Why is ophthalmology so brilliant?

**Introduction: The Necessity of Ophthalmology**

For those that study the eye, ophthalmology offers a wide array of academic and clinical interest: intricate surgical procedures, complex disease process and cutting-edge technology. But for patients with ocular diseases, the eye is not primarily an object of medical fascination. For the patient, eyes are — first and foremost — a means of sight. As one patient experiencing vision loss secondary to glaucoma put it, “I would rather have my arm or my leg cut off [than lose my vision]. I just want my sight to see the beauty of the world”.1

We live in a world overflowing with vibrant visual stimuli. Of all our senses, sight is one of the most powerful for making sense of our surroundings. To see colour, for example, each eye is equipped with 6 million cones cells seamlessly coordinating with the optic nerve and brain. From appreciating colours in nature to finding food for survival, our sophisticated ocular system enables us to enjoy and navigate the world around us.

Vision is not just useful for aesthetic enjoyment and basic survival skills but is deeply ingrained in our society and culture. Sight allows us to see friends and facilitates socialising; it is used for reading books and watching films; most professionals need vision at work: builders, doctors, taxi drivers, and so on. Even the readers of this article are depending on sight to read the words I am typing!

As medical professionals we grossly undervalue the sense of sight. In one study, patients and medical students were asked to estimate the impact of visual impairment on quality of life.2 Compared to patients, medical students underestimated the quality-of-life loss associated with mild vision loss and blindness by 425% and 153% respectively. It seems that — despite the important and wide-reaching role of sight in our society — we struggle to fully appreciate its value until we personally experience visual impairment.

The implications of ocular disease and visual impairment are significant. Many with sight loss experience curtailed educational and career opportunities. Others lose their independence, no longer being able to drive or walk by themselves but having to rely on others. It is no wonder that some patients would rather lose their arm or leg than their vision.

**The Efficacy of Ophthalmology**

Recognising the social, cultural, and economic implications of visual impairment is essential for appreciating the brilliance of ophthalmology — a specialty concerned with diagnosing and treating disorders of the eye. Loss of sight has a profound effect on the personal lives of patients and their wider communities. Thus, the endpoint of ophthalmic treatment — the restoration of sight — is one of the most impactful outcomes medicine has to offer.

For a medical specialty to be *truly* brilliant, it cannot just be brilliant in theory but must demonstrate brilliance in practice. It is not enough for ophthalmologists to know how to restore sight, they must also act to make it a reality. When it comes to this practical realisation of brilliance, the specialty of ophthalmology is second to none. In the NHS, for example, cataract surgery is the most frequently performed operation. Just under half a million cataract surgeries are performed every year, vastly improving the quality of life for a substantial proportion of the elderly population.3 Moreover, ophthalmology is one of the highest volume outpatient specialties in the NHS, providing over 7.5 million appointments annually.3 From retinopathy of prematurity screening for new-borns to age-related macular degeneration services for the elderly, NHS services transform visual outcomes for millions each year.

However, the NHS is only the tip of the ophthalmic iceberg. Looking to examples of eye care services further afield elucidates the truly global impact of ophthalmology. In India, Aravind Eye Hospitals use a unique assembly-line approach — inspired by the fast-food chain McDonald’s — to deliver over 450,000 cataract operations a year.4 Despite being one of the largest ophthalmic providers worldwide, Aravind champions equitable models of service delivery: providing eye care for all irrespective of economic status. In rural Africa, trachoma is one of the leading causes of blindness.4 To tackle the trachoma hyperepidemic, the “SAFE” strategy — surgery, antibiotics, facial cleanliness, and environmental improvement — has been widely implemented with 95.2 million people receiving antibiotics for trachoma in 2019 alone.5 As of 07 March 2022, the “SAFE” strategy has seen 14 previously endemic countries declaring that trachoma is no longer a public health problem.5 Whether it be in rural Africa, India or the NHS, every setting presents distinct challenges to eye care services. The innovative ways that ophthalmic communities have risen to meet these challenges globally exhibits the true brilliance of ophthalmology.

Perhaps the most impressive aspect of ophthalmology’s global impact is that it is characterised by collaboration. In 1999, the World Health Organisation (WHO) launched *Vision 2020: the Global Initiative for the Elimination of Avoidable Blindness*, strategically mobilising its 193 member states to prioritise the elimination of avoidable causes of blindness.6 Spurred on by *Vision 2020*, more than 100 countries developed national eye care plans and hundreds of millions of pounds worth of funds and resources were donated to eye care programmes worldwide.7,8 Underpinning the successes of *Vision 2020* was an exemplary reliance on global partnership and advocacy. Individuals and organisations from across the globe came together around a common purpose, creating a powerful and lasting impact. The achievements of *Vision 2020* — and countless other global ophthalmic initiatives —indicate that, for the ophthalmologist, brilliance and collaboration are often inextricably linked.

**The Future of Ophthalmology**

Despite the concerted efforts of *Vision 2020*, avoidable blindness has not yet been eliminated. On the contrary, between 1990 and 2020, the number of people with blindness globally rose by around 50%.9 The situation is only expected to worsen. It is forecast that by 2050, the cases of blindness worldwide will rise from 43.3 million to 61 million — an increase roughly equivalent to the population of London becoming blind twice over.9

It is especially discouraging that the global surge in visual impairment has occurred during a period of rapid improvement in global eye health. The last 20 years have seen remarkable service growth and innovation — and yet — the global burden of blindness and visual impairment continues to outgrow service capacity. In the face of such a vast challenge, how can ophthalmology stay afloat — much less aspire to brilliance?

One of the greatest challenges facing ophthalmology today is the ageing global population. As life expectancies rise, populations are becoming larger and more prone to age-related eye diseases. For example, estimates based on recent demographic trends in the UK indicate that the number of people with cataract and age-related macular degeneration will increase by 52% and 64% respectively by 2035.10 Meeting the ever-increasing patient demand for ophthalmic services — while continuing to foster innovation and brilliance — necessitates unprecedented service expansion.

Not only is the burden of visual impairment outgrowing service capacity, but access to ophthalmic services is also becoming more inequitable. At present, around 90% of those affected by vision loss live in low- and middle-income countries.11 However, the cataract surgical rate — a common proxy indicator of access to eye care services — is around 10 to 20 times greater in high-income countries than low-income countries.12 In addition, high-income countries have significantly more ophthalmologists with an average of 76.2 per million of the population compared to 3.7 in low-income countries.13 Global trends towards inequitable eye care provision are by no means recent but have been gradually worsening over the last three decades.14 If future service expansion is to be an effective strategy for overcoming the growing global burden of visual impairment, services must be redesigned to benefit communities with the greatest need.

**Conclusion: Ophthalmology as a Collective Ambition**

The brilliance of ophthalmology is not confined to the NHS — or indeed any individual service provider — but is most evident in global collaborative efforts. Afterall, vision loss is a global problem and so requires a global response. As exemplified by *Vision 2020* — and more recently the *World Report on Vision* — it is when the global ophthalmic community works together, unified around the common goal of improving visual outcomes, that the greatest impact is achieved.

Although much progress has been made in global eye health over the last few decades, there is still a long way to go. It is yet to be seen how ophthalmic services will tackle the burgeoning demand for eye care, or how health care providers will respond to growing inequalities in access to services. Clearly, the future challenges facing ophthalmology are significant. But the hope of restoring sight to 61 million people is a truly exciting possibility. If the precedent set by global ophthalmic collaboration over the last two decades is sustained and extended, ophthalmology is more than equipped to rise to the challenge.

**References**

1. Lange R, Kumagai A, Weiss S, et al. Vision-related quality of life in adults with severe peripheral vision loss: a qualitative interview study. *J Patient-Reported Outcomes*. 2021;5(1). doi:10.1186/s41687-020-00281-y
2. Chaudry I, Brown GC, Brown MM. Medical student and patient perceptions of quality of life associated with vision loss. *Can J Ophthalmol*. 2015;50(3):217-224. doi:10.1016/j.jcjo.2015.02.004
3. MacEwen C, Davis A, Chang L. *Ophthalmology: GIRFT Programme National Specialty Report*. 2019.
4. Aravind Eye Care System. About Aravind: Our Story. Accessed August 5, 2022. <https://aravind.org/our-story/>
5. World Health Organisation. Trachoma. Accessed August 5, 2022. <https://www.who.int/news-room/fact-sheets/detail/trachoma>
6. World Health Organization. *Global Initiative for the Elimination of Avoidable Blindness*. 2000.
7. 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
8. Rao G. The achievements and lasting effects of VISION 2020. Eye News. Published 2020. Accessed August 13, 2022. <https://www.eyenews.uk.com/features/humanitarian/post/in-focus-the-achievements-and-lasting-effects-of-vision-2020>
9. Bourne RRA, 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 Heal*. 2021;9(2):e130-e143. doi:10.1016/S2214-109X(20)30425-3
10. Buchan JC, Norman P, Shickle D, Cassels-Brown A, MacEwen C. Failing to plan and planning to fail. Can we predict the future growth of demand on UK Eye Care Services? *Eye*. 2019;33(7):1029-1031.
11. Burton MJ, Ramke J, Marques AP, et al. The Lancet Global Health Commission on Global Eye Health: vision beyond 2020. *Lancet Glob Heal*. 2021;9(4):e489-e551. doi:10.1016/S2214-109X(20)30488-5
12. Wang W, Yan W, Fotis K, et al. Cataract surgical rate and socioeconomics: A global study. *Investig Ophthalmol Vis Sci*. 2016;57(14):5872-5881. doi:10.1167/iovs.16-19894
13. Resnikoff S, Lansingh VC, Washburn L, et al. Estimated number of ophthalmologists worldwide (International Council of Ophthalmology update): Will we meet the needs? *Br J Ophthalmol*. 2020;104(4):588-592. doi:10.1136/bjophthalmol-2019-314336
14. Lou L, Wang J, Xu P, Ye X, Ye J. Socioeconomic Disparity in Global Burden of Cataract: An Analysis for 2013 With Time Trends Since 1990. *Am J Ophthalmol*. 2017;180:91-96. doi:10.1016/j.ajo.2017.04.008