

# Global Blindness: The Progress We Are Making and Still Need to Make

*Hugh R. Taylor, AC MD*

**Abstract:** The actual numbers of people blind or with poor vision continue to increase despite so excellent progress that is being made in reducing the prevalence or percentage of people affected. More attention is required to provide quality outcomes for cataract surgery, prevent and manage myopia, detect and treat diabetic retinopathy, glaucoma, and age-related macular degeneration (AMD). Although more ophthalmologists are needed to provide this eye care, it is important that ophthalmologists work in effective teams with allied eye health personal to be able to meet the community needs.

**Key Words:** blindness, cataract, eye care, myopia

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## BACKGROUND

Twenty-five years ago, the World Health Organization estimated that there were some 45 million people blind.<sup>1</sup> About 60% of that was due to 2 conditions that could be addressed right away: cataract and refractive error. There were about 15% of causes that really needed a public health intervention: Vitamin A deficiency, onchocerciasis, and trachoma. There were another 15% of conditions that at that time were difficult to manage and treat and that could not be cured: diabetic eye disease and glaucoma. Then there was a final 10% for which more or less nothing could be done including AMD and optic atrophy. Childhood blindness was also identified as another important issue.

It was projected that the number of blind would increase from 45 million people in 1995 to double and become 90 million by the year 2020. However, if we actually acted and prevented the things we knew how to prevent and treated the things we could treat, we could reduce that number down to 25 million and this led to this global initiative Vision 2020: The Right to Sight.

From the Melbourne Laureate Professor, Harold Mitchell Chair of Indigenous Eye Health, Melbourne School of Population and Global Health, University of Melbourne, Carlton, VIC, Australia.

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Correspondence: Hugh R. Taylor, AC, MD, Melbourne Laureate Professor, Harold Mitchell Chair of Indigenous Eye Health, Melbourne School of Population and Global Health, University of Melbourne, Level 5, 207 Bouverie Street, Carlton, VIC 3053, Australia. E-mail: h.taylor@unimelb.edu.au, web: www.ieh.unimelb.edu.au.

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The analysis by the Vision Loss Expert Group showed that by 2010, very significant progress was being made and the prevalence of blindness had dropped actually down to 32 million. Of even more significance was the 42% drop in the age-specific prevalence, showing that if we did what we know to do, we would actually make a big difference<sup>2</sup> (Fig. 1).

The WHO developed a Global Action Plan in 2013 with a global target of reducing avoidable blindness by 25% by the year 2019.<sup>1</sup> It was taken as indicators of the prevalence and causes of vision loss, Cataract Surgery Rate, and the number of eyecare personnel. The member states or countries were obliged to report back to WHO in 2017 and again next year in 2020 on the progress that was being made.

The more detailed data analysis by the Vision Loss Expert Group shows there has been a significant reduction in the amount of blindness over the last 25 years for both for males and females and in every one of the 17 subregions around the world<sup>2</sup> (Fig. 1). Although the rate of blindness in the less developed countries is much higher than the rate of blindness in the high-income countries, all have seen the prevalence drop.

## CURRENT SITUATION

However, the prevalence vision impairment and blindness are still much higher in sub-Saharan Africa and through southern Asia. But there are also problem areas in Latin America, the rest of Asia, and so forth. Because of their very large populations in China and India, the Asia-Pacific region has a much higher number with vision loss compared with Europe or the Americas.

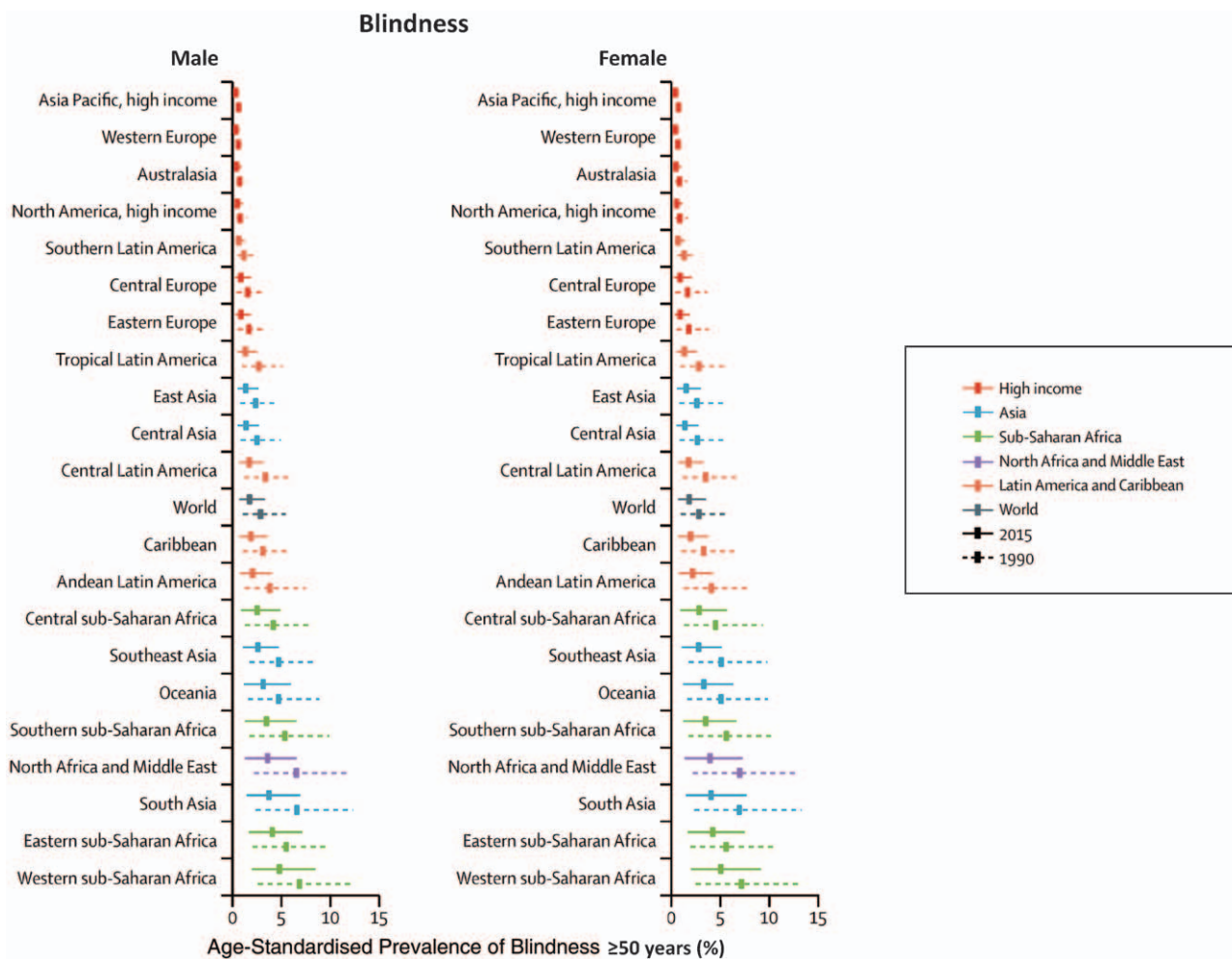
Overall, nearly one-fifth of blindness is due to refractive error, predominantly myopia, which is a major problem particularly in East Asia, 30% due to unoperated cataract, glaucoma 8%, AMD about 6%, diabetic retinopathy 1%, and corneal opacity and trachoma each 2%<sup>2</sup> (Fig. 2).

## CHALLENGES IN THE ASIA-PACIFIC

We have got real problems with this very specific increase in myopia that's occurring around the world but particularly in East Asia and particularly rapid increase in high myopia such that some 80% or 90% of school leavers now are reported to be myopic<sup>3</sup> (Fig. 3).

Diabetes is another major problem that is increasing rapidly with very large numbers of people requiring screening examinations and treatment in our region, particularly in China and in India, but increasing throughout the Asia-Pacific region.<sup>4</sup>

Also there are quite dramatic increases in the number of people with glaucoma due both to the increase in population size and the increase in the aging of the population as glaucoma is so age-related<sup>5</sup> (Fig. 4).

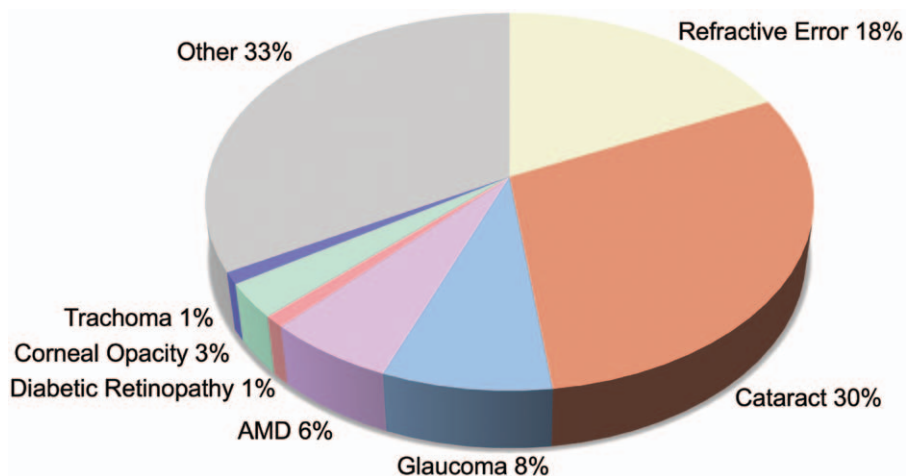


**FIGURE 1.** Demonstrated significant decrease in rates of blindness in all regions between 1990 and 2015 created from data in Flaxman SR, Bourne RRA, Resnikoff S, et al. Global causes of blindness and distance vision impairment 1990–2020: a systematic review and meta-analysis. *Lancet Glob Health* 2017; 5: e1221-e1234. AMD indicates age-related macular degeneration.

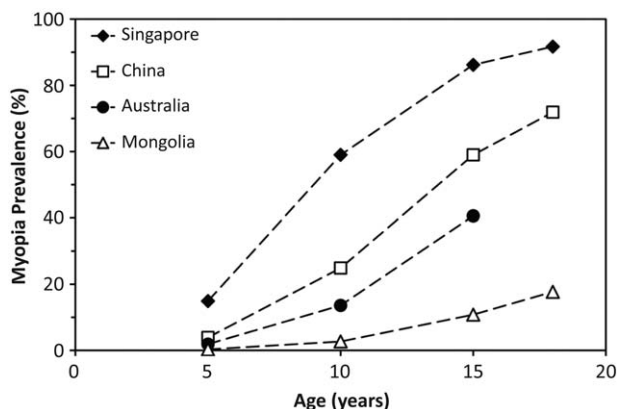
However, one of the real remaining challenges is the need for cataract surgery as cataract is still the major cause of vision loss and blindness still. Over time, there have been quite prodigious changes in the volume and quality of cataract surgery. The Cataract Surgery Rate (CSR) in India has increased tremendously over the decades and is now running at around 9000 per million

per year<sup>6</sup> (Fig. 5), whereas the CSR for China is still far below the population-based need, despite a major government initiative to do 1 million Cataract operations.

What is really important for cataract surgery is not the actual number of operations done, but the postoperative results, that is how many people have good or functional vision after surgery.



**FIGURE 2.** Percentage of diagnosed causes of blindness and vision impairment created from data in Flaxman SR, Bourne RRA, Resnikoff S, et al. Global causes of blindness and distance vision impairment 1990–2020: a systematic review and meta-analysis. *Lancet Glob Health* 2017; 5: e1221-e1234. AMD indicates age-related macular degeneration.



**FIGURE 3.** Modeled prevalence of myopia by age for East Asians by selected country of residence from a systematic review and quantitative meta-analysis adjusted to the year 2005 (except for Mongolia, which is 2003), first appearing in Wolffsohn JS, Flitcroft DI, G KL, et al. IMI - Myopia Control Reports Overview and Introduction. *Invest Ophthalmol Vis Sci.* 2019; 60: M1-M19. This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

The Effective Cataract Surgery Coverage Rate is used to measure this (Personal correspondence with Raj Thulsi, January 2019) (Fig. 6). It is the proportion of people after surgery whose vision is 6/18 or better compared with the total number of people who have had surgery. In many countries there is still a very significant shortfall both in the number of surgeries that need to be done and the effective coverage rate that is those with a good postoperative result.

To make sure we do effective cataract surgery, we as ophthalmologists need to be careful to select and insert the appropriate intraocular lens, adjust for or correct astigmatism,

teach and practice good surgical technique, and also determine the presence of preexisting disease.<sup>7</sup>

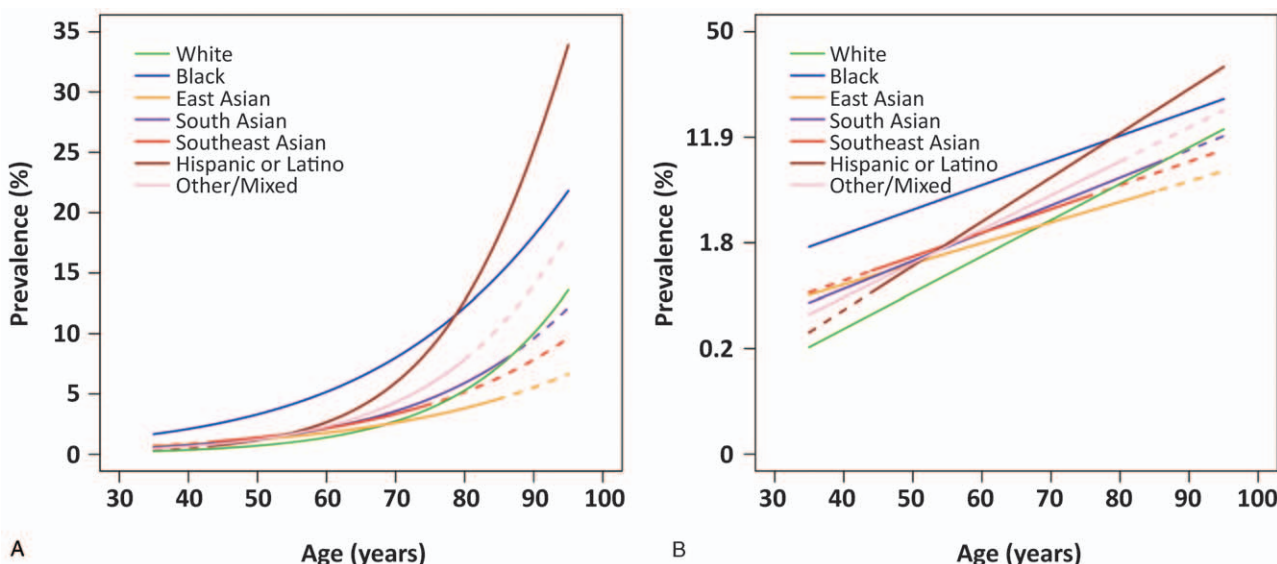
The United Nations have set the Sustainable Development Goals. Goal 3 is for good health and within that Goal 3.8 is the achievement of Universal Health Coverage (UHC).<sup>8</sup> UHC includes financial risk protection, access to quality essential health-care services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all. It is important to have eye care built into UHC as part of comprehensive health care. Part of this of course includes the provision of near correction for those with presbyopia to give all people the best quality of vision for the whole of their lives.

The International Council of Ophthalmology (ICO) is working very hard to try to improve the level of eye care worldwide in terms of education including the ICO Exams and the ICO Fellowships.<sup>9</sup> The ICO is also working with national societies and working global organizations including WHO.

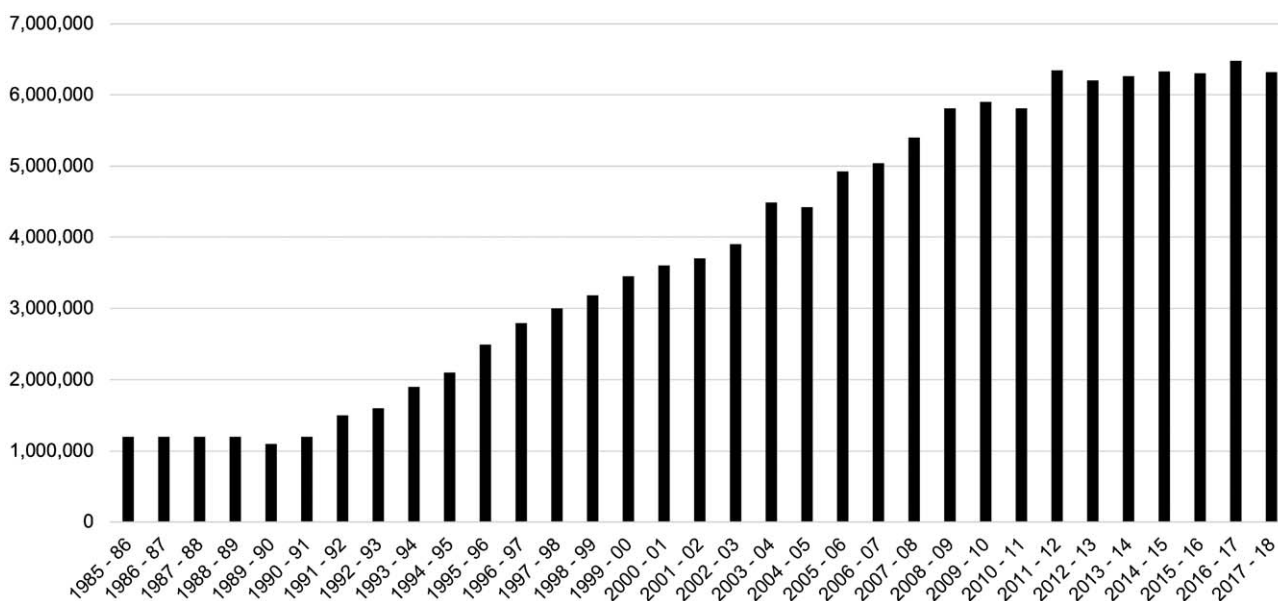
Recently the ICO has determined the number and distribution of ophthalmologists in 2015 and found there were 232,000 ophthalmologists.<sup>10</sup> However, there is a very asymmetric distribution across the many different countries. We do need to train more ophthalmologists to meet the population needs, but we also need to recognize that we need to do appropriate eye care by working in teams with each person in the team doing their job in concert with the other team members.

In summary, there are great efforts being made worldwide to reduce avoidable blindness and real progress is being made, but the needs in the Asia-Pacific region—our region—remain a real challenge. Obviously, we need to train and educate more ophthalmologists, but they need to be working in teams. Nationally ophthalmologists need to become involved and provide leadership and advocacy; we need to think globally but we must act locally.

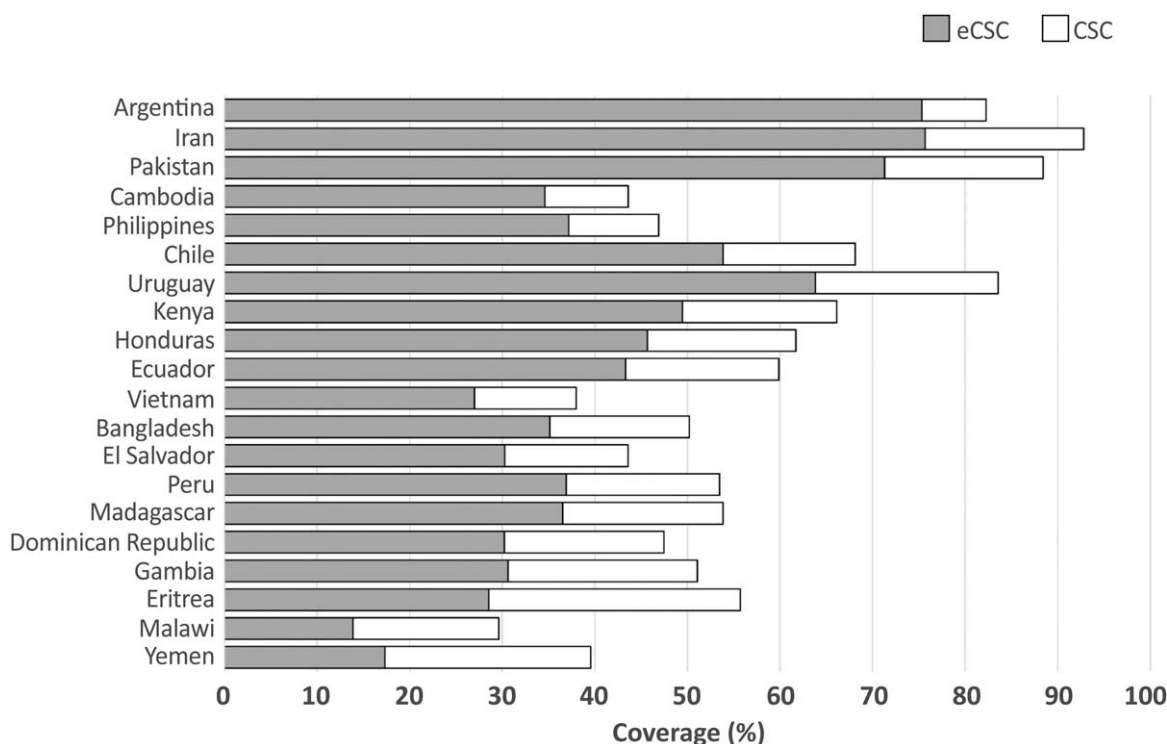
Finally, I would like to invite you all to the next World Ophthalmology Congress in Cape Town in June 2020.



**FIGURE 4.** Estimated prevalence (%) of primary open angle glaucoma with age for men and women combined by ethnicity. A, shows prevalence on the y axis on the normal scale; B, on the log scale. Coloured lines come from regression models adjusting for age (log-linear relationship), fitted separately for White (green), Black (blue), East Asian (orange), South Asian (purple), Southeast Asian (navy), Hispanic or Latino (brown), and other or mixed ethnicity (pink) groups. Solid lines are given across the age range of available data for each ethnic group, first appearing in Kapetanakis VV, Chan MPY, Foster PJ, et al. Global variations and time trends in the prevalence of primary open angle glaucoma (POAG): a systematic review and meta-analysis. *Br J Ophthalmol* Published Online first 18 August 2015; doi:10.1136/bjophthalmol2015-307223. This is an Open Access article distributed in accordance with the terms of the Creative Commons Attribution License.



**FIGURE 5.** Numbers of cataract surgeries conducted in India between 1985 and 2018 created from data in Directorate General of Health Services, Ministry of Health & Family Welfare, Government of India. National Program for Control of Blindness & Visual Impairment (NPCBVI) Statistics [National Program for Control of Blindness & Visual Impairment (NPCBVI) web site]. September 24, 2012. Available at: <http://npcb.nic.in/index1.asp?linkid=93&langid=1>. Accessed May 15, 2019.



**FIGURE 6.** Cataract surgical coverage (CSC) and effective cataract surgical coverage (eCSC); persons first appearing in Ramke J, Gilbert CE, Lee AC, et al. Effective cataract surgical coverage: An indicator for measuring quality-of-care in the context of Universal Health Coverage. *PLoS One*. 2017; 12: e0172342-e0172342. This is an open access article distributed under the terms of the Creative Commons Attribution License.

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