

The cost of sight loss

The economic impact of vision impairment
and blindness in the Republic of Ireland



NCBI

Working for People
with Sight Loss

Summary Report

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Foreword

The Cost of Sight Loss study was commissioned by NCBI for the following reasons:

- to identify the trends of sight loss in the Irish population by age and types of eye conditions in 2010, 2015 and 2020;
- to provide Irish planners with tangible evidence as to why investments in vision and sight loss services makes economic sense;
- to provide ophthalmologists and other sight loss professionals with robust research data to support the development of eye health and eye care services in Ireland through the application of drug therapies, screening programmes, surgery and rehabilitation services and
- to provide the Irish Government with an evidence framework on which to build a national vision strategy, which was promised in 2004 but has yet to be delivered.

Deloitte Access Economics was chosen for this research because of their unique expertise in quantifying all the elements of sight loss into the new vocabulary of economic persuasion. We must express our concerns for favourable treatment of sight loss with arguments grounded in both the logic of measurable rationale and the passion of our advocacy role. It is this combination that will persuade Government to invest in organising treatments, therapies and care around people with low vision and people who are blind.

The culmination of work on this major study was assisted by an advisory group comprised of professors Colm O'Brien and Jonathan Jackson, Dr. Bláithín Gallagher and Mr. Desmond Kenny.

The funding of the study was made possible through a significant educational grant from Novartis Ireland Ltd.

**Margaret McDowell,
Chairperson,
NCBI**

The Economic Cost of Vision Impairment and Blindness in the Republic of Ireland:

Summary Report, June 2011

Background

In 2010, the NCBI (National Council for the Blind of Ireland) commissioned Deloitte Access Economics, a world-leading independent economic consulting firm, to conduct a comprehensive study on the burden of vision impairment and blindness to the Republic of Ireland. Specialists in model-based health forecasting and analysis, Deloitte Access Economics has previously estimated the burden of vision loss for Australia, Canada, Japan, the United Kingdom, and the United States, and globally. This is the first study to report the societal burden of vision impairment and blindness for the whole of Ireland.

Using data from the NCBI's register, with an adjustment for likely under-registration, and previous reports for other countries, Deloitte Access Economics estimated the numbers of people in Ireland with varying degrees of vision loss for the years 2010 to 2020, including:

- Mild vision impairment ($6/18 < \text{visual acuity} \leq 6/12$)
- Moderate vision impairment ($6/60 < \text{visual acuity} \leq 6/18$)
- Blindness ($\text{visual acuity} < 6/60$).

The study's findings are based on information from the Irish health care system, Irish government reports, and the 2006 National Disability Survey, supplemented by overseas study data where required. The findings are extrapolated to the entire Irish population, accounting for the current demographic structure and expected population growth.

The findings are the most comprehensive data currently available on the burden of vision impairment and blindness in Ireland. The report includes the health care system costs, value of lost productivity (due to unemployment and premature death associated with impaired vision), the economic value of ‘informal’ caregiver time, and the ‘deadweight’ efficiency losses from government expenditure on the vision impaired. All costs are reported in 2010 euros. The population health burden is also measured, using disability-adjusted life years (DALYs), which is the preferred metric of the World Health Organization (WHO).

This document provides a summary of the full report, *The Economic Impact of Vision Impairment and Blindness in the Republic of Ireland*, which will be released in June 2011.

About NCBI

NCBI is a not-for-profit charitable organisation providing support and services across Ireland to people experiencing sight loss. NCBI also support public and private sector organisations to ensure their services are accessible by people who are blind or vision impaired. NCBI’s mission is to enable the blind and vision impaired to overcome the barriers that impede their independence and participation in society.

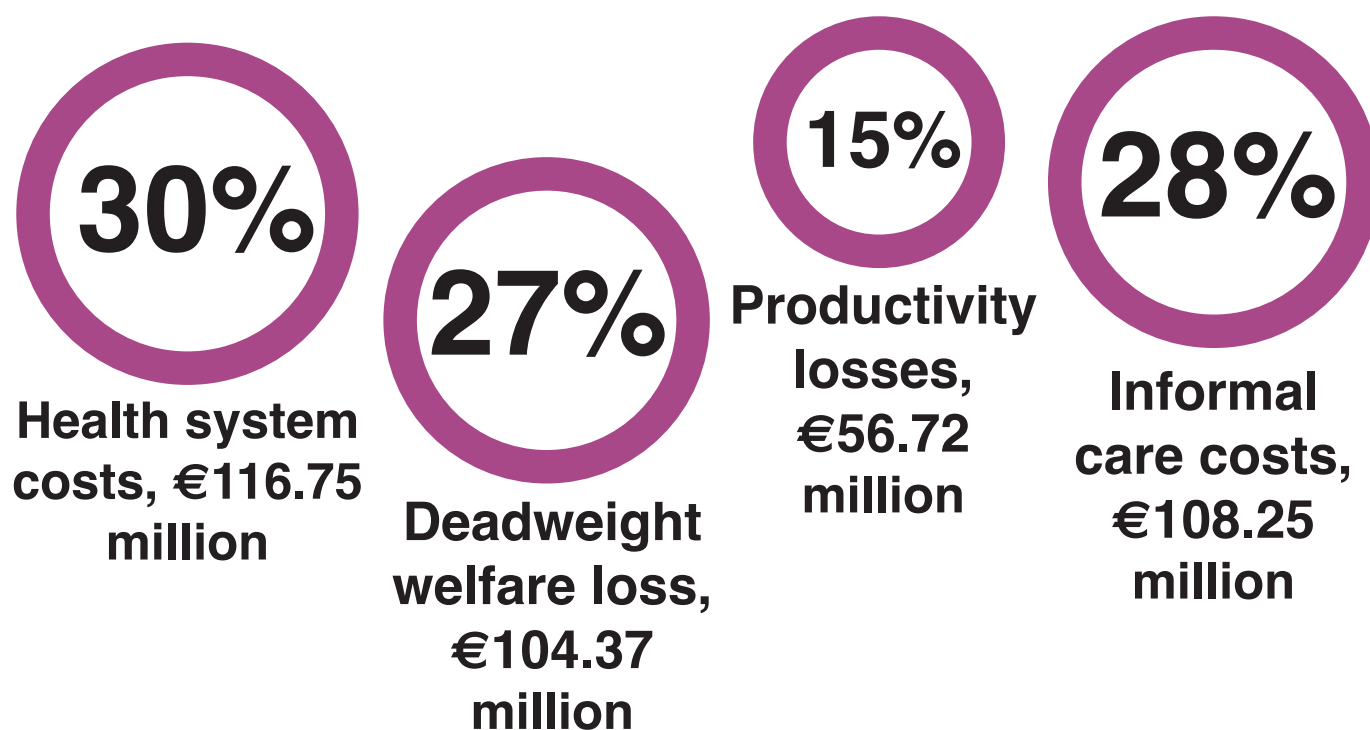
To find out more, visit www.ncbi.ie

The Cost of Vision Impairment and Blindness in Ireland

The real financial cost of vision impairment and blindness in Ireland is estimated to be €386.09 million in 2010.

- This cost is incurred by an estimated 224,832 people with a visual acuity below 6/12, including 12,995 people classified as blind (visual acuity below 6/60).
- The real financial cost is comprised of two components: health care system (direct) costs of vision loss estimated at €116.75 million, and other (indirect) costs, including production losses, informal care and deadweight welfare losses (DWL), estimated at €269.34 million. DWL losses are the distorting effects to the economy from raising income tax and other tax revenues to fund government expenditure on eye care, blind welfare payments and cover lost taxation due to unemployment.

Figure 1: Financial Costs of Vision Impairment and Blindness in Ireland in 2010

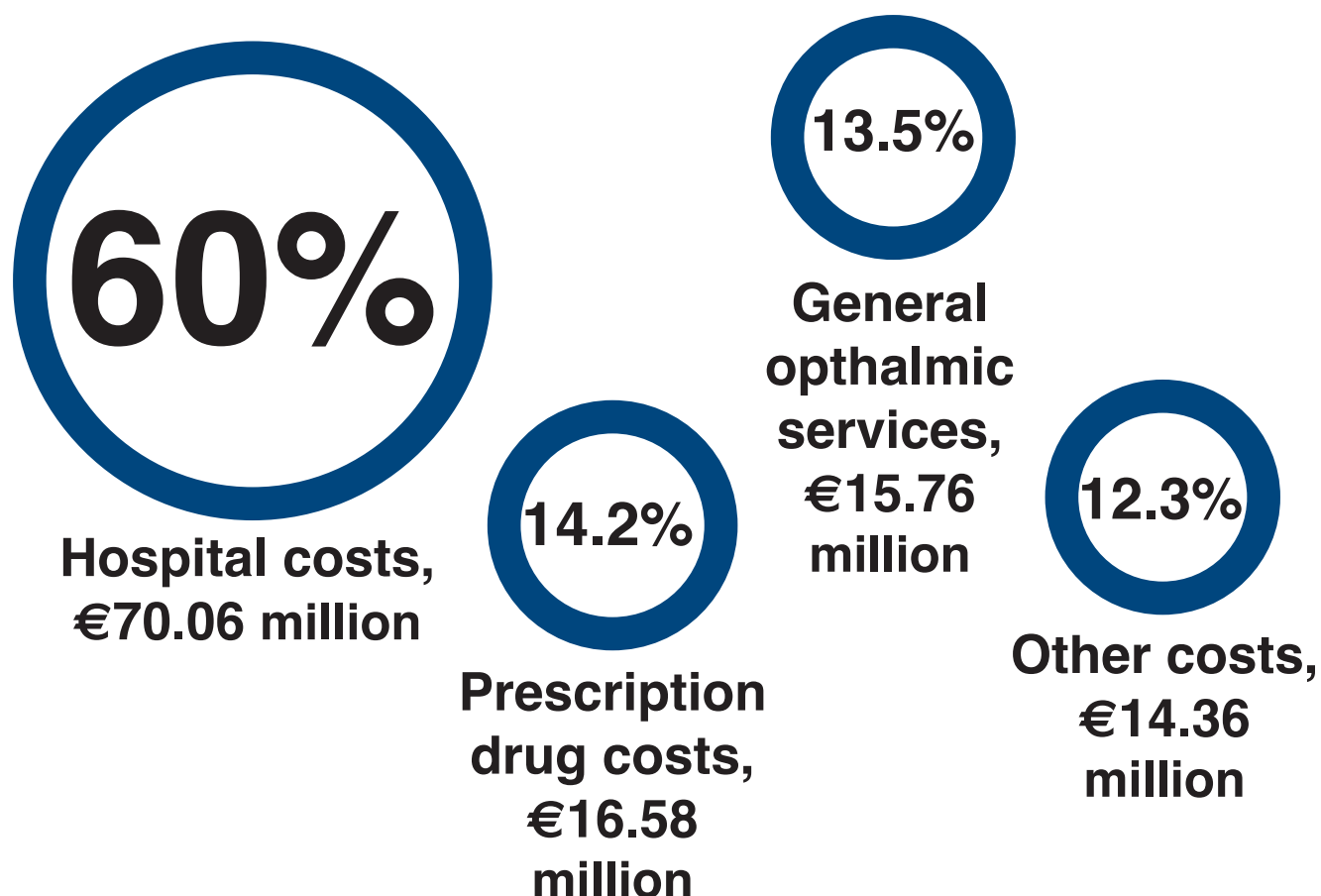


Health Care System Costs

The direct cost of vision impairment and blindness to the Irish health care system, paid by government and individuals, is estimated at €116.75 million in 2010.

- Public and private hospital costs for treating various eye conditions associated with vision impairment comprise the bulk of direct costs
- Expenditure on pharmaceutical treatments for AMD (age-related macular degeneration) and glaucoma form the next largest component
- Other costs to the health care system include eye examinations for the vision impaired, appliances (e.g. spectacles), and other assessment and care funded by the Irish government.

Figure 2: National Health Care System Costs of Vision Impairment and Blindness in 2010

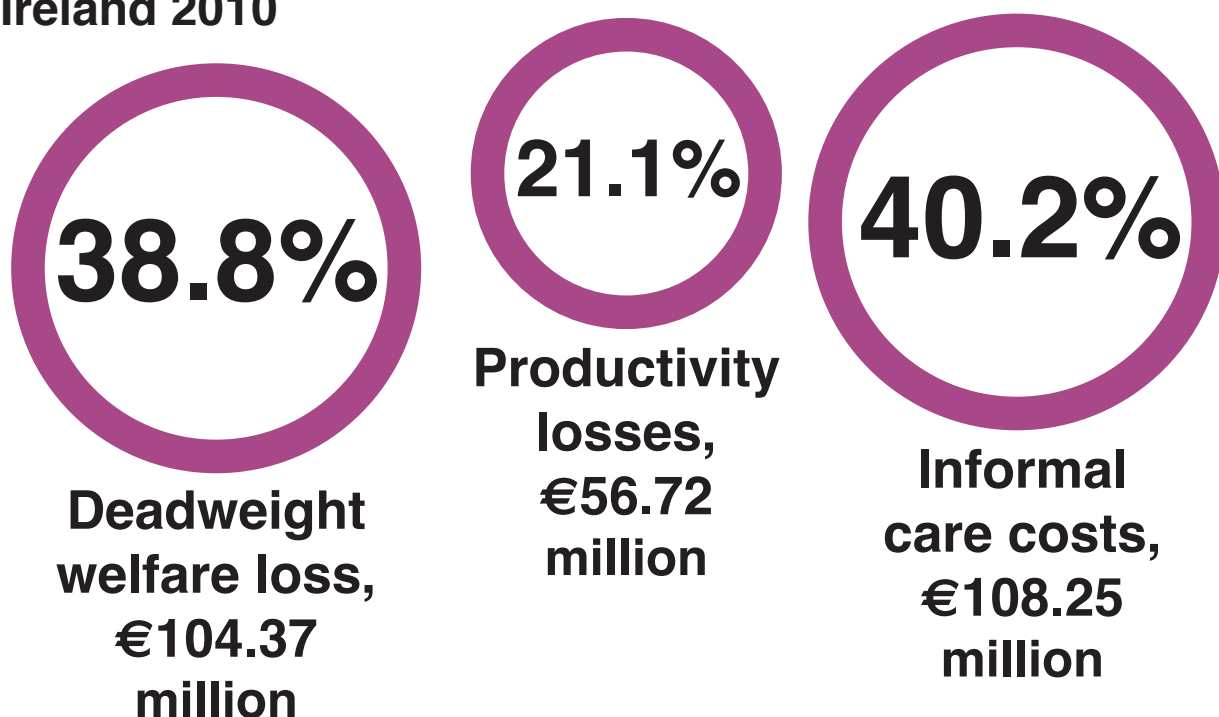


Indirect Costs of Vision Impairment and Blindness

Just as important as the direct costs of vision loss are the indirect costs, which are estimated to add €269.34 million to the overall cost of vision impairment and blindness in 2010, or 70% of total costs.

- Informal care constitutes 40% of all indirect costs – this is the value of lost working or leisure time for family and friends who assist the vision impaired with their everyday activities (as assessed in the 2006 National Disability Survey).
- Lost productivity due to vision impairment and blindness (including related premature deaths) is estimated to cost the Irish economy nearly €56.72 million in 2010 or 21% of all indirect costs.
- Deadweight welfare losses are the distorting effects to the economy from raising income tax and other tax revenues to fund government expenditure on eye care, blind welfare payments and cover lost taxation due to unemployment. These losses constitute 39% of all indirect costs.

Figure 3: Indirect Costs of Vision Impairment and Blindness in Ireland 2010



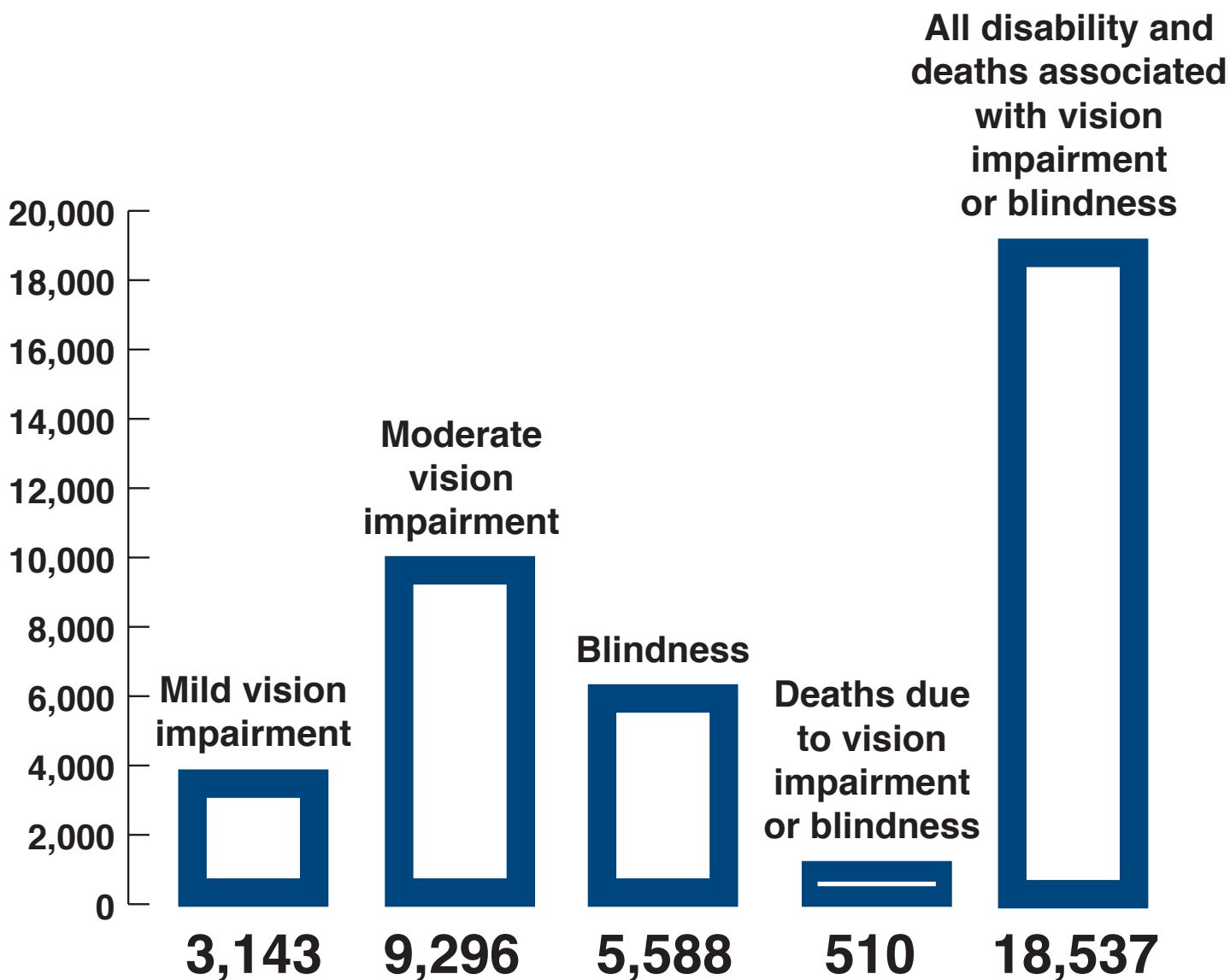
Burden of disease

Vision impairment and blindness impose a substantial amount of suffering, and prevent healthy, independent living and ageing.

- Compared to people who are not vision impaired, people with vision loss experience:
 - A reduced quality of life
 - Greater difficulty with daily living and social dependence
 - Higher rates of clinical depression
 - An higher risk of early death
 - An increased risk of falls and related hip fractures
 - Premature admission to nursing homes
- The WHO developed the disability adjusted life year (DALY) to measure overall disease burden, where one DALY represents the loss of the equivalent of one full year of health. The DALY measure accounts for both disability and premature death associated with a disease.

In 2010, Irish residents were deprived of the equivalent of 18,537 years of healthy life due to disability and premature death associated with vision impairment and blindness.

Figure 4: DALY Burdens Due To Vision Impairment and Blindness in 2010



Causes of vision loss

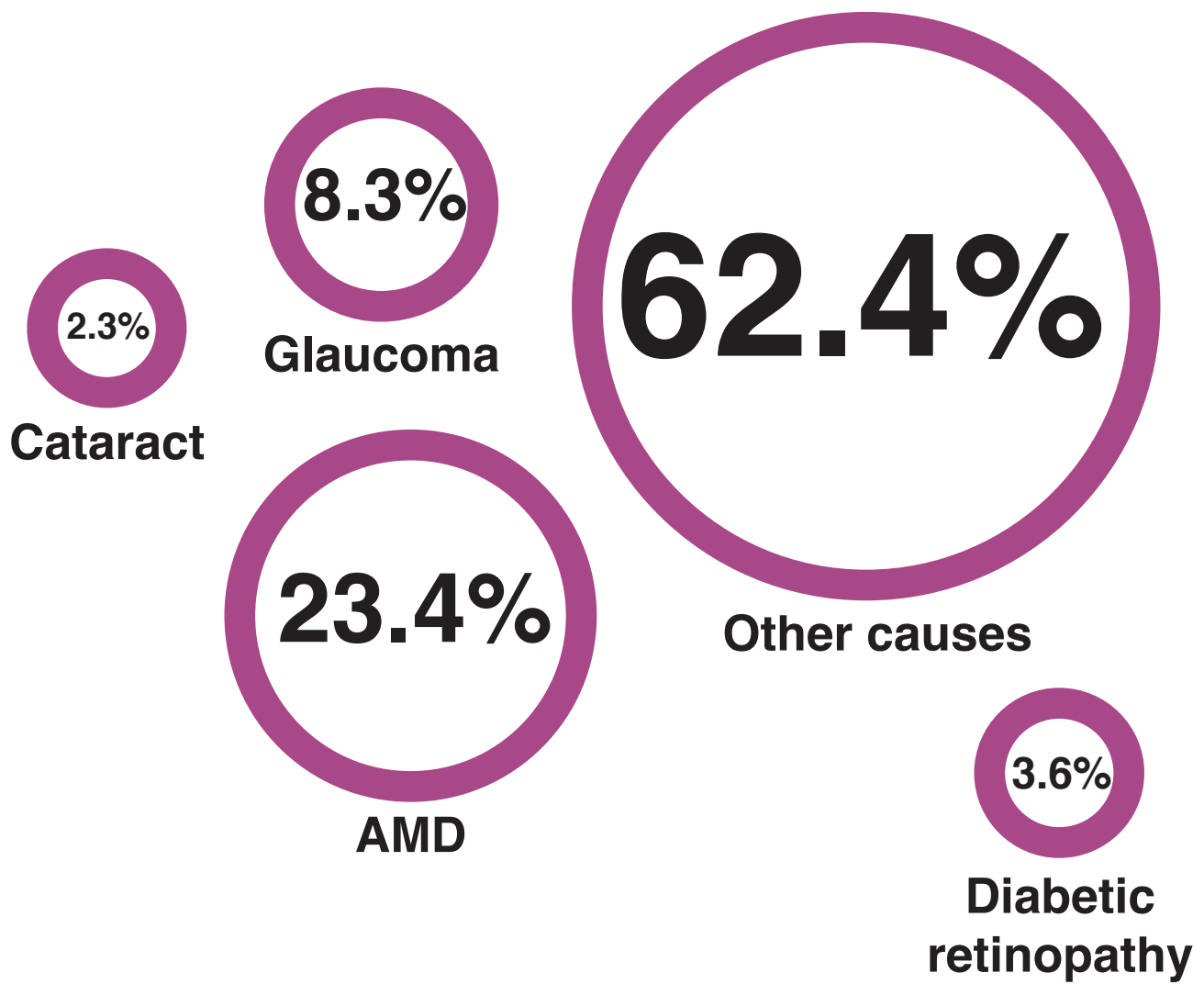
Most vision loss in developed countries is caused by five eye conditions:

- Age-related macular degeneration (AMD)
- Cataract
- Diabetic retinopathy
- Glaucoma
- Refractive error

The major causes of blindness in Ireland are suggested within the NCBI register data.

- AMD is the primary cause recorded for 23% of people registered as blind up to 2010; this proportion has remained almost constant since 2003 (Kelliher et al 2006)
- 'Other causes' of blindness (besides AMD, glaucoma, cataracts and diabetes) include retinitis pigmentosa, myopia, optic atrophy and less common eye diseases
- The primary causes of blindness derived from the NCBI's register are consistent with WHO data on the causes of vision impairment in developed regions (Resnikoff et al 2004)

Figure 5: Distribution of Blindness by Primary Cause in 2010 (all ages)



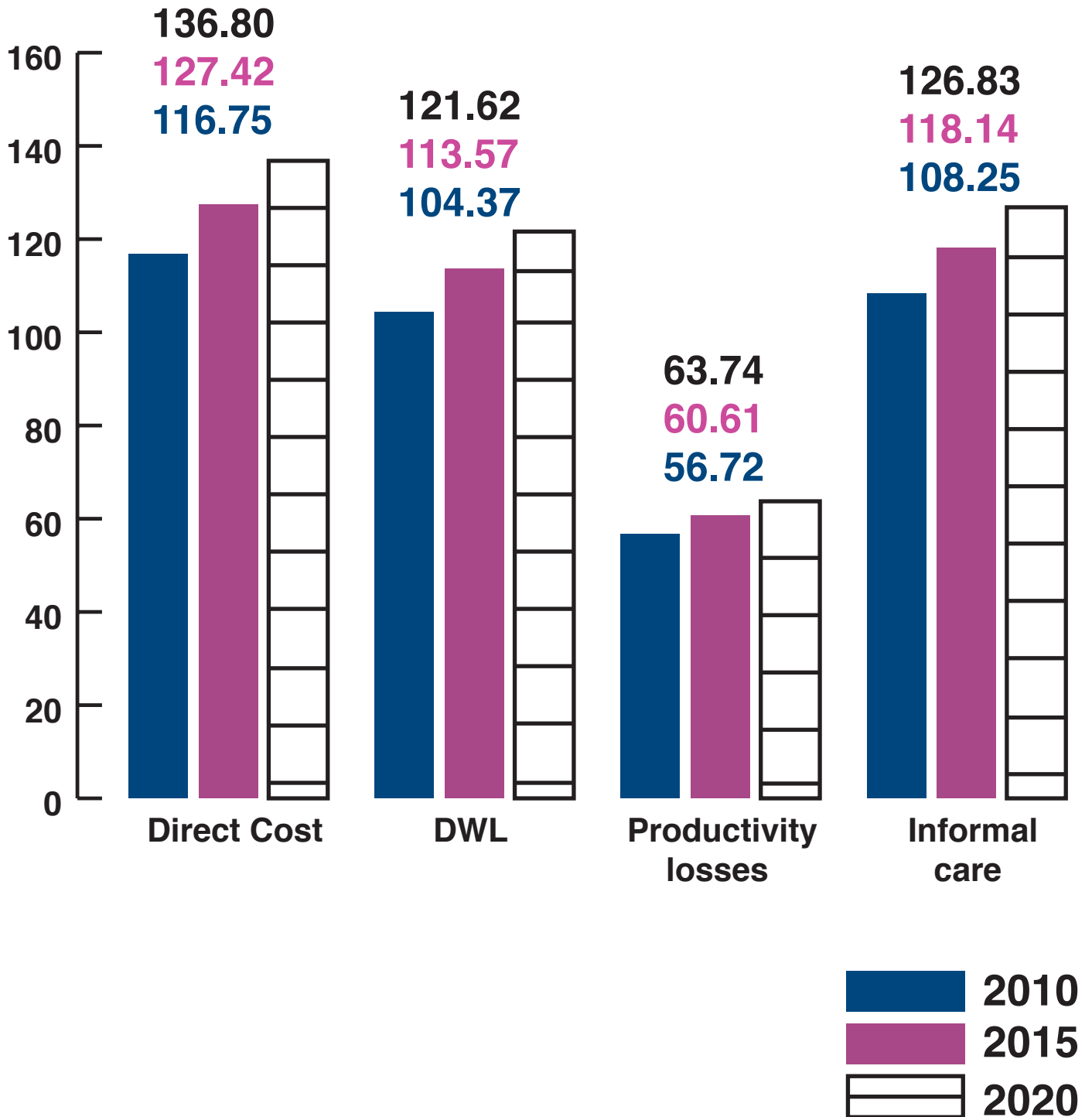
This distribution reflects 2010 data and is likely to vary over time with changes in the population age structure

Vision loss in the future

Unless action is taken, the costs of vision impairment and blindness will continue to rise, placing larger demands on the Irish health care system and taking ever greater tolls on the health and welfare of the Irish population.

- There are expected to be 271,996 people with vision impairment or blindness by 2020 – a projected increase of 21% from 2010. This number will continue to escalate alongside population growth.
- Under these projections, the financial cost of vision loss will be €449.00 million by 2020 (at 2010 prices), of which €136.80 million is direct costs to the health care system.
- The spiralling cost will be compounded by increasing health care prices, diabetes prevalence, and population aging, among other factors.

Figure 6: Projected Increases in the Costs of Vision Impairment and Blindness, 2010-2020



What can be done?

Most vision impairment can be avoided or treated with well known methods. These would reduce the significant personal, social and economic burdens of vision loss in Ireland.

- With more research funding allocated to vision health, we could become much closer to preventing, and treating more effectively, a range of eye diseases.
- By elevating vision health as a public health issue, people could become better informed about vision loss and take significant steps to reduce their risk.

There is still much preventable blindness to eradicate. By investing in the right strategies, the rising trends of vision impairment could be reversed.

Five Steps to Reduce the National Burden of Vision Impairment

1. Coordinate greater screening of high-risk groups including people with diabetes and the elderly; the prevalence of vision impairment due to longevity and non-communicable chronic diseases is increasing, particularly in developed countries such as Ireland.

2. Provide more funding to hospital ophthalmology units, to reduce waiting lists for cataract surgery and other eye procedures to correct sight loss.

3. Encourage all Irish citizens to undergo an eye examination, at least once each year.

4. Promote the clinical importance of ‘mild’ vision impairment, which impacts everyday activities and often progresses to more severe sight loss.

5. Target earlier treatment of eye diseases that impair vision, such as AMD, cataract and glaucoma.

Appendix A: The burden of vision impairment and blindness

Calculations and detailed cost data are presented in the full study report.

Table A-1: The Burden of Vision Impairment and Blindness in Ireland (2010 prices)

	2010	2015	2020
Direct Health Care Costs			
Hospital costs	€70,058,945	€76,458,670	€82,087,024
Prescriptions	€16,579,287	€18,093,767	€19,425,704
General ophthalmic services	€15,758,155	€17,197,627	€18,463,596
Other	€14,357,781	€15,669,332	€16,822,798
Total health care costs (a)	€116,754,169	€127,419,396	€136,799,122
Indirect Costs			
Productivity losses	€56,719,003	€60,607,068	€63,743,444
Informal care	€108,249,563	€118,137,914	€126,834,403
DWL	€104,371,674	€113,567,451	€121,624,658
Total indirect costs (b)	€269,340,241	€292,312,433	€312,202,505
Total financial cost (a)+(b)	€386,094,410	€419,731,829	€449,001,627
Burden of Disease			
Disability DALYs	18,027	20,195	22,729
Economic value (disability)	€1,708,826,867	€1,914,318,439	€2,154,584,789
Premature mortality DALYs	510	610	736
Economic value (mortality)	€48,331,023	€57,795,499	€69,780,546
Total DALYs	18,537	20,804	23,465
Economic value of total DALYs (c)	€1,757,157,890	€1,972,113,938	€2,224,365,335
Total economic cost (a)+(b)+(c)	€2,143,252,300	€2,391,845,767	€2,673,366,962

Source: Access Economics calculations

Blind prevalence was estimated using NCBI register data adjusted upwards by 27.1% for likely under-registration (Kelliher et al 2006). Prevalence numbers for mild and moderate vision impairment (VI) were derived from international data on the relative prevalence rates of blindness and other VI. A literature review suggested relativities in Ireland to be most similar to the UK (Coffey et al 1993, Access Economics 2009). Results for 2015 and 2020 reflect CSO projections of population growth.

Public hospital admissions for eye conditions associated with VI (ESRI 2010) were adjusted upwards for private hospital activity (Colombo & Tappay 2004). Irish costs per admission were not identified and were proxied by adjusting Australian costs for price differences (using the GDP per capita ratio on a purchasing power parity basis). Expenditure on prescription drugs for AMD and glaucoma were derived from IMS Health data. General ophthalmic service costs include eye examinations for people with an eye condition associated with VI, and appliances (e.g. spectacles). Other health care costs were estimated from Ireland Disability Programme expenditure on 'assessment and care of the visually impaired' in 2003 (expenditure specific to VI could not be identified after the 2004 reorganisation of the Irish health care system).

Productivity losses due to disability or premature mortality were calculated using the human capital method (it is assumed that Ireland operates at sufficiently low unemployment to incur a permanent productivity loss). Productivity losses were estimated using 2006 National Disability Survey (NDS) data on the number of adults in private households unable to work due to a seeing disability (CSO 2010), and average salaries in Ireland proxied the value of lost production. Productivity losses due to premature mortality assume a 2.34 relative mortality risk (McCarty et al 2001), 1.38% etiological fraction (proportion of additional deaths specifically due to VI), and a retirement age of 65 years.

Informal care costs were estimated using NDS data on the number of adults in private households with a seeing disability indicating help with everyday activities from family, friends or neighbours (CSO 2010). An hour of informal care was valued using the average hourly wage.

Deadweight welfare losses were based on an efficiency loss for Ireland of €0.57 for every €1 raised by taxation (Kleven and Kreiner 2003) applied to: (1) government expenditure on health care associated with VI (currently 80.7% of health care expenditure in Ireland is funded by government); (2) welfare payments to the blind; (3) lost tax revenue from time off work due to VI (patients and carers).

DALYs are the sum of years of healthy life lost due to disability (YLD) or premature death (YLL). The YLD calculation uses disability weights of 0.02 for mild VI, 0.17 for moderate VI, and 0.43 for blindness (Stouthard et al 1997). Each YLL incurs one DALY. The economic value of one DALY in Ireland is estimated to be €94,794 (Mason et al 2009).

Appendix B: Key references consulted for the study

A comprehensive reference list is provided in the full study report.

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