

ELIMINATING POOR VISION IN A GENERATION

What will it take to eliminate uncorrected refractive errors by 2050?

2020



Foreword



Ridding the world of poor vision is within our grasp. I urge everyone reading this report to join the effort to make this happen.

Through my engagement with leading eye health organisations, including The Queen Elizabeth Diamond Jubilee Trust, I have seen many people both young and old have sight restored to their unseeing eyes.

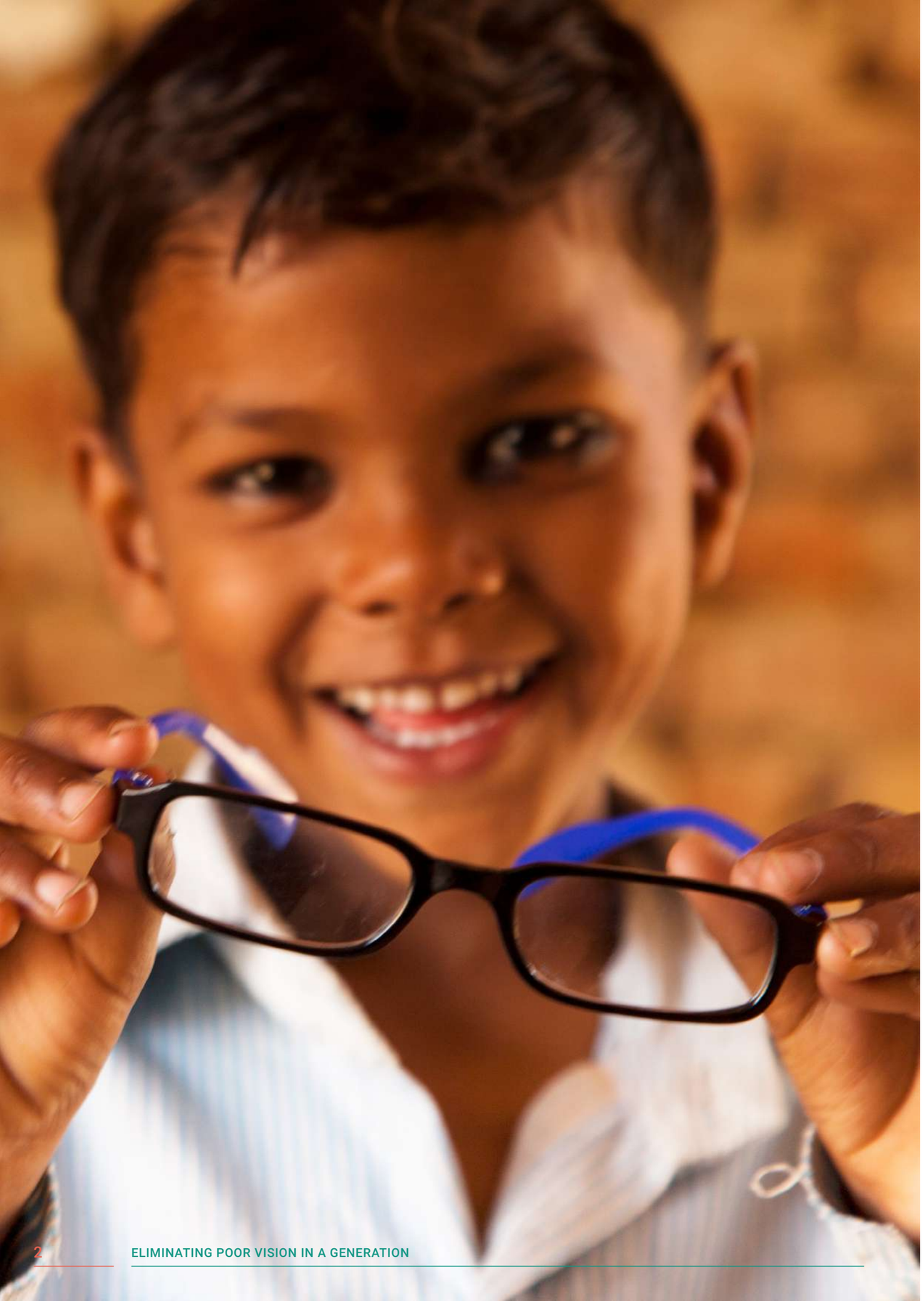
It is a truly joyful experience to witness the profound, positive change this brings to them and to their families and communities. The Trust's work, now at an end, demonstrated quite how much can be achieved in a short time by working collaboratively with the aim of long term, systemic change. While the Trust is closing, it is vital that others take forward action to free the world of all forms of avoidable blindness.

Great progress has been achieved towards ridding the world of blinding trachoma, an infectious cause of blindness. An equivalent concerted effort is needed to eliminate refractive errors.

I therefore welcome this report and the ambition behind it to see poor vision eliminated by 2050. The report makes clear that committed partnerships and collaborative working are key to realising this ambition. I have seen just how powerful these approaches can be, to make progress towards overcoming one of the world's biggest unmet health needs and bring hope to millions who are unable to live life to its fullest because of an avoidable and treatable disability.

Ridding the world of poor vision is within our grasp. I urge everyone reading this report to join the effort to make this happen.

HRH The Countess of Wessex



Foreword



Good vision is a basic human right, and sight is our most powerful sense.

These fundamental beliefs drive Essilor's mission to *improve lives by improving sight*.

Affecting everyone at some stage of life, one in three people today cannot see the world clearly due to a refractive error. This is unacceptable when we have the solutions to fix it.



In 2013, Essilor announced 2.5 billion people were living with uncorrected refractive errors. This was perhaps the first time the scale of the vision care crisis was understood. A few years later, the World Economic Forum and EYElliance published the groundbreaking report, Eyeglasses for Global Development: Bridging the Visual Divide, making the case for the urgent provision of eyeglasses to improve educational outcomes, increase productivity and stimulate the global economy. While the world has seen some success, it is simply not enough.

As the world leader in ophthalmic optics, and a firm believer in business' responsibility to serve society, we have an ambition to eliminate poor vision. While recent years have seen a move from the private sector to fulfil its social obligations, it is rare for one company to take on such a challenge and, as such, there is simply no blueprint to follow to achieve our ambition. To help us go further in our efforts, we commissioned McKinsey & Company to investigate what it will take.

> **"We have a once in a lifetime opportunity to end a public health crisis"**

This analysis offers insight into the scale of the vision problem between now and 2050, and the actions and investments needed to solve it. It proves we have a once in a lifetime opportunity to end a public health crisis.

We present this report with the hope it will spark the right debate. That it will raise awareness about poor vision and inspire widespread systems change to make good vision accessible to all.

Hubert Sagnières
Executive Vice-Chairman, EssilorLuxottica
Chairman, Essilor SAS

Laurent Vacherot
Chief Executive Officer, Essilor SAS



Our priority is health and among other things, we wish for every Bhutanese person to live a fulfilling life, relishing rich colors and beauties in our country's natural surroundings.

Eyes are an important sensory organ. We treat those who are visually impaired, ensuring protection and correction of poor vision for our people.

Eyeglasses are encouraged as an answer to the growing vision problems. But for a nation like ours, not everyone can afford a pair. This is where we see our partners coming in.

Through them, we can make glasses available for all those in need, particularly our rural folks who are unable to afford one. Thanks to the support of our partners like Essilor, we are motivated to make Bhutan the first country in the world where every citizen has 'clearer' vision.

This, in turn, will translate to a nation where its citizens live a good life of health and happiness.

Dr Lotay Tshering
Prime Minister of Bhutan

"We are motivated to make Bhutan the first country in the world where every citizen has 'clearer' vision"

Contents

08 Preface

10 Key messages

12 Overview

14 The world's largest unaddressed disability

20 The true cost of uncorrected poor vision

22 State of the world today

Affordable products
Access creation
Refraction tools
Public awareness
Expansion of funding
Government programs
Coalitions and data

42 Where we could be by 2050 and how much it will cost

Creating sustainable access points
Innovating for affordable solutions
Funding subsidized and free services
Raising awareness
Accelerating actions through coalitions and data

62 What will success look like?

64 Closing statement

66 Appendix

How eliminating poor vision contributes to the UN SDGs
Methodology

Preface

We are pleased to support Essilor See Change's Eliminating Poor Vision in A Generation, a roadmap of how uncorrected refractive errors can be eliminated by 2050. The analysis presents a real opportunity for vision care and an urgent need for investment. We believe it can be done.

With collective action, we have the rare opportunity to solve one of the world's biggest problems and have the means to do it. By improving the vision of billions of people, we can improve their lives through better education, work opportunities, safety and overall well-being and health.

The time is now.

We will not succeed with the status quo. And we will not succeed alone. The eye health sector must seek the support and engagement of those whose resources can accelerate progress towards the goal of eliminating uncorrected refractive errors by 2050.

We are committed.

Kiran Anandampillai
Founder and Chief Executive Officer, Drishti Eye Hospitals

Aly Bandali
President & Chief Executive Officer, Operation Eyesight Universal

Dr. Andrew Bastawrous
Co-Founder and Chief Executive Officer, Peek Vision

James Chen
Founder, Clearly

Nicola Chevis
Chief Executive Officer, Vision Aid Overseas

Vinod Daniel
Chief Executive Officer and Managing Trustee, India Vision Institute

Professor Daniel Etya'ale Essi
Chief Executive Officer, Magrabi ICO Cameroon Eye Institute

Reade Fahs
Chairman of the Board, VisionSpring
Chief Executive Officer, National Vision Inc,
Board Member, RestoringVision

Kristan Gross
Global Executive Director, Vision Impact Institute

Dr. Danny Haddad
Chief of Programs, Orbis International

Dr. Caroline Harper CBE
Chief Executive, Sightsavers

Peter Holland
Chief Executive, International Agency for the Prevention of Blindness (IAPB)

Professor A.H.M. Enayet Hussain
Additional Director General, Planning & Development, Directorate General of Health Services, Ministry of Health and Family Welfare, Bangladesh

Jordan Kassalow
Co-Founder, EYElliance

Professor Li Ling
Director, China Center for Health Development at Peking University

Dr. Umang Mathur
Executive Director, Dr. Shroff's Charity Eye Hospital, New Delhi, India

Dr. Allyala Krishna Nandakumar
Professor of the Practice and Director of the Master of Science Program in Global Health and Development, Brandeis University
Chief Economist at the Office of the Global AIDS Coordinator, USA
Former Chief Economist for Global Health, USAID

K-T Overbey
President and Executive Director, OneSight

Dr. Babar Qureshi
Director Inclusive Eye Health, CBM

Arun Bharat Ram
Chairman, SRF Limited

Dr. Gullapalli N Rao
Founder-Chair, L V Prasad Eye Institute

Sabine Rehbichler
International Director Programmes - Advocacy and Strategic Partners, Light for the World

Dr. Serge Resnikoff
International Eye Health Expert
Former Senior Policy Advisor and Coordinator, World Health Organization (WHO)

Dr. Sanduk Ruit
Founder & Executive Director, Tilganga Institute of Ophthalmology

Dr. Timothy P. Shriver
Chairman, Special Olympics, Inc.

Elizabeth Smith
Chief Executive and Co-Founder, EYElliance

Kathy Spahn
President and Chief Executive Officer, Helen Keller International

Dr. Aravind Srinivasan
Chief Medical Officer, Aravind Eye Hospital

Dr. J. Daniel Twelker
President, VOSH/International

Ian Wishart
Chief Executive Officer, The Fred Hollows Foundation



Names and logos are listed in alphabetical order

Key messages

$14 BILLION

IS NEEDED TO CREATE A WORLD FREE FROM UNCORRECTED REFRACTIVE ERRORS

$2.4B

to create 1 million new sustainable access points which will equip 90 percent of the population in need

Of the 1 million new sustainable access points, 600,000 need to offer full refraction services.

Aligning the necessary organizations and resources around an agreed set of goals is an immediate priority.

$0.7B

for innovation to accelerate the affordability of cost-to-serve and cost of products

Investment in low-cost, digital or automated screening tools requiring less operator training can significantly accelerate the scale-up of digitization of existing and new efforts.

Governments, NGOs, bilateral and multilateral organizations, donors and the private sector all have a role to play in securing this funding and ensuring uncorrected refractive errors are eliminated by 2050.

$4.5B

to increase awareness of poor vision and its socio-economic impact at an individual and societal level

Increased awareness of poor vision and its socio-economic impact is needed at both an individual and societal level to drive demand for glasses and the uptake of services, and drive investment in new and existing services.

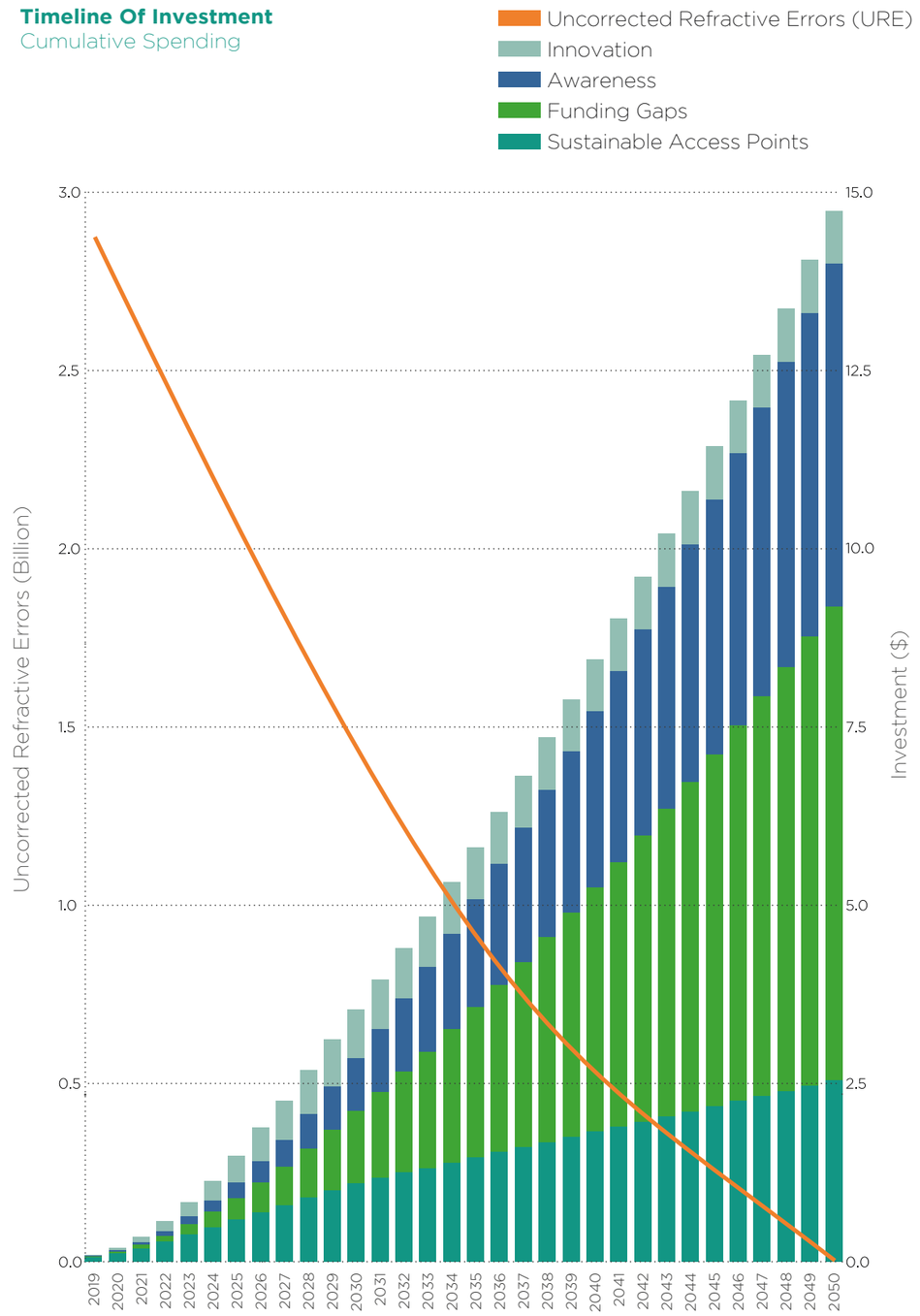
While strategic investments will be made at specific times to prioritize action in certain areas, investment cannot be made into one area in isolation; awareness drives demand, sustainable access points provide the service, affordable solutions make the cycle sustainable and a portion of the population will always need subsidized/free support.

$6.2B

to fill funding gaps across affordability and access for people unable to pay for services

50 percent of wearers in need of subsidized or free services can be served, through specialist schemes and programs, by sustainable access points.

Timeline Of Investment
Cumulative Spending



Overview

Eliminating Poor Vision in a Generation **seeks to define the scale of the vision care crisis, as it relates to uncorrected refractive errors, over the next 30 years and proposes key priorities, actions and investment needed to sustainably address it.**

What follows is an evidence based plan, using analytical support provided by McKinsey & Company, with the objective of catalyzing greater engagement and resources, and inspire widespread systems change by clarifying what it will take to eliminate refractive errors by 2050.

Over 100 experts in eye health, academia and program implementation were interviewed for the study. Key data sources include: the World Bank Group, The Economist Intelligence Unit, World Poverty Clock, Dalberg and various reports and databases focused on vision care.

While acknowledging technological advances, regulatory shifts, demographic shocks and other such disruptions will change the vision correction landscape between now and 2050, several assumptions and considerations were made in the development of this report, including:

- 'Poor vision' is defined as refractive errors (RE) and 'uncorrected poor vision' as uncorrected refractive errors (URE) unless stated otherwise.
- For the purpose of this report, McKinsey estimates the number of people suffering from URE in 2018 to be 2.7 billion[1] people. Calculations in this report use this figure, while the report makes the case to create a sustainable infrastructure that can service many more. All figures are indicative, not absolute.
- Optometrists and Ophthalmologists are the foundation of eye care infrastructure and there is a need to create more. This report does not address this need and focuses on the potential to develop a global network of primary vision care providers.
- This report focuses on eyeglasses as the simplest solution to refractive errors. The refraction test and opportunity for on-the-spot delivery provide instant positive change to the beneficiary. Other solutions are acknowledged but not featured in this report.
- While other strategies are recognized, this report proposes specific interventions for investment as priorities to bring about access to glasses.
- This report takes the position that subsidized or free services should be provided to the poorest of the poor through government funding, NGOs and philanthropic aid. Where the means for sustainable enterprises exists, it should be used to drive affordable, sustainable access for the economic base of the pyramid (BoP)[2].
- Predictions regarding innovation have been conservative. The report recognizes the difficulty in predicting how improvements in today's products, technologies and service delivery models will have an impact over the long-term time frame the report attempts to tackle. Therefore, actions and investments have been estimated based on what is thought to be possible in the next three to 10 years, rather than the next 30. Nevertheless, a front-loaded innovation investment (in the first 10 years) will continue to be needed. The sooner product, technology and service delivery model innovations are realized, the faster the elimination ambition can be achieved.
- All $ are USD unless stated otherwise.
- While this report highlights some of the efforts already underway to eliminate uncorrected refractive errors, there are many more it could not include. What follows is not intended to be a glossary of actions happening today, rather a look to the future and what should, and can be done.

[1] Those with a Visual Acuity of 6/9 or worse. See 'Methodology' in the Appendix for more information.
[2] Coimbatore Prahalad, and Stuart Hart, "The Fortune at the Bottom of the Pyramid," Strategy+Business 26 (2002): 54-67, http://dx.doi.org/10.19177/reen.v1e220081-23.



The world's largest unaddressed disability

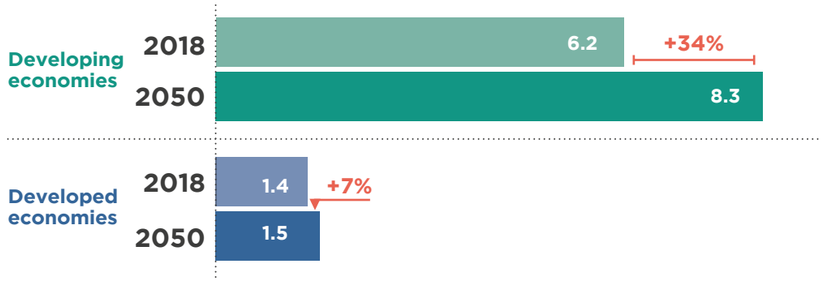
Uncorrected poor vision is the world's most widespread unaddressed disability.

It indiscriminately affects one in three people, 90 percent[3] of whom live in the developing world at the BoP.

And these numbers are rising.

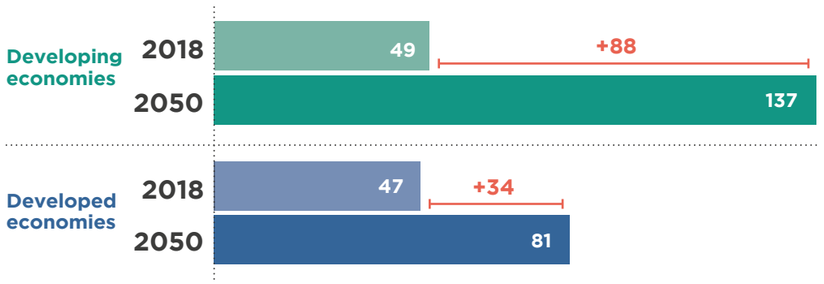
POPULATION GROWTH

Billions of people



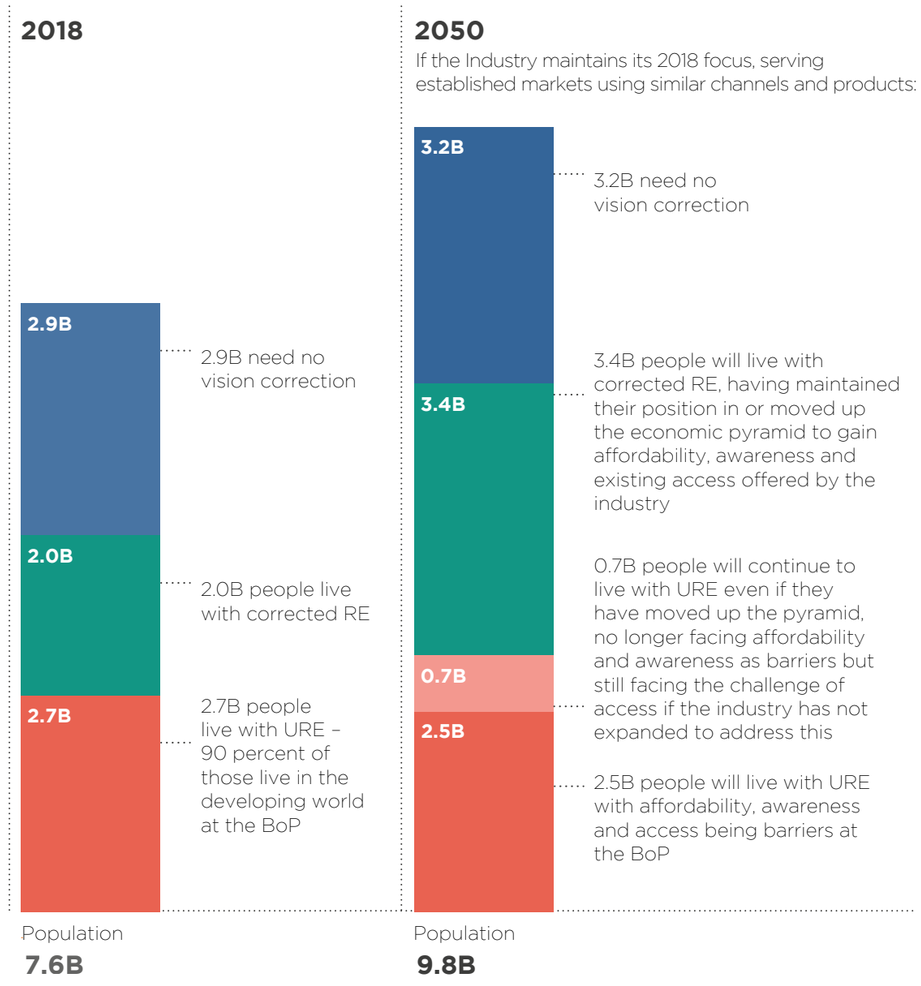
GDP

Trillion USD, constant 2010 $



[3] World Health Organization, "Universal Eye Health: A Global Action Plan 2014–2019," World Health Organization (2013): 4, https://www.who.int/blindness/AP2014_19_English.pdf.

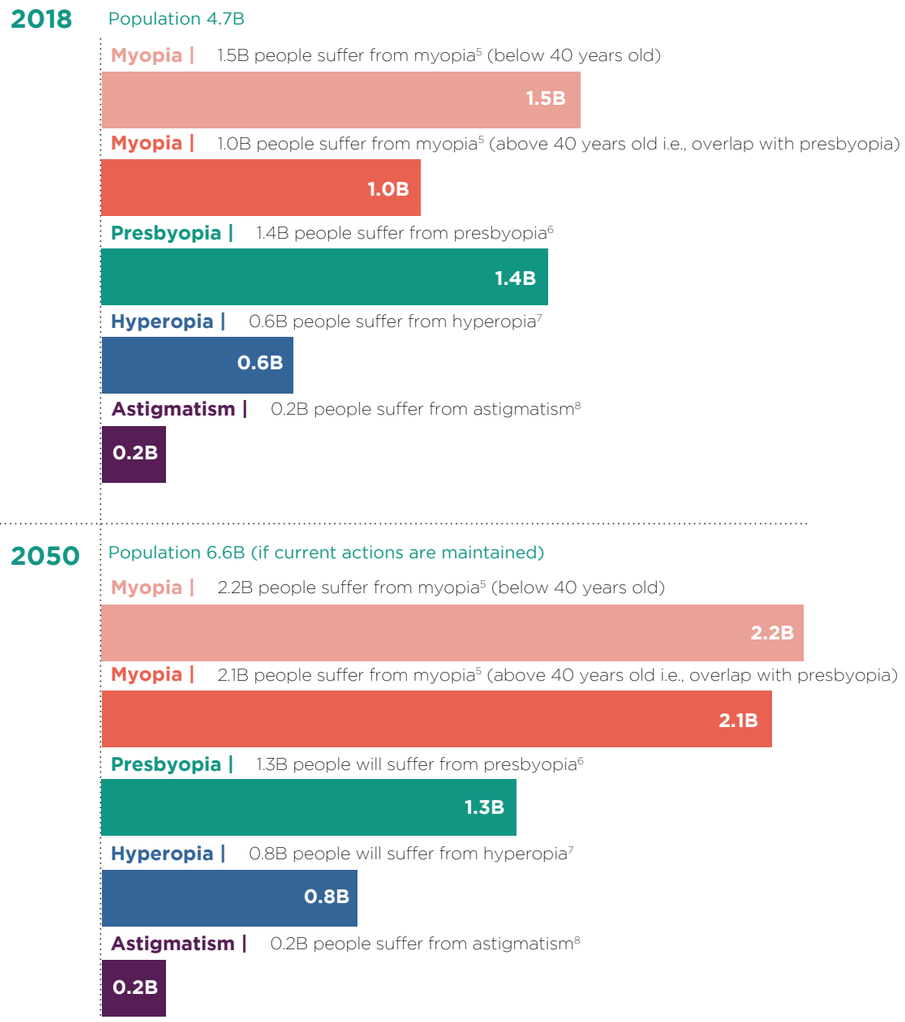
GLOBAL REFRACTIVE ERROR BURDEN[4]



Contributing factors include population growth, rise in myopia (near-sightedness) and increase in presbyopia (age-related inability to focus on near objects).

[4] Those with a Visual Acuity of 6/9 or worse. See 'Methodology' in the Appendix for more information.

REFRACTIVE ERROR CASES BY TYPE



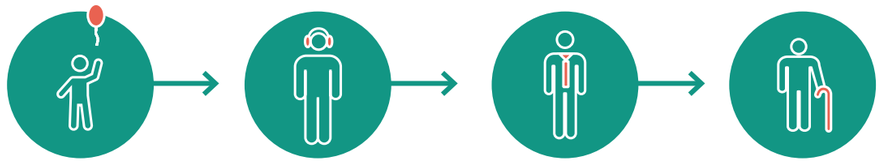
[5] The value of myopia here refers to all cases of myopia, including those who have myopia with other refractive errors, such as myopic astigmatism, myopia with presbyopia etc. McKinsey & Company were able to procure the prevalence for the entire myopic population by using prevalence inputs from paper "Global Prevalence of Myopia and High Myopia (2016)". Source: Brien A. Holden PhD, DSc et al., "Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050," Ophthalmology, Volume 123, Issue 5 (May 2016): 1036-1042. https://doi.org/10.1016/j.ophtha.2016.01.006.

[6] The value of presbyopia here refers to cases of pure presbyopia (presbyopia with no overlap with other refractive errors) and presbyopia with astigmatism. McKinsey & Company excluded myopia by using inputs from paper "Global Prevalence of Presbyopia and Visual Impairment (2018)", which already excludes myopes whose dominant symptom is myopic. Source: Timothy R. Fricke MSc et al., "Global Prevalence of Presbyopia and Vision Impairment from Uncorrected Presbyopia: Systematic Review, Meta-analysis, and Modelling," Ophthalmology, Volume 125, Issue 10 (October 2018): 1492-1499, https://doi.org/10.1016/j.ophtha.2018.04.013.

[7] The value of hyperopia here refers to all cases of hyperopia, including those who have hyperopia with other refractive errors, such as hyperopic astigmatism, hyperopia with presbyopia etc.

[8] The value of astigmatism here refers to cases of pure astigmatism (astigmatism with no overlap with other refractive errors). This is assumed to be ~10 percent of the entire astigmatic population.

REFRACTIVE ERROR TYPES BY AGE



BABY/CHILD (0 - 10 years)

Hyperopia (far-sightedness) is common in children and should be corrected if it persists. Some children "outgrow" it as the eyeball lengthens with normal growth
Myopia (short-sightedness), often inherited, appears between 5 and 10 years old
Astigmatism can be present at the time of birth, or develop gradually in life

TEENAGER (11 - 17 years)

Hyperopia
Myopia might worsen during puberty
Astigmatism can develop gradually in life

ADULT (18 - 60 years)

Hyperopia
Myopia stabilizes in early adulthood but sometimes it continues to progress with age
Astigmatism
Presbyopia (long-sightedness), will arise from 40 onwards

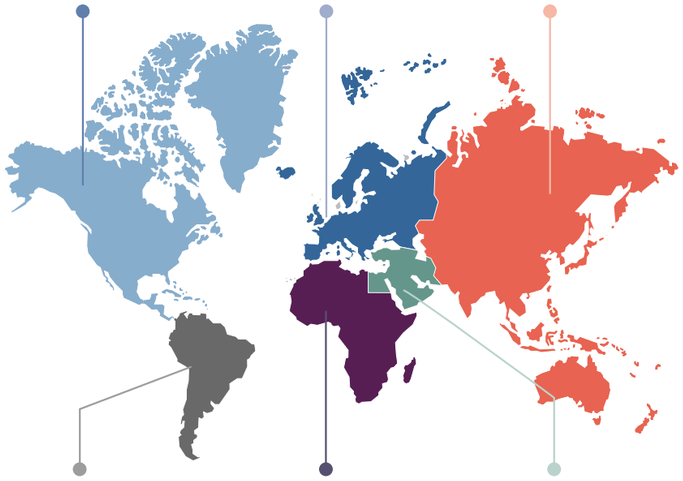
SENIOR (over 60 years)

Hyperopia
Myopia
Astigmatism
Presbyopia slows down near 60 years old
Aging of the eye is often associated with diseases that can lead to low vision or blindness



REFRACTIVE ERROR CASES BY REGION

2018
Population 4.7B



NORTH AMERICA
0.3B RE
(0.06B URE)

EUROPE
0.5B RE
(0.16B URE)

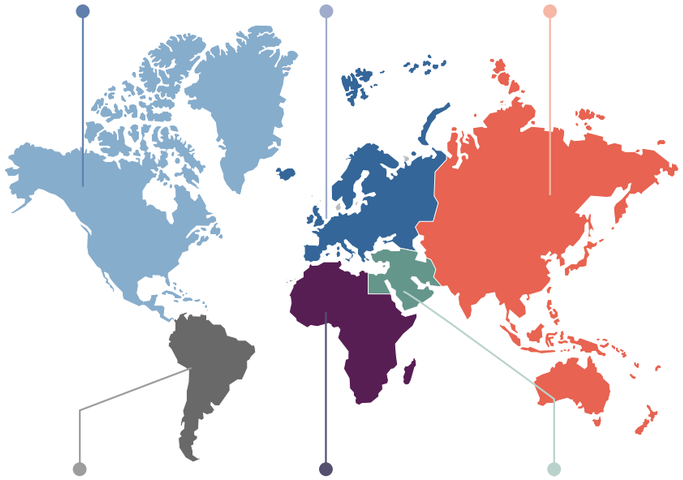
ASIA
2.8B RE
(1.76B URE)

LATIN AMERICA
0.4B RE
(0.18B URE)

AFRICA
0.4B RE
(0.34B URE)

MIDDLE EAST
0.3B RE
(0.18B URE)

2050
Population 6.6B



NORTH AMERICA
0.3B RE
(0.06B URE)

EUROPE
0.5B RE
(0.1B URE)

ASIA
3.8B RE
(1.15B URE)

LATIN AMERICA
0.5B RE
(0.17B URE)

AFRICA
1.0B RE
(0.73B URE)

MIDDLE EAST
0.5B RE
(0.28B URE)

TOP 10 COUNTRIES WITH LARGEST URE POPULATIONS

2018
Population 2.7B

- 23% live in India
- 22% live in China
- 5% live in Indonesia
- 3% live in Pakistan
- 3% live in Bangladesh
- 3% live in Nigeria
- 3% live in Brazil
- 2% live in Russia
- 2% live in Philippines
- 2% live in Vietnam

2050
Population 2.5B

- 19% live in India
- 6% live in Nigeria
- 5% live in China
- 4% live in Indonesia
- 4% live in Pakistan
- 3% live in Democratic Republic of the Congo
- 2% live in Bangladesh
- 2% live in Brazil
- 2% live in Ethiopia
- 2% live in Philippines

The true cost of uncorrected poor vision

Despite the staggering number of people it affects, the impact of poor vision is largely unknown by those with the ability to influence, change and enforce public policy for good eye health.

Many of those suffering do not know something can be done or may be subject to cultural stigmas around vision correction or use of glasses.

30%
of commercial drivers[9] lack the ability to see in the distance, putting themselves and others in danger

Children with poor vision are 3x more likely to fall behind in class[10]

In the UK, elderly with low vision are more prone to falls - treating these injuries cost GBP128 million[11] every year

Every year uncorrected poor vision costs the global economy $272 billion[12] in lost productivity.

And the problem is only getting worse.

Modern lifestyles, including children spending less time outdoors and the ever increasing use of screens, have contributed to a rise in myopia. This crisis is predicted to reach epidemic proportions. By 2050, over 50 percent of the world's population is expected to suffer from myopia[13], many with serious vision-threatening side effects and drastic long-term implications.

But it doesn't have to be this way.

We can choose to solve it.

[9] Extrapolated from: Central Road Research Institute, "Assessment of Visual Limitations of Commercial Drivers in Metropolitan Cities in India," Vision Impact Institute (September 2017), https://visionimpactinstitute.org/research/assessment-visual-limitations-commercial-drivers-metropolitan-cities-india-interim-report/.
[10] Carolina Cumani Toledo et al., "Early Detection of Visual Impairment and its Relation to Academic Performance," Rev. Assoc. Med. Bras. [online] vol.56, n.4 (2010): 415-419, http://dx.doi.org/10.1590/S0104-42302010000400013.
[11] Bruce J. W. Evans, and Gillian Rowlands, "Correctable Visual Impairment in Older People: A Major Unmet Need," Ophthalmic Physiol Opt. 24(3) (May 2004): 161-80. https://doi.org/10.1111/j.1475-1313.2004.00197.x.
[12] TST Smith et al., "Potential Lost Productivity Resulting from the Global Burden of Uncorrected Refractive Error," Bull World Health Organ. 87(6) (June 2009): 431–437, http://dx.doi.org/10.2471/BLT.08.055673. Updated for population and inflation, 2015.
[13] Kovin S. Naidoo PhD et al., "Potential Lost Productivity Resulting from the Global Burden of Myopia: Systematic Review, Meta-analysis, and Modeling," Ophthalmology Volume 126, Issue 3 (March 2019): 338-346, https://doi.org/10.1016/j.ophtha.2018.10.029.

State of the world today

More than 7.6 billion people share our planet. 2 billion of them enjoy vision correction provided by 600,000 eye care professionals predominantly operating in big towns and cities. But 2.7 billion people live with uncorrected poor vision due to a lack of affordability, access, awareness, and in some cases, acceptance.

There are many actions happening around the world today to bring good vision to everyone everywhere. These efforts are led by both the public and private sector and supported by multilateral organizations and donors. The following pages highlight some examples of:

- Affordable products
- Access creation
- Refraction tools
- Public awareness
- Expansion of funding
- Government programs
- Coalitions and data



AFFORDABLE PRODUCTS

Essilor's experience shows the men and women who live in BoP communities share the same aspirations as consumers with high levels of disposable income. They want quality, comfort and style at a price they can afford.

In 2013, Essilor recognized the need to produce solutions to meet these aspirations and invested in the development of an affordable product range. In 2019, more than 250 affordable styles, certified to European standards, are available for BoP consumers and NGO partners through 2.5 New Vision Generation™ (2.5 NVG™).

Despite this and other successes, there is a need to do more.

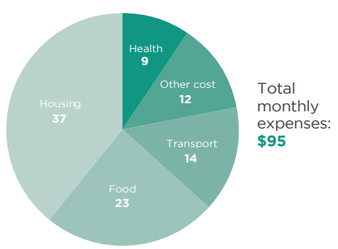
In addition to continued innovation to increase the affordability of glasses, further efforts are needed to develop logistics and supply chains that can keep cost-to-serve low. Progress on this front remains limited. However this is not a unique challenge for eye health and does not need to be the case. Best-in-class examples can be found in consumer goods companies who have successfully provided products like personal care and beverages to rural communities.

Regulatory barriers and high import duties also inhibit the reduction of delivery costs around the world. Until this is addressed by national governments, affordability will remain an issue.

Studies found on average, Asia's working poor are willing to pay ~three days wages ($7-$11) for glasses[14].

Working poor average monthly expenses, USD per person (absolute, not PPP[15])

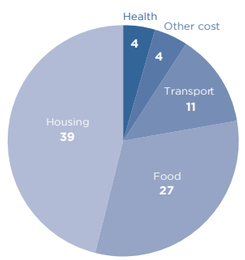
CHINA, 2016



Total monthly expenses: **$95**

3.4 days of working poor income in China is **USD ~$10.80**

INDONESIA, 2018



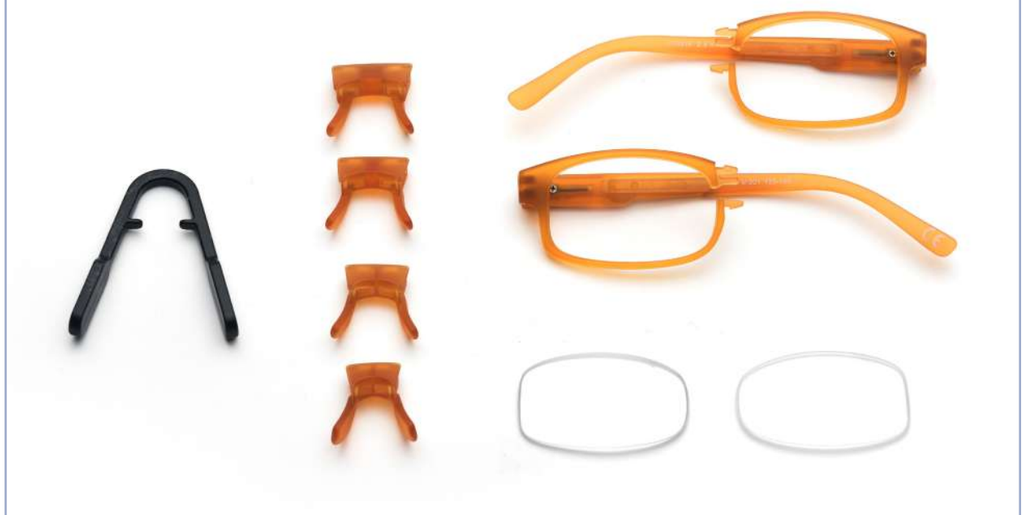
Total monthly expenses: **$85**

3.4 days of working poor income in Indonesia is **USD ~$9.60**

[14] McKinsey & Company extrapolated the data based on the following studies conducted in China, Indonesia and Bangladesh.
- China: "China Consumption Trends - China Digital Banking Report 2017," BBVA Research, accessed August 27, 2019, https://www.bbvaresearch.com/wp-content/uploads/2017/03/2017-China-Consumption-Trends-1.pdf.
- Indonesia: McKinsey & Company used mean single adult monthly data from Living Wage Series for overall population (urban + rural) - January 2018 in local currencies and converted to USD using exchange rates as of 23 November 2018. Source: "Living Wage Series - Indonesia - January 2018 - In Rupiah, per Month," WageIndicator.org, accessed August 27, 2019, https://wageindicator.org/salary/living-wage/indonesia-living-wage-series-january-2018-country-overview.
- Bangladesh: estimates are based on study "Understanding Demand and Provision of Eye Care Services among Slum-Dwellers in Dhaka, Bangladesh". Source: Dr. Malabika Sarker et al., "Understanding demand and provision of eye care services among slum-dwellers in Dhaka, Bangladesh," IAPB.com, accessed September 5, 2019, https://www.iapb.org/wp-content/uploads/Bangladesh-Report_final-version_02-06-2015.pdf.

[15] PPP stands for Purchasing Power Parity - a way of measuring prices at different locations and different currencies using a common currency.

The Ready2Clip™ range is designed to fit any face shape and enables on-the-spot customization and delivery for each wearer, adapted to their unique prescriptions.



"Using ready-made spectacles for school eye health programs can increase access to spectacles for children. Dispensed on the spot, they have the potential to increase compliance by reducing waiting time and minimizing costs for parents. The cost savings to programs is also significant (over USD 1,500 per 100 children needing spectacles) allowing service providers to utilize these resources for other aspects of the program e.g. health education, primary eye care services."

Dr. Priya Morjaria, PhD completed her doctorate on interventions to increase the efficacy of school eye health programs and implemented a clinical trial on the use of Ready2Clip™ glasses.





ACCESS CREATION

There are a number of initiatives providing access to subsidized/free and sustainable services that have seen great success over the years.

Governments and NGOs have long-established vision centers and other integrated eye health services as the critical backbone of eye care infrastructure. Hospitals have further developed this network through onsite and satellite locations. Mobile (van) clinics, while incurring a capital expense and running costs, have proved extremely effective in providing access to rural communities.

Hospitals and NGOs have perhaps had the biggest impact to date on eye health through eye camps and outreach services. Traditionally leveraged to identify and treat conditions like cataracts and glaucoma, many have more recently begun to integrate refraction services. However, there is a recognition these need to adapt to sustainable eye care programs implemented at scale.

Since 2013, Essilor's inclusive business, 2.5 NVG™, has worked to help support and extend the eye care infrastructure for refractive error through a range of sustainable models.



Working to create sustainable access where none exists, 2.5 NVG™'s flagship model **Eye Mitra** ('Friend of the Eye' in Hindi), trains young, under and unemployed people to become primary vision care providers. The program trains them to carry out basic vision tests, refer people to other eye care providers for non-refractive issues, and supports them to set up their own business to sell prescription glasses and sunglasses in their community.

Participants follow certified vocational training in refraction and visual health over 12 months as well as learn the commercial skills to run a successful small vision care business. Essilor provides ongoing skills and entrepreneurship training and logistics and marketing support to help Eye Mitras grow their business, and run outreach screening events to expand vision care to outlying rural areas. Today, Eye Mitra is the world's largest rural optical network.

> **"A large part of our success in providing widespread vision care is down to the investment we have made in training across all levels; from Vision Technicians to Optometrists and Ophthalmologists. By creating this comprehensive infrastructure we have been able to provide for even the most remote and hard to reach communities."**

Dr. Gullapalli N Rao
Founder-Chair, L V Prasad Eye Institute

In Indonesia, there is a unique network. 30,000 primary vision care providers, known as Optik Keliling ('Mobile Optician' in Bahasa), travel on motorbikes to perform basic vision screenings and provide glasses outside cities. Essilor is working to upskill these entrepreneurs with specialist training to provide affordable, quality vision care across Indonesia. After completing a course in refraction, business management and referral training, participants qualify as Mitra Mata ('Friend of the Eye' in Bahasa). Essilor offers Mitra Matas the opportunity for further professional development through its Mitra Mata Optician program. Comprising continual professional development and specialized training recognized by optometry schools, the program supports Mitra Matas to set up optical shops in their communities.

Independent NGO OneSight works within existing public health systems to create sustainable access. Working with local governments, they build and develop vision centers, providing vision care at a community level and a source of income for the public health facility to promote sustainability. Since 2013, they have established 131 vision care centers.

"The introduction of our self-sustaining solution demonstrates how the global vision care gap can be solved through partnering and empowering local governments and NGOs to provide self-sustaining care."

K-T Overbey
President and Executive Director, OneSight

Even with these and other efforts, sustainable access for BoP communities remains limited.



REFRACTION TOOLS

Despite progress in affordability and access, the equipment and tools needed to diagnose refractive errors are still prohibitively expensive.



Autorefractors are costly and require electricity to run, and retinoscopes, although relatively inexpensive, are difficult to use. Unless we can resolve this bottleneck for vision care organizations and entrepreneurs, we will never realize the scale of access needed to serve everyone, everywhere.

> **Correcting refractive error is one of the most cost-effective ways individuals with poor vision can realize their potential. Appropriate technology to identify those in need and ensure they get affordable treatment in a timely manner will radically increase access to good vision and all the benefits it brings.**
>
> **Dr. Andrew Bastawrous**
> Co-Founder and Chief Executive Officer, Peek Vision

Some promising innovations include:

QuickSee, designed by PlenOptika (USA) and manufactured by Aurolab, is a handheld autorefractor that makes clinically accurate[16] measurements possible anywhere. It combines an open, binocular view and wavefront aberrometry in a portable, field-durable format. In 2017 QuickSee was awarded a special Grand Jury Prize in the Essilor See Change Challenge for its innovative approach to addressing the global burden of poor vision. e-see is a special version of QuickSee exclusively for Aurolab to market in the SAARC[17] region.

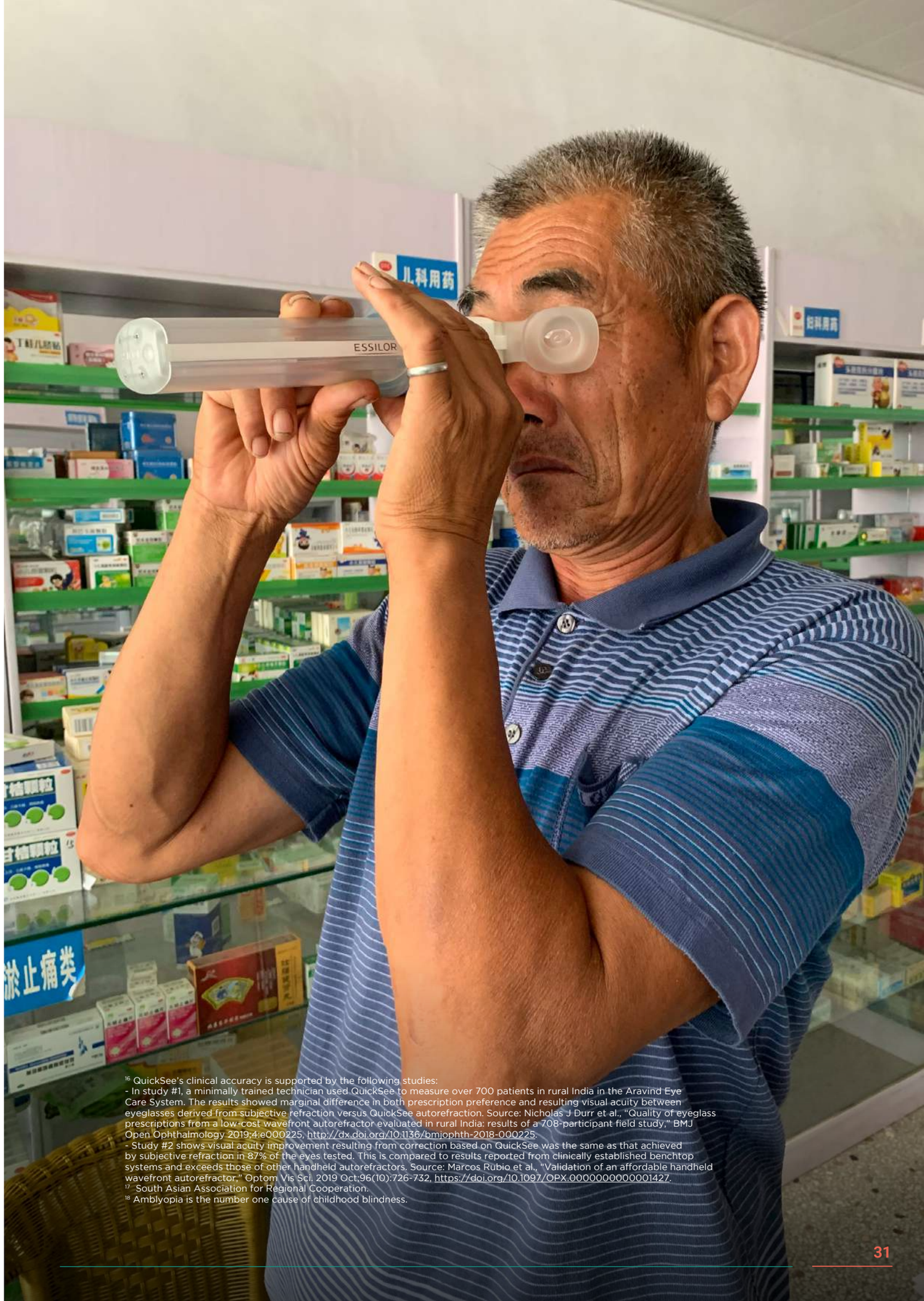


GoCheck Kids is an easily deployed, low-cost mobile app used to detect amblyopia[18], risk factors in children too young for visual acuity tests. It is currently only available in the US.



ClickCheck was the winner of the See Change Challenge launched by Essilor in 2016 to uncover low-cost, easy-to-use, scalable solutions that can be used by primary vision care providers in underserved areas to accurately measure refractive errors. Pilot tests in India and Indonesia of this portable, handheld device have shown more than adequate accuracy for an initial diagnosis. At the time of print, the device is expected to be available for use by primary vision care providers for $50 by the end of 2019.





[16] QuickSee's clinical accuracy is supported by the following studies:
- In study #1, a minimally trained technician used QuickSee to measure over 700 patients in rural India in the Aravind Eye Care System. The results showed marginal difference in both prescription preference and resulting visual acuity between eyeglasses derived from subjective refraction versus QuickSee autorefraction. Source: Nicholas J Durr et al., "Quality of eyeglass prescriptions from a low-cost wavefront autorefractor evaluated in rural India: results of a 708-participant field study," BMJ Open Ophthalmology 2019;4:e000225. http://dx.doi.org/10.1136/bmjophth-2018-000225.
- Study #2 shows visual acuity improvement resulting from correction based on QuickSee was the same as that achieved by subjective refraction in 87% of the eyes tested. This is compared to results reported from clinically established benchtop systems and exceeds those of other handheld autorefractors. Source: Marcos Rubio et al., "Validation of an affordable handheld wavefront autorefractor," Optom Vis Sci. 2019 Oct;96(10):726-732, https://doi.org/10.1097/OPX.0000000000001427.

[17] South Asian Association for Regional Cooperation.

[18] Amblyopia is the number one cause of childhood blindness.



PUBLIC AWARENESS

While possibly the most critical intervention to drive the uptake of services, we have seen comparatively little success in raising awareness of refractive error on a large scale.

We know from the success of awareness-raising around cataracts and trachoma, eye health campaigns can drive not only patient awareness and education, but also advocacy engagement.

However, there are unique challenges when it comes to awareness and education on refractive error. Even when services are available, people do not get their vision tested. Why? Many people are unaware their vision problems can be solved, have learned to compensate or may be subject to cultural stigmas around wearing glasses.

Awareness for the uptake of services is just one aspect of what is needed.

Advocacy is also needed to raise awareness of good vision and its socio-economic impact among policy makers and key opinion leaders. Read more on existing advocacy efforts on page 40.

One such campaign tackling these issues is **See Now.**

See Now is a global campaign created by **The Fred Hollows Foundation** in partnership with Sightsavers, Vision 2020 and Essilor's social impact fund Vision For Life™. Its objective is to increase awareness and drive public mobilization on ending avoidable blindness and vision impairment.

In 2019, See Now launched a pilot campaign in Uttar Pradesh, North India, with the support of celebrity ambassador Amitabh Bachchan. The campaign was designed to be sustainable, calling for people to get their vision tested at existing eye care services. Targeted communications on eye health were delivered via social media, radio, television, local newspapers, WhatsApp, cinema advertising and outdoor billboards. Using a free "call back" service, respondents were advised the location of their nearest eye health service. And results were positive:

- At the time of print the campaign had reached more than 32 million people
- Four out of five people requested a call back to learn where their nearest service is located
- Eye camps in urban and regional settings saw a 38 percent increase in attendance
- The message was passed among families and communities; while men were overwhelmingly the recipients of the call center calls, women were the predominant attendees to camps

EXPANSION OF FUNDING

NGOs and governments have long fulfilled a critical role providing subsidized and free services, but a significant global funding gap still remains. Encouragingly a number of efforts have been announced in recent years to help fill this gap, but they are not enough. These include:

The Vision Catalyst Fund, an ambitious multi-stakeholder initiative to bring eye care to all people in the Commonwealth and around the world is set to launch in 2020 with public and private sector partners including Standard Chartered, UBS, Essilor International, Clearly, Sightsavers, The Fred Hollows Foundation, the International Agency for the Prevention of Blindness, CBM and the London School of Hygiene and Tropical Medicine.

Once operational, the $1 billion Fund will seek to accelerate systems change and expand universal eye health services led by governments, to provide sustainable and efficient long-term solutions for eye health.



ATscale is a global partnership of DIFD, USAID, WHO, UNICEF, Kenya, Norway, the Clinton Health Access Initiative and others. Its objective is to accelerate access to assistive technologies for 500 million people by 2030, through service delivery and market-shaping approaches. Glasses, wheelchairs, hearing aids and prosthetics, along with others, have been recognized as critical devices to alleviate disability around the world.

Vision For Life™, Essilor's social impact fund was created in 2015, to support sustainable vision care infrastructure and programs, focusing on the one in three people in the world living with poor vision. It is dedicated to eliminating uncorrected refractive error.

Launched in March 2018, the Cameroon Cataract Bond is a type of Development Impact Bond, a results-based contract in which investors provide financing for social programs upfront, and donor organizations repay investors their principal plus a return based on realized performance in delivering social outcomes. The Cataract Bond will support the Magrabi ICO Cameroon Eye Institute (MICEI) to provide 18,000 cataract surgeries in Cameroon over five years, enabling low income patients to receive surgery for free or low cost, and help MICEI become self-sufficient in five years. The bond is led by the Cataract Bond Design Coalition, comprising The Fred Hollows Foundation, the Conrad N. Hilton Foundation, Sightsavers, the African Eye Foundation and Volta Capital.

"The Cameroon Cataract Bond has strengthened our community-wide mandate to 'reach out to all' in so many ways. Not only by giving a new impetus to our outreach activities but also helping us realize how many more 'needs' are out there besides the cataract blind. Which explains why our outreach services now routinely include screening for diabetic retinopathy and refractive errors, and providing readers to all those in need of them onsite.

While the above initiatives, many of them hospital-based, may go some way in helping address the current huge gap in refractive services delivery, more sustainable approaches, built on networks of or nation-wide fixed access points, must urgently be promoted, further tested and where successful, scaled up. Something which, at MICEI, we plan to do and properly document."

Professor Daniel Etya'ale Essi
Chief Executive Officer, Magrabi ICO Cameroon Eye Institute (MICEI)



GOVERNMENT PROGRAMS

No efforts will truly reach the rapid scale needed to eliminate poor vision by 2050, without the engagement of national and local governments. There are encouraging actions happening in different corners of the world.

In 2017, the Government of Liberia launched a national campaign in collaboration with EYElliance and its members (Sightsavers, LV Prasad Eye Institute, OneSight, Our Children's Vision, Essilor's 2.5 NVG™ and New Sight Eye Center) to provide eye care to Liberians via schools and community health workers. The campaign is due to screen 1 million school students for vision problems every year and provide glasses to those in need. In addition, 1.2 million Liberians living in remote communities far away from existing health care will also receive basic vision care.

The Government of Botswana developed a National Plan for Eye Health to reduce avoidable blindness by 30 percent and all visual impairment by 25 percent by 2020 – in line with commitments to the WHO's Global Action Plan[19]. Part of its plan includes a particular focus on national school eye health. The government makes use of Peek Vision's technologies to scale and optimize health service delivery across schools in the country, including the use of a smartphone app to facilitate vision screenings. Botswana is also fortunate to have a relatively high number of eye health professionals (compared to other nations in the region). This means comprehensive eye exams conducted at, or near schools, will be performed by a combination of private optometrists and public eye health professionals employed by the Ministry of Health & Wellness. 500,000 children will receive a vision screening, a pair of eyeglasses if needed, and be referred for appropriate treatment if non-refractive eye conditions or disorders are found.



In 2008 the Government of Uganda implemented a National Intervention on Uncorrected Refractive Errors. The program trains eye health personnel to conduct refraction screenings and order affordable glasses which are then delivered in three days. In addition, integrated school eye health initiatives and an Optometry degree, subsidized by the government, have been introduced. Recognized by the International Council of Ophthalmology as 'best practice', the program is supported by Light for the World and Brien Holden Vision Institute.

Project DRESTI (District Refractive Error and Eye Care Search and Treat Initiative) was launched by the Clear Vision Collective comprising VisionSpring, BRAC, OneSight, Orbis and Essilor's 2.5 NVG™, in partnership with the Government of Bangladesh. Over a two-year pilot period, the project aims to dramatically increase eyeglasses coverage and vision correction rates among adults and children in the Sherpur district of Bangladesh, by using inclusive market-based solutions to provide sustainable vision care services.

The Government of Bhutan has committed to being the first country to be free from refractive error. By strengthening the current health system's vision screening capabilities and supporting the creation of a network of vision care entrepreneurs, the availability of affordable solutions will be made more widespread and sustainable. To drive the uptake of services, community-level health assistants and the nationwide network of monasteries will spread awareness about the importance of good vision.

In 2018, the State Government of Telangana, India pledged to create the first state free from avoidable blindness. Providing universal eye care to state citizens, medical teams screened 35 million people, provided glasses, medicine, surgery and other treatments free of cost to those in need, and ran awareness and education campaigns on eye health. The program, Kanti Velugu (Eye Light), was successfully completed in only eight months, with 27 percent of those screened equipped with free glasses, and 0.93 million identified for secondary and tertiary referrals. Medical teams comprised a medical officer, an optometrist and up to eight support staff.



"Ensuring our citizens can see well is one of the most simple but effective things we can do to ensure a good quality of life."

Shanti Kumari
IAS, Chief Special Secretary, Health & Family Welfare, Government of Telangana, India

[19]Andrew Bastawrous et al., "Blindness and Visual Impairment Due to Age-Related Cataract in Sub-Saharan Africa: A Systematic Review of Recent Population-Based Studies," Br J Ophthalmol. 97(10) (October 2013): 1237-43, http://dx.doi.org/10.1136/bjophthalmol-2013-303135.



The Ministry of Health and Family Welfare of the **Government of Karnataka** launched the Namma Kannu Namma Doddaballapura (My Eyes, My Doddaballapura) with the support of Prerana Trust, Drishti Eye Hospital and Essilor Vision Foundation (EVF) India in 2018, to make Doddaballapura the first Indian region free from uncorrected refractive errors by 2021. A team of trained personnel will visit every household of Doddaballapura to conduct eye screenings, dispense glasses if needed and spread awareness on the importance of good vision. People with complex vision correction needs who cannot be equipped on the spot will be referred to a mobile eye camp. There they will receive a comprehensive eye exam carried out by staff from Drishti Eye Hospital. Within 15 days, a pair of customized corrective glasses will be delivered to their doorstep. The goal is to reach 325,000 people across the region's 290 villages and 33 urban wards.

The **Government of Huoqiu County, Anhui Province, China** is the first in the country to commit to and execute plans to eliminate poor vision from the county. In 2019, it announced a partnership with Essilor and Huoqiu Boai Hospital to correct the vision of its people in three years. The partners will conduct vision screenings for more than 200,000 elderly people and school children across the county, and provide free glasses to those who cannot afford them. They will also collaborate on training support for vision care providers and other philanthropic activities.

While these and other efforts are commendable, other governments must follow their example if the world is ever to be free of uncorrected refractive errors. Including refractive services as an integrated part of eye care and health services is an absolute necessity.

"The joy in the face of a rural school child when they see their vision can be clear is something to cherish. We know how to create the required talent, use proven low-cost technology and create sustainable economics to ensure everyone in a given geography can be screened and treated. It is time for Social and Philanthropic capital along with Governments to make the commitment to scale up these innovations and ensure a world without uncorrected refractive errors."

Kiran Anandampillai
Founder and Chief Executive Officer. Drishti Eye Hospitals

COALITIONS AND DATA



Both within and outside public health, coalitions are effective in catalyzing efforts and campaigning for change, while independent data has helped to define strategies and move agendas.

The World Health Organization (WHO) publishes data driven, vision-centric publications, including the upcoming World Report on Vision. The report will offer recommendations focused on ensuring comprehensive and integrated vision services to assist countries to reduce the burden of vision loss, improve the lives of people with vision impairment, and achieve the UN SDGs.

Founded in 1975, the International Agency for the Prevention of Blindness (IAPB) is perhaps the most well established alliance of civil society organizations, corporations and professional bodies promoting eye health. IAPB leads international efforts in blindness prevention and its Refractive Error Work Group is specially tasked with keeping the issue of refractive error on the agenda of health and development policy makers.

IAPB's Vision Atlas provides comprehensive data and evidence on avoidable blindness. The data provides a wealth of information relevant to policy makers, health planners, eye health professionals, NGOs, patient groups and advocates. The Vision Atlas is a valuable resource for those responsible for achieving Universal Health Coverage and the implementation of the SDGs.

Established in 2016, EYElliance is a multi-sector coalition that drives the global strategy to increase access to spectacles at scale. Its report, Eyeglasses for Global Development: Bridging the Visual Divide, published with The World Economic Forum in 2016, is a collection of findings on the urgent need for national governments, the private sector and development partners to substantially increase investment in providing eyeglasses to improve educational outcomes, increase productivity and stimulate the global economy. In 2018, EYElliance's efforts led to the US Government allocating a distinct line item for the provision of eyeglasses within USAID's annual budget.

The Vision Impact Institute (VII) curates a global database of reports, studies and articles to inform government policymakers, optical industry professionals and other advocates. Its objective is to increase awareness of the importance of good vision and inform smart policy decisions.

In 2016, the VII, in partnership with Optometry Giving Sight and other US organizations, created Kids See: Success, an initiative designed to advocate for eye exams for children before they enter kindergarten. The campaign's most notable success to date has been lobbying the State of New Jersey to require children, age six and younger, entering a public preschool, public school, or a Head Start Program for the first time, to have a comprehensive eye examination by January 1 of the child's first year of enrollment. Bill SB2804 passed unanimously in the Senate and then was unanimously approved by the State Assembly in May 2019. At the time of print, the Bill was pending the Governor's signature to pass into legislation.

Launched in 2016, Our Children's Vision was founded by the Brien Holden Vision Institute and Essilor's Vision For Life™ to accelerate and expand access to eye health services for children all over the world. Over 80 partners share a commitment to reach 50 million children by 2020. Essilor supports the campaign by providing free glasses to partner programs. By the end of 2019, it will have supported the donation of more than 500,000 pairs of glasses.

While today's efforts have made great progress, actions must be scaled and any shortfalls addressed to meet the needs of a growing population.



Where we could be by 2050 and how much it will cost

McKinsey's analysis estimates $14 billion is needed to create a world free from uncorrected refractive errors.

This is to be invested in:

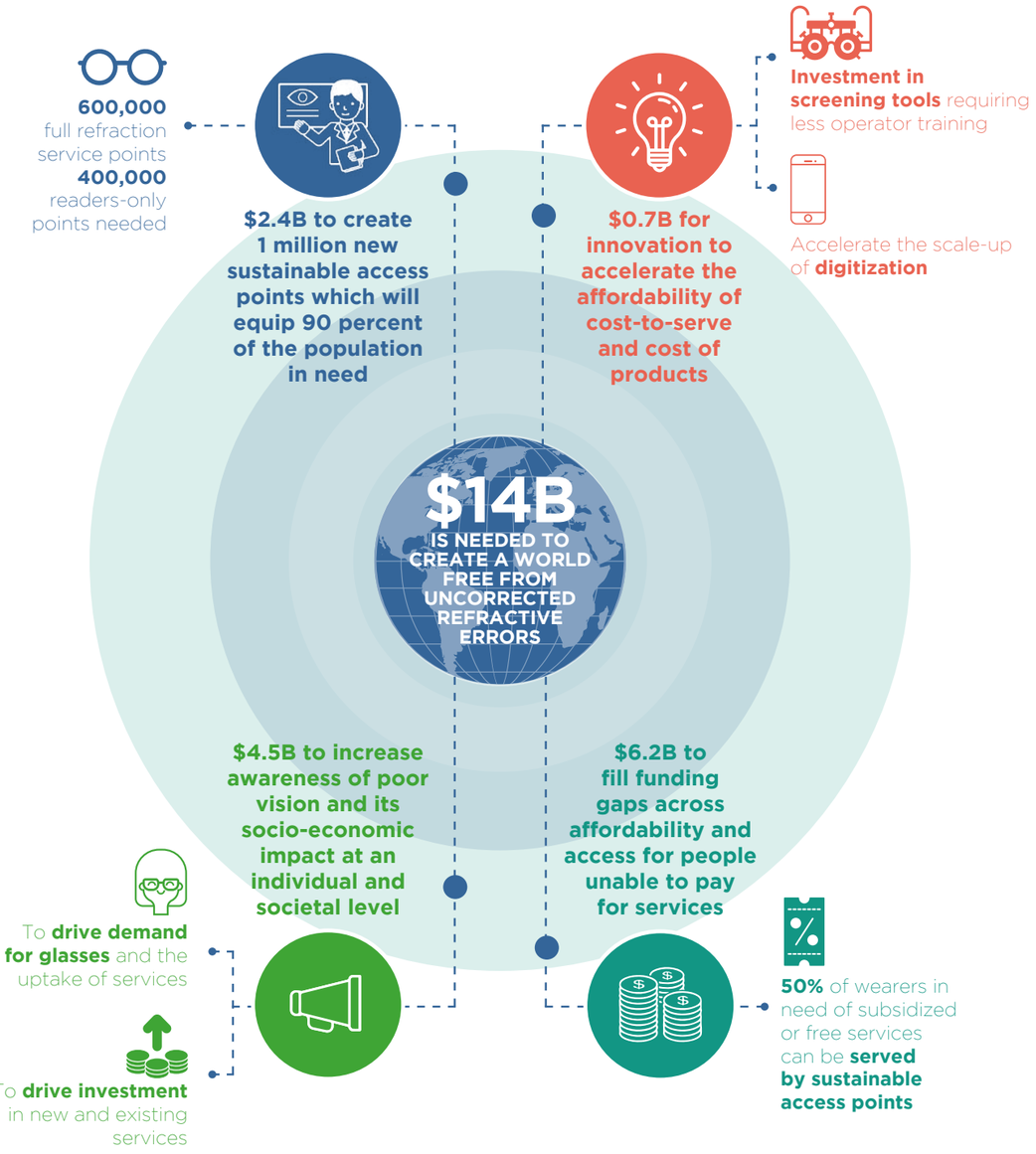
- Creating sustainable access points
- Innovating for affordable solutions
- Funding subsidized and free services
- Raising awareness

This allows for relatively conservative investment in innovation to break down existing bottlenecks including, but not limited to, low-cost, easy-to-use autorefractors and technologically advanced delivery systems.

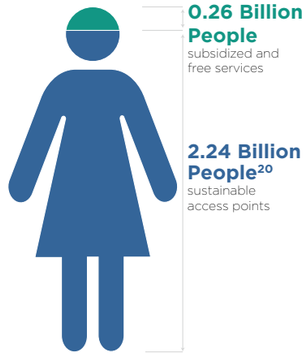
A small fraction of the total invested in public health, $14 billion for eye health will generate huge socio-economic returns.



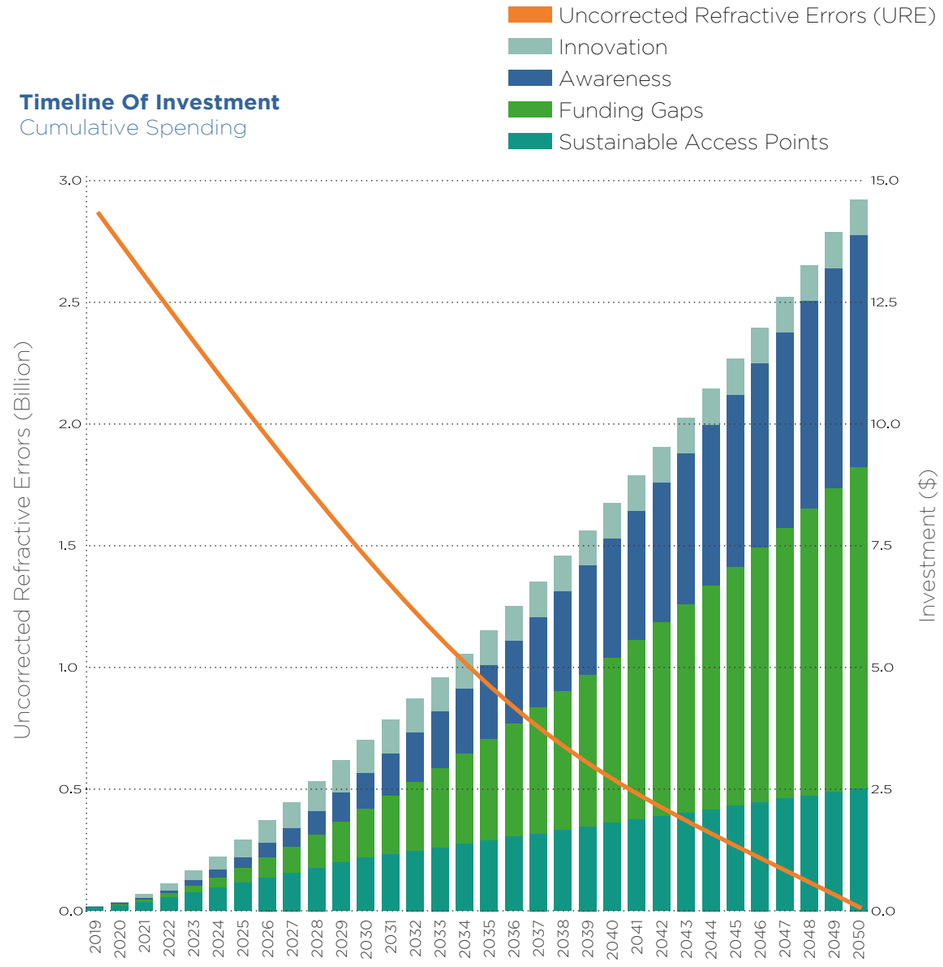
POOR VISION CAN BE ELIMINATED BY 2050



How 2.5 Billion People Will Be Served



Timeline Of Investment
Cumulative Spending



Governments, NGOs, bilateral and multilateral organizations, donors and the private sector all have a role to play in securing this funding. While strategic investments will be made at specific times to prioritize action in certain areas, investment cannot be made into one area in isolation; awareness drives demand, sustainable access points provide the service, affordable solutions make the cycle sustainable and a portion of the population will always need subsidized/free support.

[20] With most retail categories witnessing a rapidly growing e-commerce share and assumed developments in digital eye screening and vision tests, McKinsey & Company's analysis conservatively surmises 25 percent of wearers, 0.56 billion, will be served through e-commerce and will not require a physical access point.

CREATING SUSTAINABLE ACCESS POINTS

1 MILLION NEW ACCESS POINTS CAN EQUIP 90 PERCENT OF THE POPULATION IN NEED

McKinsey's analysis shows it will cost $2.4 billion to create 1 million new sustainable access points, offering products and services at an affordable price point[21], to serve 90 percent of the BoP population who are able and willing to pay for products and services[22].

Sustainable access points are defined as those providing ongoing access to the services and products needed to correct someone's vision (e.g., screening, refraction, spectacles). These access points are managed to ensure financial sustainability, guaranteeing communities have ongoing access without the need for subsidy.

~600,000 FULL REFRACTION ACCESS POINTS

~600,000 full refraction sustainable access points are needed to serve those requiring bespoke prescriptions.

Where this service is not required (primarily people over 35 who have become presbyopic), readers-only access points will suffice.

~400,000 READERS-ONLY ACCESS POINTS

Readers-only sustainable access points do not need to stand alone. They can, and in most cases should, be integrated into existing channels, including pharmacies and general stores. This assumes reading glasses can be dispensed without a highly trained technician, as is common in many countries today. Education on the need for a regular, comprehensive eye exam must happen in parallel.

90 PERCENT OF THE PROBLEM SOLVED FOR 17 PERCENT OF THE TOTAL COST

The cumulative investment needed into financially sustainable access points is calculated to be $2.4 billion, approximately 17 percent of the total $14 billion investment for the global elimination of uncorrected refractive errors. This is lower than the cost estimates associated with raising awareness or the provision of subsidized and free services.

50 PERCENT OF WEARERS IN NEED OF SUBSIDIZED OR FREE SERVICES, CAN BE SERVED THROUGH SUSTAINABLE ACCESS POINTS

As McKinsey considered what it would take to serve those who could not afford even the most affordable glasses, they determined this financially sustainable infrastructure was a platform from which subsidized or free glasses could be distributed to the most financially vulnerable. While recognizing these schemes (e.g. voucher schemes), administered through a mix of sustainable channels, are not easy to structure or manage, this is an important finding as we work towards efficient solutions that can equip everyone who needs glasses and does not currently have access. In this context, local vision care entrepreneurs have the potential to become suppliers of affordable optical correction to local hospitals and clinics, resolving current logistics and financial barriers.

[21] Studies found on average, Asia's working poor are willing to pay ~three days wages ($7-$11) for glasses. Please refer to page 24 for more information.
[22] Predicated on the scale-up of existing access points and assumes global costs are similar to those observed in Asia.



There is also an opportunity to explore the feasibility of local governments working to build capacity to operate and manage vision centers within existing public health facilities. OneSight has seen success with this model, working with several African governments, building and developing capacity in vision centers to provide a source of income to the public facilities while establishing sustainable vision care services at a community level.

Many of the rural and semi-urban communities in need of vision care services are also burdened with high rates of under and unemployment among youth. Including members of these communities in the solution, by providing them with the skills, knowledge and tools to become vision care entrepreneurs, does not simply just provide local vision care. This model of inclusive business supports sustainable livelihood promotion, as proven by the Eye Mitra model.

McKinsey's analysis concluded innovative finance models provide opportunities to raise the funds required to eliminate poor vision. An impact bond, that is pay-for-success, is a suitable instrument to promote the inflow of funds to scale the training of vision care entrepreneurs and equip them with the requisite starting equipment.

"Dalberg's analysis of training vision care entrepreneurs shows there are compelling impact outcomes in the education, economic, socio-cultural and health space. There is a significant Social Return on Investment for impact oriented investors."

Gaurav Gupta
Partner and Regional Director for Asia, Dalberg





SUMMARY

Who has a role to play?
Private sector, Governments, NGOs

What does success look like?
1 million new sustainable access points within one day's return travel for 100 percent of population

What is required to fill the gaps by 2050
- Scale-up of country-specific sustainable access points to all regions and demographics that can be sustainably served
- Building government capacity to launch and sustain vision centers alongside public health posts
- Deploy innovative financing schemes to catalyze rapid scale-up of inclusive businesses
- Leverage technology to increase coverage of access points and referral systems

What will it cost to achieve this?
$2.4B

INNOVATING FOR AFFORDABLE SOLUTIONS

$0.7 BILLION IS NEEDED FOR INNOVATION TO ACCELERATE THE AFFORDABILITY OF COST-TO-SERVE AND COST OF PRODUCTS

This was estimated by benchmarking the size of the need to similar innovation funds set up in different contexts.

INVESTMENT IN INNOVATION TO BE FRONT-LOADED IN THE FIRST THREE TO 10 YEARS

While the exact figure of how much investment will be needed to find the innovative breakthrough that can bring down barriers to scale remains debatable, what is clear is the need for the investment in innovation to be front-loaded in the first three to 10 years. This will ensure the resulting technologies and solutions can scale up to the required levels by 2050.

The cost of dispensing an affordable pair of spectacles is dependent on three things:

- affordable products
- affordable refraction tools
- a supply chain that can keep cost-to-serve low

EMERGING LOW-COST AUTOREFRACTOR TECHNOLOGIES SIGNIFICANTLY REDUCE THE COST TO SUPPLY

While there has been progress in affordable products, the design and cost of supply interventions could be radically impacted by emerging autorefractor technologies that are both low-cost and require less operator training.

DIGITAL OR AUTOMATED SCREENING TOOLS CAN ACCELERATE SCALE-UP

Innovations for low-cost digital or automated eye screening and vision test tools, which act as an alternative to refractionists, can lower the cost-to-serve and greatly accelerate the pace of scale-up.

A mobile phone app combined with the rapid growth of e-commerce, can drastically reduce barriers to access. Improvements in digital vision testing will also be a driver for e-commerce, reducing the need to build physical infrastructure for access. At the time of print, advancements in mobile phone technologies suggest a self-refraction mobile phone app could be imminent. Combined with the rapid growth of e-commerce, it could drastically reduce barriers to access.

APPROPRIATE REGULATIONS AND REDUCTION IN IMPORT DUTIES WILL CREATE GREATER AFFORDABILITY

Prescription lenses and affordable frames should be excluded from import duties. Providing the cost savings are passed on to the consumer, greater affordability can be achieved.

To deliver the required volumes, the optical industry must expand to meet the manufacturing capacity necessary.

“Governments have a vital role to play by developing policies which promote comprehensive, person-centered eye care that is affordable and accessible to those most in need and by reducing or removing regulatory barriers and import duties where they restrict access to affordable glasses.”

Peter Holland
Chief Executive, IAPB



SUMMARY

Who has a role to play?
Private sector, NGOs, Governments

What does success look like?
Everyone above the extreme poverty line can purchase a solution for less than three days’ wages

What is required to fill the gaps by 2050

- Continue innovation to lower the cost of correction
- Invest in supply chains required to deliver volumes at low costs
- Appropriate regulations and import duties
- Establish manufacturing capacity necessary to deliver required volumes

What will it cost to achieve this?
$0.7B

FUNDING SUBSIDIZED AND FREE SERVICES

Funding for subsidized and free services is the most significant funding need of all the areas of investment and will serve 0.26 billion people. The most financially vulnerable population, the 0.26 billion people comprises:

- the destitute[23] population (assumed at 3 percent of the URE population), which will be served once every 2.5 years
- children from working poor[24] families, where every child will receive a free pair of spectacles before the age of 10

70 PERCENT OF THE $6.2 BILLION IS NEEDED FOR ASIA AND AFRICA

Asia
$2.5B
712M wearers[25]

Africa
$1.8B
412M wearers[25]

McKinsey estimates $2.5 billion is needed for programs in Asia, and $1.8 billion for programs in Africa where a large proportion of the world's destitute and children of the working poor will live between now and 2050.

It is expected the majority of world poverty will be concentrated in Africa (estimated at 103 million people by 2050), where affordability will continue to be a barrier to correcting poor vision.

In Asia, a part of the population will develop to cross the affordability threshold by 2050 but still live in rural areas with no access; the remaining will continue to face both affordability and access barriers (estimated at 94 million people by 2050).

By 2050, despite a smaller proportion of the population in Asia than in Africa being classified as financially vulnerable, philanthropic spending needed in Asia is projected to be greater because the overall population served is greater.

Asia and Africa are home to the largest numbers of people with uncorrected refractive errors. Together, they represent almost 50% of the global burden. This is due to the combination of two factors: the proportion of people having a refractive error – mainly myopia and presbyopia, and on the other hand, the proportion of these people having the appropriate optical correction. This correction rate is mainly determined by the economic development, which in turn drives access to refractive services and provision of spectacles.

In many places in Africa these services are not available and the vast majority (about 70%) of those with refractive errors, mainly presbyopia, have some level of vision impairment.

In Asia, the most populated region, the situation is essentially driven by the myopia epidemics, which in many places surpasses the development of refractive services. Behavioral and environmental factors that are at play are not predicted to change dramatically in the near future and a significant gap between the needs and the services will remain unless dramatic actions are taken. In addition, rapid population growth and aging in both Africa and Asia will make that these two regions will remain the most affected in the world; they need to be given the highest priority.

Dr. Serge Resnikoff
International Eye Health Expert,
Former Senior Policy Advisor and Coordinator,
World Health Organization

[23] Destitute or the extreme poor refers to people living with a daily income of <$1.90. This is based on the World Bank's definition of extreme poverty. Source: "Poverty." The World Bank, last modified April 3, 2019. https://www.worldbank.org/en/topic/poverty/overview.
[24] Working poor is a term coined by Essilor to contrast with 'destitute' or 'extreme poor' – it refers to people with household income of $1,000/month or less and people whom Essilor terms as non-compliant (i.e., above the household income threshold, but for whatever reason do not correct their vision). It is assumed that everyone with URE belongs to the working poor, except those who are destitute.
[25] Not unique wearers.



50 PERCENT CAN BE SERVED THROUGH SUSTAINABLE ACCESS POINTS

Again this figure is based on conservative innovation advances and assumes 50 percent of those in need of subsidized or free services can leverage financially sustainable access points through voucher schemes or similar. Despite the management difficulties associated with schemes administered through a mix of sustainable channels, this has the potential to reduce the cost of serving 0.13 billion people, to the cost of a pair of spectacles per person. The rate of service for this population will be proportional to the creation and scale-up of sustainable access points.

The remaining 50 percent will be served by the expansion of more traditional philanthropic services (e.g. vision camps, outreach services, government vision centers). The cost to serve each person would be direct program costs, including manpower, training and spectacles.

STRATEGIC PHILANTHROPY CAN HELP SUPPORT AND STRENGTHEN GOVERNMENT SERVICES FOR SUSTAINABILITY AND SCALE

To be most effective, philanthropic contributions to subsidized and free services should be strategically invested to support and strengthen government services. This analysis recommends a systems approach, integrating refractive services into broader eye health and health infrastructure. This is critical to ensure sustainability and reach. Adhoc or isolated philanthropy projects, while well intentioned, will have limited impact given the scale of the need.

Additional funding can act as a catalyst for service expansion when leveraged against existing government investment. In 2018, it was announced that the Vision Catalyst Fund, an ambitious multi-stakeholder initiative to bring eye care to all people in the Commonwealth and around the world is set to launch in 2020 with public and private sector partners. Once operational, the $1 billion Fund will seek to accelerate systems change and expand universal eye health services led by governments, to provide sustainable and efficient long-term solutions for eye health.

“Our experience and success in curing various eye conditions like cataracts through consistent high quality and low-cost care, shows us the eye health sector has the experience to create sustainable access to refractive services. A cross-subsidy business model has delivered success for Aravind Eye Hospital and further innovation in this area can only help the sector improve productivity, maintain quality and reach the scale needed. We strongly believe eliminating refractive errors from the world will bring in huge productivity gains and bring in tremendous improvements in the quality of life of everyone in the world.”

Dr. Aravind Srinivasan
Chief Medical Officer, Aravind Eye Hospital



SUMMARY

Who has a role to play?
Governments, bilateral and private donors

What does success look like?
Funding is available and distributed, allowing the poorest and most remote people to have corrective solutions

What is required to fill the gaps by 2050
- Expand funding for destitute URE, especially in Africa and Asia, to subsidize the cost of delivery and glasses
- Significantly reduce the barriers for access points or individuals to claim reimbursements through private or public health insurance schemes

What will it cost to achieve this?
$6.2B

RAISING AWARENESS

$4.5 BILLION IS NEEDED TO INCREASE AWARENESS OF POOR VISION AND ITS SOCIO-ECONOMIC IMPACT AT AN INDIVIDUAL AND SOCIETAL LEVEL

Increased awareness will help to:

- drive public demand for glasses and the uptake of services
- drive investment in new and existing services

DRIVING PUBLIC DEMAND FOR GLASSES AND THE UPTAKE OF SERVICES

Many people simply accept poor or deteriorating vision as a part of life, including young children who may not realize they see any differently to their peers, or adults who adapt to compensate for near vision loss. Some do not even know their vision can be improved or may be subject to cultural stigmas around poor or corrected vision. Alerting everyone to the transformative benefits of good vision is a crucial first step on the road to eliminating poor vision, while ensuring affordable services are accessible.

Education needed goes beyond one-off awareness-raising activities

A good understanding of what it takes to acquire and/or maintain good vision and eye health is ultimately required. This kind of behavior change needs sizeable and sustained investment.

Given the prevalence of URE in rural areas and among the urban poor, awareness methods that combine local outreach with low-cost mobile phone based messaging are likely to be the most effective tactics, costing <$2 per person[26].

Urgent need to prevent and manage myopia epidemic

The world is facing an unprecedented crisis with the rise in myopia. Not simply a form of refractive error, high levels of myopia (typically cases of -5 power or worse) can increase the risk of eye diseases and lead to permanent blindness. Modern lifestyles, including the use of screens and a lack of time outdoors, put children around the world, particularly in Asia, at risk. Myopia can be managed by early detection and the adoption of good vision habits.

Everyone has a role to play

The public and private sector have complementary expertise and skills which can be a powerful catalyst for health behavior change when aligned.

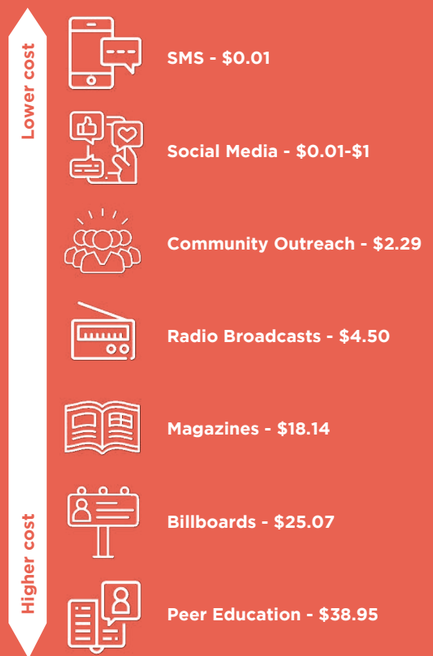
Leveraging their natural strengths, governments can contribute their expertise of public health messaging and the extensive reach of state-owned service delivery channels including, but not limited to, schools, community health workers and hospitals. NGOs, particularly the global health community, are experts in behavior change, and the private sector are practiced marketers and authorities on consumer insight.

Professional associations and their members are uniquely placed to support health promotion campaigns, particularly in the instance of myopia management, due to their proximity and contact with patients.

[26] Dalberg has assumed a ~$1 -$2 per person cost to raise public awareness, given the primary usage of (i) public outreach, with the need to reach rural consumers and the urban poor and (ii) digital media, with the increasing efficacy of marketing through digital channels and increasing digital adoption, especially in urban areas, based on the following sources:
- Justine Hsu et al., "Comparative Costs and Cost-Effectiveness of Behavioral Interventions as Part of HIV Prevention Strategies," Health Policy and Planning, Volume 28, Issue 1 (January 2013): 20–29, https://doi.org/10.1093/heapol/czs021. Behavior change is demonstrated by number of people reporting systematic condom use.
- Kara Hanson et al., "Cost-Effectiveness of Social Marketing of Insecticide-Treated Nets for Malaria Control in the United Republic of Tanzania," Bulletin of the World Health Organization 81 (4) (2003), https://www.who.int/bulletin/volumes/81/4/Hanson0403.pdf. For SMS, standard costs to mass SMS are used, leveraging rates of a large Indian provider (Exotel).
- Metricool, "Facebook Ads Study". Community outreach includes activities held in local communities and hosted by a network of 16 contracted nongovernmental organizations to disseminate messages via theatrical sketches, condom use demonstrations and the projection of short videos. Messages raise awareness on prevention and transmission of HIV, promote safer sexual behavior and address social norms.



Cost per person to drive health behavior change, by media channel[26]



Around the world people simply accept poor vision as a part of life because they have never heard there is a chance their sight could be improved. It's why community awareness raising and education are such a critical part of how we must respond to the challenge of rising rates of vision loss. Once there is awareness, we can address service delivery to communities most in need.

Eye health is a universal problem. This is why new approaches are needed to raise awareness inclusive of entire communities. Mobile phones, messaging apps, traditional newspaper advertisements, radio, and word-of-mouth are all important ways to make sure everyone hears about eye health. By informing whole communities, and reaching those in need directly, we can make sure people seek treatment."

Nick Martin
Deputy Chief Executive Officer,
The Fred Hollows Foundation

Limited research exists on the value of providing spectacles, so governments often de-prioritize spectacles from their agenda. There is a strong need to develop an evidence base around the value of providing eyewear and conveying this to secure public sector funding.

Kristan Gross
Global Executive Director, Vision Impact Institute

DRIVING INVESTMENT IN NEW AND EXISTING SERVICES

Increased awareness among policymakers and donors who can enable improvements in access, affordability and awareness through policy and programs is fundamental.

Making the case for investment

Successful engagement of key opinion leaders and investors on the need for funding in a specific health intervention or infrastructure, is most often seen when compelling research is presented by strong coalitions and aligned stakeholders. (How this can be done is explored on page 60).

Advocates for establishing vision care services have the opportunity to appeal to not only the health investors or policy makers, but also those representing education, work and productivity, safety - specifically road safety, employment, skills building, and many more. While some of these themes have been researched, there is potential for further exploration. Areas for exploration include: disaggregated data at a country level on prevalence rates, subpopulations and impact related data with respect to the impact of corrected refractive errors on education, employment, productivity, gender equality and road safety.





SUMMARY

Who is the natural owner?
Governments, NGOs, private sector

What does success look like?
People with RE obtain and use corrective solutions

What is required to fill the gaps by 2050
- Government programs to leverage community institutions (e.g., schools) as channels for information campaigns and screenings
- Consumer-facing awareness campaigns to address awareness and acceptability
- Leveraging local influencers and celebrities to reinforce the importance of good vision
- Drive engagement with influencers in adjacent issues e.g. education and road safety

What will it cost to achieve this?
$4.5B

ACCELERATING ACTIONS THROUGH COALITIONS AND DATA

ALIGNING MULTI-SECTOR PARTNERS AND MOBILIZING THE NECESSARY RESOURCES BEHIND AN AGREED SET OF GOALS LEADING TO THE ELIMINATION OF REFRACTIVE ERRORS BY 2050, IS A CRITICAL FIRST STEP FOR SUCCESS

Ensuring this collaboration among cross-sector partners at a global and national level can help influence and progress national level strategies. Central to successful coalitions is establishing a supporting structure that can: maintain focus on a shared strategy, track and report on progress, facilitate the alignment of complementary activities and report progress to global stakeholders. This includes identifying the appropriate parties to set forth global guidelines to facilitate the ongoing training and increased quality of primary vision care providers. Professional associations have a role to play in defining the training requirements as access to service expands.

More detailed and open databases with relevant demographic breakdowns are needed to understand and track progress against the URE burden over the next 30 years. Recognizing the unique opportunity to bring multiple players into the solution alongside existing private and public practitioners, it is important to design new data collection methodologies that account for delivery of glasses through current and new sustainable access points.

There is a clear role for multilateral organizations to establish the benchmark for what it means to be "poor vision free" and the data set by which progress will be measured.

The global RBM Partnership (Roll Back Malaria Partnership) has seen great success over the 20 years it has mobilized support for the global eradication of malaria. Global deaths from malaria have decreased 60 percent in the last 20 years, representing 7 million lives saved. The 500 partners who make up this coalition are supported by a 14-person Secretariat that enables a focus on specific goals associated with each global strategy period.

The current objectives include:

- keeping malaria high on the political and developmental agendas through a robust multi-sectoral approach to ensure continued commitment and investment to achieve the milestones and targets
- promoting and supporting regional approaches to the fight against malaria anchored in existing political and economic platforms such as regional economic communities, including in complex/ humanitarian settings
- promoting and advocating for sustainable malaria financing with substantial increases in domestic financing



By synthesizing experiential learnings on proven models and scaling pathways surfaced by our members, EYElliance has broadened ownership of the issue area to include global development actors working in education, community health systems, road safety and literacy – and we've seen governments in low and middle income countries taking responsibility for children's vision on a national level. As we look to 2050, solving this problem will require an infusion of catalytic philanthropic investment to unlock government resources and blended finance to crowd in private capital and establish a new impact industry.

Elizabeth Smith
Chief Executive and Co-Founder, EYElliance

SUMMARY

Who has a role to play?
Multilateral institutions, NGOs, private sector, governments and philanthropic funders

What does success look like?

- Public, private and social sector stakeholders are energized and supportive of tackling URE
- Clear data and evidence on correction of URE is available

What is required to fill the gaps by 2050

- Prioritization by leading global multilateral institutions
- Detailed, open databases on RE and URE burden with relevant demographic breakdowns
- Monitoring and evaluation mechanisms for supply-demand interventions

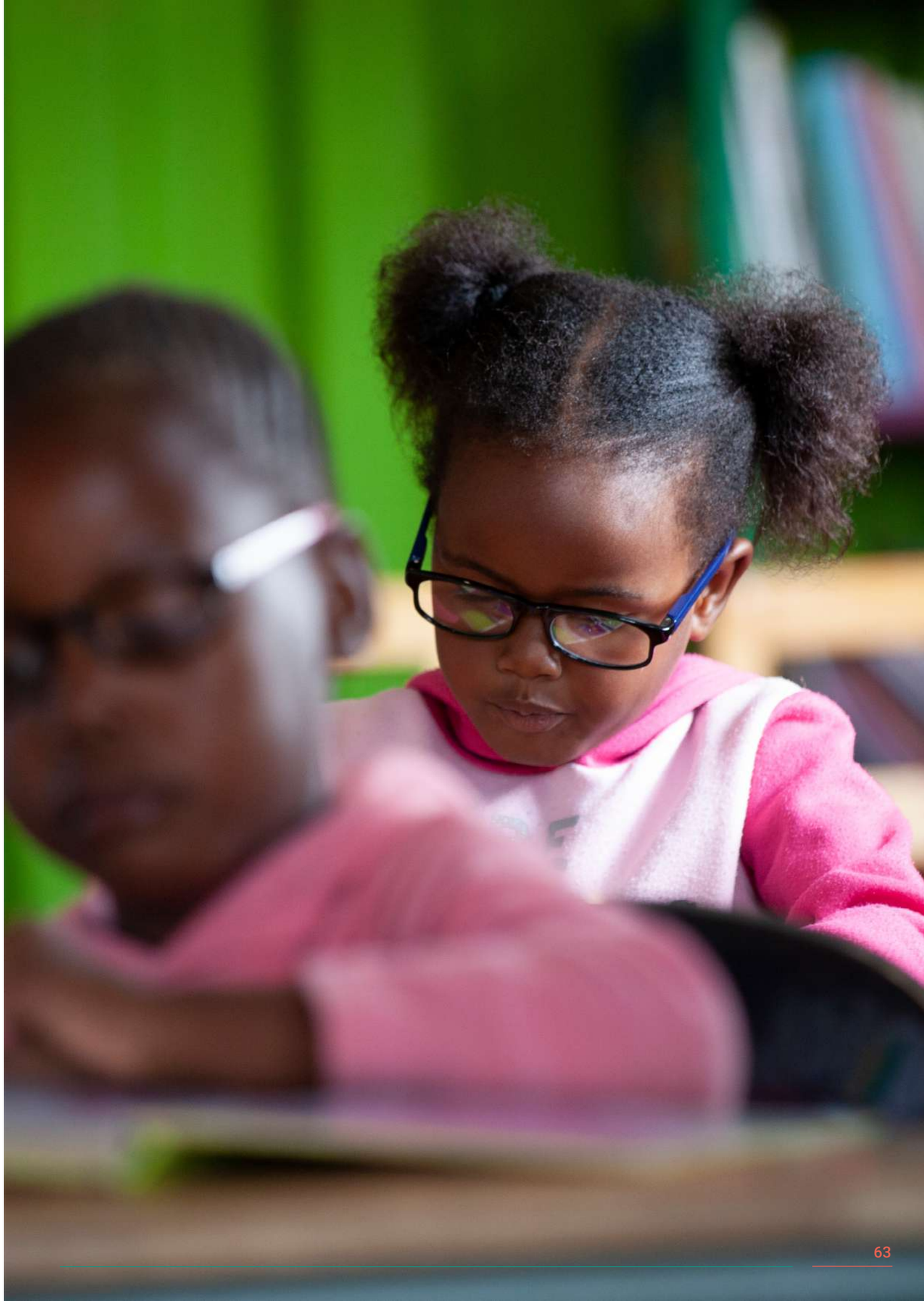
What will success look like?

McKinsey's analysis has indicated it is possible to eliminate poor vision by 2050, but what does success look like and how can it be measured? Informed by learnings and precedents from other health sectors, below is a suggested set of key performance indicators (KPIs) for consideration, which, if achieved, should effectively mean a geography can be declared poor vision (specifically refractive error) free.

	Financially sustainable access point	**Affordable solutions**	**Funding for subsidized/free services and products**	**Awareness**
Input KPIs Have the interventions been implemented?	100 percent of people have at least one access point within one day's return travel	Corrective lenses equal to three days wages or less are available to all people	Subsidized or free refractive error solutions are available for those living in extreme poverty for life and all children of the working poor before the age of 10, and provided when needed subsequently	All communities receive information about importance of vision care (including URE)
Intervention outputs Are the interventions reaching the required number of people?	95 percent of children aged 2-16 receives one eye exam per year[27] 95 percent of adults over the age of 16 receives one eye exam per two years[27]	Number of corrective solutions distributed equals the projected RE population (95 percent)		100 percent of people were exposed to at least one message about vision care (including URE) in the last one year
Program outcomes Has success been definitively achieved?	95 percent of people with refractive errors have had their vision corrected			

[27] Except when specific diseases are detected.

These KPIs are intended as a guide; rigorous scientific studies of initial pilot programs are needed to demonstrate these conditions are necessary and sufficient for creating a geography free from uncorrected refractive errors. Such pilot programs and subsequent KPIs will be most effective if adopted and refined at a country level by relevant stakeholders.



Closing Statement



This report presents us with an amazing opportunity.

It provides a roadmap to 'Eliminating Poor Vision in a Generation' and demonstrates clearly the role everyone can play in addressing one of the world's biggest public health challenges. It rightly acknowledges the great strides we have taken working together to date and builds on the important work already undertaken.

Enabling individuals to meet their full potential is good for everyone – families, communities, society and economies – and it is simply the right thing to do. Good vision is a must-have for future global development and impacts all of the UN SDGs. The findings crystalize my belief the global community has a responsibility to address this disability.

We now have a clear mandate on what needs to be done over the next 30 years to achieve our goal and with the knowledge and support of many partners, this is not an impossible challenge. The power of great public/private partnerships cannot be underestimated and as a private company, we take our role very seriously.

I thank all those who contributed to this report and am excited to see what we can and will accomplish when we work together.

Jayanth Bhuvaraghan
Chief Mission Officer, EssilorLuxottica and Essilor SAS

Appendix



How eliminating poor vision contributes to the UN SDGs

Good vision is a must-have for future global development and impacts all of the UN's Sustainable Development Goals, either as a means of achieving the Goal or as a beneficial outcome.



It is directly relevant to the Global Goal on Health, which aims to 'ensure healthy lives and promote well-being for all at all ages' and targets to achieve universal health coverage, where everyone gets the health services they need and where there is sufficient and low-cost access for under-served and BoP communities.





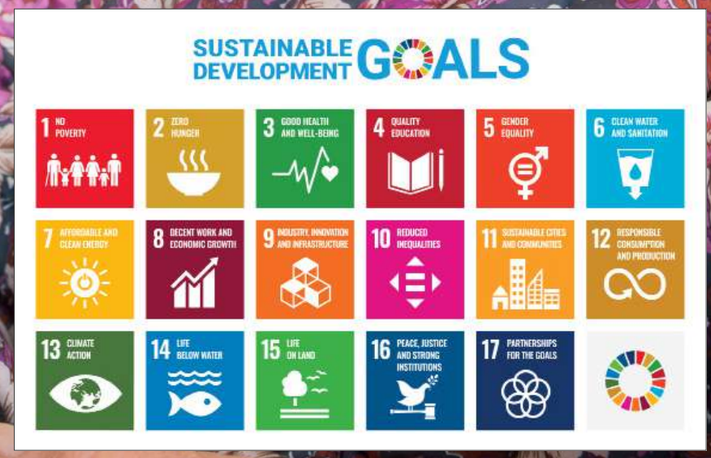
Correcting vision contributes to the Global Goals on Poverty and Reduced Inequalities as it enables people to work safely, boosting productivity and earning potential as well as enabling them to remain active in the workforce.



Early detection of problems and management of eye health in children will help achieve the Global Goal on Education by reducing the possibility of them dropping out of school and helping to improve academic performance.



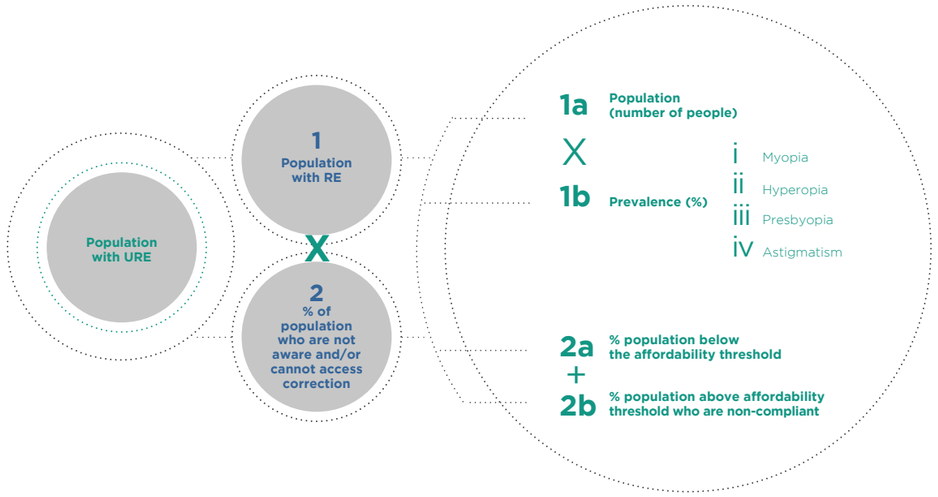
Women are more prone to vision health issues and face more barriers to accessing vision health services than men. So the Global Goal on Gender Equality is an opportunity to promote equal access to those services.



Methodology

1) SIZING THE URE POPULATION IN 2050

The URE population is determined through firstly understanding the population of people with RE (by region and by year), secondly estimating the percentage of this population who would be unable to correct their RE.



To determine the population with RE from 2018 – 2050, various research studies were used as a base to understand the prevalence rate of various RE conditions (myopia, hyperopia, presbyopia, astigmatism) in different geographies.

The following research studies were used to provide base data:

- Myopia prevalence rates: 2010 rates by age cohort and GBD (Global Burden of Disease) regions, which includes overlaps with presbyopia and astigmatism (Source: Holden, Brien A., et al., "Global prevalence of myopia and high myopia and temporal trends from 2000 through 2050." Ophthalmology 123.5 (2016): 1036-1042)
- Hyperopia prevalence rates: 2010 rates by age cohort and GBD regions, which includes overlaps with presbyopia and astigmatism (Source: Castagno, Victor Delpizzo, et al., "Hyperopia: a meta-analysis of prevalence and a review of associated factors among school-aged children." BMC ophthalmology 14.1 (2014): 163.)
- Presbyopia prevalence rates: 2010 – 2050 projected global rates, which excludes overlaps with myopia (Source: Fricke, Timothy R., et al., "Global Prevalence of Presbyopia and Vision Impairment from Uncorrected Presbyopia: Systematic Review, Meta-analysis, and Modelling." Ophthalmology (2018)
- Astigmatism: 2010 prevalence rate was estimated through a review of various studies from 1990 to 2018, and assuming that astigmatism stays relatively constant through age groups. (Source: Global and regional estimates of prevalence of refractive errors (2017))

Using this base information the prevalence rate of the various RE conditions, from 2018 – 2050, and by GBD regions, can be estimated through taking into consideration these factors:

- A cohort effect is applied across all RE conditions, which means that if you have a condition today, you will have the condition for the rest of your life. Therefore, prevalence rates for every age group will, at the very least, be maintained as they graduate into the following age groups.
- For myopia and hyperopia, where only 2010 rates by age cohort are known, a peak prevalence at the age of 25 years old is assumed. In projecting the prevalence rates of future years, prevalence rates will continue to rise till an age cohort reaches 25 years old, and plateaus afterwards. It is also assumed a convergence of prevalence rates (lifestyle effect), where prevalence rates of 0-25 year olds in developing countries will converge towards observed 2010 prevalence rates for 0-25 year olds in more developed countries. The rate of convergence depends on the projected time for the developing country to reach the same GDP/ capita as the developed country in 2010.
- For presbyopia, based on available research for 2010 - 2050 projected rates, overlaps with hyperopia can be removed by subtracting the population of hyperopes above 40 years old. This gives a global population with presbyopia. Assuming a consistent global prevalence among all 40+ year olds, the global total is then allocated to regions based on demographic data.
- For astigmatism, it is assumed between 2% - 10% of the astigmatism population (depending on the prevalence of myopia as estimated earlier) has pure astigmatism, i.e., with no overlaps with other RE conditions.

The estimated prevalence rates are then multiplied by world population projections in order to determine the size of the population with various RE conditions.

To estimate the percentage of population with RE who are not aware and/or cannot access correction, two main factors have been taken into consideration. It is assumed the lack of ability to correct occurs due to lack of affordability (i.e., they would like to correct their condition but are unable to do so due to an inability to afford the correction), or due to lack of compliance (i.e., they are aware of their condition but due to certain reasons, are unwilling to correct the condition).

- For affordability, it is assumed that households earning below $1,000/ month (Purchasing Power Parity - PPP) (constant 2005 prices) are unable to correct their refractive error. (Source: Economist Intelligence Unit, "Global Household Income Projections, 2010 – 2030; projections between 2030 – 2050 were conservatively extrapolated based on historical growth).
- A non-compliance percentage is assumed (between 5% - 25%) by GBD region, based on market knowledge in key markets and research (Aravind Eye Hospitals, "Melur Barrier Study").

By multiplying the population with RE with the percentage who are not aware and/or cannot access correction, the size of population with URE is estimated.

2) DETERMINING NUMBER OF SUSTAINABLE ACCESS POINTS REQUIRED IN 2050

Of the 3.2 billion with URE, 0.7 billion will be the population projected to exceed the affordability threshold of $1,000/month (PPP), but today live in rural areas. This means the main barrier to correction by then would be access, assuming no access points are created there. The remaining 2.5 billion people will be the population that continues to face barriers in terms of affordability and access.

It is assumed the 0.7 billion will be recognized as a market gap by existing optical shops, where setting up an access point in today's rural areas would allow them to serve new customers. For the purposes of the calculation of sustainable access points, it is based on 2.5 billion people.

Based on the estimated URE population of 2.5 billion in 2050, the number of access points required through allocating the population across different channels to serve can be estimated.

Firstly, it is assumed sustainable access points will need to be created for the 2.5 billion population excluding destitutes (estimated based on World Poverty Clock) and children of the working poor between the ages of 0-10 years old.

It is assumed 25% of this population will be served through e-commerce, meaning less physical access points will be needed. Based on research by the Federal Reserve in the USA, 28% of retail sales in the GAFO category (General Merchandise, Apparel and Accessories, Furniture and Other Sales) can be attributed to e-commerce. In 2016, it was estimated that 4.2% of glasses purchased in the USA are done so through e-commerce (2016 Internet Influence Report" by The Vision Council). With improvements in digital eye screening and vision tests, it is conservatively estimated e-commerce will be able to serve at least 25% of wearers by 2050.

For the destitute and children of the working poor, it is assumed half will be served through subsidized or free services, and the remaining half will be served through distributing subsidized or free products at sustainable access points already created (i.e., no additional access points are created just to serve this population).

Estimating readers-only access points (~400,000)

Based on the estimated population with presbyopia in 2050, it is assumed this population will be served evenly through full refraction access points, readers-only access points and e-commerce. The population that would need to be served through readers-only access points in 2050 can then be estimated.

Assuming a replacement rate of 2.5 years (i.e., a person would replace their pair of glasses once every 2.5 years), the wearers that would need to be served per year through readers-only access points can be estimated.

Based on Essilor's experience with setting up readers-only access points, the average wearers served ranges from 4 to 13 a month. This depends on the years of experience in selling readers.

The number of readers-only access points can then be calculated by dividing the presbyopic population served through readers-only access points (i.e., one-third of the full presbyopic population) by the wearer capacity of each access point.

Estimating full refraction access points (~600,000)

Full refraction access points are calculated through a similar calculation. First the non-destitute population above 10 years old, excluding two-thirds of the presbyopic population (served through readers-only access points and ecommerce) is calculated. This will be the population that needs to be served through the creation of full refraction access points. Using a replacement rate of 2.5 years, the number of wearers that need to be served per year can be estimated.

Based on experience in Asia, full refraction access points have a specific capacity for serving wearers. For example, 600 wearers per year is the typical capacity for a full refraction entrepreneur in Asia.

By dividing the wearer population to be served by each type of access point per year, by the capacity of each access point, the number of full refraction access points can be estimated.

3) DETERMINING INVESTMENT REQUIRED IN 2050

To create sustainable access

The investment required to create sustainable access follows the number of sustainable access points that will need to be created. To determine overall investment, the investment involved in setting up each type of access point is estimated. For the calculation, only CAPEX and training costs are included. Operating profits that could be generated to lower the cost of access creation are not included.

The costs of each type of sustainable access point are estimated based on inputs from various sources. Besides figures based on Essilor's own experience in Asia, external estimations were also used (e.g. based on analysis and information from Dalberg and OneSight). From this an investment of $2.4 billion can be calculated.

To create affordable solutions

It is assumed that creation of affordable solutions would be achieved through new innovations in eye care, to drive down service and product delivery costs. Taking into account analysis conducted by Dalberg, the total funding need was estimated to be between $0.6 billion - $0.8 billion. This was determined through an analysis of nine innovation funds to determine the cost per beneficiary. These funds include general or healthcare innovation funds such as Strategic Innovation Fund, Merck Global Health Innovation Fund, Global Innovation Fund, and eye care innovation funds such as IAPB Seeing is Believing Innovation Fund and Eye Care Innovation Fund.

Based on the range, an average of $0.7 billion was used for the purpose of the analysis.

To create awareness

Awareness to address URE would involve creating public awareness to drive consumer demand of eyeglasses, as well as targeted advocacy to increase public sector investment in eye care. The costs of different media channels in driving health behavior change per person were determined, and it was found mobile phone based messaging ($0.01 per person), social media ($0.01 - $1 per person) and community outreach ($2.29) were the most cost-effective in driving public behavior change.

A total funding need was estimated between $3 billion - $6 billion, and $4.5 billion is assumed as the average within the range.

To provide subsidized/free services

The investment required to provide subsidized/free services is estimated based on the destitute population, and population of children of the working poor below 10 years old. It is assumed sustainable access points are unable to serve children due to regulatory barriers.

The annual wearer capacity for the destitute population is estimated, by dividing the destitute population by 2.5 years (i.e., the replacement rate). For children from working poor families, it is assumed this population will be given one pair of spectacles before they are 10 years old. Therefore for any given year, free spectacles are given to an equivalent of one age cohort of children. The population served each year by subsidized/free services is then estimated.

To estimate the cost of providing these services, it is assumed 50% of this population is served through sustainable access points (already created to serve the majority of URE), meaning the cost to serve is the cost price of a pair of spectacles. The remaining 50% will be served through outreach services, of which the cost will involve manpower, equipment and spectacles. Such outreach services may occur in the form of large-scale health promotion initiatives by governments or NGOs.

As it is assumed half of the population who require subsidized/free services will be leveraging on sustainable access points, a ramp-up rate is applied to determine the investment required per year. The ramp-up rate will eventually increase to 100% by 2050, where the full population in need will receive subsidized/free services.

4) DETERMINING TOP COUNTRIES

Top 10 countries were determined by their share of global URE in the year of 2018, which is the proportion of URE in a country globally. Based on the sizing exercise done to determine URE in 2050, projections from 2018 - 2050 by country were developed. From this data, it was identified the top three countries are India (23% share of global URE), China (22%) and Indonesia (5%). 50% of global URE burden is in these three countries.


eyeMITRA
2.5 new VISION generation
An ESSILOR Group Initiative

ELIMINATING POOR VISION IN A GENERATION:
What will it take to eliminate poor vision by 2050?

Analytical support provided by McKinsey & Company

We thank all the people who contributed to this report and all those working to improve lives by improving sight.

© Essilor SAS 2020
www.essilorseechange.com

Cover Photo: Screening event in Ladakh, India
Credit: Sight to Sky

Other Photo Credits:
Essilor image library
Graham Coates
Claire Eggers
Preston Kunz
Mathias Magg
Sajib Muhammad