



2011

# Addressing the Burden of Uncorrected Refractive Error in Mozambique

Stephen Thompson

*Dublin Institute of Technology*, [stephenjamesthompson@hotmail.co.uk](mailto:stephenjamesthompson@hotmail.co.uk)

James Loughman

*Dublin Institute of Technology*, [james.loughman@dit.ie](mailto:james.loughman@dit.ie)

Prasidh Ramson

Luigi Bilotti

Geoff Harris

*See next page for additional authors*

Follow this and additional works at: <http://arrow.dit.ie/optpomcon>

 Part of the [Community Health and Preventive Medicine Commons](#), [Eye Diseases Commons](#), [Health Services Research Commons](#), and the [Optometry Commons](#)

## Recommended Citation

Thompson, S. et al 2011. Addressing the burden of uncorrected refractive error in Mozambique. American Academy of Optometry Annual Conference 2011, Boston, USA.

This Conference Paper is brought to you for free and open access by the Department of Optometry at ARROW@DIT. It has been accepted for inclusion in Conference Papers by an authorized administrator of ARROW@DIT. For more information, please contact [yvonne.desmond@dit.ie](mailto:yvonne.desmond@dit.ie), [arrow.admin@dit.ie](mailto:arrow.admin@dit.ie), [brian.widdis@dit.ie](mailto:brian.widdis@dit.ie).



This work is licensed under a [Creative Commons Attribution-NonCommercial-Share Alike 3.0 License](#)



---

**Authors**

Stephen Thompson, James Loughman, Prasad Ramson, Luigi Bilotti, Geoff Harris, and Kovin Naidoo

---

**Authors**

Stephen J. Thompson Mr., James Loughman Dr., Prasad Ramson, Luigi Bilotto Dr., Geoff Harris Prof., and  
Kovin Naidoo Prof.

---



# Addressing the burden of uncorrected refractive error in Mozambique

Stephen Thompson <sup>a, b, c</sup>, MSc BSc, James Loughman <sup>a, b,</sup>, PhD, FAOI, Prasad Ramson <sup>b, c,</sup>, BSc, B.Optom,

Luigi Bilotto <sup>b, c, d</sup>, MSc OD, Geoff Harris <sup>d</sup>, BComHons, DipEd, MEc, PhD, Kovin Naidoo <sup>b, c, d</sup>, OD MPH, PhD FAAO,

a. Dublin Institute of Technology, b. African Vision Research Institute c. International Centre for Eyecare Education d. University of KwaZulu-Natal

## Introduction

- The global burden of disease due to uncorrected refractive error (URE) is accepted as significant <sup>1</sup>.
- Data from a National Situational Analysis of Eyecare services and estimates of refractive error prevalence indicates an unfulfilled demand for spectacle correction in Mozambique <sup>2</sup>.

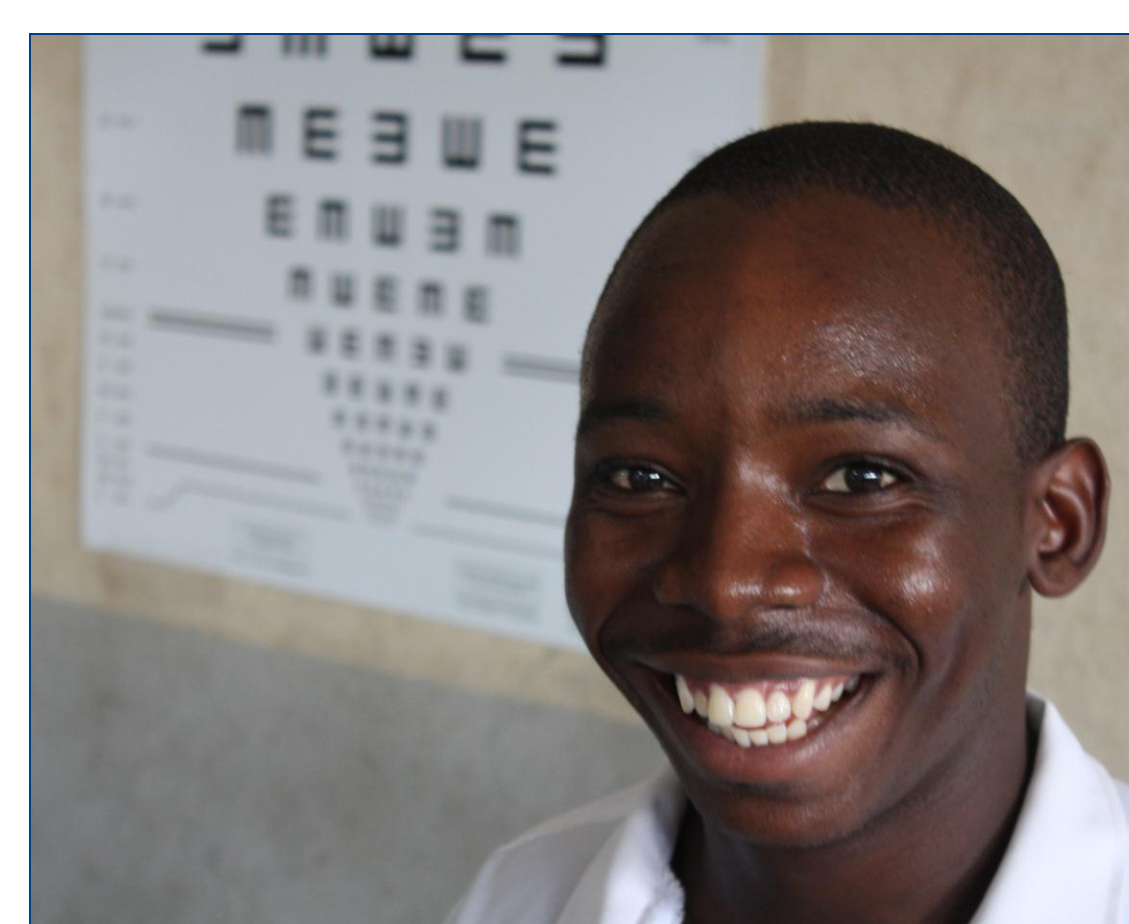


Figure 1 – A second year optometry student

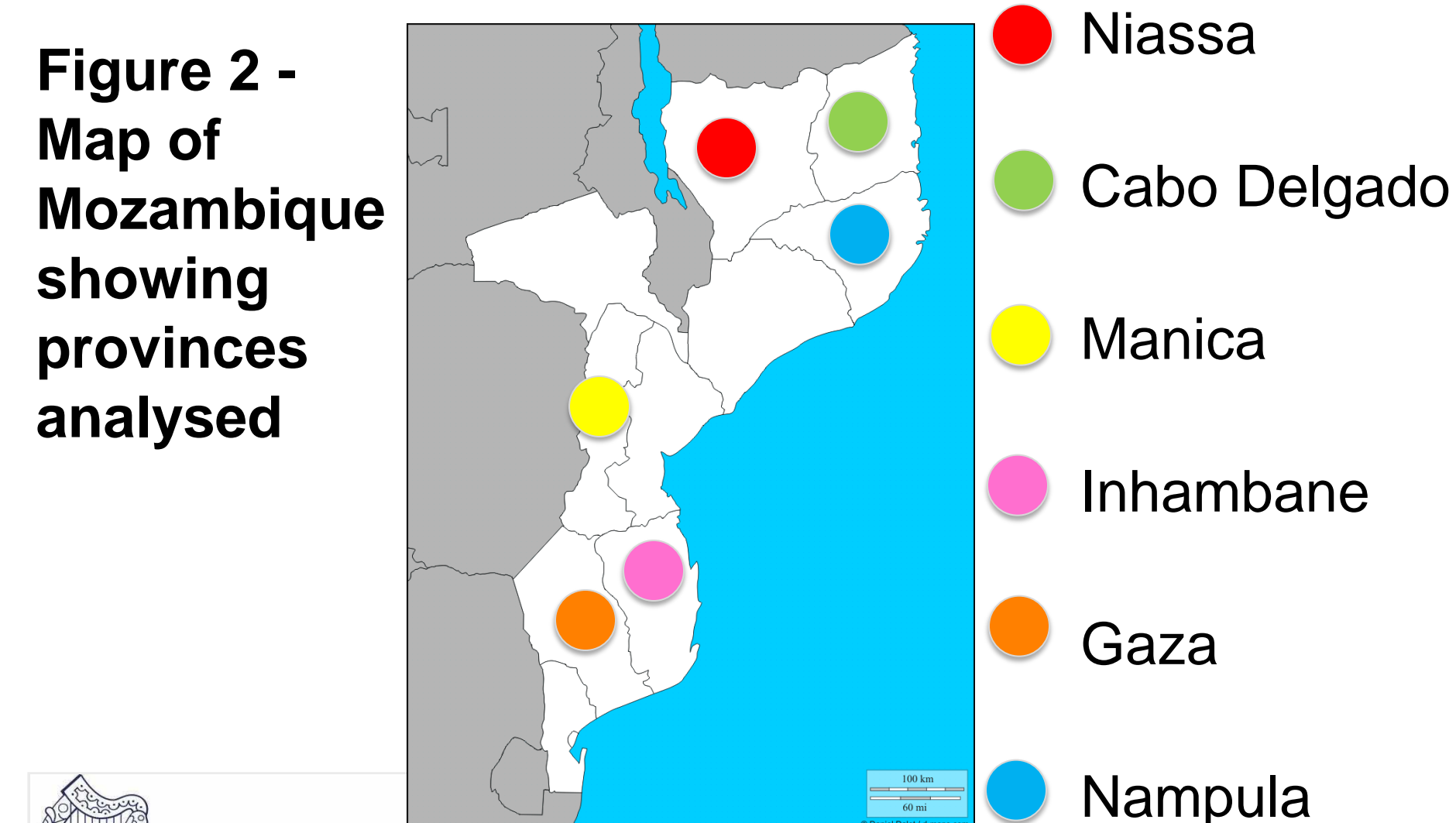
- Mozambique is currently failing to meet the World Health Organisation recommended Vision 2020 ratio of eye care personnel to head of population <sup>3</sup>.
- To address this deficit in human resources, a key output of the Mozambique Eyecare Project is an undergraduate optometry course based at Universidade Lúrio, Nampula.

## Methods

- A World Health Organisation tool was used to conduct a situational analysis of eye health services in Mozambique <sup>2</sup>.
- For each province, a tool was completed by the Provincial Eye Health Director.
- The results were combined with other data sets <sup>1, 3-7</sup> to form the basis of an economic evaluation of eye care services in Mozambique.
- Analysis of the data is ongoing.

## Location

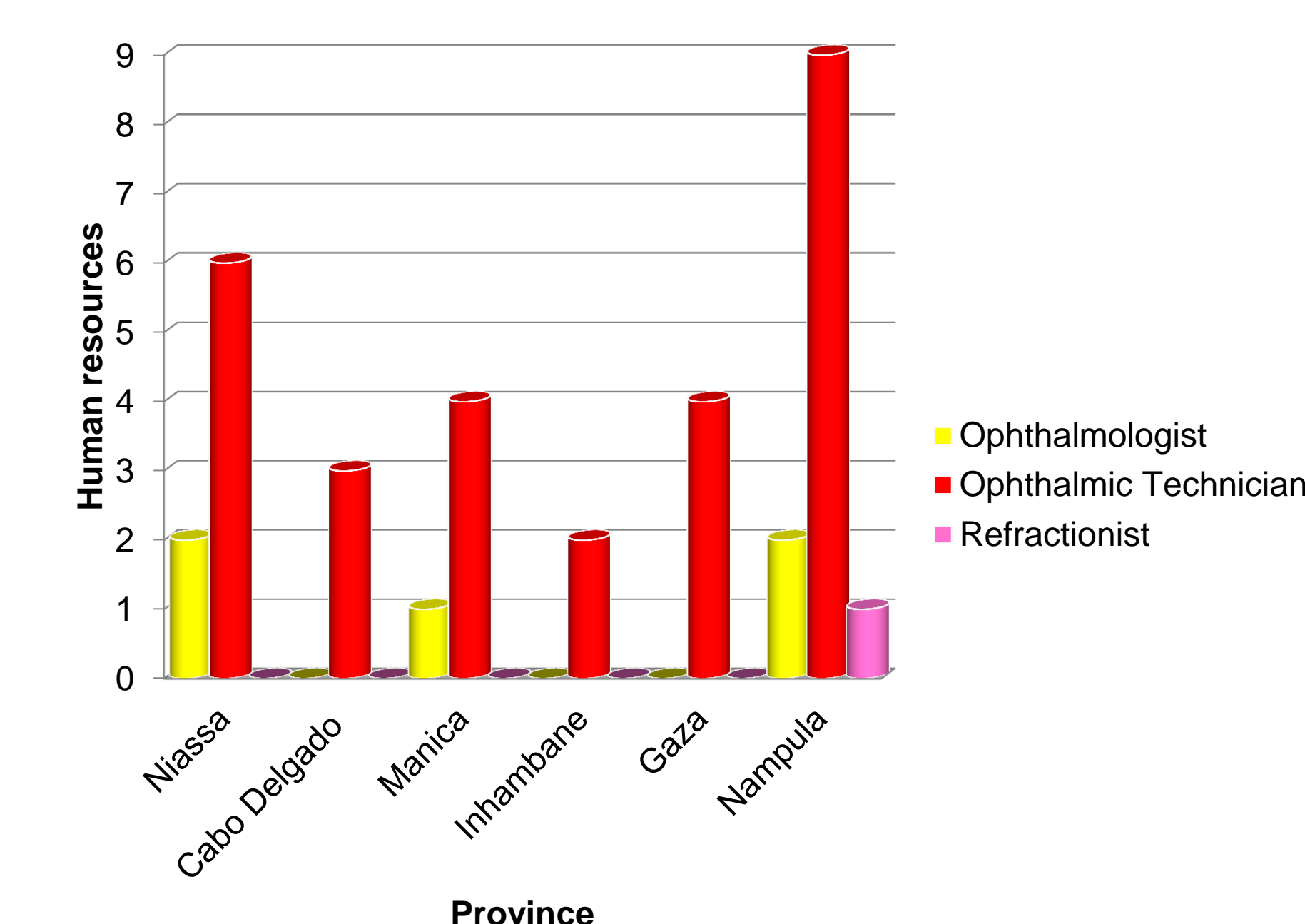
Data from the following provinces were used:



## Results

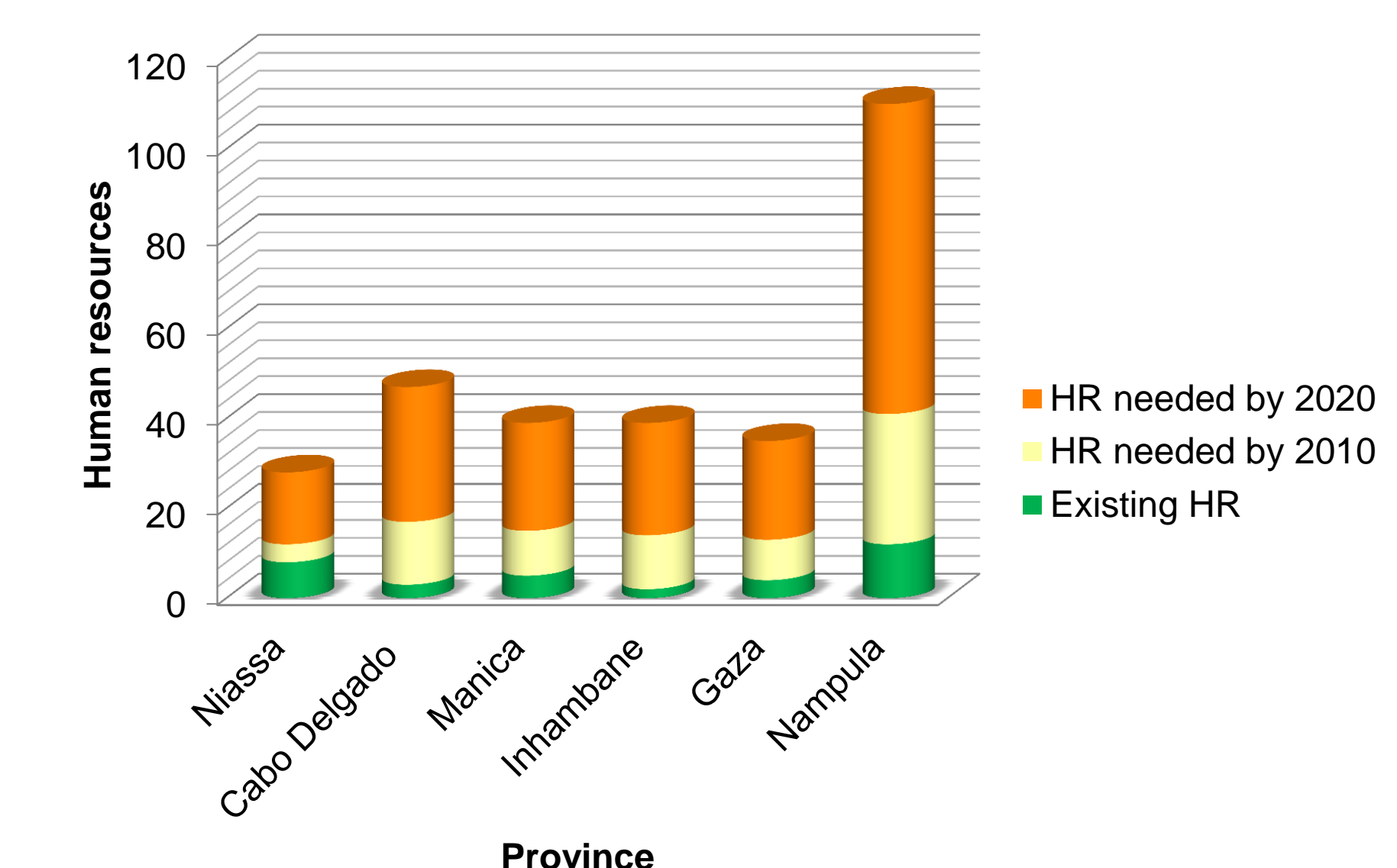
- Figure 3 below indicates the distribution of human resources (HR) by province.
- There are currently no optometrists working in the public sector.

Figure 3 - Eye health human resources by province



- Figure 4 below indicates existing HR compared to what is needed to meet the V2020 target ratios.

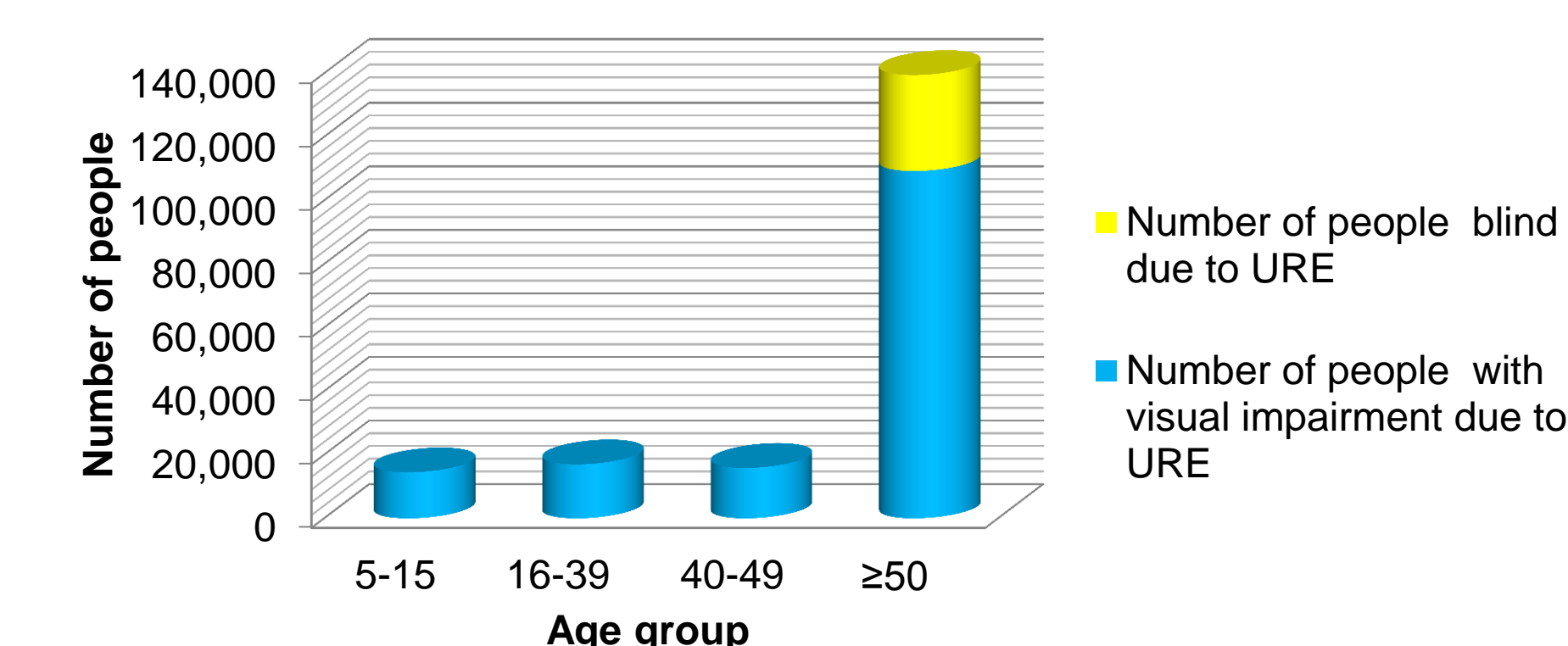
Figure 4 – Existing Human Resources compared to what is needed to meet the V2020 target ratios



- V2020 targets suggest each country should aim to achieve a ratio of 1 operational eye health worker who can refract per 100,000 people by 2010 and 1:50,000 by 2020 <sup>3</sup>.
- Mozambique is yet to meet these targets in each province analysed.
- For this research, ophthalmic technicians were included as being capable of refracting, although more research is needed to assess the extent of their skills and how much time they actually dedicate to offering a refraction service.

- Assuming that the existing 34 workers in the six provinces in question keep offering a refraction service, an additional 184 workers are needed to achieve the V2020 target ratio.
- To understand the need for HR development, the prevalence of visual impairment (VI) and blindness due to uncorrected refractive error (URE) in Mozambique was estimated.
- This was calculated by combining 2007 census data <sup>4</sup> and prevalence estimates from Resnikoff *et al.* <sup>5</sup>.

Figure 5 - Estimated people with VI or blindness due to URE



- The prevalence estimates were combined with economic data from various sources <sup>6, 7</sup>.
- Following the methodology used by Smith *et al.* <sup>1</sup>, GDP per capita can be used as a proxy measure of productivity.
- Disability weights were assigned to visual impairment to provide the estimate that the potential lost productivity resulting from the global burden of URE for Mozambique to be **\$14,486,692**
- This figure is adjusted for Labour Force Participation Rate (LFPR) <sup>7</sup> and Employment Rate (ER) <sup>6</sup>.

VI due to URE	Blind due to URE	Unadjusted GDP loss (US\$)	LFPR	ER	Conservative adjusted GDP loss (US\$)
156,677	30,175	50,700,550	0.8275	0.79	14,486,692

- This is a conservative estimate, calculated assuming that those who are ≥50 years old do not contribute to the national economy. Also the burden of presbyopia is not included, which would considerably increase this estimate.
- For every year there is not enough HR to address URE, **\$14,486,692** is a very conservative estimate of the cost incurred by Mozambique in terms of lost productivity.

## Conclusions

- The situational analysis indicates a lack of eye health personnel who can and do refract. The logical course of action would be to train more eye health personnel.
- A conservative estimated annual burden of URE in lost productivity in Mozambique is **\$14,486,692**
- To achieve the V2020 target ratio, an extra 184 workers are needed in six provinces analysed.
- The analysis assumes the existing personnel are well trained and dedicate time to offering a refraction service. It also assumes that the patient receives the care they require. Other aspects of the situational analysis suggest this is currently not always the case. A more comprehensive analysis would look at the number of work hours each person dedicates to refraction and the outcome.
- Further research into the costs of training personnel needs to be conducted.

## References

- Smith, T. Frick, K, Holden, B. Fricke, T. Naidoo, K. *Potential lost productivity resulting from the global burden of uncorrected refractive error*, Bulletin of the World Health Organisation, 2009, 87, 431 – 437
- National Situational Analysis for Mozambique based on WHO tool. Details available from [mozambique-eye-care-coalition@googlegroups.com](mailto:mozambique-eye-care-coalition@googlegroups.com)
- Vision 2020 The Right to Sight – Global initiative for the elimination of avoidable blindness – Action plan 2006 – 2011.
- The Mozambican National Census 2007, <http://www.ine.gov.mz> accessed 13.09.2011
- Resnikoff, S. Pascolini, D. Mariotti, S. P. & Gopal, P. *Global Magnitude of Visual Impairment caused by Uncorrected refractive errors in 2004*, Bulletin of the WHO, 2008, 86 (1), 63 – 70
- The World Fact Book – Mozambique - <https://www.cia.gov/library/publications/the-world-factbook/geos/mz.html> - accessed 13.09.2011
- UN data - <http://data.un.org/CountryProfile.aspx?crName=Mozambique#Economic> - accessed 13.09.2011

## Acknowledgements

- The Mozambique Eyecare Project is co-funded by Irish Aid.
- The Mozambique Eye Care Coalition funded and facilitated the national situational analysis.

## For further information

stephen@iceeafrica.co.za  
www.mozeyecare.org