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Case study: Clinical research

While working as an ophthalmologist in a hospital in Tanzania in the 1980s, I became interested in why so many children were blind due to corneal scarring. Keratomalacia (drying and clouding of the cornea) due to vitamin A deficiency had been reported in Asia, but Bitot's spots – normally associated with keratomalacia – were rarely seen in African children. The children's parents often said the eye problems and blindness was due to measles. In addition, herpes simplex keratitis had been reported as a cause of corneal ulceration after measles in Nigeria.

By good fortune, I met Prof Al Sommer, who was working on vitamin A deficiency in Indonesia and Nepal. With his advice and encouragement, we started a prospective study to investigate and photograph all cases of corneal ulceration in children who came to the hospital where I was working. Over three years, we documented 130 cases of corneal ulceration in children and found that, although herpes simplex virus was the commonest cause of ulceration overall, vitamin A deficiency was the major cause of bilateral ulceration, subsequent blindness, and mortality in this series of patients.

As so often happens, our research led to more questions and further studies, including one which



Giving vitamin A to a child. TANZANIA

showed that vitamin A supplementation reduced mortality in children hospitalised with measles. This work contributed to the evidence that led WHO and UNICEF in 1997 to announce a programme of vitamin A supplementation for children with measles.

What did I learn from this initial research experience?

- 1 Identify a clear research question
- 2 Take time to plan the study
- 3 Work with colleagues who have other expertise.

Further reading

Foster A, Sommer A. Corneal Ulceration in Tanzanian Children. *Br J Ophthalmol*. 1987;71:331-43.

Barclay AW, Foster A, Sommer A. Vitamin A Supplements and Mortality Related to Measles. *Randomised Clinical Trial*. *Br Medical J*. 1987;294(6567):294-6.



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The rapid assessment of avoidable blindness (RAAB) survey methodology

Rapid assessment of avoidable blindness (RAAB) is a population-based survey methodology that is designed to provide a simple and affordable – yet reliable – estimate of the prevalence and causes of vision impairment and blindness among people aged 50 years and older in a defined population.¹

The locally relevant data that RAAB surveys provide are used by governments and non-governmental eye health service providers to support evidence-based eye care planning, eye service monitoring and evaluation. RAAB is therefore an important tool in achieving the global eye health priorities set out by the World Health Organization's World Report on Vision and the Lancet Global Health Commission on Global Eye Health.^{2,3}

RAAB surveys provide the majority of the data used to estimate the global and regional prevalence and causes of vision impairment, as well as data which are vital for tracking progress towards eye health within universal health coverage, such as effective cataract surgical coverage and effective refractive error coverage.^{4,5}

The RAAB repository (www.raab.world) collates RAAB survey results and datasets and makes them available for secondary analyses; data from 118 of the 330 RAABs carried out since 2000 have been made available for this purpose. We encourage more RAAB survey principal investigators and data owners to share their data via the repository, so that the global eye health community collectively can have a more comprehensive and powerful evidence base for research and advocacy.



Visual acuity testing during a RAAB survey. MEXICO

References

- 1 Mactaggart I, Limburg H, Bastawrous A, et al. Rapid Assessment of Avoidable Blindness: looking back, looking forward. *Br J Ophthalmol*. 2019; 103: 1549-1552. 2019/07/04. DOI: 10.1136/bjophthalmol-2019-314015.
- 2 World Health Organization. World report on vision. 2019. Geneva.
- 3 Burton MJ, Ramke J, Marques AP, et al. The Lancet Global Health Commission on Global Eye Health: vision beyond 2020. *Lancet Glob Health*. 2021; 9: e489-e551. DOI: 10.1016/S2214-109X(20)30488-5.
- 4 Bourne R, Steinmetz JD, Flaxman S, et al. Trends in prevalence of blindness and distance and near vision impairment over 30 years: an analysis for the Global Burden of Disease Study. *Lancet Glob Health*. 2021; 9: e130-e143. DOI: 10.1016/S2214-109X(20)30425-3.
- 5 Steinmetz JD, Bourne RRA, Briant PS, et al. Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of avoidable blindness in relation to VISION 2020: the Right to Sight: an analysis for the Global Burden of Disease Study. *The Lancet Global Health* 2021; 9: e144-e160. DOI: 10.1016/S2214-109X(20)30489-7.