

Comparison between MMed Anaesthesia programmes in the SADC

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Objectives. There are 19 physician anaesthesia training programmes within the 16 Southern Africa Development Community (SADC) region countries, all based in 7 countries. With a new MMed Anaesthesia programme starting in Botswana, the study sought to compare the curricula of these programmes, identifying the similarities and differences.

Design. Course programme directors were contacted for information, other information was sought from the Internet and following up literature references. Follow-up telephone and email conversations were used to fill in gaps where possible. Document analysis and tabulation of results were done.

Results. Of the 19 programmes there was little or no information on 6 (2 in the Democratic Republic of the Congo (DRC) and 4 in Madagascar). Of the remaining 13 programmes, 8 are in South Africa. The South African and Botswana programmes use competency-based training (CBT)

and use both the college Fellowship and the MMed simultaneously. The remaining programmes in Zimbabwe, Malawi and Tanzania use a traditional curriculum and are entirely MMed programmes. In general the faculties are small, resulting in small trainee intakes. Programme duration is generally 3 years in East Africa (including Tanzania – a SADC member) and 4 years in Southern Africa. Entry requirements are generally similar but internal organisation of the courses differs. This is important for meeting regional harmonisation policies.

Conclusions. This paper adds to the literature and discusses some of the key issues facing training programmes in the region. A mixture of College Fellowship- and university-based MMed programmes with new thinking on curriculum will be required to grow the specialty's role in service delivery.

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Introduction

There is a global concern that Africa's health workforce is inadequate in quantity and quality. The continent is the hardest hit by the 'skills drain' crisis of health workers. The establishment of a medical school in Botswana with both undergraduate and postgraduate courses is of national and regional importance because it adds to the training capacity in the region. With its small population and relatively developed economy it is expected that the national needs will be met in a reasonably short period of time and the training focus can then shift to training for the region. The 'region' is essentially the Southern Africa Development Community (SADC) (Fig. 1), but Botswana has been attractive to people from further afield because of its stable economic and political history.

The University of Botswana inaugurated a new medical school in August 2009. As well as initiating an undergraduate programme, there has been urgency in setting up postgraduate medical courses. This has been driven by a shortage of Botswana doctors in the health system. Over the last 10 years nearly 1 000 Botswana have been sent outside the country (Australia, Ghana, Ireland, South Africa, UK and West Indies) to train. Only about 60 are currently on the Botswana Health Professions Council (BHPC) Register. It is hoped that by providing local training, more Botswana graduates will remain in Botswana, while the postgraduate courses will attract back some of those abroad. This has been the case with other training programmes elsewhere in Africa.¹



Fig. 1. Southern Africa Development Community (SADC) countries. Source: SARUA (<http://www.sarua.org>).

The postgraduate anaesthesia curricula currently used in countries such as the UK, Australasia and North America are being changed to a competency-based training (CBT) model structured around the CanMEDS graduate profile.² This is the approach the University of Botswana School of Medicine (UBSoM) is using in its undergraduate and MMed curricula design.

Traditional curricula tend to focus mainly on the examination process and are designed to meet examination needs. Teaching in such programmes is mostly didactic and teacher-focused. It is seen as less resource-intensive compared with the CBT model, which relies on intensive and repetitive assessment of competencies. Some universities in the region have been reluctant to take on the new medical curriculum design model on resource grounds. Finally, it is part of the SADC programme to make the educational programmes in the region mutually registerable through harmonisation of curricula.³ In the longer term, a CBT model for curriculum design may achieve this goal.

Aim

There is a paucity of published literature on the development of anaesthesia training programmes in Africa and their current activities. All the training programmes in the SADC region, including those in South Africa, do not train enough to meet their national needs, let alone regional needs. Documenting the features of the current programmes could facilitate discussion about how best to develop these programmes for the future and standardise learning in existing programmes within the SADC region.

Literature review

Anaesthesia is one of the postgraduate medical courses that started in 2011 at UBSoM. This programme joins others in the region in the Democratic Republic of the Congo (DRC), Madagascar, Malawi, South Africa, Tanzania and Zimbabwe; several other countries do not have programmes, e.g. Zambia, Lesotho, Swaziland, Mozambique, Angola, Mauritius and the Seychelles.

Challenges to the development of anaesthesia as a specialty in sub-Saharan Africa are many. As a service, it supports many other disciplines, whose development is thereby limited. Different models of training physician anaesthetists are operating in the region simultaneously. The university-based Masters in Medicine (MMed) programmes are preponderant over the College Fellowship-based training format. South Africa combines the college format, through the South African Colleges of Medicine, with the university-based MMed. In the East, Central and Southern African College of Surgeons qualification, surgical training using the Fellowship format is available alongside the MMed programmes but this is not the case in anaesthesiology. However, the College qualification, whether from South Africa or abroad, is recognised by the health professions registering bodies in the region.

MMed programmes in sub-Saharan Africa, with the exception of South Africa, started at Makerere University, Kampala, Uganda, in surgery in the late 1960s. The first group qualified in 1970, but little has been published in the literature about them.¹ The early programmes were modelled on those of the UK Colleges and graduates were eligible to sit the final exam of the Royal College of Surgeons of Edinburgh. This was essential to validate the MMed qualification and give it credibility among African medical graduates who did not want to have an inferior postgraduate qualification imposed on them. Later programmes in the region used the experience of Makerere University and others to develop their own programmes.¹ Anaesthesia training programmes in the region are independent of each other, with the exception of the Malawi MMed in Anaesthesia which is linked to 2 years of training in South Africa through the University of Cape Town. The MMed in Zimbabwe was linked to the Stoke School of Anaesthesia with trainees

spending 6 months of the 4-year programme in the UK. Although not in the SADC, the programmes in many parts of Africa are linked to external programmes such as Uganda to Canada, Rwanda to Canada and the USA, etc.⁴ Although partners for the Botswana programmes have not yet been identified, it is anticipated these will be South African institutions.

South Africa has had two separate systems of certifying anaesthetists since the 1950s; training leading to a Fellowship of the College of Anaesthetists (FCA) of the Colleges of Medicine of South Africa and the university-based MMed (Anaesthesia).⁵ More recently there has been recognition of the need for uniform certification based on the College of Anaesthetists examinations to standardise the quality of training across the 8 different medical schools. In the East Central and Southern African Regions, which include all the SADC countries, the surgical associations have established a College of Surgery which offers a Fellowship programme with training decentralised to include district hospitals.⁶ This programme runs alongside the MMed (Surgery) programmes offered by the various universities.

Establishment of programmes at UBSoM has taken into account current training practices globally as well as regionally. In addition to questions about harmonisation of higher education programmes in Africa, and the SADC in particular, the programmes speak to the differences between the MMed programmes in the region.³

No literature could be found on programmes in the Francophone parts of the SADC. The Francophone West Africa region is even more poorly resourced than the SADC region.⁷

In many countries the Departments of Anaesthesia are still organised within the surgical departments, limiting their development and profile as attractive postgraduate career options.^{8,9}

Methods

Universities in the SADC region that run postgraduate training programmes in anaesthesia were identified and contacted. The programme directors were contacted through the dean's office. 'Significant other' programmes, such as at Makerere University, were considered as they have had a major influence on MMed programmes in the region and have the same regulations across the East African Community (EAC), which includes one member of the SADC, Tanzania.

A consent form was used to enrol participants. Follow-up telephone or email discussions were conducted with programme directors to obtain additional information, where needed. Questions that often needed additional information related to numbers of trainees per intake, staff in the department, external links and methods of assessment. It was often difficult to get simple answers about intakes and staffing levels because both varied widely from year to year for some institutions. The websites of the institutions were searched for information about the respective MMed curricula. Individuals in departments were also contacted where information was lacking or deficient. This was done by telephoning the departments or searching the journal literature for authors from those departments.

Course descriptions of methods of instruction, assessment and evaluation were recorded and tabulated for comparison (Table 1). Other information was collected for providing background and any local context, such as: course

Table 1. Sources of information on MMed programmes in the SADC region

Country	Programme director	Website	Journal articles	Personal communication
Botswana University of Botswana School of Medicine	Course regulations Syllabus	None	None	
Congo , DRC University of Kinshasa University of Lubumbashi		None	Yes	Syllabus (contact found through following journal references)
Madagascar	None	None	None	None
Malawi University of Malawi College of Medicine	Course regulations Syllabus	None	None	Personal communication
South Africa Colleges of Medicine of South Africa University of Cape Town University of the Free State University of KwaZulu-Natal Limpopo University (MEDUNSA) University of Pretoria Stellenbosch University Walter Sisulu University University of the Witwatersrand	Pretoria : Course regulations	Syllabus and regulations (CMSA) Course regulations (UCT) Regulations/syllabus (UFS) MMed Handbook (UKZN) Prospectus (MEDUNSA) Programme intake (all) Staff establishments (all) Prospectus (WSU)	None	College of Anaesthetists SA regulations Course regulations
Tanzania Kilimanjaro Christian Med College Muhimbili University of Health and Allied Sciences (MUHAS)	Course regulations (KCMC)	Course regulations (MUHAS)	None	Information about intake
Zimbabwe College of Health Sciences, University of Zimbabwe	Course regulations Syllabus	None	None	Information about intake

Table 2. Postgraduate physician anaesthesia programmes in the SADC

SADC countries	Universities	Medical schools	Postgraduate anaesthesia programmes	Countries with MMed (Anaesthesia) programmes (<i>n</i>)
16	102	23 (8 in SA)	19 (8 in SA)	7

duration, any changes during this period and whether the programme has accreditation in other countries.

Results

There are 102 universities in the SADC region (Table 2), out of which 23 have medical schools (8 medical schools in South Africa). Only 7 of the 16 SADC countries have physician postgraduate anaesthesia training programmes. Angola and Mozambique do not have any such programmes. The DRC and Madagascar (French-speaking) have physician postgraduate programmes modelled on a different system to the MMed. Limited information was obtained from the DRC but none from Madagascar. Only 4 countries have more than one medical school in the region, these being the DRC (2), Madagascar (4), South Africa (8) and Tanzania (3).

Historically universities in the region have been state-owned or parastatal institutions with funding from the local government. A number of universities are now privately owned and funded. These may be supported by faith-based organisations (Kilimanjaro Christian Medical College (KCMC), Tanzania), or independent funding (Hubert Kairuki University, Tanzania).

It can be seen in Table 3 that there is a very wide variation in the number of anaesthetists in each country and the ratio of anaesthetists to the population. All the statistics reflect serious shortages compared with well-resourced countries where anaesthetists average 1:10 000 population. Some countries such as Botswana and Malawi are completely expatriate-dependant for physician anaesthetists, many of whom are on short-term contracts.

The duration of training programmes varies from 3 to 5 years. Most postgraduate anaesthesia programmes currently consist of a Basic Science Part I and Clinical Part II training process. Tanzania is part of the East African Community (EAC – together with Kenya, Uganda, Rwanda and Burundi) as well as the SADC. Within the EAC all the state universities (except Rwanda) have shortened their programmes to a 3-year MMed programme with a 1-year Part I component. In Tanzania, KCMC has retained the 4-year MMed. In South Africa Part I of the FCA is pre-programme, and the Part II longer.

The entry requirements for the training programmes are broadly the same. After students obtain the MB BS/MB ChB (MD in Tanzania) qualification, a variable period of internship (ranging from 2 to 3 years) is required to achieve

Table 3. Structure of MMed programmes in the SADC region

Country (number of local physician anaesthetists)	Number of physician anaesthetists per population (million)	Programme title	Duration (years)	Entry qualification	First part	Second part	Curriculum	Academic staff/ numbers of trainee per intake
Botswana (none)	(only expats): for ~2 million	MMed (1 programme)	4	MB BS + 2 years	2 years + Part I	Year 4: Part II + dissertation	CBT	2:6 Gaborone
Congo (DRC) (50)	~1:1 200 000	2 programmes	5	MB BS + 2 years		Year 5: Final exam	Traditional	Kinshasa? Lubumbashi ?
Madagascar	? :20 million population	4 programmes		MB BS + 2 years				?
Malawi	1:13 million (many expats)	MMed (1 programme)	4	MB BS + 2 years	Year 1: Part I	Year : Part II + dissertation	Traditional	1:2
South Africa (900)	1:55 000	MMed, FCA (8 programmes)	4	MB BS + 2 years 6/8 prog DA + Part I, FCA	Pre-entry	Year 4: Part II + dissertation	CBT	8 : ? MEDUNSA 6 : ? Walter Sisulu University 22+:10 University of Pretoria 60+:10 University of the Witwatersrand 20+:10 University of the Free State 40+:10 University of KwaZulu-Natal 40+:10 University of Cape Town
Tanzania (13)	1:3 million	MMed (2 programmes)	3, 4	MB BS + 2 years	Year 1: Part I	Yr 3/4: Part II + dissertation	Traditional	?:5 Muhimbili 1-2:1 Kilimanjaro
Zimbabwe (35)	1:350 000	MMed (1 programme)	4	MB BS + 2 years	Year: DA Year 2: Part I	Yr 4: Part II+ dissertation	Traditional	1-4:5-10

CBT = competency-based training; DA = Diploma in Anaesthetics.

full registration as a medical doctor. The degree of anaesthetic experience each candidate brings pre-programme is very variable. In the traditional undergraduate curriculum, anaesthesia consisted of a few didactic lectures and a short rotation of exposure through an anaesthesia department. During internship in some countries, there is a rotation in anaesthesia in the central (Zimbabwe) or district/rural hospitals (South Africa).

In countries where there is a Diploma in Anaesthesia (DA), this is variably used as a requirement (South Africa), an added advantage (Uganda) or a barrier course into the MMed programme (Zimbabwe). Trainees who do not progress to the MMed level still have considerable anaesthesia skills to work in district areas where the skills of a specialist anaesthetist may not be fully utilised.

Part II of the postgraduate anaesthesia programmes consists of clinical training and a dissertation. The dissertation is aimed at developing the research skills of trainees. It is not clear from the requirements of many

programmes whether publication is a required outcome, but publication standard is expected at all institutions.

With the exception of 6 of the 8 South African universities, all the anaesthesia departments in the SADC region have few academic staff, usually less than 5. The anaesthesia departments are usually staffed by nurse anaesthetists, clinical officers, etc., who deliver a substantial amount of the workload. The trainee intakes are correspondingly small, being generally 5 or less. In South Africa, through a combination of joint academic and service appointments, and large secondary level hospitals with anaesthetic specialists, university departments have a large pool of anaesthetic specialists who augment the academic staff. Their intakes are larger, being at least 10 annually.

Discussion

The results (Table 1) illustrate the difficulty in obtaining and comparing information about anaesthesia training programmes in Africa. There is very

little in the published literature and there are also significant differences and similarities in the structure of the programmes. Publication in this area clearly needs to develop.

Historically the qualification in anaesthesia was at diploma level which started in the UK in 1934. Some programmes have dispensed with the DA while others have separated it from the MMed (South Africa). The Zimbabwe programme has a 1-year diploma integrated into the MMed with Part I forming the second year of the programme. This is a qualification that is underutilised, especially where basic anaesthesia skills are needed to support mid-level health workers.¹¹ With the growth of family medicine as a specialty in Africa, the DA could allow for a new lease on life for district-level hospital specialists.

The Part II and the MMed programme as a whole are designed to produce a generalist anaesthesia specialist through a series of rotations in the main subject areas of anaesthesia, such as obstetric, neurosurgical, thoracic, ear, nose and throat (ENT), paediatric, orthopaedic and trauma anaesthesia, as well as intensive care medicine and pain management. The CBT model states explicitly what outcomes are expected from the training and each rotation, whereas in the traditional curricula these are only stated in general terms. Two countries (9 programmes) use CBT in the region. A dissertation is required in addition to the clinical rotations. In a study from the University of Nairobi, where 285 dissertations were completed by MMed trainees in the Department of Surgery (including 46 by anaesthesia trainees) over a 22-year period, there is no report of a publication.⁸ There was one PhD, however. There are no reports from other MMed programmes.

Abroad the duration of training is increasing; in part because of reduced working hours for doctors, but largely because of the expanding role and complexity of the anaesthetic domain. Critical care, pain medicine and emergency medicine have expanded in addition to the growing role of anaesthetists in hospital quality of care improvement. It cannot be argued that shortening the duration of training programmes to 3 years makes a significant impact on the number of anaesthetists in service (Table 3) as the programmes generally have small annual intakes and national service requirements are enormous. One-year diplomas (e.g. critical care medicine) and 2-year subspecialty MPhil and MS (e.g. paediatric anaesthesia) programmes have been added to some MMed programmes as a way of extending training time.

The small number of specialist anaesthetists in academic departments does not allow an opportunity for the specialty to develop as a critical mass is not achieved. The departments of anaesthesia are sometimes found within surgical departments where they are dominated and overshadowed, or exist in environments where service attitudes minimise the role of physician anaesthetists. The clinical workload is large and the mid-level anaesthetists (nurse anaesthetists, clinical officers, etc.) who do most of the basic anaesthesia and are present in larger numbers, are neither in a position to develop the specialty nor affect service delivery. Most of the programme graduates leave for private practice after a short period, disperse thinly across a wide range of hospitals or leave the country. The result is that numbers grow slowly and critical mass is not achieved. Other consequences are that the training programmes themselves renew slowly and recent developments take time to be assimilated.

In view of the many issues facing anaesthesia in sub-Saharan Africa in general, and the individual countries in particular, it may be opportune for a discussion about what kind of anaesthesia training programmes do, or want to, produce. The service load is disproportionate to the numbers of anaesthetists and the programmes will never meet the demand in their current form. An anaesthetist 'for service' (the current product) essentially takes over where the mid-level health worker's capability ends. What are needed are probably, additionally, higher level skills to develop and supervise the whole anaesthesia service. The CanMEDS¹ explicitly defines the skills to be achieved over a range of domains, which allows for definition of a locally relevant skills mix.

With small faculties come small intakes. It is possible to increase intakes by devolving training over a group of hospitals ('school of anaesthesia' or 'teaching platform'). This also brings 'service' specialists into the teaching/training domain and increases teaching capacity for a variety of cadres, not just physician anaesthetists.

The low profile of anaesthesia and its relatively poor perception among medical students is partly because it is overshadowed by surgery, but also because it is perceived as a non-medical (or mid-level health worker) specialty. This perception may limit recruitment to programmes (many programmes in Africa suffer recruitment shortage) but the perception can be changed by greater engagement of anaesthetists with undergraduate teaching and public and global collaborations in anaesthesia training.

Conclusion

This paper adds to the literature, as well as discussing some of the key issues facing anaesthesia training programmes in the region. Anaesthesia as a specialty in Africa is small and struggling to attract physician trainees while trying to emerge out of the shadow of surgery and find a balance with the middle-level health worker role. A mixture of college-based Fellowship and university-based MMed programmes with new thinking on curriculum design is required to grow the specialty's role in service delivery and academic scholarship.

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Appendix

Anaesthesiologists: North American terminology (and some continental European countries) for a physician with specialist training and certification in anaesthesia. In North American nomenclature 'anaesthetist' refers to a non-physician who is trained and works in anaesthesia roles.

Anaesthetist: in the British (and Commonwealth) system it is generally applied to physician anaesthetists, qualified and in training. For other anaesthesia providers the term is qualified, such as 'nurse anaesthetist'. Sometimes the term 'physician anaesthetist' is used to make the distinction.

Mid-level anaesthetist: Non-physicians trained to give anaesthesia. In some countries these are nurses (Zimbabwe, Botswana, and Uganda), clinical officers (Tanzania, Kenya) or technicians (Zambia, Mozambique).

Mid-level health worker: same as mid-level anaesthetists but trained for other fields such as obstetrics, internal medicine, etc.

Professional associations use both terms in their names. Often the use of the term anaesthesiologists indicates that no mid-level health workers are included in the association e.g. South African Society of Anaesthesiologists (SASA) or Kenya Society of Anaesthesiologists (KSA) or to conform to naming styles of other societies (Botswana Society of Anaesthesiologists). Most societies in the British Commonwealth countries use the term anaesthetists.

Health professions councils and employers in the region tend to use the terms 'specialist anaesthetist' for fully trained physician anaesthetists.