

# EYE HEALTH

03 TRACKING AGEING AND SIGHT LOSS

05 MACULAR DEGENERATION ON THE RISE

08 TECH INNOVATION CHANGING LIVES

## MYOPIA

# Short-sightedness now a global epidemic

More of us are experiencing short-sightedness or myopia, so to what extent are our modern lifestyles and hours spent staring at screens to blame?

FIONA DUFFY

By 2050, half the world's population – a staggering five billion people – are expected to be short-sighted compared to roughly 1.4 billion people today, according to 2016 study published in the journal *Ophthalmology*.

More intense education and a lack of time spent outdoors is leading to an explosion in the condition, warn experts.

"The prevalence of myopia – the medical term for short-sightedness – has risen rapidly over last few decades to a global epidemic," warns Dr Denize Atan, consultant senior lecturer in ophthalmology at the University of Bristol. "Currently, 30 to 50 per cent of adults in the United States and Europe are myopic while, in high-income countries in East and South Eastern Asia, myopia preva-

lence has risen from 1 per cent to 80 or 90 per cent in school-leavers aged 17 or 18."

Developing myopia can mean far more than simply needing specs for distance vision. Experts warn that it can increase the risk of developing other eye conditions like myopic macular degeneration, glaucoma and retinal detachment. For the 10 per cent who develop severe myopia there is a real risk of blindness.

Someone with myopia has clear and sharply focused vision for things that are close to them but blurry vision for things that are distant from them, explains Dr Atan. "They may find it increasingly difficult to read writing on the whiteboard at school, road signs, car number plates etc unless they are close up – and might start holding books closer to their faces to read or sitting closer to the TV to see it clearly."

There is no one definitive answer for the dramatic increase in cases, says Dr Louise Gow, specialist lead in eye health for Royal National Institute of Blind People (RNIB). "We know genetics is a factor; if you have a parent who is short-sighted then you are much more likely to become short-sighted," she says.

Education is also a major contribution, adds Dr Atan, referring to a study led by Cardiff University and the University of Bristol she was involved in. It concluded that every year of education incrementally increases myopia to the extent that, if the average school-leaver at 16 had 20/20 vision, the average university graduate would legally need glasses to drive.

The increased intensity of educational pressures in young children has coincided with the rapid rise in myopia cases; half of children in East Asia are now myop-

ic by the end of primary school. Because the eye continues to grow during the school years, children with early onset myopia will have much higher prescriptions and higher risk of complications from their myopia.

"Very simply, those who spend more time in education may have less exposure to natural light," says Dr Atan. "Children need to spend more time outside. They should be encouraged to spend their break times outdoors during school hours and when not at school."

Professor Jez Guggenheim from the School of Optometry and Vision Sciences at Cardiff University, who also worked on the study, agrees. "In two randomised control trials of children aged six to 12 years old in China and Taiwan, children given 40 minutes to an hour extra outdoors each day had a reduced incidence of myopia," he says.

It's not just children and teenagers that are a cause for concern. New research suggests the average office worker spends almost 1,700 hours a year in front of a computer screen – the equivalent of more than 70 days. "For millions now, staring at a screen all day is the norm," said Katie McGeechan from contact lens manufacturer ACUVUE, which commissioned the research. "However, if you look back just a few decades, far fewer of us would have spent the day looking into the same glowing rectangle, and when you add mobile phones into the mix, we're putting our eyes through a lot every day."

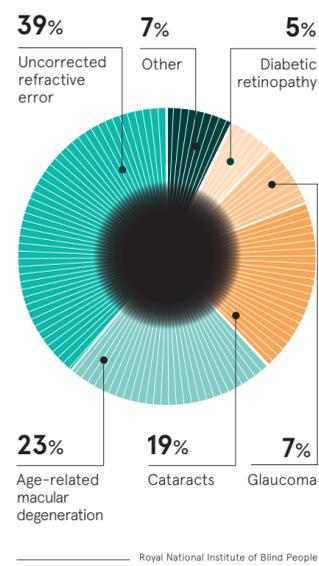
There's no evidence that actually using screens on devices such as computers, tablets and phones physically harms the eye, explains Dr Gow. It's the amount of time spent on them. Official health and safety regulations stipulate that if you regularly use display screen equipment (DSE), your employer should be funding regular eye examinations and, if they reveal that you need to wear special corrective spectacles when using a visual display then your employer is obliged to pay for them. If an ordinary prescription is suitable for your DSE work, your employer doesn't have to pay.

There is no legal guidance on screen breaks but experts advise breaking up long spells of DSE work with frequent short breaks. A five-minute break every hour is better than 20 minutes every two hours. "Eye muscles get tired when staring at a screen for any length of time because they don't have a variety of focus," explains Dr Gow. "Follow the 20/20/20 rule – look 20 feet away from the screen every 20 minutes, for 20 seconds – and remember to blink. We blink far less when staring at a screen – so the lubricating tear film dries out."

Resist the urge to scroll through social media on your phone – that is, after all, just a smaller screen – and avoid collapsing in front of your TV or laptop when you get home.

There is no cure for myopia but certain treatments are known to slow

## Causes of sight loss in the UK



**This generation is set to be the most myopic the world has ever seen. We can't simply stand by and do nothing**

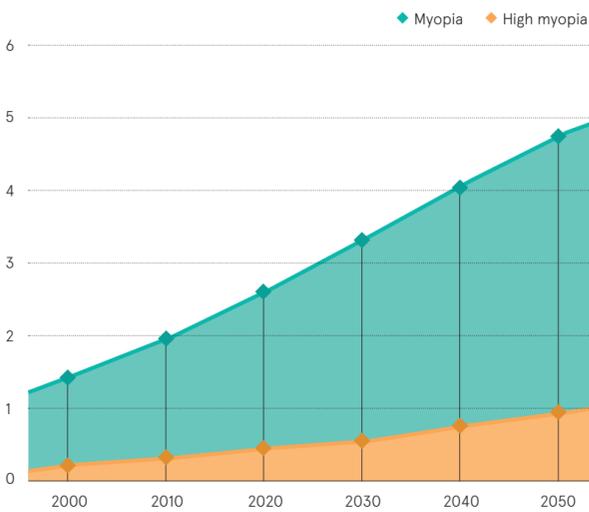
down the rate of progression, says Dr Atan. These include atropine eye drops in low concentrations.

"This generation is set to be the most myopic the world has ever seen. We can't simply stand by and do nothing," says Keith Tempany, immediate past president of the British Contact Lens Association. "Studies have shown that certain contact lenses can actually slow the progression of myopia in children by as much as 59 per cent."

"Examples include orthokeratology lenses, a rigid lens worn overnight but removed in the morning, giving the patient clear vision all day without needing to wear glasses or contact lenses. There are also soft lenses with dual focus designs, available as either daily disposables or reusables which have been shown to slow down myopic progression," he says. "There are a raft of other lenses coming onto the market and this gives us an opportunity to make a long-lasting difference to the eye health of generations to come." ♦

## Growing prevalence of myopia worldwide

Number of people (bn)



\*Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050\*, *Ophthalmology* 2016

## Growing prevalence of myopia worldwide

**28%**

of the world's population suffered from myopia in 2010, equal to 1.95 billion people

**50%**

are expected to be myopic by 2050, equal to 4.76 billion people

**938m**

people are predicted to suffer from high myopia by 2050, which puts them at risk of more serious eye conditions

Although this publication is funded through advertising and sponsorship, all editorial is without bias and sponsored features are clearly labelled. For an upcoming schedule, partnership inquiries or feedback, please call +44 (0)20 8616 7100 or e-mail info@raconteur.net. Raconteur is a leading

publisher of special-interest content and research. Its publications and articles cover a wide range of topics, including business, finance, sustainability, healthcare, lifestyle and technology. Raconteur special reports are published exclusively in *The Times* and *The Sunday Times* as well as online at

raconteur.net. The information contained in this publication has been obtained from sources the Proprietors believe to be correct. However, no legal liability can be accepted for any errors. No part of this publication may be reproduced without the prior consent of the Publisher. © Raconteur Media

Distributed in

**THE SUNDAY TIMES**

Published in association with

**NATIONAL EYE HEALTH WEEK**  
YOUR VISION MATTERS

## CONTRIBUTORS

**MARTIN BARROW**  
Journalist and writer, he is a former health editor of *The Times*.

**SIMON BROOKE**  
Award-winning freelance journalist, who writes for a number of international publications, he specialises in lifestyle trends, health, business and marketing.

**DANNY BUCKLAND**  
Award-winning health journalist, he writes for national newspapers and magazines, and blogs about health innovation and technology.

**FIONA DUFFY**  
Freelance journalist, she writes for national newspapers and magazines, specialising in health, fitness, lifestyle and human interest.

**JOHN ILLMAN**  
Author and former national newspaper health editor and medical correspondent, he is a visiting lecturer at the University of Cambridge and University of Westminster.

**raconteur reports**

Publishing manager  
**Richard Hadler**

Production editor  
**Benjamin Chiou**

Commissioning editor  
**Simon Brooke**

Head of production  
**Justyna O'Connell**

Digital content executive  
**Fran Cassidy**

Design  
**Grant Chapman**  
**Kellie Jerrard**  
**Samuele Motta**

Head of Design  
**Tim Whitlock**

f /raconteur.net

@raconteur

@raconteur\_london

raconteur.net /eye-health-2018

# 50% of sight loss is avoidable

Book an eye test at [specsavers.co.uk](https://www.specsavers.co.uk)

**RNIB** **Specsavers**

Transforming eye health

Source: Specsavers and RNIB State of the Nation report 2017. ©2018 Specsavers. All rights reserved.

# Eye health cannot be ignored

National Eye Health Week is an opportunity for all of us to improve the nation's vision, especially as the population ages

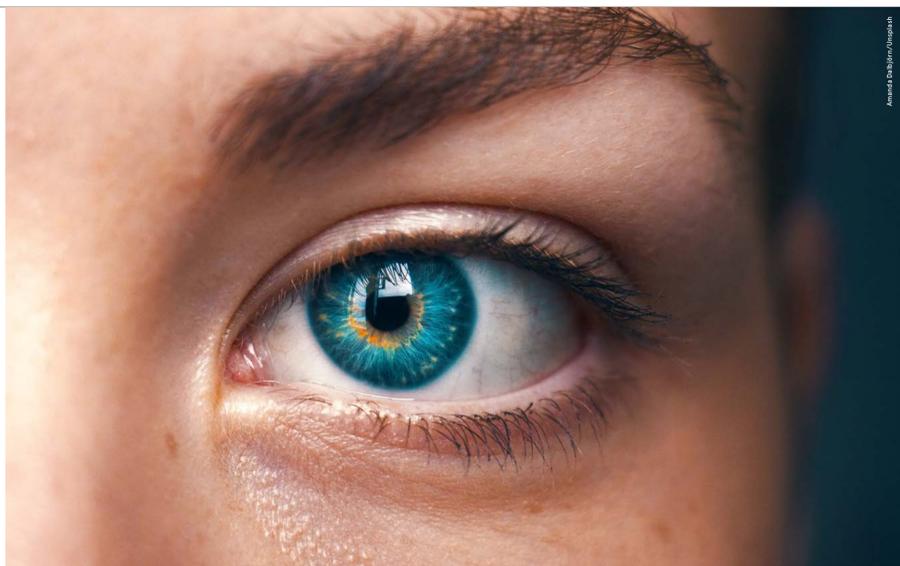
SIMON BROOKE

As National Eye Health Week begins, and opticians around the country work with charities and other organisations to persuade us to think about the health of our eyes and get them tested regularly, the UK picture and eye health is mixed. Every day 250 people start to lose their sight in the UK and since 2015, more than

**Insight**  
**Manifesto for better eyecare**

This summer's *See the Light* report from the All-Party Parliamentary Group on Eye Health and Visual Impairment calls for improvements in the way that the NHS and others handle eye health. Here are a few of their recommendations:

- Include eye health specifically within the NHS England mandate to ensure that it's accorded a higher priority.
- Bring ophthalmology fully within the NHS transformation programme whilst adequately funding service redesign.
- Urgently review the National Tariff for ophthalmology which currently seriously disadvantages some patients with glaucoma, wet age-related macular degeneration and diabetic retinopathy, who require follow-up appointments and are particularly at risk of avoidable sight loss.
- Establish a national target for all ensure patients requiring follow-up appointments are seen within clinically appropriate times to prevent delayed and cancelled appointments resulting in patients lost to follow up.
- Work with NHS Digital, urgently implement IT connectivity between community optometry and the wider NHS to improve patient care and efficiency.
- Review regulations to ensure that necessary amounts of drugs are dispensed, stored and available in theatre and outpatient treatment rooms in advance of the day's list for treatment.
- Establish separate ophthalmology contracts with NHS providers from April 2019 to ensure there is public transparency about funding invested in eyecare and how this correlates to assessed need in Joint Strategic Needs Assessments.
- Review booking procedures to ensure patients who need further appointments can book their next appointment, within clinically appropriate timescales, before leaving the clinic. This will benefit patients and aid capacity planning.
- Build on strong support from all relevant professional bodies for consistent learning outcomes from curriculum and training systems for ophthalmic professionals, such as optometrists, opticians, nurses and orthoptists.



our ageing demographic. One in five people aged 75 and over are living with sight loss, with this figure rising to one in two people aged 90 and over, says RNIB. The cost to the economy is also on the rise. Having risen from £22 billion in 2008 to £28 billion in 2013, it is predicted to reach £30.8 billion by 2020. The growing obesity crisis and high prevalence of smoking among millennials are just two factors that are thought to be damaging our eyesight.

Too many of us are not taking our eye health seriously. According to Eye Health UK, the charity responsible for running National Eye Health Week, almost 14 million of us don't have regular eye tests, even though we're advised to. Three quarters of British people admit they had suffered poor eye health in the last 12 months and more than one in five (22 per cent) said that this had restricted or impaired their daily life.

## Two million British people are living with sight loss severe enough to have a significant impact on their daily lives

Members of the black, Asian and minority ethnic communities and those with disabilities are particularly at risk, as are women. "Nearly two thirds of people living with sight loss are women," says RNIB. "People from black and minority ethnic communities are at greater risk of some of the leading causes of sight loss. Adults with learning disabilities are ten times more likely to be blind or partially sighted than the general population." A report published in June by the All-Party Parliamentary Group for Eye Health and Vision Impairment said that while the NHS is providing excellent care to

many people with eye conditions, there is more work to be done. "The current system is failing patients on a grand scale. Services are delaying and cancelling time-critical appointments, resulting in some patients not receiving sight-saving treatment and care when they need it. As a result, people are experiencing avoidable sight loss, fear, loss of independence and impaired wellbeing. This is unacceptable."

The Group is calling for the secretary of state for health and social care, NHS England, the Department of Health and Social Care, local authorities, commissioners, delivery bodies, NHS providers, and sustainability and transformation partnerships to act now on eye health.

That said, more of us are realising that we need to wear glasses or contact lenses and are going out and buying them. According to findings published in February by market research firm MINTEL, 70 per cent of us already wear some kind of prescription eyewear and the optical goods and services market is set to grow by 15 per cent by 2022. "The market continues to be largely driven by sales of spectacles, and an ageing population and continued innovation in terms of spectacle lenses has boosted demand," it says.

The growing number of minor eye conditions services (MECS) schemes within community optometric practices now allows experts to help patients with a range of acute eye conditions more quickly and easily. A recent study published in the *British Medical Journal* concluded: "The Lambeth and Lewisham MECS demonstrates clinical effectiveness, reduction in hospital attendances and high patient satisfaction, and represents a successful collaboration between commissioners... and primary healthcare providers."

The NHS and private providers are now working together to make eye treatments more easily available. This may see the opening of two community-based services in North and South Manchester, the result of a joint working partnership between Manchester University NHS Foundation Trust and Bayer, the pharmaceutical company.

**250** people start to lose their sight in the UK every day

**2m+** people in the UK have been living with sight loss

**30%** estimated increase in the number of people that will be affected by sight loss by 2030

The one-stop shop for assessment and treatment services is easily accessible by public transport and the aim is for patients to have to wait less than an hour for an appointment.

"The new services launched in Manchester bring vital eye care to the high street," says Dr Sajjad Mahmood, consultant ophthalmologist at Manchester Royal Eye Hospital. The new services provide "significant benefits for our large patient community with vital care in convenient, close-to-home locations", he says.

Moving routine and non-emergency eye health services into local opticians' or optometrists' practices will allow the hospital sector to concentrate on the most urgent and complex cases, argues the Local Optical Committee Support Unit. "There are an estimated five million eye-related GP and 400,000 A&E

### Insight National Eye Health Week – take action now for your eyes' sake

Whether it's discussing eye health with friends, family and colleagues, getting together with a local optician to arrange an event to raise awareness, or even holding a lunch with food that is good for healthy eyes such as blueberries, avocados, eggs and green leafy vegetables. National Eye Health Week offers people so many activities. Meanwhile, high street opticians are being urged to display National Eye Health Week leaflets and posters in their windows, to highlight how looking after your eyes has benefits beyond how well you can see. It can help you rethink a poor diet, get active and even be the motivation you need to quit smoking. Charities, businesses and other organisations can also share important news and information about eye health. This could include putting posters in windows, inviting an optician to come in and speak to their staff or students, or promoting the campaign in their newsletter or email alert.

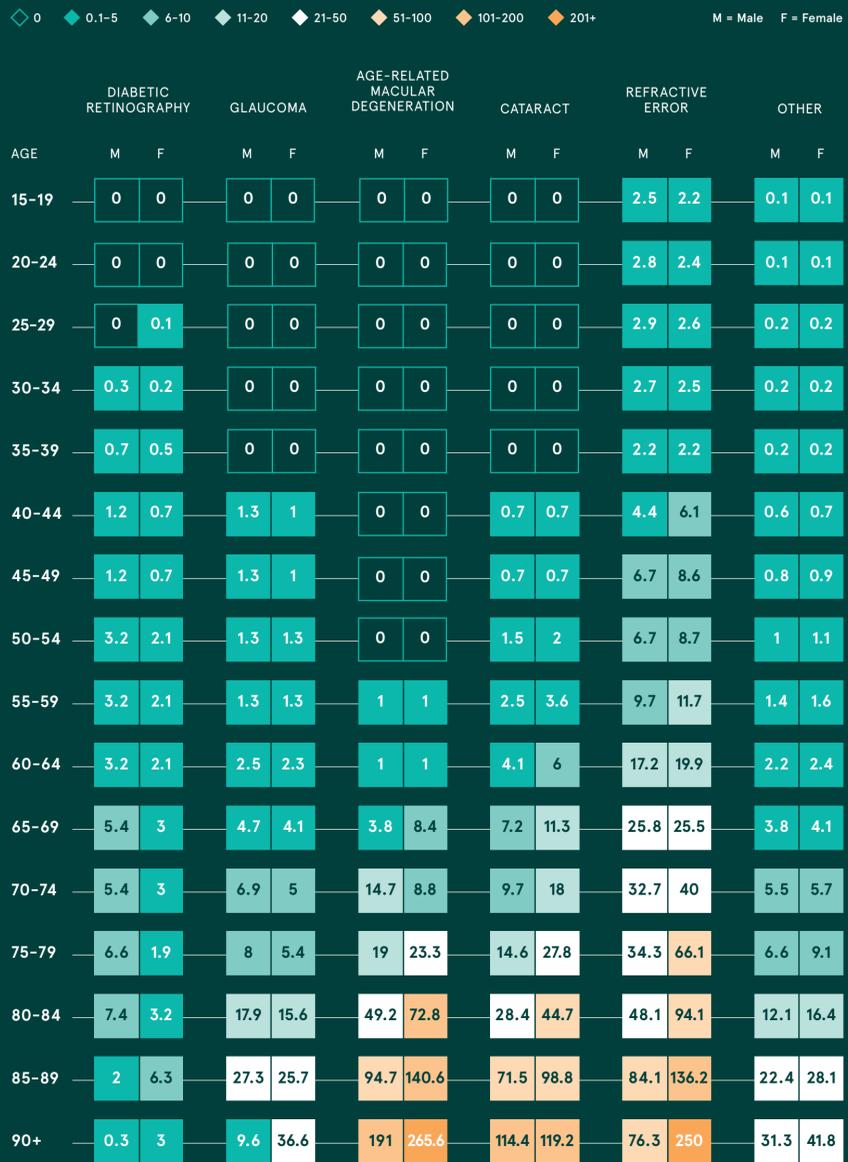
appointments," says Richard Whittington, its chief operating officer. "At a time of acute pressure, around 80 per cent of patients with minor eye conditions can be diagnosed and treated in the optical practice, but only around half of England is covered by an NHS scheme."

He points out that optical practices are handy to find in every local community, most with seven-day opening and extended hours, and patients can normally be seen for MECS within 24 hours. As National Eye Health Week begins, this and other initiatives are to be welcomed. ♦

# AGEING VISION

## Prevalence of sight loss or blindness by condition

Number of cases per 1,000 people in the UK



From glaucoma to cataracts, incidence rates for a range of eye conditions worsen as people get older. An ageing population means a growing number of people will suffer from some form of sight loss in the future

**1.6m**

people aged over 65 in the UK are living with sight loss

**80%**

of the total number of people with sight loss or blindness are aged 65 or older

### UK sight loss predictions

◆ Number of people living with sight loss  
◇ Percentage of population over 65



### OPINION COLUMN

## ‘Investing money and resources in the nation’s eye care will bring about huge returns’

David Cartwright, Optometrist and chair of Eye Health UK

The strange thing about eye-sight is that, although we're all intuitively aware of its importance as one of our major senses, too many of us don't do enough to protect it and avoid eye conditions that could damage our quality of life and, in some cases, even lead to blindness.

So much can and should be done to inform and educate the public about

eye health. Politicians, the NHS and others are struggling with the challenge of managing our ageing population. As more people are living longer it's important for us as individuals and for society as a whole that we can live independent lives for as long as possible. Ensuring people have good vision and healthy eyes as they age is essential to achieve this goal.

And yet if you look at the Public Health England website and other sources of health information you'll find lots of information about issues such as obesity, children's teeth and smoking cessation, but there's very little if anything about eye health. Some easily understood points about the importance of eye health and some tips and advice on how to maintain healthy eyes could be incredibly useful.

Looking after your eyes has health benefits beyond just how well you can see. It can help you consider your diet and quit smoking. Regular eye checks can also spot signs of poor health, including high cholesterol and increased risk of a stroke. There's growing evidence of an increase in short-sightedness, myopia, among younger people. This might well be associated with the fact

that children, millennials and others don't spend enough time outdoors. It's sometimes thought that if you are short-sighted you just need to get some glasses and you've solved the problem. However, myopia can be a risk factor for other eye conditions later in life and so it needs to be treated seriously.

There are a number of reasons why not enough of us go for regular eye tests. It's sometimes said, for instance, that people are worried about the cost of spectacles. In fact many of us don't need them and even those who do can pick them up very cheaply. A significant proportion of the population are eligible for free glasses and even those who pay can pick up a perfectly good pair starting at about £25. It's a relatively small amount of money but it can bring such a huge benefit in return.

Opticians are usually open six and in some cases seven days a week and they need to remind people of how easy and accessible they are. An eye examination might cost around £20, but we need to point out that this is a detailed examination with a highly trained healthcare professional using a lot of advanced technology. And many people, including those over 60 and children, are exempt from paying.

Perhaps we need to think about our language here. An eye "examination" or "test" sounds like something you could fail. Instead, perhaps we should emphasise the health aspect. After all, whenever I carry out a consultation, less time is spent on testing a patient's sight with the majority of the

time spent checking the health of the eyes and giving advice. An eye health check-up might sound more appealing to consumers.

We all need to do more to ensure that everyone takes better care of their eyes. The cost to the NHS and social services caring for those with low or no vision, and the loss to the economy of those who can't work because of sight problems, is enormous. Investing money and resources in the nation's eye care will bring about huge returns. National Eye Health Week is the ideal time for all of us to take action.

**41%**

of people who had not had an eye test in the last two years thought their vision was fine

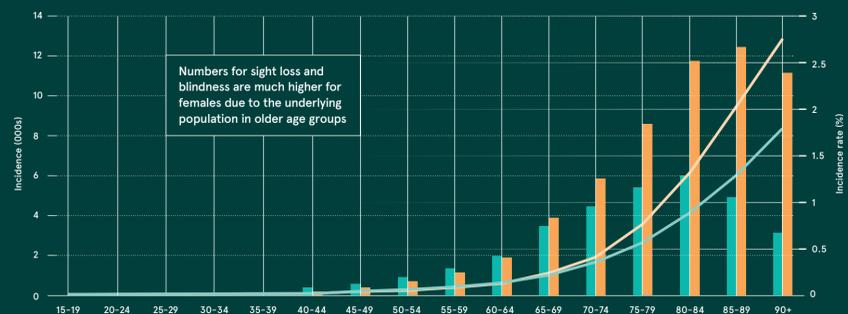
**26%**

said they were worried about the cost

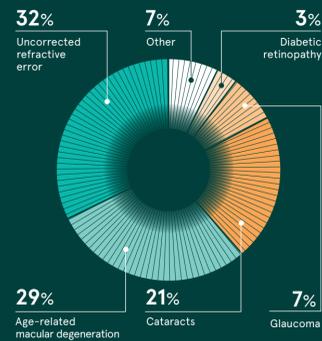
## Number of people in the UK with permanent sight loss or blindness

Number in thousands and incidence per 100,000 people, 2016 to 2017

Incidence: ◆ Male ◆ Female Incidence rate: — Male — Female



## Causes of sight loss for those aged 65 and over



Commercial feature



## “I was lucky that my optician picked it up”

Hairy Biker Dave Myers's glaucoma was diagnosed early. Now he's working with Specsavers and the Royal National Institute of Blind People to encourage everyone to have regular eye tests

They say that you eat with your eyes and so for a chef good eyesight is very important. It's also essential if you're riding a motorbike. If you're Dave Myers, one half of the Hairy Bikers cooking duo, and you do both of these things, then being able to see well is essential. My diagnosis of glaucoma, a condition that can lead to blindness if left untreated, could have been catastrophic, but luckily it was picked up early and now he has a simple daily regime to manage it. With many other people not so fortunate Myers, 61, is now passionate about getting other people to go for regular eye tests so that if they turn out to have glaucoma – or a range of other conditions – they can get advice and treatment before it's too late. That's why he's teamed up with Specsavers and RNIB to champion the importance of eye tests so that more people get tested regularly and can have conditions such as glaucoma diagnosed quickly.



### Case study Glaucoma – not easy to spot

Glaucoma is thought to affect nearly 600,000 people in the UK. Worryingly, nearly half of these cases go undetected. The condition is caused by the pressure of the fluid inside the eye damaging the optic nerve. Many people don't notice any difference to their sight because glaucoma affects the peripheral vision (also known as the side vision) first.

As peripheral vision is not as sensitive as central vision, early changes are not always easy to notice, but sight is still being damaged. There's no treatment to restore sight loss caused by glaucoma, but treatments such as eye drops, laser treatment and surgery, can help prevent further sight loss from happening.

**R N I B** **Specsavers**

Transforming eye health

Myers's glaucoma was diagnosed about seven years ago at one of his regular eye tests. "I was very surprised because there were no symptoms," he says. "I thought glaucoma was the preserve of the elderly but I was in my early 50s and my eyes were performing and functioning normally. That's the thing about glaucoma. It creeps up on you. I was lucky that my optician picked it up." Almost all of us would consider our eyes to be vitally important to us – hence the need for regular sight tests – but for Myers being able to see clearly has always had an extra significance. "Ever since I was a boy my eyesight has been so important to me. My father was a papermaker, so we had no money but lots of paper and pencils – I was forever drawing. It's always been important to me to keep on top of my eye health."

His experience underlines the value of regular eye tests, according to Specsavers. "People often assume that going to see the optician is simply to check whether you're getting more or less long or short-sighted but it's about so much more than that," says Dr Josie Forte, a head of enhanced optical services at Specsavers. "Your optician can also pick up on conditions such as glaucoma and diabetes."

Having been diagnosed with glaucoma relatively early, Myers was given some straightforward treatment and advice to manage the condition. "I have prescription eye drops, and in my case, it really is as simple as a couple of drops in each eye every night before I go to bed. They reduce the pressure in my eyes which stops the glaucoma damaging my sight. I clean my teeth, then I put my eye drops in. I receive my eye drops in three-month batches, so I only have to go to the doctors four times a year."

prosthetics and sculpture. I'd passionately cooked all my life before I launched my culinary career. As a make-up artist I was working with such fine detail, especially with prosthetics. I had to effectively fit a new nose onto an actor's face without viewers seeing the join." It was on the set of a BBC drama called *The Gambling Man* that Myers met his *Hairy Bikers* co-star Si King. "I was in charge of make-up and prosthetics and Si was an assistant director and location manager," he says. "On my first day I met all of the crew in the pub. Everyone was ordering white wine spritzers and sandwiches, but Si asked for a pint of lager and a curry. I thought: 'I'll have what he's having.'" Myers and King discovered that they had more in common than a career in television and an enthusiasm for curry and lager. "After lunch he came outside and saw my motorbike then invited me round to his house for Sunday lunch," remembers Myers. "He'd grown up in a parallel world to mine, also cooking and riding motorbikes all his life."

*Hairy Bikers Cookbook* started in 2004 and Myers says: "I have the best job in the world."

Today the Hairy Bikers are both concerned with healthy eating and the effect that food can have on eye health and other parts of the body. Since his diagnosis Myers is more aware than ever of the need to look after his eyes. "I use the eye drops every day and I have my eyes tested regularly, so I'm quite optimistic that it won't have any impact on my life. I'd say to anyone who is worried, just go and have an eye test."

## The right fit is more important than you think

Specsavers' clinical spokesperson Dr Nigel Best offers some advice on spectacles to suit each face shape and a range of different lens options



**Why are properly fitting glasses so important?**  
The first thing people see when they meet you is your face – your smile, your teeth, your hair and your eyes – and perhaps your glasses. They all say something about who you are. With so many different styles to choose from, glasses can change your look dramatically. But properly fitting specs aren't just about personal image. A good fit is essential not only for comfort but also to ensure an accurate prescription and clearest vision.

**How can you ensure a good fit?**  
Specsavers uses state-of-the-art imaging software, which runs on a tablet and uses its camera to capture a precise range of dispensing measurements for a customer. It's a quick and easy process and the measurements are unique to each customer, ensuring they receive completely bespoke glasses. Alongside that we have our Frame Styler virtual try-on software, allowing you to see how you look wearing glasses from every angle – and to see yourself as others would see you. All this coupled with our qualified frame stylists in-store will ensure your glasses not only fit perfectly but also look great on you.

**How can I match my face to a new pair of glasses?**  
The key thing is that the frame size is in proportion to your face. For example, if you have a small face, don't choose big frames. In most cases the frame should not be wider than the overall width of your face at the temples.

**How high should the top of the frame be?**  
It's usually best, except when you are choosing sunglasses, if it covers the eyebrows or is slightly lower – never above or it may look as if you have two sets of eyebrows! Check that the lower edge of the frame doesn't sit on your cheeks otherwise it may rub or irritate.

**What about matching my face type to my new glasses?**  
Again our in-store specialists and Frame Styler technology will help. For example, oval or round glasses tend to soften the features of people with square, angular faces. In contrast, glasses with square, angular frames highlight angular characteristics and are not generally recommended unless you are intentionally aiming for a severe style, like the fictional Clark Kent of Superman fame.

**What if I have an oval face?**  
An oval face is typically twice as long as it is wide, meaning that you can wear more or less any style – round, angular or bold – but it may be best to avoid very narrow frames if they make your face look longer. Being the exception to the rule, you may also suit a frame style that is a little bit wider than the widest part of your face.

**What about a triangular face?**  
These are widest at the jaw, narrowing up to the forehead. We advise frames that add a little width to the narrowest part of the face to really highlight your eyes. Visit our website for more about fitting glasses to your face shape.

**I'm not sure which face shape I have? What can I do?**  
Have a good look at yourself in the mirror and get familiar with common face shapes like oval, square or heart-shaped. Also, why not ask a friend or relative. Friends or partners often accompany our customers when they choose a pair of spectacles. And again, of course, we're here to help, with our specialist staff and state-of-the-art

Commercial feature

against ultraviolet rays, prescription sunglasses, low vision aids, dry eye, and sport and safety eyewear.

A number of our dispensing opticians and optical assistants have also completed specialist frame styling training – our Frame Perfect course was put together in collaboration with the London School of Styling.

**What about your range of lenses?**  
Specsavers offers a comprehensive range of lenses, which type is best for you depends on a variety of things, such as your lifestyle, job, preference and vision needs. Single-vision lenses have a single prescription that covers the whole lens. People under 40 mostly opt for these as they're more likely to have just one prescription. So if you only need glasses for one type of vision, your optician may prescribe these to you. All Specsavers glasses come with a free scratch-resistant treatment for standard single-vision lenses.

**What about bifocal lenses?**  
Bifocal lenses offer a convenient option for those who need to be able to focus clearly at two separate distances. They do this by combining any two different prescriptions into one lens. For example, an office worker may want to have intermediate vision for looking at a computer screen at arm's length, and near vision for looking at some paperwork.

**What's the difference between bifocals and varifocal lenses?**  
Varifocals are similar to bifocals, but they have a gradient or transition between the prescription areas rather than two distinct prescription zones allowing the wearer to see clearly at multiple distances. Specsavers also offers a range of lens extras and treatment. These include Extra Thin + Lite lenses, which improve the appearance and comfort for those with high prescriptions; Reactions, which go dark in sunlight; and a range of tints for sunshine, driving and other pursuits.



MACULAR DEGENERATION

## Sight loss a growing problem for ageing populations

Our ageing population is driving a rise in age-related macular degeneration, and there is a race against time to find new treatments

MARTIN BARROW

Age-related macular degeneration or AMD is by far the leading cause of blindness in the UK. And with an ageing population its prevalence is certain to rise.

The National Institute for Health and Care Excellence (NICE) reports a significant increase in hospital activity for cases of AMD from fewer than 10,000 in 2005-06 to more than 75,000 in 2013-14. The condition is thought to affect 600,000 people in the UK.

AMD affects the central part of the retina, which is called the macula, and causes changes to the central vision. This is most common among people in their 80s and 90s. It does not cause total blindness but can make everyday activities like reading and recognising people's faces difficult, which leads to a loss of independence. The exact cause of AMD is unknown. There are a number of risk factors which could increase your chances of developing the condition, such as smoking, high blood pressure, being overweight and a family history of the condition.

There are two types of macular disease, known as 'wet' and 'dry'. The dry variant of the disease tends to progress more slowly, while the wet variant can appear over a few weeks or months.

There's currently no way to treat dry AMD, however there is some evidence that vitamins can help slow down disease progression in certain patients. The treatment for wet AMD available on the NHS is with a group of medications called anti-vascular endothelial growth factor (anti-VEGF) drugs. These work by stopping new blood vessels from growing, preventing further damage to sight. The medicine is injected into the vitreous, the gel-like substance inside the eye.



**1 in 10**  
of those aged 65 and older have some form of sight loss

**1 in 5**  
of those aged 75 and older have some form of sight loss

**1 in 2**  
of those aged 90 and older have some form of sight loss

Royal National Institute of Blind People

CHALLENGES



## Barriers to good eyecare

Almost every high street has an optician, so why are so many people still not getting the eyecare they need?

MARTIN BARROW

Opticians enjoy a higher profile than ever before, ubiquitous on the high street and on TV. Glasses come in a million fashionable varieties and contact lenses are easier to use than ever before. Many people qualify for free eye tests, from the under 16s to the over 60s, people on certain benefits or with specific medical conditions and everyone living in Scotland.

Despite this, the nation's eye health is a cause of concern. Every day about 250 people start to lose their sight in the UK. More than two million live with sight loss that is severe enough to have an impact on their daily lives.

Why do more people not prioritise eye health in the same way they might go to a GP or a dentist? There is a broad lack of

public understanding of eye health and its relationship with general physical health. National Eye Health Week was established to help raise awareness, promoting the importance of eye tests and how they can help reduce avoidable sight loss. Making eye health visible, including the £28-billion cost of sight loss to the UK economy, remains a priority.

Social inequalities that affect healthcare generally also apply to eye health. "Certain deprived areas of the UK have less access to eye health services. Evidence shows that, even if services are readily available, the populations in such areas are far less likely to access them," says the College of Optometrists.

Although many people do not have to pay for eye tests, public perception remains that a visit to the optician will prove expensive, including the cost of spectacles, contact lenses or eye treatments.

The first symptom is often a section of blurred or distorted vision. Other symptoms include seeing straight lines as wavy or crooked and objects looking smaller than normal. Sometimes AMD may be found during a routine eye test before the symptoms materialise.

The expected increase in patient numbers, combined with the high cost of existing treatments, means funding new research into AMD and treatments for the condition has never been more critical. Earlier this year doctors announced they had taken a significant step forward, using cells from a human embryo which were grown into a patch inserted into the back of the eye. The macula is made up of rods and cones that sense light, and behind those are a layer of nourishing cells called the retinal pigment epithelium. When this support layer fails, it causes macular degeneration and blindness. Doctors at Moorfields have devised a way to build a new retinal pigment epithelium which can be implanted into the eye.

In July promising results emerged of the effectiveness of a small, refillable eye implant, which could mean patients go sev-

**The expected increase in patient numbers, combined with the high cost of existing treatments, has sparked significant clinical research into AMD**

eral months between treatment but even if proved to be effective this implant is years away from being made available.

Meanwhile, other companies are looking at similar technology to treat wet AMD, including Regeneron which has recently begun its own sustained-release initiative for Eylea, a medication that is administered by an injection into the eye. With an ageing population, new products to prevent and treat AMD will be welcomed by many. ♦

**'Since the treatment centre has opened it has been fantastic'**

Micheal Saunders, a lorry driver of 40 years, was forced to give up his job after being diagnosed with wet age-related macular degeneration (AMD). A decade on, Micheal, 74, visits the Austin Friars Eye Treatment Centre every four weeks.

A collaboration between Aneurin Bevan University Health Board and Specsavers in Newport, it's the first of its kind in the UK. Specsavers optometrists provide initial screening and referrals for people with symptoms of wet AMD, and



NHS staff deliver treatment for the condition at the same location. "For years I was treated at hospital, which would often mean long waiting times, but since the treatment centre has opened it has been fantastic," says Mr Saunders.



**'I was told I would go blind. I was shocked, absolutely shocked'**

Retired police officer Charlie Bennett, 79, was a regular golfer and, at one point, a volunteer on nine different charity committees. But this all changed in January 2013 when he went for a routine eye test and was given the devastating news that he was losing his sight to age-related macular degeneration (AMD). He was offered treatment in the form

of an injection into his eye to help stabilise his condition, but it offered him little comfort.

"When I was told I needed an injection, it was my choice whether I had one. When I asked what would happen if I didn't have it, I was told I would go blind," he says. "I was shocked, absolutely shocked, for a number of reasons. I know now that I went into denial. I didn't want to speak about it. I didn't want to seek help. My wife had a hard time of it, trying to do her best to get help, but I was just digging my heels in and saying I didn't want to do that. It was a terrible time."

Charlie was eventually persuaded to attend a support group set up by national charity the Macular Society, for people in Dumfries and Galloway where he lives.

"That was the best thing that happened to me," he says. "It gave me the feeling that it wasn't the end of the world. I could contribute. I could do things. It really gave me a boost. Also, mixing with people with the same condition as you is a big benefit. That got me back on track."

OPINION COLUMN

## 'Children's faces have different proportions to adult faces, but the specs all too often are simply scaled-down versions of adult designs'

Did you know that if your child's glasses slip down their face this can make their eyes feel more tired? A frame that fits a child's face well does not acknowledge eye health and sight loss as a key priority.

The *State of the Nation Eye Health 2017* report by Royal National Institute of Blind People and Specsavers called for better links between high street opticians and the NHS as a way of improving eyecare. This includes sharing information with primary care and hospital eye services, requiring investment in IT infrastructure. High street opticians and NHS clinicians need to work more closely together to monitor outcomes and patient satisfaction to build evidence that will help to commission effective eye services.

There is broad support to make eyecare a priority in the UK. The question is: how this can be achieved at a time of budgetary constraints in the NHS? The answer must be that failing to act now will cost so much more in the long run. ♦

High street opticians and NHS clinicians need to work more closely together to monitor outcomes and patient satisfaction to build evidence that will help to commission effective eye services

And if you have struggled to find a frame that is a great fit for your child, you'll be pleased to know that Alicia Thompson, director of examinations for the Association of British Dispensing Opticians, is carrying out research into the fit of children's frames. Her innovative research project captures 3D scans of children's faces so that accurate post-capture measurements can be taken. Children's faces have different proportions to adult faces, but the specs all too often are simply scaled-down versions of adult designs. Manufacturers are already using this new research to create frames that can be made specifically to fit children, so it will soon be easier to find a great fitting frame for your child.

well and it will be happy to help however often you need to return.

And if you have struggled to find a frame that is a great fit for your child, you'll be pleased to know that Alicia Thompson, director of examinations for the Association of British Dispensing Opticians, is carrying out research into the fit of children's frames. Her innovative research project captures 3D scans of children's faces so that accurate post-capture measurements can be taken.

Children's faces have different proportions to adult faces, but the specs all too often are simply scaled-down versions of adult designs. Manufacturers are already using this new research to create frames that can be made specifically to fit children, so it will soon be easier to find a great fitting frame for your child.



**Clive Marchant**  
President, Association of British Dispensing Opticians



## Sight loss increasingly linked to poor diets

The UK's eye clinics are bulging with the strain of dealing with an ageing population and the rising tide of obesity

DANNY BUCKLAND

Experts fear the nation is stumbling towards increased levels of sight loss – which already costs the nation £28.1 billion a year in lost productivity and health costs – one contributing factor to this is a lack of awareness of the elevated risk to sight from being overweight.

Studies have identified poor diet, obesity and type 2 diabetes as heightened risk factors for a range of conditions including glaucoma, cataracts, age-related macular degeneration (AMD) and diabetic retinopathy – one of the leading causes of blindness in the working population.

Further research is needed to establish direct links but the eyes are put under increased strain from high blood pressure, oxidative stress and disordered lipid metabolism, which are all associated with weight levels above guidelines.

£8.8bn

cost of Type 2 diabetes treatments each year, just under 9 per cent of the NHS budget

Public Health England

1 in 5

patients in hospital have diabetes

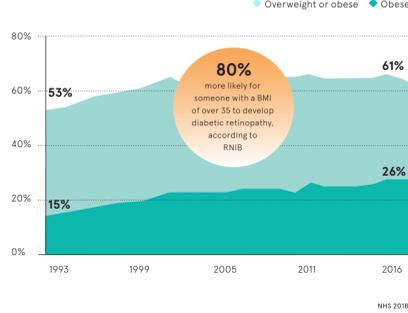
40%+

of the public do not realise that blindness is one of the major complications of diabetes

Diabetes UK

### Obesity levels have surged

Obesity among adults in England; obesity is classified as a body mass index (BMI) of 30 or above



## Debunking the most common eye myths

JOHN ILLMAN

### 'Carrots are good for sight at night'

In World War Two the Allies promoted the idea that their pilots could see in the dark because they ate a lot of carrots. The idea was to stop the Germans learning about the discovery of radar which was alerting the RAF to the location of enemy bombers before they even reached the English Channel. It is true that carrots are rich in beta carotene (Vitamin A) which helps to promote good eye health – but they won't give you 20/20 vision.



### 'Children with a squint will grow out of it'

This is a dangerous old wives' tale. Untreated squints can result in lazy eye (amblyopia) in which vision in the affected eye gradually deteriorates as the brain ignores its weaker messages. London's Moorfields Eye Hospital says: "It is important to treat it as soon as possible." Known medically as strabismus, a squint results in the eyes pointing in different directions. Moorfields hospital explains:

"One eye may turn inwards, outwards, upwards or downwards, while the other eye looks forwards." Affecting about one in 20 children, squints usually develop before a child is five, but can appear later. People with squints may also be prone to double vision and abnormal head positioning. Treatments include glasses and occasionally eye exercises. A child with a lazy eye may need an eye patch to improve vision in the affected eye. A few squint cases are treated surgically, usually to improve the appearance of the eye, sometimes to correct double vision.

### 'You don't need regular eye tests'

A test every two years – which is recommended – can result in early detection of glaucoma, a slow, insidious disease that can seriously affect your sight if left untreated. The sooner it is detected the better. Treatment can halt or slow its progress. Regular check-ups may also detect AMD and other eye conditions as well as heart disease, hypertension, diabetes and arthritis. This may sound extraordinary, but the eye is the only organ with direct external access to the brain – it is actually part of the brain. The eye's blood vessels are the only ones in the body that can be seen in a living and natural state.



### 'Parents who both have blue eyes cannot have a brown-eyed child'

Researchers used to believe that eye colour was determined by a simple inheritance pattern in which brown eyes were dominant to blue eyes – meaning, or so they thought, that two blue-eyed parents could not have brown-eyed offspring. But inheritance of eye colour is far more complex than originally thought and involves multiple genes. The US National Institute of Health says a child's eye colour can often be predicted by their parents' eye colours, but that genetic variation sometimes produces unexpected results.

### 'Excessive computer use or reading in bad light can cause astigmatism'

Not true. People with astigmatism have abnormally shaped eyes that have nothing to do with computer or reading habits. Moorfields hospital explains: "The front surface of a normal eye is round like a football, but people with astigmatism have eyes shaped more like an oval rugby football. This changes the path of light so that the image formed at the back of the eye is not so sharply focused."

People can either be born with the condition or develop it later in life. So what does cause astigmatism? Moorfields hospital says: "The exact cause is unknown, although genetics can play a part. Sometimes astigmatism can develop after an eye injury, surgery or because of an eye disease." Treatments include glasses and contact lenses.



### 'You'll hurt your eyes if you sit too close to the TV'

There is no scientific proof that this will damage your sight, but if you have to be near the screen, it may mean you are short-sighted and need a sight test.

### Using glasses for long periods will cause your vision to deteriorate'

This idea is based on the erroneous belief that wearing glasses or contact lenses adversely changes the physiology of the eye, leading to an increased dependence on corrective lenses, but

natural ageing leads to inevitable deterioration in our sight. What this means is that someone needing reading glasses at the age of 45 will probably require a stronger prescription ten years later.



### 'Staring directly at the sun is not dangerous if you're wearing sunglasses'

Excessive exposure to the sun's ultraviolet (UV) rays may damage your sight. Sunglasses – not even the best – will not block all UV rays. There is some evidence that the cumulative effect of over-exposure may increase risk of pterygium (a pinkish, triangular growth on the corner of the eye), cataracts and other age-related eye disorders.

The Association of Optometrists says that the easiest way to protect eyes from UV light is to wear CE-marked sunglasses. This indicates that they have the fullest possible UV protection. "Glasses that sit closer to the eye and wrap around, blocking out more light, are usually better, but also wear a hat to reduce light coming over the top," it says.

### 'Having 20/20 vision means that the eyes are perfect'

Not true. "20/20" denotes a person with excellent central vision. The US Mayo Clinic Health System warns that other types of vision – such as side vision, night vision or colour vision might be imperfect. Some potentially blinding eye diseases, such as glaucoma or diabetic retinopathy, can take years to develop. During this time, they will harm parts of the inner eye, but central vision may remain unaffected.

### 'Eye exercise helps to correct eye defects'

We exercise our eyes all the time during our waking hours just by looking at the world around us. So-called vision exercise regimes will not give you eagle eyes. ♦

## Learning how to live with low vision

For those suffering from sight loss, advice and support is at hand to improve quality of life

FIONA DUFFY

When it comes to life expectancy we're reaching ages that our ancestors could only ever dream of – with over 85s becoming the fastest growing age group in the UK. But extra time on the planet is taking a toll on our bodies and, particularly, our eyes.

The world's ageing population means that the number of people with low vision is expected to double over the next 20 to 30 years, predicts the International Agency for the Prevention of Blindness (IAPB).

According to Royal National Institute of Blind People (RNIB), there are more than two million people in the UK living with sight loss severe enough to have a significant impact on their daily lives, such as not being able to drive. Those figures are predicted to rise to more than 2.7 million by 2030 and nearly four million by 2050.

Low vision not only affects a person's independence but has significant psychosocial and economic impacts, says the IAPB. These can include access to education and employment, higher risk of falls, difficulties with daily living and increased dependence.

"For patients, the hardest thing is no longer being able to drive – followed by watching TV, reading, shopping and using public transport," says Maria Pikulski-Hughes, eye clinic liaison officer at St Helens Hospital, Merseyside.

Different conditions can have hugely varying impacts on vision, explains Dr Louise Gow, specialist lead in eye health for RNIB. "Macular degeneration, for example, affects central vision – so you have difficulty recognising faces or reading a food label. However, glaucoma affects peripheral vision – you can still recognise faces and read medicine packets but you might have trouble spotting a bus approaching from your left or right."

"Sight loss due to eye disease related to diabetes can affect both central and peripheral vision – with an even greater impact on quality of life. Usually, it's what the person used to do for leisure that is impacted the most – so driving, reading, seeing grandchildren and painting," she says.

"But there are solutions and a dispensing optician or low vision practitioner would look at how to help them continue doing these things. Advances in technology mean we have devices that you can use to switch your heating on and off without fiddling with buttons, or voice-recognition gadgets to access information."

Ms Pikulski-Hughes agrees that being positive is the way forward. "It's the sense we dread losing – but there is life after sight loss," she says. "You learn to adapt and cope with what you have. When it comes to shopping, most supermarkets and big stores now offer an assisted shopping service. You just simply have to say: 'Can I have an assisted shop, please?' Smaller

## Your eye test is about more than just your sight

Today's eye tests go beyond how well you can see – they provide vital early warning signs of various conditions

A visit to the high street optician should be as routine as a dental check-up. But many people waiting for signs of sight loss before booking an eye test, which may be due to a lack of awareness that your family optician does so much more than check your vision.

While 80 per cent of those asked expect an optician to be checking for eye health conditions, only 27 per cent expect their general health to be covered within the appointment. More than 80 per cent of the nation are not aware that an eye test can detect signs of cardiovascular disease, one of the major causes of death in the UK.

Less than half the time taken during an eye appointment involves testing sight. Most of the time is spent assessing indicators of wider eye health, including cataracts, glaucoma and age-related macular degeneration, and general health issues, such as diabetes and high blood pressure.

Dr Nigel Best, clinical spokesperson at Specsavers, says: "Eyes are a window into your general health. Putting off having an eye test potentially prevents your optician from detecting signs of eye health problems or other medical issues at an early stage. We know that early intervention is important in the management and successful treatment of many conditions."

Susan Cooper, 69, from Milton Keynes, was diagnosed with cataracts in both eyes after her son raised concerns about her driving. She was initially hesitant about visiting the opticians. "I'm very independent, and although several people had mentioned that my driving hadn't been too good, I kept putting off the visit, believing my eyesight to be fine," she says.

"The team at Specsavers spotted cataracts straight away. It wasn't until they asked me to cover my better eye that I realised how much my vision was impaired. When I think back to how my eyesight had deteriorated, and how much worse things could have been for me, I feel so relieved that I did eventually visit the opticians. I just wish I'd done something about it sooner."

was wrong when he skipped past the "ABC" [Snellen chart] tests and started looking at the back of her eye."

Freya was rushed to hospital in London and underwent emergency surgery the following day to reduce the swelling in her skull and to remove a dangerous tumour.

"We were just in absolute shock, especially when she came back from the MRI scan. Then to have her on a blue light ambulance travelling to London and to be told she needed an emergency operation was very scary."

Following further surgery and a year of radiotherapy and chemotherapy, Freya has since made a full recovery and has just completed her GCSEs.

A new generation of optometrists is helping to shape the future of the medicalisation of high street optometry. Raimonda Bullaj, 25, is currently studying for her Masters degree, does some work at a Newmedica ophthalmology clinic and practises at Specsavers and at the charity SeeAbility. Her aim is to have her own Specsavers store. "They have been extremely helpful and supportive of everything I have done so far," she says.

All Specsavers UK stores are able to deliver additional eye care services provided by qualified optometrists. Customers can get help for a range of common eye conditions instead of waiting for an appointment with a GP or hospital. Not only do customers receive the care that they need promptly, but this also helps to alleviate the pressure on hard-pressed NHS staff.

Services available at Specsavers include management of a range of conditions, such as red or watery eyes, dry eye, sticky eye or any sudden changes in vision, such as flashing lights or an increase in floaters. In many



shops are even more helpful and happy to provide a personal touch. For example, staff in card shops will describe the picture and read out the verse to help you choose." She adds: "Public transport is also easier these days for those with low vision. Operators like Virgin organise assistance whereby someone will meet you at the station and help you to your seat, fetch refreshments from the on-board shop and help you onto the platform at the other end. And if you explain to a bus driver that you have low vision they should make allowances – like letting you sit down before pulling away."

When it comes to letters and statements

you have the right to ask for these to be sent in your preferred format, says Dr Gow. "So, for example, you could ask for big print, audio or braille. Those things can make life so much easier."

Improvements are also being made in the world of finance with new measures including apps, talking cash machines used via a headset, high-contrast screens, raised dots on keypad buttons, modified plastic cards and in-branch accessibility with better lighting and layout.

Charities like The Beacon Centre in Wolverhampton also work with businesses, shopping centres, housing associations and even theatres to train staff to become

sight-friendly. "We show teams how to guide people with a visual impairment and also use simulation glasses to give an idea of what it's like to live with different eye conditions," says the charity's Helen Brown. "All workplaces can become more sight-friendly with just a few simple changes. One of the first things we advise is for companies to look at the font size they use... just switching to a size 14 font or above can make a massive difference to those with sight issues and prevent others from squinting at the screen. We tell people to think about colour contrast as well, black writing on a blue background might look great but it's not sight friendly."

"And where there are employees with sight loss we also advise that staff announce themselves when they enter or leave a room and maintain a tidy workplace. A box on the floor might be visible to most people but it can cause a trip hazard for others."

The Access to Work scheme, run by Jobcentre Plus, provides advice, support and grants for equipment that may help in the workplace, such as voice-recognition software.

Improvements are even being made in the holiday and leisure industry. Traveleyes, a commercial tour operator which takes blind and sighted travellers around the world together, is the brainchild of entrepreneur Amar Latif who had lost 95 per cent of his

3 in 4

of registered blind and partially sighted people in work receive some type of support to help them do their job

48%

have been provided with special aids or equipment

33%

had been given flexibility in working hours

32%

said their employers had identified adaptations to the working environment

Royal National Institute of Blind People

vision by the age of 18. "No travel company would accommodate an independent blind traveller," he says. He launched Traveleyes to make the world more accessible for blind and visually impaired travellers. Sighted travellers, who get a 50 per cent discount on their trip, help guide and describe sights to travellers with

## It's the sense we dread losing – but there is life after sight loss. You learn to adapt and cope with what you have

visual impairments.

"Not only do we receive great feedback from our blind travellers, but sighted people love our trips too," he says. "They often comment on how they take in more surroundings as they describe the sights and explore the destination with their other senses. Travel is more than just the seeing of sights, and when you start looking with your other senses, the world becomes more alive." ♦

Commercial feature



stores, care is provided by Specsavers opticians on behalf of the NHS, which means that there is no cost to the customer. The 3,500 or so optometrists at Specsavers have between them completed more than 10,000 postgraduate accreditations since 2017 in detecting and monitoring glaucoma, cataracts and other eye health concerns from organisations, including Cardiff University and the College of Optometrists.

Optical coherence tomography (OCT) is hospital-grade eye-testing technology which was previously only found in hospital eye departments, but is now available in many high street opticians. Currently more than 150 Specsavers stores have OCT scanners and the plan is for every store to offer OCT within the next two years. OCT produces such a detailed picture of the structures in the eye that it allows optometrists to identify signs of diseases, such as macular degeneration and glaucoma, years earlier than traditional methods.

The OCT scan at Specsavers is used in addition to a thorough eye test, during which the optometrist will use a range of clinical tests and procedures to measure the quality of someone's vision, as well as taking an overview of the health and function of their eyes and how they work together. The OCT scan, which costs £10, takes just a few seconds and is non-contact and painless.

Doug Perkins, Specsavers co-founder and an optometrist for more than 50 years, says: "Specsavers has long been a champion of the importance of regular eye tests and of general eye health. We are proud to take our clinical expertise a stage further and enhance the level of care we offer patients, with the added benefit of helping to reduce the pressure on GP surgeries, including Cardiff University and the College of Optometrists."

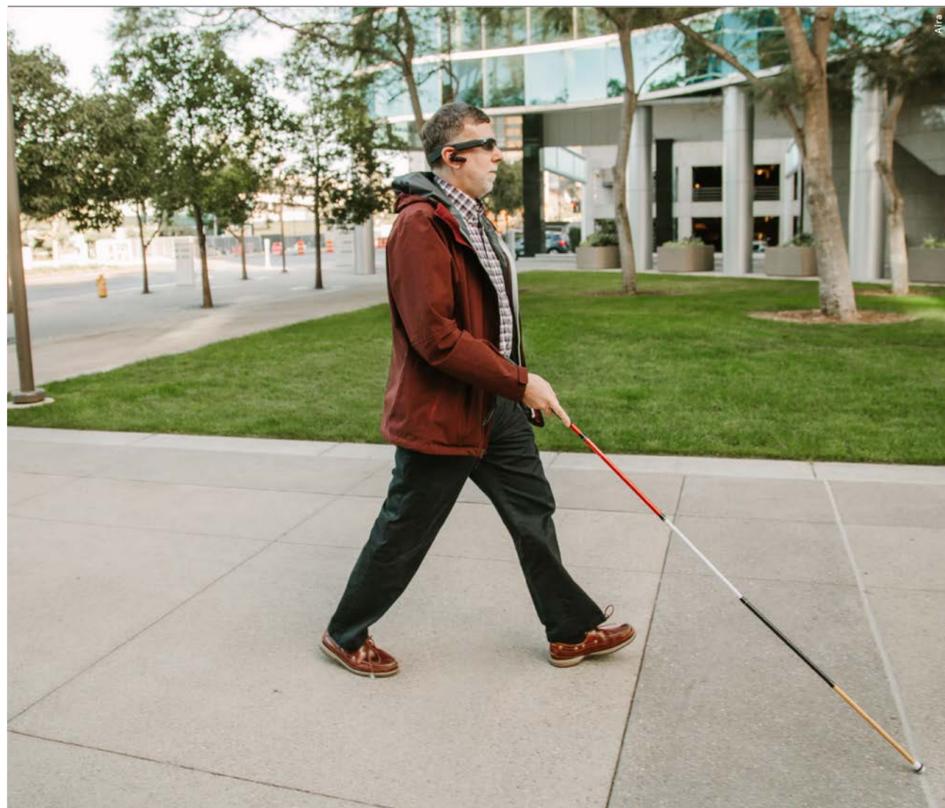
With an ageing UK population set to increase pressures on the health service and social care over the next few years, Specsavers is well-placed to take a leading role in championing eye health and to support GPs and hospitals through continued, significant investment in training and the latest technology.

There are some eye conditions that need advanced medical or surgical care. In such cases, Specsavers can refer the patient to its eye health partner Newmedica, which provides ophthalmology services on behalf of the NHS, at no cost to the patient. With a proven track record of working with the NHS, Newmedica safely and effectively delivers more than 100,000 patient interactions annually from more than 20 locations throughout England.

For more information please visit [www.rnib.org.uk](http://www.rnib.org.uk) or [www.specsavers.co.uk](http://www.specsavers.co.uk)

RNIB Specsavers

Transforming eye health



Aira's smart glasses connect people suffering with sight loss to remotely located agents to give them real-time information to help with tasks such as using public transport and reading prescription labels

## Medical innovations offer patients new hope

From artificial intelligence to augmented reality, new technologies are revolutionising eyecare and transforming the lives of those suffering with sight loss

SIMON BROOKE

It's 2025 and you make a routine visit to the opticians. You go through the usual tests and then the optician has a warning for you — you're at risk of stroke or even a cardiovascular event such as a heart attack. How does the health professional whose job it is to look after your eyes know what might be happening with your heart function? The answer is that he or she has taken a photo of your retina and used an artificial intelligence (AI) based algorithm to check.

This capability, currently being developed by Google AI and Verily Life Sciences, a subsidiary of Google's parent company Alphabet that develops health technology, is not yet available to high

street opticians but it might be only four or five years away.

Of course, opticians can already detect conditions such as diabetes, extreme high blood pressure, high cholesterol and certain cancers. But now, building on this capability researchers have used AI to analyse retina photos and other health data from over a quarter of a million patients to identify the risk of cardiovascular attacks.

Specifically, it looked at photos that show blood vessels in the eye, called retinal fundus images. Age, blood pressure and gender, among other factors, influence the chances of someone suffering a cardiovascular event.

The technology was presented with retinal photographs from two patients and asked to identify which of the patients was

most likely to suffer a major cardiac event or stroke; it chose the correct one 70 per cent of the time. By comparison, the European SCORE risk calculator, which is currently used to predict risk for cardiovascular disease and which requires a blood test, predicted the right scan in 72 per cent of the cases.

As in almost every other area of life, technology is set to revolutionise eyecare and change the way in which opticians interact with their patients. "The future is already here — it's just not very evenly distributed," says the writer and futurologist William Gibson. Already procedures and treatments that are currently being used in other areas of medicine are being adapted to improve eyecare and could soon be available to patients more widely.

Just last month it was revealed that technology created by another Google subsidiary, its AI company DeepMind, could diagnose eye disease with more than 94 per cent accuracy within seconds. As a result, waiting lists for assessments could be slashed from weeks to days, increasing the chances of treatment before irreversible damage occurs.

Intense pulsed light (IPL) therapy, more commonly known for its use in hair removal and dermatology treatments such as treating unwanted superficial veins in skin around the nose, has proved to be effective as a way of treating chronic dry eye disease when related to meibomian gland dysfunction and ocular rosa-

cea, commonly known as dry eyes.

"IPL therapy uses the pulses of light to dissolve and release the hardened oils that have blocked the glands in the eyelids, as well as to shut down over-abundant tiny capillary vessels," says Professor Dan Reinstein, founder of the London Vision Clinic. "Untreated, patients report grittiness, dry eyes and a burning sensation. IPL, over other dry eye solutions such as artificial tears and hot compresses, focuses on the root cause in some types of dry eye and therefore aims to offer a solution with more longevity from the symptoms."

Increasingly technology will help those with low or no vision to live as sighted people do. Aira is a service that uses a combination of augmented reality, AI and professional agents to provide instant access to visual information.

Aira's smart glasses are worn by blind and low-vision users known as "Explorers". These wearers have recently been connected to trained agents via a global network provided by AT&T. The agents use a built-for-purpose dashboard that provides details such as the Explorer's location and profile, in combination with a secure, near real-time stream of video. At just the tap of a button, this information is provided to Explorers so that they can perform almost any task. The service will be available in the UK later this year.

The Aira service is part of a growing trend. Powered by cutting-edge artifi-

cial vision technology OrCam MyEye 2.0, it is designed to give people who are blind, visually impaired, have a reading disability or similar conditions, greater independence.

It is magnetically mounted onto a user's eyeglasses or sunglasses frame. Completely wireless, about the size of a finger, it weighs less than an ounce. The device's smart camera takes a photo of an object, printed text or a human that is in front of it and then uses AI to analyse the visual information. The device then communicates the visual information aurally to the user via an HD speaker.

Michael Atkin from Immingham, just outside Grimsby, suffers from Stargardt disease, an inherited condition that causes blurring, distortion and blank areas in the vision. "I can't see anything at all now on a bright day, and on a dull day I can only see blurry outlines of shapes and people. Without help I couldn't read anything smaller than about three inches across," he says.

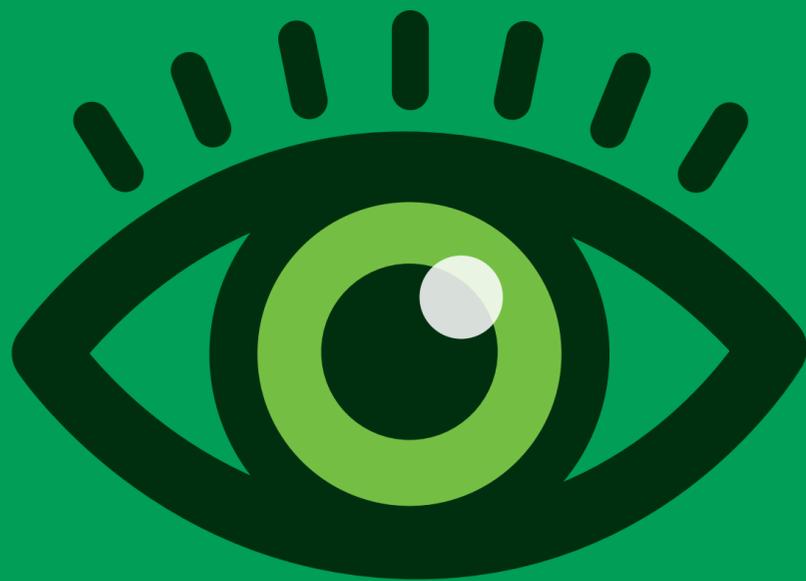
Mr Atkin has been using the device for the last few months. "It has opened up a new world for me. My wife and I have started sharing books again."

Cataracts are responsible for 51 per cent of world blindness, which represents about 35 million people. Currently when a patient has a cataract operation a new monofocal lens is inserted into the eye, although patients can suffer problems with light distribution, resolution and visual disturbances.

**As in almost every other area of life, technology is set to revolutionise eyecare and change the way in which opticians interact with their patients**

Developed by a cataract lens replacement provider called Swiss Advanced Vision, R-TASC (Real-Time Autofocus Servo Control) is an active lens with real-time autofocus and wireless connectivity. The R-TASC lens can focus on any object viewed by the patient, in real time. It is also capable of incorporating technology such as augmented reality. It will be fitted alongside a monofocal lens for distance vision or added on for patients who already have a monofocal lens but want to improve their sight.

Thanks to this and other current innovations patients faced with sight loss have new hope. ♦



# IMPORTANT INFORMATION INSIDE

By looking into your eyes, our opticians can help keep your eyes healthy and detect a range of health conditions.

At least 50% of sight loss is avoidable.  
Book an eye test at [specsavers.co.uk](https://www.specsavers.co.uk)

R N I B 

Transforming eye health