The Fred Hollows Foundation

Background brief
December 2015

Ageing and avoidable blindness

World population ageing and the value of sight for older people.

Key facts and figures

- Vision loss is the most common disability among older people worldwide. [7] [8]
- Globally, there are 901 million people aged 60 years or older, representing 12.3% of the world population. [2]
- 590 million older people live in low and middle income countries, forecast to grow to nearly 1 billion by 2030. [2]
- Of the world's estimated 32.4 million blind population, 33% are aged 50-69 years and another 52% are aged 70 years and over. [4]
- An estimated 16.8 million people aged 70 or older are affected by blindness and 70 million are affected by moderate and severe visual impairment. [4]
- 86% of older people with blindness live in low and middle income countries. [23]
- While eye disease is more common as people age, blindness is not inevitable – as much as 80% of blindness is caused by eye diseases that could have been prevented or could be treated, to avoid vision loss and blindness. [46]

Summary

According to the United Nations, the world population will soon reach a new juncture: by the year 2020 there will be more people aged 65 plus years in the world than children younger than 5 years. [1] [2] This trend toward population ageing is building global attention on the health, productivity and wellbeing of older people, in order to avoid excess pressure on national health systems and economies. [3]

As vision loss is a leading cause of disability among older people, and much of this vision loss can be prevented or treated, the global eye health sector has an important role in meeting the challenges of world population ageing. Older people in low and middle income countries are a main beneficiary of the global campaign to eliminate avoidable blindness: half of the people currently living with avoidable blindness are aged 70 years or older, and most of them live in poor regions of the world. [4]

Eye health care and surgery to restore vision is a cost-effective method to avoid disability and maintain a person's health, productivity, family life and social participation. [5] The combined effort of the global eye health sector has already avoided the burden of blindness for millions of people over the past twenty years. [6] [4] There remain, however, significant challenges to ending avoidable blindness and its impact on the health and productivity of an ageing world population.

The purpose of this brief is to explain the relationship between vision loss and ageing; highlight the impact of world population ageing on global blindness; and outline the role of eye health care for healthy ageing.

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What age is older?

This brief uses the term "older people" to generally refer to people aged 60 years or older, unless otherwise stated.

In high income countries, terms like "older" and "ageing" are often associated with the retirement age of around 65 years and over. However, the World Health Organisation (WHO) has recognised that this may not always be appropriate for low income countries where life expectancy is lower.

Earlier advice from WHO suggested 50 plus years as an appropriate marker of "ageing" for many countries in Africa. [10] [50] However, recent progress in worldwide life expectancy can be seen by an increase in the average life expectancy in Africa to 60 years, [14] suggesting that this may now be a more useful marker for discussions on ageing.

The vast majority of population studies of blindness and vision loss are conducted among people aged 50 years and older; the age from which eye disease becomes most prevalent. [4]

What is population ageing and population growth?

Population ageing generally describes the situation where the proportion of older people in a population is increasing compared to younger people. This occurs through declining fertility, meaning fewer younger people, combined with increasing life expectancy, meaning older people survive for longer. [14] Note that the total population size of both younger and older people continues to grow, as the proportion changes. Thus, the reality of world population ageing includes a growing number of older people.

Relationship between vision loss and ageing

Vision loss is the most common cause of disability among older people worldwide, particularly in low and middle income countries (LMICs). [7] [8] Figure 1 illustrates the size of the impact of vision loss, from various eye diseases, compared to other causes of disability.

Eye disease is more common as people grow older, and ageing is a significant "risk factor" for eye diseases. Refractive error and cataract are the leading causes of blindness and visual impairment amongst older people in LMICs, as illustrated in figure 2, despite each being easily treated with glasses or inexpensive surgery. [7]

Age is also a risk factor for diabetes and its vision related complication, diabetic retinopathy. The risk of visual impairment and blindness rises with the number of years of lived with diabetes and around 75% of people who have had diabetes for 20 years or more will experience some form of diabetic retinopathy. [9]

Vision is an important part of healthy and active ageing. The loss of vision is associated with poor health outcomes, less social participation, reduced independence and increased anxiety and depression. [10] [11] Vision impairment is associated with decreased life expectancy among older people, even in high income countries. [12]

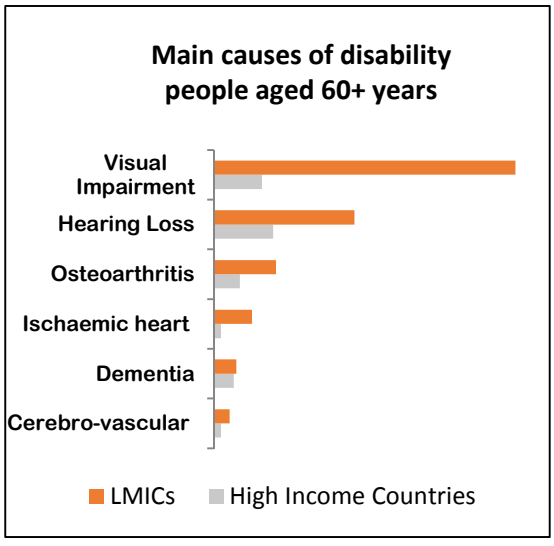

Figure 1: Global causes of disability in older people [7]

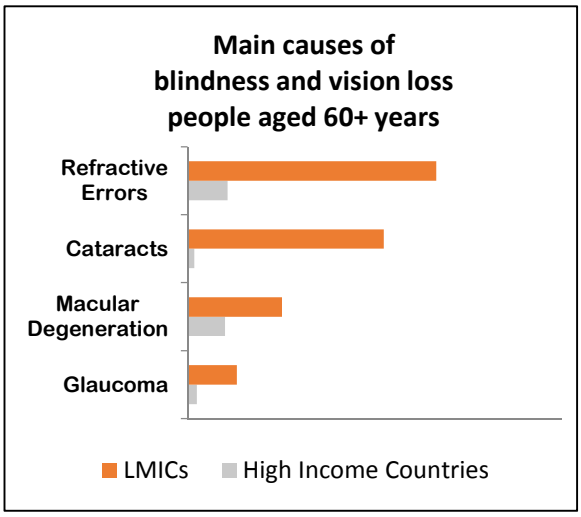

Figure 2: Global causes of vision loss [7]

Prevalence of vision loss and ageing

The prevalence of vision loss is much higher in older people and rises sharply beyond the age of 50 to 60 years, as illustrated in figure 3. The global prevalence of blindness is 4.2% for males aged 70 and older, and slightly higher for females of the same age at 5.3%. [4]

The burden of eye disease is greatest in older people living in poor regions, without adequate access to eye health care prevention and treatment services. The prevalence of blindness amongst adults aged 50 years and over is greater than 4% in regions throughout

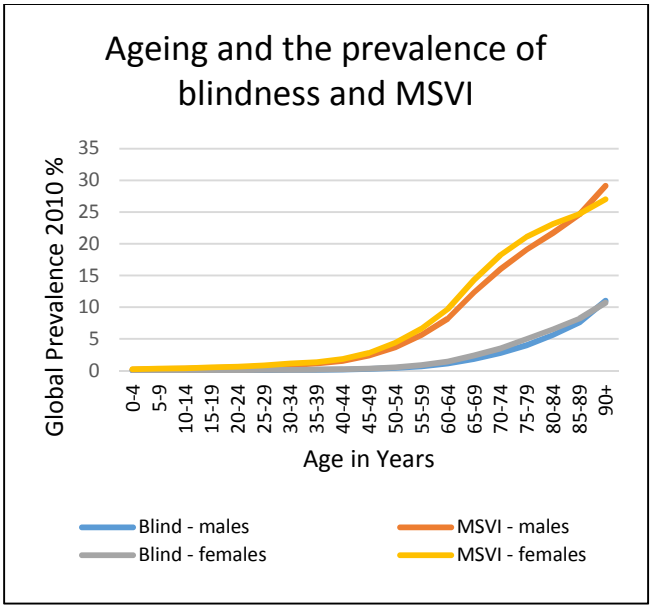

Figure 3: The age-standardised prevalence of blindness or moderate and severe visual impairment (MSVI) rises sharply after the age of 50 years. Source: GBD 2010, Appendix B [4]

Africa and South Asia. This compares to a prevalence of just 0.4% or less in high income regions. [4] Similarly, the prevalence of moderate and severe visual impairment (MSVI) amongst adults aged 50 years and over is around 16% in regions of Africa and 24% in South Asia, compared to less than 5% in high income regions. [4]

World population ageing and vision loss

There is a global trend toward population ageing, a result of increased life expectancy and decreased birth rate in most regions of the world. Globally there are 901 million older people, aged 60 years and older, two-thirds of whom live in LMICs. By 2030, the number of older people in LMICs is expected to grow to nearly one billion people, of which 420 million will be aged 70 years and over. [2]

As cataract and other eye diseases are more likely to occur during ageing, the growing world population of older people will produce a continual need for eye care services in all countries of the world. These services will need to be maintained and scaled to meet the challenge of a rising older population with age-related eye disease, to avoid a growing backlog of avoidable blindness. [13]

Analysis of the Global Burden of Disease study 2010 (GBD) illustrates the impact of population ageing and growth on global blindness, and provides support for the role of the eye health sector in healthy ageing. The GBD shows that, without the combined efforts of the global eye health sector, population ageing would have accounted for 30% of the likely increase in the global number of people who are blind over the period 1990 to 2010. [4] This concept is illustrated in figure 4 below.

Fortunately, several decades of investment and action to tackle the backlog of avoidable blindness and improve the availability of eye care services has been fruitful. The end result has been that the eye care sector has stayed on top of the combined effects of age-related eye diseases and population growth and ageing. The GBD results show that the global *number* of blind stayed fairly stable over the twenty year period, despite an increased number of older people. [6] [4] There remain significant inequities in eye health care between countries and regions, as well as emerging challenges such as diabetic retinopathy; the need to scale up blindness prevention programs in LMICs is paramount to future health of ageing populations.

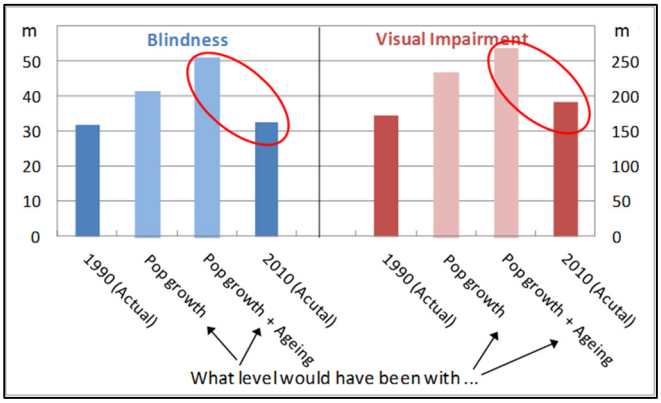

Figure 4: Columns 3 estimates what would have been the likely impact of population ageing and growth on the number of blind and visually impaired worldwide by the year 2010, if there had not been concerted effort to prevent and treat eye diseases such as cataract. The 2010 actual numbers appear in columns 4 of each graph. Based on the Global Burden of Disease Study, 2010. [4]

Increasing longevity, healthy life expectancy and eye health

As mentioned previously, one of the factors that has contributed to population ageing is the increase in life expectancy, or the extension of the number of years of life. Average global life expectancy has risen by three years over the past couple of decades to 70 years. Africa has experienced the largest increase in life expectancy over the past 15 years, rising six years from 54 years to 60 years. Life expectancy in Africa is expected to reach 70 years by 2045-2050 largely due to improvements in health, particularly prevention and treatment of HIV. [14]

For those who survive to older age, the life expectancy beyond 60 years has also lengthened, and

people are likely to live another 20.65 years beyond their sixtieth birthday. (15)

Longevity after the sixtieth birthday differs from region to region. Life expectancy after 60 years is 17.2 years in low income countries, 19.3 in middle income countries and 23.7 years for people in high income countries. Life expectancy after the seventieth birthday is 10.7 years, 12.4 and 16.0 in low, middle and high income countries respectively. (15)

Overall, more people worldwide are living until 60 and those who do can look forward to more years of life ahead of them, than people in the past.

Despite increasing longevity, there are signs that life expectancy is growing faster than *healthy life expectancy*. The GBD data shows that for every year gained in life expectancy, only around three-quarters of a year was gained in *healthy life expectancy*. People are living longer, but a good part of these extra years will be in ill-health or disability. (16)

As life expectancy increases in most countries around the world there is a need to ensure that the extra years lived are done so at the highest level of health and wellbeing possible, to avoid excess burden of illness and disability on individuals, families and national health systems. Many non-communicable diseases, including eye disease, heart disease and diabetes are more prevalent among older people. (16) (3) (17)

People's longevity after sixty and seventy years is important for eye health care planners because, as previously discussed, this is the age from when the incidence of eye disease begins to grow and the risk of disability from vision loss increases. Without prevention and treatment of eye diseases, older people potentially face decades of life with disability from avoidable vision loss. In addition, older people with vision loss may be at a higher risk of premature death, than those with good eye health. (12)

Impact of vision loss on older people

Vision loss and blindness are known to have an *accumulative negative* impact on quality of life of older people. (8)

Blindness and vision loss adversely affect the productivity of older people through premature retirement or inability to work and reduced ability to contribute to family life such as cooking and caring for grandchildren. (11) For many, this loss of vision and productivity starts from the age of 50-60 years.

In low income countries, older people tend to live with their extended family and the role of caring for a disabled older relative, along with the financial costs, falls largely on family members. (10) The costs include the lost earnings of working age carers and the disrupted education of child aged carers.

Vision impairment is associated with increased falls, nursing home placement and decreased life expectancy among older people, even in high income countries. (12) (18)

Impact of vision loss on ageing

Ageing and vision loss have a compounding impact that reduces quality of life, including through:

- loss of income and productivity (11)
- increased risk of falling over (18)
- reduced life expectancy (12)
- co-morbidity with other chronic diseases (48) (26)
- reduced ability to access health services (10) (47)
- increased risk of depression and loss of self esteem (11) (22) (49)
- loss of independence for self-care, daily activities and mobility (11) (49)
- reduced social interaction (11) (49)
- greater likelihood to have pain and discomfort. (8).

Eye health as an indicator of disability among older populations

The relationship between eye health and healthy ageing was recently recognised by the World Health Organization and the World Bank, when they included Cataract Surgical Coverage* among a set of global indicators for tracking world progression toward universal health coverage. Cataract Surgical Coverage was included as an indicator *"of disability among older adults and access to care by the elderly"* as well as an indicator of the progress toward eliminating avoidable blindness. (44)

* the rate at which people with cataract vision loss receive surgical treatment

Barriers for older people in accessing eye health care

In low income countries of Africa and Southeast Asia, 61% of older people, aged 60 plus years, have never had an eye exam, compared with just 5% in high income countries. (19)

There are numerous barriers that inhibit people of all ages from accessing eye health care in LMICs, in particular, the cost of treatment, a lack of local eye health services, and difficulties with transport. Some barriers, however, are experienced differently or to a greater extent by older people, particularly the very elderly and older women. (10) Barriers include:

- older people's expectations of their own health and abilities can be lowered with ageing and thus they may be less motivated to attend to their eye health (10) (20)
- older people in LMICs are amongst the poorest and are often financially dependent on other family members (21) (22)
- lower levels of literacy and education among older people negatively impacts on their awareness of eye disease prevention and treatments (19) (21)
- older people are not seen as a priority for health care in poor households and they can be unwilling to use scarce family income to pay for their eye health treatment. Both direct costs of surgery and indirect costs, such as transport and the loss of income for a family member to accompany them, may discourage older people from seeking treatment (22) (21)
- belief that blindness is an inevitable part of ageing (8)
- the relationship between vision loss and reduced quality of life is often overlooked for older people, as is the link between vision loss and depression (8)
- discrimination by health services and doctors on the basis of age and belief that illness is inevitable and treatment unlikely to be effective. (23)

Co-morbidity is the experience of more than one illness or health problem by a person at the same time. Co-morbidity of vision loss with other illnesses or physical disabilities works as a barrier to accessing eye health. (10) (21) (24) For example, co-morbidities:

- add to the difficulty for mobility and the need for assistance to attend eye health care clinics
- reduce an older person's strength and physical capacity to undergo eye surgery or treatment and to self-administer eye-drops or other medications
- may lessen the priority of eye health compared to other health issues and makes seeking eye care more effortful. (10) (21) (24)

Chronic disease, vision loss and healthy ageing

Older people are more likely to be affected by chronic disease in addition to vision loss, resulting in a greater impact on their quality of life and independence. The more health problems a person has, or co-morbidities, the more likely that they will have reduced functional ability for self-care and a reduced sense of wellbeing. (23) (25)

Older people with vision loss report reduced quality of life and the combination of vision loss and other

health problems in ageing places extra burden on older people and a more rapid decline in their quality of life. [25]

Recent research shows that vision loss as a co-morbidity with other chronic illness, such as stroke, heart disease and depression, magnifies the negative impact of the illness on quality of life. [26] Hence, while it can be difficult to pinpoint which health issue is the main cause of disability, [27] it is likely that treating eye disease is important to avoid the complications of vision loss on top of other chronic illnesses. Restoring sight may also provide renewed mobility and opportunity to seek health care for other chronic illnesses.

With improvements in health care there is likely to be a rise in the number of much older people (85 years plus). These much older people are more likely again to be affected by multiple chronic illnesses as well as vision loss, such as hypertension, diabetes and heart disease. Much older cataract patients are more likely to also be affected by age-related macular degeneration or glaucoma and this may contribute to a poor outcome for cataract surgery. [28] However, a study of people aged 90 years and older in Hong Kong found that 4 out of 5 people had improved visual acuity outcomes after cataract surgery, despite the high prevalence of other eye health problems along with cataract. [29] The eye health sector's response to and treatment of much older patients will become more important as this section of the population grows, particularly in middle income countries.

Gender, ageing and eye health

Globally, women are 1.5 times more likely to be affected by vision loss than men. [4] Women account for 63% of the 16.8 million people aged 70 or over, who are blind worldwide, and 60% of the visually impaired. [4] This gender imbalance is explained by several factors including: women live longer than men; longer life expectancy increases the risk of age-related eye diseases; older women are often carers of grandchildren and thus have more exposure to eye infections carried by children, such as trachoma; and women face unique and additional barriers to accessing eye health care services in many parts of the world, particularly in poor regions. [30] [31] [32]

Older women with blindness in LMICs face compounding obstacles to receiving eye health care services and treatments, due to their gender roles and restrictions, discriminations based on age, and poverty. Many of the barriers that stop people from having good eye sight affect older women to a greater extent than older men due to their lower social support, less access to family money, reluctance to be a burden on their family and less decision making authority. [21] [22]

Benefits of eye health care to healthy ageing

Treatment of eye diseases such as cataract and trachoma have been repeatedly shown as highly cost-effective interventions that reduce the burden of disability and improve the productivity and quality of life of older people. [33] [34] [5]

Restoring vision through cataract surgery has also been shown to reduce the rate of older people falling over, particularly for women undergoing cataract surgery in the first eye. [35] A study in Vietnam found the number of older people reporting that they had fallen was reduced from 12.8% before cataract surgery to 6.7% in the year after cataract surgery. [36] A systematic review in Australia found that early treatment of cataracts was among the most cost-effective of interventions to prevent falls among older people living at home. [37] Furthermore, a global analysis of the cost-benefits of eliminating avoidable blindness suggests that in excess of USD 4.1 billion in savings could be made by avoiding the health costs of falls each year. [38]

Treatment of avoidable blindness also preserves people's independence, reducing the need for assistance and carers. [33] [11] The structure of families and living arrangements in many LMICs is changing due to decreased fertility and family size, and the increased migration of younger people to cities. This means that many older people will age without care and support from extended family. [39] [3] Health planners are starting to look at ways to safeguard

people's *functioning* as they age and to enable them to stay in their homes and communities. [39]

Maintaining functioning and productivity is a critical benefit of eye health care in older people. [11] For example, the average age of farmers in Kenya is now 60 years, due to movement of younger people to cities and their preference for work other than farming. Similarly, in the urban slums of Kenya, 30% of older women and 20% of older men look after children. [40] Thus, eye sight is vital to older people's continued productivity in paid and unpaid work, and the burden of lost productivity from vision loss is largely in LMICs. [38]

Aged care residential facilities and eye eye health

There is little information about the eye health situation within aged care residential facilities in LMICs, which may reflect fewer numbers of such facilities in these countries and a lack of information about resident's eye health within the facilities that do exist.

A 2012 study investigated the eye health of residents living in seven aged care facilities in Kathmandu Valley, Nepal, and found very high prevalence of vision problems. Forty-four percent of residents were affected by visual impairment or blindness, largely due to cataract, age related macular degeneration, corneal opacity, glaucoma and macular scarring. Uncorrected or poorly corrected refractive error was also a significant cause of vision loss. The study found a lack of vision screening in the aged care facilities and inadequate provision of glasses or referral for cataract surgery. [41]

Studies in high income countries have also found a higher prevalence of visual impairment among residents of aged care facilities compared to older people living in communities. [42] There is debate around vision impairment as a contributor to residential care admission and whether eye care treatments would avoid people entering residential care. [43] Some studies suggest that vision status alone does not determine residential care admission, but rather vision loss occurs alongside other health problems as people age and their ability to care for themselves decreases. There is a suggestion that part of the higher prevalence of visual impairment in residential care facilities may be attributed to specific barriers for residents to access eye treatments including a reluctance of carers to agree to surgical interventions, even when eye care screening is available in the facility. [43]

Conclusion

As the size of the older population grows and life expectancy lengthens, national health systems will need to invest in interventions that improve the health and well-being of older people, particularly interventions that address chronic disease and prevent or delay disability. [3]

National and international eye health programs make an important contribution to avoiding the burden of disability and improving the productivity and wellbeing of older populations. The benefits of preserving and restoring vision to older people are measureable and substantial for individuals, communities and national economies.

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