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# Addressing Avoidable Vision Impairment in Mozambique and the Africa Region

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## Addressing avoidable vision impairment through sustainable human resource development

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Keywords:	Partnership < Civil society, Disability < Gender and diversity, Poverty reduction < Labour and livelihoods, Economics < Labour and livelihoods, Education < Social sector, Health < Social sector, Region: Sub-Saharan Africa, Capacity development < Aid
Abstract:	The Mozambique Eyecare Project was an international partnership that developed a sustainable model for eye health education. An optometry degree was implemented at Universidade Lúrio, Mozambique. The optometry graduates were subsequently integrated into the national health system. In addition, existing eye health workers were upskilled with training. Researchers from various disciplines evaluated the project and its potential for impact on eye health in the region. The body of evidence generated from the research provides useful lessons for development programmes in general, as well as specific lessons for delivering sustainable eye health education and service delivery models for low income settings.

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## Addressing avoidable vision impairment through sustainable human resource development

### Abstract

The Mozambique Eyecare Project was an international partnership that developed a sustainable model for eye health education. An optometry degree was implemented at Universidade Lúrio, Mozambique. The optometry graduates were subsequently integrated into the national health system. In addition, existing eye health workers were upskilled with training. Researchers from various disciplines evaluated the project and its potential for impact on eye health in the region. The body of evidence generated from the research provides useful lessons for development programmes in general, as well as specific lessons for delivering sustainable eye health education and service delivery models for low income settings.

### Key words

Capacity development, Partnership, Disability, Poverty reduction, Economics, Education, Health, Sub-Saharan Africa

Review Only

## Introduction

There are an estimated 253 million people living with vision impairment (VI) in the world. Over 80% of all VI can be prevented or cured. Globally, uncorrected refractive error (URE), a disorder where the eye cannot focus correctly, is the main cause of VI (WHO 2017). The prevalence of VI in Mozambique was found to be 3.5% (95%, CI 2.7%–4.2%). URE prevalence in Mozambique was found to be 2.6% (95%, CI 2.1–3.2%), and was established as the primary cause of VI among 64.5% of cases. Despite the fact that most cases of refractive error (RE) can be addressed with spectacles dispensed after an eye test, spectacle coverage in Mozambique was found to be 0%. The prevalence of Presbyopia (a form of RE that occurs typically in middle and old age) was found to be 25.8% (95%, CI 12.0–30.5%), with 2.2% spectacle coverage (Loughman et al. 2015). The number of adequately trained professionals present in Mozambique was found to be insufficient to address the burden of URE (Moodley, Loughman, and Naidoo 2014). The spectacle supply system was also reported as inadequate. The demand for eye health services and a dearth of appropriate human resources (HR) in Mozambique and other countries in the Africa region have motivated the establishment of optometry training programmes (Moodley, Loughman, and Naidoo 2015). High URE prevalence and the low level of spectacle coverage in Mozambique indicated an urgent need for the development and delivery of a comprehensive RE service (Loughman et al. 2015). The Mozambique Eyecare Project (MEP) - a North-South partnership between Dublin Institute of Technology (DIT), University of Ulster (UU), Universidade Lúrio (UniLúrio) and Brien Holden Vision Institute (BHVI) - implemented a sustainable model of optometric education and service delivery in Mozambique, with potential for adaptation to other low income settings.

## Methodology and research objective

Under the MEP, an international team of researchers from various disciplines including vision science, public health and social sciences undertook a series of investigations into higher education for eye health in the Africa region. The findings of these investigations were published as peer reviewed articles. The research objective of this practical note is to synthesise the evidence generated from the resulting portfolio of research. This paper details the lessons learnt from the MEP for the benefit of future eye health education programmes and other development programmes being implemented in low income contexts.

## Lessons from the Mozambique Eyecare Project

As part of the MEP, an optometry undergraduate degree program was implemented at UniLúrio, Mozambique, based on a curriculum developed by BHVI with competencies drawn from the global competency-based model of the World Council of Optometry (WCO) and the Association of Regulatory Boards of Optometry (ARBO) (Shah et al. 2017). Prior to the MEP, there were no appropriately qualified optometrists in Mozambique (Wallace, Loughman, and Naidoo 2016). Aside from functional and health

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4 benefits, the development of an optometry system was shown to be economically justifiable. A Cost Benefit  
5 Analysis indicated that by correcting URE in 24.3 million potentially economically productive persons, a net  
6 present value of societal benefit of up to \$1.1 billion is possible by 2049. This represents a Benefit-Cost ratio  
7 of 14:1 (Thompson et al. 2014). The first optometrists graduated in 2013. Table 1 shows the net present  
8 value of societal benefits for the first 10 years of the optometry programme, which was negative until the first  
9 optometrists graduated and began to treat URE. From that point forward, the net present value of societal  
10 benefit was positive for every year included in the analysis, until 2049. Appropriately trained personnel are  
11 now unlocking the potential for improved economic productivity by eliminating avoidable VI (Thompson et al.  
12 2014).

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18 [Table 1]

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20 The establishment of optometry as a new profession was found to present several challenges in terms of  
21 integration with the existing national eye health system. Failure to address professional regulatory  
22 requirements for new programs (where equal or similar qualifications do not already exist) could result in the  
23 profession not being officially recognised by the relevant health authorities, restricting its integration into  
24 public health services. Recognition of qualifications and the mainstreaming of service provision are essential  
25 to protect the public from unscrupulous health care practices (Wallace, Loughman, and Naidoo 2016).

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30 When developing health programmes, training standards and scope of practice must be appropriate to local  
31 needs (Wallace, Loughman, and Naidoo 2016). This can be achieved by ensuring that educational quality  
32 assurance standards are prioritised, and by underpinning the optometric education programme in principles  
33 of social accountability. Socially accountable programmes ensure that local health needs and social  
34 determinants inform programme design, governance, curriculum, HR, quality assurance and research. A  
35 socially accountable quality assurance framework for optometric education was developed to assist  
36 institutions in the Africa region to implement and self-monitor the integration of social accountability into their  
37 optometry programmes (Moodley, Loughman, and Naidoo 2016).

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43 On inspection, Mozambique's existing ophthalmic technicians (OTs) demonstrated inadequate refraction  
44 skills. Their confidence and competence in refraction varied depending on training, location of work, clinical  
45 load, availability of equipment and other eye care personnel. Upskilling was found to have a significant  
46 positive impact on OT confidence and competence levels in refraction (Shah et al. 2016).

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50 Under the MEP, a comprehensive framework of competency standards for OTs and optometrists in  
51 Mozambique was developed using a modified Delphi consensus approach involving local and international  
52 experts. Once the optometry degree program was operational, studies were undertaken to inform the design  
53 of the competency assessment process (Shah et al. 2015; Shah et al. 2017). Only four students out of 15  
54 optometry degree students were graded as clinically competent in refraction. Analyses indicated that student

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4 learning context, teaching context, clinic conditions and assessment, and the existing operating health care  
5 context were important determinants of student refraction competencies. This competency framework has  
6 informed the curricula for both cadres in relation to important aspects of training including communication,  
7 patient evaluation, patient management, community, technical, and research and training. In addition, it has  
8 improved the structure of teaching and learning environments by recommending a preparatory year, a  
9 review of the curriculum and clinic structure, more transparent entry requirements and better internet  
10 infrastructure (Shah et al. 2015). The framework has the potential for replication in other regions where there  
11 is a need to develop socially responsive education for eye health professionals (Shah, Naidoo, and  
12 Loughman 2016).  
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18 Limited access to education is a stark reality for many students in the Africa region. Barriers to optometric  
19 education in Mozambique included cost, lack of knowledge of optometry, high admission criteria, limited  
20 student spaces, poor mathematics and science results, gender inequalities and geographical challenges. A  
21 lack of funding was identified as the main contributing factor for high attrition rates from university where  
22 students had to pay their own fees. Where tertiary education was free, the limited number of spaces  
23 available was the major barrier to access (Moodley, Loughman, and Naidoo 2014). Low awareness of  
24 optometry as a profession was found to impact on student recruitment and expectations (Shah et al. 2015).  
25 Despite these findings, optometry students acknowledged a lack of eye health personnel in Mozambique  
26 and that optometry training would resolve this challenge. Understanding prospective student perceptions  
27 and expectations can assist the development of student support systems and awareness strategies for eye  
28 health professional training (Chan et al. 2015). Several other institutional and socio-economic factors also  
29 contributed to disparities in recruitment and selection. It was concluded that for optometric education  
30 programmes in Africa to have a meaningful impact, geographical, gender, economic and educational  
31 disparities must be addressed (Moodley, Loughman, and Naidoo 2015).  
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39 Inadequate HR to address RE is a key supply-side barrier to eye health services. A study of the perceptions  
40 of over 1,000 Mozambicans with VI indicated that cost was the most frequently cited demand-side barrier, as  
41 identified by 53% of participants. Other barriers included lack of felt need (20%), distance to travel (15%),  
42 and lack of awareness (13%). These critical barriers to RE services in Mozambique must be considered to  
43 ensure service uptake by the general population and to inform decision-making for improved service delivery  
44 (Thompson et al. 2015).  
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49 The MEP experience provides useful lessons for the planning of future development programmes. The  
50 lessons will have particular resonance for those responsible for planning future sustainable eye health  
51 education and service delivery models for low income settings. Figure 1 summarises the MEP outputs and  
52 achievements against the objectives of the World Health Organization's Global Action Plan for Universal Eye  
53 Health (World Health Organization 2013). With a goal of achieving a measurable reduction of 25% of  
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4 avoidable VI by 2019, the objectives focused on the generation of evidence through multi-sectoral  
5 partnerships to strengthen eye health systems.  
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8 [Figure 1]  
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## 10 **Conclusion**

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13 The supply of adequately trained eye health professionals to meet the demand for refraction in Mozambique  
14 is currently insufficient (Moodley, Loughman, and Naidoo 2014). As with many countries in Africa, there is an  
15 urgent need for the development and delivery of a comprehensive RE service in Mozambique (Loughman et  
16 al. 2015). Sustainable international collaborative approaches to develop HR to address URE have been  
17 shown to be economically justifiable and should be considered in countries where HR are similarly deficient  
18 (Thompson et al. 2014).  
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23 Eye health projects (and development projects in general) must address issues of professional identity.  
24 Developing adequate health profession regulations is necessary, so that graduate qualifications are  
25 legitimised through official recognition by relevant local authorities (Wallace, Loughman, and Naidoo 2016).  
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29 To address barriers to optometric education (cost, lack of knowledge, high admission criteria, limited student  
30 spaces, poor results, gender inequalities and geographical challenges) educators, policymakers and health  
31 professionals must together formulate strategies to increase access (Moodley, Loughman, and Naidoo  
32 2014). Student awareness of optometry can promote its development as a primary healthcare profession  
33 (Chan et al. 2015). For optometry education programmes in Africa to have a meaningful impact on meeting  
34 societal needs, universities must integrate social accountability in all facets of education, including  
35 curriculum design, research, recruitment and selection (Moodley, Loughman, and Naidoo 2015).  
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40 Socially responsive, competency-based approaches can enable coordinated training and development for all  
41 mid-level eye care personnel and optometrists in low income contexts (Shah, Naidoo, and Loughman 2016).  
42 Guidance on the selection of competency assessment methods would assist institutions to adopt models  
43 that can be sustained locally, giving due regard to limited available resources (Shah et al. 2017). Identifying  
44 factors affecting refraction competence, in collaboration with the academic faculty, can strengthen teaching  
45 and improve learning environments for optometric education (Shah et al. 2015). The upskilling of existing  
46 eye health workers in low income contexts can also effectively improve confidence and competence levels  
47 for refraction (Shah et al. 2016).  
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52 The development of HR for eye health alone is not sufficient to address the burden of avoidable VI – a  
53 comprehensive approach must be taken to strengthen all aspects of eye health and the broader health  
54 system. To be effective, public sector refractive services must consider the demand-side implications of cost,  
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4 affordability and geographical inequalities. They must also have a clear strategy for overcoming lack of felt  
5 need through improved advocacy and health promotion (Thompson et al. 2015).  
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11 No potential conflict of interest was reported by the authors.  
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Table 1 – Net Present Value of societal benefits (\$) for the first 10 years of the optometry programme.

Year	Net Present Value of societal benefits (\$)
2009	-273,596
2010	-529,534
2011	-630,384
2012	-595,349
2013	-308,291
2014	1,069,098
2015	3,641,100
2016	6,589,276
2017	9,558,510
2018	12,403,620
2019	15,002,333

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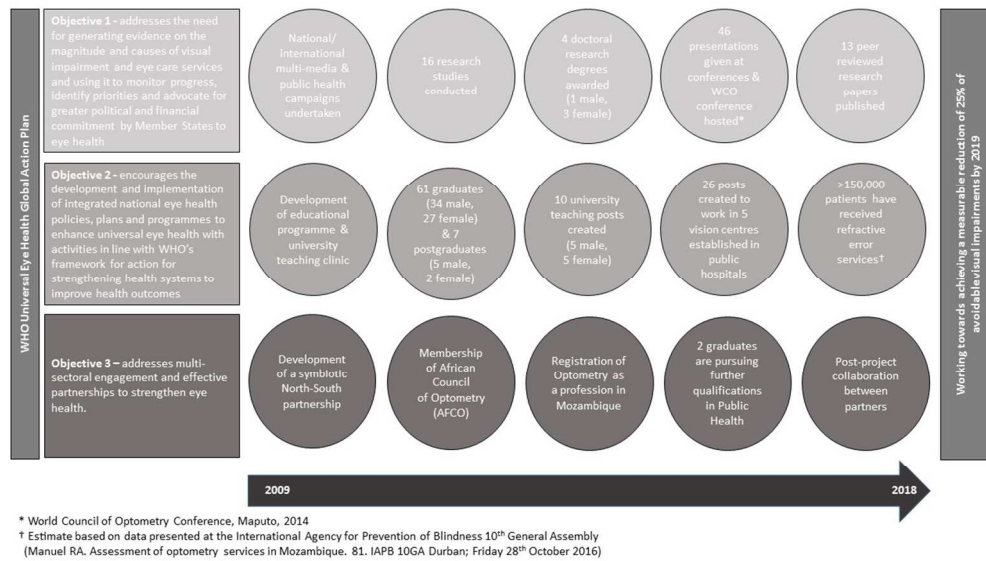


Figure 1 – Outputs and achievements of the MEP in relation to the Global Action Plan objectives

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