INTERNATIONAL CENTRE FOR EYE HEALTH

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

INTERNATIONAL CENTRE FOR EYE HEALTH

CONTENTS

Updated August 2023

Image credit: (Cover) Cynthia Matonhodze.

INTRODUCTION

Worldwide there are 1.1 billion people living with vision impairment, of whom 43 million are blind. Yet 90% of this vision impairment is either treatable or preventable. Poor eye health can have profound effects on health and wellbeing. It can also increase poverty, impede learning, shorten life span and reduce quality of life. Vision loss also affects national economies through lost productivity.

The International Centre for Eye Health (ICEH), which is based at the London School of Hygiene & Tropical Medicine (LSHTM) are working towards a world in which everyone, everywhere has good eye health. This is achieved by developing high quality eye care services and improving access to them. ICEH are contributing to this endeavour through research, education, capacity strengthening and technology. We have a proven track record in improving eye health over decades, and the tools to realise this in the future.

Image credit: Saiyna Bashir / The Queen Elizabeth Diamond Jubilee Trust.

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Of whom
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Sight loss can affect health and wellbeing, increase poverty, impede learning, shorten life span and reduce quality of life

Globally, vision impairment results in $411 billion (PPP) lost productivity each year

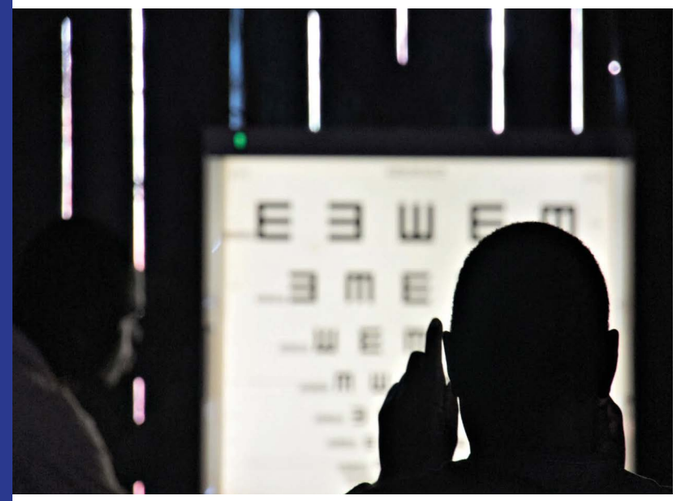


Image credit: Peek Vision.

OUR VISION

Improving eye health worldwide

OUR MISSION

- **We work through partnerships, particularly in low and middle-income countries, to deliver excellence in research, education, capacity strengthening and technology for eye health.**
- **We develop and translate evidence into policy and practice, in order to empower health service providers to deliver quality, sustainable eye care to everyone.**
- **Our work is quality-driven, people-focused and evidence-based.**

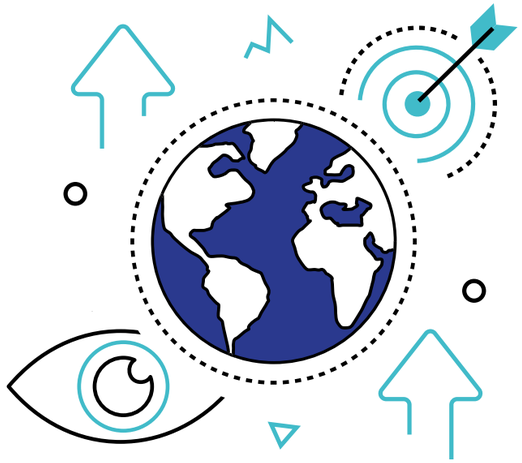


Image credit: Jeff Mayers / The Queen Elizabeth Diamond Jubilee Trust.

OUR STRATEGIC APPROACH

We seek to be a world-leading collaborative and inclusive network for global eye health that delivers:

Research

We are an interdisciplinary research team of eye health clinicians, public health specialists, statisticians and many more. Our research is done through long-standing and new partnerships globally, forming a large international network of people and institutions working together on evidence for eye health. We have a broad portfolio of work including cross-cutting themes alongside condition-specific research, and we undertake multiple clinical trials each year.

Education

ICEH is widely viewed as the leading centre for education and training in global eye health and public health for eye care. We run a face-to-face MSc at LSHTM, which has trained more than 750 people from 100 countries over 40 years, creating an alumni network of leaders in eye health internationally. We also run an annual one-week short course and seven highly popular online courses (MOOCs) in topics across eye health.

Technology & Intelligence

Our close partner Peek Vision, a social enterprise born out of ICEH research, develops software, programme design and data intelligence platforms to help community and school eye health programmes become more efficient, more equitable and more effective. ICEH and Peek collaborate on research to develop tools and innovative technology to improve service delivery. We jointly support population-based surveys that gather crucial data on global vision loss, which informs policy and practice worldwide.

Capacity Strengthening

ICEH works to strengthen research capacity through training PhD students and research mentorship with partners. The Centre also coordinates networks that enable shared learning between eye care professionals globally. These facilitate collaboration and learning between countries and regions, improving skills and data sharing worldwide. Peek's programmes enable health professionals and communities to improve eye services.

Knowledge Sharing

All of our efforts involve communicating the knowledge we generate. We publish the *Community Eye Health Journal,* a free, peer-reviewed resource that provides vital updates for eye care professionals in some of the hardest-to-reach places globally. Through our alumni, networks and education we facilitate the sharing and debating of key ideas, combining evidence and discussion to improve eye health globally.

IMPACT OVERVIEW

ICEH's work has had a huge impact on eye care globally. We have:

DEVELOPED THE EVIDENCE THAT SUPPORTED:

THE FIRST UNITED NATIONS RESOLUTION ON PREVENTABLE SIGHT LOSS, REPOSITIONING EYE HEALTH WITHIN THE UNITED NATIONS' SUSTAINABLE DEVELOPMENT GOALS FRAMEWORK

NEW WORLD HEALTH ASSEMBLY TARGETS ON EFFECTIVE COVERAGE OF CATARACT SURGERY AND EFFECTIVE COVERAGE OF REFRACTIVE ERROR

REPORTED:

>100

PEER-REVIEWED RESEARCH STUDY PUBLICATIONS EACH YEAR

2-3

CLINICAL TRIALS PER YEAR

TRAINED:

>80%

OF EYE HEALTH PROFESSIONALS WITH PhDs IN THE AFRICAN REGION

25

STUDENTS AWARDED PhDs SINCE 2010, MAJORITY IN LMICs

EDUCATED:

>750

MSc STUDENTS SINCE 1981 FROM 100 COUNTRIES

>40K

PEOPLE FROM 180 COUNTRIES HAVE TAKEN OUR ONLINE COURSES

SERVED:

>4M

PEOPLE REACHED IN PROGRAMMES POWERED BY PEEK

>2M

PUBMED "HITS" PER YEAR ON *COMMUNITY EYE HEALTH JOURNAL* ARTICLES

330

RAPID ASSESSMENT OF AVOIDABLE BLINDNESS SURVEYS FACILITATED

CONNECTED:

30

INSTITUTIONS IN HEALTH CAPACITY STRENGTHENING PARTNERSHIPS

121

DISEASE NETWORK PARTNERS

AWARDED:

QUEEN'S ANNIVERSARY PRIZE FOR HIGHER AND FURTHER EDUCATION

VISION CARE SECTION OUTSTANDING SCIENTIFIC PAPER AWARD

ABILITY TECH4GOOD FOR AFRICA AWARD

HISTORY OVERVIEW

1980

ICEH founded

1988

The *Community Eye Health Journal* launches

1993

First Master's Course in Community Eye Health

1997

ICEH Instrumental in developing VISION 2020 – The Right to Sight, a global initiative on eye health

2004

VISION LINKS programme launched

2006

The Cataract Impact Study provides the first evidence that cataract surgery improves quality of life and economic productivity

2012

ICEH starts testing prototype smartphone tools, Peek Vision created

2014

First disease-specific network launches – the Diabetic Retinopathy Network

2014

First free open online course on Global Blindness launched

2016

ICEH collaborates on a series of trials to improve the surgical treatment of trachomatous trichiasis, leading to several global policy changes

2017

ICEH collaborates to define and demonstrate effective cataract surgical coverage, used as a WHO indicator

2018

The Government of Botswana commits to using Peek to deliver a national school eye health programme

2018

100th issue of the CEHJ published

2021

ICEH coordinates the Lancet Commission on Global Eye Health

INTERNATIONAL CENTRE FOR EYE HEALTH

WHO WE ARE

INTERNATIONAL CENTRE FOR EYE HEALTH

ICEH is an international team of more than 50 academic and support staff, alongside multiple PhD and MSc students. The Centre is based at the London School of Hygiene & Tropical Medicine. The team is an interdisciplinary group of eye health clinicians, public health specialists, epidemiologists, statisticians, health economists, and evidence synthesis specialists. ICEH is led by the Director, Prof. Matthew Burton.

ICEH is guided by an External Advisory Panel which provides independent advice to the leadership team. The panel consists of leaders within eye health from a range of disciplines and regions with a majority based in low and middle-income countries.

Image credit: Aeesha Malik.

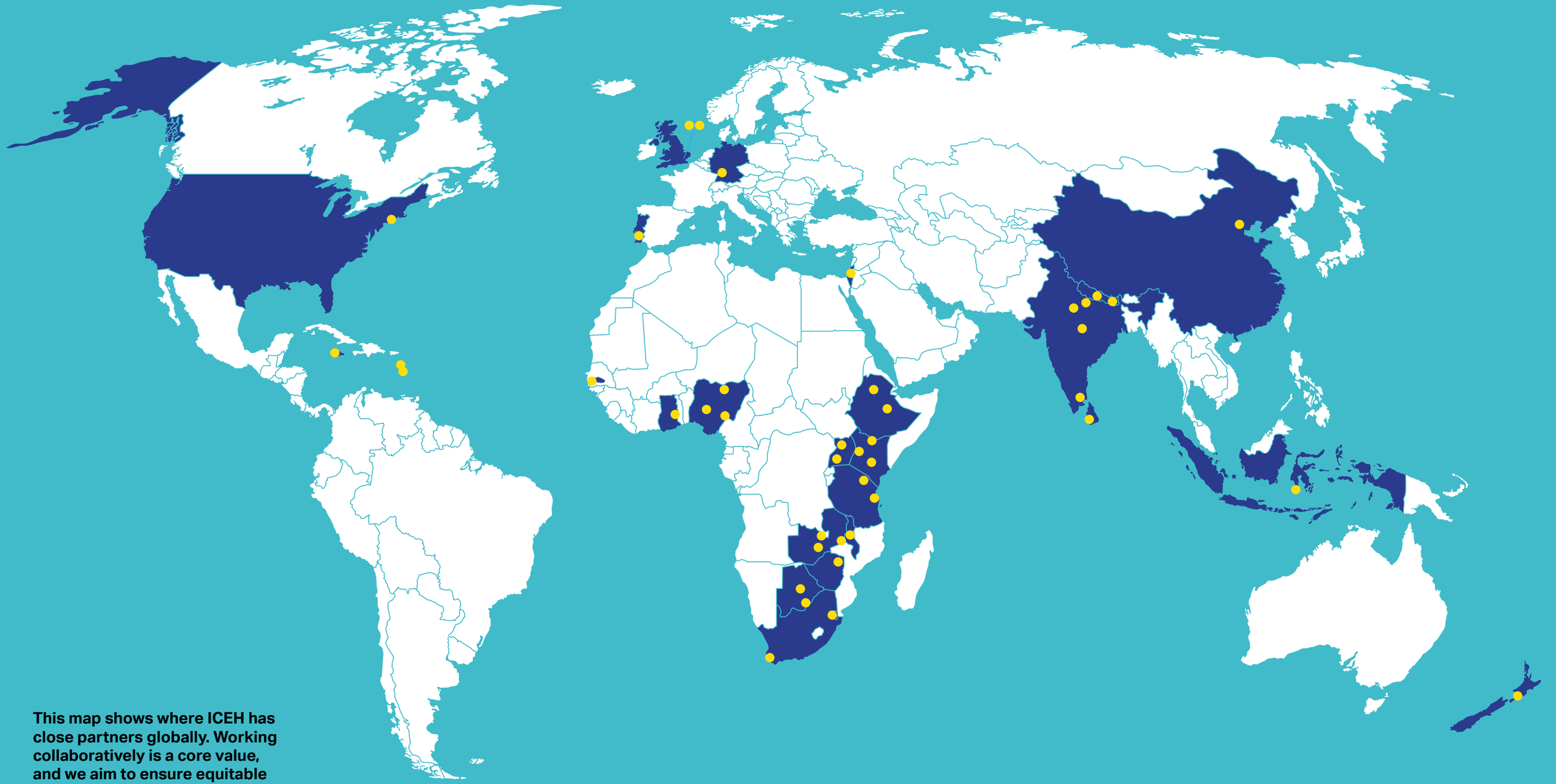
Image credit: Simon Arunga.

Image credit: Rolex / Joan Bardeletti.

Image credit: Nick Astbury.

Image credit: Nazif Jemal.

COLLABORATOR MAP



This map shows where ICEH has close partners globally. Working collaboratively is a core value, and we aim to ensure equitable partnerships wherever we work. We jointly design and deliver projects with our partners, seeking to learn from each other, building trust and working towards mutually beneficial outcomes.

Countries

Botswana	Ethiopia	Indonesia	Malawi	Portugal	Tanzania	USA
China	Germany	Israel	Nepal	South Africa	The Gambia	Zambia
Dominica	Ghana	Jamaica	New Zealand	Sri Lanka	Uganda	Zimbabwe
Eswatini	India	Kenya	Nigeria	St Lucia	UK	

RESEARCH

ICEH has an interdisciplinary research team of eye health clinicians, public health specialists, epidemiologists, statisticians, health economists and many more. Our research work is done through long-standing research partnerships with colleagues – including many alumni – in institutions in multiple countries. We have a deep portfolio of research work including cross-cutting themes and methodologies alongside condition-specific research areas. Over the last five years we have produced on average more than 100 peer-reviewed research publications each year. For a complete publication list please visit the ICEH Publication Directory.

The *Lancet Global Health* Commission on Global Eye Health

ICEH recently led the *Lancet Global Health* Commission on Global Eye Health, published in February 2021.[1] Prof Matthew Burton was lead author and co-chair with Prof Hannah Faal from Calabar, Nigeria. Major contributions were also made by other members of the ICEH and Peek teams.

The Commission involved undertaking more than 20 new studies and publications, creating and organising evidence for many areas of global eye health. These include key analyses in eye health, highlighting that:

- eye health is integral to achieving seven of the United Nation's Sustainable Development Goals[2]
- the risk of death increases substantially with increasing severity of vision impairment, compared to normal vision[3]
- vision impairment leads to an estimated $411 billion in lost productivity globally each year[4]
- 90% of people living with vision loss reside in low and middle- income countries (LMICs)[1]
- over 90% of people with vision impairment require cataract surgery or glasses, both existing highly cost-effective treatments[1]

The Commission conducted several globally representative Delphi exercises on eye health research prioritisation,[5] eye health indicators[6] and improving access to cataract services. It also explored the environmental sustainability of eye care.[7]

The Commission report has been very influential, including translating into policy through supporting the case for the first United Nations General Assembly Resolution on Vision in July 2021. The findings from the Commission have been used widely for eye health advocacy to make the case for the importance of improving eye health.


THE LANCET
Global Health

February, 2021 www.thelancet.com

The *Lancet Global Health* Commission on Global Eye Health: vision beyond 2020

"Investing in universal eye health is a realistic, cost-effective way of unlocking human potential by improving health and wellbeing, education, work, and the economy; it is essential to achieving the Sustainable Development Goals."

A Commission published by *The Lancet Global Health*


The Lancet Global Health Commission

Image credit: *The Lancet Global Health.*

Population Health Surveys

Image credit: Peek Vision.

We support population-based eye health surveys and their analysis. This is primarily through the Rapid Assessment of Avoidable Blindness (RAAB) survey methodology. These surveys provide the data for the majority of global and regional estimates of the magnitude of vision impairment and its causes. These data have multiple users, including government eye care programmes, the World Health Organization, the International Agency for the Prevention of Blindness, NGOs and the Global Burden of Disease project.

To date >330 RAAB surveys have been conducted across 81 countries in multiple world regions, primarily in low- and middle-income settings.

Data from RAABs are primarily used for local and national planning of eye health services. By assessing need within an area, service providers can appropriately distribute care and plan strategic programmes to improve eye health. RAAB estimates can be used to shape and prioritise policy, contributing to reducing avoidable sight loss.

RAABs are now done on a digital end-to-end platform powered by Peek technology (RAAB7). RAAB is currently the main tool used to generate data to track progress towards WHO's effective coverage of eye health targets for 2030:

- a 30-percentage point increase in effective cataract surgical coverage (eCSC)
- a 40-percentage point increase in effective refractive error coverage (eREC)

RAAB data was instrumental in developing and establishing the baseline estimates for these targets.[8,9]

The latest version of RAAB also includes an optional module on diabetic retinopathy and one on disability, which uses the Washington Group Short Set, a module endorsed by various United Nations' agencies for disaggregation of Sustainable Development Goal indicators.

Potential future modules for inclusion in the RAAB tool include standardised data collection on health economics, glaucoma and primary eye care. We are pilot testing the integration of a new Peek Vision application for assessing near vision. This will begin to address a global data gap on near vision impairment and allow RAAB users to report eREC for near as well as for distance vision.

RAAB data that are made available open access are held in an online repository (www.raab.world) where users can access data and reports and view country profiles. We encourage all RAAB users past and present to make their data available open access on the repository to support ongoing eye health research and advocacy efforts.

Map of where RAAB surveys have been carried out to date.

Image credit: Peek Vision.

RAAB is focussed on older adults, but no comparable tool exists for children.

Effective school eye health programmes are a critical part of any health system. Addressing eye health problems in childhood can have a powerful effect on an individual's chance of educational success, prosperity, and wellbeing.

To plan, fund and implement effective school eye health programmes, health service personnel need to understand the prevalence and characteristics of eye health problems in the populations they serve. This can be surprisingly difficult using existing tools.

The School Eye Health Rapid Assessment (SEHRA) tool has been developed by Peek and ICEH with input from school eye health experts in the sector. SEHRA is the first planning tool dedicated to providing school eye health programmes with comprehensive data needed to allocate scarce resources and guide programme implementation.[10] It will enable partners to understand the eye health needs of their school-aged population.

The tool consists of two modules. The Scoping Module explores five components: Sectoral legislation, policy, and strategy; Institutional and service delivery environment; Human resources and Barriers. The Magnitude Module is a school-based survey on a random sample of children. Data from these can then be used to understand the environment and then plan, monitor and evaluate school eye health programmes to improve the eye health of children in the area.

The Framework for SEHRA

INPUT

Desk exercise and interviews with stakeholders

MODULE

1

Minto Method

Scoping Module

OUTPUT

School Eye Health (SEH) Screening Programme Feasibility

If Scoping Module determines a SEH programme is not feasible: no further assessments are conducted through SEHRA at this stage. The key reasons for lack of feasibility are known, and further expense is spared. If a programme is determined to be feasible: move on to Magnitude Module + / - further optional module.

App based School level survey to determine representative eye health needs for a population

2

Population Survey

Magnitude Module

Estimate the proportion of and identify the causes of referrable eye conditions in school children to guide eye health service provision.

Trachoma

Trachoma is the leading infectious cause of blindness. It has major consequences for affected individuals and communities, frequently compounding health problems and poverty. Prevention of blindness from trachoma is a major public health priority internationally.

The disease is caused by repeated infections of the bacterium *Chlamydia trachomatis,* leading to progressive scarring and the eyelashes turning inwards (trichiasis), so that they scratch the surface of the cornea. The cornea becomes irreversibly scarred leading to visual impairment and blindness.

We have conducted five clinical trials to try to improve the outcomes from trichiasis surgery, for example comparing alternative operations, post-operative antibiotics, alternative suture types and epilation.[11,12,13] These have had impact on policy, including updating WHO's surgery policy for the condition.

We are currently working with the Ethiopian Federal Ministry of Health on a large cluster randomised controlled trial testing out new enhanced approaches for trachoma elimination, developed through an enhanced understanding of transmission[14] and extensive co-creation work with the communities involved.

Some of our work has focused on the rational use of antibiotics.[15] This work has contributed to an understanding of the major reservoirs of infection within endemic communities and to the current approaches for the use of the drugs.

We are also studying the way that the human immune system reacts to chlamydial infection, conducting large scale cohort studies in Tanzania and Ethiopia that have regularly assessed people for disease and infection.[16]

Image credit: Oumer Shafi.

Corneal Infection

Infections of the cornea are a major cause of sight loss, and this condition is associated with considerable morbidity and reductions in quality of life.

We lead a collaborative programme of research on corneal infection, with a focus on South Asia and East Africa, and infections caused by fungi. We recently published the first global estimate of the annual incidence of fungal corneal infections, based on a systematic review and meta-analysis of the literature, showing that more than one million people worldwide develop the infections each year.[17] The large majority of people affected live in low and middle-income countries and there is some evidence that numbers are increasing.

We have investigated the aetiology and epidemiology of corneal infections in a series of studies in South Asia and East Africa, including a case-control study in Uganda on risk factors and its impact on quality of life (QoL).[18] We found a large reduction in QoL during the acute phase with some improvement with treatment; however, there was persistent long-term reduction in QoL.

The determination of the type of infection can be difficult. Therefore, we have conducted several studies exploring approaches to distinguishing bacterial from fungal infections. These include large evaluation studies of in vivo confocal microscopy and alternative microbiology techniques.[19]

We are currently conducting clinical trials to compare alternative treatments for fungal infections and approaches for early diagnosis and treatment to try to improve outcomes. The first of these studies compared natamycin to chlorhexidine eye drops, and found the former to be better for treating fungus.[20]

Image credit: Vanessa Kerton / The Queen Elizabeth Diamond Jubilee Trust.

Image credit: Simon Arunga.

Child eye health

Globally more than 70 million children aged 0-14 years are vision impaired, 1.4 million of whom are blind. In LMICs approximately half of this blindness is avoidable.

There are challenges in studying children's eye conditions: children with poor vision do not complain; measuring vision, examination and surgery are more difficult than in adults; and urgent sight-restoring treatment is essential in young children for normal vision development.

To increase access to eye care services by young children, primary care should include eye health, but this is generally lacking in LMICs. We have undertaken several studies in Tanzania which have culminated in eye health being an integral component of the government's primary level child health program.[21] The Ministry of Health made this a policy, and training is being rolled out. We plan to further assess the effectiveness of this approach in Tanzania and Nepal, using cluster randomised trials.

Eye screening of newborns can detect eye conditions early. We reviewed the literature and WHO now recommend eye screening as part of general newborn examination.[22] In Tanzania primary health care workers are being trained to screen children's eyes using a low-cost ophthalmoscope (Arclight), with the aim of screening 100,000 children over a year.

Image credit: Aeesha Malik.

Image credit: Aeesha Malik.

The commonest cause of vision impairment in children is uncorrected refractive errors, which can be corrected with spectacles, but children often do not wear them. We explored whether a health education package increased spectacle wear, and to determine the proportion of children eligible for lower cost "ready-made" spectacles.[23] Over 80% of children were eligible which would reduce the cost of school eye health programs by 15%.

Cerebral vision impairment (CVI) from brain damage is an important cause of vision problems in LMICs, which range from difficulties with walking down stairs to complete blindness. In Bangladesh, India and Nigeria a high proportion of children with cerebral palsy have unrecognized visual problems, which affects their quality of life. We have tested assessment methods and interventions to enable doctors, carers and teachers to understand these problems better, and to minimize their impact.[24]

We run capacity strengthening networks for ROP, a blinding complication of preterm birth, and retinoblastoma (Rb), a malignant tumour. These networks improve knowledge and skills and have led to the expansion of retinopathy of prematurity services in Africa, and collaborative research for Rb. More information on these networks can be found later in this report.

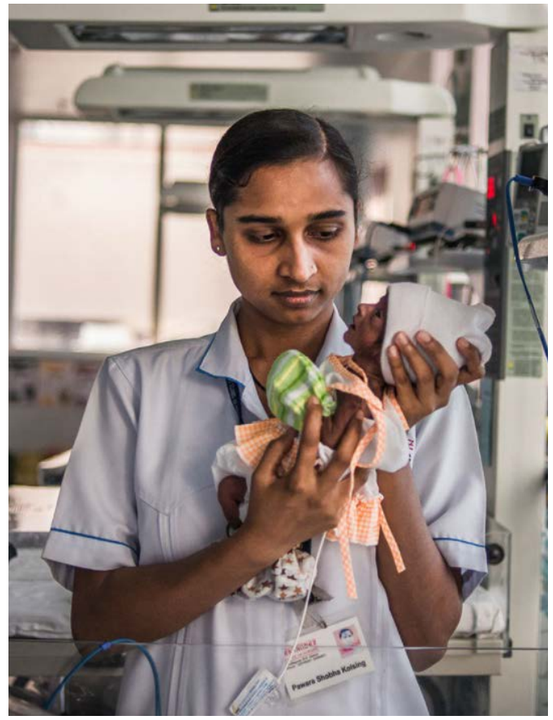


Image credit: The Queen Elizabeth Diamond Jubilee Trust / Poulomi Basu.

Retinopathy of prematurity

Image credit: Aeesha Malik.

Retinopathy of prematurity (ROP) can make infants born preterm irreversibly blind. In ROP, the retinal blood vessels grow abnormally, and in advanced stages the retina can detach. Blindness from ROP can largely be prevented by high quality neonatal care and screening to detect infants with severe ROP followed by urgent treatment.

In the 1940s ROP was a major cause of blindness in children in the USA and western Europe but then declined after excess oxygen, as an important risk factor, was better controlled. During the 1990s staff at ICEH reported that ROP was a major cause of blindness in children in middle-income countries in Latin America and South East Asia because they had started to provide services for preterm infants. This "epidemic" of blindness is now starting in sub-Saharan Africa. In 2010, our group in collaboration with others, estimated that approximately 32,000 infants born preterm become blind or vision impaired every year.[25]

Our research work on ROP encompasses epidemiological research and developing and evaluating model programs for ROP. Studies have described which infants are most at risk of severe ROP in different settings and why infants become blind from ROP. We have evaluated the impact of a training course for neonatal nurses in Brazil and explored factors which led to the development of a successful national ROP program in Argentina.

ICEH has facilitated almost 40 national and regional workshops, bringing together neonatal teams, ophthalmologists and government policy makers. The workshops led to regional guidelines for Latin America, expansion of ROP services for screening and treatment, and in some countries, major support from Ministries of Health and other donors.

In India, we provided technical contributions to the establishment of model ROP services in over 30 neonatal units in four States. Ministries of Health were actively engaged and government, private and not-for-profit hospitals worked together to train staff and deliver services. National guidelines were produced, as well as educational materials for parents and policy briefs for decision makers. As a result, all four States scaled up services to other neonatal units, and new States started delivering services.

Our education work on ROP has involved producing an open online course, an issue of the *Community Eye Health Journal,* and training materials for neonatal nurses. ICEH also leads an ROP network (see later section of this report).

Glaucoma

The glaucomas are a group of eye diseases affecting the optic nerve that lead to a progressive and irreversible vision loss. Globally, the glaucomas are the most frequent cause of irreversible blindness. The highest prevalence and incidence of glaucoma is found in the African region. Also, the prevalence of blindness due to glaucoma is higher in sub- Saharan Africa than in other regions of the world.

To provide more evidence to tackle these challenges, the glaucoma research team at ICEH combines expertise in epidemiology, diagnostic studies, clinical trials, implementation science, and health economics. The team collaborates with several academic institutions in Nigeria, Tanzania, Ethiopia and The Gambia, among others. Currently, the main research foci are early detection and treatment of glaucoma.

Research in Nigeria and Tanzania concerns the detection and diagnosis of glaucoma, which is currently challenging and requires multiple tests, expensive equipment and highly trained personnel. Low-cost and easily carried out tests would help to detect glaucoma at an earlier stage and reduce the progression to blindness. The study in Tanzania tests three methods for more affordable and easier detection. The work assesses the feasibility and repeatability of the tests, which could then potentially be deployed in low-resource settings.

In Nigeria we have a PhD project which is evaluating the use of similar portable diagnostic devices in detection of glaucoma in community health care settings. In a separate study in Northern Nigeria we are conducting a feasibility study to try and determine the effectiveness and acceptability of different types of laser treatment in the treatment of glaucoma. Effective and affordable laser treatment will be an advantage as surgical and medical treatments are often not practical or acceptable to patients in this setting.

Concerning treatment of glaucoma, we recently reported a clinical trial conducted in Tanzania. This demonstrated the superiority of laser treatment (selective laser trabeculoplasty) over the current standard eye drops. The findings have the potential to significantly improve glaucoma care through more effective and sustainable treatment in the African context and elsewhere, potentially at no extra cost.[26]

Image credit: Heiko Philippin.

Surgical Training

We support work on strengthening ophthalmology clinical training and human resources for eye health through research. This includes projects analysing the current work force and training institution capacity in the Africa region.

Recently we reported two trials of simulation-based surgical training for cataract and glaucoma in several African countries, which demonstrated marked improvements in skill acquisition and surgical safety.[27,28]

Simulation and virtual training has the potential to substantially improve surgical skill acquisition. We are working with multiple training centres to develop surgical simulation facilities and train faculty members to deliver courses.

Health Economics

Health economics has become an important area of research for us in recent years, with an aim of strengthening the economic evidence base for improving eye health globally. A study for the Lancet Commission provides an up-to-date estimate for lost productivity globally, at $411billion each year, providing a starting point for international advocacy.[4]

Further research is being undertaken into developing a reference case for eye health, which will allow robust economic analyses across thematic areas and countries in the future. Developing practical financial mechanisms for systems aiming to improve eye health is critical to realistic and sustainable success.

Image credit: The Royal College of Ophthalmologists.

Equity

The Sustainable Development Goals and Universal Health Coverage initiatives both emphasize the importance of addressing inequity so that no one is left behind. Historically, equity in eye health has been an under-researched area. Lack of effective approaches to address inequity has resulted in increased levels of avoidable blindness worldwide.

We are working to address this research neglect by focusing on four key areas of equity research: quantifying inequality and understanding inequity; developing strategies that promote equity in eye health; strengthening the collection and use of health information to promote equity; and promoting the equity, diversity and inclusion of eye health organisations and leadership.

Equity is embedded across our work, with an emphasis on including equity markers in trial design, disaggregating data by gender, and ensuring equitable partnerships within our collaborations. Our research allows us to be at the forefront of equity in eye health and ensure it is reflected in all our activities.

Examples of recent work include:

- Exploring how further equity indicators can be included in RAAB population surveys
- Identifying context-specific strategies to improve access to cataract services for underserved groups through global consultation across all regions[29]
- Summarising the extent to which equity has been considered in previous eye health research, including Cochrane reviews and population-based surveys
- Assessing gender parity and ethnic diversity among leadership bodies in global eye health

Image credit: Ashley Gilbertson.

Image credit: Ashley Gilbertson.

Diabetic Retinopathy

Diabetic retinopathy (DR) is a complication of diabetes, caused by high blood sugar levels damaging the back of the eye (retina). DR has increased rapidly in recent years alongside global increases in diabetes. In 2020 there were one million people blind and three million people living with moderate or severe sight loss globally due to DR.

We conduct clinical trials to test interventions which can improve the journey of a person with diabetes towards visual loss prevention. One current trial is testing artificial intelligence models for DR screening within a programme in Tanzania, to compare the technology to standard services. The results have the potential to allow faster screening and timely treatment for the condition, at a cost-effective price for rural and remote services.

A previous trial looked at how peer support can increase uptake of DR screening, finding that five times as many people who received the peer support interventions attended DR screenings compared to those who did not.[30]

Image credit: Ashley Gilbertson.

The interventions have been shown to be feasible and reaching those most in need of care, providing a template for future services.

Further research looks at evidence synthesis to explore the interventions and practices that are already in place for screening, referral and management of people with diabetes in the context of LMICs.

We also have a highly successful and popular global capacity strengthening network for DR, the DR-NET, more details of which are later in this report.

Image credit: Ashley Gilbertson.

Cataract

Cataract, the clouding of the lens of the eye, is responsible for around 50% of people living with avoidable blindness globally. However, the majority of those affected only need a 10-minute surgery to regain their sight.

Our cataract research aims to understand who is affected by the condition and why, levels of service coverage and quality, and barriers to accessing care.

Although it is assumed that people with vision impairment are likely to experience poorer quality of life, there has historically been little evidence of this from low-income countries. Research by ICEH looked at the impact of cataract surgery on household finances, activity and quality of life, finding that a year after surgery all three improved compared to before, confirming an association between surgery and life improvements for those affected.[31]

The indicator used by WHO to track progress in cataract service provision, effective cataract surgical coverage (eCSC), was based on an initial proposal by ICEH. eCSC is a measure of how many people with cataract needing surgery have received it with a good outcome, and the baseline estimates used by WHO to track its current targets are from research led by the Centre.[8] This research also showed that eCSC was highest in high-income countries and higher in men than women, providing information from which to monitor equitable improvements in cataract services.

Image credit: Ulrich Eigner.

Recent research into cataract by ICEH revealed the groups most underserved by cataract services, alongside the best strategies to improve access for them. The study showed that rural and remote dwellers, people with low socioeconomic status and people with low social support were the groups most underserved. The strategies most promising to improve access for these groups were policy development for primary care screening programmes and strengthening the skills of primary care staff.[29]

Image credit: Vanessa Kerton / The Queen Elizabeth Diamond Jubilee Trust.

Peek Vision Research

Image credit: Priya Morjaria / Peek Vision.

Peek began life in 2010 and became a research project in Kenya led by ICEH in 2012. Peek's technology was originally developed and tested with a small team of visionary local clinicians and technical experts. They worked on the first prototypes of a smartphone vision-testing app that could be used by anyone with a smartphone, even in the hardest-to-reach locations.

That app developed into Peek Acuity, which launched in 2016 as the world's first clinically-validated visual acuity test smartphone app. In 2017 it was nominated the "Best Social Impact Application" by Google. It is still available for free and has been downloaded and used by over 50,000 people in 160 countries.

In 2015, Peek spun out from LSHTM to become an independent non-profit organisation. Since then, teams working in Botswana, India and Kenya have tested and refined the tools, which now incorporate Peek Acuity as part of a powerful system for eye health data capture and analysis. With Peek, eye health programme providers can follow the patient journey from screening to treatment and identify where patients are being left behind.

Peek tools are backed by numerous peer-reviewed research studies. With a strong, ongoing research collaboration with ICEH, Peek continues to develop, refine and validate its tools. Peek's software, programme design tools and data insights are now used in schools and communities across Africa and Asia.

Developing and validating Peek Acuity

Peek Acuity, Peek's vision check app, is embedded into Peek's software for eye health surveys and school and community eye health programmes. Research published in *JAMA Ophthalmology* in 2015 shows that Peek Acuity is at least as accurate as conventional distance vision checks when used by non-specialist community health workers in Kenya, and is also slightly quicker than a conventional test.[32]

In an external systematic review of 14 mobile visual acuity tests in 2020, the Peek Acuity app was determined to have the best reproducibility and correlation with standard testing methods.

School and Community eye health programme approach validation

A school eye health programme powered by Peek in Kenya was evaluated in a randomised controlled trial comparing it to a conventional school eye health programme and published in *The Lancet Global Health* in 2018. 21,000 children were screened by 25 teachers over nine days. The results show that with Peek, **more than double the proportion of children attended follow-up appointments**.[33] The programme was later scaled up to reach all 200,000 school-going children in the county.

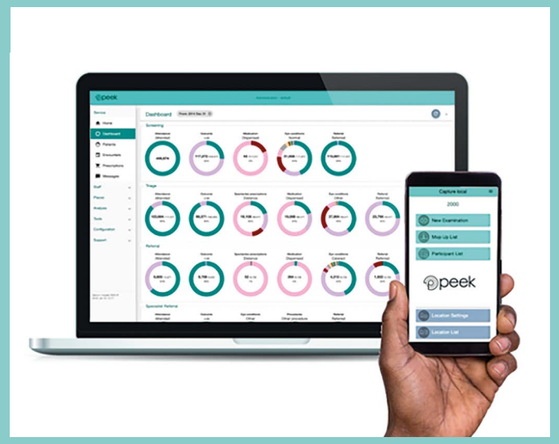


Image credit: Peek Vision.

Another randomised controlled trial in Kenya compared a community eye health programme powered by Peek to a conventional programme. Published in *The Lancet Digital Health* in 2021, the study showed that with Peek, **almost three times the number of people with eye problems were connected to care** compared to conventional programmes.[34] The study also showed how programmes powered by Peek can improve their use of specialist resources. With Peek, the proportion of people attending hospitals for eye problems that could have been treated at the primary care level reduced from 61% to 17%, while the proportion being treated at hospitals for more complex conditions rose from 8% to 63%.

Further research

Peek is working concurrently on multiple projects to provide new services, for instance with partners in Nepal, where Peek has developed and validated a new smartphone-based near visual acuity test.[35]

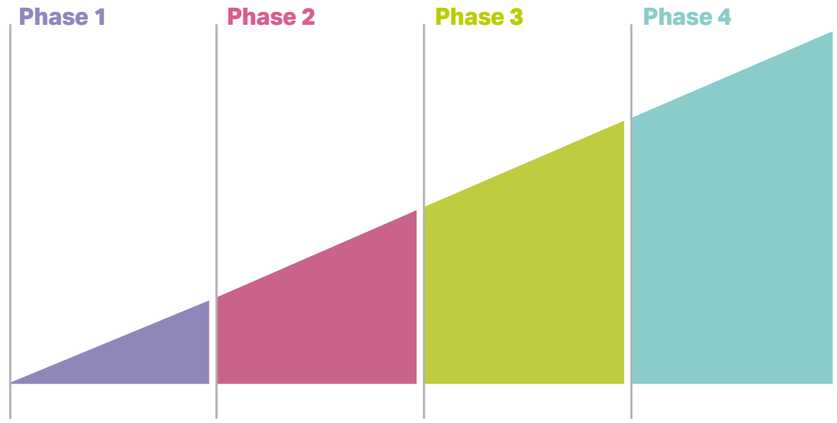
Unaddressed near vision impairment affects more than 500 million people, and WHO are using both the near and distance vision app for data collection in surveys and surveillance.

Future research includes adaptive trials in Kenya, Botswana and India inspired by methods routinely used in software development.[36] These trials will allow service providers to rapidly evaluate different ways to improve services, with the methods being developed having the potential to transform health service improvement in other fields beyond eye care.

From proof of concept to scale

Peek has proven its solutions work with a solid evidence base and has tested it in practice with partners.

Peek is now preparing for exponential scale.



Reach & equity increase phase by phase, resulting in impact at scale

Initial research

Key partner: ICEH

The idea of a vision check tool becomes a Proof of Concept (PoC): Peek Acuity

Spin out

Key partners: ICEH, QEDJT

2014 - 2018: The idea of using Peek Acuity *within a system* becomes the next PoC

High touch-low volume

Key partners: CBM, ICEH

2018-2022: Systems approach PoC to productisation

Low touch-high volume

Multiple partners & customers

2022 - 2025+: Strengthening systems using products

CAPACITY STRENGTHENING

Our group works to improve eye health professional capacity globally. We strengthen research capacity through training PhD students and research mentorship with partners, while co-ordinating networks that enable shared learning between eye care professionals globally. Peek's programmes support health professionals to better identify people in need and connect them to services.

Image credit: Ashley Gilbertson.

Commonwealth Eye Health Consortium

ICEH led the establishment of the Commonwealth Eye Health Consortium (CEHC) in 2014 with the support of a generous grant from The Queen Elizabeth Diamond Jubilee Trust. The CEHC was an international collaborative network of leading training and research institutions, regional Colleges of Ophthalmology, Ministries of Health, NGOs and service providers.

The Consortium made a substantial contribution to the strengthening of the eye health workforce in Commonwealth countries and beyond, strengthening eye health systems, research capacity and improving integration with the wider health sector. People from at least 39 countries benefited from new or improved services, brought about through training, increasing and sharing knowledge, and developing new tools and technology.

The Consortium supported the development and delivery of several online courses for eye health, now taken by >40,000 people in 188 countries. It supported the training of 180 eye health personnel in public health leadership or specialist clinical disciplines – resulting in the development and delivery of new services and increased regional training capacity in many countries. It facilitated the establishment of new services for diabetic retinopathy in 17 countries, retinoblastoma in 14 countries and retinopathy of prematurity in 6 countries.

Image credit: (Above) Rolex / Joan Bardeletti. (Right) Andrew Bastawrous / Peek Vision.

Research capacity strengthening

We invest considerable time and energy in supporting the strengthening of eye health research capacity, most notably in several countries where we have particularly close and long-standing partnerships. This strengthening has a focus on clinical researchers. Since 2010 we have had 25 research degree students (registered at LSHTM) who have been awarded their PhDs; 15 of these are nationals of LMICs. Of people holding PhDs in the field of ophthalmology / eye health from the Africa region, ICEH has trained the large majority of them (>80%).

CEHC funding led to approximately a doubling of the number of research active clinicians trained to PhD level from the African region. These researchers are conducting contextually relevant, public health-orientated eye health research.

It has led to regional networks of researchers collaborating to further build this capacity, with ongoing collaboration and support with the ICEH team.

Case Study: Post-doctoral Research Fellowship

"Research capacity development is an often-unspoken need for improving eye health in East Africa. Perhaps this is because basic needs like deficiencies in infrastructure, consumables and health personnel are so overwhelming that it seems superfluous to think of research. Yet countries in this position need to be sure that interventions are proven to work locally before committing the few resources available. Developing research capacity is really useful towards this end. Until recently, in Kenya we had only a few ophthalmologists with master's degree training in research and none at PhD level – now we have 4 with PhDs."

Dr Stephen Gichuhi, Chair of the Department of Ophthalmology, **University of Nairobi, Kenya**

Dr Gichuhi completed his PhD at ICEH in 2016

Capacity Strengthening

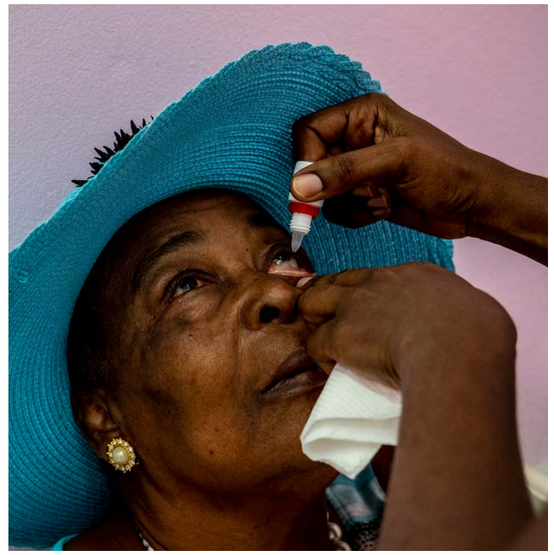


Image credit: Ashley Gilbertson.

The VISION 2020 LINKS & Networks Eye Health Partnerships Programme ('LINKS Programme') was started by ICEH in 2004. It connects hospitals and eye health training centres/institutions in LMICs, with an emphasis on Africa, with hospital eye departments, mostly in the UK. The purpose is to support the strengthening of clinical training and service provision. More than 30 long-term partnerships have been established across 18 countries.

Over time, disease-specific networks have been developed. These consist of LINKS partners with the same priority need. The first network was for Diabetic Retinopathy (DR-NET) and more recently Retinoblastoma (Rb-NET), Retinopathy of Prematurity (ROP) and Glaucoma. Networks enable shared learning within and between countries and across regions where many centres face similar problems and can share solutions south-south.

As well as strengthening clinical skills and capacity, the LINKS and Networks team at ICEH also facilitates national policy and guideline development, at the request of Ministries of Health. The networks have proven to be powerful catalysts for change and, besides measurable capacity-strengthening, have also led to widespread data-sharing and impactful research. All the LINKS and Networks staff team and all the work they do is entirely funded by grants and donations from individual donors and philanthropists, trusts and foundations.

Image credit: Ashley Gilbertson.

VISION 2020 LINKS & Networks Programme

The VISION 2020 LINKS & Networks Programme was established to address one of the key needs for eye care in Africa – strengthening the capacity of eye health workers to help them deliver better quality care for their patients.

Each LINK partnership is established in response to the priority training and capacity-strengthening needs identified by the overseas partner institution. The LINKS Programme 'matches' potential partners, organises and facilitates visits, supports and monitors ongoing LINKS and seeks funding for the partners to carry out their joint programme of training activities.

The LINKS Programme facilitates the sharing of the best UK eye care expertise (NHS Trust hospital eye departments – ophthalmologists, optometrists, nurses, managers, IT specialists etc) with African eye departments, to help the African partner team to meet the priority needs of the population they serve. The benefits are mutual; the UK team members return from training visits with much greater awareness of their role in global eye health, stronger teaching skills and enhanced knowledge and morale.

The LINKS approach establishes equitable, sustainable institution-institution partnerships. It is recognised that through long-term partnership, trust and friendships develop, which in turn enhance the value of the training and increase the likelihood of the LINK partner achieving their specific goals. LINKS bring about lasting change in every aspect of an eye department.

The VISION 2020 LINKS Programme relies entirely on charitable donations and grants from trusts, NGOs and individuals.

Image credit: Ashley Gilbertson.

Image credit: Ashley Gilbertson.

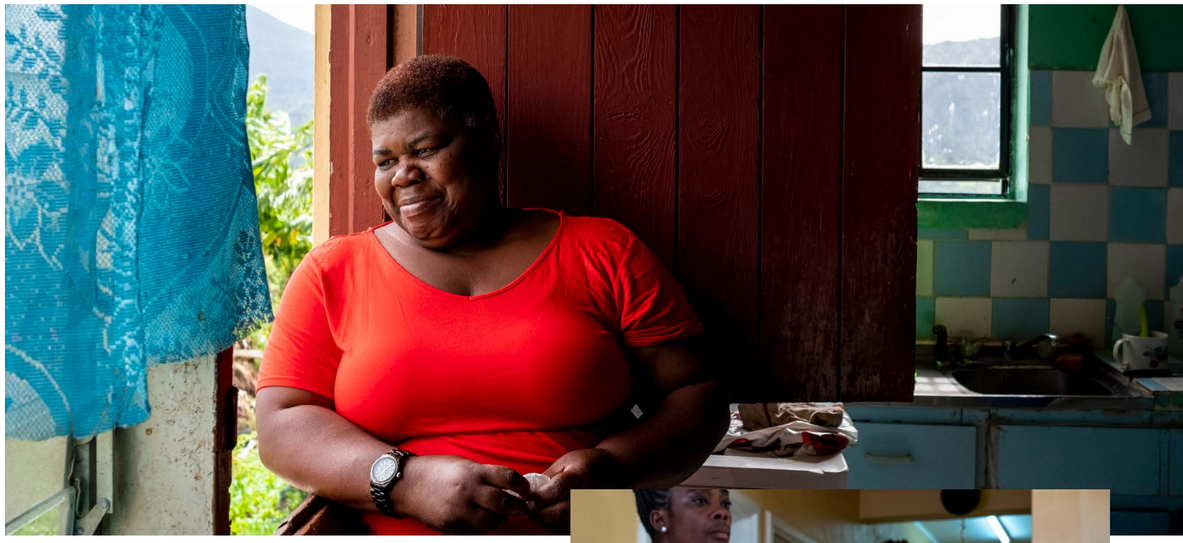


Image credit: Ashley Gilbertson.

Image credit: Ashley Gilbertson.

The DR-NET

Diabetes is a major public health problem and is rapidly increasing globally. More than half a billion people are living with diabetes. Diabetic retinopathy (DR) is the leading cause of blindness among adults of working age. Thousands of people go blind every year in LMICs simply because their DR is diagnosed too late.

The DR-NET was formed in 2013 with the aim of building capacity in LMICs to establish and run integrated DR screening programmes to identify and treat people with diabetes whose sight is threatened. There are now 38 DR screening partnerships in the network, involving 22 countries in Africa, Asia, the Caribbean and the Pacific. The network brings together key Ministry of Health and clinical leads to facilitate the development of national and regional DR policy and service frameworks, with associated implementation plans. National DR guidelines have been developed in Tanzania, Zambia, Botswana, Ghana and Nigeria through close collaboration with the Ministries of Health of each country.

Partners in the DR-NET have achieved major health system improvements leading to many people with diabetes having access to screening and treatment for the first time. All countries have established new DR services, and some are now scaling up towards consolidation as national DR screening and treatment programmes. In the first five years of the network more than 190,000 people were screened and 37,000 treated, an 88% increase in number of patients screened and a 40% increase in number treated. This was estimated to prevent 750,000 years of blindness.

DR-NET also runs a programme of online and in-person international educational activities to directly strengthen capacity for service delivery. These include Workshops where Network partners share their experiences and learn from each other, and specialist training for health care professionals in, for example, laser treatment to prevent blindness.

As the prevalence of diabetes continues to grow in Africa, it is essential that health service providers work together to ensure that diabetes services include offering people with diabetes regular eye screening, education and counselling, with timely treatment when needed, to save sight and prevent blindness.

Image credit: Swathi Kaliki.

The Rb-NET

The Rb-NET was established in 2017 with the aim of improving retinoblastoma (Rb) outcomes in LMICs, enabling more children to survive and see. Retinoblastoma (Rb) is the most common and most devastating eye cancer that affects children worldwide.

There are 9,000 new cases of Rb every year and if diagnosis is delayed or treatment is not available the child will die. In high-income countries, with specialised Rb centres, almost all children will survive, and most eyes do not have to be removed. Sadly, that high success rate is not yet possible in LMICs, where about 60% of children affected by Rb will die.

Rb-NET was initially made up of 10 Rb treatment centres in six sub-Saharan African countries (Tanzania, Uganda, Malawi, Kenya, Nigeria and Zimbabwe), linked with experts from specialist Rb centres in the UK, India, Israel, Europe and the USA. The network trains multi-disciplinary teams who work together to develop and deliver comprehensive Rb care. The network has grown since its establishment and the expert panel now holds regular national Multidisciplinary Team meetings (MDTs) online for 12 countries in sub-Saharan Africa and Asia. Cases are discussed and treatment plans developed. The sessions are recorded and made available as a resource on the website, so that learning can be further shared globally.

This network has enabled the development of an Rb research network, which now includes clinical centres in 149 countries, contributing data on more than half of the children who presented globally in 2017 with this condition. This has led to significant new research, including a study published in 2022 showing that children in low-income countries are at 16 times greater risk of dying within three years from Rb compared to their peers in high income countries, highlighting deep inequities in the diagnosis and treatment of this condition.[37] In addition to public health initiatives for earlier diagnosis, we are starting a new drug trial in Africa to improve survival in late-presenting Rb, the first of its kind.

Bringing global specialists together through Rb-NET raises the profile of Rb and draws international attention to the inequity, together with the need for better access to early diagnosis and curative treatment for children with Rb in LMICs. All the work of the Rb-NET is dependent on grants and donations to help improve the diagnosis and treatment of children with Rb in LMICs.

The ROP-NET

The ROP network was established in 2017 and included six "mentee" countries: Ghana, Nigeria, Kenya, Tanzania, Pakistan and Sri Lanka. A network model with South-South partnerships, principally with experienced mentors in India, was established.

Important principles included; joint local neonatology-ophthalmology teams leading the programmes, training and team building and needs-based, country-specific plans.

The partners worked together to develop and establish their ROP programme goals including multi -disciplinary training in the India institutions, team visits between institutions, increasing awareness of ROP within country and working with national Ministries of Health. This has led to National ROP guidelines and delivering ROP screening in several countries for the first time.

The network is currently focusing on establishing ROP telemedicine screening, strengthening data collection, and collaborating with Ministries of Health, WHO and UNICEF for sustainable integration into national policies. The network holds regular webinars and meetings to discuss clinical cases and service challenges for continuing education and ongoing support.

The Glaucoma-NET

The Glaucoma-NET was established in 2021 to improve diagnosis and treatment of glaucoma, with the aim of preserving and maximising sight through a range of activities including knowledge-sharing and development of clinical services.

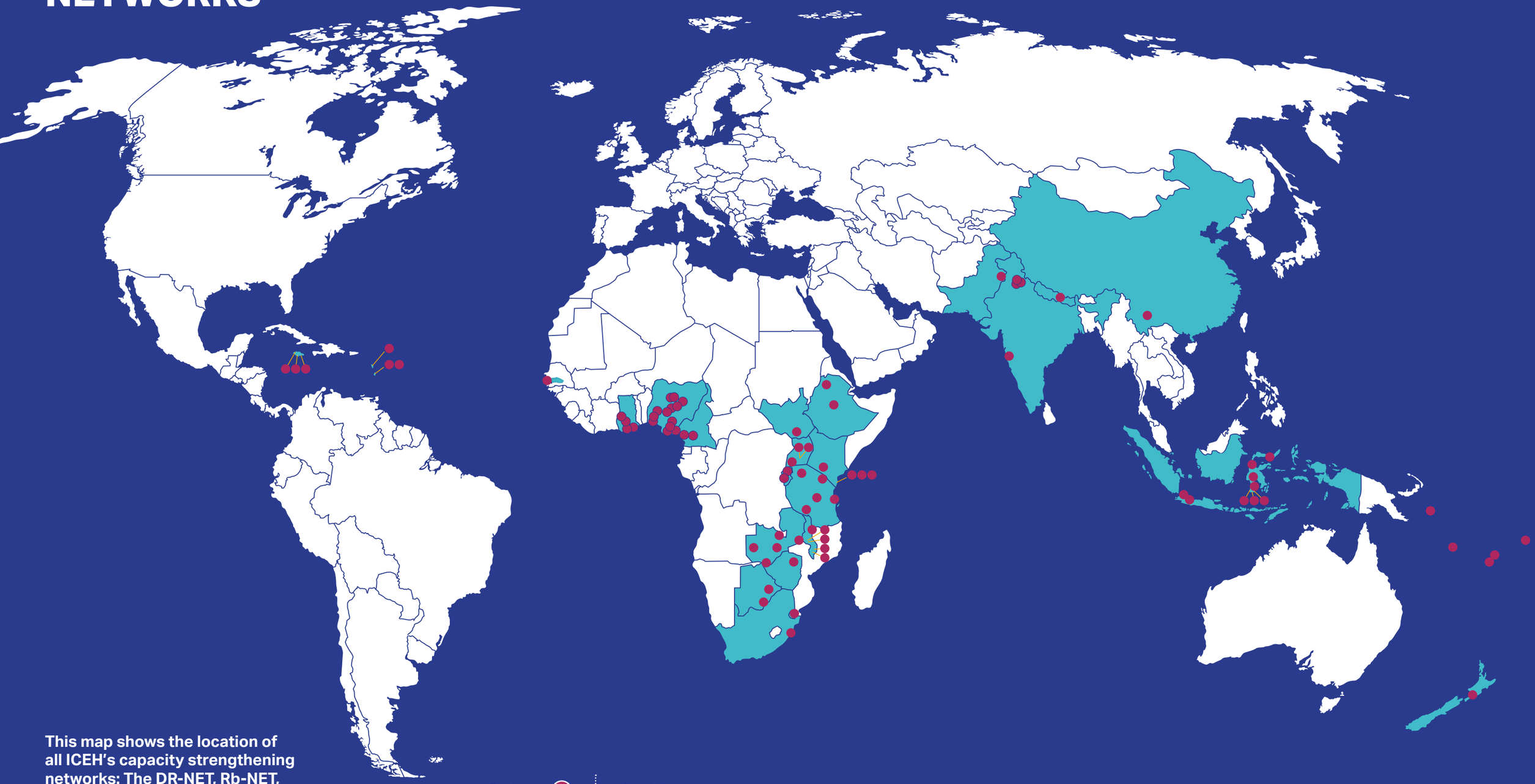
Glaucoma-NET leads and coordinates glaucoma clinicians, Ministries of Health, patient groups and other key stakeholders to establish national frameworks, guidelines and action plans for development of services to improve the outcomes for glaucoma patients in LMICs.

A key achievement is the development and implementation of the Toolkit for Glaucoma Management in sub-Saharan Africa. This provides a framework for best practice, which countries can adapt to their specific national context. Surgical skills training for glaucoma specialists in LMICs makes use of GLAucoma Simulation-based Surgical (GLASS) training and offers intensive hands-on courses. Glaucoma-NET also offers a framework for collaborative multi-country research to address key issues in glaucoma management in LMICs. Advocacy for improved resources for glaucoma care in LMICs, including patient groups, are a vital feature of the Network's activities.

Image credit: Heiko Philippin.

Glaucoma-NET hosts monthly online training and case discussion sessions with participants from LMICs including Burkina Faso, Cameroon, Ethiopia, The Gambia, Ghana, Kenya, Mozambique, Nigeria, South Sudan, Tanzania and Uganda, to share learning and strengthen capacity to prevent vision loss in people with glaucoma.

CAPACITY STRENGTHENING NETWORKS



This map shows the location of all ICEH's capacity strengthening networks: The DR-NET, Rb-NET, ROP-NET and Glaucoma-NET.

Some institutions are members of all four networks. Each network continues to expand.

Partners

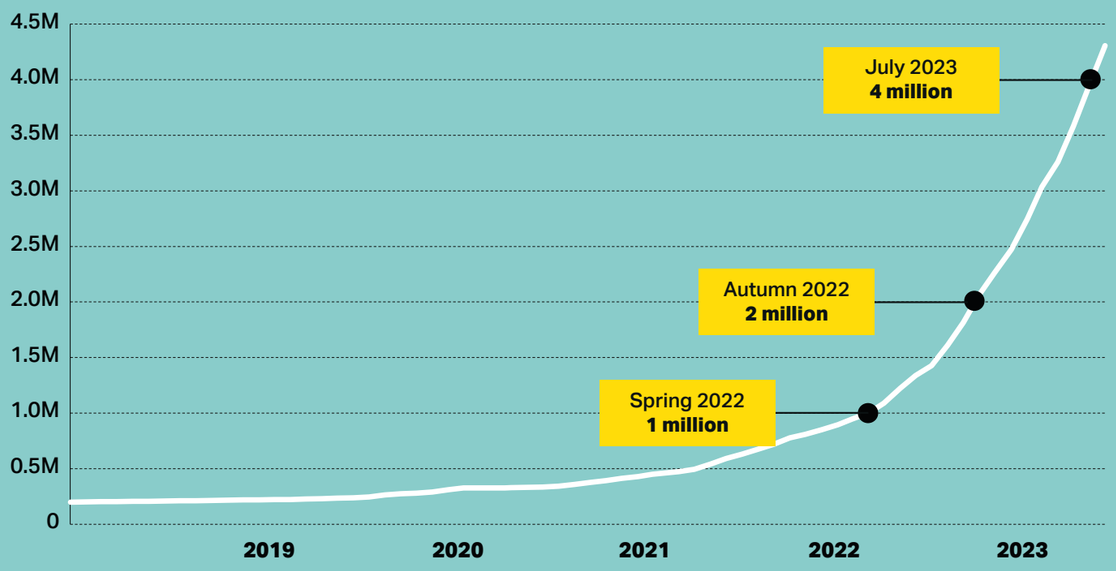
Countries

Botswana	Dominica	Ghana	Kenya	Pakistan	Solomon Islands	The Gambia	Zimbabwe
Burundi	Eswatini	India	Malawi	Rwanda	South Africa	Uganda	
Cameroon	Ethiopia	Indonesia	Nepal	South Sudan	St Lucia	Vanuatu	
China	Fiji	Jamaica	Nigeria	Samoa	Tanzania	Zambia	

Peek Vision

Through Peek's own research and partner organisations' programmes, Peek has powered the screening of over four million people and connected half a million people to care (July 2023). Momentum is growing. It took a decade to reach the first million people (Spring 2022) and just six months to reach the next million (Autumn 2022). In July 2023 alone, Peek was used to screen over 375,000 people. There are currently 54 live programmes powered by Peek across 12 countries.

People Reached in programmes powered by Peek



A Peek-powered programme enables non-specialists to conduct large-scale eye health screening in schools and communities. Patients requiring specialist review are identified and referred for appropriate treatment. Patients and / or carers receive automated text or voice messages in local languages notifying them of results and actions. Results are sent to local programme managers, head teachers and / or appropriate professionals to facilitate coordination of necessary actions (e.g. appointment booking; organising group local transport). Crucially, "loop-closure" is tracked in real-time with live data to close the huge gap in the proportion of people identified with an eye health need who never make it to treatment, which can be as high as 80-90%.

Eye health providers use Peek's software and data intelligence platform and comprehensive approach to identify hidden barriers to eye health across their programmes. By uncovering these hidden barriers, Peek is enabling system level changes resulting in eye health systems that are more impactful, cost-effective, efficient and equitable.

Peek and CBM Christian Blind Mission, Peek's anchor INGO partner, commissioned a return on investment study facilitated by an independent health economist.[38] The study compared eye health programmes in four comparable districts in Pakistan, two that were using Peek and two that were not. All projects were implemented over the same one year time period.

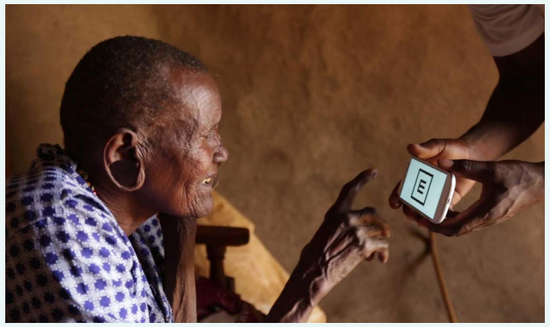


Image credit: Peek Vision.

The key findings were impressive:

2.5x — **Increased screening coverage**
More than **2 times** the total population screened

16x — **More people treated**
With Peek, there were **16 times more** people connected to care and receiving treatment

6x — **Lower cost per referral**
More than **6 times cheaper** per referral attendance.

Peek works within existing systems, complementing programme delivery processes that are already in place. Working in tandem with eye health providers, Peek assists in optimising and accelerating eye health screening and referral pathways through an entire system to increase efficiency and equity of care. Peek is an attractive solution for national governments to adopt and strengthen sustainable, government-led eye health delivery.

Current examples include:

Botswana

Pono Yame (My Vision) is the Government of Botswana's national school eye health programme, powered by Peek technology. It is one of Africa's first government-led national school eye health programmes and will screen and provide appropriate treatment to every school-going child in the country. To date, over 70,000 children have been screened.

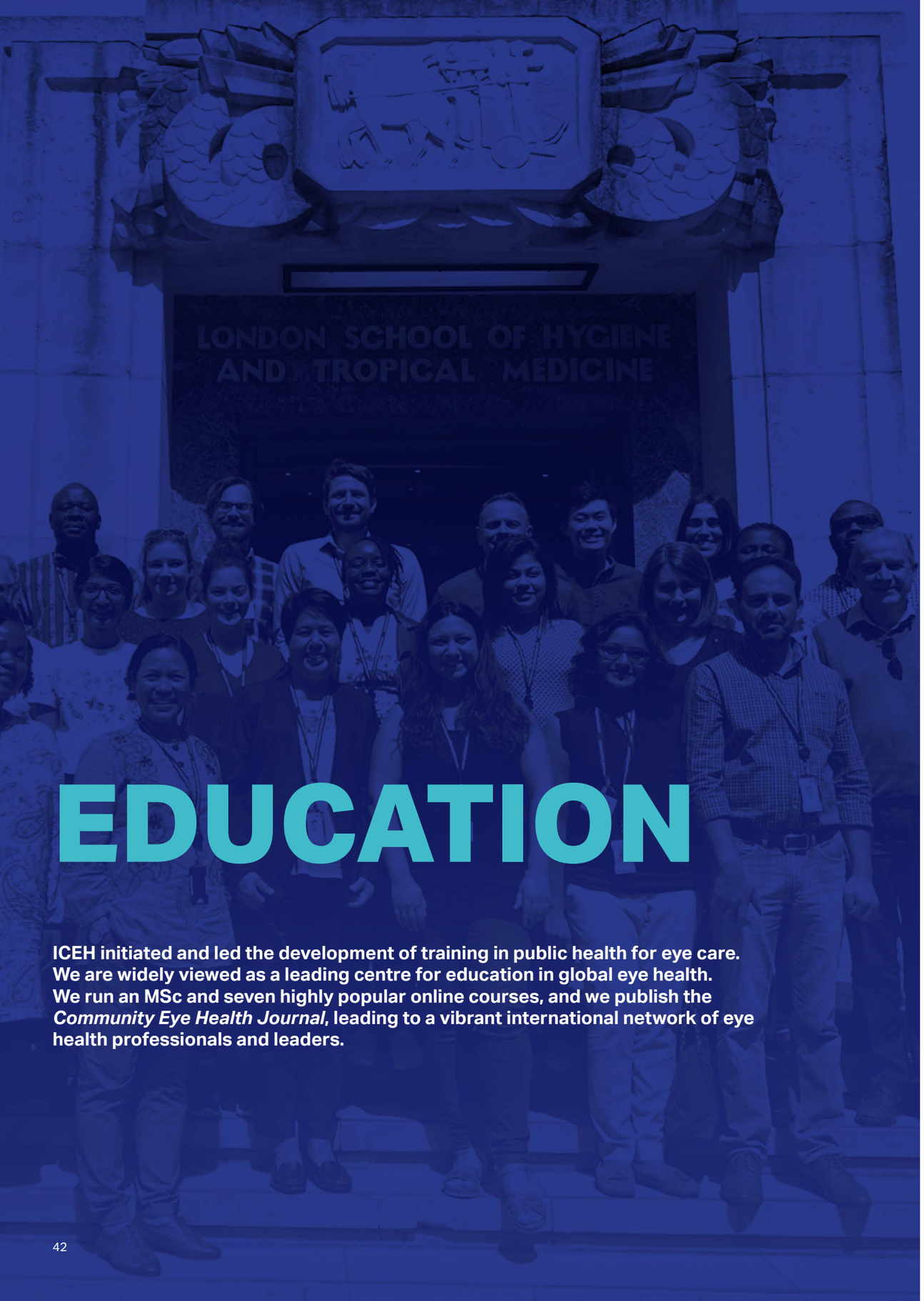
Credit: Peek Vision.

Kenya

Peek is providing the technology for the CBM and Ministry of Health-led *Vision Impact Project,* covering 10 counties in Kenya. More than one million people have been screened in the first 11 months of the programme, which is strengthening health systems and providing inclusive access to quality eye care. Peek is referenced in Kenya's National Eye Health Strategic Plan 2020-2025 as a technology to pursue.

Pakistan

The flagship CBM-Peek programme in Pakistan first launched in October 2018 with three health facilities. To increase coverage, 1,200 government-employed Lady Health Workers in Pakistan were successfully introduced to the programme to carry out door-to-door screening in communities. The Peek powered programme in Pakistan has grown to over 140 connected health facilities and 1,700+ connected schools, with more than 100,000 screenings performed each month.



EDUCATION

ICEH initiated and led the development of training in public health for eye care. We are widely viewed as a leading centre for education in global eye health. We run an MSc and seven highly popular online courses, and we publish the *Community Eye Health Journal*, leading to a vibrant international network of eye health professionals and leaders.

Online Education

Since 2014, ICEH has extended access to public health for eye care training through the development and delivery an extensive portfolio of free online courses: Open Education in Eye Health. The rationale was to bridge the curriculum gap between disease-focused clinical training and a public health approach. It has extended access to a wide group of health professionals, improving availability and increasing access by removing costs.

The courses have been built with contributions from more than 30 members of our team and 80 external contributors from 25 countries. Five courses now also carry professional accreditation. The course portfolio contains >600 individual open learning resources, which are being used and adapted by multiple training programmes globally.

IMPACT

Overall, >40,000 people from over 180 countries have engaged with these courses. Each course is annually updated to maintain its relevance and quality for the global participants.

The "on demand" format provides users with complete flexibility to access the course at a time that suits them and complete the course at their own pace. We provide supportive facilitation across the courses. The courses are designed to support self-directed and social learning, with students able to interact through comments and feedback.

The impact of these courses has been very widespread, and we have received consistently very high ratings and positive feedback. These have become recognised trainings for many organisations.

Course	What will you gain
Global Blindness: planning and managing eye care services (also translated into French, Spanish, Portuguese and Chinese)	Understand magnitude of global blindness and how to plan effective cataract and refractive error services eye care.
Eliminating Trachoma	Discover how the SAFE strategy is used by communities and experts to end trachoma disease across 44 endemic countries.
Diabetic Eye Disease: strengthening services	Recognise the magnitude of the diabetes challenge and its impact on vision. Understand the principles of screening and application to prevent blindness.
Retinopathy of Prematurity: practical approaches to prevent blindness	Explore the Neonatal and ophthalmic strategies to prevent and treat retinopathy of prematurity (ROP) across health systems.
Glaucoma: a public health approach to preventing blindness	Develop a public health understanding of glaucoma, its lifelong management, and raising awareness for better quality eye care.
Ophthalmic Epidemiology Part 1 – Basic Principles	Discover the key concepts of epidemiology for eye care, explore the causes and distribution of visual impairment in populations, learn about key epidemiological study designs and assess their strengths and limitations for studying eye disease.
Ophthalmic Epidemiology Part 2 – Application to eye diseases	Learn to critically analyse the different features of the main epidemiological study designs and how they are used to address different research questions in eye health.

MSc Public Health for Eye Care

Our Master's course in Public Health for Eye Care has been training eye health professionals from around the world for over 40 years. This one-year programme is taught by a global faculty of subject experts.

This training equips eye care professionals to effectively develop, manage, monitor and evaluate programmes, become advocates and trainers in eye health, develop relevant research, and directly influence national eye health policy.

Along with the public eye health education on the MSc, the curriculum includes training in epidemiology, epidemiological research methods, statistics and health economics, culminating in a research project and dissertation, with the fieldwork usually conducted in the candidate's own country.

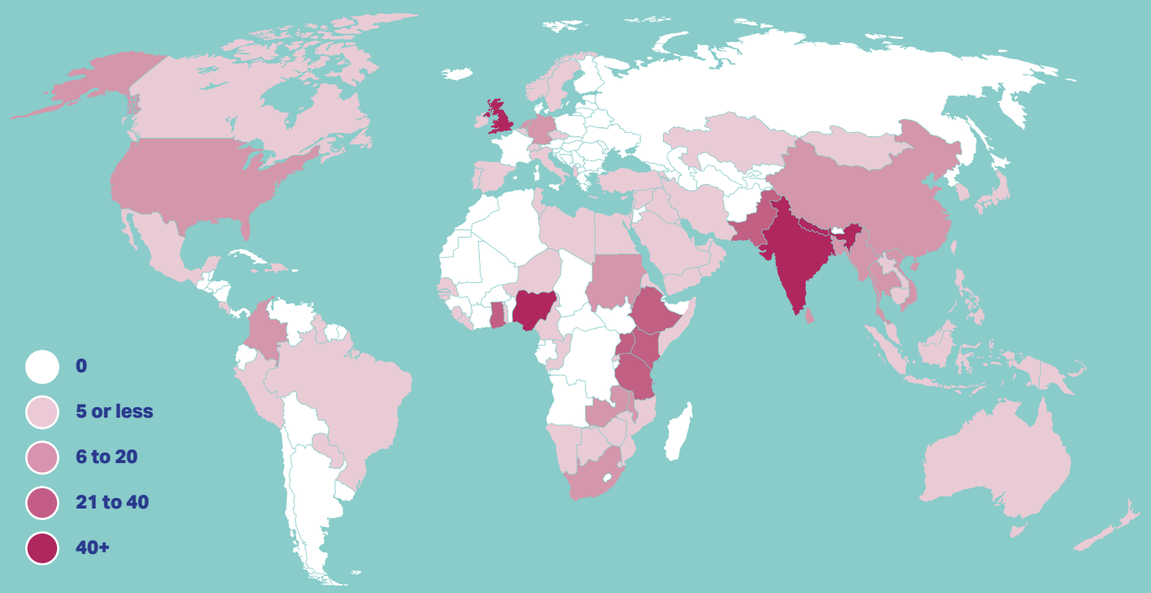
IMPACT

The impact of this course has been substantial, global in reach, and long-term in duration. This course is unique in the ophthalmic world and provides capacity-strengthening for research and population health approaches to eye care service provision at a local level.

Since the course began, this face-to-face one-year MSc has trained >750 people from 100 countries. Our alumni have gone on to many different roles within the eye health field, holding leadership positions within WHO, many national MOH eye health leads, senior positions in international and national NGOs, academic roles and clinical training and service delivery positions.

In the last ten years 50% of students have been female, and 79% come from low- or middle-income countries. Over these last ten years 75% of our MSc students have been supported through fully funded scholarships. Each year we work hard to raise this scholarship support with several donor organisations.

ICEH MSc Alumni –
by country of origin, 1981 onwards



Outline of course content:

The MSc programme can be taken full time (12 months) or split (24 months) and starts each September. It predominantly takes place as face-to-face teaching in London. The course has the following desired outcomes:

- describe the basic epidemiology of the major blinding eye diseases
- design and interpret studies to assess public health eye care needs using appropriate research methods
- critically appraise evidence and select appropriate public health interventions for the major blinding eye diseases
- design a comprehensive eye care programme for appropriate preventive and therapeutic measures for a community
- develop the skills necessary for resource mobilisation, management and evaluation of local comprehensive eye care programmes and integration into health systems

Compulsory modules on the course include Basic Epidemiology, Basic Statistics for Public Health & Policy, Foundations of Global Eye Health and Eye Care Programmes, Introduction to Health Economics, Epidemiological Methods Applied to Eye Diseases, Skills for Field Research in Eye Care, Childhood Eye Disease and Ocular Infections, and Non-Communicable Eye Diseases.

ALUMNI PERSPECTIVE: DR SUCHETA KULKARNI

I opted to do the master's in public health for eyecare after almost 17 years of clinical practice, joining the course in London in 2015 with the specific purpose of learning research and programme management skills.

Focused modules on research skills and lots of practice helped me plan and successfully implement several research projects after my master's. The second objective of learning programme management skills was achieved during the second term of the MSc. Understanding the programme cycle and applying this knowledge in several interactive practice sessions as well as in written assignments, helped me develop a broader perspective of looking at any programme with respect to manpower, material, and money. Similarly I developed a very clear understanding of how 'service provider' and 'health seeker' factors affect outcome of any project/ programme.

After completing my master's, I implemented several research projects in my local area and published them. I also guide young health care professionals to design and implement research projects. Similarly, I have managed several eye care projects including those on diabetic retinopathy and retinopathy of prematurity successfully in the last 7-8 years. I have also been working to raise awareness about disability among eye care professionals, following the modules I took during the MSc.

The *Community Eye Health Journal*

The *Community Eye Health Journal* (CEHJ) provides free, practical, peer-reviewed guidance to eye care providers (including ophthalmic nurses and allied health personnel, ophthalmologists and optometrists), managers and policy makers in low-resource settings.

Our goal is to reach as wide a readership as possible of eye care workers in LMICs, providing relevant and useful content to improve patient care. It is a unique resource and for many eye care workers in low-income countries the journal is their only source of up-to-date information on how to deliver high quality services.

ICEH has produced the CEHJ since 1988. There are currently three editions: International (English), South Asian (English/Hindi) and Francophone Africa (French). We are expanding to Chinese (Mandarin) with plans also for Latin America (Spanish) and Eastern Mediterranean (Arabic) with local editorial teams.

The journal has an international editorial board, the majority of whom are experts from LMICs. The journal relies on donations to fund its production and distribution.

IMPACT

Copies are sent quarterly to readers in 134 countries and content is freely available online via our website and smartphone app. We estimate that the onward readership is 5-10 for every print distributed, and the journals are collectively considered a 'living library' by many. In the past year our website received 354,000 visits from 178,000 users, and our articles received over 2 million 'hits' on PubMED.

Our reader surveys show that 87% respondents reported making positive changes to their practice due to things they had read in the journal:

> **"My patient customer care has improved. I handle my instruments with extra care and I take good care of them. I do eye exam systematically. My confidence and competence has increase through the knowledge I get from reading the journals."**

Alumni Network

Many alumni of our MSc return to or take up posts in which they are responsible for the leadership and delivery of eye health programmes for regions of countries, whole countries and internationally.

The training they have received informs the shaping and leadership of these programmes, benefitting millions of people. Therefore, the course has had very considerable strategic impact. The work of previous alumni ranges from: leading eye care at ministries of health; positions at WHO; regional leadership roles with the International Agency for the Prevention of Blindness; directing community eye health training in educational institutions and universities; leadership roles with international NGOs, and leading eye research in their own countries.

Our alumni are a great resource within eye health, but also a group of friends and colleagues that we hold dear. We aim to work collaboratively with this group as much as possible and provide opportunities for networking throughout their careers.

Image credit: The International Centre for Eye Health.

DR OTERI OKOLO

Dr Oteri is an ophthalmologist and the National Eye Health Coordinator for Nigeria. She also serves on the board of the National Eye Hospital (NEC), Kaduna.

Since her MSc at ICEH she has been instrumental in strengthening National and State level leadership structures and effective coordination between government and development partners. She has also been involved in improving service delivery, human resource training and research capacity at NEC, finalization of country-level indicators and data tools, advocacy, and development of national guidelines for diabetic retinopathy and glaucoma. She has facilitated in-service training of Community Health Extension Workers (CHEWs) in Primary Eye Care (PEC) in 3 states of the country with plans for a national scale up.

Her research work on the acceptability of the WHO Primary Eye Care manual has led to the upgrade of the curricula for the preservice training of CHEWs. 70% of Nigeria's population reside in rural areas and lack access to basic eye care services. This landmark achievement will potentially increase access to quality eye care services.

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3. **The Association Between Vision Impairment and Mortality: A Systematic Review and Meta-Analysis.**
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38. **Data on file**

ICEH looks towards the future with a shared goal of continuing excellence in eye health worldwide through collaborative and equitable partnerships. In future we seek to:

- Further develop global networks of academics, clinicians and policymakers to tackle the greatest challenges in eye health
- Create innovative and integrated service programmes through research, collaboration and tools
- Expand our capacity strengthening networks, providing eye health workers globally with the skills and support they need to carry out successful diagnosis, treatment and prevention programmes
- Continue to train and support eye health researchers throughout their careers
- Share knowledge and skills through education and our journal, reaching the entire eye care workforce with up-to-date information
- Translate all our work into policy and practice through dissemination, engagement and advocacy

Our work would not be possible without funding from international institutions, donors and partners. We are extremely grateful to all our funders for their continued support and help to improve eye health worldwide.


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