity.

b Strengthening HRH **regulatory capacity**.

c Scaling up **education and training** of health workers.

d Optimising the utilisation, **retention and performance** of the active health workforce.

e Improving health workforce **information** and generation of evidence for decision-making.

f Strengthening health workforce **dialogue and partnership**.

While echoing the global approach of the parent body in taking a broad health systems perspective, the regional office does emphasise the central role of the education and training of health workers, but without a specific emphasis on rural or underserved areas.

It is important to clarify the definitions of 'rural', 'remote' and 'underserved' areas for the purposes of monitoring and funding these interventions. In the USA, the term 'health professional shortage areas' (HPSAs) are federally designated as having shortages of primary medical care, dental or mental health providers and may be geographic (a county or service area), demographic (low-income population) or

institutional (health centre or other public facility). Medically underserved areas/ populations are areas or populations designated as having too few primary care providers, high infant mortality, high poverty and/or high elderly population. For the purposes of this chapter, 'rural and underserved' areas are defined as areas or sub-districts outside of metropolitan areas where there is a limitation of access to first-contact health services. 'Remote rural' areas are understood as those with a very low population density, usually at a greater distance from human settlements than 'rural' areas.

5.2 How should universities respond?

Globally, university curricula often do not accurately reflect the disease burden of the areas in which HCPs are most urgently needed, clinical training sites are most often urban tertiary centres where practice conditions are unlike those graduates will ultimately face, and the failure to HPE to the needs of the local healthcare system often leaves graduates unprepared to assist in improving the healthcare system (Celletti *et al.*, 2011).

> "More health professionals are therefore needed, but not more of the same. A transformation of health professional education should put population health needs and expectations at the centre and should be directed by the reality of health service delivery" (WHO, 2008).

In the South African context, this means ensuring that, on graduation, HCPs are fully prepared and supported to work in areas of need in the public service, particularly in PHC and in rural areas. If all health professionals give at least some years of service in a rural area, access to care will improve, and they will have been impacted in terms of the way they practise and approach patients, namely with a more patient and community-centred focus. Such an approach will inevitably have benefits for other underserved communities, even if these HCPs later migrate to larger towns and cities.

Health science faculties should demonstrate the impact they are having on access to healthcare through the outcomes of the distribution of their graduates and how they are supporting PHC and health services in rural and underserved areas. This could be encouraged through incentives based on the measured outcome of a proportion of their graduates working in rural and remote areas (WHO, 2010; Wilson *et al.*, 2009).

Such social accountability would be in line with the international understanding of the role of health science faculties and medical schools, expressed in documents such as the 2010 *Global Consensus on Social Accountability* and in the WHO guidelines on *Scaling Up and Transforming Health Professions Education*, released in 2013. Faculties need to recognise their responsibility towards a defined population that they serve, and work towards a reciprocal relationship with those communities not only in terms of teaching but also in research and service. The importance of training aligned to a country's own needs was emphasised in the 2008 report of the *Task Force for Scaling Up Education and Training for Health Workers* (WHO, 2008). More recently, the Lancet Commission (Frenk *et al.*, 2010) delineated the

challenges for health science faculties in the 21st century as the need to:

a improve quality, equity, relevance and effectiveness in healthcare delivery;

b reduce the mismatch with societal priorities;

c redefine roles of HCPs;

d provide evidence of impact on people's health status.

In South Africa, social accountability is also a principle that the Undergraduate Committee of the Medical and Dental Professions Board of the HPCSA has adopted and will include in accreditation of medical schools in future. Universities should give priority to this principle through a reorientation towards primary care and underserved communities, including rural health.

5.2.1 Student selection

There is substantial evidence from various countries, including South Africa, that selecting students of rural origin or background is associated with their eventual practice in rural areas (De Vries and Reid, 2003; Easterbrook *et al.,* 1999; Laven and Wilkinson, 2003; Playford *et al.,* 2006; Rabinowitz, 1993; Stearns *et al.,* 2000). In this respect, rural origin is especially linked to the decision to choose a rural community as one's first practice location (Page, 2014; Sen Gupta and Young, 2014; Stagg, 2014). A Cochrane systematic review states: *"It appears to be the single factor most strongly associated with rural practice"* (Grobler *et al.*, 2009). In South Africa, students from rural areas are about 3.5 times more likely to work in such areas on graduation than their urban counterparts (De Vries and Reid, 2003).

While a bias in favour of selecting students with a rural background might be warranted, we know this process is not simple. Obligatory online application systems for admission to higher education institutions present a challenge to rural high-school students who do not have access to online facilities. Identifying the right students, and finding students who meet the criteria for admission to health science programmes, given the state of rural education in South Africa, can be a challenge. However, there are very successful models of rural recruitment in South Africa for example, in the Umthombo Youth Development and the Wits Initiative for Rural Health Education (WIRHE) bursary programmes (Ross, 2007; Ross and Couper, 2004). Furthermore, evidence from these schemes, in KwaZulu-Natal and North West provinces, shows that working with local health districts in the selection process and supporting the application process are also critical. Once students are admitted, on-going mentorship and support, and a continuing relationship with the districts are critical (Ross, 2007; Ross *et al.*, 2015).

5.2.2 Rural clinical placements

A 'rural placement' is defined as one in which students stay overnight (usually for a few weeks or more) at a location away from the main campus of their health sciences faculty (Doherty, 2011). The intention of the placement includes exposure to the complex circumstances of healthcare provision in rural, remote and often disadvantaged communities, even when students are accommodated in towns.

Doherty (2011) described five broad models for rural placements, which fall along a continuum:

a Comprehensive rural programmes: The rural programme is the only programme offered and it is compulsory for all students to attend rural placements which happen periodically throughout the curriculum, some of which are quite lengthy (six months to a year).

b Dedicated rural track offered throughout a traditional programme: These programmes allow selected students to focus on rural issues as part of the traditional, urban-based programme. Students on the track are expected to meet the same educational and clinical competencies as other students but, for a large part of the curriculum, do so through different avenues, including extended rural placements.

c Dedicated rural track offered for part of a traditional programme: This variation on the above approach involves offering a rural track for part of the curriculum. For example, students joining this track depart for an extended rural placement during one of their clinical years.

d Rural tracks offered as supplements to traditional programmes: These programmes allow selected students to engage in activities additional to the traditional programme, including a rural placement.

e Rural placement offered within a traditional programme: Under this approach, all students experience a brief rural placement of a few weeks (typically a clerkship). The rural placement is compulsory but the rest of the programme does not have a specifically rural focus.

Worley *et al.* (2016) describe a typology of three broad types of longitudinal integrated clerkships (LICs) as comprehensive LICs, blended LICs, and LIC-like amalgamative clerkships. Many of these are situated in rural areas.

There is evidence from the global literature that training students in rural areas increases the likelihood of them choosing rural practice (Longombe, 2009; Smucny *et al.*, 2005; Wang, 2002; Wilson *et al.*, 2009) and this has also been found in the South African context (Reid *et al.*, 2011). Furthermore, studies in Australia have demonstrated an even greater effect from combining rural origin with rural training (Walker *et al.*, 2012). This is also one of the WHO Global Policy Recommendations (WHO, 2010). Australia, in particular, has positive experience of linking funding initiatives to a requirement for students to spend time in rural clinical training (Denz-Penhey *et al.*, 2005); in its case, rural clinical schools receive extra funding when 25% of students spend at least one clinical year in a rural or regional centre.

Faculties in South Africa should explore local adaptations of various rural models, with a stipulated minimum of clinical time spent in rural areas for each curriculum. Setting up, or expanding, a rural placement is complex. At the very least, it includes identifying collaborating teaching hospitals, clinics and communities, as well as preceptors, partnering with community-based organisations (including rural health professional associations), developing a tailor-made curriculum and integrating the programme into existing faculty curriculum commitments (Doherty, 2014). The type of model a health science faculty chooses depends on its vision and commitment,

as well as practical considerations around logistics and resources. Whatever model is chosen, it needs to be accompanied by an implementation plan that builds on the strengths of rural medical education approaches whilst overcoming the many challenges of training students in remote locations.

Recent experiences with the longitudinal model of integrated clinical learning in South Africa have been described as successful (Van Schalkwyk *et al.,* 2014; Voss *et al.*, 2015) despite some initial hesitation on the part of the students (Daniels-Felix *et al.,* 2015) and their clinical supervisors (Blitz et al., 2014). The initial academic results of the students indicates that they were not disadvantaged by rural placements in terms of academic achievement compared to their urban peers, and did marginally better academically in some aspects (Van Schalkwyk *et al.,* 2015). However the longer-term impact of their educational experiences in rural settings in terms of teamwork, communication, leadership, patient-centredness and career choices will only be able to be evaluated after some years.

5.2.3 Community-based education

The re-engineering of PHC enables the development of a community-oriented primary care (COPC)[3] approach as the basis of healthcare in the country, in line with the philosophy of PHC. Universities should play a vital role in establishing COPC. This is done by engaging with the re-engineering of PHC in a systematic manner to assist in developing the concepts, participating in implementation of and research on primary care re-engineering, and reporting on the process, outcomes and impact of this initiative. This means a formal, permanent community-oriented PHC academic platform in which service delivery, teaching and research take place.

Full involvement of undergraduate and postgraduate students is necessary to achieve this. This will not only ensure more appropriate teaching, but will also create an extensive new teaching platform for the planned expansion of medical education. This district-based academic platform in rural and urban areas will consolidate and integrate the re-engineering of PHC and create space for further expansion of the teaching platform. The beginnings of this already exist, in rural sites used by many schools, with a leading example being the Stellenbosch University's rural clinical school (Van Schalkwyk, 2014) and in the clinical learning centres of a number of schools (e.g. University of the Witwatersrand, University of Pretoria, University of KwaZulu-Natal and the Walter Sisulu University), as well as in the urban primary care sites of other schools such as the University of Pretoria COPC development in Tshwane.

As part of this process of community orientation, faculties should engage with all the elements of re-engineering of PHC, namely district clinical specialist teams, ward-based outreach teams and school health. Registrars in family medicine, paediatrics and obstetrics and gynaecology should do significant rotations in

3 Community-oriented primary care is defined as: "A continuous process by which primary health care is provided to a defined community on the basis of its assessed health needs, by the planned integration of primary care practice and public health" Abramson and Kark (1983).

district-level services and participate in the training of undergraduate medical students in these services.

The purpose of this engagement is to expose students to PHC early in their programme, from the first year. In this way they will be made aware of patients' home and community circumstances, especially with regard to the major epidemics in South Africa, such as human immunodeficiency virus/tuberculosis (HIV/TB), chronic diseases of lifestyle, maternal and child health, violence and injuries. Such early experience will foster a deep understanding of the context of care; facilitate acquisition of content knowledge and skills; help students align themselves with patient and community perspectives on illness and healthcare and make their learning more real and relevant (Dornan *et al.*, 2006; Littlewood, 2005; Yardley et al., 2010). As longitudinal involvement of students with patients, teachers and communities increases the chance of workforce impact (Maley, 2009), students should ideally engage the same communities and services over several years of their study to build up relationships with health workers, patients, families and communities over time.

5.3 Graduate tracking

It is routine practice in many countries to be able to determine trends and monitor outcomes of interventions at different levels of the health system, in terms of HCPs' locations and type of practice. This information is crucial not only for human resource planning and management, but also for monitoring the outcomes of the higher education institutions in terms of their graduates' career choices and impact on the health system. South Africa currently lacks the ability to track health science graduates once they have completed community service. A human-resource tracking system linked to the obligatory annual registration renewal processes could be implemented by the professional boards. An online survey form requesting information about each practitioner's location and type of practice could be instituted as a mandatory first step in the annual registration renewal process. Such data could be entered into a database with restricted access, and anonymised data could then be extracted for monitoring and research purposes.

5.4 Recommendations

a Training should be orientated towards addressing inequity and meeting the needs of the most underserved, through supporting a primary care focus and increasing the supply of HCPs to rural areas.

b In their student selection policies, higher education institutions should prioritise applicants from rural and remote areas who meet the minimum academic criteria, in order to address the maldistribution of graduates in the country.

c Faculties should explore local adaptations of various models of rural education, with a stipulated minimum of clinical time spent in rural areas for each curriculum. Whatever model is chosen, it should be accompanied by an implementation plan that builds on the strengths of rural medical education approaches whilst overcoming the many challenges of training students in remote locations

d Community members, health practitioners and other relevant service providers in rural settings must be trained and developed as the key teachers of students in the rural and underserved areas.

e Community-oriented primary care is recommended as a strategy to support service and learning, as this approach meets all stakeholders' needs in both rural and urban settings, especially in underserved areas.

f In terms of social accountability, health science faculties must demonstrate the impact they have on service delivery through the distribution of their graduates and to what extent they are supporting primary healthcare in rural and underserved areas after completion of community service in order to meet the healthcare needs of the country.

g It is proposed that the professional boards supported by the DoH design and implement a tracking and monitoring system for all HCPs in the national interest.

CHAPTER 6

Inter-professional Education and Collaborative Practice

Key points

- Inter-professional education and collaborative practice holds substantial potential for transformative learning and the strengthening of the health system.
- A number of international inter-professional education frameworks have been developed as guides for developing competency-based IPE curricula (including assessment strategies).
- Optimal mastery of IPE competencies requires students to be integrated in health care teams during longitudinal clerkships and to be exposed to good role models of IPECP.
- Inter-professional learning should follow a staged approach, progressing from 'exposure' through 'immersion' and finally 'mastery'.
- The literature provides limited guidance on the assessment of inter-professional (IP) competencies, but suggests that attitudes as well as knowledge, skills and behaviours should be assessed.
- Students should not only be assessed individually, but also in teams, and assessment should be aligned with the students' developmental stage.
- Effective inter-professional communication and collaboration requires a common bio-psycho-social-spiritual approach to patient care and utilisation of a common framework for clinical reasoning and decision-making such as the International Classification of Functioning, Disability and Health (ICF).
- Well-trained facilitators of IPE and role models of inter-professional collaborative practice are essential for successful IPE. Structured and well-planned faculty development initiatives are therefore required.
- Barriers to, as well as enablers for successful IPE, are present at the levels of government and the professions, training institutions and individuals. Strategies are available to overcome barriers and leverage enablers.
- Research provides some evidence for the value of ICP in patient harm reduction, reduced in-patient length of stay, sustainable health outcomes, and staff recruitment and retention. However, clear evidence for the impact of IPECP on the improvement of population health, reduction of health care costs, improvement of the quality of health care delivery and patients' experience of care is lacking.
- Twelve themes were identified as components of a strategy to ensure the sustainable implementation of IPECP in South Africa: stakeholder needs; stakeholder engagement; consultation with statutory and regulatory bodies; development of a contextualised competency framework; curriculum development; local and international collaboration; sharing best-practice; partnerships with government; health education institution culture; research; value/ethos and academic faculty development.

6.1 Introduction

IPE is defined by WHO as "the process by which a group of more than two professions, specifically students from health-related occupations with different educational backgrounds, learn together during certain periods of their education with interaction as an important goal". ICP in healthcare occurs when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across settings (WHO, 2010).

The importance of IPECP lies in its potential as a transformative approach to healthcare. The WHO (2010) stresses the following: "governments around the world are looking for innovative, system-transforming solutions that will ensure the appropriate supply, mix and distribution of the health workforce. One of the most promising solutions can be found in inter-professional collaboration".

6.1.1 Aims

This chapter aims to:

a discuss the key components of an IPECP strategy, namely:
- inculcating and assessing core competencies;
- adopting an inter-professional approach to healthcare;
- providing innovative ideas to empower role models through faculty development and capacity building in the service-delivery sector;

b identify enablers and barriers and suggest steps to address these;

c stimulate discourse to study the impact of IPECP on HPE, patient outcomes and health systems;

d explore ways to ensure the sustainability of IPECP in South Africa;

e formulate recommendations.

These different components of implementing an IPECP strategy will be discussed in more detail.

6.2 Inculcating and assessing core competencies for ICP (See Chapter 7)

6.2.1 Uni-professional competency frameworks

Globally, there is a shift towards competency-based training in the health professions and in IPE. This has led to the development of a number of general (uni-professional) competency frameworks. These include:

a CanMEDS 2015 Competency Framework of the College of Physicians and Surgeons of Canada (Frank *et al.*, 2015) (an adapted version of the 2005 version was accepted by the Medical and Dental Board of South Africa) (HPCSA, 2014).

b Learning Objectives for Medical Student Education (AAMC, 1998).

c Tomorrow's Doctors (GMC, 2009).

d Standards for Assessment and Accreditation of Primary Medical Programmes (AMC, 2012).

e Reference List of General Physician Competencies (Englander *et al.,* 2013).

6.2.2 IPE-specific competency frameworks

IPE-specific competency frameworks have also been developed. The following are used internationally:

a Canada: A National Inter-professional Competency Framework (CIHC, 2010).

b USA: Core Competencies for Inter-professional Collaborative Practice (AACN *et al.,* 2011).

c Australia: Inter-professional Capability Framework (Curtin University, 2011).

6.2.2.1 Why do we need IPECP-specific competency frameworks?

The need for competencies for IPECP is listed in the American framework (IECE Panel, 2011) and is said to be required to:

a "create a coordinated effort across the health professions to embed essential content in all health professions education curricula;

b guide professional and institutional curricular development of learning approaches and assessment strategies to achieve productive outcomes;

c provide the foundation for a learning continuum in inter-professional competency development across the professions and the lifelong learning trajectory;

d acknowledge that evaluation and research work will strengthen the scholarship in this area;

e prompt dialogue to evaluate the 'fit' between educationally identified core competencies for inter-professional collaborative practice and practice needs/demands;

f find opportunities to integrate essential inter-professional education content consistent with current accreditation expectations for each health professions education programme;

g offer information to accreditors of educational programmes across the health professions that they can use to set common accreditation standards for inter-professional education, and to know where to look in institutional settings for examples of implementation of those standards;

h inform professional licensing and credentialing bodies in defining potential testing content for inter-professional collaborative practice".

6.2.2.2 Canadian framework

In the preamble to the Canadian framework (CIHC, 2010), Gilbert provides a lens through which this and other IPE competency frameworks should be viewed: "Well-researched, clearly defined and measurable competencies are now the norm across the professions, where uni-professional standards are relatively easily articulated. Describing and defining inter-professional competencies has proven to be a much more difficult task because at the present time, the field of inter-professional education and care is still not well understood."

In the Canadian framework (Fig. 6.1), inter-professional communication and patient/client/family/community-centred care are seen as 'supporting domains' that influence the other four domains. Underpinning this are three considerations that influence the way the framework is applied namely the complexity of the situation or encounter, the context of practice, and quality improvement.

6.2.2.3 American framework

In the development of the American Core Competencies for Inter-professional Collaborative Practice (IECE Panel 2011), the following 'desired principles' for inter-professional competencies were identified:

a Patient/family-centred.

b Community/population-orientated.

c Relationship-focused.

d Process-oriented.

e Linked to learning activities, educational strategies, and behavioural assessments appropriate for the learner.

f Able to be integrated across the learning continuum.

g Sensitive to the systems context.

h Applicable across professions.

i Stated in language common and meaningful across the professions.

j Outcome-driven.

The brief of the IPEC to its expert panel was to recommend a core set of competencies relevant across the professions for ICP as well as learning experiences and educational strategies for achieving the competencies. Such an approach highlights "essential behavioural combinations of knowledge, skills, attitudes, and values that make up a 'collaborative practice-ready' graduate" (AACN *et al.*, 2011).

6.2.2.4Australian framework

The Australian framework (Curtin University, 2011), is underpinned by the following assumptions:

Source: Canadian Inter-professional Health Collaborative, 2010

Figure 6.1: A diagrammatic representation of the Canadian National Inter-professional Competency Framework

a Collaborative practice is critical to service user safety and quality.

b IPE occurs on a continuum from early exposure to other professions through to collaborative practice in teams.

c The learner moves through the levels at different rates according to their personal and professional experiences.

d A student's capacity to demonstrate inter-professional capabilities in different settings will be impacted by their comfort level, familiarity and skill set within that context.

This resonates well with the opinion of Bainbridge *et al.* (2010) who explain that IPE competency statements "identify specific knowledge, skills, attitudes, values and judgments that are dynamic, developmental and evolutionary". This implies that competencies are not static, but need to be adapted to changing population needs (Thistlethwaite *et al.*, 2014). A diagrammatic representation of the framework is presented in Figure 6.2.

Figure 6.2: Diagrammatic representation of the Inter-professional Capability Framework developed by the Faculty of Medicine and Health Sciences, Curtin University, Australia

Three capability levels are described, namely, 'novice' (a student at the end of the first year of an undergraduate degree); 'intermediate' (a student at the end of the second or third year of an undergraduate degree) and 'the entry to practice' level (a student at the end of the final year of an undergraduate degree). Van Heerden (2015) summarised the competencies proposed by these frameworks.

These frameworks are admirable, but have often resulted "in more confusion, with the introduction of varying definitions about similar constructs (such as competency and its relation to terms such as learning objective, learning outcome, and capability), particularly in relation to what IPE actually means" (Thistlethwaite *et al.*, 2014).

6.2.3 Value of the international IPE competency frameworks

Thistlethwaite *et al.* (2014: 873) further emphasise that for inter-professional competency frameworks to be of benefit to students, educators and HCPs, "they need to add value to existing curricula outcomes, rather than duplicate them, and to emphasise those outcomes that may be attained only through inter-professional activities".

For students to achieve inter-professional competencies, they need to become active team members. Students on longitudinal placements are therefore more likely to attain inter-professional competencies.

Good role-modelling by staff is an essential component of IPE. IPE reforms should be aligned with changes in healthcare delivery and practice reform. Students who do not see HCPs working together in practice are unlikely to consider that collaborative inter-professional practice is important.

The University of British Columbia (UBC) has developed a model of IPE which consists of three overlapping learning stages, namely "exposure, immersion and mastery". In an article describing the model the authors provide examples of learning opportunities for each stage (Charles *et al.* 2010). The model leans heavily on Mezirow's (1998) theory which emphasises that a properly structured IPE curriculum can provide an excellent platform for transformative learning.

To graduate, students in the health professions are assessed primarily as individuals. Assessment of inter-professional competencies, however, should not only look at individuals but also at team performance as whole (Thistlethwaite *et al.*, 2014). Lingard (2009) states: "our way of seeing competence reflects the individualist orientation of the education system" and "that we cannot guarantee that, by bringing together individuals assessed as competent, a competent, functioning team will result". Talbot (2004) argues that competency is not synonymous with competence and that criterion-referenced approaches do not encourage deep and reflective engagement required during professional practice-based learning. He argues "that attainment of competencies does not guarantee satisfactory performance, which requires technical ability aligned with reflective practice". The inclusion of reflection as a competency might counter this concern.

6.2.4 Assessment of IPE competencies

Thistlethwaite *et al.* (2014) point out that the assessment of competencies is not well defined in any of the frameworks. They point out that the broad competencies can sometimes be difficult to translate into observable behaviours. Lurie (2012) argues that the situations in which competencies are relevant have to be specified and,

according to Thistlethwaite *et al.* (2014), this "has implications for the development of work-based assessments (WBAs)".

In a recent study, Blue *et al.* (2015) reviewed the current state of assessment in IPE. This was done by interviewing 20 IPE programme leaders in the USA and Canada, a literature review and an expert research meeting. They found that a diverse collection of methods and tools exist for the assessment of IPE competencies. These include tools to assess individual students' attitudes (e.g. the Readiness for Inter-professional Learning Scale (RIPLS) (Parsell and Bligh, 1999) and the Interdisciplinary Education Perception Scale (IEPS) (Luecht *et al.*, 1990), as well as number of instruments for the assessment of institution-specific goals and objectives. Only a few programmes used systematic processes to assess students' skills and behaviours in IPC. One exception being the use in Canada of the behaviour-based Inter-professional Collaborator Assessment Rubric (ICAR) (Curran *et al.*, 2011). A limited number of programmes report the use of modified objective-structured clinical exam (OSCE)-type or behaviourally based teamwork instruments for student assessment in a team context.

The authors conclude that the following are needed:

a Multiple methods of learner assessment that measure knowledge, skills and behaviour over time in various contexts (i.e. exam scores, reflective essays, projects, self-assessments, team-based assessments, multi-source feedback, preceptor assessments, etc.).

b Sound, behaviourally based assessments including objective-structured clinical exams that are team-based or require engagement with other professionals; alternately, an assessment rubric-grounded in observed behaviours.

c Frameworks that link a learner's performance with team and patient outcomes.

6.2.5 Summary

In summary, a number of national competency frameworks for IPE have been developed in, inter alia, the USA, Canada, Australia and the United Kingdom (UK). A framework is still needed for the South African context. For students to optimally master IPE competencies, they need to be integrated as members of healthcare teams, preferably during longitudinal clerkships, and be exposed to good role-modelling of IPC practice. Inter-professional learning (IPL) is dynamic and IPE should follow a staged approach progressing from 'exposure' (or 'novice level') in the early years through 'immersion' (or 'intermediate level') and finally 'mastery' (entry to 'practice level') before graduation. In the South African context attention should be given to the potential of the internship and community service to build on the competencies acquired during undergraduate study.

An IPE framework should also provide guidance on the educational activities and processes that facilitate the acquisition of competencies. One of the challenges is that there is little guidance on the best methods and tools to assess IPE competencies. What is clear is that not only attitudes to inter-professional practice

should be assessed, but also knowledge, skills and behaviours. Students should not only be assessed individually, but also in teams and assessment should also be aligned with their developmental stage.

6.3 Adopting an inter-professional approach to individualised healthcare

To facilitate effective inter-professional communication and collaboration health workers need a common bio-psycho-social-spiritual approach to patients (Fig. 6.3), allowing each profession to add its pieces to form a patient's 'health mosaic', using the same terms with the same understanding, and utilising the same framework for clinical reasoning and decision-making.

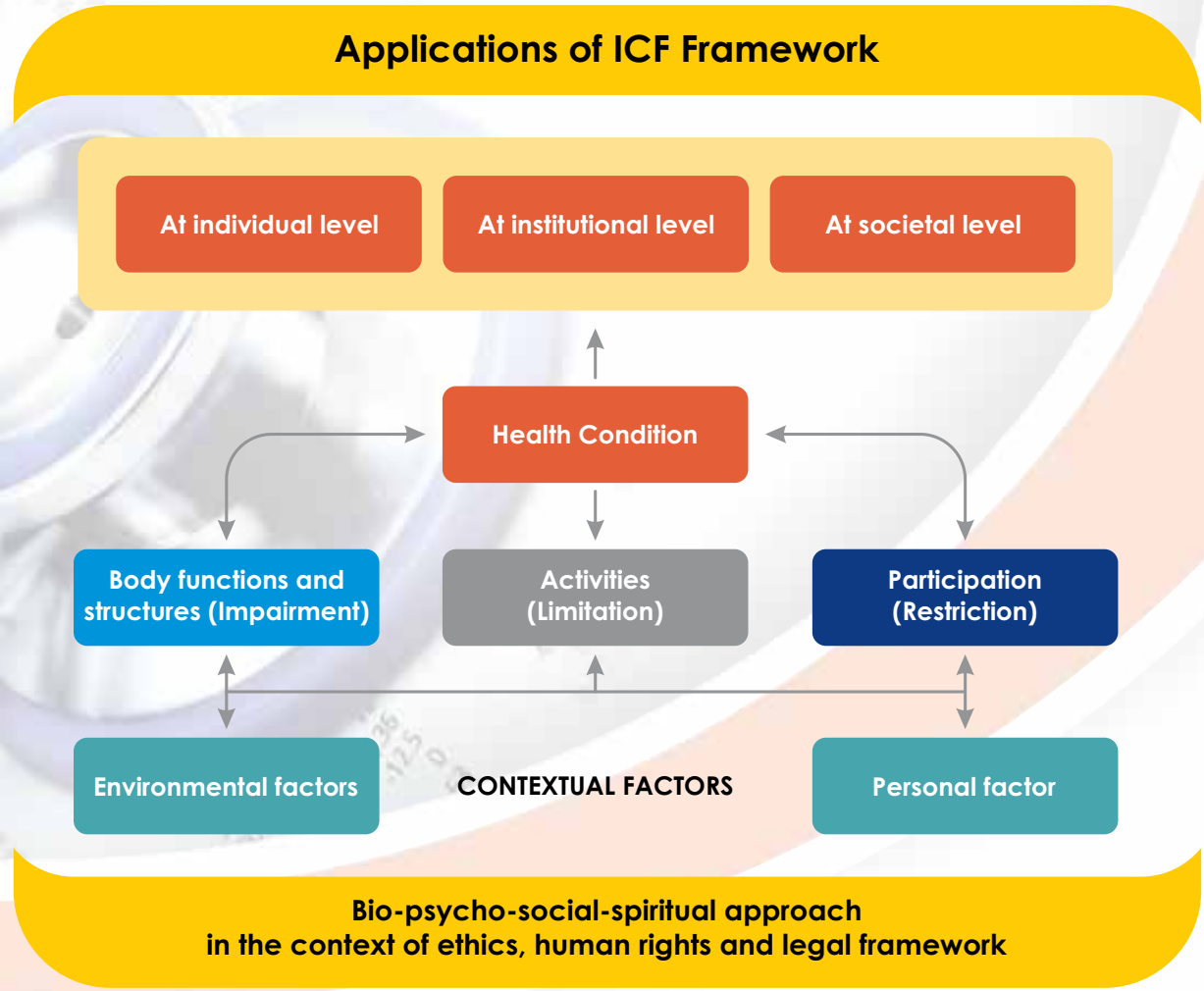


Figure 6.3: The ICF as inter-professional care and collaboration framework (adapted from WHO (2001) and used with permission of Talaat and Ladhani (2014)

In a recently published article, Snyman *et al.* (2015) discussed such a framework:

> "In 2001 the WHO launched the International Classification of Functioning, Disability and Health (ICF) as a comprehensive coding system for functioning and disability, a conceptual framework and "common language between all professions" (WHO, 2001). In HPE, ICF has not been widely taught as a

conceptual framework in approaching and managing patients (Allan *et al.*, 2006; WHO, 2013a). Rather, students are often taught numerous, potentially contradictory, frameworks in approaching patients and communities. These contradictions may serve as barrier to inter-professional communication and a bio-psycho-social-spiritual approach to patient-centred care (Fehrsen and Henbest, 1993; Barr 2011; Frenk *et al.*, 2010; Oandasan and Reeves, 2005; Thibault and Schoenbaum, 2013; WHO, 2010). Dufour and Lucy (2010) advocate for using ICF which "not only highlights the need for a diverse team of healthcare professionals, but also represents a paradigm shift in how to approach health and healthcare" (p. 668)" Snyman *et al.* (2015:313).

6.3.1 The value of the ICF as conceptual framework to facilitate IPECP

Numerous studies have investigated the value of using the ICF as a conceptual framework in facilitating IPECP. These can be summarised as follows:

a enabling a more comprehensive and holistic understanding and management of patients (Snyman *et al.*, 2015);

b facilitating clinical reasoning, to elicit the non-linear complexity of health and to serve as framework in the iterative 'juggling' during patient interactions (Allan *et al.*, 2006; Jelsma and Scott, 2011; Snyman *et al.*, 2015; Tempest and McIntyre, 2006);

c providing a systematic, though non-mechanical means of engaging with patients, carers and inter-professional team members (Snyman *et al.*, 2015; WHO, 2013a);

d causing team members to value inputs from other team members (Snyman *et al.*, 2015);

e improving skills-exchange between colleagues from different professions (Snyman *et al.*, 2015);

f breaking down the traditional hierarchy and professional (Allan *et al.*, 2006, Cahill *et al.*, 2013, Dufour and Lucy, 2010, Lawson, 2004, Snyman *et al.*, 2015, Tempest and McIntyre, 2006);

g enhancing respect, collaborative leadership, job satisfaction, trust relationships and accountability between team members, as well as a culture of on-going learning (Snyman *et al.*, 2015); and,

h creating awareness of contextual factors influencing patients' health, especially to conceptualise patient functioning as dynamic interaction between a person's health condition, environmental and personal factors (Snyman *et al.*, 2015; WHO, 2013a).

6.4 Empower role models through faculty development and capacity building

An important question related to IPE is how to best prepare facilitators of learning to deliver a workable context-specific IPE curriculum that advances their ability to implement, teach and offer IPE that assures optimal student engagement and learning (See Chapter 8).

6.4.1 Challenges to the introduction and delivery of an IPE curriculum

Anderson *et al.* (2014) address this issue and identify five challenges to the introduction and delivery of an IPE curriculum and explain how faculty development (FD) can overcome these:

a The crossing of professional boundaries in the process of developing curriculum.

b Integration of IPE within each profession's existing curriculum.

c Paying attention to the theoretical rigour and the evidence base for IPE.

d Managing the changeable and unpredictable nature of IPE development and delivery.

e Recognising that IP learning is complex and different.

In this section the FD model proposed by Anderson et al. (2014) will be used as an example of how one can approach this important component of IPECP.

Coles and Grant's model curriculum (Coles and Grant, 1985) consists of three overlapping components: the "curriculum-on-paper", "curriculum-in-action" and the curriculum experienced by the students. Anderson *et al.* (2014) propose that this model can guide FD through attention to the need to maximise, as much as possible, component coherence. They state that "the IPE curriculum is not only influenced by the contributions and interplay of its three different components but additionally by the different professions working in IPE and the diversity of the inter-professional learning students."

FD initiatives should be available to all involved in the planning and delivery of an IPE curriculum and their design should reflect the different roles for faculty members. According to Anderson *et al*. (2014), persons in these roles are the "IPE Champions", "IPE Professional Leads" and "IPE Facilitators". Other stakeholders include regulatory bodies, deans/heads of schools, faculty/university decision-making structures, students, patients/clients, service-user reference groups, administrators, internal and external examiners, those responsible for quality assurance and accreditors.

Anderson *et al.* (2014) see the purpose of FD for IPE to ensure closer alignment of the three IPE curriculum components ('written', 'in-action' and 'experienced') and believe IPE FD should assure a vibrant community of highly competent teachers who advance their practice and student learning through evidence-based teaching.

Anderson *et al.* (2014) also believe that FD initiatives that bring together members of different professions to work together on curriculum development provide opportunities to model IP learning by promoting group work and the formation of a new community of practice. The function of team building cannot be understated.

6.4.2 The use of FD to address the challenges

The proposals by Anderson *et al.* (2014) to use FD to address their five challenges include:

Challenge 1: Early FD activities should be aimed at gaining an understanding of the education contexts of the other professions including opportunities for sharing information about the various professional programmes and their underlying educational values. Group work that enables participants to learn more about each other, their programmes and their interest in developing IPE will facilitate better understanding. Sharing of course documentation, professional body standards, etc., can serve as a starting point.

Challenge 2: Finding areas of 'common ground' (e.g. patient/client safety) in the various existing professional curricula is an important step.

Challenges 2 and 3: Participants should agree on the IPE competency framework to be used and develop learning outcomes aligned with those competencies. This means translating the broader philosophical issues into learning outcomes that are coherent with the curriculum rationale and resonate with curriculum documentation conventions in the institutions. Learning outcomes include: patient-centred team-working, the different roles and responsibilities of health and social care professionals, IP communication, IP reflection, patient safety and human behaviour and ethical aspects of shared practice (Thistlethwaite and Moran, 2010).

The obvious subsequent step would be to design appropriate, theoretically sound and evidence-informed IP learning activities.

Challenges 1, 3 and 4 Sharing of the assessment regimes of each profession and eventually agreeing on appropriate IPE assessment model will help address these challenges. The following should be considered according to Anderson *et al.* (2014):

a Deciding if the assessment will measure learning in action or the attainment of learning outcomes (knowledge recall). Competency frameworks can be used to guide the assessment of knowledge, skills and attitudes. Decisions should also be made about the inclusion of team-based assessments.

b A flexible assessment strategy that satisfies profession-specific requirements. For example, a case study report or essay following patient-centred, practice-based IPE could both fulfil the professional requirements and the agreed local IPE assessment strategy.

c An assessment strategy that allows for measurement of progress over time. A professional portfolio, for example, can show student development along the continuum.

d In accordance with Miller's (1990) description of the need to assess knowledge ('knows'), competency ('knows how'), knowledge application ('shows how') and what students eventually do with this knowledge in practice ('does') calls for written and practical assessment opportunities and tools.

Students and patient/service-user involvement in the assessment process is also important McKenzie, 2002).

Challenges 2, 3 and 4 Finally, agreement should be reached on how to align and integrate IPE throughout profession-specific curricula (Bigg and Tang, 2007; Stone, 2010). This requires decisions on whether IPE is to be placed within modules at set times, *versus* approaches where IPE is included as small group activities run at different times. Anderson *et al.* (2014) suggest "avoiding too much rigidity and focusing on a pathway of learning that starts with theory and knowledge and progresses to application for understanding in practice. Experiential learning to appreciate the complexity of effective team-based collaborative practice, based in practice, should be included as soon as students are familiar with learning alongside other student professions" (Anderson *et al.*, 2014: 296).

"To achieve this understanding, faculty development activities should include mapping exercises to ensure that all faculty members can articulate how the IPE curriculum on paper has been (vertically and horizontally) aligned and integrated for coherence within the core profession-specific curriculum of participating professions" (Anderson *et al.*, 2014: 296).

6.5 Barriers and enablers to IPECP and ways to address these challenges

Identifying enablers and barriers to IPE is essential for successful curricular change and implementation. IPECP straddles individual, team, institutional, sectoral and national levels and many complex factors must align to provide successful IPECP. The WHO (2010) recognises that the mechanisms that shape IPECP are not the same in every health setting and that policymakers must choose those that are context specific and appropriate. Figures 6.4 and 6.5 illustrate the three stakeholder levels with examples of barriers and enablers.

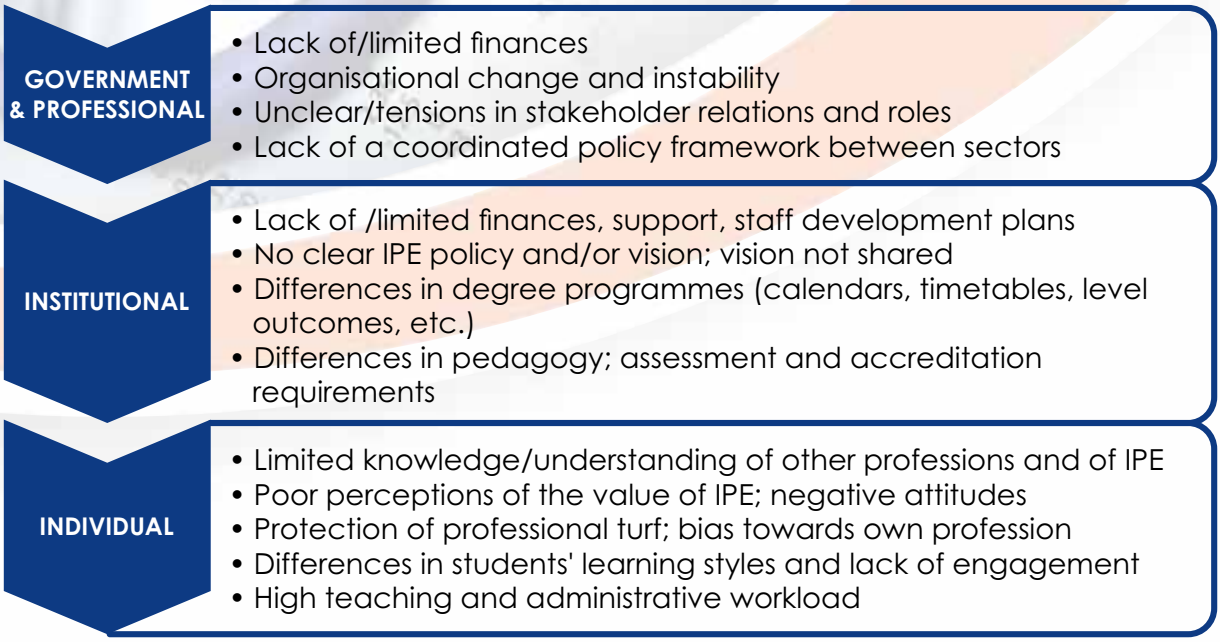


Figure 6.4: Barriers to IPECP at three primary stakeholder levels

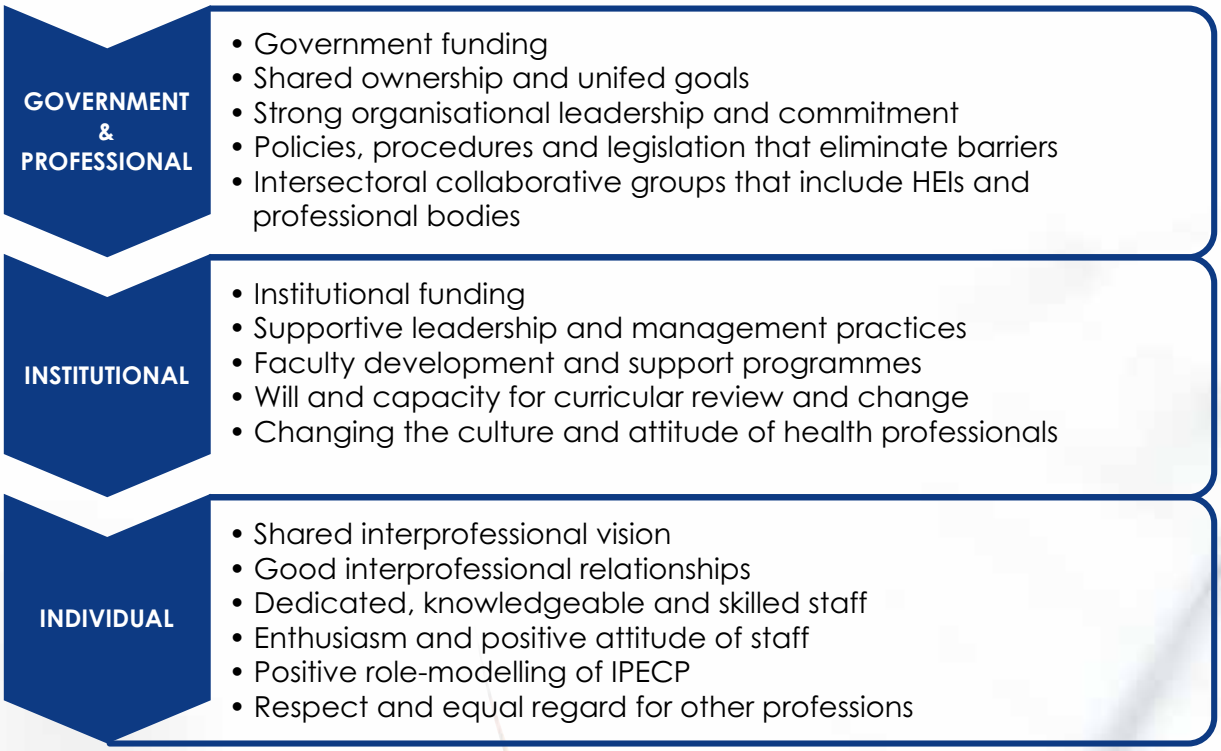


Figure 6.5: Enablers to IPECP at three primary stakeholder levels

6.5.1 Barriers

IPE barriers are not mutually exclusive and are constantly interacting to exert a negative effect on embedding IPE into curricula. Missen *et al.* (2012) point to a lack of government and political encouragement; insufficient organisational and administrative support; regulatory requirements; and, resistance from higher education institutions to implement curricula change (Ginsburg and Tregunno, 2005; Kvarnstrom, 2008; Stone (2007) in Missen *et al.*, 2012).

6.5.1.1 Summary of main barriers

a Governmental and the organisational barriers

At government and professional level, direct policy development is often either lacking or uncoordinated, creating uncertainly and role confusion. Maintaining links between partners and stakeholders is vital for coordinated efforts in IPE. However, these links are often challenged by organisational change (Lawlis *et al.*, 2014), of which a leadership void can be catastrophic. These changes can disrupt communication, diminish enthusiasm, break continuity and erode ownership, which may result in abdication of responsibility. On the other hand, planned organisational change relooks at practices, procedures, policies and routines. These processes need to include modifying attitudes to embrace the benefits of collaboration, modifying practices and routines to reflect the new organisational culture and beliefs, creating strong leadership and redistributing resources to bring about new practices and policies that support IPE (Ginsburg and Tregunno, 2005; Ho *et al.*, 2008).

b Regulatory barriers

Regulatory and licensing restrictions are also highlighted by Missen *et al.* (2012: 193). They point to the UK National Health System as an example of where regulatory, governing and accrediting bodies have assisted in facilitating change. Similarly, the lack of recognition of IPECP competencies by regulatory bodies and HEIs is a major barrier. Murray-Davis *et al.* (2012) in a UK-based study with midwifery students identified that competencies for IPECP were not assessed the same as clinical competencies.

c Funding barriers

Funding constraints straddle government and institutional levels and are a pervasive challenge. Embarking on sustainable IPE is resource-intensive (Lawlis *et al.,* 2014). Traditional competitive funding models do not encourage IPC and increase staff perceptions about the lack of rewards and incentives for IPE.

d Institutional barriers

At institutional level, the 2013 WHO case-study report identifies the lack of a shared vision, professional cultures and stereotypes, use and understanding of language including communication, accreditation and curricula as important IPE barriers (WHO, 2013b).

An institutional culture – faculty and health services – that is not patient-centred and does not give patients decision-making power was also identified as a barrier (Daly, 2004). In some health services in the UK where IP care is well established and IP care pathway groups exist, an expert patient board governs such groups. Daly (2004) believes that this is one of the ways that real power is given to patients. For the successful implementation of IP care and collaboration a payment system that emphasises quality and incentivises collaboration is essential (Brown, 2009).

e Curricular barriers

With regard to educational programmes, Newton *et al.* (2015) add the following barriers: overloaded, inflexible curricula; lack of credit portability between courses, lack of alignment of clinical placements; lack of facility and preceptor development for IPE; IPE not mainstreamed or prioritised; human, financial and space resource constraints; (outmoded) education policies and overall lack of commitment. In particular, curricula are criticised for being rigid, 'siloed' and timetable bound.

f Staff and students as barriers

At an individual level, the preparedness and commitment of staff, students and clinical staff is key to embedding IPE into the curriculum. Often 'buy-in' is determined by attitudes towards IPECP. Negative attitudes are disabling and are mainly around issues of added workload, lack of appreciation of the value of IPE, lack of knowledge and skill, devaluing other professions and their role in the health team, and lack of rewards for IPE activities. Negativity also stems from staff not being involved in planning IPE initiatives (Lawlis *et al.,* 2014). A clear, shared vision and staff involvement is essential.

These barriers pose major challenges to IPECP and the embedding of IPE into curricula. We summarise the main challenges and offer suggestions to address these.

6.5.1.2 Ways to address the main challenges

a **Policy level issues – no political commitment and national co-ordination**

The lack of sustained political commitment and integrated health and education policies are major obstacles to IPECP. The WHO (2010), Steketee *et al.* (2014) and Lawlis et al. (2014) all identify the need for closer and sustained links between the education and health sectors. Some ideas to address high-level policy and political issues include, first, direct IPE policy development between the national education and health departments, regulatory and accreditation bodies. Policy processes include aligned legal, regulatory and accreditation frameworks (WHO, 2010). Coordinated policy development should involve health consumers and national academic/higher education structures. Health workforce planning is an essential convergence point for health and education (Gilbert *et al.,* 2010). If health workforce planning and policymaking is integrated IPE can be fully supported to produce graduates ready to practice collaboratively in teams.

Second, HEIs as change agents have the capacity to advocate for and facilitate intersectoral policy development (Lawlis *et al.*, 2014). Funding is also an important catalyst for policy implementation and sustainability. Unless there is adequate funding and resources, policy on its own cannot enable IPE initiatives.

b **No shared vision, co-ordination and collaboration across sectors**

It is problematic when the IPECP agenda is not given the same priority in different settings and sectors, or when there is no shared jurisdiction. There is thus a need for HEIs to work closely with stakeholders to develop IPE placement opportunities; use of the best-available IP student mix; facilitating the inclusion of medical students in IPE with nurses and other HPs; and, authentic IPE materials (Derbyshire and Machin, 2011).

As Marshall and Gordon (2010) point out: "The favourable learning environment for IPE created within universities may be fruitless if it is not supported within the clinical setting (Murray-Davis *et al.*, 2012). They also emphasise that the extent to which the clinical workplace promotes IPECP influences the sustainability of these skills following graduation/qualification. In this regard, Missen *et al.* (2012) believe that the inclusion of IPECP in the mission statements of health services is important. This, in addition to a clear university/health sciences faculty vision and mission statement that espouses IPECP, is crucial for staff buy-in and retention, and for students when choosing an institution at which to study. It is essential that the faculty vision is shared by staff, which will assist in removing professional boundaries and increasing respect and equality of treatment of all professionals (McNair *et al.,* 2001). Ways to do this include setting up regular forums at which guided discussions occur with steps or action plans to manage issues that threaten IPC. Opportunities for professional showcasing and team role enactment are also important.

c Funding and resource issues

IPECP may require additional funding (WHO, 2010) or reallocated financial and other resources like infrastructure, time and human resources. In the light of declining government subsidies it is not possible for universities to carry the costs associated with IPE. Earmarked grants allocated by the New Funding Formula in South Africa may have to include IPECP in the same way it does for community development and the teaching of foundation programmes. HEIs too will have to find innovative ways to fund IPE, which could include raising grants. However, as Daly (2004) points out "Increased budgets alone are not sufficient. Localisation of budgets, use of resources for generic skills acquisition, auditing and improvement of multi-professional care as part of budget allocation, and the broadening of the research arena to include all professional groups would be a step forward" (Daly, 2004:79).

Other logistical issues such as geography, timetabling, classroom space and limited availability of staff also hinder IPE implementation (Freeth and Reeves, 2004; Solomon and Missen *et al.*, 2012). IPE in clinical placements that are at a distance from the HEI incur costs associated with transport, travel time, off-site supervisor/facilitator time and internet connectivity. Institutions need to develop appropriate organisational structures and administrative support to facilitate and coordinate IPE activities across programmes (Lawlis *et al.*, 2014). Processes that will require support include curriculum review, administration (calendars, timetables, placements, etc.), staffing and logistics. Although an IPECP champion may be required to lead the IPE processes it is essential to include the implementers.

Funding concerns are amplified in staff perceptions that there are no rewards or incentives associated with IPE involvement. The literature (Clifton *et al.*, 2006; Lawlis *et al.*, 2014; WHO, 2010) points to the need for management to recognise and support IPE with appropriate remuneration, reward, and related structures.

d Professional and communication issues

Maintaining professional relationships with colleagues from other disciplines is essential for the success of IPE (Lawlis *et al.*, 2014) and is a significant enabler of IPECP. Through these relationships academics transfer their enthusiasm for IPE to students, fostering student engagement and promoting the transfer of IPE knowledge and skills (Forte and Fowler, 2009; Ho *et al.*, 2008; McNair *et al.*, 2001). Direct communication between team members is also an issue because different disciplines use different language (jargon) and meanings. However, this also encompasses broader communication in the sense of power struggles and hierarchy between team members as well as professional boundaries (stereotypes), and different ethics and care models. Clark, cited in Murray-Davis *et al.* (2012), points to professional socialisation as a way of emphasising common ground between professions rather than divisions. This can be a tool for creating a new, shared perspective that fosters collaboration, rather than the historical, divisive professional ideologies. Morgan *et al.* (2015:1218) also emphasise the need for informal communication. Communication issues include using ICT solutions.

e **Staff development and training issues**
Staff development programmes are key for the successful implementation of IPE, however, they must go hand-in-hand with adequate funding, organisational support and recognition to ensure sustainability (Lawlis *et al.*, 2014). In clinical placement sites, IP training of clinical preceptors, mentors or clinical facilitators helps to increase student confidence and acceptance of IPE.

The lack of a continuum of IPE training – pre and post-qualification with clinical mentors who are able to teach and assess IPE skills was also highlighted by Murray-Davis *et al.* (2012). Caldwell and Atwal (2003) suggest that the best areas for shared learning are those that present complex patients, where professionals are required to work together in well-established teams who hold regular meetings, involving patients in care decisions (cited in Derbyshire and Machin, 2011). At student level, IPE opportunities in small, interactive groups are acknowledged as the most effective learning and teaching approach, especially where this learning focuses on practice realities. Research indicates that IPE is most effective when it is based on adult learning principles, when learning situations reflect real-world practices and when students interact (WHO, 2010). Teaching-learning approaches that support adult learning include, problem-based learning, case-based learning and other forms of active learning. Coupling these with e-learning goes a long way to appeal to a new generation of students. Staff development in these progressive pedagogies is essential but the content of such programmes must be adapted to staff needs and IPE context.

6.5.2 Enablers

The enablers (Fig. 6.5) are less well researched, however, they are widely recognised as the stimulus for the promotion of IPE success and sustainability (Matthews *et al.*, 2011). According to the WHO (2010, 2013c) a range of factors enable effective IPECP including:

a strong government and academic leadership, institutional support and appropriate legislation;

b supportive management practices, procedures and protocols;

c supported champions and leaders;

d changing the culture and attitudes of health workers;

e a willingness to revise curricula;

f communication;

g a positive physical environment that doesn't reflect traditional hierarchies.

At an operational level, Dean et al. (2014) identified the following enablers:

a formal staff training in IPE facilitation;

b formal student orientation;

c written objectives, case-based projects and small-group learning;

d team assignments;

e shared professional development seminars;

f regular team meetings and protected time and space for students and facilitators;

g a collaborative care culture with strong, committed leadership.

6.5.2.1 Main enablers identified

a Leadership

Leadership was identified as the most important enabler in a number of studies. Steketee (2014) found that national leadership was the most important factor towards building a connected, coherent and nationally coordinated approach to the development of IPE. In a study about what clinicians think of the role of leadership in IPE in Australia, Missen *et al.* (2012) point out that leadership from education providers, health services and regulatory bodies was crucial to enable IPE to be implemented and sustained within clinical settings. Without committed leadership IPE barriers are difficult to overcome. Leadership also extends to local settings where the need for champions and student leaders is highlighted.

b Collaborative curriculum development

Involvement of clinical staff in IPE curriculum development and facilitation is crucial. In this regard (Murray-Davis *et al.*, 2012: 294) state that the "Joint implementation of the IPE curriculum between the university and clinical site may be one strategy for promoting IPE within the workplace. In this way, both the university-based curriculum and practice setting promote a culture of IPE". This should include integrating IPE into job descriptions and performance management, training clinical staff and creating IPE champions.

Derbyshire and Machin (2011) focus on the need to develop curriculum content that is relevant across professions. Steketee (2014) identified the need for dedicated funding for IPE curriculum development and implementation, and the need for the professional development of IPE educators. While making IPE an explicit requirement in HCP courses is seen as an enabler by Missen *et al.* (2012).

c Allocation of appropriate human resources

Dedicated, trained and resourced co-ordinators and facilitators are a valuable enabler. The WHO points to a 2011 study that demonstrates that the facilitator is pivotal to IPE success (WHO, 2013c). Godden-Webster and Murphy (2014) believe that facilitators can enhance IPE decision-making. A working culture is one of three mechanisms identified by the WHO (2010) that help shape collaborative practice.

6.6 Stimulate discourse to research the impact of IPECP on HPE, patient outcomes and health systems

6.6.1 Gaps in IPE research that need to be addressed

Although research evidence is emerging in this field, for example, evidence that demonstrates the value of IPC in areas such as harm reduction, reduced length of stay, sustainable health outcomes, and staff recruitment and retention (Newton *et al.,* 2015), there are substantial gaps in conclusive, methodologically sound evaluation research.

Brandt *et al.* (2014) in a review that examined literature from 2008 to 2013, point out that "Despite a four-decade history of inquiry into IPE and/or collaborative practice, scholars have not yet demonstrated the impact of IPE and/or collaborative practice on simultaneously improving population health, reducing healthcare costs or improving the quality of delivered care and patients' experiences of care received" (p. 393). Their review revealed that existing research mainly looks at individual-level changes that IPECP has on knowledge, skills and attitudes; practice-based processes and organisational-level changes and very little focused on population health, health outcomes or healthcare costs (Brandt *et al.*, 2014: 396).

An updated Cochrane review, published in 2013, to assess the effectiveness of IPE interventions found that although studies reported some positive outcomes, due to the small number and the heterogeneity of interventions and outcome measures, it was not possible to draw generalisable inferences about key elements of IPE and its effectiveness. The review was restricted to studies that measured patient outcomes or healthcare processes and included 15 studies which measured the effectiveness of IPE interventions compared to no educational intervention. The authors concluded that to improve the quality of evidence relating to IPE and patient outcomes or healthcare process outcomes, the following gaps need to be filled:

a studies that assess the effectiveness of IPE interventions compared to separate, profession-specific interventions;

b randomised controlled trials, controlled before-after or interrupted time-series studies with qualitative strands examining processes relating to the IPE and practice changes;

c cost-benefit analyses (Reeves *et al.,* 2013).

Steketee *et al.* (2014) also point to the need for an evidence-informed approach to mainstream IPE in HP practice, education and learning. The need for further research to determine the link between theory and practice-based IPE, and evidence-based work on the quality of collaborative care provision are pointed to by Derbyshire and Machin (2011) and Virani (2012). While Kent and Keating (2015) emphasise the need for comparing care delivered in IPC settings to that delivered in single-discipline teams.

Brandt *et al.* (2014) similarly emphasise the need for generalisable qualitative and quantitative research on the practice of IPE, healthcare delivery, health outcomes

and costs. A recent systematic review conducted by Kent and Keating (2015) showed the quality of studies in this field is poor which limits analysis. Their review demonstrates how little is known about students and patient outcomes.

6.6.2 Research needs identified

6.6.2.1 Evaluation research

The WHO case study report (2013c), as well as the work of Dean *et al.* (2014), Brandt *et al.* (2014) and Steketee et al. (2014) all highlight the lack of methodologically sound, rigorous evaluation research of existing IPC projects and the need for development of a knowledge base that links IPECP to health outcomes.

Morgan *et al.* (2015) emphasise the need for generally agreed outcome measures for studies of IPC. They recommend 'real time' direct-observation studies although they point to this work as being difficult and expensive (Morgan *et al.,* 2015: 1228). Some of the areas that require evaluation data include whether IPECP can improve: access to and co-ordination of health services; health outcomes especially for chronic diseases; patient care and safety; complications; hospital admissions and length of stay, and mortality rates; as well as staff issues such as turnover.

Clifton *et al.* (2006) also point to the need to evaluate which specific approaches in IPECP result in improvements in service delivery, clinical outcomes and patient care.

6.6.2.2 Context-specific research

The WHO emphasises the need for researching context-specific experiences with implications for other settings including comparative studies of different sites in similar contexts (WHO, 2013b). They also point to the need for international comparative studies that are asset-based.

6.6.2.3 Organisation issues

Clifton *et al. (*2006) point to the need for research into the organisational conditions that promote sustainable IPC. Another organisational issue highlighted is the need to understand the most effective team compositions. The Champlain Study Team (Casimiro *et al.,* 2011) identified the need to research the composition of IPC teams in various settings including those with limited resources.

6.6.2.4 Research into teaching pedagogies, strategies and methodologies

Newton *et al.* (2015) report on the need for research into strategies that foster collaborative learning that are versatile and easy to implement locally.

New ways to think about and conduct educational and practice research were identified as major gaps by Steketee *et al.* (2014). They add that there is a need to understand how IPE takes place within and between individuals, how understanding of different roles is achieved, and how competencies are gained.

While Derbyshire and Machin (2011) emphasise the need to understand effective methodologies – "ambiguity persists in relation to the most effective methodology for effective IPE and the optimum timing of its delivery. In particular, the degree to which IPE should take place in the classroom or in clinical practice is unclear" (Derbyshire and Machin, 2011:239).

Virani (2012) also emphasises the need to understand how educational models are experienced in the field, whilst Dean et al. (2014) highlight the need for formal evaluation of the effectiveness of the teaching of collaborative care competencies on HP career choice and professional behaviour in the short and long term.

6.6.2.5 Understanding different roles

The role of students in IPE as well as a need for greater understanding of the patient/family role was emphasised by Newton *et al.* (2015) and Casimiro *et al.* (2011). Newton *et al.* (2015) also indicated the need for further research on the impact of cultural variables in team development and in patient/healthcare provider relationships. Kent and Keating (2015) indicated a need for more understanding of how to measure student outcomes in IPC clinical settings.

6.6.2.6 Effective communication in IPECP

Effective communication, including the crucial role of ICT, was highlighted as an area requiring research by Casimiro *et al.* (2011).

6.7 Explore ways to ensure the sustainability of IPECP in South Africa

6.7.1 The current situation in South Africa

There are numerous examples of IPL activities at South African universities. Some institutions have 'inter-professional' modules or sessions, involving students from various professions together in classes, small groups or on clinical rounds, but not necessarily developing competencies to work together effectively to provide person-centred care. Other institutions create IPL opportunities either through the use of paper patient cases or by students examining and presenting a patient. There are also examples of inter-professional service-learning activities in communities where students focus on community projects, e.g. involving health promotion and primary care.

Although praiseworthy, these activities do not necessarily facilitate institutional change to embrace a philosophy, culture and practice of IPECP. The Centre for HPE at Stellenbosch University developed an IPECP strategy, attempting to change the institutional culture towards one of inter-professionalism. This resulted in the university being selected by the Institute of Medicine to participate in its Global Forum on the Innovation of HPE relating to IPE (Cuff *et al.*, 2014).

In 2010/11 this strategy was revised by a group representing all undergraduate programmes (human nutrition, medicine, occupational therapy, physiotherapy and speech-language and hearing therapy), as well as postgraduate nursing (De

Villiers *et al.,* 2014). In keeping with findings of the CIHC (2010), Frenk et al. (2010), an IECE Panel (2011), IOM (2011) and WHO (2010), this revised strategy considered the pivotal role of IPECP in equipping students as change agents.

The group chose to integrate IPECP into current curricula, rather than designing separate module(s). Three focus areas were identified (Fig. 6.6):

a Development, integration and assessment of core competencies in curricula (Stephenson *et al.,* 2002), based on the CanMEDS competency framework (Frank, 2005) and competencies for ICP (CIHC, 2010; Curtin University, 2011).

b Promotion of an inter-professional care and collaboration framework, based on International Classification of Functioning, Disability and Health as common language between professions at individual, institutional and societal levels (Fig. 6.6) (Allan *et al.,* 2006; Cahill *et al.,* 2013; Tempest and McIntyre, 2006; WHO, 2001).

c Harmonisation between two key stakeholders in HPE: higher education (universities) and service providers (government health departments and community-based organisations). The aim was to build relationships and capacity in modelling ICP (Boelen, 2010; Clark, 2004; Craddock *et al.*, 2013; Lawson, 2004; Steinert, 2005).

Figure 6.6: The IPECP strategy at Stellenbosch University (Adapted and used with permission of Talaat and Ladhani, 2014)

6.7.2 National consultative workshop in July 2015

In order to get input on the question of how to ensure sustainability of IPECP in South Africa, a national consultation workshop on integrating IPE and graduate competencies in health professions education in South Africa was convened on 31 July 2015 (Solomon and Baig, 2015).

Participants endorsed IPECP and agreed that a strategic plan is required to guide its sustainable implementation in educational, regulatory and practice settings. Strategies were suggested to help ensure successful implementation. These were grouped into 12 themes, each with a strategic descriptor (Table 6.1).

Table 6.1: Twelve themes, with strategy descriptors, identified as components of a strategy to ensure the sustainable implementation of IPECP in South Africa

THEME	STRATEGY DESCRIPTOR
Stakeholder needs	Identify stakeholders and perform needs analysis (social needs, organisational needs, perceived needs and observed needs)
Stakeholder engagement	Engage all identified stakeholders and generate policy and strategy consensus
Statutory and regulatory consultees	Link funding to evidence of IPE impact
Develop contextualised IPCP competency framework for South Africa	Generate consensus on a national IPCP competency framework linked the needs assessment and accreditation requirements
Curriculum development	Use the IPCP competency framework to develop milestones, entrustable professional activities, instructional and assessment methods, as well guidance how to integrate and implement IPE into current programmes, curricula and modules.
Local and national collaboration	Coordinated and systematic national collaboration (including sub-Saharan Africa through AfIN)
Sharing best practice stories	Encourage educators to show and tell stories of IPECP successes and failures.
Partnerships with government	Collaborate with national and provincial governments to ensure that the clinical training platforms are adequately resourced to enable optimal opportunities for IPECP
Higher education institutions' (HEI) culture	Obtain HEI buy-in and facilitate instructional, as well as institutional changes in cultural and structure
Research	Develop a national collaborative research agenda for IPECP
Value (ethos)	Guiding principles for collaborative IPECP implementation
Academic faculty development together with curriculum and culture	Focused academic staff development for IPECP

6.8 Recommendations

Based on the evidence presented in this chapter and the proceedings of the consultative workshop summarised above, recommendations are proposed to enable IPECP to become sustainably embedded in HPE in South Africa.

a Formation of a single regulatory body for HCPs in South Africa which will ensure consistency across the health professions, while at the same time allowing for flexibility in terms of the functions of individual professions. The professional councils and boards will continue to exist, but be under the guidance and support of the umbrella body.

b Formation of a national working group to develop and guide implementation of a strategic plan for IPECP in South Africa. Such a working group should consist of patient representation, health professions student representatives, IPE experts/practitioners, project planners, service providers and professional boards.

c The formation in 2015 of the Africa Inter-professional Education and Collaborative Practice Network (AfIN) at the Towards Unity in Health Conference in Johannesburg was discussed. This community of practice has already documented well-formulated goals and would be well positioned to convene the national working group.

d Alternatives could include the South African Society of Health Educationalists (SAAHE), the South African Committees of Medical Deans, Dental Deans and/or Health Sciences Deans, the HPCSA and the South African Nursing Council (SANC). This responsibility could also be shared as collaboration will be necessary to help ensure funding.

The strategic plan should include:

a A detailed stakeholder analysis and plans for stakeholder engagement. It will be crucial to get buy-in from the:

- various regulatory professional councils (HPCSA, SANC, Pharmacy Council, etc.);
- national and provincial departments of health;
- committees of Medical, Dental and Health Sciences Deans;
- health professions students' representative bodies;
- service-user (patient) representatives.

b A plan for the development of an IPECP competency framework – an existing competency framework could be adapted for South Africa.

c A plan for the development of an IPE curriculum, based on this competency framework, for undergraduate, postgraduate as well as continuous professional education of HCPs. Such a curriculum should provide comprehensive guidance to educators and students on teaching and learning activities to ensure that the required competencies are reached, as well as a detailed assessment strategy. It will need to take cognisance of the need for IPE to be integrated

into existing curricula and modules on a continuum from early exposure to other professions through to collaborative practice in teams in the practice setting. It should also be easily adaptable to changing population needs.

d A plan for ensuring the required educational capacity development of educators and service providers that will be involved in the integration and implementation of IPE curricula at the country's educational institutions. The model proposed by Anderson *et al.* (2014) might be considered.

e A research plan to ensure that the implementation of IPECP in South Africa is based on evidence and that impact can be evaluated.

f A plan for how the instructional and institutional barriers should be overcome from national to local level.

CHAPTER 7

Core Competencies of South African Healthcare Professionals

Key points

- The development of core competencies is driven primarily by professional and regulatory bodies.
- Generic competencies straddle across health professions, breaking down professional silos and give rise to a new professionalism.
- Transformative pedagogy using meaningful combinations of learning strategies are best to achieve generic competencies.
- Assessment for learning is gaining acceptance and is expanding to include qualitative approaches when assessing competencies.
- Core competencies are used to guide and coordinate all assessment and evaluation efforts.

7.1 Introduction

The need for new, innovative ways to prepare future HCPs and transform pedagogy and curricula brings into focus the changing roles of academics and universities. Frenk *et al.* (2010) argue for curricula to be transformed to produce HCPs with the ability to recognise and adapt to the demands of new and changing environments in a manner that enables lifelong learning to acquire the necessary knowledge and skills to do so.

Adapting health professional curricula and courses in response to demands and changes in the immediate environment has become common practice. However, WHO (WHO, 2013:23) cautions that it is not sufficient to simply adapt curricula in line with the changing environment and technologies, "but what is more critical today, is that health professionals must be able to adapt to cultural variations and values, as well as attitudes to the different health problems of populations". This implies a more considered, less-reactive approach to HPE that enables core competency development rather than merely defining a set of context-specific skills.

Currently, in South Africa, profession-specific competencies are devised and organised within well-guarded competency frameworks, which are being contested in debates around quality assurance in higher education (Ballim et al., 2014) and around ideas about the new professionalism. Regulatory and licensing authorities, globally, adopt competency frameworks to ensure health professionals' fitness for practice and licensing. For educational institutions, this means that competency frameworks should form the bedrock for competency-based learning programmes while accepting that they do not embody all that is expected and required from graduates for healthcare in the 21st century. Competency is not the sum of everything that is expected from a health science graduate; only the minimum or core.

7.2 Key findings from the literature

7.2.1 Competence and competency

In broad terms, competence is commonly understood as a holistic concept that refers to the judicious use of an integrated body of knowledge, skill (behavioural and technical), attitude and values, in an authentic practice context (Bruce and Klopper, 2011; Epstein, 2007; Kilminster, 2007). Competency is a narrower but more dynamic concept that entails an individual's performance in a particular work role, specifying domains of ability and context (Bezuidenhoudt, 2014). Competency thus focuses on an individual's ability to perform activities related to their area of work, practice or learning.

Core competencies are those essential competencies that a HCP is expected to possess upon entering the profession. It is described as a level of expertise that is essential or fundamental to a particular profession. In nursing, core competencies frame the entry-level practice expectations of registered nurses that require them to utilise depth and breadth of knowledge, skill and judgement for safe and competent practice and adaptation to a changing healthcare environment (College of Nurses of Ontario, 2014). When these competencies are common to a range of HCPs, roles or job contexts they are referred to as generic competencies. Increasingly, employers and workplaces seek employees who possess not only job or profession-specific competencies, but also generic, high-level competencies (Young and Chapman, 2010). Examples of these include communication, interpersonal relations, problem-solving and conflict management. Globalisation, societal change and technological advances have forced organisations to employ graduates who, additionally, possess a global mindset, are socially accountable and IT-savvy. As a result, higher education institutions strive more and more towards engendering such generic competencies in their graduates.

In the South African education system, critical cross-field outcomes (CCFOs) set by the South African Qualifications Authority (SAQA) determine the generic competencies for all graduates. They describe the knowledge, skills and attributes that educators must develop in individuals for the social and economic development of the broader society (Bruce and Klopper, 2011). These CCFOs (Table 7.1) serve as a guide for designing HCP curricula and qualifications.

Table 7.1: Critical cross-field outcomes (Adapted from SAQA, 2000)

	Critical cross-field outcomes	Domain
Critical outcomes	• Identify and solve problems using critical and creative thinking • Work effectively as member of a team or group • Organise and manage oneself and one's activities responsibly and effectively • Collect, analyse and critical evaluate information • Communicate effectively using a range of skills in oral and written communication • Use science and technology critically and effectively showing responsibility to the environment and the health of others • Demonstrate understanding of the world as a set of related systems	Problem-solving; critical thinking Teamwork Self-management Research; scholarship Communication Scientific and technological literacy Global and systems thinking
Developmental outcomes	• Explore and apply various and appropriate learning and development strategies, and evaluate their effectiveness • Participate responsibly in local, national and global communities • Be culturally and aesthetically sensitive across a range of social contexts • Explore education and career opportunities • Develop entrepreneurial opportunities	Learning and development Responsible citizenship Sociocultural understanding Education; career directedness Entrepreneurship

7.2.2 Competency-based education

Competency-based education can be traced back to developments in teacher education programmes in the late 1960s in the USA. It has its theoretical origins in the behavioural-objectives movement, which has also been a major point of criticism against competency-based education. In the 1980s William Spady coined the term outcomes-based education (OBE), declaring that competency-based education (CBE) and mastery learning share an orientation in which learning outcomes rather than time and routinised scheduling constitute the basic operating principle of instructional delivery and student progress. All these approaches including criterion-referenced assessment, according to Van der Horst and McDonald (1997), form the theoretical foundation of OBE. Today the terms competency-based education and outcomes-based education are used interchangeably in the health professional education literature. Morcke *et al.* (2013) conclude that whilst the two concepts differ in detail, the differences are subtle. Both describe educational models based on the premise that teaching, learning and assessment should be guided by predetermined outcomes, and both focus on the end-product, as opposed to the

process of the curriculum. Harden (2015), who prefers the term OBE, concurs that OBE has a distinct focus on the "outcome or product and specifies the expected learning outcomes and competences that healthcare professionals need to develop in order to progress to the next stage of their training programme or be accredited as independent healthcare professionals" (Harden, 2015:27).

CBE refers to a teaching and learning approach that emphasises explicit learning outcomes that can be assessed in a flexible environment and timeframe. It focuses on the *mastery of learning outcomes*, rather than on academic achievement through fixed time structures (Burke, 2005). De-emphasising time in a competency-based curriculum is a major discussion point in the competency-based medical education (CBME) discourse. Given the fact that most HPE systems are time-based often linked to a specified number of 'blocks' or a prescribed number of weeks for clinical rotation, serious concerns are raised about the logistical chaos and disruption of services that might ensue if students are allowed to progress through their training at different rates in a 'pure' CBE system (Taber *et al.*, 2010; Touchie and Ten Cate, 2016). Hybrid versions of competency-based education are proposed and are currently being explored in CBME. Suggestions by the Royal College of Physicians and Surgeons of Canada (Frank *et al.*, 2014) include the option of having credit-bearing timed rotations, where progression to the next phase would not depend on completing the set number of rotations and a log book of procedures, for example, but instead on whether all relevant competencies were acquired at the specified level for the current phase of the curriculum. CBE is experiencing renewed interest due to the increasing demands for a new type of HCP and notions around new professionalism.

Developing HCPs with core and generic competencies requires an approach to HPE that, at most, is competency-based. Members of the CBME Collaborators[4] group (Frenk *et al.*, 2010: 641) describe CBME as "an outcomes-based approach to the design, implementation, assessment, and evaluation of medical education programmes, using an organising framework of competencies". They stress four overarching themes: curricula planning linked to the needs of those served; an emphasis on abilities and prior learning, not just knowledge; a de-emphasis on time-based learning; and the promotion of learner centredness – with learners reaching milestones at their own pace. In the context of nurse education, Anema and McCoy (2010: 32) emphasise how different CBE is from traditional education approaches. They posit that competencies are developed according to the expectations of what graduates should be able to do; processes are important and are put in place for students to demonstrate competency and for when they do not demonstrate competency; assessments are specifically linked to competencies; and, results are used to adjust student experiences and assist them to become competent.

A **generic CBE** model asks four essential questions that guide curriculum and course development (Anema and McCoy, 2010). This is illustrated in Figure 7.1.

4 The International Competency-based Medical Education Collaborators group was formed to examine conceptual issues and current debates in CBME identifying areas needing clarification, proposing definitions and concepts, and exploring future directions.

Figure 7.1: Essential elements of a competency-based education model

Criticisms against a competency-based approach are mostly about its conventional task-orientated and technical nature at the expense of subjective, humanistic outcomes associated with HPE (Chapman, 1999; Mulder *et al.*, 2009; Wheelahan, 2009). Humanistic outcomes such as caring, empathy and compassion that are difficult to define and measure are either omitted or neglected in a competency-based approach (Chapman, 1999; Hills and Watson, 2011). Such criticism has led to the inclusion of other domains such as the interpersonal, social and (critical) thinking domains. The dominance of 'outcomes' over 'process' in CBE, has also enjoyed a fair amount of criticism where learning outcomes are seen to be divorced from the processes of learning (Wheelahan, 2009). It may be argued that a competency-based approach that optimises both the product and process of learning is best described as *competency-based learning*. In coining this phrase it means that student learning as process is central to achieving the outcome.

Within the South African education context an 'applied competence' approach tempers such criticism and informs the type of competence that a graduate must demonstrate, in an authentic context, as a result of the learning process. It therefore takes into account not only skills but knowledge, thinking, reasoning, justifying, prioritising and adapting as part of learning. Applied competence includes:

a Practical competence: demonstrated ability to distinguish between a range of possibilities for action/intervention, to make decisions about such actions and to perform the action/ intervention.

b Foundational competence: demonstrated understanding of the knowledge and thinking that informs action/intervention.

c Reflexive competence: demonstrated ability to integrate actions and

decision-making with understanding; it includes justification for actions/ decisions and adaptability to changed circumstances.

Despite the prevailing contestations university acceptance of the usefulness of CBE is on the increase, but with due acknowledgement that further research is needed into, among others, the societal effects of its integration into programmes (Mulder *et al.*, 2009).

7.2.3 Perspectives of core and generic competencies

The literature is replete with writings on core competencies for HCPs in specific categories and, more recently, on cross-disciplinary competencies such as collaboration and teamwork. Core competencies have been developed mainly by international organisations and within a variety of country contexts. Canada and other developed countries such as the United States and the United Kingdomhave predominated in this area and, more recently, there has been increased involvement in some developing countries. Cross-country collaboration in medical curriculum review, described by Kiguli-Malwadde *et al.* (2014), has led to the development of a competency-based approach in two sub-Saharan African medical schools, taking into account the health and education systems of each country.

The most comprehensive competency framework identified appears to CanMEDS. Figure 7.2 illustrates the roles embodied by competent physicians within the CanMEDS framework. Competencies are detailed and outlined within the roles of: medical expert (the central role); *communicator; collaborator; leader; health advocate; scholar and professional* (CanMEDS 2005; Frank *et al.*, 2010; 2014). In this framework various specific competencies are identified with different milestones across the levels of medical school, residency and learning in practice. Within these categories there is further differentiation: for medical school these are medical school fundamentals and early clinical activity; for residency they comprise transition to discipline, foundations of discipline, core of discipline, and transition to practice. The milestones are generic across specialties and represent "the progression of competence from the start of medical training through advanced practice" (p. 4).

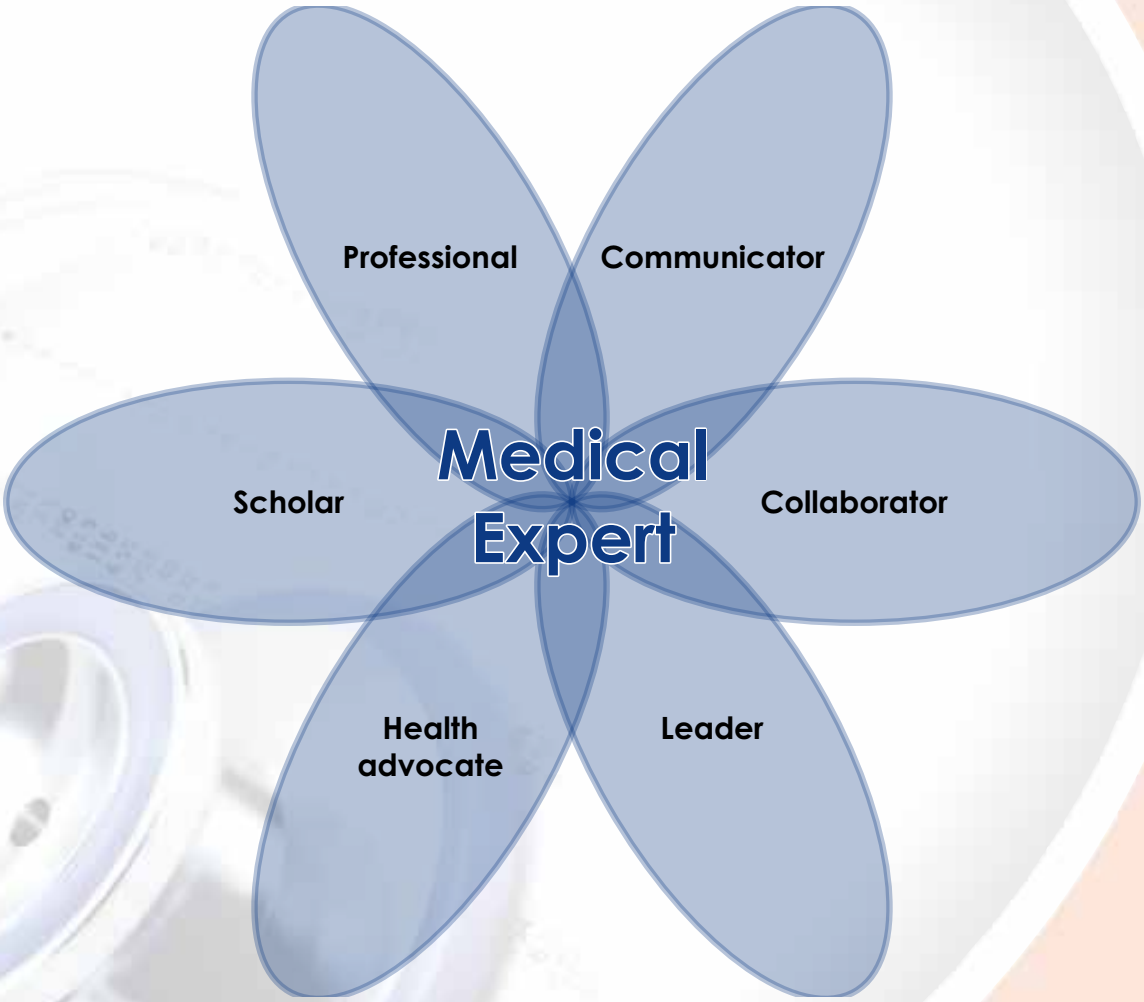


Figure 7.2: CanMEDS roles framework for physician competencies (Frank *et al.*, 2014)

7.2.4 Current competencies and standards in South Africa

South Africa has three main professional registration bodies for HCPs – the HPCSA, SANC and SAPC. In 2014 the Medical and Dental Professions Board published an updated version of the *Core competencies for undergraduate students in clinical associate, dentistry and medical teaching and learning programmes in South Africa* (HPCSA, 2014). This document, originally published in 2012, represents an adapted and contextualised version of the CanMEDS 2005 framework that was agreed upon between the Medical and Dental Professions Board and the training institutions (Van Heerden, 2013). Graduates from these programmes are expected to fulfil seven distinct roles. The HCP role is identified as the central role interlinked with that of professional, communicator, collaborator, leader and manager, health advocate and scholar. The medical expert role (espoused by CanMEDS) was replaced by HCP to encourage its adoption outside of medicine. Furthermore, this competency framework includes leadership and management competencies, which are considered essential for change management and for organisational efficiency and effectiveness. For each role key competencies are identified along with enabling competencies, referring to the means to achieve key competencies that involve others and a range of actions, decisions and values. Throughout

the document there is a recurring emphasis on patient-centred care; ethics; commitment to primary healthcare including prevention; holistic care; patient, family and community decision-making; the need to understand and respect cultural, religious and ethnic diversity; and, the need for professional teamwork.

For graduates from nursing programmes, the SANC has developed a *Bachelor's Degree in Nursing and Midwifery Qualification Framework* (SANC, undated), which provides detailed exit-level outcomes and their associated assessment criteria. In addition to the expected technical knowledge and skills, other competencies include sound ethical and legal practice; managing multi-disciplinary teams and health facilities; conducting research; information management; personal and professional development; and, providing care that is responsive to the individual's needs. Problem-solving, teamwork and communication are also emphasised.

The HPCSA document on training standards for physiotherapists (HPCSA, undated draft) outlines only technical skills required. However, the South African Society of Physiotherapy details in their Standards of Physiotherapy Practice (2012: 4) document the "performance and conditions that it expects physiotherapists to aspire to in order to provide high-quality physiotherapy professional services to society". These standards include: administration and practice management, communication, community responsibility, cultural competence, documentation, education, ethical behaviour, informed consent, legal, patient/client management, personal/professional development, quality assurance, research and support personnel. The South African Qualification Authority standards document for occupational therapists (OT) outlines exit-level assessment criteria, which recognise the changing role of the professional and include the need to understand the historical, cultural, societal context; applying primary healthcare and health-promotion principles; scientific knowledge, ethics and research, a people-centred approach; critical awareness of the "person-occupation-environment relationship"; effective OT practice in a range of contexts; critical thinking and problem-solving; teamwork; and, mediation and human rights advocacy.

In their vision, mission and values for the pharmacy profession in South Africa (www.sacp.org.za), the SACP outlines key themes that include leadership, providing high-quality accessible services, responsiveness including collaboration and innovation, and patient-centric services based on health outcomes. It also proposes values for the profession namely caring, leadership, collaboration, excellence and professionalism. It seems likely that these would also form part of the competencies of pharmacists registered with the Council.

7.2.5 Conceptualising core competencies

During a mapping and matching exercise it becomes clear that the professions of medicine, dentistry, clinical associates, nursing, pharmacy, physiotherapy and occupational therapy have overlapping core competencies. Figure 7.3 illustrates the main competency themes and their related sub-themes from the professional regulatory bodies of these professions. Competencies in each of these themes and sub-themes are underpinned and informed by certain principles, values and contexts for HCP practice. In conceptualising a common set of competencies

for 21st century HCPs it is important that such competencies are aligned with the critical cross-field outcomes of SAQA.

Competency Themes	Competency Sub-themes
Collaborative practice	Teamwork (interprofessional; multicultural) Team negotiation and conflict resolution skills Team problem-solving Accountability to team members and society
Health advocacy	Critical awareness; responsiveness (to health needs) Positive influence Mediation; cultural competence Human rights advocacy
Healthcare practice	Profesional care and caring Clinical reasoning; critical thinking Interpersonal relationships (patient/client; family; others) Clinical and procedural skills
Information and communication	information management including technology Faciliative communication Communication skills (verbal; written; other); listening skills Teaching of patients, groups, communities, students, others
Management and leadership	Organisation and provision of healthcare services and treatment Administration and management of healthcare delivery; practice management Leading and managing change Excellent, accessible services; quality assurance
Professionalism	High personal and professional standards Profession-led self-regulation; self-care Continuous professional development Life long learning
Research and scholarship	High personal and professional standards Profession-led self-regulation; self-care Continuous professional development Lifelong learning

Legal framework; ethical principles; human rights principles and specific contexts (global, regional, socio-political, health systems, clinical practice, primary healthcare)

Figure 7.3: Conceptual framework of overlapping competencies of health professionals in South Africa

7.3 Pedagogical approaches for achieving competencies

Questions about the best ways to achieve or learn the desired competencies address the issue of pedagogy in a competency-based curriculum. Pedagogy is the science and art of teaching and pedagogical approaches refer to the

overall perspectives used to plan and implement one or several teaching-learning strategies. According to Horsfall *et al.* (2012) contemporary pedagogies emerged from critiques of assumptions about teaching, learning and people, and new forms of knowing and knowledge. Contemporary theories around adult learning (andragogy), popularly applied in HPE, are also being challenged causing teachers to think differently about the way they teach and the way their students learn. Speaking to the andragogic principle of intrinsic motivation, Larson (2012) mentions, for example, that adult students, who find themselves in a learning programme that they have not chosen or are not interested in, will not be motivated to learn. Similarly, the (adult) student's prior experience, presumed to be a rich source of learning can be a barrier to learning if such experiences are sparse, negative or limiting. The latter thus challenges how we optimise students' abilities and prior learning, not just their knowledge, in a CBE approach (Frenk *et al.,* 2010).

Contemporary pedagogical approaches for producing HCPs for the 21st century must take into account student conditions and characteristics, the social context and the educational philosophy or values statement of the institution. Focusing on the latter, it means that the vision and mission of the institution responsible for educating HCPs determines the type of graduate (competencies) and the pedagogical approach to deliver learning programmes for the development of core competencies. It is clear from the literature that educational systems and institutions that embrace societal change and foster progressive, adaptive approaches to HPE are best placed to produce HCPs for the 21st century Frenk *et al.,* 2010; Hay and Marais, 2011; Van Heerden, 2013; WHO, 2013). Adaptive curricula, according to Hay and Marais (2011:230) that continually evolve in response to socio-economic, political and professional imperatives ensure ongoing institutional transformation. The transformative power of a university curriculum, they say, is evident when students' knowledge and experience help restructure conventions within the institution and also become a vehicle for changing societies for the better over time.

7.3.1 Transformative pedagogy

Within the known descriptions of pedagogy, transformative teaching and learning processes induce meaningful change that steers the person or the institution into new directions – the common denominator being an improved quality of life for all people. Transformative pedagogy combines the elements of constructivist and critical pedagogy (Ukpokodu, 2010) that empowers students to examine critically their beliefs, values, and knowledge – the student is thus at the centre of the teaching-learning encounter. In Chapter 8, mention is made of developing faculty members as leaders who, according to Frenk *et al.* (2010) will act as "enlightened change agents". The learning environment that optimises transformative pedagogy is characterised as democratic, emancipatory and empowering, during which students and teachers engage as co-learners, valuing each other's contributions and constructions of knowledge. Students are active participants in the process of learning, which helps them find self-expression and their own power to affect social change. At the level of teaching and learning, Horsfall et al. (2012) outline some of the contemporary pedagogies, which include involving learners as active participants (student-centred learning), promoting dialogue, focusing on the

relationship between teacher and learners, and noting the importance of values, emotions, cultural background and ethics. Longitudinal electronic portfolios and portfolio coaches are becoming a prominent feature of competency-based learning as demonstrated by Hall *et al.* (2012). The roles of contemporary educators include facilitation, trust development, role modelling, constructive communication and interaction, reflective practice and active engagement.

Active engagement in the learning process to see the world in a new way has its origins in the work of John Dewey (Dewey, 1933) and is the crux of transformative pedagogy. From the viewpoint of learning, Mezirow (2000) defines transformative learning as a process of changing our familiar frames of reference, making them more inclusive, open (to change), reflective and discerning so that they may shape beliefs, attitudes and views that will be more authentic and justified to guide our actions and behaviours (Ukpokodu, 2010). In the pecking order of curriculum orientations (transmission, transaction and transformation), a transformative approach requires total integration between the learner (L) and the curriculum (C) (Fig. 7.4), with a view to giving meaning and relevance to the learning encounter, characterised by humanism and social adaptation – the aim, to transfer learning into social action outside of the classroom (Carl 2014). In alignment with the work of Carl (2014) is the view of Frenk et al. (2010: 1924) of transformative learning as "the highest of three successive levels, moving from informative to formative to transformative learning", which is mentioned in Chapter 1.

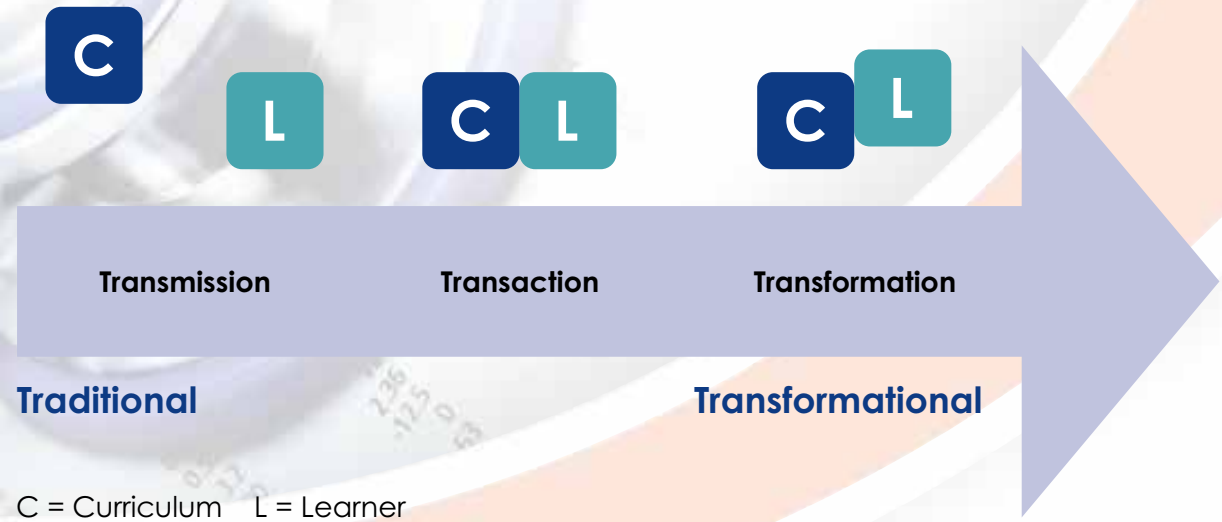


Figure 7.4: Curriculum orientations: from traditional to transformational

As no single pedagogical approach is the answer to transformative learning, *meaningful combinations* may be preferred which take into account varying student characteristics and experiences, and different learning contexts. A study conducted in an Irish nursing school (Murphy *et al.*, 2011) considered combining two pedagogical approaches – problem-based learning (PBL) and simulation. These approaches were combined, according to the authors, to enable students to generate meaningful knowledge related to a particular patient problem within a community context (in a PBL tutorial group) and then demonstrate in a controlled-simulated setting how they would manage that problem. In so doing,

"students engage in active learning, and critical situations can be reproduced to meet program learning outcomes, thus ensuring equity within the curricula" (p. e143). The study found that combining pedagogical approaches in a synchronous manner offered students a variety of ways of learning and transforms knowledge in different yet controlled environments. The ultimate goal is to challenge students to think for themselves and to think differently. We highlight some of the approaches that foster transformative learning.

Walsh (2011) investigated the value of *narrative pedagogy* when used in conjunction with a content and competency-based health science curriculum. Ukpokodu (2010) describes this strategy as pre-post narrative inquiries, designed according to Walsh's study, to open up new ways of learning and knowing, placing more focus on communication, emotion and the psycho-social aspects of health with the ensuing development of more complex and sophisticated patterns of thought. Narrative pedagogy helps students to identify knowledge gaps and reconfigure knowledge to create new understandings about self and their relationship with society. The question arises whether transformative learning can be experienced in a single course. Proponents (Mezirow, 2000; Kitchenham, 2008; Ukpokodu, 2010) believe that transformation can occur in stages, can be incremental and that even one course can enhance learners' understanding of the social context of teaching and learning.

Curriculum infusion as an approach to enhancing social awareness and accountability with regard to issues in the social environment (e.g. drug and alcohol abuse) has been successfully employed as a vehicle for transformative education. Riley and Yearwood (2012) describe curriculum infusion as the blending of a health/wellness issue with typical academic content. In this case the technique was used to enhance self-awareness and reflection, which was infused with education on quality and safety education, patient-centred care, teamwork and collaboration, and evidence-based practice. The authors reported that the learning gains went beyond mere knowledge acquisition. Curriculum infusion, they say, affords students the ability to generate their own knowledge and strategies that enhance their self-management and self-care and also to adapt their role as future practitioners in the healthcare system. "Students demonstrated an ability to be self-advocates when discussing the challenges they faced in their experiences" (p. 371).

The role of technology and, in particular, e-learning in transforming higher education is well known (Miller *et al.,* 2014; Al-Shorbaji *et al.,* 2015). Significant advances in e-learning technology have led to the development of adaptive learning technologies aimed at personalised, self-paced learning, which are key features of CBE. In a comprehensive review of best practices in e-learning for allied health clinical training and education, Grimmer-Somers *et al.* (2011) and the WHO, through the work of Al-Shorbaji *et al.* (2015), advocate for the use of *blended learning strategies* (combining e-learning with traditional approaches) for undergraduate HPE, and also postgraduate and continuing professional development courses. They point out that no one-size-fits-all, so educators should apply a range of strategies to address the learning needs of all students and there should be an emphasis on active learning (interactive problem-solving, case demonstrations and scenarios, quizzes and problem-based learning in groups) which employs

concrete as well as abstract thinking, and that use of innovative media should complement students' learning styles. As a transformative learning tool, students can be engaged in structured and threaded online discussions (Ukpokodu, 2010) to clarify their questions and test their assumptions and stereotypes in a multi-cultural education context.

Another transformative teaching-learning approach that not only encourages active learning but also improves the relevance of content/materials being learnt is the 'flipped classroom' where materials normally presented in class are learnt outside of the classroom and activities that would be assigned as 'homework' are dealt with collaboratively in the classroom (Prober and Khan, 2013). Leveraging their technological capabilities, students learn requisite material through video clips, podcasts, webinars and other forms of online presentations. Embedded activities including a series of questions, of various types, and problem-solving activities can be dealt with collaboratively within the classroom (Prober and Khan, 2013).

7.4 Competency assessment

In a typical CBE model (Fig. 7.2) competency assessment addresses the question: "What are the most effective ways to assess whether competencies have been achieved?" Within the range of measurement or assessment methods that exist, no method is inherently good or poor. Neither are existing assessment methods and tools used in isolation of one another. In a systematic review of the literature between 1999 and 2008, Lurie *et al.* (2009) found no evidence that current measurement tools can assess generic competencies independently (in the context of graduate medical education). According to the authors, what matters is that competencies should guide and coordinate assessment efforts (rather than developing tools to measure individual competencies) and that assessment should be integrated with the curriculum from the outset (Lurie *et al.*, 2009; Van der Vleuten and Schuwirth, 2005).

The call for assessment that is fit for purpose has become more pronounced over the past ten years. More recently, authors such as Van der Vleuten *et al.* (2012) and Franklin and Melville (2015) argue *for* assessments to be done over time in various situations, including clinical environments, and a programmatic assessment model that optimises assessment for learning rather than assessment of learning. Following on and referring to medical education, Holmboe *et al.* (2010) emphasise that robust, multi-faceted assessment which recognises multiple settings, and which is continuous and frequent, is essential in CBE. In assessing core competencies, professions have developed valid and reliable ways, some standardised and some not, to assess their students. However, assessing generic competencies such as the ability to work in a team, advocacy and professionalism, requires a different assessment orientation (Bezuidenhoudt, 2014; Van der Vleuten and Schuwirth, 2005). In a similar way to curriculum orientation (Fig. 7.4) we argue for transformational assessment in which assessment is fully integrated in the curriculum and its generic competencies.

The criteria which all good assessments must fulfil include: reliability, validity, feasibility, acceptability, cost-effectiveness and learning impact. Over time, little has

changed in these criteria with the exception of newer developments around reliability, validity and impact on learning. Reliability is no longer conditional on objectivity and standardisation as in the case of OSCEs; instead careful sampling across conditions of measurement has been found to produce reliable scores during assessments (Van der Vleuten and Schuwirth, 2005; Williams *et al.,* 2003). Developments in reliability naturally impacts validity – moving assessment from controlled environments back into the work place, particularly to achieve the final level in Miller's competency pyramid (the 'does' level), is gaining acceptance among educators (Van der Vleuten and Schuwirth, 2005). Again, the principle of adequate sampling across different contexts and assessors must apply in all workplace assessments. The impact on learning, also known as consequential validity is predicated on the notion that assessment drives learning (Van der Vleuten *et al.,* 2012). Although a familiar concept among educators, formative assessment is probably the least appreciated in its potential to drive learning. Developments in the learning impact of assessments suggest maximising feedback from formative assessments, spreading assessments over time, combining and balancing summative and formative assessments, and sustaining formative feedback.

Collecting data and information on the achievement of generic competencies will increasingly rely on the use of qualitative methods, and descriptive and narrative information (Van der Vleuten and Schuwirth, 2005) and the involvement of patients in assessment (Holmboe *et al.*, 2010). Given developments in assessment criteria, popular methods for assessing generic competencies would include self-assessment, peer assessment, 360-degree evaluation and portfolios (Bezuidenhoudt, 2014; Van der Vleuten and Schuwirth, 2005). These can be as reliable and valid as structured, standardised and simulated assessments.

A major concern relating to competency assessment is that of reductionism, whereby the translation of competencies into behaviour leads to the creation of endless nested lists of abilities (tick-box approach). Recently, an innovative approach to the holistic assessment of clinical performance emerged in the form of entrustable professional activities (EPAs). Coined by Ten Cate (2005), EPAs provide a practical and synthetic framework for the integrative assessment of competencies particularly in the clinical-learning environment. EPAs are "critical clinical tasks or responsibilities that can be entrusted to a trainee once sufficient, specific competence is reached to allow for unsupervised execution" (Ten Cate, 2013:6). Building explicitly on CBME, each EPA encompasses competencies from different domains, consisting of specific knowledge, skills and attitudes. EPAs can thus be used to clarify learning objectives and be linked to training and assessment opportunities in the clinical environment along a trajectory of developmental milestones (Carraccio and Englander, 2013; Touchie and Ten Cate, 2016).

In closing, the literature on transforming assessment in higher education points to the need for more collaborative research to address challenges in assessment, including identifying best practice and training faculty to be evaluators. The adoption of a hybrid competency-based approach to preparing future HCPs needs further exploration and inquiry.

7.5 Recommendations

a The framework and processes regulating and governing HPE in South Africa should, at all regulatory levels, be carefully aligned with the transformation imperatives for HPE highlighted in this report. Accreditation standards should explicitly recognise the imperatives identified in order to enhance quality of care and health outcomes.

b An inter-professional education and collaborative practice strategy should inform all curriculum reviews towards generic competency development.

c A hybrid competency-based education model that emphasises the process of learning and the achievement of learning outcomes is recommended; competency-based *learning* is thus the recommended approach.

d To transform learning among HCPs a meaningful combination of teaching, learning and assessment approaches is recommended. Such approaches:

- As input, require funding and the human and material resources commensurate to the processes and outcomes of a transformed HPE model.
- As process, require the integration of e-learning, blended learning and adaptive learning technologies in a conducive, student-centred learning environment;
- As outcome, aim to change societies for the better with an improved quality of life as the common denominator.

e Faculty development and continuing professional development in progressive and transformative HPE, including assessment should be implemented for successful competency development of future HCPs (See Chapter 8).

f An Inter-Professional Regulatory Council Working Group is recommended to build consensus around a set of generic competencies for all HCPs incorporating:

- SAQA's generic Critical Crossfield Outcomes as foundational in competency development;
- existing competency frameworks;
- conceptual framework.

These should be integrated into scopes of practice.

CHAPTER 8

Faculty Development

Key points

- Although educators are known to exert a powerful influence over the type and quality of graduates produced, faculty development is still a relatively neglected area in the training of health professionals.
- A useful conceptual framework for faculty development will require: understanding of the multiple roles of health educators, content areas, target populations, educational formats, the differing needs of faculty at different levels, contextual factors, teacher student systems and, organisational structures.
- The environment in which the teaching occurs, needs to be developed to grow and value the teaching role.
- There is a need to develop faculty from the pool of professionals, as well as to recognise educators on non-traditional platforms as part of the faculty establishment.
- Educators must acquire the knowledge and skills related to content development, pedagogy and assessments.
- Advocacy and leadership should be considered as foundational attributes and competencies for educators. Processes used in faculty development should aspire to transform participants into engaged agents of change.
- The shift from workshop-based development to the development of communities of practice has become a key feature of faculty development.
- Faculty development must ensure that ongoing reflection and scholarship inform future developments.

8.1 Introduction

The development of those entrusted with the teaching and training of future generations of HCPs is crucial because educators exert a powerful influence over the type and quality of graduates produced. Despite this being widely recognised, a systematic approach to faculty development is not yet the norm in most training institutions, including those in sub-Saharan Africa (Greyson *et al.*, 2011).

This chapter begins by providing a definition of faculty development (FD), briefly reviews the literature on FD to identify aspects and insights which are particularly pertinent to the transformation of HPE in South Africa, highlights some key concepts in relation to FD, and proposes a stepped approach for the development of health professions educators. It thus adds to earlier references in this report to the important role FD can play in empowering educators as change agents in HPE and the health system (See Chapters 2, 4 and 7 in particular).

8.2 What is faculty development?

FD has been defined as "a planned programme of events aimed at preparing individuals for their roles as teachers, clinicians, researchers and administrators with the purpose of enabling the institution to meet its goals, vision and mission, and its social and moral responsibilities to the communities it serves" (Frenk *et al.*, 2010 and Couper *et al.*, 2012 cited in WHO, 2013a: 24). FD initiatives must address a wide range of topics, including personal and interpersonal effectiveness, leadership and change management, conflict resolution and negotiation, team building and collaboration, and organisational development.

According to Swanwick (cited in Steinert, 2011), FD should be "an institution-wide pursuit with the intent of professionalising the educational activities of teachers, enhancing educational infrastructure, and building educational capacity for the future" (p. 410).

FD programmes also need to be flexible enough to address the needs of different types of educators. O'Sullivan *et al.* (2011) mention four types of educators (1) students, residents, and fellows who are required to teach but have little expertise and/or are launching their medical education careers; (2) faculty members who teach at universities or community-based sites, but for whom teaching is a small component of their responsibilities; (3) faculty members who have a major teaching role; and, (4) faculty members who want to become medical education researchers and faculty developers – all of whom may have differing needs.

Greysen *et al.* (2011) identify important challenges in the sub-Saharan Africa region including physical infrastructure and learning resources for teaching and learning, the tension between training generalists versus specialists and building the adaptive capacity of the educators to use active learning techniques and create opportunities to deepen critical reasoning.

The Lancet Commission Report (Frenk *et al.*, 2010) which has made significant recommendations for transforming approaches to educating a new generation of HCPs, highlights the central role of appropriate faculty development making the following specific recommendations:

a strengthen resources through increased investments in education of educators, stable and rewarding career paths, and constructive assessment linked to incentives;

b expand from academic centres to systems;

c link educators worldwide through networks, alliances, and consortia; and,

d nurture a culture of critical inquiry (Frenk *et al.*, 2010).

8.3 Faculty development literature

Couper *et al.* (2012) produced a comprehensive policy brief on faculty development for the WHO based on extensive research and review of the literature. The main intent of this section is to provide a summary of the key issues highlighted by the

WHO report. This is followed by supplemental information drawn from additional literature regarding core competencies for educators.

The WHO brief outlines the following considerations in developing a conceptual framework for FD: understanding the multiple roles of health educators; the content areas; target populations; educational formats; the differing needs of faculty at different levels; contextual factors; teacher student systems; and, organisational structures. Overall, the authors found very little literature addressing the selection of teaching staff and tailoring FD to local context and need.

The authors point to the following challenges related to the development of faculty for their teaching role:

a the multi-dimensional roles of health professionals either as clinician teachers with little education expertise or as educators with secondary clinical responsibility (including that teaching is often not afforded the same priority as research);

b attitudes towards teaching which manifest in the hidden curriculum;

c conflicting opportunities relating to the superior remuneration in clinical practice impact negatively on recruitment and retention;

d the overall shortage of teachers and the need for teachers who represent the communities served, including minority populations;

e the increased demand for health professionals (especially physicians, nurses and midwives);

f inadequate development of health professionals for a teaching role;

g rewards for teaching;

h the complexity of the faculty environment which may not always support faculty development.

They state: "Globally faculties face heavy teaching loads, a shortage of educators, limited infrastructure and competing demands for research and clinical services" (p. 4). Quoting Holmboe *et al.* (2011) they report that there is substantial evidence that health professional educators are insufficiently prepared across both traditional competencies of knowledge and skills, and more current competencies such as evidence-based practice, interdisciplinary teamwork and academic leadership. Referring to the literature review by Greysen *et al.* (2011), the brief highlights the difficulties in recruiting and retaining academic staff who are able to build the teaching and research missions of schools as a critical limiting step in efforts to innovate and improve academic medicine in sub-Saharan Africa.

The report points to the need for FD that includes skills development in clinical teaching and clinical skills teaching, small-group facilitation, large group presentations, feedback and evaluation. "Faculty need to be assisted to develop or adapt curricula that are context-specific and relevant to the populations they serve. Specific competencies such as teaching and evaluating communication skills, professionalism and the use of technology may also be targeted. Further skills are needed in personal development, educational leadership and scholarship, organizational development, and change management" (p. 8).

Multiple teaching methods are discussed such as workshops, seminars, short courses, sabbaticals and fellowships, integrated-longitudinal programmes and decentralised activities (community-based where possible) as well as more informal approaches including work-based learning; communities of practice; organisational support and development; and, mentorship and role modelling.

Additionally, quoting Wilkerson and Doyle (2011), they also emphasise "the need for continuous quality improvement strategies that enable the individual teacher to customise their faculty development through self-assessment, peer and student assessment, reflection, planning and mapping of their learning/teaching trajectory" (p. 8).

Examples of useful current initiatives highlighted in the report include:

a SANC which requires that all nursing educators have a teaching and administration qualification and that the qualifications of those who teach in the theoretical and clinical components of the course must be satisfactory in the opinion of SANC.

b The Study of Clinical Teachers in Canadian Faculties of Medicine which recommends that FD should be an intrinsic part of functioning as a clinical teacher, rather than an option. This emphasises that clinical teachers should be required to undertake periodic refresher courses in teaching using alternative formats and teaching methods.

c The international Best Evidence Medical Education (BEME) Collaboration which is committed to moving the education of physicians from ''opinion-based education to evidence-based education''. It provides medical teachers and administrators with the latest findings from scientifically grounded educational research (www.bemecollaboration.org).

d The Foundation for the Advancement of International Medical Education and Research (FAIMER) Institute which promotes an international health professions education fellowship and strives to develop a community of educators (www.faimer.org/education/institute).

e The model of South-South Cooperation and Twinning partnerships, developed in southern Africa through the Primafamed Network (www.primafamed.ugent.be/primafamed-edulink) is highlighted.

Importantly, the authors also identify the need for systematic research to demonstrate the impact faculty development has on HCP education and health outcomes: "Many low-resource settings lack the infrastructure and equipment required for high quality, appropriate and relevant education of health professionals. While there is a move towards evidence-based health education, there is little robust evidence evaluating the impact or quality of faculty development interventions much beyond satisfaction of participants" (p. 12). (The brief includes a detailed appendix which outlines all the studies sourced on FD outcomes.) Notably, the study identified only a few articles that detailed FD programmes aimed at ensuring graduates are equipped for practice that addresses community health concerns. This is a significant knowledge gap.

The brief points to the need for policy reforms in several areas:

a organisational change to support effective FD;

b encouraging culture change in educational institutions;

c shifting towards evidence-based education;

d addressing research gaps;

e embedding FD in accreditation processes; and,

f developing strategies to overcome barriers.

Finally, specific recommendations for health faculties and schools; government, funders and accrediting bodies; and, international organisations and donors are provided. For health faculties these recommendations include:

a Ensure teaching has equal stature in recruitment and promotion.

b Develop academic tracks for teaching staff with rewards.

c Ensure all new teaching staff are given appropriate orientation and educational training.

d Implement ongoing FD programmes.

e Create health professional education units and/or teaching and learning academies.

8.3.1 Core competencies for educators

While the WHO Policy Brief (Couper *et al.*, 2012) did not identify general competencies for healthcare educators, the field-specific competencies developed for Midwife Educators by the WHO (WHO, 2013b) are cross-cutting and may help to fill this gap. They include the following:

a evidence-based knowledge; applying research in practice; high-quality care; lifelong learning;

b understanding locally relevant health issues, epidemiology and health policies;

c the use of appropriate educational approaches (including problem-based learning; case study or narrative-based learning; discussion and group work; seminars; experiential learning; workshops; projects; active/participatory lectures; use of audio-visual materials; and e-learning);

d modelling critical and reflective thinking;

e fostering relationships;

f meeting learners' individual needs; fostering the cognitive, psychomotor and affective development of learners; assisting learners to engage in self and peer evaluation;

g using personal attributes (e.g. caring, confidence, patience, integrity and flexibility) that facilitate learning;

h fostering professional growth and personal development by effective communication;

i acting as a role model; working in multi and interdisciplinary teams; demonstrating cultural sensitivity; and, accountability for safeguarding human rights (WHO, 2013b).

The South African Nursing Council *Competencies for Nurse Educators* published in 2014 also identifies the need to function as a change agent and leader focusing on cultural sensitivity issues and innovation. These competencies highlight the need to understand the social, economic, political and institutional forces that influence the field and emphasise the importance for political advocacy for nursing education. Interdisciplinary work is stressed as is the integration of professionalism and values. Furthermore, a commitment to lifelong learning and scholarship is emphasised, and ethics and human rights are included (SANC, 2014).

In many countries leadership is now acknowledged as a core competency of HCPs and is therefore being offered as a component of FD (WHO in Doherty *et al.*, 2013). Chan *et al.* (2010) call for inter-professional educational opportunities to be integrated into curricula. This means incorporating learning methods which facilitate interaction between learners from different professions, including small-group learning formats such as case and problem-based learning. Hawala-Druy *et al.* (2012), furthermore, point to the importance of culturally appropriate education.

E-learning has been stressed by Frehywot *et al.* (2013). While pointing out that e-learning requires human and infrastructural resources not always present in low and middle-income countries, they conclude that employing e-learning approaches can have a positive impact both on student learning and the performance of faculty. Ventura *et al.* (2014) also stress that health education institutions need to invest in the technological training of faculty members. Other areas for FD are performance assessment and evaluation (Al-Eraky *et al.*, 2015).

Additionally, the development of communities of practice has been identified as being important for faculty development. In their study on the impact of the Foundation for Advancement of International Medical Education and Research (FAIMER)[5] programme, Frantz *et al.* (2015) highlighted that communities of practice allow knowledge creation and sharing, and personal and professional development. The Sub-Saharan Africa-FAIMER Regional Institute (SAFRI) established by FAIMER as training programme for health professions faculty in 2008 has made a significant contribution in this respect in the African region. Furthermore, the South African Association of Health Educationalists (SAAHE) an association of health professional

5 Since the early 2000s, the Foundation for Advancement of International Medical Education and Research (FAIMER), a US-based, not-for-profit organisation, has provided faculty development for health sciences educators in developing countries via a fellowship programme. The goal is to strengthen health sciences education and to help build a sustainable discipline in resource-constrained settings. In 2008 the sub-Saharan FAIMER Regional Institute launched a faculty development programme for health professions educators in sub-Saharan Africa. This two-year programme of residential and distance-learning activities, focuses on developing leadership, project management and evaluation skills as well as teaching the key principles of health professions education-curriculum design, teaching and learning, and assessment.

educators from South African universities, NGOs and government and private sectors has been in operation since 2004. SAAHE strives to improve the quality of teaching and learning in health sciences education in an effort to strengthen the delivery of healthcare in both the public and private sector.

A further importance competency for FD is social accountability. Boelen *et al.* (2009) stress that medical faculties need to be judged according to their social accountability – "a commitment to respond as best as possible to the priority health needs of citizens and society" (p. 887). There is a need to develop accreditation standards and norms that reflect social accountability. "Only then can educational institutions be measured and rewarded for their real capacity to meet the pressing healthcare needs of society" (p. 887). This means forging relationships with the health services and regularly adjusting curricula to meet changing health-system needs. However, they also point to a need for more evidence that socially accountable institutions result in HCPs who are responsive to society's priority healthcare needs.

Michaels *et al*. (2014) as part of the Collaboration for Health Equity in Education and Research (CHEER) group[c], examined peer review as a technique to measure social accountability in health sciences faculties and found that the peer-review process has the potential to align faculty and stakeholders around a common vision of social accountability. The study identified six criteria for establishing standards for reflecting social accountability – values, reference population, partnerships, student profile, graduate outcomes and impact.

Greysen *et al.* (2011) point to community-based education and service as an innovation in medical education in the sub-Saharan region, however, they add that it is time-consuming and requires faculty commitment, and also comes with challenges including unreliable infrastructure and language barriers. A South African study by Reid *et al.* (2011), found that doctors in rural areas were more than twice as likely to report having been exposed to rural situations during their undergraduate training, and five times more likely than urban respondents to state that such exposure had influenced their choice of where they practise. A high level of community accountability was also found[6].

8.3.2 WHO recommendations

The WHO's 2009 Global Standards for the initial education of professional nurses and midwives emphasises that academic and clinical faculty should hold appropriate university degrees and that systems and policies should be in place for validating and updating their education expertise; providing opportunities, resources and dedicated time for faculty development; and, instituting appropriate reward and recognition systems (WHO, 2009).

6 This work was conducted as part of the Collaboration for Health Equity in Education and Research (CHEER) a research team formed in 2003 in South Africa to investigate issues related to health equity and human resources. It brought together representatives from all the health science faculties in the country. The main focus was identifying educational strategies that would support health science graduates to choose to practice in rural and underserved areas.

In 2013, the WHO (WHO, 2013a) published *Guidelines on Transforming and Scaling Up Health Professionals Education and Training*. They state that the current environment puts an extra burden on staff and incentives like faculty development are part of the response to bridge the gap between teaching and clinical work. They point out that career structures and incentive and reward systems need to be developed or improved and that efforts are needed to train, attract and retain teaching staff with competencies in primary care to provide future HCPs with relevant knowledge and role models.

Concerning FD, the report makes the following overall recommendations:

- HCP education and training institutions should consider designing and implementing continuing professional development programmes for faculty and teaching staff relevant to the evolving healthcare needs of their communities.

This includes: promotion and reward for programme participation; conducting needs assessments to ensure relevant programming; incorporating principles of adult learning and instructional design; offering diverse educational methods; and, peer consultation. Some examples of academic centres in South Africa that are playing a leading role in FD through short courses, as well as Masters and doctoral degrees in HPE include the Centre for Health Professions Education at Stellenbosch University.

- Governments, funders and accrediting bodies should consider supporting the implementation of higher education policies for mandatory FD programmes that are relevant to the evolving healthcare needs of their communities.

This includes determining priorities; conducting needs assessments to ensure relevant programming; and, developing different programmes to accommodate diverse needs that incorporate principles of adult learning and instructional design.

- HCP education and training institutions should consider innovative expansion of faculty, through the recruitment of community-based clinicians and health workers as educators.

This means ensuring that educators come from and are based in the context in which health professionals are needed to ensure socially accountable training; and the up-skilling and in-service education (faculty development) of these educators.

The WHO guidelines stress the value of FD programmes in recruiting and retaining teachers and in improving the quality and relevance of medical-education programmes. "Faculty development should be designed to help reach the objective of scaling-up the quality and relevance of the education of future health professionals, while covering key areas such as clinical teaching, small group facilitation, large group presentations, feedback and evaluation, personal and organisational development, leadership and scholarship, and change management" (p. 17). They do note, however, the cost-effectiveness of FD programmes has not yet been determined.

They outline the following steps in designing programmes:

a understand the organisational culture;

b determine clear goals and priorities;

c conduct needs assessments;

d develop different programmes to accommodate diverse needs;

e incorporate principles of adult learning;

f use diverse educational methods;

g promote 'buy-in' and market effectively;

h prepare staff developers;

i evaluate and demonstrate effectiveness;

j encourage faculty initiatives;

k conduct meaningful formative and summative assessments (WHO, 2013a).

Based on similar considerations, Cilliers and Tekian (2016) offer a framing of effective FD as being dependant on a clear understanding of the interventions, the participants and the implementation. The authors emphasise the importance of meeting individual needs, context of practice and the reward of effective delivery. Programmes that are responsive to individual needs will emphasise the participants' capacity and their interaction through goal setting and feedback. These initiatives will depend in large part on the disciplinary knowledge and skills which participants bring and the extent to which these may be developed for effective transfer.

8.4 Key concepts related to FD

8.4.1 Relationship-centred teaching and learning

Key to the successful implementation of the Lancet Commission's recommendations, is the importance of educators reflecting on their position within health systems and the relationships within which they and their learners are engaged.

Relationship-centred teaching and learning is an emerging model crossing many fields. According to the Brandon Hall Group (Harris *et al.*, 2013) "Over the last 100 years, the learning industry has progressed from apprenticeship models, to teaching-centred approaches, to competency-based, learner-centred models, and today's emerging model focused on relationships" (p. 3). The authors argue that relationship-centred learning "leverages the connections between content, people, their environment, and their goals to constantly make accessible the most relevant learning in the most usable format to benefit both individual learners and the enterprise" (p. 5). This idea is central to the development of the responsive and accountable HCP reflected in part in community teaching. Relationships should be seen as the unit of engagement within communities of practice.

According to the Pew-Fetzer Task Force[7] (Tresolini and the Pew-Fetzer Task Force, 1994) "relational variables are important in improving healthcare outcomes" (p. 5) and therefore the healthcare system should be based on relationships and the health education system should include those relationships as part of its professional curriculum. Relationship-centred care is reflected in learner-centred education. "The caring relationship between practitioner and patient is modelled by the nurturing environment that students, faculty, and practitioners themselves create through the quality of their relationships" (p. 40).

The authors further point out that relationship-centred teaching requires strategies that include: apprenticeship; non-competitive, formative assessments; ongoing support for faculty development; introspection and reflection, self-awareness and knowledge; observation and listening; effective use of community-based clinics as education institutions; recruiting faculty for professional and cultural diversity; and, experiential learning in an interdisciplinary healthcare community. Christianson *et al.* (2007) also emphasise relationship-centred values such as effective communication skills and respect for different perspectives.

An area in which these relationships are particularly crucial is in inter-professional education which depends on cooperation and consensus among educators from different professional backgrounds (See Chapter 6).

Anderson *et al.* (2014) identify five challenges to the introduction and delivery of an IPE curriculum and explain how faculty development can help to overcome them:

a Crossing of professional boundaries in the process of developing an IP curriculum.

b Integration of IPE within each profession's existing curriculum.

c Paying attention to the theoretical rigour and the evidence base for IPE.

d Managing the changeable and unpredictable nature of IPE development and delivery.

e Recognising that IP learning is complex and different.

They refer to the model of the curriculum as comprising three overlapping components: the 'curriculum-on-paper', 'curriculum-in-action' and the curriculum experienced by the students (Coles and Grant, 1985) and suggest this can "usefully guide faculty development through attention to the need to maximise, as much as possible, component coherence". They continue: "It is particularly useful in health professions learning where courses include practice experiences, often including unplanned, opportunistic learning" and state that "the IPE curriculum is not only influenced by the contributions and interplay of its three different components but additionally by the different professions working in IPE and the diversity of the IPL students".

7 The Pew-Fetzer Task Force on Psychosocial Health Education was formed in 1992 to develop an agenda for encouraging the development or expansion of educational programmes that reflect an integrated biomedical psychosocial perspective.

FD initiatives should be available to all involved in the planning and delivery of an IPE curriculum and their design should reflect the different roles for faculty members, especially those essential to the success of an IPE curriculum. According to Anderson *et al.* (2014) persons in these roles are the 'IPE Champion', the 'IPE Professional Leads' and 'IPE Facilitators'. Other roleplayers/stakeholders involved in IPE curriculum development, implementation, delivery and evaluation include regulatory bodies; deans/heads of schools; faculty/university decision-making structures; students; patients/clients; service-user reference groups; administrators; internal and external examiners; those responsible for quality assurance; accreditors, etc.

Anderson *et al.* (2014) see the purpose of FD for IPE as ensuring closer alignment of the three IPE curriculum components ('written', 'in-action' and 'experienced') and believe IPE FD should assure a vibrant community of highly competent teachers who advance their practice and student learning through evidenced-based teaching. To achieve these goals FD must overcome the five challenges mentioned above.

An further perspective advanced by Anderson *et al.* (2014) is that FD initiatives that bring together members of different professions to work together on curriculum development provide opportunities to model IP learning by promoting group work and the formation of a new community of practice. The function of team building cannot be understated. "…the aim here is to encourage ownership of the curriculum-on-paper." FD, therefore, enables modelling of (IPC) and the opportunity for relationship-building between the professions.

8.5 Transformative learning

Mezirow's theory of transformative learning may be a key approach for the realisation of relationship-based faculty development. According to his original definition "Transformative learning refers to the process by which we transform our taken-for-granted frames of reference to make them more inclusive, discriminating, open, emotionally capable of change and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action" (Mezirow, 2000: 7).

Pardíñaz-Solís and Hastings (2015) argue that transformative-learning approaches that support critical thinking are necessary to allow medical students to develop into globally competent physicians (Pardíñaz-Solís and Hastings, 2015: 2). This is in line with the Lancet Commission report (Frenk *et al.*, 2010) which sees transformative learning as being focused on developing leaders who will act as "enlightened change agents". While these ideas have largely been applied to undergraduate education, it is difficult to see such changes taking place without similar shifts in the approach to faculty development.

8.6 Chapter summary and recommendations

Based on the current literature a number of components can be identified that are central to advancing faculty development which will contribute to health professions educators being responsive to their internal learning community and,

more importantly, to the community beyond the institution. This may best be characterised as a progressive process of six steps (Fig. 8.1):

Figure 8.1: Stepped process to advance faculty development

Each of these steps is briefly described below:

a **Supportive institutional climate valuing teaching**
The value of the educational role within institutions must be enhanced. We agree with the recommendation of Couper *et al.* (2012) that the environment in which the teaching occurs, needs to be developed explicitly to grow the teaching role. They suggest the development of teaching academies in which the nurturing of educators is central and acknowledged. Clear goal setting towards an education focus is also an integral part of the recommendations from the WHO. Furthermore, Steinert's (2011) discussion document proposes that in the postgraduate area the institutional climate may be enhanced through recognising individual needs in tandem with organisational priorities.

b **Recruitment and integration of faculty**
The teaching role in health professions education is often secondary to the clinical professional role. There is a need to develop faculty from the pool of professionals, as well as to recognise educators on non-traditional platforms, such as the primary care environment and the community preceptors, as part of the faculty establishment. Cilliers *et al.* (2016) propose that faculty development be constructed around the requirements of the job.

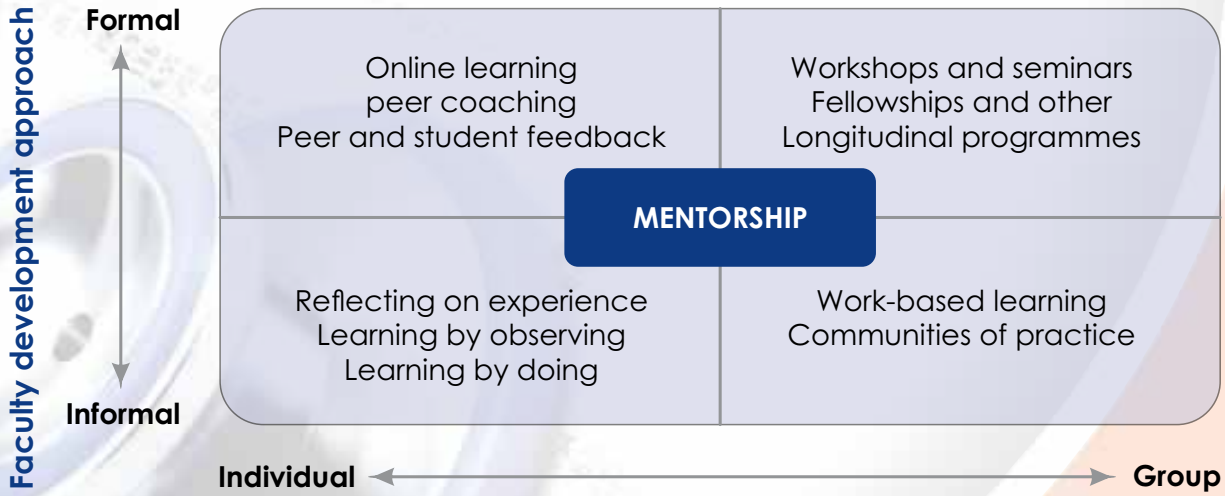
c **Competencies for change agency**
Educators must have the knowledge and skills related to content development, pedagogy and assessments as core. The 2014 SANC declaration of change agency as part of the competencies for the educators of nurses is important. Here, advocacy and leadership are highlighted as foundational attributes and competencies for educators. Tekian *et al.* (2014) describe these as important attributes to be achieved through postgraduate education together with enhanced scholarship.

d **Transformative educational strategies**
Processes used in faculty development should aspire to transform participants into engaged agents of change. Walker *et al.* reflecting on the role of universities in poverty reduction propose a praxis pedagogy of three elements which may be easily applied to the context of faculty development: contextual

knowledge and critical reflexivity; development of identity, commitment and community and challenging participative pedagogies.

e Adaptive education communities

The establishment of a critical mass of faculty developers allows for the development of an educating community which is adaptive and responsive to needs of both the educators and the context in which they will contribute. The shift from workshop-based development to the development of communities of practice is now a key feature of international faculty development. Steinert (2010) provides the following graphic (Fig. 8.2) which focuses on the mentoring of faculty in the process of shifting from event-based development to communities of practice.



Source: Steinert, 2010

Figure 8.2: Faculty development – from workshops to communities of practice

f Scholarship and reflection

Critical reflection is the apex of transformative learning. Greysen *et al.* (2011) have shown the patchy coverage of scholarship in the area of faculty development in sub-Saharan Africa which needs to be reversed. Faculty development must ensure that ongoing reflection and scholarship inform future developments. These competencies must be developed as part of specialist training and other postgraduate programmes. Based on the Stellenbosch rural education initiative, Van Schalkwyk *et al.* (2012) propose an educational evaluation framework consisting of three iterative components: establishing a research rationale and agenda; reflecting on current positions; and, declaring the desired end points.

CHAPTER 9

Internship and Community Service in South Africa: Implications for Undergraduate Education

"The world is moving on, and in many countries, including my own, the medical profession and medical educators can no longer remain aloof to the unmet needs of vast numbers of people. The old arguments that we are preserving a standard of excellence are wearing thin, not because that standard is invalid but because there has been so little effort to extend the knowledge derived from that standard to the unserved.

*Every apparent success must be measured against the needs of all. Every effort, every cluster of resources must be divided by the total number of people. The insistence of using this denominator – **all** the people – has profound social, political, ethical and educational implications."*

John Bryant, WHO (1969)

Key points regarding internship

- Internship is a formal component of basic professional education for medicine, pharmacy and psychology.
- Internship is a crucial period of transition, professional development and identity formation.
- However, the current experience of internship could be undermining the vision and intention of undergraduate health professional education.
- Tertiary educational institutions are not involved in internship in South Africa.
- The Lancet Commission recommendations are not carried through into internship.

Key points regarding community service

- Community service can be seen as the 'testing ground' for the completion of undergraduate education by health care professionals.
- CS officers (CSOs) take full responsibility for the first time for their own professional development.
- Service demands have outweighed learning from the inception of the programme, but the majority of CSOs report having developed professionally through the year.
- Attitudes towards CS are increasingly positive as the system has matured.
- Active professional development could optimise this continuous resource of young HCPs, including learning portfolios, online resources and inter-professional learning.
- Feedback by CSOs directly into the undergraduate curriculum could assist the process of alignment and 'fit-for-purpose' graduates.

9.1 Introduction

Professional experiences immediately after completion of undergraduate HPE in South Africa, are strongly influenced by the period of internship for certain professions, and the year of compulsory community service for all health professions. While internship is regarded as part of professional education, CS was specifically constructed and implemented not as training but as service to the nation. The implications for undergraduate education of this immersion into the public health system immediately after graduation are striking. The public health service makes demands on graduates not only in terms of professional competency but also with regard to resource limitations, particularly human-resource shortages; the social determinants of health and burden of disease; the role of the public servant in dealing with the public; as well as peculiarities of local systems in which young professionals find themselves. In terms of social learning theory, through which learning is not just cognitively but socially constructed, each hospital or departmental team creates its own dynamics which new initiates must negotiate and adapt to, within the wider context of an enormous burden of disease.

The compulsory nature of internship and CS injects a particular set of attitudes and responses, some of which may even be anti-educational, as young professionals struggle to adapt to a situation not of their choosing. The vision and intention of undergraduate HPE programmes may be systematically undermined by internship and CS as currently structured in South Africa. While the attitude illustrated by the article Slaves of the State (Erasmus, 2012), represents one end of the spectrum of responses CS at the other end are the significant and energetic contributions that young HCPs make to the health system on the basis of their education and preparation. With better alignment, internship and CS could be an opportunity to refine the skills and competencies necessary to face a challenging health system.

Seeing internship and particularly CS as the 'testing ground' for young professionals, potentially gives educationalists a broader view of their mission and purpose beyond graduation. This accords with the framework for social accountability of HPE, in terms of which a university can be judged on the type and quality of practice of its graduates, and their impact on the health system. The health services would do well to welcome students into real situations as often as possible, since the more exposure and mentoring they receive in such environments, the better they will contribute as the future workforce.

Frenk *et al*. (2010) redefined the post-modern age of HPE in their paper for the Lancet Commission which identified different levels of learning, signalling the need for a significant change in the way that HCPs are educated. The outcome of transformational learning would be seen in young graduates acting as 'change agents' by impacting on the systems and communities in which they find themselves. This potential should be enacted and tested during internship.

In 2013, WHO (WHO, 2013) produced guidelines for transforming and scaling up health professionals' education and training, using the Lancet Commission report. They formulated the components of a vision for transformative education which are outlined in the introduction chapter.

In terms of the social accountability of HPE, as put forward in the Conceptualisation – Production – Utilisation (CPU) model, the outcomes of HPE should be measured in terms of the impact of graduates on health and health systems. This concept was endorsed by an international group as the Global Consensus for Social Accountability of Medical Schools (2010). It relates directly to the conceptual model proposed in Chapter 2, in which HPE impacts on a population, and is determined by the health professionals skills mix required to provide the health services, that are generated by population health needs in a circular manner (Chapter 2, Fig. 2.1).

In 2014, South Africa responded by developing core competencies for undergraduates in clinical associate, dentistry and medical teaching and learning programmes. In addition to the two-year internship for medical practitioners and one-year internship for pharmacists and clinical psychologists, a compulsory year of CS in the public health sector is obligatory for all HCPs before full registration for independent practice. Each of these components will be described and analysed in this chapter. Too few studies traverse the gap between undergraduate education and the health system: most assume that the final examinations represent the ultimate educational outcome. Similarly, most studies of health personnel do not address their educational antecedents in depth, or understand the disruptive transitions that graduates traverse to enter the world of work. This is a pattern repeated annually by every HCP graduate, and new data are emerging regarding the nature of these transitions. The evidence such as it is, presented in this chapter, is more positive than expected.

9.2 Methodology

Annual surveys have been conducted, allowing community service officers to reflect on their experiences and future plans (Reid, 2015). Most of the data relate to medical doctors, dentists and pharmacists. The findings of these surveys as well as a literature review comprised the main methodology for this chapter.

9.3 Key findings from the literature

9.3.1 Medical internship

Medical internship was introduced in South Africa in 1950 by the South African Medical and Dental Council and has been regulated and administered by the HPCSA from 1997. The purpose is to equip trainees with the knowledge and practical skills for them to become independent, competent and safe medical professionals having obligations to patients, health systems and communities (HPCSA, 2002). In the early years, internship training took place in specialised and sub-specialised departments and lasted one year. Initial lack of uniformity in the programmes led to some interns spending six months in medicine and six months in surgery without exposure to other domains, such as obstetrics and gynaecology or paediatrics (Meintjies, 2003). Since then the format has become more structured with prescribed rotations through different disciplines (Meintjies, 2003). Criteria are set in terms of a minimum time spent in each domain, rather than competency-based exit criteria. The structure of rotations from a one year to a two-year programme was phased

in from 2005 in order to address skills deficiencies in unsupervised CSOs, as brought to light by the Confidential Enquiry into Maternal Deaths in South Africa (Moodley *et al.,* 2014). However, despite accreditation and monitoring of health facilities, there is considerable variation in the quality and scope of internship supervision and practice at facilities due to situational challenges. The major issues raised repeatedly by junior doctors include excessive workloads, overtime work, stress and sleep deprivation, in addition to the predictable adjustments from university to the world of work (Essa, 2010; Sun *et al.,* 2008). Sein and Tumbo (2012) identified the determinants of effective training in internship as good-quality supervisors, effective supervision, adequate opportunity for experiential learning, conducive environment, good support system (hospital management, hospital staff, academic opportunities), personal attributes and reasonable workload.

Internship for medical and psychology graduates is regarded as part of their training, as laid down in the following extract from the Health Act regulations 2009:

4.1 The curriculum of a student in medicine shall provide for (a) academic learning, (b) training and development of skills; and (c) development of a student's professional attitudes and conduct.

4.2 On the successful completion of the curriculum referred to above, such student should have developed into a basic medical practitioner under supervision in an approved internship programme.

4.7 In order to develop a graduate who has all the above characteristics, a two-phased approach shall be followed, consisting of undergraduate education and training, followed by an internship training programme.

It is noteworthy that although internship is legally part of professional training in South Africa, it does not involve tertiary educational institutions. By contrast, in other countries, internship or its equivalent (known in the UK as Foundation Years FY1 and FY2 and in Australia as Postgraduate Years PG1 and PG2) is managed by postgraduate councils or deaneries and includes a strong academic component. In countries where there is a greater involvement of tertiary educational institutions, this appears to benefit the learning and development of newly qualified doctors (Higgins and Cavendish, 2006; Pardhan and Saad, 2011; Sein and Tumbo, 2012). In a study conducted in Ireland, 84 interns considered an improved clinical experience throughout the undergraduate years to be at the heart of curriculum development but stressed that, to succeed, it would have to be accompanied by leadership within the healthcare system and efforts to improve the learning environment after qualification (Hannon, 2000).

Problems with internship in South Africa were highlighted by two studies in the 1980s. A national survey of interns in 1982 and 1983 by Brink *et al.* (1986) drew a response rate of 85%, and found long working hours, lack of formal training and negative attitudes towards the medical profession. They showed a loss of enthusiasm for medicine over the course of the internship year, and recommended urgent changes including that universities should be involved in internship training, and a more formal, structured vocational training programme be implemented. Touyz *et al.* (1988) surveyed interns in Johannesburg hospitals in 1985 and 1986 and found similar levels of stress, workload and lack of sleep, with around 40% reporting a loss

of interest in medicine. They suggested that this is not unexpected from interns who are fatigued, anxious and excessively stressed, with inadequate in-service teaching in most departments. Their recommendation of support groups and a mentoring system, is still relevant, and could turn internship into a more reflective experience by making the professional and personal development aspects more explicit.

The key competencies required of a South African medical graduate have been studied extensively (See Chapter 6), and most studies report that final-year students felt well prepared for internship (Draper and Louw, 2012). Nkabinde *et al.* (2013) found that the two-year internship adequately prepares South African medical graduates for CS, and that has provided the basis for independent medical practice in district hospitals. However, certain critical skill gaps need attention, particularly in obstetrics and anaesthesia. Areas of weakness in ear, nose and throat, urology, ophthalmology and dermatology could be addressed by including these as a compulsory rotation in surgery, medicine or family medicine during internship.

Clinical competence is the focus of most medical education studies, which tend to ignore the lived experience of interns. Medical internship is most often viewed as an apprenticeship, in which the novice learns through immersion in a work environment, through close observation of and interaction with experienced clinicians. Bandura's social learning theory (1971) would view this type of learning as based in relationships rather than in knowledge or content. Lave and Wenger (1991) developed the situated learning theory involving 'learning as participation' situated within 'communities of practice'. Professional identity formation is a major process during this period, which has implications for professional development and career choice. The social and psychological transition from university life, the frontline responsibility for patient care, the long hours without sleep, the development of professional attributes, and the attitudinal and ethical challenges of clinical work, all test the adaptability of the intern to an extreme. Those who have been through it see it in retrospect as a formative experience, refining the graduates' professional identity through mastery of practical knowledge and skills. Although largely a matter of individual development, Lave and Wenger (1991) emphasise the collective nature of the processes in terms of the norms and limits imposed by the professional community, which the novice is expected to conform to, as well as challenge.

In South Africa there has been little or no explicit effort to incorporate the reforms proposed by the Lancet Commission into internship training, such as the promotion of inter-professional education, or the 'new professionalism' that envisages HCPs as 'change agents' engaged in 'critical enquiry'. In the absence of involvement of education institutions, interns are generally regarded as a junior component of the medical labour force, rather than as learners, let alone innovators. Immediate service pressures, particularly in low-resource settings, take precedence over learning, innovation, and even the health of workers. The reforms proposed by the Lancet Commission have little chance of being implemented, as the hierarchical system into which interns are inducted perpetuates the dynamics of power and maintains the *status quo*. Light (1988) postulated that apart from workload pressures, the hierarchical power structures contribute to making internship a potentially damaging experience. He links this hierarchy to the arrogance observed in interactions of doctors with subordinates and patients.

9.3.2 Pharmacy internship

Internship for pharmacists follows immediately after completion of four years of full-time study leading to the awarding of a B Pharm degree. The period for pre-registration is a minimum of 12 months. The year is important as an opportunity for the intern to gain practical experience and knowledge in the practice setting including community and institutional pharmacies, and manufacturing pharmacies.

During this period, interns complete a continuing professional development (CPD) portfolio, tutors submit progress reports and the intern writes the pre-registration examination, offered three times a year. After successful completion, the intern may register as a pharmacist performing CS in a public-sector facility before he/she can practice independently. The pre-registration programme is based on exit-level outcomes which describe the knowledge, skills and attitudes required of an entry-level pharmacist. During the year, the intern should gain the technical skills to augment their undergraduate study.

This competency-based approach developed by the SAPC is salutary, as it directly influences pharmacy undergraduate education (Summers *et al.,* 2001), and sets a precedent for other professions. There have been no published reviews of internship for pharmacists, but the first large group of CS pharmacists was studied in 2001 (Reid, 2002). In an exit questionnaire, the vast majority felt that they had made a difference during the year, and had developed professionally. Pharmacists placed in institutions where there had never been a pharmacist especially rural hospitals made a tangible difference. Examples included introducing new stock systems and budget control, better patient counselling, training of primary care nurses on drug use, and attending ward rounds. Most CS pharmacists felt valued as part of a team, and played a part in management of the pharmacy or unit. However, there were enormous variations in the quality of management.

9.3.3 Clinical and counselling psychology internship

Leach *et al.* (2003) examined the state of counselling psychology in South Africa through discussion of its racial history and present-day positions, and noted that counselling psychology is undergoing significant changes. Pillay and Johnston (2011) found that only a third of clinical psychology interns felt adequately prepared for their internship, and one-third planned to emigrate. Pillay and Kramers (2003) reviewed the intern clinical psychology training programme for a 20-year period (1981 to 2000). They reported a significant increase in female interns and found that a quarter of former interns were working outside South Africa, the majority in Europe.

Counselling psychologists are often at the frontline of societal friction and trauma, as they deal with the 'downstream' consequences of the socio-political determinants of health. When compulsory CS was instituted for clinical psychologists in 2003, Pillay and Harvey (2006) found that more than half the respondents were not proficient in the primary language spoken by their patients. Notwithstanding the difficulties, around 90% of the sample believed they made a difference in the communities they served. In line with other studies of newly qualified HCPs, Kottler and Swatz

(2004) describe intern training as a rite of passage, similar to an initiation process. For psychologists this involves moving from lay to professional status. Watson and Fouche (2007) suggested that the counselling profession is struggling to establish a relevant identity that addresses the inherent problems created by South Africa's history. More assertive social advocacy would enhance the status of the profession.

Counselling interns are potential change agents who are well placed to make a difference beyond providing clinical care. Empowering people with the tools to deal with challenging work, family or community situations before they develop mental illness, could prevent a significant amount of ill-health.

9.4 Community service

Compulsory CS for HCPs is established practice in over 70 countries (Fig. 9.1). Frehywot et al. (2010) in an international study evaluating whether compulsory service programmes work as a mechanism for recruiting health workers to remote and rural areas, described three types of compulsory service:

a as a condition of service/state employment programme;

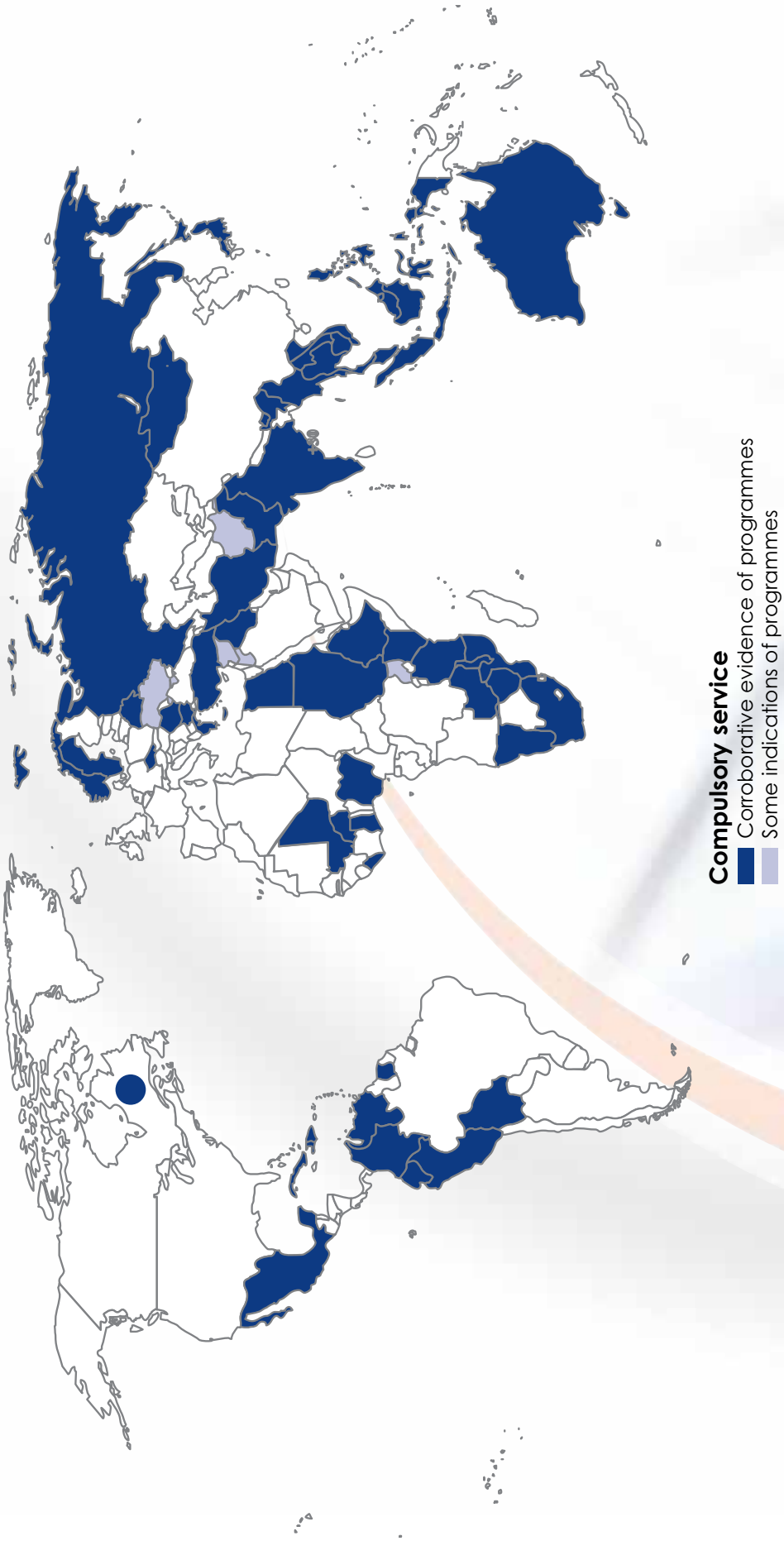
b compulsory service with incentives; and,

c compulsory service without incentives.

South Africa falls into the first category, since internship is a state-employment programme that is a prerequisite for full registration.

The second category, 'community service with incentives' is more directly linked to education. Students are required to undergo a rural placement during their training. If the compulsory service requirement is not met, the diploma or degree is not given. Another approach requires the graduate to serve in an underserved region as a prerequisite for entering a postgraduate or specialisation programme. Countries requiring this type of service include Mongolia, Pakistan and Vietnam. There is also a funding strategy where rural placement is required after graduation, often for one year for each year financial support was provided. This is found in Australia, Lesotho and Japan.

In South Africa the history of the development of CS is instructive. Following demo-cratic elections in 1994, the government adopted the primary healthcare approach to provide primary-level healthcare to all South Africans (ANC, 1994). The Ministerial Committee on Human Resource Development recommended that postgraduate vocational training (PGVT), with appropriate supervision, be made compulsory after internship. In July 1996, the interim South African Medical and Dental Council approved the introduction of PGVT for doctors from January 1998 (PHILA, 1996). DoH simultaneously proposed two-year compulsory CS for all medical graduates after internship, to meet the health needs of rural communities. In 1997, the Medical and Dental Education Committee and Technical Group of the HPCSA recommended a five-year undergraduate degree followed by a two-year structured internship programme to ensure competencies and skills in all domains. As an outcome of intense lobbying by the Junior Doctors Association, PGVT was replaced with one year of compulsory CS post-internship in 1998, via the Health



Source: Frehywot et al., 2010

Figure 9.1: Countries that have compulsory service programmes for HCPs

Professions Amendment Act (Reid and Conco, 1999). In their arguments, the junior doctors maintained that they were prepared to serve in areas of need as part of their social obligation, but it would be unrealistic to call it training when the level of supervision was unlikely to be adequate, particularly in rural hospitals. As independent practitioners therefore, they are expected to take full responsibility for clinical matters within their scope of practice as generalists.

CS primarily aimed to improve the supply of professional health personnel in underserved areas, thereby improving health service provision to all South Africans. The objectives were as follows:

a To ensure improved provision of health services especially to the rural and underserved areas of our country.

b To provide our young professionals with an opportunity to further develop their skills, acquire knowledge, behaviour patterns and critical thinking that will help them in their professional development and future careers (Reid, 2001).

It is significant that the two objectives were given equal importance, although, in practice, the former is regarded as the main purpose of the year. As the programme consisted of 'service not training', CS officers were allocated according to healthcare needs as determined by the DoH, rather than available supervision (Reid, 2001).

The pioneer group of 26 CS doctors were mostly allocated to urban hospitals in July 1998, followed by a cohort of 1 088 in January 1999. The first group of 173 dental graduates began their CS year in July 2000, and were allocated to sites in all nine provinces as well as the SA Military Health Service. Four hundred and six newly qualified pharmacists started CS in 2001, and in 2003 a further six professional groups followed – physiotherapists, occupational and speech therapists, clinical psychologists, dieticians, radiographers and environmental health officers. The largest single professional group (nurses) began in 2005, bringing the total number of CSOs each year to around 7 000.

It has been questioned whether CSOs are adequately prepared to enter independent practice following internship. The first national Confidential Enquiries into Maternal Deaths found that a number of maternal deaths occurred in district hospitals due to the inadequate anaesthetic and obstetric skills of junior staff thus raising concerns about the readiness of junior doctors for independent practice (DoH, 1998). Furthermore, an internal report by a specific task team on the skills and competencies of interns and community service doctors in 2001 revealed serious problems (Mathebula *et al.*, 2001).

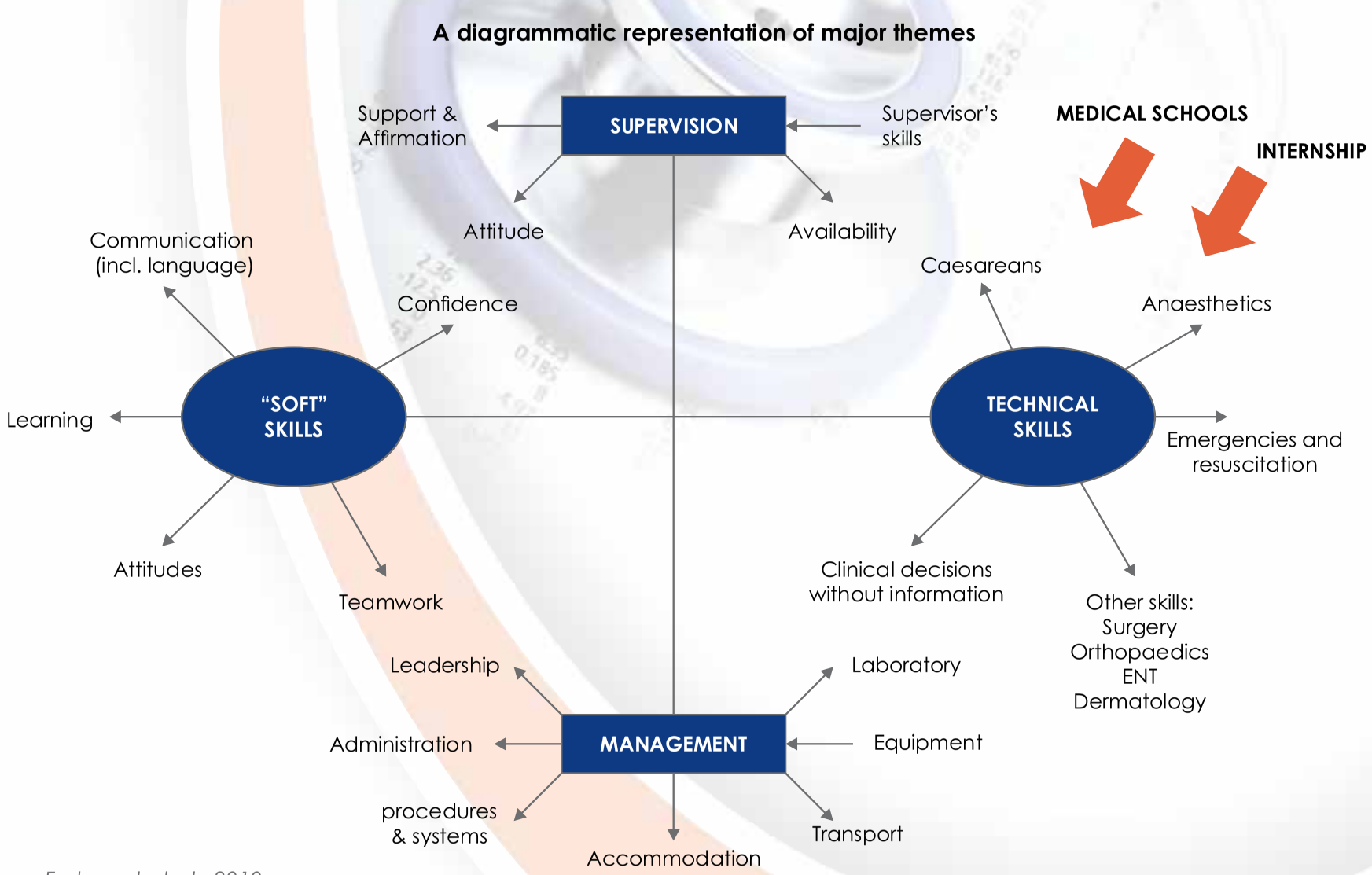
This evidence stimulated the revival of the two-year internship proposal, which was eventually implemented in 2005. Thus internship, as part of the professional training period, was adjusted specifically to meet the service needs encountered during the CS year. This re-alignment of internship and community service for doctors was not, however, extended back to its antecedents in undergraduate medical education.

Skills and competencies of doctors generally refer to clinical skills, or 'technical' medical skills such as clinical diagnosis and management, surgical and other procedural skills. The 2001 task team found that the highest priority technical skills amongst junior doctors were emergency procedures, particularly Caesarean sections, anaesthetics and resuscitation skills. Also important was the flexibility to work in resource-constrained settings where essential equipment was absent, and the competencies to make clinical decisions without complete diagnostic information, where facilities were limited.

In addition to technical competencies, the task team found that less-tangible issues such as attitude, teamwork, confidence and communication, were equally important in the delivery of quality medical services (Fig. 9.2). Deficiency in these skills and attributes in individuals and teams hampered the provision of quality medical services. CS doctors and interns were often thrust into situations of clinical responsibility without the personal maturity needed to work as a team. Attitudinal adequacy to face the challenges of the public service was found to be critical in determining the quality of health services.

The skills, competencies and attitudes of CS doctors and interns were also found to be significantly enhanced or hampered by the degree of supervision available and the management capacity of the institution. In terms of supervision, the level of competence and confidence of the more senior doctors was critical in making the CS doctor's work a positive learning experience. Many of the senior doctors were foreign-qualified, and did not share the background and cultural norms of their junior colleagues. Some contributed their experience and teaching willingly, while others did not see supporting junior South African doctors as their responsibility. Availability of supervisors was also variable, especially in isolated rural situations where CS doctors were often unsupervised (Mathebula *et al.,* 2001).

This major injection of newly qualified professionals into the system each year represents a significant opportunity for incorporating up-to-date evidence and practice. However, CS is only one strategy to address human resource shortages. It is in this context that South Africa has developed a Human Resources for Health Strategy (2011) which includes three strategic objectives directly relevant to HPE: human resource management, quality of care, and access to healthcare in rural areas (Table 9.1).



Source: Frehywot et al., 2010

Figure 9.2: Major themes identified by the task team on the skills and competencies of interns and CS doctors in 2001

Table 9.1: Components of HRH Strategy for the health sector: 2012/13 – 2016/17 that apply to community service

Strategic Objective 6	Strategic Objective 7	Strategic Objective 8
Professional Human Resource Management	**Quality Professional Care**	**Access in Rural and Remote Areas**
To effectively manage human resources in a manner that attracts, retains and motivates the health workforce to both the public and private sectors in an appropriate balance.	To develop a health workforce that delivers an evidenced-based quality service, with competence, care and compassion.	To promote access to health professionals in rural and remote areas.

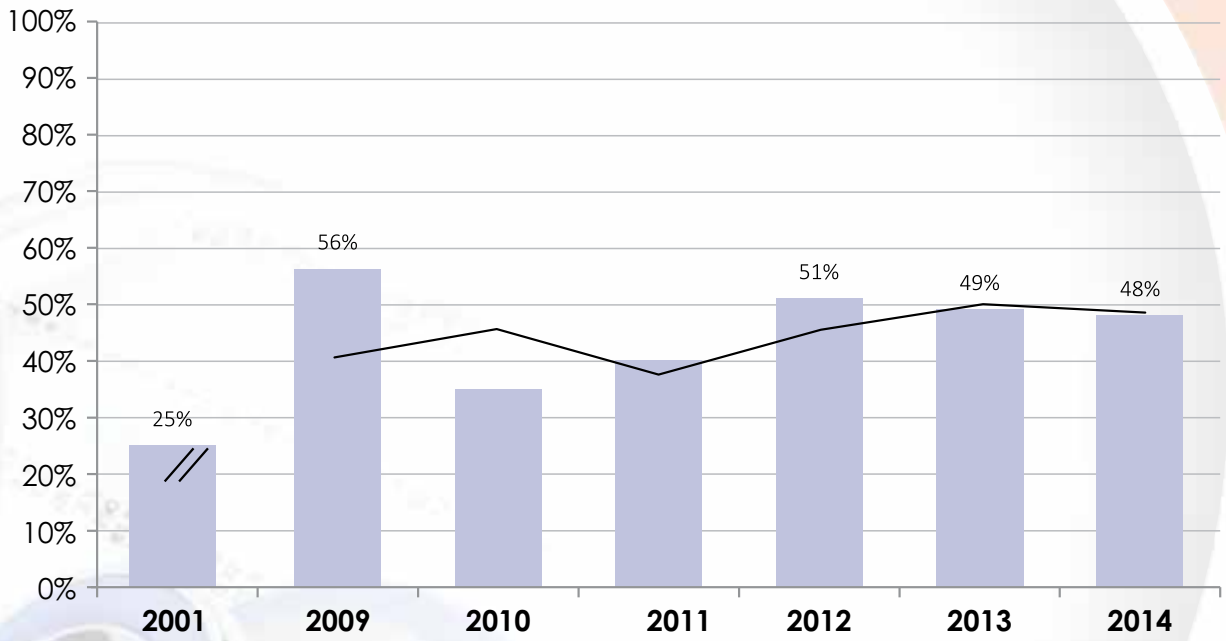
Source: DoH (2011).

With regard to CS, the WHO guidelines on the retention of HCPs in rural and remote areas were used (WHO, 2010). In this framework, education is regarded as one strategy to improve access to health services, not as an end in itself.

Over the 15 years the CS programme has been running there have been a number of significant shifts. First, not all those eligible for CS turn up: they either delay their year, leave the country, or take another professional direction. This is an indicator of the acceptability of CS. The average turn-up rate for CS doctors from 2001-2007 was 89%, but the trend was downwards (Reid *et al.*, 2015). This means that an average of 130 doctors are lost to the health sector after internship, equivalent to the output of one small medical school. Similar data are not available for other HCPs. The question is whether undergraduate education is preparing students for the challenges of the health system beyond the centres where they are trained, particularly in rural health facilities in different provinces.

Second, the number of respondents indicating that they received a provincial bursary has doubled in recent years, from 22% in 2009 to 42% in 2014, indicating a shift in funding from private to government sources (Reid *et al.*, 2015). These bursaries carry a year-for-year service obligation, so health science education has become increasingly dictated by the health service needs of government.

Last, the percentage of CS doctors placed in rural areas (as indicated by the allocation of the rural allowance) hovers around 50% but has improved from the early years when only a quarter of CSOs were placed in rural facilities (Fig. 9.3).

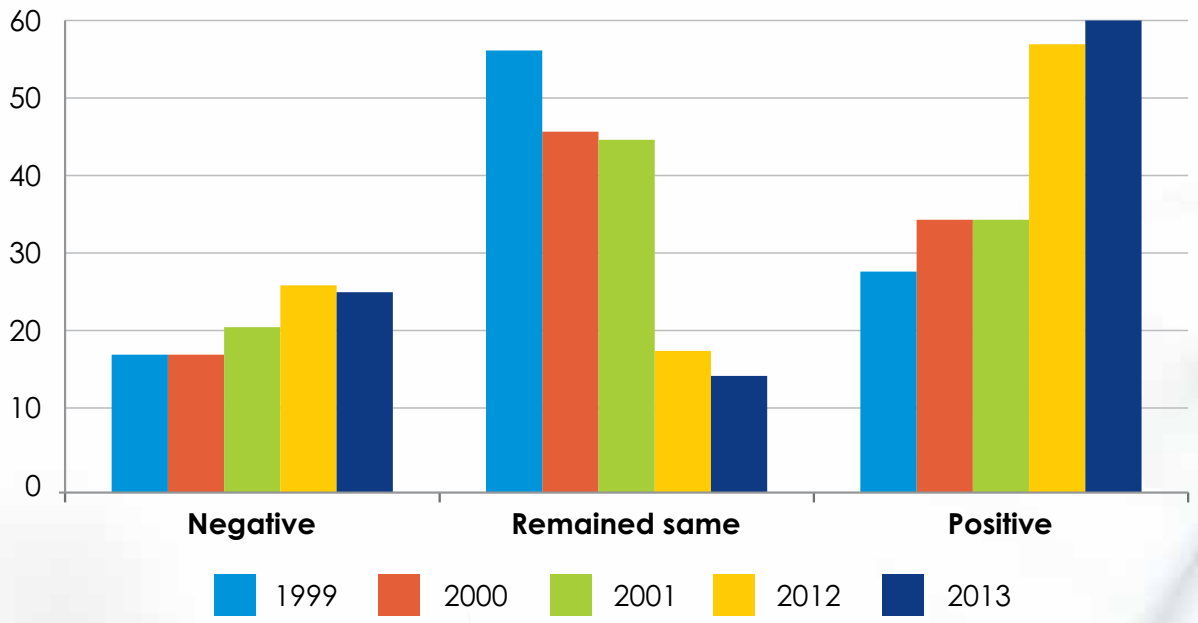


Source: Reid et al., 2015

Figure 9.3: Percentage of CS doctors placed in rural positions based on rural allowances

9.4.1 Experiences of CS

Around 80% of respondents in the annual surveys have consistently reported that they experienced professional development during the year, indicating that a significant degree of formal and informal learning continues after internship (Reid *et al.*, 2015). Almost all CS doctors performed overtime duties regularly, but this was not regarded as excessive. A positive trend has been observed in the experience of good clinical supervision, the availability of senior professionals, and the responsiveness of management to their concerns. Around 90% felt that they had contributed to the health of the community, and had made a difference. The CS experience has been increasingly perceived as positive overall from 1999 to 2013 (Fig. 9.4).



Source: Reid et al., 2015

Figure 9.4: Change in attitudes towards CS amongst doctors: response to the question: "My attitude towards community service has become more positive as a result of my experience this year"

This is an interesting finding, as it indicates that the experience of CS has improved substantially. The uncertainty that surrounded CS in its early years has possibly given way to acceptance of it as an unavoidable part of career development. This has allowed CS officers to experience immersion in a community of practice for 12 months in areas of need, and to use their skills constructively. An average of 50% of CS doctors planned to specialise immediately after completing their obligatory year. This has implications for postgraduate training, as it is beyond the capacity of the registrar training system to absorb these numbers.

9.4.2 Non-medical HCPs

A number of reviews have been carried out on other HCPs, including dentists (Naidoo, 2002; 2007), dieticians (Visser, 2006; Paterson, 2007), pharmacists (Khan, 2002), therapists (Khan, 2009; Penn, 2009), speech-language and hearing therapy professionals (Wranz, 2011), and nurses (Erasmus and Blaauw, 2011). Although the majority of CSOs in every profession report that they made a difference and found the experience professionally rewarding, common findings include a mismatch between the competencies of graduates and health-service demands, especially when essential equipment or supplies are not available. CS dentists, for example, find that they are not able to practise advanced skills because of the lack of equipment, and the overwhelming demand for dental extractions (Naidoo, 2002; 2007). They argue that the greater need for preventative and promotion of oral health work could be performed by dental assistants rather than trained dentists.

Many CSOs struggle with cultural adaptations to the communities they serve, with language being a major barrier. Speech-language and hearing therapy

professionals expressed concerns about the shortage of speech-language and hearing therapy services, absence of mentors and supervision, inadequate budgets, and amenities and resources. Readjustment must involve all stakeholders to ensure that CS honours its original objectives. Without adaptations from the health services and educational institutions, and better alignment, CS has been described as "running before we can walk" (Paterson *et al.*, 2007), as graduates are pitched into a dysfunctional situation without the necessary capacity or support to meet the challenges positively and proactively.

A significant, successful precedent has been set by the Department of Speech Pathology and Audiology at the University of the Witwatersrand (Penn *et al.*, 2009). Aided by an endowment, they have hosted a feedback session for all their graduates in the middle of their CS year to gain insight into their concerns and ascertain their views on their clinical and theoretical preparation for practice. This feedback has helped the department to modify and focus its syllabus in contextually relevant areas, as well as providing feedback for curriculum development. Apart from the cathartic opportunity for CSOs to share their experiences, this active alignment of the feedback into the curriculum gives a sense of urgency and relevance to the process. This includes the ethical issues that CSOs confront in dealing with poverty, vulnerability and disease burden.

9.5 Policy initiatives

Although the legislation for CS was promulgated in 1998, regulations were never published, and it was left to the provincial Departments of Health to make their own implementation plans. Only KwaZulu-Natal has developed a written policy on CS (KZN DoH, 2010), the purpose of which is to optimise the contribution of CSOs of all professional categories to health service delivery in the province by ensuring that:

a Healthcare services are delivered equitably in accordance with the National Health-prescribed package of services at district and primary healthcare levels throughout the province.

b There is equitable allocation of CSOs to facilities.

c There is appropriate supervision and support.

d A supportive working environment is created that encourages CSOs to remain in the public service, particularly in underserved areas.

Amongst other decisions that clarify the objectives of CS in KwaZulu-Natal, rural and underserved areas are explicitly given preference when allocating CSOs.

A National Summit on CS was hosted by the Foundation for Professional Development in April 2015 to review the experience, policy and objectives of the first 15 years of the programme, and to make recommendations. The data available indicate that for doctors the CS programme largely meets its two stated objectives, namely to increase skilled human resources in rural and underserved areas, and to support professional development. Around 50% of CS doctors are placed in rural facilities and over 80% report professional growth during their CS year. The

summit produced a number of recommendations regarding policy, research and partnerships to optimise the impact of CS (Table 9.2).

Table 9.2: Recommendations from the National Summit on CS

Recommendations
Regarding policy: a A Facility Accreditation System (FAS) for facilities designated for CS should be developed and implemented. b The CS policy should be amended to create incentives to improve the experience of CSOs during rural placements and could include supported professional development opportunities, study leave and job security through multi-year employment contracts that extend beyond CS year. c The policy should clearly articulate a strict focus on underserved areas (rural and urban) where CSOs are enabled to meet community needs. d There should be a clear policy and transparent standardised guidelines on the allocation of CS posts. Requests for alternative placements should not compromise the policy objectives, particularly placement in rural, underserved areas, and a system to monitor abuse should be established. e Full-time positions in the public sector should be marketed to CSOs. f More peripheral sites should be accredited for academic rotations to ensure increased access to senior professionals for clinical support and exposure to specialties.
Regarding partnerships: a Developing quality accommodation potentially through public-private partnerships (PPPs) should be investigated. Consideration should be given to models where government provides land, financial guarantees and rentals. Alternatively accessing corporate social investment (CSI) funding sources should be explored. b Sponsorship for CSOs to attend national conferences would reduce their personal isolation during CS and provide them with professional development. c Finding a mechanism through which to link CS-hosting hospitals with WiFi would improve access to training via online portals, as well as allow professional support and training via telemedicine and video conferencing. d Local senior professionals should be approached for support, including District Clinical Specialist Teams. e The role of communities around rural and underserved facilities should be defined and promoted including community awareness of the services and involvement in providing support. Community members should be included in orientation programmes. f Training and support partners should be engaged to design and implement orientation for CS professionals (cultural, logistical and clinical) based on existing programmes.
Regarding research: a CS research must be driven by the human resource needs of the country, each province, district and facility, as determined by the Human Resources for Health Strategy and also Workload Indicators of Staffing Need. b Research into the CS programme must be framed in terms of the National HRH Strategy, and should both strengthen and be supported by the strategy. c Qualitative information about CS should be collected and analysed on an ongoing basis. This is one form of giving the participants a voice. d Budgeting for posts, the cost-effectiveness of community service, and the follow-up of provincial bursary-holders, are important issues that affect the implementation of CS. Cost-effectiveness and efficiency studies should be undertaken.

Most of the recommendations from the summit are too recent to have been acted upon, but the National Minister of Health has strongly recommended to provinces that CS posts in rural areas be filled before urban areas in the 2018 allocations.

Similarly, a workshop on internship and CS held at the Towards Unity for Health conference in Pretoria, in 2015 which included participants from 12 countries made various recommendations (Table 9.3).

Table 9.3: Recommendations from the workshop on internship and CS

Recommendations
a Students should have mentors and coaches to whom they remain accountable as developing professionals. There should be an objective process to evaluate whether students have developed the required skills and attributes at each stage of development.
b The development of skills of critique and analysis is a crucial aspect, including critical-incident analysis in the clinical situation. Trainees should be given opportunities to reflect on their own and others' mistakes, to learn from them. This requires the development of trusting relationships between trainees and facilitators.
c The learning portfolio is a useful tool for postgraduate learning, and an aggregate reflection of accumulated experiences can be a powerful trigger for reflection. The degree of formalisation and structure of the portfolio is important, as is the opportunity to discuss it with educators.
d It is crucial to assess trainees' progress as they transition between phases of professional development, by providing the skills and opportunities for reflection at the conclusion of each phase.
e Inter-professional teaching and learning practices should be improved, and cross-assessment between health professions around graduate attributes should be introduced.
f Blended learning, including digital and web-based resources in combination with clinical learning in practice would enhance the efficiencies with which students can learn. South Africa is behind other countries in this area.

9.6 HPE as a continuum into early professional life for the strengthening of the health system

It is clear that HPE needs to be reconceptualised as a continuum into early professional life, rather than a series of discrete, uncoordinated periods of development. Internship is legally and functionally an essential part of professional education for certain professions, but has no academic basis and relies on time-bound periods of supervised practice. HPE will be advanced by incorporating formal academic oversight of internship through universities, and ensuring that minimum exit competencies are met before graduates commence unsupervised practice in CS settings.

With the testing ground of CS in mind, undergraduate education programmes would do well to better prepare graduates for the realities of the South African public health service and burden of disease, in various settings. The disjuncture between tertiary education and the working world is enormous for any graduate,

but the pressure and responsibility for patients' lives that is suddenly thrust upon young HCPs in a health service that is stretched to capacity, could be ameliorated by better preparation and support. Rotations of at least two months through district hospitals in rural areas should be a mandatory part of the undergraduate curriculum. Learning the language of one's patients is essential to communicating effectively, which is central to the clinical encounter and should be a prerequisite for service. Since there are 11 official languages, the clinical health science graduate should have an approach to learning languages, and not just mastery of a few.

In terms of entering and influencing the health system, a more holistic approach is needed. Every new HCP should be involved in teaching other health workers, or in a project promoting the health of the community that they serve. It is crucial that they engage with communities directly, and see their role in terms of the whole community they serve. This corresponds to the roles of communicator and coordinator in the core competencies for undergraduate students.

The role of health advocate needs specific attention during internship and community service. Young graduates need to develop the tools, competencies and confidence to tackle health service challenges proactively, to improve access and systems, and to act on behalf of patients and communities who struggle to gain access to health services.

With better alignment, the early career experiences of internship and community service could be an opportunity to refine university graduates' skills and competencies necessary to face a challenging health system, and change it for the better.

9.7 Recommendations

9.7.1 Related to universities:

a Maintain academic continuity from undergraduate years into internship and community service. Universities and their faculties of health sciences need to take responsibility for education and professional development from admission to the end of the CS year. This forms a significant part of social accountability.

b Regular 'talk-back' by CSOs to the undergraduate programme committees and students of their universities, would improve the alignment of undergraduate education and the health-system outcomes.

c Develop the skills and capacity of students as potential change agents for health system change and improvement, including advocacy. Project-based health promotion through community-oriented care should be an essential component of every HCP curriculum.

d Promote longitudinal integrated clinical models of learning in communities, in order to stimulate student advocacy and challenges to power.

e Partnership models of teaching and learning should be developed which use patients as teachers and are participative and collaborative.

9.7.2 Related to professional councils:

a Internship should be renamed 'Postgraduate Years 1 & 2' which would signal a shift from the mindset of interns as the lowest level of medical worker to the active development of young professionals better prepared for the public health service.

b Structured reflection sessions facilitated by senior clinicians and academics should be mandatory for interns to promote the conscious development of a professional identity through mentoring.

c The earlier differentiation of postgraduates into specialties could be considered, as nine years is a long period for the production of a generalist doctor.

9.7.3 Related to the Department of Health:

a The provincial departments of health should facilitate structured reflection sessions for interns by senior clinicians.

b Greater use of peer review during internship and community service, for example through sharing of case portfolios, would stimulate reflection and learning.

c The use of digital technology and social media would make structured eflection more accessible and acceptable.

d There needs to be greater grounding and support in primary and community-oriented care for interns and CS doctors to be able to tackle the broader challenges of healthcare in a given district, as opposed to being exclusively hospital-based.

e Every clinician should be supported to be actively involved in a community project.

f Community service should be renamed 'Postgraduate Year 3' and active support provided for preparation for specialty training, such as HIV and AIDS training, advanced trauma life support (ATLS), advanced paediatric life support (APLS), advanced cardiovascular life support (ACLS) and essential steps in the management of obstetric emergencies (ESMOE), as well as first-part exams for registrars.

9.7.4 Related to the Department of Higher Education and Training:

a Universities need to be more actively involved in postgraduate professional development during the internship and CS years.

b Postgraduate deaneries should be established to oversee early professional development activities including preparation for specialisation.

c Leadership potential needs to be identified amongst interns and community service officers, and nurtured through specific mentoring programmes, as future leaders.

CHAPTER 10

Financing Health Science Education in South Africa

Key points regarding internship

- Transformation of health professional education, as envisaged in this report, requires action to ensure that health sciences education is properly financed.
- Long-standing shortcomings in planning, organising and financing of health sciences education in South Africa are often related to difficulties in aligning the interests of key stakeholders.
- There is a need for a co-ordinated, long-term analysis of human resource needs for the country and an agreed plan by discipline for expansion of supply in the short, medium and long term. A more rational, systemic and integrated approach to demand and supply-side planning, with regular costing, better alignment of incentives and improved performance management, should be adopted.
- Strengthening governance structures at national and provincial level and building a joint vision is the critical first step needed to ensure that detailed costing and planning activities produce their full intended benefit.
- The establishment of the Joint Health Sciences Education Committee was an important step towards joint planning. The main purpose of JHSEC is to establish a clear vision and policy related to health sciences student education and training. However, the approach to date has been uncoordinated and urgent action is required to strengthen the capacity and accelerate the momentum of JHSEC.

10.1 Introduction

Few of the health professional education reforms envisaged in this report will be possible without concomitant action to ensure that health sciences education is properly financed. In South Africa the responsibility for the education and training of HCPs falls primarily to public HEIs and nursing education institutions (NEIs). These institutions work closely with the various provincial departments of health in fulfilling their mandate. HEIs typically obtain their funding from three revenue streams: government subsidies, student fees and third-stream income, while provincial funding is derived from national revenue via the equitable share formula and conditional grants.

Given the experiential nature of HCP training programmes, the availability of, and equitable access to the service platform is necessary. Furthermore, training staff are often practising HCPs employed by the provincial DoH. These factors contribute to making the funding environment in the health sciences both unique and complex. Proper planning of HCP education, including the production of HCPs and paraprofessionals, therefore requires close collaboration between DoH and the Department of Higher Education and Training. This is to ensure that the need for priority skills is addressed and HCPs are produced in sufficient quantity and quality, and that training is relevant to the needs of the country.

Several concerns regarding the planning, organising and financing of health sciences education in South Africa are longstanding and have been remarkably difficult to solve (Auditor-General, 2005; DoH, 2011; National Treasury, 2004-2008; Strachan, 2009).

These include, but are not limited, to the following:

a Weak demand planning and linkage to supply (university enrolment plans) and budgets.

b Inadequate alignment between the number of health sciences graduates and the provincial staffing budgets to absorb workers in internship, community service and practitioner posts.

c Inadequate budgetary adjustments for student volume increases, e.g. for universities.

d Cost and accessibility of higher education.

e Lack of innovation to address the shortage of health worker, e.g. involvement of the private sector.

f Weaknesses in coordination between key departments and institutions at both national and provincial levels.

g Various issues in nursing education, such as under what authority the training function should be located and the huge variability in nursing training platforms and quality of graduates.

h Establishment of academic health complexes.

i Governance and management of central hospitals and the role of universities in governance of central hospitals and their referring tertiary, regional and district hospitals.

Failure to agree on solutions to these issues has led to a great deal of frustration between the various parties. The resulting impasse is partly because of the difficulty in consistently aligning the interests of the main sector partners (Health, Higher Education and Training, Science and Technology, and Finance) at national, provincial and institutional levels.

In this chapter, we review the current funding arrangements, draw attention to some key challenges and opportunities related to the planning and funding of health professional education and make recommendations for addressing these issues.

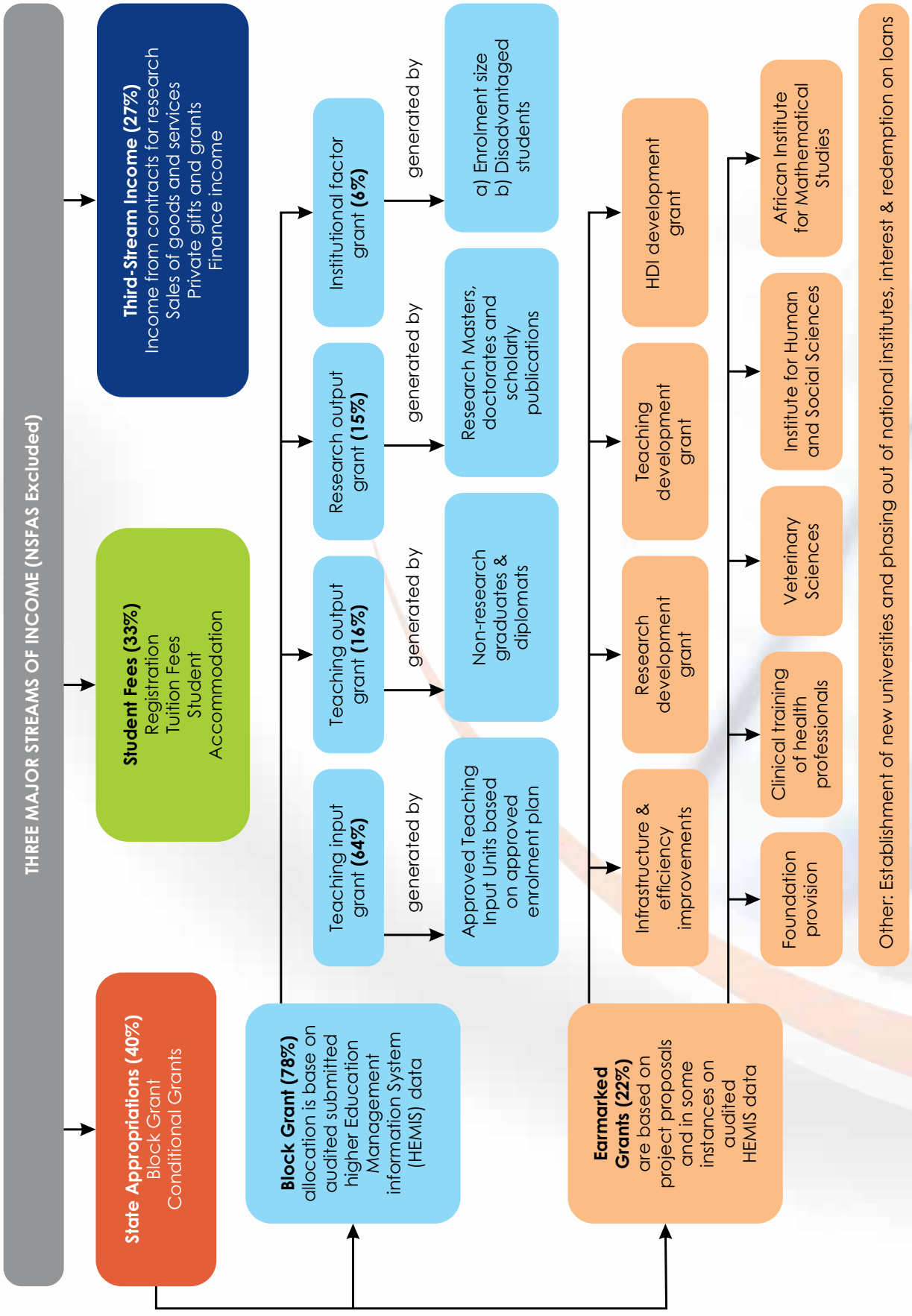
10.2 Funding of health sciences education in South Africa

10.2.1 Public funding of higher education: the university funding framework

The current funding framework is designed to give the Minister of Higher Education and Training the ability to reprioritise funding allocations in line with priority areas and policy incentives. Ideally funding allocations should take into account

growth in student enrolments in existing programmes; student enrolments in new programmes addressing the social and economic needs of the country; the capacity of institutions in terms of human and capital resources to deliver on their planned mandate; and, fiscal and other available resources. In practice, however, funding allocations are driven by the principles of affordability (government decides how much it can afford to spend on higher education and then allocates funds to institutions, according to national needs and priorities); distribution (a distributive mechanism to allocate government funds to individual institutions in accordance with available budget and taking into account policy priorities and plans); and, cost-sharing (higher education costs shared by government, students and households, and private donors).

As shown in Figure 10.1 the university funding framework comprises three distinct sources of income: government subsidies, student fees and third-stream income. Government subsidies take the form of block and earmarked grants. Block grants are designated as HEI Council-controlled and are mainly used to fund operational, and teaching and learning activities. Earmarked grants fund specific programmes or policy priorities and currently include the infrastructure and efficiency grant, clinical teaching grant, teaching development grant, research development grant, historically disadvantaged institutions development grant, veterinary sciences grant, and a grant for the development of the two newly established universities, Sol Plaatje University and the University of Mpumalanga. The relative split in the funding between block and earmarked grants changes annually, and is influenced by university enrolments and the policy direction of DHET. The DHET budget for universities has increased from R9.9 billion in 2004/05 when the existing funding framework was introduced, to R30.3 billion in 2015/16 – including funding for the National Student Financial Aid Scheme (NSFAS).



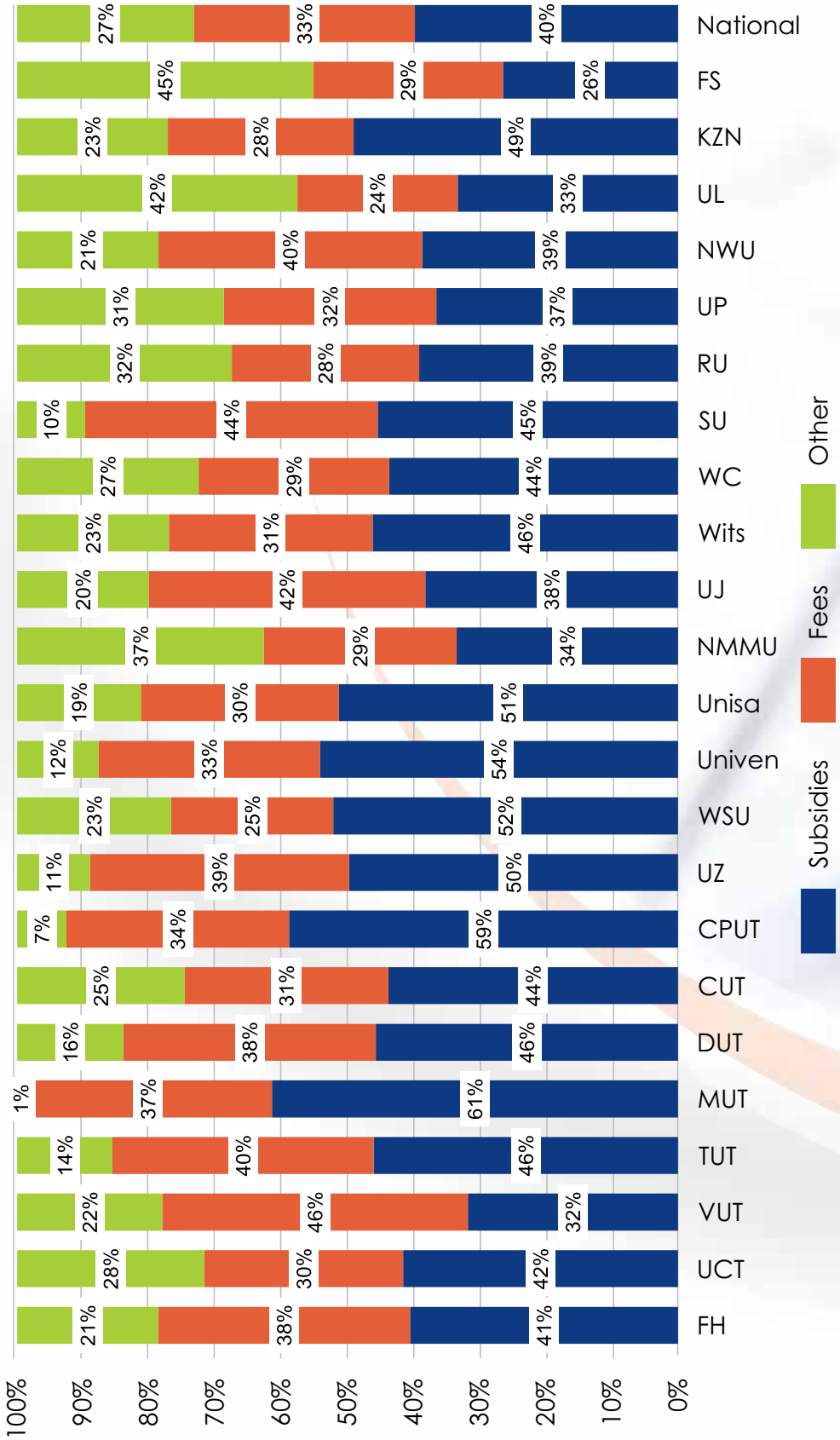
Source: DHET, 2015

Figure 10.1: Structure of university funding framework, 2015/16

In 2013, a Ministerial Committee on the Review of the Funding of Universities examined the effect and impact of the government-funding framework of universities since its introduction in 2004/05 (DHET, 2013). The committee found that improvements have been made in achieving a more representative student body; a higher growth rate in graduates than enrolments; increasing research publication units; more funds being channelled towards universities with a higher share of students from disadvantaged backgrounds; and, increasing access to higher education students through increased provision of student financial aid.

The funding framework for HEIs was designed to align with government's planning process. It is based on student enrolments although there are also performance-output allocations that influence total funding levels. Enrolment planning is key to accessing funding: each university prepares an enrolment plan for a six-year period (which can be revised every three years) and negotiates their estimates with DHET until an agreement is reached. The final enrolment plan is signed off by each university council for approval by the National Minister of Higher Education and Training.

In 2013, universities received about 40% of their income from government subsidies, 33% from tuition and residence fees (with some of this being subsidised by NSFAS), and 27% from third-stream income generated through research contracts, donations, investments and facilities rental. There are, however, substantial differences between the HEIs in terms of the percentage contribution of total income from the various sources. For instance, third-stream income as a proportion of total income ranges from 1% at Walter Sisulu University to 45% at the University of the Witwatersrand in 2015. Some universities, typically previously advantaged universities, are better placed to attract additional sources of funding such as donations or endowments. Figure 10.2 shows the distribution of the three income sources by institution.



Source: DHET 2015

Figure 10.2: Percentage distribution of sources of income by university, 2013

10.2.2 Health sciences: student enrolment and graduate numbers

The numbers of health science enrolled students and graduates by academic programme for the period 2009 to 2013 are shown in Table 10.1. There were 55 962 health science students enrolled in HEIs and 12 368 graduates. Graduates by discipline for the same year are shown in Table 10.2.

Table 10.1: Student enrolment and graduate numbers: Health professions and related clinical sciences

	2009		2010		2011		2012		2013	
	Enrolled	Graduats	Enrolled	Graduats	Enrolled	Graduats	Enrolled	Graduats	Enrolled	Graduats
Undergraduate	37 505	7 455	35 970	7 298	36 403	7 754	38 871	7 612	40 312	8 131
PG <Masters	5 516	2,688	5 465	2 710	5 464	2 654	5 722	2 849	5 211	2 652
Masters	8 598	1 084	8 116	1 084	8 317	1 169	8 558	1 311	8 669	1 370
Doctorate	1 266	168	1,064	111	1 285	155	1 485	186	1 770	216
TOTAL	**52 884**	**11 396**	**50 615**	**11 202**	**51 469**	**11 733**	**54 636**	**11 958**	**55 962**	**12 368**

Source: HEMIS 2016

Table 10.2: Number of graduates in health professions and related clinical sciences by programme, 2013

2013 GRADUATES	Undergraduate	PG <Masters	Masters	Doctorate	TOTAL
Health professions and related clinical sciences	8 131	2 652	1 370	216	12 368
Chiropractic	75	-	48	-	123
Communications Disorders Sciences and Services	151	25	37	3	216
Dentistry, Advanced Dentistry and Oral Sciences	261	69	37	4	370
Dental Support Services and Allied Professions	285	-	1	-	286
Health and Medical Administrative Services	664	47	15	-	725
Medicine	603	6	8	12	629
Medical Clinical Sciences	1 603	255	383	67	2 308
Nursing	1 436	1 193	158	30	2 817
Optometry	102	5	1	-	108

2013 GRADUATES	Undergraduate	PG <Masters	Masters	Doctorate	TOTAL
Osteopathic Medicine/Osteopathy	-	-	-	-	-
Pharmacy, Pharmaceutical Sciences and Administration	749	9	92	13	862
Podiatric Medicine/Podiatry	13	-	-	-	13
Public Health	516	407	265	32	1 219
Rehabilitation and Therapeutic Professions	708	203	107	26	1 043
Veterinary Medicine	14	34	-	-	48
Veterinary Biomedical and Clinical Sciences	35	114	32	13	193
Medical Illustration and Informatics	-	-	-	-	-
Dietetics and Clinical Nutrition Services	132	15	21	7	175
Bioethics/Medical Ethics	-	-	5	-	5
Alternative and Complementary Medicine and Medical Systems	37	1	17	1	56
Somatic Bodywork and Related Thereapeutic Services	139	1	2	-	141
Movement and Mind-Body Therapies and Education	11	-	-	-	11
Energy and Biologically-based Therapies	-	-	-	-	1
Medical Raiologic Technology/Science (Radiography)	406	7	8	3	424
Health Professions and Related Clinical Sciences, Other	195	263	133	6	596

Source: HEMIS 2016

Ideally a data and information management system should exist which links enrolment and graduation data with sectoral human resources for health planning. In addition, the budget allocation should be aligned with enrolment planning numbers by discipline and scarce skills. Such data are currently not available for planning purposes.

10.2.3 Financing clinical teaching and training

Provincial DoHs provide the clinical platform for the experiential learning taking place at all levels of the public health sector. Hosting students on the provincial health platform incurs costs, e.g. the cost of additional consumables when undergraduate and postgraduate students are seeing patients; possible opportunity costs incurred when provincial staff provide clinical teaching and training to students and forgo part of their clinical time spent on seeing patients; and so forth. There is, however, little empirical evidence quantifying these additional costs. Currently, the hosting costs and opportunity costs are being funded from three sources: The Equitable Share, the Health Professionals Training and Development Grant (HPTDG) and the CTG.

10.2.3.1 Health Professionals Training and Development Grant (HPTDG) and equitable share formula

The provincial DoH's main sources of funding are derived from national revenue (via the provincial government's equitable share allocation) and conditional grants (including the National Tertiary Services Grant and the HPTDG). The equitable share formula determines the national allocation to the provincial government, which has the constitutional power to determine intra-provincial allocations to health, education, social development, and so forth. The national 2015/16 Medium-Term Expenditure (MTE) estimate for the National Tertiary Services Grant (NTSG) is R10.4 billion (National Treasury, 2015). This is a Schedule 4 conditional grant allocated to provinces to supplement the provincial funding of the programme/function. For the HPTDG the national 2015/16 Medium-Term Expenditure estimate is R2.37 billion (National Treasury, 2015). This is a Schedule 5 conditional grant allocated to provinces for a specific purpose of national interest without a requirement or additional funds from provincial own budgets (Financial and Fiscal Commission 2014/5).

The original intention of the HPTDG was fourfold, to:

a compensate a province for the additional service costs of students (medical, dental, allied and nursing;

b compensation for any reduced service time of qualified staff participating in teaching activities;

c compensation for any reduced service time of qualified staff resulting from research activities intended as part of their normal activities;

d provision for a redistributive component which could be used to develop capacity to train medical students where this did not exist before (applies exclusively to medical students) (Financial and Fiscal Submission 2007/8).

As shown in Table 10.3 the HPTDG has not kept up with CPI inflation – growing only 4.6% per annum over the past three years.

Table 10.3. Trends in health professions development grant overall and by province

Rand Million	12/13	13/14	14/15	15/16	16/17	17/18	18/19	12-1315/16 pa	12-1315/16 pa
Eastern Cape	178.6	188.6	199.6	204.4	213.2	226.6	239.7	4.6%	5.4%
Free State	130.7	138.1	146.4	149.8	156.2	166.0	175.6	4.7%	5.4%
Gauteng	725.3	765.2	811.1	829.6	865.2	919.4	972.8	4.6%	5.4%
KwaZulu-Natal	262.4	276.3	292.8	299.5	312.4	331.9	351.2	4.5%	5.4%
Limpopo	104.7	109.6	116.2	118.9	124.0	131.7	139.4	4.3%	5.4%
Mpumalanga	84.8	89.9	95.3	97.5	101.6	108.0	114.3	4.8%	5.4%
Northern Cape	68.8	72.4	76.7	78.4	111.6	118.6	125.4	4.5%	16.9%
North West	92.7	98.7	104.6	107.0	81.8	86.9	92.0	4.9%	-4.9%
Western Cape	428.2	451.7	478.8	489.7	510.7	542.7	574.2	4.6%	5.4%
Total	**2 076.2**	**2 190.4**	**2 321.8**	**2 374.7**	**2 476.7**	**2 631.8**	**2 784.5**	**4.6%**	**5.4%**

10.2.3.2 Clinical Training Grant

HEIs, in negotiations with the provincial DoHs experience difficulties in obtaining access to the appropriate clinical platform. This is partly due to underfunding through the HPTDG. DHET has responded to this need by establishing the CTG. The CTG was allocated to universities for the first time in 2008/09 as earmarked funding to support universities to improve clinical teaching and training and increase the production of HCPs. The Ministerial Statement on Clinical Training Grants sets out the policy for the Minister of Higher Education and Training on the allocation of clinical training grants. In 2016/2017 the value of the grant is R429 million.

Universities that qualify for the CTG are required to submit budget proposals once every two years; and their audited student enrolments by 31 July every year. The grant is currently allocated to 23 of the country's 26 universities; excluded is the University of South Africa, Sol Plaatje University, and the University of Mpumalanga. Table 10.4 provides a breakdown of CTG grants allocated to the universities and Table 10.5 shows the distribution in allocations across different programmes.

Table 10.4: Estimates of expenditure – Earmarked clinical training grant

UNIVERSITY	R'000									
	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
CPUT	-	-	3 470	3 678	5 239	5 528	5 325	5 570	6 067	6 847
UCT	23 610	35 410	32 148	34 077	36 570	38 581	35 425	37 055	34 615	41 711
CUT	-	-	1 686	1 787	2 012	2 122	2 559	2 677	3 032	3 428
DUT	-	-	3 088	3 274	5 348	5 643	8 356	8 741	10 745	12 926
UFH	-	-	3 489	3 698	4 151	4 379	5 233	5 474	5 920	6 453
UFS	15 700	23 550	22 941	24 317	21 464	22 644	28 266	29 567	29 257	32 296
UJ	-	-	4 813	5 102	6 032	6 364	6 440	6 736	6 813	7 348
UKZN	30 130	45 190	51 565	54 661	61 733	65 127	68 974	72 144	73 501	63 509
UL	24 510	36 760	34 162	36 211	38 906	41 046	42 047	4 728	5 728	5 844
MUT	-	-	297	315	379	400	435	455	943	1 080
NMU	260	390	5 478	5 807	6 437	6 791	7 513	7 859	9 262	10 979
NWU	740	1 100	5 785	6 132	6 836	7 212	8 957	9 369	11 029	12 270
UP	29 540	44 310	35 424	37 550	37 796	39 875	40 879	42 760	47 087	51 190
RU	260	400	725	768	658	695	871	911	1 151	1 016
SMU	-	-	-	-	-	-	-	39 253	38 096	44 633
SU	22 670	34 010	29 519	31 290	32 571	34 362	35 159	36 777	37 061	39 134
TUT	-	-	4 042	4 284	3 338	3 521	5 263	5 505	6 622	7 306
VUT	-	-	1005	1065	1 880	1 983	2 549	2 666	3 843	4 007
UV	-	-	2 946	3 123	2 627	2 772	3 341	3 495	3 974	4 500
WSU	8 200	12 290	13 341	14 141	12 986	13 700	14 759	15 438	17 335	15 439
UWC	9 980	14 980	24 163	25 613	25 971	27 400	26 142	27 344	28 033	27 859
Wits	34 400	51 610	46 747	49 552	51 036	53 843	57 345	59 983	66 927	69 658
UZ	-	-	3 166	3 355	3 320	3 503	4 902	5 128	5 365	5 593
TOTAL	**200 000**	**300 000**	**330 000**	**349 800**	**367 290**	**387 491**	**410 740**	**429 635**	**452 406**	**475 026**

Source: DHET (2016)

Table 10.5: Allocations of the clinical training grant by programme – total over two-year cycles

Programme	R'000		
	2010/11 & 2011/12	2014/15 & 2015/16	2016/17 & 2017/18
MBChB	155 216	175 660	183 517
BDS	24 462	25 054	24 712
Physiotherapy	7 571	8 836	9 353
Occupational Therapy	5 924	7 210	7 878
Speech & Hearing	3 520	4 794	5 900
Pharmacy	11 711	15 499	18 979
Dental Therapy	574	913	1 019
Dietetics	9 130	12 308	13 799
MMed	281 612	345 665	369 981
MMed (Fam Med)	5 595	29 157	25 294
MDent	9 947	8 428	8 753
M Fam Med	8 703	569	399
Nursing Initial	124 126	162 090	183 410
Biomedical Technology	6 976	12 494	18 078
Clinical Technology	3 059	3 772	3 551
Emergency Medical Care	5 205	6 760	7 473
Radiography	16 471	21 165	22 715
TOTAL	**679 800**	**840 375**	**904 812**

Source: DHET (2016)

Criteria that must be satisfied for a health sciences programme to be supported by the grant are (i) the programme must not be offered in partnership with a college or other external institutions; (ii) curricula must include clinical training which requires students to have access to facilities, patients and clinical staff of provincial hospital services; and, (iii) programmes must be at undergraduate level and offer initial training in a health sciences discipline (exceptions are Masters-level programmes that offer specialist training in medicine, surgery and dentistry).

Health sciences programmes supported by the CTG are:

a Professional undergraduate degrees in medicine (MBChB).

b Professional undergraduate degrees in dentistry (BDS).

c Professional undergraduate degrees in physiotherapy, occupational therapy, dental therapy, speech and hearing, pharmacy, dietetics.

d Professional Masters degrees in dentistry, medicine and family medicine.

e Undergraduate initial nursing training in Bachelor's degrees and national diplomas.

f Undergraduate in biomedical technology in Bachelor's degrees and national diplomas.

g Undergraduate programmes in clinical technology in Bachelor's degrees and national diplomas.

h Undergraduate programmes in emergency medical care in Bachelor's degrees and national diplomas.

i Undergraduate programmes in radiography in Bachelor's degrees and national diplomas.

Utilisation of the CTG is limited to appointing (additional) clinical training staff; appointing other staff to support the delivery of clinical training services; supporting partnership agreements with public and/or private providers of clinical training services; meeting part of the operating costs of clinical training service delivery; and, improving the infrastructure needed for clinical training, including equipment, building refurbishment, and the construction of new facilities.

10.2.4 Provincial health sciences training expenditure

Programme 6 in provincial DoH budgets is health science training, and includes nursing colleges, emergency medical services colleges, bursaries and primary healthcare and other training. In 2016/17, the total amount budgeted for in this programme is R4.7 billion. Table 10.6 shows the trends in budgeted amounts in the various categories.

Table 10.6: Provincial health sciences and training budget programme

Rand million	12/13	13/14	14/15	15/16	16/17	17/18	18/19	12/13 – 15/16 pa	15/16 – 18/19 pa
Nurse Training College	1 955	1 954	1 959	2 147	2 345	2 485	2 613	3.2%	6.8%
Emergency Medical Services (EMS) Training College	103	114	119	135	157	171	182	9.3%	10.4%
Bursaries	416	556	816	859	774	781	826	27.4%	-1.3%
Primary Health Care (PHC) Training	128	120	84	101	90	108	114	-7.7%	4.3%
Training Other	1 124	1 298	1 266	1 280	1 523	1 671	1 674	4.4%	9.4%
Total	**3 726**	**4 041**	**4 244**	**4 523**	**4 890**	**5 216**	**5 408**	**6.7%**	**6.1%**

10.3 Challenges and opportunities

10.3.1 Inadequate funding of high education and health professional training

Overall funding for universities is not growing meaningfully in real terms; the block grant allocation has not kept pace with inflation and student growth, which, over the last ten years resulted in a net decrease in the per capita full-time equivalent student allocation in real terms of -1.35% between 2004/05 and 2014/15. Given that it is a national priority to increase higher education coverage rates, it is of concern that the higher education funding formula does not have a well-defined process of upward adjustment to address increasing student numbers.

Furthermore, while government funding for higher education through NSFAS aspires to support access and success of all eligible students at public HEIs and public technical and vocational education and training colleges who would otherwise not be able to afford to study, the available resources are currently insufficient to support all eligible students. It is clear that additional funds are needed to provide support to a much wider student base.

In response to the 'Fees must fall' protests the President, in January 2016, appointed a commission of inquiry to consider the feasibility of free higher education and training in South Africa. It aimed to assess the various roles that the government, universities, private sector and students should play in higher education funding and related issues. The commission's report was publicly released on 13 November 2017 and this was followed by the President's announcement in December 2017 of free tertiary education for first-year students from South African households with a combined annual income of up to R350 000. The full implications of this are unfolding at the time of finalising this report.

The costs of achieving the demand for 'free higher education' are larger than simply addressing current enrolled students, given future targets to expand post-school education and the necessity of an expanded supply-side strategy for the health sector. It is not conceivable to both significantly expand supply and simultaneously lower (or eliminate) fees, without identifying an appropriate financing source.

With respect to health professional training specifically it has already been noted that the HPTDG has not kept up with consumer price index (CPI) inflation growing only 4.6% per annum over the past three years. There have been several difficulties experienced with this grant. Health science education institutions need to place their students in clinical services usually operated by provinces to receive clinical teaching and training. However, possibly because HEIs do not hold the grant and cannot leverage its use, they often complain that provinces who receive the grant directly are not responsive enough to the type, location and quality of training they need to provide. They often perceive that provincial managers under pressure from funding cuts elsewhere use this funding source to plug service gaps. Thus, we can conclude that there is a problem in the way the grant is designed, and some have suggested that the grant should be given directly to HEIs who would then 'purchase' the relevant clinical platform from the provincial DoHs. However,

this has been difficult to achieve. Failure to reach agreement and dissatisfaction with the grant have contributed to it not being increased for over a decade and the grant may now be underfunded for the true cost of clinical teaching and training HEIs provide. Furthermore, costing is difficult (usually done by estimating the proportion of time each professional spends in teaching activities) and thus has not been routinely done. In the face of relatively weak common purpose, this grant has received little attention in budget processes.

10.3.2 Inadequate long-term demand and supply-side planning

A related problem is the lack of a co-ordinated long-term analysis of human resource needs for the country and an agreed plan by discipline for expansion of supply in the short, medium and long term. Part of this relates to the short-term focus of budgeting – the three-year MTEF is short compared to a decade or more needed for HRH planning, resource allocation and budgeting to meet the country's needs such as increasing medical graduate enrolment and output. Another part of the problem is the difficulty in achieving consensus on sectoral targets within a higher education sector that calls for expansion on many areas. Progress needs to be made in these areas for better national planning, resource allocation and budgeting (See also Chapter 2).

In addition to the need for a more rational, systemic and integrated HRH cycle, there is also a need for the actual costs of programmes delivered by the HEIs to be better documented and understood. Programme costs are historical and costings by discipline are likely to be out of date. Because of this the current higher education funding formula which provides for input and output subsidies per student may not match the actual costs of training. It is also important to investigate and better understand the cost drivers in HEIs that result in 'higher education inflation' being reported to outpace the consumer price index. There is a need for greater transparency from all stakeholder parties with respect to the funding models and financing of health sciences education. This includes transparency regarding the cost structures of the academic programmes and disciplines.

As indicated, perceptions of weak linkages between the HPTDG and actual clinical training needs have made it difficult to consider funding increases to this grant and it may now be underfunded. The CTG largely fills gaps but the two grants are not well coordinated. At national level and in most provinces, there are not sufficiently well-developed processes to determine training needs and requirements, and to allocate training resources to the satisfaction of all parties.

The DoH and the DHET have independently commissioned reviews of the HPTDG and the CTG. Although, the DoH's National Conditional Grant Task Team and HPTDG review report was tabled with the National Health Council in August 2013 its recommendations have not yet been implemented. The DHET's CTG Steering Committee has also reviewed this grant. While both departments secured representation from relevant stakeholders on their respective committees, neither review process was jointly envisioned, procured and owned – and hence there will not be a joint process to debate and find common ground so that full implementation can proceed as a joint initiative.

10.3.3 Foreign training vs. expansion of local medical training programmes

In the absence of local capacity to massively increase supply of medical training, the DoH HRH strategy included the expansion of an existing Mandela-Castro medical programme as an interim measure. South African students obtain a medical degree from a Cuban medical school having completed five years of study in Cuba and a completion phase of 15 to 24 months at South African medical schools prior to graduating. Foreign education and training programmes are expensive therefore the full costs of these programmes need to be documented to assess the relative cost and benefits. More than 800 students are returning from Cuba in 2018 and this presents a major challenge for absorption and funding.

In October 2011, the Minister of Health launched the HRH Strategy 2012/13 – 2016/17 at the University of the Witwatersrand. The Minister also announced this initiative to expand by 40, medical students from disadvantaged backgrounds. This was subsequently extended to five other universities: University of Cape Town, Walter Sisulu University, University of KwaZulu-Natal, Stellenbosch University and the University of Pretoria. This brings the total number of students in this programme to 216; far short of the numbers needed. The Public Health Enhancement Fund (PHEF) was launched in November 2012 by the Minister of Health and the CEOs of leading healthcare companies a social compact to support to support the increase in the production of medical graduates. Companies have pledged a fixed annual contribution over an initial three-year period to collaborate on strengthening the public health system. This programme funds students from disadvantaged backgrounds to study medicine.

The HRH strategy must compare the cost-benefit ratio of supporting the expansion of the MBChB programme in medical schools in South Africa with supporting the expansion through South African government-sponsored foreign qualified doctors (e.g. medical schools in Cuba, Turkey, Russia, etc.).

10.3.4 Nursing education

Given that higher education is a competency of the DHET, it is problematic that the health sector directly offers programmes such as nursing education without appropriate governance oversight in partnership with the DHET. If this is to continue, stronger joint regulation and management of these processes is required at a national level to ensure quality and standards.

Additionally, from a financing perspective greater alignment of planning and financing is also required, because the current system is fragmented between multiple departments leading to many difficulties. The DHET has poorly established relationships with provinces which govern and manage these colleges; and, there are multiple, variable institutional structures of governance and management across the provinces with no national framework to provide the policy parameters for governance, management, funding and institutional arrangements. Consideration is being given to shifting the provincial nursing colleges to the national Department of Health, to improve coordination with Higher Education.

Other challenges for the funding of nursing education with which the DoH is grappling, include:

a the great variability in the structure and nature of nursing colleges across provinces;

b the lack of clarity on whether institutions training nurses can use funds from the HPTDG and CTG;

c uncertainty over long-term future location of function (health or higher education);

d difficulty in measuring and ensuring quality standards.

10.3.5 Potential partnerships in health sciences education

In the context of severe shortfalls in supply in certain disciplines and potential students who are keen to enrol in health sciences education programmes and are 'willing to pay' towards their studies, a number of partners have raised the possibility of South Africa (a) developing an enabling environment for both publicly funded and privately owned educational institutions; and, (b) to allow South African universities the opportunity to enrol South African students as 'full fee paying' and utilise this additional income to cross-subside students who cannot afford university education. There is considerable experience with private nursing educational institutions in South African and public policy should be developed as to whether this should be extended to other health professions, such as medical specialist training. Concerns about the quality and relevance of training programmes from private educational institutions could be addressed through appropriate regulatory mechanisms.

10.4 The Joint Health Sciences Education Committee – a critical role player

The establishment of the Bi-Ministerial Joint Health Sciences Education Committee in 2014 was an important step towards joint planning. JHSEC was established to co-ordinate and align strategy, policy and financing of health sciences education with co-responsibility between the DHET and DoH. The National Treasury was included as a participating member. The main purpose of JHSEC is to establish a clear vision and policy related to health sciences student education and training. Despite good progress made in establishing JHSEC, the approach to date has unfortunately been uncoordinated and progress has been slow in addressing core issues, such as obtaining agreement on the quantities and range of HCPs and mid-level health workers needed.

Strengthened national governance through the JHSEC (supported where necessary by deans and heads of departments) is essential to break a longstanding log-jam created by a lack of a common vision and relatively poor alignment of programmes

of the various parties. Stronger national and provincial governance structures could help find solutions, including frameworks for joint agreements, agreement on training targets and approaches to matching training resources to needs and linking funding of preclinical to clinical training.

Universities have called for increases in the CTG, and for new and existing programmes to be considered for inclusion in an expanded CTG. The outcome of the current CTG review may assist in this regard. To enhance public accountability and transparency between all the stakeholder parties, the outcomes of the DoH and DHET reviews must be made available for public consultation and the JHSEC should be the custodian of the process.

10.5 Conclusions

We estimate that as much as R12 billion is being spent annually in South Africa on health sciences education, over multiple fragmented funding streams and departments. While South Africa is renowned for HCP education and training excellence in certain areas, the general picture is one of fragmentation, weak coordination and governance, leading to inefficient use of resources with shortfalls in the quantity, quality and relevance of HCP education and training.

There are multiple interested parties involved and solving this problem has been extremely difficult given the interests of each respective party. However, through renewed governance structures at national and provincial level, the application of a more rational, systemic and integrated approach to demand and supply-side planning, improved and more regular costing, better alignment of incentives and improved performance management, much progress could be made.

Health science education and training and their financing are relatively fragmented between multiple institutions. This would not in itself be a problem if strong governance structures existed at national and provincial levels to undertake the necessary investigations, planning, costing, etc. JHSEC has been a good start, but needs to be further strengthened.

10.6 Recommendations

10.6.1 Improve governance of health sciences funding

The capacity and momentum of JHSEC needs to be accelerated along with the ability to commission investigations, establish sub-committees and make recommendations to relevant Ministers. JHSEC needs to be able to draw on deans of HEIs and provincial HODs. It also needs to facilitate a framework for provincial committees that can undertake detailed negotiations around issues such as joint agreements and training plans, and, where necessary, guide and play a role in adjudicating disputes.

The JHSEC membership needs to be strengthened to enhance governance and coordination. Improving joint governance is central to all the recommendations in this chapter. It is important that JHSEC be fully established as originally intended, including stakeholder parties[8]. Strengthening governance structures and building a joint vision is the critical first step without which detailed costing and planning activities might not produce their full intended benefit.

10.6.2 Improve human resources for health planning, resource allocation and budgeting

If the appropriate governance structures are in place and strong, the necessary planning and costing studies, and other investigations such as on the design of joint agreements, and so forth would be facilitated.

The following issues should receive priority:

a Adoption of a rational, systemic and integrated approach to planning health sciences education and training.

b A long-term HRH national plan for the expansion of the supply of skilled health practitioners based on demand and supply-side modelling.

c The Treasury should consider introducing a form of performance-based programme budgeting which more regularly adjusts the higher education funding formula for volume increases (in the context of an agreed long-term national plan).

d Consistently and progressively align the funding streams to volumes and unit costs by discipline for preclinical and clinical training which would bring a more rational, systemic and integrated approach to the fore.

e Mechanisms to recoup education and training costs as a return on investment strategy – JHSEC to commission work that will provide the policy evidence for the implementation of various mechanisms to ensure retention of HCPs and securing return on investment into HCP education and training.

8 Core membership of the Committee should comprise representatives of those stakeholders who are directly responsible for education and training of HCPs including (a) three senior members of the Department of Higher Education and Training (one of whom must be the responsible Deputy Director-General) (b) three senior members of the Department of Health (one of whom must be the responsible Deputy Director-General) (c) one senior member from National Treasury (d) four representatives from provincial Departments of Health (e) one representative from the National Health Laboratory Service (f) one representative from the South African Military Health Services (g) two representatives from Higher Education Institutions nominated by the Medical Dean's Forum (h) two representatives from Higher Education Institutions nominated by the Health Science Dean's Forum (i) one representative from Higher Education Institutions nominated by the Dental Dean's Forum. The JHSEC will establish various technical subcommittees that will provide advice on relevant issues as listed in the scope of work. The technical subcommittees will comprise of members of the JHSEC together with selected experts and stakeholders e.g. Chair of the Health Science Deans Forum; Chair of the Medical Deans Forum; Chair of the Dental Deans Forum and the Forum of University Nursing Deans of South Africa (FUNDISA).

10.6.3 Joint governance structures at institutional level

At the institutional level, provinces have tended to assume complete responsibility and authority over health institutions such as hospitals, and have generally moved to distance HEIs from this function. However, given the centrality of skills development in South Africa, the joint nature of the service-teaching-research platform and severe quality problems in many parts of the public health sector, strong consideration should be given to reviving the concept of the academic health sciences complex with a joint governing board. This model, if properly supported, has the potential to radically improve skills development, institutional governance and quality, and could form a strong basis for strengthening alignment of interests and more effective service delivery, as well as health sciences education. The model also has great relevance in the context of greater institutional decentralisation required for the purchaser-provider split under NHI.

CHAPTER 11

Overarching Summary Recommendations

This final chapter highlights the key overarching recommendations contained in the report.

11.1 STUDENT SELECTION

Recommendation 1: There is a need to reconceptualise student selection with the aim of evaluating a broader set of criteria than those currently in use. Universities should conduct rigorous research to determine which selection criteria and student support measures best predict student success and promote the attainment of the desired graduate competencies in the South African setting. This is needed to inform and promote evidence-based interventions most likely to advance equity of student access and outcome. It is important to ensure demographically and geographically representative student cohorts, taking due cognisance of the challenges within the secondary education sector.

Recommendation 2: There is a need to institute academic and non-academic monitoring, development, support and mentoring programmes to translate access into retention and success. In this respect, the professional councils should introduce mandatory educational qualifications, certification or professional development for health professional educators and develop metrics of professional standards, and feed measurement results back into student selection. The DoH should provide an expanded, appropriately staffed clinical training platform spanning rural and urban areas across all level of healthcare. The DHET should increase funding for academic development and support programmes at universities and adequately fund students to ensure that access translates to retention and success.

11.2 SCALING UP THE HEALTH WORKFORCE

Recommendation 3: Public sector academic institutions need to be strengthened to scale up the production of HCPs.

a National Treasury needs to allocate more funding for the provision of adequate training facilities and infrastructure.

b DHET, working together with the DoH, needs to expand the clinical training platforms across both public and private practice environments in anticipation of the move to a National Health Insurance system.

c The private sector needs to play a role in addressing shortages across all cadres of HCPs by offering training, extending the clinical training platform and introducing international scholarship programmes.

d Academic institutions need to make greater use of information and communications technology to augment classroom tuition to increase production and reduce costs.

Recommendation 4: The DoH needs to improve human resources planning and this should be supported by a regulatory environment that tracks and reports on key indicators.

a A minimum national dataset of key human resources for health information that allows adequate strategic planning should be established and made publicly available.

b The DoH needs to establish a multi-stakeholder forum to track and advise on HRH issues in line with the Global Health Force Alliance recommendations on the composition for Country Coordination and Facilitation mechanisms.

Recommendation 5: Strategies to improve retention during studies and to improve retention in the profession and in the country need to be scaled-up and strengthened and new strategies need to be implemented.

a A multi-stakeholder and multi-sectoral approach (involving academic institutions, DoH, DHET, professional councils and non-governmental organisations) is needed to improve retention.

b The retention strategies need to be part of accreditation requirements within a policy environment that tracks student retention rates and incentivises institutions to improve such rates.

11.3 STENGTHENING HEALTH PROFESSIONALS' EDUCATION FOR PRACTICE IN RURAL AND UNDERSERVED AREAS

Recommendation 6: Selection and training should be orientated towards addressing inequity and meeting the needs of the most underserved, through supporting a primary care focus and increasing the supply of HCPs to rural areas.

a In their student selection policies, higher education institutions should prioritise applicants from rural and remote areas who meet the minimum academic criteria, in order to address the urban-rural maldistribution of graduates in the country.

b Faculties should explore local adaptations of various models of rural education, with a stipulated minimum of clinical time spent in rural areas for each curriculum.

c Whatever model is chosen should be accompanied by an implementation plan that builds on the strengths of rural medical education approaches whilst overcoming the many challenges of training students in remote locations. Community-oriented primary care is recommended as a strategy to support service and learning, as this approach meets all stakeholders' needs in both rural and urban settings, especially in underserved areas.

Recommendation 7: Professional councils (such as the HPCSA), supported by the DoH must design and implement a monitoring system to track progress in HPE for practice in rural and underserved areas.

a Health sciences faculties need to embrace social accountability in their training.

b Health sciences faculties must demonstrate impact on service delivery through the distribution of their graduates and the extent to which they are supporting primary healthcare in rural and underserved areas after completion of community service.

11.4 INTER-PROFESSIONAL EDUCATION AND COLLABORATIVE PRACTICE

Recommendation 8: To enable IPECP to become sustainably embedded in HPE in South Africa, a multi-stakeholder, national working group should be formed to develop and guide the implementation of a strategic plan for IPECP.

The working group should consist of patient representation, health professions and student representatives, IPE experts/practitioners, project planners, service providers and professional boards. The plan should include a detailed stakeholder analysis and plans for stakeholder engagement and buy-in. It should also delineate an IPECP competency framework and an inter-professional education curriculum, based on this competency framework, for undergraduate, postgraduate and continuous professional education of HCPs.

11.5 CORE COMPETENCIES OF SOUTH AFRICAN HEALTHCARE PROFESSIONALS

Recommendation 9: A hybrid competency-based education model that emphasises the process of learning and the achievement of learning outcomes is recommended.

The framework and processes regulating and governing HPE in South Africa should, at all regulatory levels, be aligned with the transformation imperatives for HPE highlighted in this report. An Inter-Professional Regulatory Council Working Group is recommended to build consensus around a set of generic competencies for all HCPs. Transformation of learning among HCPs will require a meaningful combination of teaching, learning and assessment approaches.

11.6 FACULTY DEVELOPMENT

Recommendation 10: Health professions educators should become more responsive to their internal learning community, as well as to the community beyond the institution.

This comprises a progressive process including: a supportive institutional climate which values teaching, recruitment and integration of faculty; competency for change agency; transformative educational strategies; adaptive education communities; and scholarship and reflection.

11.7 INTERNSHIP AND COMMUNITY SERVICE IN SOUTH AFRICA: IMPLICATIONS FOR UNDERGRADUATE EDUCATION

Recommendation 11: Universities should take responsibility for education and professional development from undergraduate years through to internship and community service.

This is likely to improve the alignment of undergraduate education and health system outcomes through skills development, promotion of advocacy and collaboration. Regular interaction between CSOs and the undergraduate programme committees and students of their universities, would improve the alignment of undergraduate education and the health system outcomes. The skills and capacity of students as potential change agents for health system change and improvement, including advocacy, could be developed. Project-based health promotion through community-oriented care should be an essential component of every HCP curriculum. Longitudinal integrated clinical models of learning in communities, in order to stimulate student advocacy and challenges to power, could be promoted. Partnership models of teaching and learning should be developed which use patients as teachers and are participative and collaborative.

Recommendation 12: Medical internship should be renamed 'Postgraduate Years 1 & 2' and community service should be renamed 'Postgraduate Year 3'.

This would signal a shift from the mindset of interns as the lowest level of medical worker to the active development of young professionals better prepared for the public health service. Structured reflection sessions facilitated by senior clinicians and academics should be mandatory for interns to promote the conscious development of a professional identity through mentoring. During community service there needs to be greater grounding and support in primary and community-oriented care for interns and CS doctors to be able to tackle the broader challenges of healthcare in a given district, as opposed to being exclusively hospital-based.

Recommendation 13: Earlier differentiation of postgraduates into specialties should be considered by the professional councils.

The current nine years is a long period for the production of a generalist doctor. During the CS year there needs to be active support for preparation for specialty training.

11.8 FINANCING HEALTH SCIENCES EDUCATION IN SOUTH AFRICA

Recommendation 14: Take urgent action to improve governance of health sciences funding by strengthening the capacity and accelerating the momentum of the JHSEC.

Strengthening governance structures and building a joint vision is the critical first step without which detailed costing and planning activities might not produce their full intended benefit. It is important that JHSEC be fully established as originally intended, including stakeholder parties. If the appropriate governance structures are in place and strong, the necessary planning and costing studies, and other investigations such as on the design of joint agreements would be facilitated. The

JHSEC membership needs to be strengthened by enabling it to draw on deans of HEIs and provincial HODs. It also needs to facilitate a framework for provincial committees that can undertake detailed negotiations around issues such as joint agreements and training plans, and make recommendations to relevant Ministers, and, where necessary, guide and play a role in adjudicating disputes.

Recommendation 15: Improve human resources for health planning, resource allocation and budgeting.

If the appropriate governance structures are in place and strong, the necessary planning and costing studies, and other investigations such as on the design of joint agreements, and so forth would be facilitated. The following issues should receive priority:

a Adoption of a rational, systemic and integrated approach to planning health sciences education and training.

b A long-term HRH national plan for the expansion of the supply of skilled health practitioners based on demand and supply-side modelling.

c The Treasury should consider introducing a form of performance-based programme budgeting which more regularly adjusts the higher education funding formula for volume increases (in the context of an agreed long-term national plan).

d Consistently and progressively align the funding streams to volumes and unit costs by discipline for preclinical and clinical training which would bring a more rational, systemic and integrated approach to the fore.

e Mechanisms to recoup education and training costs as a return on investment strategy – JHSEC to commission work that will provide the policy evidence for the implementation of various mechanisms to ensure retention of HCPs and securing return on investment into HCP education and training.

Recommendation 16: Introduce joint governance structures at institutional level.

At the institutional level, provinces have tended to assume complete responsibility and authority over health institutions such as hospitals, and have generally moved to distance HEIs from this function. However, given the centrality of skills development in South Africa, the joint nature of the service-teaching-research platform and severe quality problems in many parts of the public health sector, strong consideration should be given to reviving the concept of the academic health sciences complex with a joint governing board. This model, if properly supported, has the potential to radically improve skills development, institutional governance and quality, and could form a strong basis for strengthening alignment of interests and more effective service delivery, as well as health sciences education. The model also has great relevance in the context of greater institutional decentralisation required for the purchaser-provider split under NHI.

REFERENCES

Chapter 1 References

Boelen, C., 2010. Global consensus on social accountability of medical schools. *Sante Publique (Vandoeuvre-Les-Nancy, France)*, 23(3), 247–250.

Bradshaw, D., 2008. Determinants of Health and their Trends. *South African Health Review* 2008. Health Systems Trust, Durban, 51–72.

Breier, M., Wildschut, A. and Mgqolozana, T., 2009. *Nursing in a New Era: The Profession and Education of Nurses in South Africa.* HSRC Press, Cape Town.

Burch, V. and Reid, S., 2011. Fit for purpose? The appropriate education of health professionals in South Africa. *South African Medical Journal,* 101 (1), 25-26.

DoH, 2011. *Human Resources for Health for South Africa 2030.* Draft HR Strategy for the health sector 2012/13–2016/17. Consultation document. Department of Health (DoH), Pretoria.

Frank, J., (Ed), 2005. *The CanMEDS 2005 Physician Competency Framework.* The Royal College of Physicians and Surgeons of Canada, Ottawa.

Frenk, J., Chen, L., Bhutta, Z., *et al.*, 2010. Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *The Lancet*, 376(9756), 1923–1958. DOI:10.1016/S0140-6736(10)61854-5.

HPCSA, 2014. Core Competencies for Undergraduate Students in Clinical Associate, Dentistry and Medical Teaching and Learning Programmes in South Africa. Medical and Dental Professions Board, Health Professions Council of South Africa (HPCSA). Available from: http://www.hpcsa.co.za/uploads/editor/UserFiles/downloads/medical_dental/MDBCore Competencies - English - Final 2014.pdf. (Accessed 7 May 2015.)

Kinkel, H. F., Marcus, T., Memon, S., Bam, N. and Hugo, J., 2013. Community oriented primary care in Tshwane District, South Africa: Assessing the first phase of implementation. *African Journal of Primary Health Care Family Medicine,* 5(1), 36–44. DOI:10.4102/phcfm.v5i1.477.

Lazarus, J., Meservey, P.M., Joubert, R., Lawrence, G., Ngobeni, F., September, V., 1998. The South African community partnerships: Towards a model for interdisciplinary health personnel education. *Journal of Interprofessional Care*, 12(3), 279–288. DOI:10.3109/13561829809014119.

Marmot, M., 2013. Review of Social Determinants and the Health Divide in the WHO European Region. Final Report. World Health Organisation, Geneva.

NPC, 2011. National Development Plan 2030. Our Future – Make it Work. National Planning Commission (NPC), Office of the Presidency, South Africa.

RSA, 1997. General notice. Notice 667 of 1997. White Paper for the Transformation of the Health System in South Africa. Department of Health (DoH). Available from: http://www.gov.za/sites/www.gov.za/files/17910_gen667_0.pdf.

RSA, 2007. Traditional Health Practitioners Act (*No. 22 of 2007*). Available from: http://www.gov.za/documents/traditional-health-practitioners-act.

RSA, 2015. Health 2015. Accessed 7 June 2015, Available from: http://www.gov.za/about-sa/health.

THEnet, 2011. THEnet's Social Accountability Evaluation Framework Version 1. The Training for Health Equity Network (THEnet). Available from: http://www.thenetcommunity.org/files/articles/The Monograph.pdf.

UK DoH, 2013. Delivering High Quality, Effective, Compassionate Care: Developing the Right People with the Right Skills and the Right Values. A Mandate from the Government to Health Education England: April 2013 to March 2015. UK Department of Health (UK DoH).

Van Heerden, B., 2013. Effectively addressing the health needs of South Africa's population: The role of health professions education in the 21st century. *South African Medical Journal*, 103(1), 21–22. DOI:10.7196/samj.6463.

WHO, 2006. The World Health Report 2006. Working Together for Health. WHO, Geneva.

WHO, 2010. Framework for Action on Interprofessional Education and Collaborative Practice 2010. Available from http://www.who.int/hrh/nursing_midwifery/en/.

WHO, 2013. Transforming and Scaling Up Health Professionals' Education and Training: World Health Organisation Guidelines, 2013, 124 . http://apps.who.int/iris/handle/10665/93635.

WHO Regional Office for Europe, 2014. Strengthening people-centred health services delivery in the WHO European Region: concept note. Availlable from: http://www.euro.who.int/__data/assets/pdf_file/0005/258224/Strengthening-people-centred-health-services-delivery-in-the-WHO-European-Region-concept-note.pdf?ua=1.

Chapter 2 References

Amorim Lopes, M., Santos Almeida, A. and Almada-Lobo, B., 2015. Handling healthcare workforce planning with care: where do we stand? *Human Resources for Health,* 13, 38. DOI 10.1186/s12960-015-0028-0.

DoH, 2012. *Human Resources for Health South Africa.* Department of Health (DoH), Pretoria.

DoH, 2015. National Health Insurance for South Africa. Towards Universal Health Coverage. Department of Health (DoH), Pretoria.

FIP*Ed*, 2013. *FIPEd Global Education Report.* International Pharmaceutical Federation, The Hague, Netherlands, 34.

Massyn, N., Peer, N., Padarath, A., Barron, P. and Day, C., (Eds), 2015. *District Health Barometer* 2014/15. Health Systems Trust, Durban.

Msemburi, W., Pillay-Van Wyk, V., Dorrington, R.E., Neethling, I., Nannan, N., Groenewald, P., Laubscher, R., Joubert, J., Matzopoulos, R., Nicol, E., Nojilana, B., Prinsloo, M., Sithole, N., Somdyala, N. and Bradshaw, D., 2016. *Second National Burden of Disease Study for South Africa: Cause-of-death Profile for South Africa, 1997–2010.* South African Medical Research Council, Cape Town.

NORAD, 2008. Results Management in Norwegian Development Corporation. A Practical Guide. Norwegian Agency for Development Cooperation (NORAD), Oslo, Norway.

Pillay-Van Wyk, V., Laubscher, R., Msemburi, W., *et al.*, 2014. *Second South African National Burden of Disease Study: Data Cleaning, Validation and SA NBD List.* Burden of Disease Research Unit, South African Medical Research Council, Cape Town.

WHO, 2016. Global Strategy on Human Resources for Health: Workforce 2030. World Health Organisation, Geneva.

WHO, 2015. Health in All Policies Training Manual. World Health Organisation, Geneva.

WHO, 2010. *Workplace Indicators of Staffing Need User's Manual.* World Health Organisation, Geneva.

Chapter 3 References

AAMC, 2012. Association for American Medical Colleges. Diversity in Medical Education: Facts & Figures 2012. Available from: https://members.aamc.org/eweb/upload/Diversity%20in%20Medical%20Education%20Facts%20and%20Figures%202012.pdf.

AAMC, 2013. Association for American Medical Colleges Core Competencies for Entering Medical Students. Association for American Medical Colleges (AAMC). Available from: http://healthprofessions.wsu.edu/documents/2015/06/aamc-core-competencies.pdf (Accessed 26 April 2016).

Ackerman, R. and Schibrowsky, J., 2007-2008. A business marketing strategy applied to student retention: a higher education initiative. *Journal of College Student Retention*, 9(3), 307-336.

Adam, J., Bore, M., McKendree, J., Munro, D. and Powis, D., 2012. Can personal qualities of medical students predict in-course examination success and professional behaviour? An exploratory prospective cohort study. *British Medical Council Medical Education*, 12 (69), 1-8.

Altbach, P.G., Reisberg, L. and Rumbley, L.E., 2009. Trends in Global Higher Education: Tracking an Academic Revolution. UNESCO, Paris.

Astin, A.W. and Oseguera, L., 2004. The declining "equity" of American higher education. *The Review of Higher Education*, 27(3), 321-41.

Benbassat, J. and Baumal, R., 2007. Uncertainties in the selection of applicants for medical school. *Advances in Health Science Education*,12, 509-21.

Bibbings L.S., 2006. Widening participation and higher education. *Journal of Law and Society*, 33(1), 74-91.

Bowden, M.P. and Doughney, J., 2010. Socio-economic status, cultural diversity and the aspirations of secondary students in the Western Suburbs of Melbourne, Australia. *Higher Education,* 59, 115-29.

CHE, 2013. A Proposal for Undergraduate Curriculum Reform in South Africa: The Case for a Flexible Curriculum Structure. Task Team on Undergraduate Curriculum Structure, Council on Higher Education (CHE), Pretoria.

Christie, P., Butler, D. and Potterton, M., 2007. *Schools that Work*. Ministerial Committee Report. Department of Education, Pretoria.

Connor, H., Dewson, S., Tyers, C., Eccles, J., Regan, J. and Aston, J., 2001. Social Class and Higher Education: Issues affecting Decisions on Participation by Lower Social Class Groups. Institute for Employment Studies, Norwich, Report No. 267.

Crosling, G., Heagney, M. and Thomas, L., 2009. Improving student retention in higher education. *Australian Universities' Review,* 51(2), 9-18.

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

Diab, P.N., Flack, P.S., Mabuza, L.H. and Reid, S.J.Y., 2012. Qualitative exploration of the career aspirations of rural origin health science students in South Africa. *Rural and Remote Health*, 12 (2251), 1-11.

Ditaunyane, L., 2015. *Umalusi declares South African examination system ready for the 2015 end-of-year exams.* Available from: http://www.umalusi.org.za/show.php?id=3139 (Accessed 16 November 2015).

Downey, M.C., Collins, M.A. and Browning, W.D., 2002. Predictors of success in dental hygiene education: a six-year review. *J of Dental Education*, 66(11), 1269-1273.

Eley, D.S., Synnott, R., Baker, P.G. and Chater, A.B., 2012. A decade of Australian rural clinical school graduates – where are they and why? *Rural and Remote Health,* 12 (1937), 1-12.

Essack, S.Y., Naidoo. I. and Barnes, G., 2010. Government funding as leverage for quality teaching and learning: a South African perspective. *Higher Education Management and Policy*, 22(3), 1-13.

Ferguson, E., James, D. and Madeley, L., 2002. Factors associated with success in medical school: systematic review of the literature. *British Medical Journal,* 324, 952-7.

Fortunato C. and Worley P. Can medical education in poor rural areas be costeffective and sustainable: the case of the Ateneo de Zamboanga University School of Medicine. *Rural and Remote Health* 2012; 12: 1835.

Frenk, J., Chen, L., Bhutta, Z.A., Cohen, J., Crisp, N., Evans, T., *et al.,* 2010. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *The Lancet,* 376(9756), 1923-1958.

Glazer, G. and Bankston, K., 2014. Holistic Admissions in the Health Professions: Findings from a National Survey. Urban Universities for Health, Washington.

GMC., 2015. *What makes a good doctor?* Available at: http://www.gmc-uk.org/guidance/10059.asp (Accessed 16 July 2015).

Grumbach, K., Odom, K., Moreno, G., Chen, E., Vercammen-Grandjean, C. and Mertz, E., 2008. *Physician Diversity in California: New Findings from the California Medical Board Survey*. Centre for California Workforce Studies, San Francisco.

Hesser, A., Pond, E., Lewis, L., & Abbott, B. 1996. Evaluation of a supplementary retention program for African-American baccalaureate nursing students... minority academic advising program (MAAP). *Journal of Nursing Education*, 35(7), 304-309.

Hissbach, J.C., Klusmann, D. and Hampe, W., 2011. Dimensionality and predictive validity of the HAM-Nat, a test of natural sciences for medical school admission. *British Medical Council Medical Education,* 11, 83.

Hitti, M., 2006. 7 Key Traits of the Ideal Doctor. WebMD; Available at: http://www.webmd.com/news/20060309/7-key-traits-of-ideal-doctor (Accessed 16 July 2015).

HPCSA, 2014. *Core Competencies for Undergraduate Students in Clinical Associate, Dentistry and Medical Teaching and Learning Programmes in South Africa.* Heath Professions Council of South Africa (HPCSA), Pretoria.

Jerant, A., Fancher, T., Fenton, J.J., Fiscella, K., Sousa, F., Franks, P., *et al.,* 2015. How medical school applicant race, ethnicity, and socioeconomic status relate to multiple mini-interview–based admissions outcomes: findings from one medical school. *Academic Medicine,* 90(12), 1667-1674.

Jha, A.K., 2014. *What makes a good doctor, and can we measure it?* Available from: https://blogs.sph.harvard.edu/ashish-jha/what-makes-a-good-doctor-and-can-we-measure-it/. (Accessed 17 July 2015).

Koenig, T., Parrish, S.K., Terregino, C.A., Williams, J.P., Dunleavy, D.M. and Volsch, J.M., 2013. Core personal competencies important to entering students' success in medical school: what are they and how could they be assessed early in the admission process? *Academic Medicine,* 88(5), 603-13.

Kotha, S., Johnson, J., Galea, S., Agyei-Baffour, P., Nakua, E., Asabir, K., et al. 2012. Lifecourse factors and likelihood of rural practice and emigration: a survey of Ghanaian medical students. *Rural and Remote Health,* 12(1898), 1-3.

Kreuter, M.W. and Lezin, N., 2002. Social capital theory - implications for community-based health promotion. In: DiClemente, R.J., Crosby, R.A. and Kegler, M.C. (Eds). *Emerging Theories in Health Promotion Practice and Research.* Jossey-Bass, San Francisco, 228-254.

Kreiter, C.D. and Axelson, R.D., 2013. A perspective on medical school admission research and practice over the last 25 years. *Teaching and Learning in Medicine,* 25 (Supplement 1), S50-S6.

Kuncel, N.R., Ones, D.S. and Sackett, P.R., 2010. Individual differences as predictors of work, educational, and broad life outcomes. *Personality and Individual Differences,* 49(4), 331-336.

Laden, B.V., 2004. Serving emerging majority students. *New Directions for Community Colleges,* 127(Fall), 5-19.

Letseka, M., Cosser, M., Breier, M. and Visser, M., 2010. *Student retention and graduate destination: higher education and labour market access and success.* Human Sciences Research Council, Cape Town.

Lockie, N.M. and Burke, L.J., 1999. Partnership in learning for utmost success (PLUS): evaluation of a retention program for at-risk nursing students. *Journal of Nursing Education,* 38(4), 188-192.

Mabope, L. and Meyer, J., 2014. *Access, pass, throughput and dropout rates: review of a problem-based learning BPharm curriculum at a previously disadvantaged university in South Africa. African Journal of Health Professions Education,* 6(2), 133-137. Available at: http://www.ajhpe.org.za/index.php/ajhpe/article/view/287/247 (Accessed 9 July 2015).

Machingambi, S., 2011. Is access to higher education a sufficient condition for social equity in South Africa? A critical analysis. *Journal of Social Science,* 28(1), 13-20.

Marks, G.N., Fleming, N., Long, M. and McMillan, J., 2000. Patterns of Participation in Year 12 and Higher Education in Australia: Trends and Issues. Australian Council for Educational Research, Camberwell.

Miller, G.E., 1990. The assessment of clinical skills/competence/performance. *Academic Medicine,* 65(Supplement 9), S63-S7.

Mji, A., 2002. What influences students to university education? Insights from the horse's mouth. *South African Journal of Higher Education,* 16(2), 166-176.

Morrow, W., 2007. *Learning to teach in South Africa.* Human Sciences Research Council, Cape Town.

Muller, J., 2012. Every picture tells a story: Epistemological access and knowledge. Knowledge and Curriculum in Higher Education Symposium, 7-8 November 2012, University of Cape Town, 1-17.

Muzyamba, M.C., Goode, N., Kilyon, M. and Brodbelt, D., 2012. Predictors of success in a UK veterinary medical undergraduate course. *Journal of Veterinary Medical Education,* 39(4), 380-388.

Ncayiyana, D.J., 2012. The vexed question of race-based admission to medical school. *South African Medical Journal,* 102(4), 193.

New Kids Center, 2015. Qualities of a good doctor. New Kids Center. Available at: http://www.newkidscenter.com/Qualities-of-a-Good-Doctor.html (Accessed 16 July 2015).

O'Neill, L.D., Wallstedt, B., Hartvigsen, J. and Eika, B., 2012. [Admission tests for medical education] Danish. *Ugeskr Laeger,* 174(9), 560-2.

O'Mara, D.A., Canny, B.J., Rothnie, I.P., Wilson, I.G., Barnard, J. and Davies, L., 2015. The Australian Medical Schools Assessment Collaboration: benchmarking the preclinical performance of medical students. *Medical Journal of Australia,* 202(2), 95-99.

Pampallis, J., Allais, S.M., Berger, M., Bhagwan, N., Chaka, T., Kgobe, P., *et al.* 2013. White Paper for Post-school Education and Training. Department of Higher Education and Training, Pretoria.

Papadakis, M.A., 2005. Disciplinary action by medical boards and prior behavior in medical school. *New England Journal of Medicine,* 353, 2673-2682.

Pariyo, G.W., Kiwanuka, S.N., Rutebemberwa, E., Okui, O. and Ssengooba, F., 2009. Effects of changes in the pre-licensure education of health workers on health-worker supply. *Cochrane Database of Systematic Reviews,* Issue 2. Art. No.: CD007018. DOI: 10.1002/14651858.CD007018.

Patterson, F., Knight, A., Dowell, J., Nicholson, S., Cousans, F. and Cleland, J., 2016. How effective are selection methods in medical education? A systematic review. *Medical Education,* 50, 36-50.

Pourshanazari, A.A., Roohbakhsh, A., Khazael, M. and Tajadini, H., 2013. Comparing the long-term retention of a physiology course for medical students with the traditional and problem-based learning. *Advances in Health Science Education,* 18, 91. DOI:10.1007/s10459-012-9357-0.

Powis, D.A., Neame, R.L.B., Bristow, T. and Murphy, L.B., 1988. The objective structured interview for medical student selection. *British Medical Journal,* 296, 765-768.

Reibnegger, G., Caluba, H-C., Ithaler, D., Manhal, S., Neges, H.M. and Smolle, J., 2010. Progress of medical students after open admission or admission based on knowledge tests. *Medical Education,* 44, 205-214.

Ross, A.J., 2014. Building on Tinto's model of engagement and persistence: experiences from the Umthombo Youth Development Foundation Scholarship Scheme. *African Journal of Health Professions Education,* 6(2), 119. DOI:10.7196/AJHPE.404.

Salvatori, P., 2001. Reliability and validity of admissions tools used to select students for the health professions. *Advances in Health Sciences Education*, 6, 159-175.

Scott, I., Yeld, N. and Hendry, J., 2007. *A Case for improving Teaching and Learning in South African Higher Education.* Council on Higher Education, Pretoria.

Simpson, M., 1978. Selection of medical students - a review. *South African Medical Journal,* 54(22), 929-931.

Sommerville, T.E., 2012. *People and Pedagogy: Problem-based Learning in the MBChB Curriculum at UKZN Medical School.* University of KwaZulu-Natal, Durban.

Sommerville, T.E., 2014. Secondary education influences on higher education performance. *South African Journal of Higher Education,* 28(3), 923-39.

Strasser, R., Hogenbirk, J.C., Minore, B., Marsh, D.C., Berry, S,, McCready, W.G. and Graves, L., 2013. Transforming health professional education through social accountability: Canada's Northern Ontario School of Medicine. *Medical Teacher*, 35(6), 490-496.

Strobel, J. and Barneveld, A.V., 2009. When is PBL more effective? A meta-synthesis of meta-analyses comparing PBL to conventional classrooms. *Interdisciplinary Journal of Problem-based Learning,* 3(1), 44-58.

Terregino, C.A., McConnell, M. and Reiter, H.I., 2015. The effect of differential weighting of academics, experiences, and competencies measured by multiple Mini interview (MMI) on race and ethnicity of cohorts accepted to one medical school. *Academic Medicine,* 90(12), 1-7.

Thomson, W.A., Ferry, P., King, J., Martinez-Wedig, C. and Villarreal, G.B., 2010. A Baccalaureate–MD program for students from medically underserved communities: 15-year outcomes. *Academic Medicine,* 85, 668-674.

Van der Merwe, L., van Zyl, G., Gibson, A.S.C., Viljoen, M., Iputo, J., Mammen, M., *et al*., 2016. South African medical schools: current state of selection criteria and medical student's demographic profile. *South African Medical Journal,* 106(1), 76-81. DOI:10.7196/SAMJ.2016.v106i1.9913.

Waetjen, T., 2006. Measures of redress: defining disadvantage in a university access programme. *South African Review of Sociology,* 37(2), 200-217.

Wilson, N.W., Couper, I.D., De Vries, E., Reid, S., Fish, T. and Marais, B.J., 2009. A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. *Rural and Remote Health,* 9(2), 1060.

Wilson-Strydom, M., 2012. Using the NBTs to inform institutional understandings of 'under-preparedness': implications for admissions criteria. *South African Journal of Higher Education,* 26(1), 136-152.

Worthington, M., Salamonson, Y., Weaver, R. and Cleary, M., 2013. Predictive validity of the Macleod Clark Professional Identity Scale for undergraduate nursing students. *Nurse Education Today,* 33(3), 187-191.

Yang, X., 2010. Access to higher education for rural-poor students in China. *Educational Research for Policy and Practice*, 9, 193-209.

Yorke, M. and Thomas, L., 2003. Improving the retention of students from lower socio-economic groups. *Journal of Higher Education Policy Management,* 25(1), 63-74.

Chapter 4 References

AHP, 2015. Community Service Symposium. Africa Health Placements (AHP), Pretoria.

Araújo, E. and Maeda, A.. 2013. How to Recruit and Retain Health Workers in Rural and Remote Areas in Developing Countries: A Guidance Note. s.l., The International Bank for Reconstruction and Development/The World Bank, USA.

Awases, M., Gbary, A., Nyoni, J. and Chatora, R., 2004. *Migration of Health Professionals in Six Countries: A Synthesis Report.* WHO Regional Office for Africa, Brazzaville.

Baloyi, B. and Isaacs, G., 2015. South Africa's 'fees must fall' protests are about more than tuition costs CNN. Available from: http://edition.cnn.com/2015/10/27/africa/fees-must-fall-student-protest-south-africa-explainer/ (Accessed 30 November 2015).

Barrett, B., 2015. *International Trade and Higher Education Services:* The TTIP, the EHEA, and Beyond. Montreal, s.n.

Bateman, C., 2013. Doctor shortages: Unpacking the 'Cuban solution'. *South African Medical Journal,* 103(9), 603-605.

Berman, P.C., 2001. *Mobility of Health Professionals.* Dublin.

Breier, M., Wildschut, A. and Mgqolozana, T., 2009. *Nursing in a New Era. The Profession and Education of Nurses in South Africa.* Human Sciences Research Council, Cape Town, 81.

British Council, 2014. The Rationale for Sponsoring Students to Undertake International Study: An Assessment of National Student Mobility Scholarship Programmes, s.l., Going Global.

Campbell, N., McAllister, L. and Eley, D., 2012. *The Influence of Motivation in Recruitment and Retention of Rural and Remote Allied Health Professionals: A Literature Review.* James Cook University, Queensland.

CHE, 2013. *A Proposal for Undergraduate Curriculum Reform in South Africa: The Case for Flexible Curriculum Structure.* Council on Higher Education (CHE), Pretoria. Reference changed to just abbreviation. change in text

Chen, C., Buch, E., Wasserman, T., et al., 2012. A survey of Sub-Saharan African medical schools. *Human Resources for Health*, 10(4), 1-23.

Clinical Associates, 2011. About Clinical Associates, Clinical Associate: A new Kind of Health Professional in South Africa. Available from: http://www.clinicalassociate.co.za/index.php?option=com_content&task=view&id=21&Itemid=28&about_clinical_associates_south_africa.html (Accessed 30 November 2015).

CMS, 2014. *Council of Medical Schemes Annual Report 2013-2014: Governance of Medical Schemes.* Council of Medical Schemes, Pretoria.

College Board Advocacy, 2009. How Colleges Organise Themselves to Increase Student Persistence. The College Board, USA. Available from: http://www.consams.org/ (Accessed 30 November 2015).

Cota, A., Jayaram, K., Laboissière, M.C.A., 2011. *Boosting Productivity in US.* McKinsey & Company, USA.

Crisp, L.N., 2008. Task Force for Scaling Up Education and Training for Health Workers, Global Health Workers Alliance, s.l.: s.n.

Davey, S., Davey, A., Srivastava, A. and Sharma, P., 2014. Privatisation of medical education in India: A health system dilemma. *International Journal of Medicine and Public Health,* 4(1), 17-22.

David, Z. and Rosen, S., 2003. *How China Trained a New Generation Abroad.* Available from: http://www.scidev.net/global/migration/feature/how-china-trained-a-new-generation-abroad.html (Accessed 30 November 2015).

DHET, 2014. Register for Private Higher Education Institutions. Department of Higher Education and Training (DHET), Pretoria.

DoH, 2011a. DoH Human Resource Strategy for the Health Sector: Meduim Term Strategy 2012/13-2016/17. Department of Health (DoH), Pretoria.

DoH, 2011b. Human Resources for Health South Africa: HRH Strategy for Health Sector 2012/13-2016/17. Department of Health (DoH), Pretoria.

DoH, 2013. National Strategic Plan for Nurse Education, Training and Practice 2012/13 – 2016/17. Department of Health (DoH), Pretoria.

DoH, 2014. Appointment of Service Provider/s to Support the Contracting and Perfomance Management of Private General Practictioners(GP's) to Provide Preventative and Clinical Services on a Sessional Basis in Public Health Care Facilities. Department of Health (DoH), Pretoria.

Eley, D.S., Young, L., Wilkinson, D., Chater, A.B. and Baker, P.G., 2008. Coping with increasing numbers of medical students in rural clinical schools: options and opportunities. *Medical Journal of Australia,* 188(11), 669-671.

Essack, S.Y., Naidoo. I. and Barnes, G., 2010. Government funding as leverage for quality teaching and learning: a South African perspective. *Higher Education Management and Policy*, 22(3)

Essack, S.Y., 2012. Forum: issues in medicine - models for increasing the health workforce. *South African Medical Journal,*102(11), 830-832. DOI: http://dx.doi.org/10.7196%2FSAMJ.5779 10.7196/SAMJ.5779.

George, G., Quinlan, T. and Reardon, C., 2009. Human Resources for Health: A Needs and Gap Analysis of HRH in South Africa, s.l. HEARD, University of KwaZulu-Natal, Durban.

Gonzalez, L.L., 2014. Doctors' 'certificate of need' plan shelved. *IOL News.* Available from: http://mobi.iol.co.za/#!/article/doctors-certificate-of-need-plan-shelved-1.1728710 (Accessed 30 November 2015).

Henderson, L.N. and Tulloch, J., 2008. Incentives for retaining and motivating health workers in Pacific and Asian countries. *Human Resources for Health*, 6-18.

Hirschy, A., Bremer, C. and Castellano, M., 2011. Career and Technical Education (CTE) Student Success in Community Colleges. *Community College Review*, 39(3), 296-318.

HPCSA, 2015. Health Professions Council for South Africa 2013. [Online] Available from: http://www.hpcsa.co.za/ (Accessed 6 May 2014).

Joint Learning Initiative, 2004. *Human Resources for Health: Overcoming the Crisis.*, Cambridge: Mass: University Press, 2004.

Jolson, D., 2011. PEPFAR in South Africa: Moving from treatment to prevention, emergency to sustainability. *Blog 4 Global Health.* Available from: https://blog4globalhealth.wordpress.com/2011/05/10/pepfar-in-south-africa-moving-from-treatment-to-prevention-emergency-to-sustainability/ (Accessed 30 November 2015).

Kim, K-J. and Kee, C., 2010. Reform of medical education in Korea. *Medical Teacher*, 32, 113–117.

Kornik, S., 2012. Foreign doctors hold out a lifeline. *The Mail & Guardian,* 3 February 2012. Available from http://mg.co.za/article/2012-02-03-foreign-doctors-hold-out-a-lifeline.

Kritz, M.M., 2013. International student mobility and tertiary education capacity in Africa. *International Migration,* 53(1), 29-49.

Kumo, W.L., Minsat, A. and Omilola, B., 2015. African Economic Outlook. Available from: http://www.africaneconomicoutlook.org/en/country-notes/southern-africa/south-africa/ (Accessed 30 November 2015).

Lehmann, U. and Sanders, D., 1999. The production of doctors. *South African Health Review*, 187-200.

Mills, J.E., Kanters, S., Hagopian, A., *et al.*,2011. The financial cost of doctors emigrating from sub-Saharan Africa: human capital analysis. *British Medical Journal,* 343(d7031), 1-13.

Moodie, G., *et al.*, 2002. Productivity in the higher education sector: What does it mean? *Business/Higher Education Round Table*, Issue 15, 2002.

MSF, 2007. Help wanted: confronting the health care worker crisis to expand access to HIV/AIDS treatment: Médecins Sans Frontières (MSF) experience in southern Africa. Available from: www.doctorswithoutborders.org/publications/reports/2007/healthcare_worker_report_05-2007.

Myburgh, D., 2014. *Free State health crisis results in desperate UFS intervention at Universitas Academic Hospital. DAMPL.* Available from: http://www.dampl.co.za/2014/08/free-state-health-crisis-results-in-desperate-ufs-intervention-at-universitas-academic-hospital/ (Accessed 2 December 2015).

Paton, C., 2015. State salaries: Public service wage bill is 'concerning'. Available from: http://www.bdlive.co.za/national/2015/02/26/state-salaries-public-service-wage-bill-is-concerning (Accessed 30 November 2015).

Pryjmachuk, S., Easton, K. and Littlewood, A., 2008. Factors associated with attrition. Nurse Education: *Journal of Advanced Nursing,* 65(1), 149-156.

Redden, E., 2015. *U.S. For-Profits in Brazil, Inside Higher ED*. Available from: https://www.insidehighered.com/news/2015/06/16/business-booming-american-profits-brazil-good (Accessed 30 November 2015).

RSA, 1997. Higher Education Act *(No. 101 of 1997)*. Available from: http://www.che.ac.za/media_and_publications/legislation/higher-education-act-101-1997 (Accessed 30 November 2015).

SAMSS, 2014. The Sub-Saharan African Medical School Study (SAMSS). South African Nursing Council (SANC), 2014. Available from: http://www.sanc.co.za/ (Accessed 6 May 2014). Changed ref - change in text.

SANC, 2014. South African Nursing Council. [Online] Available from: http://www.sanc.co.za/ (Accessed 6 May 2014).

SANC, 2015. South African Nursing Council. [Online] Available from: http://www.sanc.co.za/ (Accessed 30 November 2015).

SAPC, 2014. South African Pharmacy Council: Statistics for Registered Persons and Organisations, 2014. Available from: http://www.pharmcouncil.co.za/B_StatsRolesByProv.asp (Accessed November 2015).

SAPC, 2015. South African Pharmacy Council: Statistics for Registered Persons and Organisations, 2015.

Scheffler, R.M., Liu, J.X., Kinfu, Y. and Dal-Poz, M., 2008. Forecasting the global shortage of physicians: an economic- and needs-based approach. *Bulletin of the World Health Organisation,* 86, 516-523.

SHRM, 2008. Articles: Salaries as a Percentage of Operating Expense. Available from: http://www.shrm.org/research/articles/articles/pages/metricofthemonthsalariesaspercentageofoperatingexpense.aspx (Accessed 30 November 2015).

Steinhobel, R., Massyn, N. and Peer, N., 2015. The Ideal Clinic Programme 2015/16. Health Systems Trust and Department of Health, Durban.

WHO, 2006. *World Health Report 2006*. World Health Organisation (WHO), Geneva.

WHO, 2008. *The World Health Report 2008 - Primary Health Care (Now More Than Ever)*. World Health Organisation (WHO), Geneva. Available from: http://www.who.int/whr/2008/en/ (Accessed 30 November 2015).

WHO, 2010. WHO Global Code of Practice on the International Recruitment of Health Personnel. World Health Organisation (WHO), Geneva. Available from: http://www.who.int/hrh/migration/code/code_en.pdf?ua=1 (Accessed 30 November 2015).

WHO, 2015. E Learning for Undergraduate Health Professional Education. World Health Organisation (WHO), Geneva. Available from: http://www.who.int/hrh/documents/14126-eLearningReport.pdf (Accessed 30 November 2015).

Wildschut, A. and Mgqolozana, T., 2009. *Skills Shortage in South Africa: Case Studies of Key Professions.* HSRC Press, Cape Town.

World Directory of Medical Schools, 2015. World Directory of Medical Schools, "Faimer Directory". [Online] Available at: http://www.wdoms.org/ (Accessed 30 November 2015).

Worthington, A.C. and Lee, B.L., 2005. *Technology and Productivity Change.* Queensland University of Technology, Brisbane.

Chapter 5 References

Abramson, J.H. and Kark, S.L., 1983. Community oriented primary care: meaning and scope. In: *Community Oriented Primary Care: New Directions for Health ervices Delivery.* Connor, E. and Mullan, F. (Eds). National Academy Press, Washington D.C.

Celletti, F., Reynolds, T.A., Wright, A., Stoertz, A. and Dayrit, M., 2011. Educating a new generation of doctors to improve the health of populations in low- and middle-income countries. *PLoS Med,* 8(10): e1001108.

Daniels-Felix, D. K., Conradie, H. and Voss, M., 2015. Choosing final-year placement: Why students decide not to go rural. *African Journal of Health Professions Education*, 7 (1), 111-114.

Denz-Penhey, H., Shannon, S., Murdoch, C.J. and Newbury, J.W., 2005. Do benefits accrue from longer rotations for students in rural clinical schools? *Rural Remote Health, 5(2), 414.*

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

DoH, 2011. Human Resources for Health South Africa. Department of Health (DoH), Pretoria.

Doherty, J., 2011. *Alternative models for rural training of health professionals: A literature review.* Rural Training Task Team, Faculty of Health Sciences, University of Witwatersrand.

Doherty J., 2014. Models for undergraduate rural health placements. Chapter 4.3.1 in *Rural Medicine Education Guidebook.* Wonca, Bangkok.

Dornan, T., Littlewood, S., Margolis, S.A., Scherpbier, A., Spencer, J. and Ypinazar V., 2006. How can experience in clinical and community settings contribute to early medical education? A BEME systematic review. *Medical Teacher,* 28(1), 3-18.

Easterbrook, M., Godwin, M., Wilson, R., Hodgetts, G., Brown, G., Pong, R., *et al.*, 1999. Rural background and clinical rural rotations during medical training: effect on practice location. *Canadian Medical Association Journal,* 160(8), 1159-1163.

Frenk, J., Chen, L., Bhutta, Z.A., Cohen, J., Crisp, N., Evans, T., et al., 2010. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *The Lancet,* 376(9756), 1923-1958.

Grobler, L., Marais, B.J., Mabunda, S.A., Marindi, P.N., Reuter, H. and Volmink, J., 2009. Interventions for increasing the proportion of health professionals practising in rural and other underserved areas. *Cochrane Database of Systematic Reviews,* 2009(1), CD005314.

Hamilton, K. and Yau, J., 2004. The global tug-of-war for health care workers. Migration Policy Institute, Washington, DC. Available from: http://www.migrationinformation.org/Feature/print.cfm?ID=271.

Joint Learning Initiative, 2004. *Human Resources for Health. Overcoming the crisis.* Cambridge, MA, Harvard University Press, 2004.

Laven, G. and Wilkinson, D., 2003. Rural doctors and rural backgrounds: how strong is the evidence? A systematic review. *Australian Journal of Rural Health,*11(6), 277-284.

Littlewood, S., Ypinazar, V., Margolis, S.A., Scherpbier, A., Spencer, J. and Dornan, T., 2005. Early practical experience and the social responsiveness of clinical education: systematic review. *British Medical Journal*, 331(7513), 387-391.

Longombe, A.O., 2009. Medical schools in rural areas--necessity or aberration? *Rural Remote Health,* 9(3), 1131.

Maley, M., Worley, P. and Dent, J., 2009. Using rural and remote settings in the undergraduate medical curriculum: AMEE Guide No. 47. *Medical Teacher,* 31(11), 969-983.

Page, S., 2014. Recruiting medical students from rural areas. Chapter 4.2.2 in *Rural Medicine Education Guidebook.* Wonca, Bangkok.

Playford, D., Larson, A. and Wheatland, B., 2006. Going country: rural student placement factors associated with future rural employment in nursing and allied health. *Australian Journal of Rural Health,* 14(1), 14-19.

Rabinowitz, H.K., 1993. Recruitment, retention, and follow-up of graduates of a programme to increase the number of family physicians in rural and underserved areas. *New England Journal of Medicine,* 328(13), 934-939.

Ross, A. and Couper, I., 2004. Rural scholarship schemes: A solution to the human resource crisis in rural district hospitals? *South African Family Practice*, 46(1), 5-6.

Ross, A.J., 2007. Success of a scholarship scheme for rural students. *South African Medical Journal,* 97(11), 1087-1090.

Ross, A., MacGregor, G. and Campbell, L., 2015. Review of the Umthombo Youth Development Foundation scholarship scheme 1999-2013. *African Journal of Primary Health Care and Family Medicine,* 7(1).

Reid, S.J., Couper, I.D. and Volmink, J., 2011. Educational factors that influence the urban-rural distribution of health professionals in South Africa: a case-control study. *South African Medical Journal,* 101(1), 29-33.

Stearns, J.A., Stearns, M.A., Glasser, M. and Londo, R.A., 2000. Illinois RMED: a comprehensive programme to improve the supply of rural family physicians. *Family Medicine,* 32(1), 17-21.

Stagg, P., 2014. Medical school admissions policies targeting rural students. Chapter 4.2.1 in *Rural Medicine Education Guidebook*. Wonca, Bangkok.)

Sen Gupta, T.K. and Young, L., 2014. Promoting rural practice through student selection. Chapter 4.2.3 in *Rural Medicine Education Guidebook.* Wonca, Bangkok.

Smucny, J., Beatty, P., Grant, W., Dennison, T. and Wolff, L.T., 2005. An evaluation of the Rural Medical Education Programme of the State University of New York Upstate Medical University, 1990-2003. *Academic Medicine,* 80(8), 733-738.

Task Force for Scaling Up Education and Training for Health Workers. *Scaling Up, Saving Lives*. Geneva: World Health Organisation/Global Health Workforce Alliance, 2008. Available at: http://www.who.int/workforcealliance/documents/Global_Health%20FINAL%20REPORT.pdf

Tudor Hart, J., 1971. The inverse care law. *The Lancet*, 297 (7696), 405-412.

Van Schalkwyk, S.C., Bezuidenhout, J., Conradie, H.H., Fish, T., Kok, N.J., Van Heerden, B.H. and de Villiers, M.R., 2014. 'Going rural': driving change through a rural medical education innovation. *Rural and Remote Health,* 14 (2), 2493. Available from: http://www.rrh.org.au.

Van Schalkwyk S., Kok, N., Conradie, H. and van Heerden, B., 2015. Academic achievement of final-year medical students on a rural clinical platform: Can we dispel the myths?. *African Journal of Health Professions Education,* 7 (1), 115-118.

Voss, M., Coetzee, J.F., Conradie, H. and van Schalkwyk, S.C., 2015. 'We have to flap our wings or fall to the ground': The experiences of medical students on a longitudinal integrated clinical model. *African Journal of Health Professions Education,* 7 (1), 119-124.

Walker, J.H., Dewitt, D.E., Pallant, J.F. and Cunningham, C.E., 2012. Rural origin plus a rural clinical school placement is a significant predictor of medical students' intentions to practice rurally: a multi-university study. *Rural Remote Health,*12, 1908.

Wang, L., 2002. A comparison of metropolitan and rural medical schools in China: which schools provide rural physicians? *Australian Journal of Rural Health*,10(2), 94-98.

Wilson, N.W., Couper, I.D., De Vries, E., Reid, S., Fish, T. and Marais, B.J., 2009. A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. *Rural Remote Health,* 9(2), 1060.

WHO, 2006. World Health Report 2006 – Working Together for Health. World Health Organisation (WHO), Geneva. WHO, 2010. Increasing Access to Health Workers in Remote and Rural Areas through Improved Retention. Global Policy Recommendations. World Health Organisation (WHO), Geneva.

WHO, 2013. Road-Map for Scaling Up the Human Resources for Health for Improved Service Delivery in the African Region: 2012-2025.

WHO Regional Office for Africa, Brazzaville. http://www.hrh-observatory.afro.who.int/wp-content/uploads/2017/01/Road-map-HRH_EN.pdf.

Worley, P., Couper, I., Strasser, R., Graves, L., Cummings, B-A., Woodman, R., Stagg, P. and Hirsh, D., 2016. A typology of longitudinal integrated clerkships. *Medical Education,* 50, 922-932.

Yardley, S., Littlewood, S., Margolis, S.A., Scherpbier, A., Spencer, J., Ypinazar, V., et al., 2010. What has changed in the evidence for early experience? Update of a BEME systematic review. *Medical Teacher,* 32(9), 740-746.

Chapter 6 References

AACN *et al.,* 2011. Available from http://www.ouhsc.edu/portals/1068/assets/documents/Educators%20for%20Excellence/ICollaborativePracticeCoreCompetenciesforFeb2011HRSAIPConferenceFINAL1-2_000.pdf.

AAMC, 1998. Association of American Medical Colleges (AAMC). *Learning objectives for medical student education:-Guidelines for medical schools. Report I of the Medical School Objectives Project. Academic medicine : Journal of the Association of American Medical Colleges* 1998. Available from https://members.aamc.org/eweb/upload/Learning Objectives for Medical Student Educ Report I.pdf.

Allan, C.M., Campbell, W.N., Guptill, C.A., Stephenson, F.F. and Campbell, K.E., 2006. A conceptual model for interprofessional education: the international classification of functioning, disability and health (ICF). *Journal of Interprofessional Care,* 20(3), 235–245. doi:10.1080/13561820600718139.

Anderson, E., Hean, S., O'Halloran, C., Pitt, R. and Hammick, M., 2014. Faculty development for interprofessional education and practice. In Y. Steinert (Ed.), *Innovation and Change in Professional Education*. Springer, New York.

Bainbridge, L., Nasmith, L., Orchard, C. and Wood, V., 2010. Competencies for interprofessional collaboration. *Journal of Physical Therapy Education,* 24(1), 6–11. Available from: http://search.proquest.com/docview/853890000?accountid=14700\nhttp://rb6fc7tv6s.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rfr_id=info:sid/ProQ:nursing&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.genre=article&rft.jtitle=.

Barr, H., 2011. Engaging with the global challenge. *Journal of Interprofessional Care,* 25(5), 319–320. doi:10.3109/13561820.2011.584831

Bigg, J. and Tang, C., 2007. *Teaching for Quality Learning at University,* (3rd ed.) Open University Press, Berkshire, UK.

Blue, A.V., Chesluk, B.J., Conforti, L.N. and Holmboe, E.S., 2015. Assessment and evaluation in interprofessional education: Exploring the field. *Journal of Allied Health,* 44 (2), 73–82. Available from: http://nyu.library.ingentaconnect.com/content/asahp/jah/2015/00000044/00000002/art00004?token=004e1a52fcc2d-d91a95c5f3b3b4746524828256f706e796c7b414f582a2f3f58723375686f4988

Boelen, C., 2010. Global consensus on social accountability of medical schools. Sante Publique *(Vandoeuvre-Les-Nancy, France)*, 23(3), 247–250.

Brandt, B., Lutfiyya, M.N., King, J.A. and Chioreso, C., 2014. A scoping review of interprofessional collaborative practice and education using the lens of the Triple Aim. *Journal of Interprofessional Care,* 28(5), 393–9. DOI:10.3109/13561820.2014.906391.

Brown, V.T., 2009. Interprofessional Education - Benefits and Barriers. Available from: http://edtheory.blogspot.co.za/2009/12/by-victoria-t.html (Accessed 23 September 2015).

Cahill, M., O'Donnell, M., Warren, A., Taylor, A. and Gowan, O., 2013. Enhancing interprofessional student practice through a case-based model. *Journal of Interprofessional Care,* 27(4): 333–5. DOI:10.3109/13561820.2013.764514.

Caldwell, K. and Atwal, A., 2003. The problems of interprofessional healthcare practice in hospitals. *British Journal of Nursing,* 12(20), 1212–1218. DOI:10.12968/bjon.2003.12.20.11844.

Casimiro, L., Hall, P., Archibald, D., Kuziemsky, C., Brasset-Latulippe, A. and Varpio, L., 2011. Barriers and Enablers to Interprofessional Collaboration in Healthcare: Research Report. A Regional Scan of Interprofessional Collaboration in the Champlain Region. Ottawa, 2011. Available from http://www.ahc-cas.ca/wp-content/uploads/2012/09/Montfort-Rapport-de-recherche_ang_1.pdf.

Charles, G., Bainbridge, L. and Gilbert, J., 2010. The University of British Columbia model of interprofessional education. *Journal of Interprofessional Care,* 24(1), 9–18. DOI:10.3109/13561820903294549.

CIHC, 2010. Canadian Interprofessional Health Collaborative (CIHC). A National Interprofessional Competency Framework, 2010. Available from http://www.cihc.ca/files/CIHC_IPCompetencies_Feb1210.pdf.

Clark, P., 2004. Institutionalising interdisciplinary health professions programmes in higher education: the implications of one story and two laws. *Journal of Interprofessional Care*, 18(3), 251–261. DOI:10.1080/13561820410001731296.

Clifton, M., Dale, C. and Bradshaw, C., 2006. The impact and effectiveness of interprofessional education in primary care: an RCN literature review. Royal College of Nursing, London. Available from https://www.rcn.org.uk/__data/assets/pdf_file/0004/78718/003091.pdf.

Coles, C.R. and Grant, J.G., 1985. Curriculum evaluation in medical and health-care education. *Medical Education,* 19(5), 405–422. DOI:10.1111/j.1365-2923.1985.tb01345.x

Cuff, P., Schmitt, M., Zierler, B., Cox, M., De Maeseneer, J., Maine, L.L. and Thibault, G.E., 2014. Interprofessional education for collaborative practice: views from a global forum workshop. *Journal of Interprofessional Care,* 28(1), 2–4. DOI:10.3109/13561820.2013.828910.

Curran, V., Casimiro, L., Banfield, V., Hall, P., Gierman, T., Lackie, K. and Wagner, S., 2011. Interprofessional collaborator assessment rubric. *Journal of Interprofessional Care,* 25(5), 339–344. DOI:10.3109/13561820.2011.589542.

Curtin University, 2011. *Interprofessional Capability Framework*. Curtin University of Technology, Perth. Available from: https://healthsciences.curtin.edu.au/local/docs/IP_Capability_Framework_booklet.pdf.

Daly, G., 2004. Understanding the barriers to multiprofessional collaboration. *Nursing Times,* 100(9), 78–79.

De Villiers, M., Conradie, H., Snyman, S., Van Heerden, B. and Van Schalkwyk, S., 2014. Experiences in developing and implementing a community-based education strategy - A case study from South Africa,. In Talaat, W. and Ladhani, L., (Eds.) *Community Based Education in Health Professions: Global Perspectives.* World Health Organisation Regional Office for the Eastern Mediterranean, Cairo, pp. 176–206. Available from http://new.themedfomscu.org/images/CommunityBasedEducationinHealthProfessions.pdf.

Dean, H. J., MacDonald, L., Alessi-Severini, S., Halipchuk, J.A.C., Sellers, E.A.C. and Grymonpre, R.E., 2014. Elements and enablers for interprofessional education clinical placements in diabetes teams. *Canadian Journal of Diabetes,* 38(4), 273–278. DOI:10.1016/j.jcjd.2014.02.024.

Derbyshire, J.A. and Machin, A.I., 2011. Learning to work collaboratively: Nurses' views of their pre-registration interprofessional education and its impact on practice. *Nurse Education in Practice,* 11(4), 239–244. DOI:10.1016/j.nepr.2010.11.010.

Dufour, S.P. and Lucy, S.D., 2010. Situating primary healthcare within the international classification of functioning, disability and health: enabling the Canadian Family Health Team Initiative. *Journal of Interprofessional Care,* 24(6), 666–677. DOI:10.3109/13561820903550671.

Fehrsen, G. and Henbest, R., 1993. In search of excellence. Expanding the patient-centred clinical method: A three-stage assessment. *Family Practice,* 1(10), 49–53.

Forte A and Fowler P. 2009 Participation in interprofessional education: An evaluation of student and staff experiences. *J Interprofessional Care* 2009; 23(1): 58–66. DOI:10.1080/13561820802551874.

Frank, J. R., Snell, L. and Sherbino, J., 2015. CanMEDS 2015 Physician Competency Framework. Royal College of Physicians and Surgeons of Canada, Ottawa. Available from http://www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/framework/canmeds2015_framework_series_IV_e.pdf.

Freeth, D. and Reeves, S., 2004. Learning to work together: using the presage, process, product (3P) model to highlight decisions and possibilities. *Journal of Interprofessional Care,* 18(1), 43–56. DOI:10.1080/13561820310001608221.

Frenk, J., Chen, L., Bhutta, Z.A., Cohen, J., Crisp, N., Evans, T. and Zurayk, H., 2010. Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *The Lancet,* 376 (9756), 1923–1958. DOI:10.1016/S0140-6736(10)61854-5.

Gilbert, J.H.V., Yan, J. and Hoffman, S.J., 2010. A WHO report: Framework for action on interprofessional education and collaborative practice. *Journal of Allied Health,* 39(3), 196–197.

Ginsburg, L. and Tregunno, D., 2005. New approaches to interprofessional education and collaborative practice: lessons from the organisational change literature. *Journal of Interprofessional Care,* 19 Suppl 1,177–187. DOI:10.1080/13561820500083105.

GMC, 2009. General Medical Council (GMC). *Tomorrow's doctor:s.* London: General Medical Council, 2009. Available from http://www.gmc-uk.org/Tomorrow_s_Doctors_1214.pdf_48905759.pdf.

Godden-Webster, A. and Murphy, G., 2014. Interprofessional Collaboration in Practice: A Guide for Strengthening Student Learning Experiences. Dalhousie University, Faculty of Health Professions, Halifax, Nova Scotia. Available from http://www.dal.ca/content/dam/dalhousie/pdf/healthprofessions/Interprofessional Health Education/Facilitator Guide FINAL - with links.pdf.

Ho, K., Jarvis-Selinger, S., Borduas, F., *et al.,* 2008. Making interprofessional education work: the strategic roles of the academy. *Academic Medicine,* 83(10), 934–940. DOI:10.1097/ACM.0b013e3181850a75.

HPCSA, 2014. Core competencies for undergraduate students in clinical associate, dentistry and medical teaching and learning programmes in South Africa, 2014. Retrieved 7 May 2015, from http://www.hpcsa.co.za/uploads/editor/UserFiles/downloads/medical_dental/MDB Core Competencies - ENGLISH - FINAL 2014.pdf.

IECE Panel, 2011. Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, D.C.: Interprofessional Education Collaborative, 2011.

IOM, 2011. The Future of Nursing : Leading Change. Advancing Health Committee of the Robert Wood Johnson Foundation Initiative on the Future of Nursing at the Institute of Medicine (IOM), Washington D.C.

Jelsma, J. and Scott, D., 2011. Impact of using the ICF framework as an assessment tool for students in paediatric physiotherapy: a preliminary study. *Physiotherapy,* 97(1), 47–54. Available from: http://www.scopus.com/inward/record.url?eid=2-s2.0-79451473123&partnerID=tZOtx3y1.

Kent, F. and Keating, J.L., 2015. Interprofessional education in primary healthcare for entry level students — A systematic literature review. *Nurse Education Today,* 35, 1221–1231. DOI:http://dx.doi.org/10.1016/j.nedt.2015.05.005.

Kvarnström, S., 2008. Difficulties in collaboration: a critical incident study of interprofessional healthcare teamwork. *Journal of Interproffessional Care.* 2008 Mar; 22(2): 191–203. doi: 10.1080/13561820701760600.

Lawlis, T.R., Anson, J. and Greenfield, D., 2014. Barriers and enablers that influence sustainable interprofessional education: a literature review. *Journal of Interprofessional Care,* 28(4), 305–310. DOI:10.3109/13561820.2014.895977.

Lawson, H., 2004. The logic of collaboration in education and the human services. Journal of Interprofessional Care,18(3), 225–237. DOI:10.1080/13561820410001731278.

Lingard, L., 2009. What we see and don't see when we look at "competence": Notes on a god term. *Advances in Health Sciences Education,* 14(5), 625–628. DOI:10.1007/s10459-009-9206-y.

Luecht, R.M., Madsen, M.K., Taugher, M.P. and Petterson, B.J., 1990. Assessing professional perceptions: design and validation of an interdisciplinary education perception scale. *Journal of Allied Health,* 19(2), 181–191.

Lurie, S.J., 2012. History and practice of competency-based assessment. *Medical Education,* 46(1), 49–57. DOI:10.1111/j.1365-2923.2011.04142.

Matthews, L.R., Pockett, R.B., Nisbet, G., *et al.,* 2011. Building capacity in Australian interprofessional health education: Perspectives from key health and higher education stakeholders. *Australian Health Review,* 35(2), 136–140. DOI:10.1071/AH10886

McNair, R., Brown, R., Stone, N. and Sims, J., 2001. Rural interprofessional education: Promoting teamwork in primary healthcare education and practice. *Australian Journal of Rural Health,* 9 (Supplement), S19–S26. DOI:10.1046/j.1440-1584.9.s1.9.x

Mezirow, J., 1998. On critical reflection. *Adult Education Quarterly,* 48(3), 185.

Miller, G.A., 1990. The assessment of clinical skills/competence/performance. *Academic Medicine,* 65(9), S63–S67.

Missen, K., Jacob, E.R., Barnett, T., Walker, L. and Cross, M., 2012. Interprofessional clinical education: Clinicians' views on the importance of leadership. *Collegian*, 19(4), 189–195. DOI:10.1016/j.colegn.2011.10.002.

Morgan, S., Pullon, S. and McKinlay, E., 2015. Observation of interprofessional collaborative practice in primary care teams: An integrative literature review. *International Journal of Nursing Studies,* 52(7), 1217–1230. DOI:10.1016/j.ijnurstu.2015.03.008.

Murray-Davis, B., Marshall, M. and Gordon, F., 2012. From school to work: Promoting the application of pre-qualification interprofessional education in the clinical workplace. *Nurse Education in Practice,*12(5), 289–296. DOI:10.1016/j.nepr.2011.10.009.

Newton, C., Bainbridge, L., Ball, V., Baum, K., Bontje, P. and Boyce, R., 2015. The Healthcare Team ChallengeTM: developing an international interprofessional education research collaboration. *Nurse Education Today*, 35(1), 4–8. DOI:10.1016/j.nedt.2014.07.010.

Oandasan, I. and Reeves, S., 2005. Key elements of interprofessional education. Part 2: factors, processes and outcomes. *Journal of Interprofessional Care,* 19 Suppl 1(May), 39–48. DOI:10.1080/13561820500081703.

Parsell, G. and Bligh, J., 1999. The development of a questionnaire to assess the readiness of healthcare students for interprofessional learning (RIPLS). *Medical Education,* 33(2), 95–100. DOI:10.1046/j.1365-2923.1999.00298.x

Snyman, S., Von Pressentin, K.B. and Clarke, M., 2015. International classification of functioning, disability and health: catalyst for interprofessional education and collaborative practice. *Journal of Interprofessional Care,* 29 (4), 313-319. DOI:10.3109/13561820.2015.1004041.

Solomon, V. and Baig, Q., 2015. Consultation Workshop on Integrating Interprofessional Education and Graduate Competencies in Health Science. Unpublished Report, Pretoria.

Steinert, Y., 2005. Learning together to teach together: interprofessional education and faculty development. *Journal of Interprofessional Care,* 19 Suppl 1(May), 60–75. DOI:10.1080/13561820500081778.

Steketee, C., Forman, D., Dunston, R., et al., 2014. Interprofessional health education in Australia: three research projects informing curriculum renewal and development. Applied Nursing Research, 27(2), 115–120. DOI:10.1016/j.apnr.2014.03.002.

Stephenson, K.S., S.M. Peloquin, S.A. Richmond, M.R. Hinman, and C.H. Christiansen. 2002. Changing educational paradigms to prepare allied health professionals for the 21st century. *Education for Health 15* (1):37-49.

Stone, J., 2010. Moving interprofessional learning forward through formal assessment. Medical Education, 44(4), 396–403. DOI:10.1111/j.1365-2923.2009.03607.x

Stone, N., 2007. Coming in from the interprofessional cold in Australia. *Australian Health Review*, 31(3), 332–340. DOI:10.1071/AH070332.

Talaat, W. and Ladhani, Z., 2014. Community-based Education in Health Professions: Global Perspectives. World Health Organisation Eastern Mediterranean Regional Office, Cairo. Available from: http://new.themedfomscu.org/images/CommunityBasedEducationinHealthProfessions.pdf.

Talbot, M., 2004. Monkey see, monkey do: a critique of the competency model in graduate medical education. *Medical Education*, 38(6), 587–592. DOI:10.1046/j.1365-2923.2004.01794.x.

Tempest, S. and McIntyre, A., 2006. Using the ICF to clarify team roles and demonstrate clinical reasoning in stroke rehabilitation. *Disability and Rehabilitation,* 28(10), 663–7. Available from: http://www.scopus.com/inward/record.url?eid=2-s2.0-33646707036&partnerID=tZOtx3y1.

Thibault, G.E. and Schoenbaum, S.C., 2013. Forging Collaboration Within Academia and Between Academia and Healthcare Delivery Organisations: Importance, Successes, and Future Work. Institute of Medicine, Washington D.C., 3–5.

Thistlethwaite, J.E., Forman, D., Matthews, L.R., Rogers, G.D., Steketee, C. and Yassine, T., 2014. Competencies and frameworks in interprofessional education: a comparative analysis. *Academic Medicine,* 89(6), 869–75. DOI:10.1097/ACM.0000000000000249.

Thistlethwaite, J.E. and Moran, M., 2010. Learning outcomes for interprofessional education (IPE): Literature review and synthesis. *Journal of Interprofessional Care,* 24(5), 503–513. DOI:10.3109/13561820.2010.483366.

Van Heerden, B., 2015. Summary of three interprofessional competency frameworks. Available from: http://www.sun.ac.za/english/faculty/healthsciences/chpe/Documents/Van%20Heerden%20(2015)%20Summary%20of%20three%20interprofessional%20competency%20frameworks.pdf.

WHO, 2001. International Classification of Functioning, Disability and Health: ICF. World Health Organisation (WHO), Geneva.

WHO, 2010. Framework for Action on Interprofessional Education and Collaborative Practice. World Health Organisation (WHO), Geneva. Available from http://www.who.int/hrh/nursing_midwifery/en/.

WHO, 2013a. How to use the ICF: A Practical Manual for using the International Classification of Functioning, Disability and Health (ICF), Exposure Draft for Interprofessional Carer Comment. World Health Organisation (WHO), Geneva.

WHO, 2013b. Resources for Health Observer Interprofessional Collaborative Practice in Primary Healthcare : Nursing and Midwifery Perspectives Six Case Studies. World Health Organisation (WHO), Geneva. Available from: http://www.who.int/hrh/resources/IPE_SixCaseStudies.pdf.

WHO, 2013c. Transforming and Scaling Up Health Professionals' Education and Training: World Health Organisation Guidelines, 124. World Health Organisation (WHO), Geneva. Available from: http://apps.who.int/iris/handle/10665/93635.

Chapter 7 References

Al-Shorbaji, N., Atun, R., Car, J., Majeed, A. and Wheeler, E., 2015. E Learning for Undergraduate Health Professional Education. World Health Organisation (WHO), Geneva.

Anema, M.G. and McCoy, J., 2010. *Competency-Based Nursing Education. A Guide to Achieving Outstanding Learner Outcomes.* Springer Publishing Company, New York.

Ballim, Y., Mabizela, S. and Mubangizi, J.C., 2014. Professional bodies and quality assurance of higher education programmes in South Africa: Towards an appropriate framework. *South African Journal of Higher Education*, 28(4), 1140-1155.

Bezuidenhoudt, J., 2014. Proposal for the Development and Implementation of a Longitudinal Portfolio in the MBChB programme. Centre for Health Professions Education, University of Stellenbosch.

Bruce, J.C. and Klopper, H.C., 2011. *Teaching the Practice of Nursing*. Pearson Education, Cape Town.

Burke, J., (Ed), 2005. Competency Based Education and Training. Available from http://www.tandfebooks.com/isbn/9780203974261.

Carl, A.E., 2014. *Teacher Empowerment through Curriculum Development. Theory into Practice.* Juta and Co, Ltd.

Carraccio, C.L. and Englander, R., 2013. From Flexner to competencies: Reflections on a Decade and the Journey Ahead. *Academic Medicine,* 88,1067–1073.

Chapman, H., 1999. Some important limitations of competency-based education with respect to nurse education: an Australian perspective. *Nurse Education Today,* 19, 129-135.

Dewey, J., 1933. *Experience and Education.* Macmillan Publishing Company, New York.

Epstein, R.M., 2007. Assessment in medical education. *New England Journal of Medicine,* 356, 387-396.

Frank, J.R., Snell, L.S., Sherbino, J., *et al.*, 2014. The Draft CanMeds 2015 Physician Competency Framework. The Royal College of Physicians and Surgeons of Canada, September 2014.

Frank, J.R., Snell, L.S., Ten Cate, O., et al., 2010. Competency-based medical education: theory to practice. *Medical Teacher*, 32, 638–645.

Franklin, N. and Melville, P., 2015. Competency assessment tools: An exploration of the pedagogical issues facing competency assessment for nurses in the clinical environment. *Collegian,* 22, 25–31.

Frenk, J., Chen, L. and Bhutta, Z.A., 2010. The Lancet Commissions. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *The Lancet,* 376, 1923–1958.

Grimmer-Somers, K., Milanese, S. and Chipcase, L., 2011. Research into Best Practices in E-Learning for Allied Health Clinical Education and Training. Clinical Education and Training, Brisbane, Queensland.

Hall, P., Byszewski, A., Sutherland, S. and Stodel, E.J., 2012. Developing a sustainable electronic portfolio (ePortfolio) programme that fosters reflective practice and incorporates CanMEDS competencies into the undergraduate medical curriculum. *Academic Medicine*, 87, 744–751.

Harden, R.M., 2015. Why outcome-based education (OBE) is an important development in medical education. In: *Routledge International Handbook of Medical Education. The Cultural Politics of Education, Development and Childhood.* Routledge. Available from: https://www.routledgehandbooks.com/doi/10.4324/9780203066201.ch3.

Hay, D. and Marais, N., 2011. The university curriculum as institutional transformation. In: Bitzer, E. and Botha, N. (Eds.). *Curriculum Enquiry in South African Higher Education*. Sun Press, Cape Town.

Hills, M. and Watson, J., 2011. *Creating a Caring Science Curriculum: An Emancipatory Pedagogy for Nursing*. Springer Publishing Company.

Holmboe, E.S., Sherbino. J., Long, D.M., Swing, S.R. and Frank, J.R., 2010. The role of assessment in competency-based medical education. *Medical Teacher,* 32, 676–682.

Horsfall, J., Cleary, M and Hunt, G.E., 2012. Developing a pedagogy for nursing teaching–learning. *Nurse Education Today,* 32, 930–933.

HPCSA, 2014. Core Competencies for Undergraduate Students in Clinical Associate, Dentistry and Medical Teaching and Learning Programmes in South Africa. Medical and Dental Professions Board, Health Professions Council of South Africa (HPCSA), Pretoria.

Kitchenham, A., 2008. The evolution of John Mezirow's transformative learning theory. *Journal of Transformative Education,* 6(2), 104-123.

Kiguli-Malwadde, E., OlapadeOlaopa, E.O., Kiguli, S., et al., 2014. Competency-based medical education in two Sub-Saharan African medical schools. *Advances in Medical Education and Practice,* 4 (5), 483–489. DOI https://dx.doi.org/10.2147/AMEP.S68480.

Kilminster, S., Cottrell, D., Grant, J. and Jolly, B., 2007. AMEE Guide No. 27: Effective educational and clinical supervision. *Medical Teacher,* 29(1), 2–19. DOI:10.1080/01421590701210907.

Larson, L.L., 2012. Pedagogical approaches – Insights for teachers of adults. NAFOL Conference: *Teacher Education Research between National Identity and Global Trends*, Trondheim, Norway.

Lurie, S.J., Mooney, C.J. and Lyness, M.J., 2009. Measurement of the general competencies of the Accreditation Council for Graduate Medical Education: A systematic review. *Academic Medicine,* 84(3), 301-309.

Mezirow, J., 2000. Learning as Transformation. Critical Perspectives of a Theory in Progress. *The Jossey-Bass Higher and Adult Education Series.* Josse-Bass Publishers, San Francisco.

Miller, G., Benke, M., Chaloux, B., *et al.*, 2014. *Leading the E-Learning Transformation of Higher Education.* Stylus Publisher, USA.

Morcke, A.M., Dornan, T. and Eika, B., 2013. Outcome (competency) based education: an exploration of its origins, theoretical basis, and empirical evidence. Advances in Health Sciences Education, 18, 851–863. DOI 10.1007/s10459-012-9405-9. Available from: http://pure.au.dk/portal/files/55932771/2013_OBE.pdf .

Mulder, M., Gulikers, J., Biemans, H. and Wesselink, R., 2009. The new competence concept in higher education: error or enrichment. *Journal of European Industrial Training*, 33 (8/9), 755-770.

Murphy, S., Hartigan, I., Walshe, N., Flynn, A. and O'Brien, S., 2011. Merging problem-based learning and simulation as an innovative pedagogy in nurse education. *Clinical Simulation in Nursing,* 7, e141-e148.

Prober, C.G. and Khan, S., 2013. Medical education reimagined: A call to action. *Academic Medicine,* 88(10), 1407-1410.

Riley, J.B. and Yearwood, E.L., 2012. The effect of a pedagogy of curriculum infusion on nursing student well-being and intent to improve the quality of nursing care. *Archives of Psychiatric Nursing*, 26 (5), 364–373.

SAQA, 2000. The National Qualifications Framework and Curriculum Development. South African Qualifications Authority (SAQA), Pretoria.

Taber, S., Frank, J.R., Harris, K.A., Glasgow, N. J., Lobst, W. and Talbot, M., 2010. Identifying the policy implications of competency-based education. *Medical Teacher,* 32(8), 687–691. Available from http://www.ncbi.nlm.nih.gov/pubmed/20662582.

Ten Cate, O., 2005. Entrustability of professional activities and competency based training. Medical Education, 39, 1176 – 1177.

Ten Cate, O., 2013. Nuts and bolts of entrustable professional activities. *Journal of Graduate Medical Education*, 5, 157–158. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3613304/.

Touchie, C. and Ten Cate, O., 2016. The promise, perils, problems and progress of competency-based medical education. *Medical Education,* 50, 93-100.

UK DoH, 2014. *Education Outcomes Framework Report 2013/2014.* United Kingdom Department of Health (UK DoH), June 2014.

Ukpokodu, O.N., 2010. Pedagogies that foster transformative learning in a multicultural education course: A reflection. *Journal of Praxis in Multicultural Education*, 4(1), 1-9.

Van der Horst, H. and McDonald, R., 1997. *Outcomes-based Education. A Teacher's Manual.* Kagiso Publishers, Pretoria.

Van der Vleuten, C.P.M. and Schuwirth, L.W.T., 2005. Assessing professional competence: form methods to programmes. *Medical Education*, 39, 309-317.

Van der Vleuten, C.P.M., Schuwirth, L.W.T., Driessen, E., et al., 2012. A model for programmatic assessment fit for purpose. *Medical Teacher,* (3), 205-14. DOI: 10.3109/0142159X.2012.652239.

Van Heerden, B.B., 2013. Effectively addressing the health needs of South Africa's population: The role of health professions education in the 21st century. *South African Medical Journal,* 103(1), 21-22.

Walsh, M., 2011. Narrative pedagogy and simulation: Future directions for nursing education. Nurse Education in Practice, 11, 216–219.

Wheelahan, L.M., 2009. The limits of competency-based training and the implications for work. Available from: www98.griffith.edu.au/dspace/bitstream/10072/29435/1/56418_1.pdf.

Williams, R.G., Klamen, D.A. and McGaghie, W.C., 2003. Cognitive, social and environmental sources of bias in clinical performance ratings. *Teaching and Learning in Medicine,* 15(4), 270-292.

WHO, 2013. Transforming and Scaling Up Health Professionals' Education and Training: World Health Organisation Guidelines. World Health Organisation (WHO), Geneva.

Young, J. and Chapman, E., 2010. Generic competency frameworks. A brief historical overview. *Education Research Perspectives,* 37(1), 1-24.

Chapter 8 References

Al-Eraky, M.M., Donkers, J., Wajid, G., Van Merrienboer, J.J.G., 2015. Faculty development for learning and teaching of medical professionalism. *Medical Teacher,* 37, S40–S46.

Anderson, E., Hean, S., O'Halloran, C., Pitt, R. and Hammick, M., 2014. Faculty development for interprofessional education and practice. In Y. Steinert (Ed.), *Innovation and Change in Professional Education*. Springer, New York.

Boelen, C. and Woollard, B., 2009. Social accountability and accreditation: a new frontier for educational institutions. *Medical Education,* 43, 887–894. doi:10.1111/j.1365-2923.2009.03413.x.

Chan, A.K. and Wood, V., 2010. Preparing tomorrow's healthcare providers for interprofessional collaborative patient-centred practice today. *University of British Columbia Medical Journal,* 1 (2), 22–24.

Christianson, C.E., McBride, R.B., Vari, R.C., Olson, L. and Wilson, H.D., 2007. From traditional to patient-centered learning: curriculum change as an intervention for changing institutional culture and promoting professionalism in undergraduate medical education. *Academic Medicine*, 82, 1079–1088.

Cilliers, F.J. and Tekian, A., 2016. Effective facukty development in an institutional context: Designing for transfer. *Journal of Graduate Medical Education,* 145-149. doi:10.4300/JGME-D-15-00117.1

Couper, I., Sen Gupta, T., McInerney, P., Larkins, S. and Evans, R., 2012. WHO Policy Brief on Faculty Development: Transforming and Scaling Up Health Professional Education and Training. World Health Organisation (WHO), Geneva.

Doherty, J.E., Couper, I.D., Campbell, D. and Walker, J., 2013. Transforming rural health systems through clinical academic leadership: lessons from South Africa. *Rural and Remote Health,* 13, 2618. Available from http://www.rrh.org.au.

Frantz, J.M., Bezuidenhout, J., Burch, V.C., Mthembu, S., Rowe, M,, Tan, C., Van Wyk, J. and Van Heerden, B., 2015. The impact of a faculty development programme for health professions educators in sub-Saharan Africa: an archival study. *British Medical Council Medical Education*, 15, 28. DOI 10.1186/s12909-015-0320-7.

Frenk, J., Chen, L. and Bhutta, Z.A., 2010. The Lancet Commissions. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *The Lancet,* 376, 1923–1958.

Frehywot, S., Vovides, Y., Talib, Z., Mikhail, N., Ross, H., Wohltjen, H., Bedada, S., Korhumel, K., Karim Koumare, A. and Scott, J., 2013. E-learning in medical education in resource constrained low- and middle-income countries. Human Resources for Health, 11, 4.

Greysen, S.R., Dovlo, D., Olapade-Olaopa, E.O., Jacobs, M., Sewankambo, N. and Mullan, F., 2011. Medical education in sub-Saharan Africa: a literature review. *Medical Education*, 45, 973–986.doi:10.1111/j.1365-2923.2011.04039.x.

Harris, S. and Wentworth, D., 2013. Relationship Centered Learning: An Adaptive Learning Model Executive Summary. Brandon Hall Group Research Team, USA. Available from https://membership.brandonhall.com/posts/557989-executive-summary-relationship-centered-learning/public.

Hawala-Druy, S. and Hill, M.H., 2012. Interdisciplinary: Cultural competency and culturally congruent education for millennials in health professions. *Nurse Education Today,* 32, 772–778.

Holmboe, E.S., Ward, D.S., Reznick, R.K., *et al.,* 2011. Faculty development in assessment: the missing link in competency-based medical education. *Academic Medicine* 86, 460–467.

Kent, A. and Burch, V.C., 2011. Are we addressing the health sciences education needs of sub-Saharan Africa? *Medical Education,* 45, 966–972.

Mezirow, J., 2000. Learning to think like an adult - core concepts of transformation theory. In: Mezirow, J. and Associates, (Eds). *Learning as Transformation.* 1st edition. Jossey-Bass, San Francisco.

Michaels, D.C., Reid, S.J. and Naidu, C.S., 2014. Peer review for social accountability of health sciences education: A model from South Africa. *Education for Health*, 27, 127-131.

O'Sullivan, P.S. and Irby, D.M., 2011. Reframing research on faculty development. *Academic Medicine,* 86, 421-428.

Pardíñaz-Solís, R. and Hastings, A., 2015. Global health education. A transformative learning challenge in undergraduate medical education. In, *An Introduction to the Study of Education 4e*, Matheson, Routledge.

Reid, S.J., Couper, I.D. and Volmink, J., 2011. Educational factors that influence the urban-rural distribution of health professionals in South Africa: A case-control study. *South African Medical Journal,* 101 (1), 29–33.

SANC, 2014. Competencies for a Nurse Educator. South African Nursing Council (SANC), Pretoria.

Steinert, Y., 2011. Commentary: faculty development: The road less travelled. *Academic Medicine,* 86, 409–411. DOI: 10.1097/ACM.0b013e31820c6fd3

Steinert, Y., 2010. Faculty development: From workshops to communities of practice. *Medical Teacher,* 32(5), 425 - 428. DOI:10.3109/01421591003677897.

Tekian, A., Roberts, T., Batty, H.P., Cook, D.A. and Norcini, J., 2014. Preparing leaders in health professions education. *Medical Teacher,* 36, 269 – 271.

Tresolini, C.P. and the Pew-Fetzer Task Force, 1994. *Health Professions Education and Relationship-centered Care*. Pew Health Professions Commission, San Franciso.

Van Schalkwyk, S., Bezuidenhout, J., Burch, V.C., Clarke, M., Conradie, H., Van Heerden, B. and De Villiers, M., 2012. Developing an educational research framework for evaluating rural training of health professionals: A case for innovation. *Medical Teacher,* 32, 1064 – 1069. http://dx.doi.org/10.3109/014215 9X.2012.719652

Ventura, C.A.A., Costa Mendes, I.A., Wilson, L.L., de Godoy, S., Tamí-Maury, I., Zárate-Grajales, R. and Salas-Segura, S., 2014. Global health competencies according to nursing faculty from Brazilian higher education institutions. *Revista Latino-Americana de Enfermagem*, 22 (2), 179-86. DOI: 10.1590/0104-1169.2996.2400.

Walker, M., McLean, M., Dison, A. and Peppin-Vaughan, R., 2009. South African universities and human development: Towards a theorisation and operationalisation of professional capabilities for poverty reduction. *International Journal of Education Development,* 29 (6), 565-572.

WHO, 2009. Global Standards for the Initial Education of Professional Nurses and Midwives. World Health Organisation (WHO), Geneva.

WHO, 2013a. Transforming and Scaling Up Health Professionals' Education and Training: World Health Organisation Guidelines. World Health Organisation (WHO), Geneva.

WHO, 2013b. Midwifery Educator Core Competencies. World Health Organisation (WHO), Geneva.

Chapter 9 References

ANC, 1994. A National Plan for Health for South Africa. African National Congress (ANC), Johannesburg, 31-32; 79-80.

Brink, A.J., Slabbert, B.R. and Barnes, J.M., 1986. The internship year in the RSA - a need for change. *South African Medical Journal,* 70(11), 679-683.

Draper, C. E., Louw G J., 2012. Competence for Internship: Perceptions of Final-Year Medical Students. *Education for Health* 2012;25:16-23.

Erasmus, E. and Blaauw, D., 2011. Nurses' attitudes towards working and living in rural areas. Initial findings from the CREHS cohort study in South Africa. CREHS research update November 2009. Centre for Health Policy. Available from: http://www.crehs.lshtm.ac.uk/downloads/publications/SA_cohort.pdf. (Accessed 20 October 2015.)

Erasmus, N., 2012. Slaves of the state – medical internship and community service in South Africa. *South African Medical Journal,* 102 (8), 655-658.

Essa, Z.I., 2010. Post-medical interns' reflections on medical internships in South African state training hospitals. MA Thesis, Faculty of Humanities, University of Witwatersrand.

Hannon, F., 2000. A national medical education needs' assessment of interns and the development of an intern education and training programme. *Medical Education,* 34(4), 275-284.

Frehywot, S., Mullan, F., Payne, P.W. and Ross, H., 2010. Compulsory service programmes for recruiting health workers in remote and rural areas: do they work? *Bulletin of the World Health Organisation*, 88, 364–70.

HPCSA, 2002. Handbook on Internship Training. Guidelines for Interns, Accredited Facilities and Health Authorities [Brochure]. Medical and Dental Professions Board, Health Professions Council of South Africa (HPCSA), Pretoria.

Khan, N.B., Knight, S. and Esterhuizen, T., 2009. Perceptions of and attitudes to the compulsory community service programme for therapists in KwaZulu-Natal. *South African Journal of Community Disorders,* 56, 15-20.

Kottler, A. and Swatz, S., 2004. Rites of passage: identity and the training of clinical psychologists in the current South African context. *South African Journal of Psychology,* 34(1), 55-71.

KZN DoH, 2010. Policy: Community Service Officers. KwaZulu-Natal (KZN) Department of Health (DoH), Pietermaritzburg.

Lave, J. and Wenger, E., 1991. *Situated Learning: Legitimate Peripheral Participation.* Cambridge: Cambridge University Press. ISBN 0-521-42374-0.

Leach, M., Akhurst, J. and Basson, C., 2003. Counseling psychology in South Africa: Current political and professional challenges and future promise. *The Counseling Psychologist,* 31 (5), 619-640. DOI: 10.1177/0011000003256787.

Mathebula, M.P., Mhlanga, E., Reid, S., Claasen, L., Mannie, J., Mutamba, G. and Shipalana, N., 2001. Skills and Competencies of Interns and Community service Doctors. Task Team of National Department of Health: Maternal, Child, Women's health and Nutrition Cluster. Department of Health, Pretoria.

Meintjies, Y., 2003. The two year internship training. *South African Medical Journal,* 93 (5), 336-337.

Moodley, J., *et al.*, 2014. The confidential enquiry into maternal deaths in South Africa: a case study. *British Journal of Obstetrics and Gynaecology,* 121 (s4), 53-60.

Naidoo, S. and Chikte, U., 2002. Community dental service - the first year. *South African Dental Journal,* 57 (5), 193-196.

Naidoo S. Community dental service – four years on. SADJ 2007;62 (6): 250, 252-3.

Nkabinde, T., Ross, A., Reid, S. and Nkwanyana, N. (2013). Internship training adequately prepares South African medical graduates for community service – with exceptions. *South African Medical Journal,* 103(12), p.930.

Pardhan A and Saad N., 2011. Governance in Postgraduate Medical Education in Canada. Members of the FMEC PG consortium.

Paterson, M., Green, M. and Maunder, E.M.W., 2007. Running before we walk: How can we maximise the benefits from community service dietitians in KwaZulu-Natal, South Africa? *Health Policy,* 82 (3), 288-301.

Penn, C., Mupawose, A. and Stein, J., 2009. From pillars to posts; some reflections on community service six years on. *South African Journal of Community Disorders*, 56, 8-16.

PHILA, 1996. Public Health Intervention Through Legislative Advocacy Programme. Two years of postgraduate vocational training for medical doctors proposal. PHILA legislative update, 1996; 6. Available at http://www.healthlink.org.za/pphc/mandserv.htm. Accessed 29 December 2015.

Pillay, A. and Kramers, A., 2003. South African clinical psychology, employment (In) equity and the "brain drain". *South African Journal of Psychology,* 33 (1), 52-60. DOI: 10.1177/008124630303300107.

Pillay, A.L. and Johnston, E.R., 2011. Intern clinical psychologists' experiences of their training and internship placements. *South African Journal of Psychology,* 41, 74-82, DOI:10.1177/008124631104100108.

Pillay, A.L. and Harvey, B.M., 2006. The experiences of the first South African community service clinical psychologists. *South African Journal of Psychology,* 36, 259-280, DOI:10.1177/008124630603600204.

Reid, S.J. and Conco, D., 1999. Monitoring the implementation of community service. In: Crisp, N., Ntuli, A. and Barron, P. (Eds.). *South African Health Review.* Health Systems Trust, Durban.

Reid, S.J., 2001. Compulsory community service for doctors in South Africa – an evaluation of the first year. *South African Medical Journal*, 91 (4), 329-336.

Reid, S., 2002. Community service for healthcare professionals. In: South African Health Review. Health Systems Trust, Durban.

Reid, S., Peacocke, J., Kornik, S. and Wolfaardt, G., 2015. Report of the Community Service for Health Professionals Summit held on 22 April 2015. Africa Health Placements, Johannesburg.

Sein N. and Tumbo J. 2012. Determinants of effective medical intern training at a training hospital in North West Province, South Africa. *African Journal of Health Professions Education* 2012;4(1):10-14. [http://dx.doi.org/10.7196/AJHPE.100].

Summers, R., Haavik, C., Summers, B., Moola, F., Lowes, M. and Enslin, B., 2001. Pharmaceutical education in the South African multicultural society. *American Journal of Pharmacy Education,* 65, 150-154.

Sun, G.R., Saloojee, H., Van Rensburg, M.J. and Manning, D., 2008. Stress during internship at three Johannesburg hospitals. *South African Medical Journal,* 98 (1), 33-35.

Visser, J., Marais, M., du Plessis, J., Steenkamp, I. and Troskie, I., 2006. Experiences and attitudes of dieticians during the first compulsory community service year (2003). *South African Journal of Clinical Nutrition,* 19 (1), 10-17.

Watson, M. B. and Fouche, P., 2007. Transforming a past into a future: Counseling psychology in South Africa. *Applied Psychology: An International Review,* 56, 152–164. DOI: 10.1111/j.1464-0597.2007.00282.x

WHO, 2010. Global Policy Recommendations for the Retention of Health Workers in Remote and Rural Areas. World Health Organisation (WHO), Geneva.

Wranz, E.S., 2011. Compulsory community service for speech-language and hearing therapy professionals: readiness, reality and readjustment. MPhil Thesis, University of Stellenbosch.

Chapter 10 References

Auditor General, 2005. *General Report of the Auditor General 2005.* Pretoria.

DHET, 2013. *Report of the Ministerial Committee for the Review of the Funding of Universities.* Department of Higher Education and Training (DHET), Pretoria.

DoH, 2011. *A Strategic Review of the HPTSG in support of the Work of the National Conditional Grant Task Team.* Department of Health (DoH), Pretoria.

National Treasury, 2004-2008. Finance and Fiscal Commission Submissions 2004/5, 2005/6 and 2007/8.

National Treasury, 2014/2015. Financial and Fiscal Commission. Submission for the 2014/15 Division of Revenue

National Treasury, 2015. Estimates of National Expenditure, Table 16.10 pg. 280 (25 February 2015).

Strachan, B., 2009. Meeting South Africa's Needs: a Preliminary Report of an Investigation into Specialists Training and Development. College of Medicine of South Africa – Strengthening academic medicine and specialists training project.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APPENDICES

Appendix 1: Biographies of panel members

1 Prof Jimmy Volmink (Chairperson), MASSAf

Prof Volmink (BSc, MBChB, DCH, MPH, DPhil) is Professor of Clinical Epidemiology and Dean of the Faculty of Medicine and Health Sciences at Stellenbosch University. He was the Founding Director of Cochrane South Africa. Previous posts also include Glaxo-Wellcome Chair of Primary Healthcare at the University of Cape Town and Director of Research and Analysis at the Global Health Council, Washington DC. He is an elected Fellow of the Royal College of Physicians of Edinburgh. Prof Volmink has a special interest in rigorous evaluation of the effects of healthcare interventions. He has extensive experience in the application of randomised controlled trials, systematic reviews and meta-analysis in evaluating strategies and therapies for the control of tuberculosis, HIV/AIDS and cardiovascular disease. He has worked with policymakers and clinicians both globally and locally (South Africa) to promote the use of research evidence in decisions about healthcare and has taught courses in evidence-based healthcare to students, health professionals and policymakers in several countries. He has authored more than 100 peer-reviewed journal articles in addition to numerous book chapters. He is a current or past member of committees and advisory boards of a number of international organisations, including the Wellcome Trust, WHO, Cochrane Collaboration, Doris Duke Charitable Foundation and the International Clinical Epidemiology Network . He served two terms as a member of the Council of the Academy of Science of South Africa and has been Honorary President of the Pharmaceutical Care Management Association of South Africa. Awards received include the Leverhulme Medal from the Liverpool School of Tropical Medicine and a Recognition Award from the South African Medical Research Council for outstanding achievements in contributions to evidence-based healthcare in Africa.

2 Prof Judith Bruce

Prof Bruce (B Cur [Nursing], MSc [Nursing], PhD) is the Head of the School of Therapeutic Sciences at the Faculty of Health Sciences, University of the Witwatersrand. Her academic and professional experience includes clinical work at hospitals in the Western Cape and Gauteng, and teaching general nursing science at the Coronation Nursing College. She joined the University of the Witwatersrand in 1993 where she served as the Head of Nursing Education between 2003 and 2010. Her research interest is in the field of nursing education, focusing on evaluation and development research in new curricula and scholarship capacity development, locally and on the African continent. She was appointed as Honorary Professor at the University of Malawi and inducted as a fellow of the Academy of Nursing of South Africa. She has supervised a large number of MSc and PhD students, published widely in peer-reviewed

journals and has written several chapters in books. She has received a number of awards, among these, the Phillip V Tobias Distinguished Teacher's Award (University of the Witwatersrand), the Charter for Extraordinary Service and Leadership (Nairobi, Kenya), International Mentor Award (Las Vegas, USA) and the Vice-Chancellor's Academic Citizenship Award (University of the Witwatersrand). She is a member of a number of professional bodies including the Nursing Education Association, Trauma Society of South Africa and Sigma Theta Tau International, Chi Xi at-Large Chapter, serving currently as President of the Chapter. Additional activities include membership of the Accreditation Committee of the Council on Higher Education and Associate Editor of the *International Journal of Africa Nursing Sciences.*

3 Prof Sabiha Essack

Prof Essack (B Pharm, M Pharm, PhD), is the South African Research Chair in Antibiotic Resistance and One Health and Professor of Pharmaceutical Sciences at the University of KwaZulu-Natal and served as the Dean of the Faculty and later School of Health Sciences for ten years. She is a Wellcome Trust Research Fellow and has a C-rating from the National Research Foundation. Having established an Antimicrobial Research Unit in Pharmaceutical Sciences, she has secured several research grants from WHO, the Wellcome Trust, the Norwegian Agency for Development Cooperation, the MRC and the NRF for investigating strategies for the prevention and containment of antibiotic resistance. She serves as expert consultant on antimicrobial resistance to the WHO Regional Office for Africa, is Vice-Chairperson of the Ministerial Advisory Committee on Antimicrobial Resistance, founder and Co-chair of the South African Chapter of the Alliance for the Prudent Use of Antibiotics, member of the International Pharmacy Federation Working Group on Antimicrobial Resistance and member of the Global Respiratory Infections Partnership. She serves on the WHO Technical Working Group on Health Workforce Education Assessment Tools, is co-founder of the South African Committee of Health Sciences Deans, an elected member of the Council of the Academy of Sciences of South Africa and a peer-reviewed member of the Southern Africa FAIMER Regional Institute community. Her current research interest include: access, retention and success in higher education; antibiotic resistance – strategies for prevention and containment based on surveillance, antibiotic use, risk factors, clinical significance, infection control, pharmaco-economics and drug pharmacokinetics and pharmacodynamics.

4 Prof Lionel Green-Thompson

Prof Green-Thompson (MBBCh, DA [SA], FCA [SA] MMed) is a Clinical Co-ordinator in the Centre for Health Science Education at the University of the Witwatersrand. He is also a practising anaesthesiologist. His job as a clinical coordinator ranges from the coordination of clinical departments involved in teaching medical students, academic staff development through the creation and delivery of courses to support their teaching. He represents the faculty at a number of national educational forums. He has also been responsible for the integration of South African medical students who have been trained

in Cuba. His academic highlights include being the National Chairperson of South African Association for Health Science Educationalists since 2012 having served on its National Council from 2005. He has had faculty leadership roles: Chair of Faculty Teaching and Learning Committee, Member of the Faculty Board and Executive, represented the faculty at the Senate Teaching and Learning and the Senate Academic Planning and Development Committee. He has published in peer-reviewed journals and is affiliated with a number of medical professional bodies.

5 Prof Khaya Mfenyana

Prof Mfenyana (BSc, MBChB, MFamMed, Fellowship of the College of Family Physicians and Masters degree in Educational Administration) is the Executive Dean of the Faculty of Health Sciences at the Walter Sisulu University. He has worked as a medical practitioner in the former Transkei at Mthatha, then at Medunsa and GaRankuwa Hospital as a Senior Lecturer and Principal Medical Officer. He was appointed as the first Professor and Head of the Department of Family Medicine at the then University of Transkei (now Walter Sisulu University) and Mthatha Hospital Complex. He has championed community-based education at this institution and this has made WSU the first medical school in South Africa to introduce a curriculum that embraces problem-based learning and community-based education as the main learning strategies from the first to final year. He became the Deputy Vice-Chancellor of the former University of Transkei at the beginning of 2005 and then served as Interim Vice-Principal of Walter Sisulu University from July 2005 to December 2007. He was appointed as the first Substantive Executive Dean of the Faculty of Health Sciences at Walter Sisulu University in January 2008 to date. He has served on many committees in and outside the university. He is currently a member of the College of Family Practice within the Colleges of Medicine in South Africa, the Vice-President of the South African Academy of Family Practice, the President of the World Organisation of Family Doctors for the Africa Region and a member of the World Organisation of Family Doctors World Executive. He is an Inspector for the accreditation of hospitals for internship training in South Africa on behalf of the Health Professions Council of South Africa. Within the Council, he is a member of the Sub-committee for Undergraduate Medical Education and Training, a committee he has been serving since 1997 to date. He was involved in the development of the Accreditation Guidelines for Undergraduate Medical Education and Training in South Africa. He has published in peer-reviewed journals in South Africa and abroad. He has also contributed a chapter in the current *Handbook of Family Medicine in South Africa*. He has presented many papers at conferences in South Africa and abroad. His current research interest is in community-based education and service-learning.

6 Prof Steve Reid

Prof Reid (BSc Med, MBChB, MFamMed, PhD) is a Family Physician with extensive experience in clinical practice, education and research in the field of rural health in South Africa. As a conscientious objector to military service in the 1980s at Bethesda Hospital in north-eastern KwaZulu-Natal, he was involved

in community initiatives in health in the Bethesda health ward, and completed his Masters thesis in Family Medicine on the topic The Community Involvement of Rural Clinic Nurses. He established a Vocational Training Programme for rural doctors at McCord Hospital. He then took up the position of Director of a research unit, the Centre for Health and Social Studies later re-named the Centre for Rural Health at the University of Natal, and with his team, pursued a number of training and operational research projects in rural districts around KwaZulu-Natal focused on the strengthening of the district health system. He was later appointed Associate Professor at the University of KwaZulu-Natal, with responsibility for community-based education and rural health. He taught undergraduate and postgraduate students in public health, family medicine and health promotion, around the theme of Community-Oriented Primary Care. He has published extensively on the issue of compulsory community service, and is involved in numerous research projects in the field of rural health, including medical education, human resources for health, and HIV and AIDS. As Director of the Centre for Rural Health, he led and facilitated numerous projects in health systems in rural areas, including in management support, use of information, antiretroviral provision, prevention of mother-to-child transmission of HIV, recruitment and retention of staff, and primary healthcare. He completed a PhD in education at the University of KwaZulu-Natal on the topic of Education for Rural Medical Practice. In January 2010, he took up the post of Glaxo-Wellcome Chair of Primary Healthcare at the University of Cape Town. As custodians of the faculty's lead theme of PHC, the unit is involved in teaching and research around this theme.

7 Prof Ben van Heerden

Prof van Heerden (MB ChB, MSc, MMed) is the Director of the Undergraduate Medical Education Unit at the Faculty of Medicine and Health Sciences of Stellenbosch University. He is registered with the Medical and Dental Professions Board as a specialist in both nuclear medicine and internal medicine. His career in nuclear medicine included a two-year postdoctoral fellowship at the Johns Hopkins University in the USA and a year as Visiting Consultant at the University of Leuven in Belgium. He was promoted to Professor, Chief Specialist and Head of the Department of Nuclear Medicine at Stellenbosch University in 2001. He developed a keen interest in health sciences education when he was appointed as the Head of the School of Medicine at Stellenbosch University in 2001. In 2006, he became the founding Director of the Centre for Health Sciences Education of the Faculty of Health Sciences at Stellenbosch University, a position he occupied till 2015. He is the programme coordinator of the undergraduate medical programme since 2001 and was the founding Director of the Undergraduate Medical Education Unit in 2015. He has been actively involved with the SA Medical Association and the Medical and Dental Professions Board for many years and is currently a member of the Board and Chairperson of the Undergraduate and Education Subcommittee of the Medical and Dental Professions Board. He is a fellow of the Foundation for the Advancement of International Medical Education and Research since 2006 and is a member of the faculty of the Southern Africa FAIMER Regional Institute since its establishment in 2008. He is a recipient of the Rector's Award for

Excellence in Teaching and Learning at Stellenbosch University and received the Higher Education Learning and Teaching Association of SA and Council on Higher Education National Award for Excellence in Teaching and Learning in 2010.

8 Dr Gustaaf Wolvaardt

Dr Wolvaardt (MBChB, MMed (Int), FCP [SA], AMP, PGCHE) heads the Foundation for Professional Development, a private institution of higher education with a focus on catalysing social change through developing people, strengthening systems and providing innovative solutions. It is one of the largest self-funding health-sector professional development organisations in Africa providing clinical and management training for more than 40 000 professionals and managers in the region per annum. The foundation is involved in various system strengthening projects in both the health and educational sector covering such areas as HIV testing and treatment, gender-based violence and improving literacy of foundation phase learners. The foundation focus on innovation underpins its research activities and various pilot programmes designed to test service-delivery models that would be compatible with the envisaged National Health Insurance healthcare delivery model. Other projects develop grassroots NGOs, use learnership models to transition graduates into the workplace and organises national and international conferences to advance discourse on public health issues. He currently Co-chairs the National HIV Think Tank and the Tshwane Mayoral AIDS Council and was previously South Africa's first Health Attaché based at the South African Permanent Mission in Geneva (1991-1996) where he re-established technical cooperation between the South African health sector and the international community in Europe as South Africa moved to democracy. He has been recognised by the South African Institute of Healthcare Managers as one of the 25 most influential healthcare leaders in South Africa.

9 Prof Henry De Holanda Campos (Brazil)

Prof de Holanda Campos (MD, MSc, PhD (Nephrology), Fellowship in Medical education) is a full Professor of Internal Medicine, Faculty of Medicine, Federal University of Ceará, Fortaleza, Brazil. He is also the Vice-Rector and has been the Director of the FAIMER Brazil Regional Institute since 2007. He was the Dean of the Faculty of Medicine from 2001 to 2007. He is a member of the Steering Committee of the Brazilian Association of Medical Education. He is a consultant to the Brazilian Ministries of Health and Education, at present coordinating the Foreign Medical Diploma Revalidation Commission, Commission for Expansion of Medical Schools within the System of Brazilian Federal Universities. His has been consultant for the implementation of Pro-Med, Pro-Saúde (incentives to curricular changes in schools of the health professions); Pet-Saúde (tutorial programme of student community-based work); Pro-Residência (expansion of placements for medical and multi-professional residencies); Specialisation courses for primary healthcare professionals offered on large scale by the Open University of the Brazilian Health System. He has been a member of the University Hospitals Commission since 2010 and a member of the Brazilian Association

of Federal Universities. He was a task force member for the World Health Organisation's report on – *Transformative scale up of medical, nursery and midwifery education: An effort to increase the numbers of health professionals and to strengthen their impact on population health*, Geneva, WHO (2011). His research interest and publications are on: organ transplantation (kidney), immunosuppression, education of the health professions and leadership.

10 Prof Jan de Maeseneer (Belgium)

Prof Jan De Maeseneer (MD, PhD) Head of Department of Family Medicine and Primary Healthcare, Vice-Dean Strategic Planning, Faculty of Medicine and Health Sciences, Ghent University; Director International Centre for Primary Healthcare and Family Medicine, Ghent University, WHO Collaborating Centre on PHC and Chairman European Forum for Primary Care. He trained as a family physician and is still active in the team of the Community Health Centre Botermarkt, Ledeberg as a family doctor. Since 1991, he has been the Head of Department of Family Medicine and Primary Healthcare. He was the Chairman of the Educational Committee for the undergraduate medical training from 1997 until 2016 in charge of a fundamental curriculum-reform from a traditional discipline-based curriculum towards an integrated contextual medical curriculum. From 2007 until 2015, he was the Secretary-General of The Network: Towards Unity of Health (www.thenetworktufh.org). Since 2005, he has been the Chairman of the European Forum for Primary Care (www.euprimarycare.org). Since 1997, he has been involved in the Primafamed-network in Africa (www.primafamed.ugent.be), a network that supports the training of family physicians in more than 20 African countries. He is also the Director of the International Centre for Primary Healthcare and Family Medicine, Ghent University, a WHO Collaborating Centre on PHC. From 2013 until 2016 he was the Chairman of the Expert Panel on Effective Ways of Investing in Health advising the European Commission.

Appendix 2: World Directory of Medical Schools

Medical school ownership by country					
COUNTRY	Public	Private	Mixed	Unknown	TOTAL
Afghanistan	2	2		4	8
Albania	1	1			2
Algeria	3			8	11
Angola	1				1
Anguilla		1			1
Antigua and Barbuda		2			2
Argentina	8	10		8	26
Armenia	1	2		1	4
Aruba		2			2
Australia	17	3			20
Austria	3	1			4
Azerbaijan	1	1		1	3
Bahrain	1	2			3
Bangladesh	17	50			67
Barbados	1	1			2
Belarus	4				4
Belgium	4	4	1	1	10
Belize		5		1	6
Benin	2				2
Bolivia	4	13		2	19
Bonaire		1			1
Bosnia and Herzegovina	4				4
Botswana	1				1
Brazil	70	95			165
Brunei Darussalam	1				1
Bulgaria	5			1	6
Burkina Faso	1				1
Burundi	1				1
Cambodia		1		1	2
Cameroon	3	2			5
Canada	17				17
Cayman Islands		1			1
Central African Republic	1				1
Chad	1			1	2

Medical school ownership by country					
COUNTRY	**Public**	**Private**	**Mixed**	**Unknown**	**TOTAL**
Chile	5	13		1	19
China	133	1		17	151
Colombia	15	31			46
Comoros				1	1
Congo	1				1
Congo, Dem. Rep.	3	6			9
Cook Islands				1	1
Costa Rica	1	5		2	8
Croatia	4				4
Cuba	11			3	14
Curaçao		3		1	4
Cyprus	1	1			2
Czech Republic	9				9
Côte d'Ivoire	2				2
Denmark	3				3
Dominica	2				2
Dominican Republic	1	9			10
Ecuador	8	11			19
Egypt	12	2		6	20
El Salvador	1	5			6
Estonia	1				1
Ethiopia	6	2		1	9
Fiji		1		1	2
Finland	5				5
France	37	1		1	39
Gabon	1				1
Gambia				2	2
Georgia	4	3		4	11
Germany	31	1		4	36
Ghana	1			1	2
Greece	7				7
Grenada		1			1
Guatemala	1	3			4
Guinea				1	1
Guinea Bissau				1	1
Guyana	1	3		1	5

Medical school ownership by country					
COUNTRY	Public	Private	Mixed	Unknown	TOTAL
Haiti	1	4			5
Honduras		1		1	2
Hong Kong				2	2
Hungary	4				4
Iceland	1				1
India	167	173	1		341
Indonesia	31	41		1	73
Iran	3	1		50	54
Iraq	18			4	22
Ireland	5	1		1	7
Israel	4			1	5
Italy	39	4			43
Jamaica	1	1			2
Japan	48	29		3	80
Jordan	4				4
Kazakhstan	7	1			8
Kenya	2				2
Korea, North				10	10
Korea, South	10	27		4	41
Kosovo	1	1			2
Kuwait	1				1
Kyrgyzstan	4	2		2	8
Laos	1				1
Latvia	2				2
Lebanon	1	6			7
Liberia				1	1
Libya	4		1	5	10
Lithuania	2				2
Macedonia	2				2
Madagascar	1			1	2
Malawi	1				1
Malaysia	1	8		13	22
Mali				1	1
Malta	1				1
Mauritius		1		3	4
Mexico	45	26		1	72

Medical school ownership by country					
COUNTRY	Public	Private	Mixed	Unknown	TOTAL
Micronesia				1	1
Moldova	1				1
Mongolia	1			6	7
Montenegro	1				1
Montserrat		1		1	2
Morocco				5	5
Mozambique	2	1			3
Myanmar	2			3	5
Namibia	1				1
Nepal	3	1	1	14	19
Netherlands	7			1	8
New Zealand	2				2
Nicaragua		1		5	6
Niger				1	1
Nigeria	25	2			27
Norway	4				4
Oman	1	1			2
Pakistan	38	49	1		88
Palestine, State of	1			2	3
Panama	1	1		1	3
Papua New Guinea				1	1
Paraguay	1	3			4
Peru	16	4		9	29
Philippines	6	14		17	37
Poland	11			3	14
Portugal	8				8
Qatar		1			1
Romania	9	2		2	13
Russian Federation	16	1		59	76
Rwanda	1				1
Saba		1			1
Saint Kitts and Nevis		4			4
Saint Lucia		6			6
Saint Vincent and the Grenadines		3		1	4

Medical school ownership by country					
COUNTRY	Public	Private	Mixed	Unknown	TOTAL
Samoa	1				1
Saudi Arabia	25	6			31
Senegal		1		1	2
Serbia	2			3	5
Sierra Leone	1				1
Singapore	3				3
Sint Maarten		2			2
Slovakia	4				4
Slovenia	2				2
Solomon Islands				1	1
Somalia		3		2	5
South Africa	8				8
South Sudan	1			2	3
Spain	29	9			38
Sri Lanka	8				8
Sudan	19	8		1	28
Suriname	1				1
Sweden	6				6
Switzerland	5				5
Syria	4	3			7
Taiwan	4	8			12
Tajikistan	1				1
Tanzania	1	3		2	6
Thailand	15	2			17
Togo	1				1
Trinidad and Tobago	1				1
Tunisia				4	4
Turkey	48	12		1	61
Turkmenistan	1				1
Uganda	1		1	2	4
Ukraine	14	1		6	21
United Arab Emirates	1	2	2		5
United Kingdom	25			8	33
United States	90	83		3	176
Uruguay	1	1			2
Uzbekistan	8				8

Medical school ownership by country					
COUNTRY	**Public**	**Private**	**Mixed**	**Unknown**	**TOTAL**
Vanuatu		1			1
Venezuela	11				11
Viet Nam	10				10
Yemen	4	1	1		6
Zambia	1	2		1	4
Zimbabwe	1				1
Total	**1 410**	**873**	**9**	**351**	**2 643**

Source: World Directory of Medical Schools. World Directory of Medical Schools, Faimer Directory, 2015. Available from http://www.wdoms.org/ (Accessed 30 November 2015).

Appendix 3: Methodological approaches to HPE

Table 4 The methodological approaches established during the first phase of research

Methodology	Description	Assumptions	Advantages	Limitations	Overcoming Limitations	Requirements	Documented Usage
Supply							
Training	Projects the availability of health-care professionals baseon the current stock of clinicians, the training process (entries and dropouts), migration flows, attritions and tetirement rates	Demand for medical services is assumed to remain constant and the projections ate used to reduce the supply gap	Predictions for the future supply can be obrained in a fairly siple and immediate way	Demand for medical services is assumed to remain constant, which may not be true NO critical assessment of the adequacy of current service levels	Incorporate a model of demand: economic or need-based (or both). Evaluate current level of service throug waiting lists, overtime hours, foreign workers,etc.	Accurate and up-to-date accounting of the current stock of physicians and nurses, migration rates, entry and drop out rates and expected retirees. Service usage lebels from the healthcare sector	Australia, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Ireland, Israel, Japan, South Korea, Norway, Switzerland, The Netherlands, United Kingdom, USA
Productivity	Reorganise services and/ or economic incentives to promote incentives to promote higher productivity. Work harder or work smarter.	Physicians and nurses act as rational agents and react to economic incentives like wage increases	Does not require a change in the quantity of human resources. Can be implemented immediately	Productivity improvements may not be enough to ac-commodate large gaps in the supply of professionals	Do not preclude from evaluating the number of professionals necessary given different productivity levels	Operational indicators like the number of patients served with a given number of FTEs (or head counts)	Australia, Canada, Japan, Korea, Netherlands, Norway, Switzerland, United Kingdom, USA

Supply							
Methodology	**Description**	**Assumptions**	**Advantages**	**Limitations**	**Overcoming Limitations**	**Requirements**	**Documented Usage**
Skill Mix	Delegate certain tasks to other health professionals. substitution can be horizontal (between medical professions) or vertical (between physicians and nurses)	Professionals can assume new roles and perform new tasks	Does not require a change in the quantity of human resources. Can be implemented immediately	Enforcing such changes can be a political challenge. Does not solve large gaps in the supply	Providing success stories to involved stakeholders, health authorities and medical associations	Education school that can provide advanced education to the existing workforce	Netherlands, United Kingdom
Workers to population ratio	specifies desirable worker-to-population ratios based on direct comparison with another region of country	Regions and/or countries can be directly compared	Extemely easy to understand and apply, Useful for providing baseline comparisons	Does not take into account the intrinsic differences between regions an countries, the productivity and skill mix of the available workforce	Does not take into account the intrinsic differences between regions and countries, the productivity and skill mix of the available workforce	Records of the current workforce to population ratios	Chile, France, Ireland, Israel, Switzerland, United Kinddom

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