The Royal College of Ophthalmologists

Essay Prize for Foundation Doctors

**The World Health Organisation’s ‘Vision 2020’ project aims to eliminate avoidable blindness. Discuss the achievements of this project, and remaining challenges.**

“*Can anybody in this lecture theatre identify the leading cause of blindness worldwide*?”

An uncomfortable silence ensues, broken by the shuffling and hushed murmurs of 250 medical students.

“*Cataracts*” suggests a voice somewhat hesitantly.

“*Anyone else*?”

“*Diabetes*?”

The silence continues; people start to look around, desperate for the correct response to emerge.

“*Lack of glasses. The answer is a lack of glasses*.”

Observing my fellow students, through my own glasses especially selected for the quirky cat-eye frames, I realise how many are bespectacled. I am taken aback; I know the UK’s leading cause of blindness is cataracts and expected this to be the answer.

**Introduction**

The Vision 2020 project was founded in 19991 by the World Health Organisation (WHO) and the International Agency for Prevention of Blindness (IAPB)1. The initial plan has been updated but the mission statement remains; to reduce and eventually eradicate preventable vision impairment and blindness1.

Uncorrected refractive errors are the commonest cause of preventable blindness and visual impairment globally2. The World Health Organisation (WHO) estimate over 2 billion people worldwide are blind or have impaired vision, and at least half of cases are preventable2. Common causes of preventable visual impairment are communicable disease, prematurity, uncorrected refractive errors, unoperated cataracts and diabetic retinopathy. Of all preventable cases, almost 125 million are attributed to uncorrected refractive errors, almost twice the number as the second most common cause, cataracts2. This issue is commonest in low- and middle-income countries, with estimates that 80% of refractive errors in some African regions are untreated, while 10% go untreated in the Western world2. Preventable visual impairment and blindness is a global socio-economic and health concern.

**Achievements**

One of the aims of Vision 2020 was to eliminate avoidable blindness by 20203, yet it remains a global health burden today2. Quantifying changes in the prevalence of visual impairment is difficult; data is incomplete, and definitions of visual impairment have evolved. Early estimates excluded visual impairment due to refractive error4, yet this is now recognised as a leading cause. In the early 2000s around 5% of the global population were visually impaired4 yet WHO figures published in 2019 outlined previously suggest around 28% people have sub-optimal vision1. Achievements are therefore more appropriately outlined qualitatively.

If you were to ask a group of one hundred people to name as many public health crises as possible in one minute, you might expect many to mention communicable diseases, heart disease, and currently, the coronavirus pandemic. But how many of the one hundred would identify preventable blindness as a public health crisis?

The major achievement of the Vision 2020 project has been generating awareness of blindness as a public health concern. This has gained momentum and encouraged governments and health boards to address the issue, especially in low- and middle-income countries. World Sight day is one such example. Introduced in 2000 by the SightFirst campaign to eradicate blindness due to trachoma, and now a Vision 2020 initiative12, the day takes place annually on the second Thursday of October. Often advertised with themes of Vision 2020 goals, such as universal eye care, the day publicises issues in eye health. The 2020 theme is “Hope in Sight.”

Since Vision 2020 started, over 100 national plans have developed4 from partnerships between a number of groups including WHO and IAPB3. Importantly these national initiatives have translated into improved clinical outcomes. State funded eye care for children in Sri Lanka changed drastically since the start of the 21st century. The implementation of the “school eye health programme” pinpoints Sri Lanka as a success story for Vision 2020. School teachers were taught to screen for refractive errors using a new simple screening card6. Children deemed high risk on initial screening were referred onwards for specialist testing, which was also funded by regional health authorities6. Children identified as having significant refractive errors on formal testing were then provided with their own choice of glasses free of charge6. All pairs of glasses were funded under the Vision 2020 Programme run by the Ministry of Health for approximately $4 USD per pair, the money for which was secured from various donor organisations6. Many children reported improved vision and quality of life following the implementation of the programme6. These changes in Sri Lankan health policy is a specific example of how awareness generated by Vision 2020 has directly improved access to eye care and reduced disability. Success has been seen in other countries too; in India the rate of cataracts surgery increased by 100% from 1995 to 20084.

**Remaining challenges**

One of the greatest challenges to tackl**e** blindness is health inequality. The IAPB reported “the major challenge in eye health remains reducing the inequality in coverage.” In sub**-**Saharan Africa and South Asia, rates of blindness are eight times higher than in high income countries7. This figure is a stark reminder that eye health is a social, educational and economic issue, not solely a health problem. Hart’s inverse care law10 undoubtedly applies to ophthalmology; the least access for those most in need. Visually depicted by Bastawrous and Henning11 in the article “The Global Inverse Care Law: A Distorted Map of Blindness,”the world map of ophthalmologists in training does not match trends in blindness. Without a holistic approach to improve health provision in low- and middle- income countries we cannot reasonably expect substantial improvements in rates of blindness in a rapidly growing population.

The dynamic nature of the population and its health needs presents another hurdle for Vision 2020. Since 1999, the aetiological map of preventable blindness has changed dramatically, and the strategies employed in the early 2000s are becoming less relevant. Owing to effective local and national programmes, communicable diseases cause fewer cases of preventable blindness than in previous decades. For example, onchocerciasis is almost completely eradicated in areas of Africa due to widespread use of insecticides, whereas the parasitic disease was previously responsible for millions of cases of river blindness in the same populations4 decades ago. Instead, the population is ageing. Non-communicable diseases are becoming more prevalent, inducing a significant paradigm shift in the aetiology of preventable visual impairment.

Age increases the risk of conditions such as age-related macular degeneration (ARMD) and glaucoma8; the prevalence of both would be expected to rise with an ageing population. Glaucoma requires early detection and treatment to prevent significant disability8, but this requires enough trained specialists and equipment, and funding for early medical or surgical treatment. Risk factors for age related macular degeneration also include smoking and hypertension8, of which both are increasing in low- and middle-income countries. As both glaucoma and ARMD cannot be prevented per se, the prevention of disease progression to significant visual impairment or blindness is key. Future initiatives will require a holistic approach to medicine and will likely involve other public health campaigns such as smoking cessation. This shift in aetiology introduces the need for ongoing research into the causes of blindness, and dynamic health strategies that can change to fit the needs of a population.

Another emerging global player in preventable blindness is diabetic retinopathy. The prevalence of diabetes has risen from 108 million in 1980 to 422 million in 20149, mainly due to increasing diagnoses of type 2 diabetes mellitus. Premature mortality due to diabetes is increasing in low and middle income countries9. We are diagnosing younger people with diabetes and people are living longer with the condition, leaving people susceptible to developing complications of the disease. Microvascular complications such as nephropathy, neuropathy and retinopathy require cost-effective screening programmes9 such as annual retinopathy screening in the UK, and well-funded diabetes care.

As we shift towards longer term, non-communicable diseases, the cost of implementing and maintaining effective screening and treatment programmes will increase. This will require local and national governments to invest significant funding into eye health and requires holistic health services. Yet, 191 of 194 countries omitted eye health from their national health strategic plans in 20197, outlining their vision for general healthcare improvement. This is concerning. Without long-term planning and funding, the achievements of Vision 2020 thus far risk becoming unravelled. The role of Vision 2020 will be to monitor the aetiology of preventable blindness, and to guide and recommend changes in healthcare policies to address these changes.

**Conclusion**

Vision 2020 represents a milestone in ophthalmology, in particular recognising visual impairment as a global health concern. While eradicating preventable blindness has not been achieved by 2020, this aim was arguably ambitious in a changing and expanding global population. Future focus should centre around preventing ophthalmological sequalae of ageing and non-communicable diseases, through adequately funded holistic healthcare and training ophthalmologists to prevent significant visual deterioration. Initial costs will be significant, but the long-term cost-benefit and health improvement will be substantial.

I remember that lecture vividly. The shock; so seemingly simple, a pair of glasses, with profound impact on global vision. The guilt; never a second thought about my own glasses. Of course, when so many cannot access clean water, why would everyone have access to glasses?

**Word count** 1490

**References**

[1] The International Agency for Prevention of Blindness. Global initiatives: What is VISION 2020?https://www.iapb.org/global-initiatives/vision-2020/what-is-vision-2020/ [Accessed 18 Sep 2020]

[2] The World Health Organisation. Fact sheets. Blindness and vision impairment. Oct 2019. https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment [Accessed 18 Sep 2020]

[3] The World Health Organisation. Vision 2020: The Right to Sight. Action plan 2006-2011. https://www.who.int/blindness/Vision2020\_report.pdf [Accessed 18 Sep 2020]

[4] Ackland P. The accomplishments of the global initiative VISION 2020: The Right to Sight and the focus for the next 8 years of the campaign. Indian J Ophthalmol. 2012;60(5):380-386. doi:10.4103/0301-4738.100531

# [5] The World Health Organisation. Onchocerciasis Control Programme (OCP). https://www.who.int/blindness/partnerships/onchocerciasis\_OCP/en/ [Accessed 18 Sep 2020]

# [6] Abeydeera A. School eye health services in Sri Lanka: An innovative way of approaching eye health in children. Community Eye Health. 2017;30(98):S21-S23.

# [7] The International Agency for Prevention of Blindness. The World Report on Vision, IAPB Summary. https://www.iapb.org/wp-content/uploads/WRV-IAPB-Summary.pdf [Accessed 18 Sep 2020]

# [8] The World Health Organisation. Priority eye diseases. https://www.who.int/blindness/causes/priority/en/index6.html [Accessed 18 Sep 2020]

# [9] The World Health Organisation. Fact sheets. Diabetes. https://www.who.int/news-room/fact-sheets/detail/diabetes [Accessed 18 Sep 2020]

# [10] Hart JT. The inverse care law. *Lancet*. 1971;1(7696):405-412. doi:10.1016/s0140-6736(71)92410-x

# [11] Bastawrous A, Hennig BD. The global inverse care law: a distorted map of blindness. *Br J Ophthalmol*. 2012;96(10):1357-1358. doi:10.1136/bjophthalmol-2012-30208

# [12] World Sight Day. (Last updated 2020). Wikipedia. Available at https://en.wikipedia.org/wiki/World\_Sight\_Day#:~:text=World%20Sight%20Day%2C%20observed%20annually,Club%20International%20Foundation%20in%202000. [Accessed 19 Sep 2020]