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## Recruitment and Selection Strategies in Optometric Education Towards Addressing Human Resource Disparities in Sub-Saharan Africa

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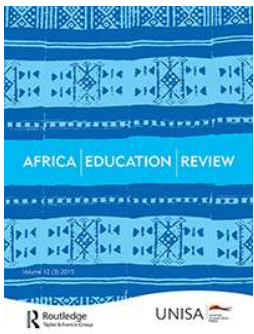
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## Recruitment and selection strategies in optometric education towards addressing human resource disparities in sub-saharan africa

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# RECRUITMENT AND SELECTION STRATEGIES IN OPTOMETRIC EDUCATION TOWARDS ADDRESSING HUMAN RESOURCE DISPARITIES IN SUB-SAHARAN AFRICA

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## ABSTRACT

The dire need for eye care services and a dearth of human resources (HR) in sub-Saharan Africa motivated the setting up of new optometry programmes. However, to make a meaningful impact, geographical, gender, economic and educational disparities must additionally be addressed. A qualitative study utilizing



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purposive sampling to select academic leadership and students from optometry programmes in sub-Saharan Africa was conducted. Individual and focus group interviews produced data that were coded and analysed using a deductive thematic analysis approach. The themes that emerged as contributing to disparities in access through recruitment and selection were institutional barriers (student intake numbers, programme marketing, minimum entry requirements, absence of pre-medical programme) and socio-economic barriers (finance, poor secondary school education, lack of knowledge of optometry, geographic location of institutions, gender). To address equity, institutions should engage with communities, market via community radio stations, offer pre-medical and bridging programmes, partner with governments and private funders to offer loans and bursaries and affirm females and rural applicants in recruitment and selection. In conclusion, universities must be socially accountable in all facets of education including recruitment and selection.

**Keywords:** optometric education, student recruitment and selection, education strategies

## 1. INTRODUCTION

The World Health Organization's (WHO) global vision impairment statistics entreats attention by all stakeholders by reporting in 2010 an estimated 285 million people having visual impairment, 246 million low vision and 39 million of this group classified as blind (WHO 2014). Sub-Saharan Africa had 4.8 million blind and 16.6 million people with moderate/severe vision impairment (MSVI) with cataracts still being the leading cause of blindness and uncorrected refractive errors contributing to at least half of the MSVI (Naidoo et al. 2014). Globally defined competencies for optometrists include the diagnosis, management and/or, where appropriate, referral of patients presenting with these leading causes of vision impairment and blindness (World Council of Optometry n.d.), thus placing the management of the causes of avoidable vision impairment within the scope of optometric practice. Considering that 80% of vision impairment can be prevented, treated and/or cured (Pascolini and Mariotti 2012) and approximately 90% of the world's visually impaired live in developing countries (Cunningham 2001), one would expect stakeholders to formulate and implement multi-pronged strategies for addressing eye care challenges affecting developing nations.

The 2006 World Health Report highlighted that Africa has 2.3 healthcare workers compared with the Americas' 24.8 and Europe's 18.9 per 1000 population (WHO 2006). This gross inequity is mirrored in eye care, with sub-Saharan Africa bearing a huge burden of blindness (Naidoo et al. 2014; Lewallen and Kello 2009) and acute shortages of eye care workers (Naidoo 2007) and yet, with its population of 936.1

million people (World Bank n.d.), only nine of the 48 countries have optometric education programmes (Oduntan et al. 2014).

Recently, there have been new optometry programmes introduced in sub-Saharan Africa in order to address the human resource (HR) eye care needs. These include programmes in Malawi, Mozambique, Kenya, Ethiopia, Eritrea and others planned for Uganda and Zimbabwe. In addition to the introduction of these new programmes to mitigate the eye care worker shortages, other strategies are required to meaningfully address eye care needs on the continent. Merely increasing student intake numbers does not necessarily provide a solution as demonstrated in Tanzania where, despite a fivefold increase in the annual medical student intake, only one-third of all doctors in the country work in rural areas (Leon and Riise 2010). In South Africa, despite the one dispensing optician and four well established optometry education programmes, gross inequities in access to eye care services still exist. The vast majority of the underprivileged rural population still has no access to optometric services whilst graduates continue to remain largely centered in urban, affluent areas (Mashige and Naidoo 2010), highlighting gross inequities.

Braveman and Gruskin (2003) state that equity in health is the absence of systematic disparities (or in the major social determinants of health) between social groups who have different levels of underlying social advantage/disadvantage – that is, different positions in a social hierarchy. Equity used in the higher education context refers to a concept of social justice which can be defined as equality of opportunities: to enroll in higher education institutions (equity of access) and to complete higher education studies (equity of results) (Kodelja 2014). Thus, to meaningfully address disparities in access to education in sub-Saharan Africa, institutions offering optometry programmes should ideally apply the principle of social justice in all institutional policies and procedures, remaining aware of and responsive to the inequities within the populations their graduates are mandated to serve. This redress should ideally commence at pre-recruitment and selection as it is at this early stage that the inequities, such as those in the rural-urban divide, can begin to be addressed.

Murray et al. (2012) cited student selection as a key strategy for producing doctors who are more likely to choose rural careers, as demonstrated at Walter Sisulu Medical School in South Africa, where 70% of their graduates, recruited from surrounding rural communities, still practice amongst the underserved populations. This success in addressing the HR disparities highlights the need for institutions to adopt a transformative approach, underpinned in social responsibility, which insists on inter-sectoral engagement on how students are recruited, educated and deployed (Celletti et al. 2011). Medical education has made strides in adopting the principles of social accountability and applying these to their recruitment and selection processes (Wilson et al. 2009; Rourke 2010; Curtis et al. 2012; Sanson-Fisher, Williams and Outram 2008) and the issue has also been addressed in disciplines such as dentistry

(Brunson et al. 2010; Anderson et al. 2007), nursing (Omeri and Ahern 1999) and pharmacy (Hayes 2008). However, there is a paucity of optometric education literature globally on the role of institutions in addressing eye health inequities in recruitment and selection policies and practices. This article explores current student recruitment and selection policies and practices in optometric education and provides guidelines to address the HR inequities.

## 2. METHODS

### 2.1 Study design

We employed a qualitative research approach using a purposive sampling strategy.

Study sample: Key stakeholders comprising academic leadership from 11 departments of optometry and dispensing opticianry based in six sub-Saharan African countries accepted the invitation to be interviewed. Nine programmes offered degrees in optometry and two offered diplomas, one in dispensing opticianry and the other graduating optometry technicians. Students ( $n=63$ ) based at the two institutions in Malawi formed the saturated student sample whilst the university administrative leadership (dean, director and registrar) supplemented the information provided by the students and academic leaders to validate factual responses.

### 2.2 Data collection

Semi-structured skype or face-to-face interviews were conducted using interview guides with the academic and administrative leadership and focus group interviews conducted and recorded with the student groups. Questions were initially piloted with two of the academic leaders in South Africa, adjusted as suggested and their respective responses were included in the results. Participants were interviewed on the current policies, practices and perceptions relating to recruitment and selection at their respective institutions.

### 2.3 Data analysis

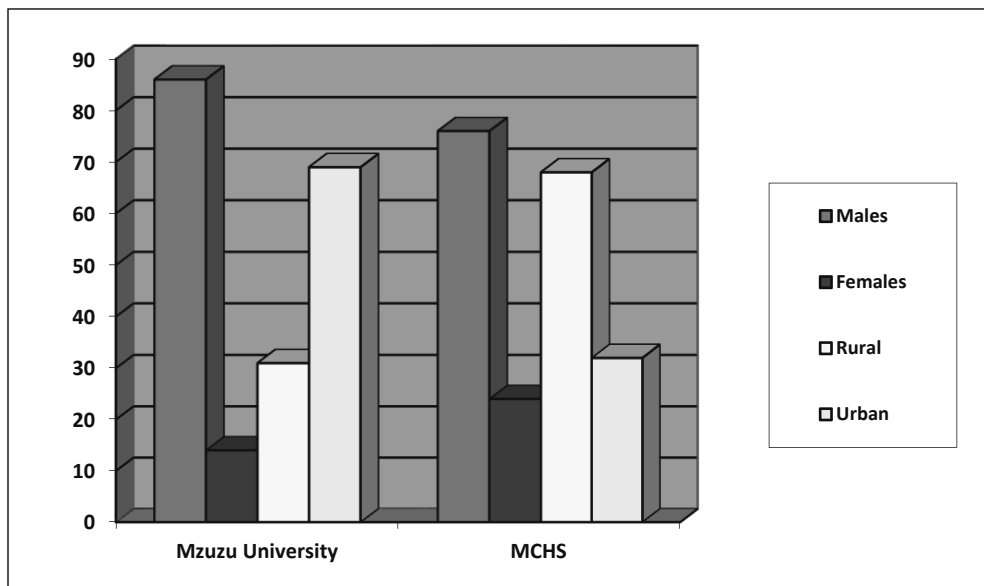
Data was transcribed, linearly coded and grouped for deductive thematic analysis and descriptive reporting.

### 2.4 Ethical consideration

Ethical approval was obtained from the research ethics committee at the Dublin Institute of Technology and all information was managed solely by the researcher to ensure confidentiality of responses.

### 3. RESULTS

The four female and seven male heads of departments were in their posts for periods ranging from 10 months to 30 years. The majority (81%) of the total student sample were male (see Figure 1) with 51% living in rural areas and 49% in urban areas. The majority of students (69%) at Mzuzu University live in urban areas and at the Malawi College of Health Sciences (MCHS) 68% live in rural areas (see Figure 1).



**Figure 1:** Demographic profile of students enrolled in the two programmes in Malawi.

The two major themes that emerged as contributors to disparities in recruitment and selection at participating institutions were institutional barriers to access (student intake numbers, marketing of optometry programmes, minimum entry requirements, lack of pre-medical programmes, high costs of education) and socio-economic barriers to access (financial, residential location, knowledge of optometry, poor secondary school education, gender)

## 4. INSTITUTIONAL BARRIERS TO ACCESS

### 4.1 Student intake

The number of students to be accepted into programmes at all but one of the institutions was determined by authorities outside of the optometry/dispensing opticianry departments. In six of the institutions the planning departments or university management informs the discipline what the intake should be, based on the clinical facilities, number of academics and other institutional resources.

Where government decides on the intake number, no reasons are provided to the optometry department, although academic leaders suspect that the number of current vacancies for optometrists or technicians within public sector facilities informs the intake value. No input on the health and social determinants or the HR needs is obtained from communities served when student intake is defined.

Most academic leaders did not know how many applications for optometry the university received annually whilst others reported receiving applications ranging from 150–2000 per year. However, the annual intake across all programmes ranged from 10–58, the majority of students coming from regions in close proximity to the institution. Matriculants/school leavers make up the majority of students accepted with graduates (<5%) (mainly with qualifications in nursing or medical science) and students from another programme, e.g. medical science or pharmacy, being in the minority. Although none of the institutions had conducted a comparative analysis of academic performance of matriculants and graduates accepted, all but one reported anecdotally that the academic performance of graduates is generally better throughout the programme. The academic leader from Ghana reported that foreign students have performed poorly in comparison to their local students recruited directly from secondary school. The University of KwaZulu–Natal (UKZN) in South Africa reported applying an affirmative action policy, where a minimum of 50% of the seats in the programme are reserved for applicants from historically disadvantaged communities.

### 4.2 Programme marketing

Only 18% of the institutions include the discipline in their marketing drives with faculty members distributing pamphlets when doing supervision in outreach clinics or the student associations conducting talks at schools. However, clinics and schools visited are located in close proximity to the urban based universities. The methods used to recruit students are shown in Table 1.



**Table 1:** Showing strategies used to market programmes and accessibility to students interviewed.

Marketing Strategies Used	Number of Institutions	Accessed by Student Groups Interviewed	Rural / Urban Accessibility
Newspaper advertisements	7	Yes	Urban
Radio advertisements	5	Yes	Rural & Urban
Open days at universities	4	No	Urban
Pamphlet distribution at hospital/clinics/schools	2	No	Urban
Internet websites	4	No	Urban
Social media	1	No	Urban/Rural

Programmes advertised in regional and national newspapers are only accessed by urban students as rural students reported only being able to access any information about the universities via the local radio stations, a medium used by less than half of the institutions. None of the other marketing strategies were easily accessible to the rural students (Table 1) who reported not having Internet or cellphone access whilst at secondary school. The MCHS has the majority of their students recruited from rural areas, the success of which is attributed to the involvement of government in both recruitment and provision of study bursaries.

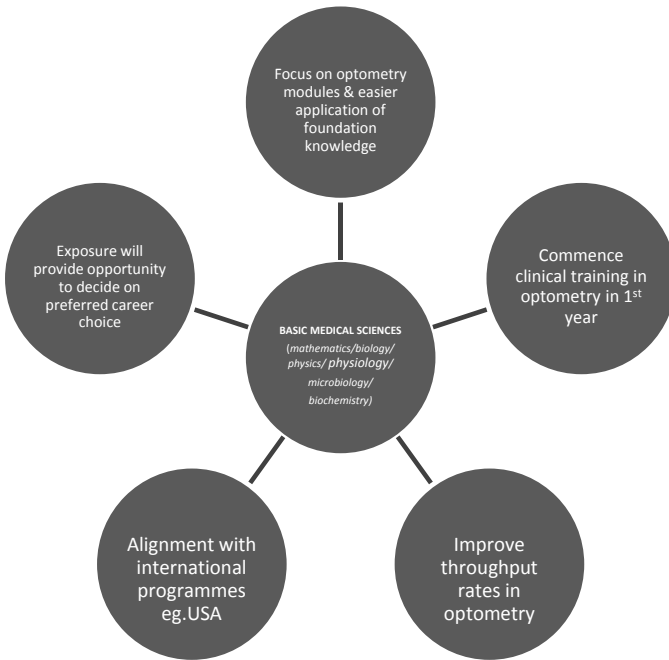
### 4.3 Minimum entry requirements

Minimum entry requirements in all participating universities includes the applicant having obtained a pass in mathematics and physics with four requiring English and three a pass in biological sciences as well. The minimum acceptable grade was 50% with one institution requiring a minimum of 60% in mathematics and physics. With the exception of Ethiopia and Ghana, academic leaders reported that the standard of mathematics at most secondary schools in their respective countries was poor and prevented many students from being accepted into health sciences programmes. Ethiopia reported a high standard of secondary school mathematics in the country whilst Tanzania reported that due to a lack of specific minimum entry criteria, the institution has challenges recruiting academically strong students. Physics was cited as the most challenging subject in optometry by all groups of students followed by mathematics.

None of the institutions conduct interviews and only MCHS conducts an admissions test, updated every three years, comprising of multiple choice questions in mathematics, biology, physics and English. MCHS prefers to conduct this independent assessment of the applicants believing that the standard of the national secondary school exit level examination is poor, hence secondary school results are not considered. However, no study was done to compare results of both these examinations to validate or refute perceptions. Students at the MCHS also indicated that although accepted into the diploma programme they consider it a conduit to apply for the degree course to practice as optometrists rather than as optometry technicians.

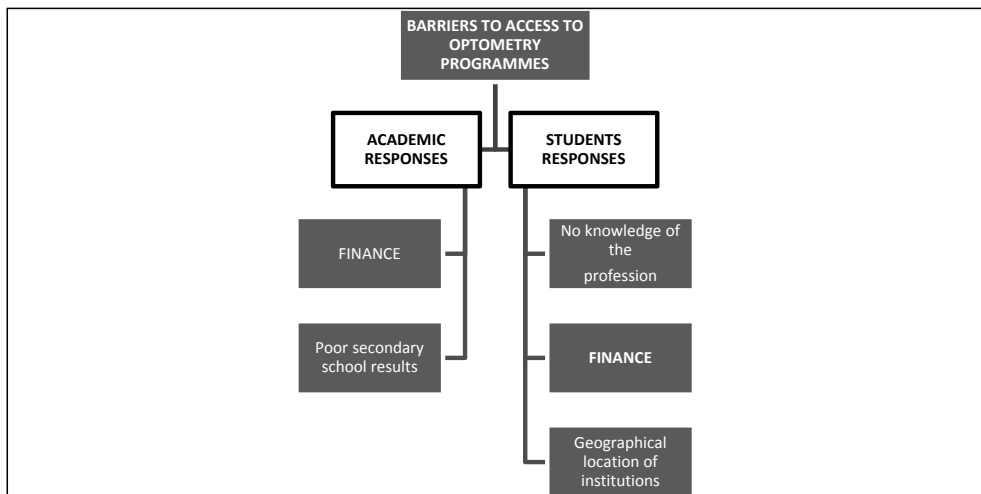
#### 4.4 Lack of pre-medical programme

As all the institutions accept students directly into the first level of optometry, recruits are not expected to have any university level basic sciences credits. However, both academic leaders and students felt that it will be most beneficial if students did a pre-medical, basic sciences programme prior to being accepted into optometry as the attrition rate from the optometry programmes was high due to failure in the basic sciences. Various benefits of doing pre-medical foundation science courses were provided by interviewees (Figure 2). Ethiopian academics felt that their government may not want students to spend additional time at university whilst the technically orientated MCHS programme indicated that their diploma course did not require extensive knowledge in basic foundational sciences. Another concern at MCHS was that introducing basic medical sciences may reduce the number of applicants interested in choosing their programme in favour of the university degree programmes. However, all students indicated that they would have preferred to complete the basic sciences and thereafter apply in health sciences as this will provide them with adequate information and time to make informed career choices and allow more opportunity in the optometry programme for practical and clinical training.



**Figure 2:** Reasons that pre-medical programme was preferred by academic leaders and students interviewed.

### 5. SOCIO-ECONOMIC BARRIERS TO ACCESS



**Figure 3:** Socio-economic barriers to access to optometric education identified by students and academic leaders.

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The main socio-economic barriers to access as identified by both students and faculty are shown in Figure 3.

## 5.1 Finance

High costs of university fees, academic resources and daily sustenance coupled with high levels of poverty in the respective countries was raised as the main barriers to access into optometry education by both students and academic leaders. In Ghana, Ethiopia and the MCHS all students are funded by government.

## 5.2 Geographical location

Rural students commented that institutions are situated in urban centres making them inaccessible and that institutions do not focus their recruitment initiatives in rural areas. None of the participating institutions have specific quotas for selection of rural students, although government funded students in Malawi are mostly from rural areas and are expected to work for government for at least five years on graduation. Self-funded students were recruited from urban schools and plan to work mainly in urban areas.

## 5.3 Knowledge of optometry

The majority of students reported coming to the university with no knowledge of what optometry was. Many planned to study towards medical degrees and were interested in the biological sciences courses, writing optometry on the forms when arriving at the university but having no idea what an optometrists did. A few (5%) indicated that they had thought they were training to be ophthalmologists and realized much later that they 'will not be performing surgery'. Only three of the 63 students in the focus group interviewed had personally known an optometrist while none reported their teachers providing information or any career guidance at school. Students were of the opinion that their teachers did not know what optometry was and therefore would not be able to provide any information on the profession. Neither community members nor organizations were utilized by institutions to assist with recruitment of students or with information relating to the profession of optometry.

## 5.4 Poor secondary school education

A generally poor secondary school standard, particularly in mathematics and sciences, was cited by all leadership interviewed creating a huge barrier to higher education. The UKZN in South Africa has introduced a science foundation programme which serves as a bridging programme for historically disadvantaged students to upgrade

their science and mathematics results to gain access into health sciences programmes like optometry.

## 5.5 Gender

A specific barrier to access reported by the leadership in MCHS was a limited number of female applicants received. Less than 20% of the total Malawian student study sample was female yet only one of the two institutions has an affirmative action policy allocating at least one third of the seats to females. Leaders from these institutions reported that females performed very poorly in the admissions tests, making it difficult to increase the female intake.

All interviewees acknowledged that institutions largely work independently and that needs of the community are not factored into the recruitment and selection policies and practices. Students were unaware of what the health and social determinants were in their local areas and admitted that their seeking a place in optometry was not informed at all by needs of their communities.

## 6. DISCUSSION

A Global Consensus for Social Accountability of Medical Schools was produced in December 2010 by 130 organizations and individuals from around the world who came together to address the issue of inequity in health care through medical education. Embedded within area four of the 10 consensus focus areas is the call for medical schools to recruit, select and support students who reflect social diversity and disadvantaged groups (Boelen et al. 2010). Although organized optometry has no consensus for social accountability in optometric education, the dire visual impairment statistics, critical shortage of optometrists and gross inequities amongst different sectors of the populations should prompt institutions in sub-Saharan Africa to underpin all aspects of their programmes in a framework of social accountability.

### 6.1 Institutional barriers to access

*Student intake:* Optometry departments are disempowered by not contributing to annual student intake numbers and intake is not informed by the population demographic profile or inequities such as the rural–urban divide. Involvement of optometry departments in consultation with stakeholders (private, public and government ministries) to inform intake numbers should be encouraged with faculty members researching and integrating the national demographic profiles and eye health needs.

Optometry programmes should heed the 1998 call by UNESCO, in its preamble of the World Conference on Higher Education, for ‘equality of access’ to higher education (UNESCO 1998). Accepting students mainly from the areas around the

institution does little to improve access. Most optometry schools are urban based and research indicates that recruitment efforts must be extended to rural populations for practitioners to return to work in those communities (Laven and Wilkinson 2003; Anzenberger, Popov and Ostermann 2011). Rabinowitz et al. (1999) found that growing up in a rural area was the most important independent predictor of practice in a rural area. Hence to ensure that each region of the country is represented, institutions should use population based pro-rated stratification in recruitment and selection. This wider distribution and better representation of rural students will be easier enabled by government involvement as demonstrated in the MCHS in Malawi where government provides all the bursaries and distribute these across regions.

South Africa has an additional responsibility of addressing the historical racial inequities and applying redress strategies as the majority of optometry programmes were set up during the apartheid era. The professional regulatory body and government in that country should monitor institutions' access to programmes to ensure priority is given to equity and redress, as indicated by Akoojee and Nkomo (2007) who state that access measures can be considered a compelling priority in the light of the current need for equity and redress. Other South African institutions should consider the reservation of seats in the programme for applicants from historically disadvantaged communities as that reported by the academic leader at the UKZN.

Limited institutional resources contribute significantly to student intake with the major deciding factor being clinical facilities. The challenge of limited clinical facilities can be addressed by institutions engaging in partnerships with community based health facilities to conduct clinical training outside the institution resulting in increased student intake and opportunities for students to identify more comprehensively with the communities.

Although reported that graduates perform better, translating to better throughput rates, they constitute less than 5% of intake across institutions. As science graduates often have credits relevant to optometry, institutions should consider increasing access to these graduates in their programmes.

## 6.2 Programme marketing

Newspaper advertisements were the main source used for programme marketing but were not readily available in rural areas. Radio advertising should be considered as rural students reported that this is often the only medium of communication that they have access to. Additional strategies should be employed by institutions such as appointing optometry student ambassadors to communities to educate both secondary school learners and community members about optometry and marketing health sciences programmes to rural schools in partnerships with government, community and civic organizations. Corporate optometry and professional associations can also assist with sponsoring IT facilities and programmes which rural teachers and students

can access to obtain information on the profession and optometry programmes in their respective countries. This will help alleviate the disadvantage experienced by the rural and economically disadvantaged schools (Boadi-Kusi et al. 2014) and address the fact that many students were unaware of the existence of the profession of optometry or optometrists until arriving at the tertiary institution. Additionally, training the teachers will allow them to provide career guidance to students.

### 6.3 Minimum entry requirements

A desktop scan of entry requirements for optometry programmes at numerous universities across the globe revealed no consistency in policy or practice. However, generally most medical schools utilize a combination of academic achievement, interviews and written assessments (Groves, Gordon and Ryan 2007). All programmes represented in this study expected passes in mathematics and physics or general science but acknowledged challenges experienced by students in these areas. Where students do not initially meet the minimum programme requirements universities could offer bridging programmes as offered by UKZN in South Africa. However, institutions must ensure that the programme standards are high by monitoring students' progress and ultimately the success of the foundation access programme.

Only the MCHS administers an admissions test but results have not been compared to secondary school results. A study should be undertaken to assist this and other institutions to consider possible introduction of admission tests. Tutton (2012) argues that medical educators pay a lot of attention to curriculum design and little on the selection of students. He concludes by imploring faculties to trial their selection instruments before using them and to publish the results.

### 6.4 Pre-medical programmes

The notion of having students complete basic sciences prior to entry into optometry was supported by the majority of interviewees who felt that this will both improve throughput rates and strengthen the optometry clinical programme. As optometric studies require a thorough understanding of basic sciences, academic leaders supported these being pre-requisites for visual science and clinical optometry courses. Students reported insufficient clinical exposure as a weakness of their programmes and a significant contributor to their academic challenges. The time in the programme currently taken up by basic sciences can be allocated to optometry practicals and clinics. Institutions in the US (Association of Schools and Colleges of Optometry n.d.) have science pre-requisites for optometry based on the firm belief that basic and advanced science courses ought to be taken at that level, not as part of the professional curriculum. This approach allows sufficient space in the first two years of the optometry professional curriculum to provide students with the vision

science and optometry courses necessary before they can provide patient care. As a result, students assume responsibility for patient care at a much earlier stage in their training, and examine a much higher number of patients by the time they graduate. (Association of Schools and Colleges of Optometry n.d.; Berkley University n.d.). Adopting this approach will allow institutions to strengthen clinical training thus improving clinical competencies of graduates in the region. This will ultimately result in patients in sub-Saharan Africa being treated by optometrists with equitable competencies to their US counterparts and improving articulation of graduates internationally for postgraduate studies.

## 6.5 Socio-economic barriers

### 6.1.1 Finances

The lack of finances was most prevalent with rural students where the majority of people are poverty stricken (Oduntan et al. 2014; Rural Poverty Portal n.d.). In implementing a multi-sectoral approach, governments can increase access of financially disadvantaged students through bursaries and loans, financial institutions should grant loans with the graduates' profession serving as collateral and the private optical sector, NGOs and community based philanthropic organizations should create partnerships with institutions to contribute to the financial support for disadvantaged students.

### 6.1.2 Poor secondary school education

The high university admission criteria, not being met due to poor secondary school standards is a problem that is largely rooted in the general quality of secondary school education. Institutions should assist in preparation of secondary school students, equipping them for the standard of mathematics and physics needed at tertiary level whilst engaging governments towards long term solutions to deal with the root causes. Interventions can include institutions holding vacation programmes in mathematics and science and professional development courses for teachers. Online basic sciences lessons can be developed and implemented via e-learning.

### 6.1.3 Geographic location

All optometry programmes are urban based and most are the only institution in the respective country offering optometry. The impact that a single programme in a country, with a small annual student intake, can make is minimal. Uganda, with a population of 36.35 million people across 111 districts and one city (Republic of Uganda n.d.), has recently commenced with one new optometry programme



admitting a reported 16–20 students per annum. Governments should consider national population demographics in determining the number of optometry schools required to provide eye care services across all districts of the respective country.

By increasing the number of optometry programmes across sub-Saharan Africa, governments will progress in meeting the Millennium Development Goals goal of having sufficient health workers (Liese and Dussault 2004) and developing an eye health workforce as defined in objective 2 of the WHO Global Action Plan for 2014–2019 (WHO 2014), ultimately impacting positively on eye care needs of the continent.

#### 6.1.4 Gender inequality

Inequality in access to education and discrimination faced by females across sub-Saharan Africa (Boadi-Kusi et al. 2014; UNESCO n.d.) must be addressed in those countries with few female optometrists. Respective institutions should have an affirmation action policy that favours female students' intake whilst concurrently engaging with communities to raise awareness of this issue towards jointly developing corrective strategies.

## 7. CONCLUSION

To begin to address health inequities across and within nations, attention must be provided to addressing disparities in the education system producing the health workforce. Institutional policies and practices related to recruitment and selection must be informed by an understanding of health and social needs of the country, demographic profiles of optometrists/dispensing opticians, pre-university education and challenges experienced by students in accessing programmes. Sub-Saharan African institutions offering optometry, plagued by similar challenges, should ideally work together to develop regional strategies towards addressing the inequities in access to optometric education towards finding an African solution to this problem.

## NOTES ON CONTRIBUTORS

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