

Framework to Adopt a Strategic Approach for Vision Health in Ireland

Preventing Blindness in Diabetes
23rd September 2013

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Cost of Blindness in Ireland**

Strategic Framework For Vision Health

WHO Objectives of Vision 2020

- VISION 2020 is a global initiative that aims to eliminate avoidable blindness by the year 2020
- It was launched on 18 February 1999 by the World Health Organisation
- The Government has just seven years to eliminate avoidable blindness wherever possible, since it has committed to the World Health Organisation (WHO) objectives of Vision 2020

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Definitions of Vision Impairment and Blindness

- Blindness is defined as best vision less than 6/60 (**<10% vision**) in the better-seeing eye
- Moderate VI is defined as BCVA less than 6/18 but better than or equal to 6/60 (**10 - 30% vision**) in the better-seeing eye
- Mild VI is defined as BCVA less than 6/12 but better than or equal to 6/18 (**30 - 50% vision**) in the better-seeing eye

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Why calculate the cost of visual impairment and Blindness?

- Lack of data for the cost of visual impairment and blindness in Ireland. Difficult to drive policy without Irish specific figures.
- Commissioned by NCBI
 - Produced by Novartis
 - J.E. Cairnes School of Business and Economics of NUI Galway
 - David Keegan and Aoife Naughton (Mater University Hospital)

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Prevalence of Blindness and Vision Impairment

	2010	2015	2020
Mild VI	157,156 3.42%	171,514 3.42%	187,928 3.49%
Moderate VI	54,681 1.19%	59,989 1.20%	66,070 1.23%
Blind	12,995 0.28%	15,270 0.30%	17,997 0.33%
Total	224,832 4.90%	246,773 4.92%	271,996 5.06%

An adjustment factor for under-registration of 1.271 was applied

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Projections of Blind People in the ROI by Cause

	2010	2015	2020
AMD	3,046 23.44%	3,742 24.51%	4,628 25.72%
Cataracts	294 2.26%	345 2.26%	403 2.24%
DR	473 3.64%	556 3.64%	654 3.63%
Glaucoma	1,073 8.26%	1,329 8.70%	1,657 9.21%
Other cause	8,110 62.41%	9,299 60.90%	10,655 59.20%
Total blind people (a)	12,995	15,270	17,997

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Macular Degeneration



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Glaucoma



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Cataract



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Diabetic Retinopathy



Normal vision



Vision with
diabetic retinopathy

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Key Terms Explained

■ Direct Costs (health care costs) include:

- Hospital expenditure
- Expenditure on general ophthalmic services
- Treatment of depression (Depression is 16% more prevalent in vision impaired populations)
- Cost of treating injurious falls.

■ Indirect Costs:

- These are the overall impacts of blindness on the economy
- Lost productivity due to blindness
- Informal care to the blind
- Deadweight welfare loss

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Key Terms to Know

- **Financial Costs include:**

- The sum of the total direct and indirect costs
- This is the current cost of “treating” blindness and the related costs to society

- **Economic Cost include:**

- The financial cost of blindness plus the intangible cost of disease burden (DALYs) due to blindness
- This captures (in a monetary value) the financial cost of blindness and the cost of the reduced quality of life that blind people experience

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Impact on Health Services

- People with vision loss are:
 - Up to **8 times** more likely to fracture a hip
 - **3 times** more likely to be depressed
 - Admission to nursing homes takes place up to **3 years earlier**
- The cost to the State increases significantly if a person progresses from being visually impaired (€1.7K per person p.a) to being blind (€21K per person p.a)
- Resources need to be improved through efficient use of existing resources and targeted increased resources

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Comparison to other studies

Irish informal carers for the visually impaired face a higher burden of care compared to other countries

	Ireland (Access Eco)	Ireland (Blindness)	Worldwide Cost of sight loss	U.K. Cost of sight loss
Direct cost (% of total VI costs)	30.2	1.7	78.1	35.3
Production losses (% of total VI costs)	14.7	18.3	5.7	26.8
Informal Care (% of total VI costs)	28	47.9	8.4	33.4
Dead Weight Loss (% of total VI costs)	27	32.1	7.3	4.4

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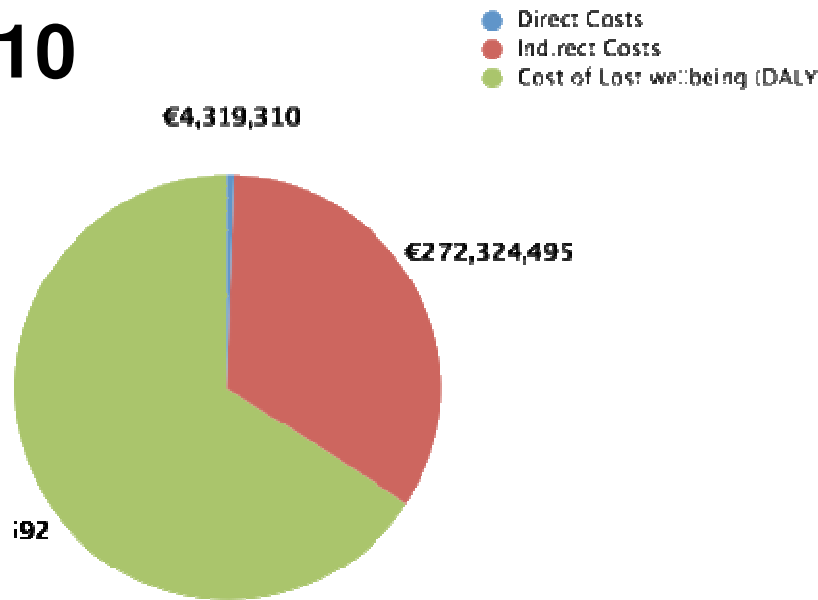
Cost of Blindness Report 2012

- More than 220,000 people in Ireland are blind or vision impaired
- Number of blind and vision impaired expected to increase by a fifth by 2020
 - Despite 75% of blindness being preventable
- The implementation of a clear vision strategy is urgently required. The public healthcare system is insufficiently resourced to treat the existing patient demand.
- Imperative that all services and supports offered are provided with **equity** of access, patient **safety** and **quality** of care at the centre of all decisions.

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The Financial Cost of Blindness will Increase if Current Trends Continue

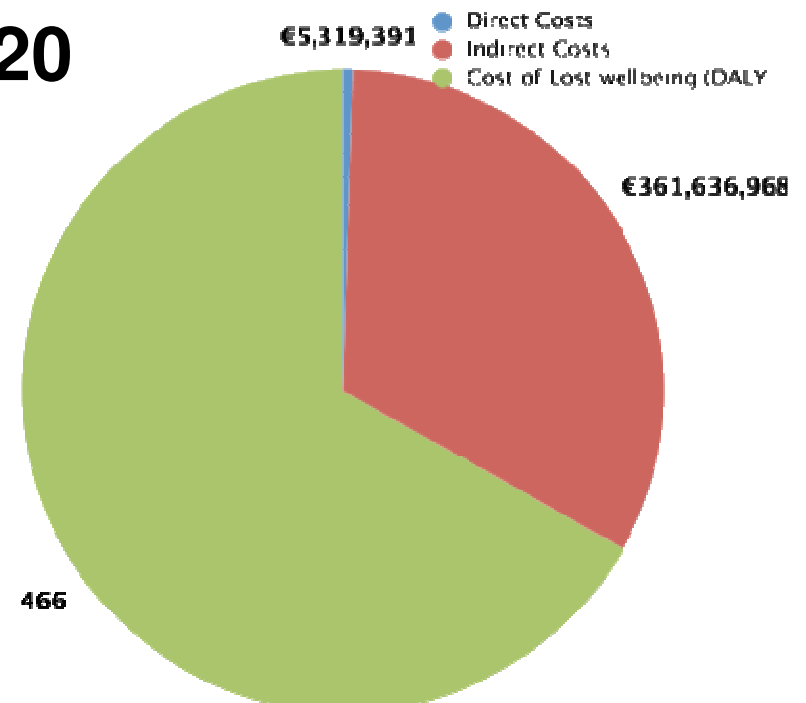
2010



Financial Cost: €276,643,805

Economic Cost: €809,196,497

2020



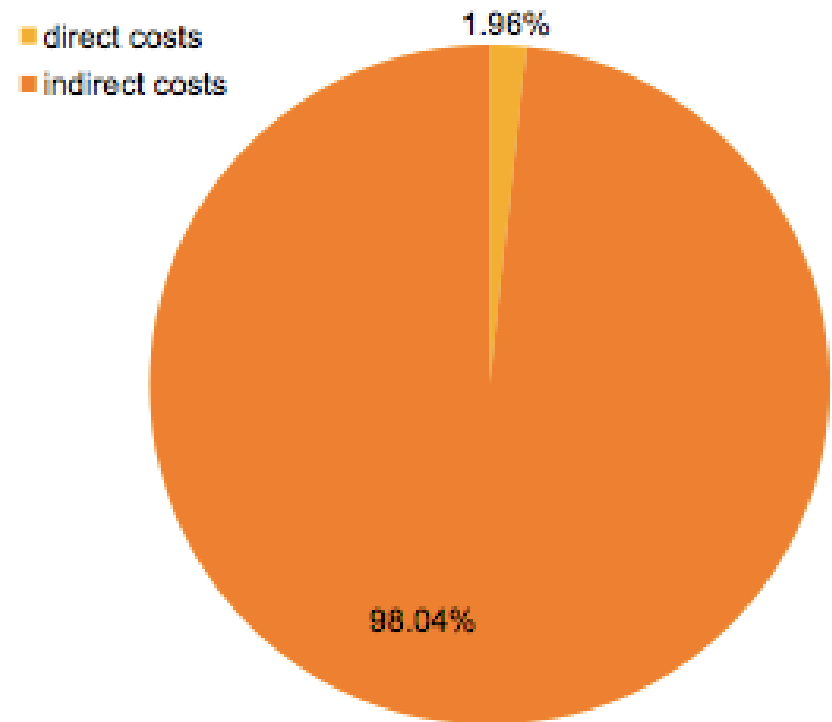
Financial Cost: €366,956,359

Economic Cost: €1,105,306,825

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Conclusions

- Financial cost is €21,288 per person (€11,500- Informal care)
- Economic cost is €62,230
- Majority of costs to society outside healthcare
- Important to protect services for these patients/clients
- Vital data ahead of follow up study on Cost of Blindness Avoidance



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Blinding Conditions to Treat

Vision 20/20 Commitment

- **Age related Macular Degeneration**

- Large Cohort
- Treatable condition
- Large welfare / care cost

- **Glaucoma**

- Large cohort
- Manageable condition

- **Diabetic Retinopathy**

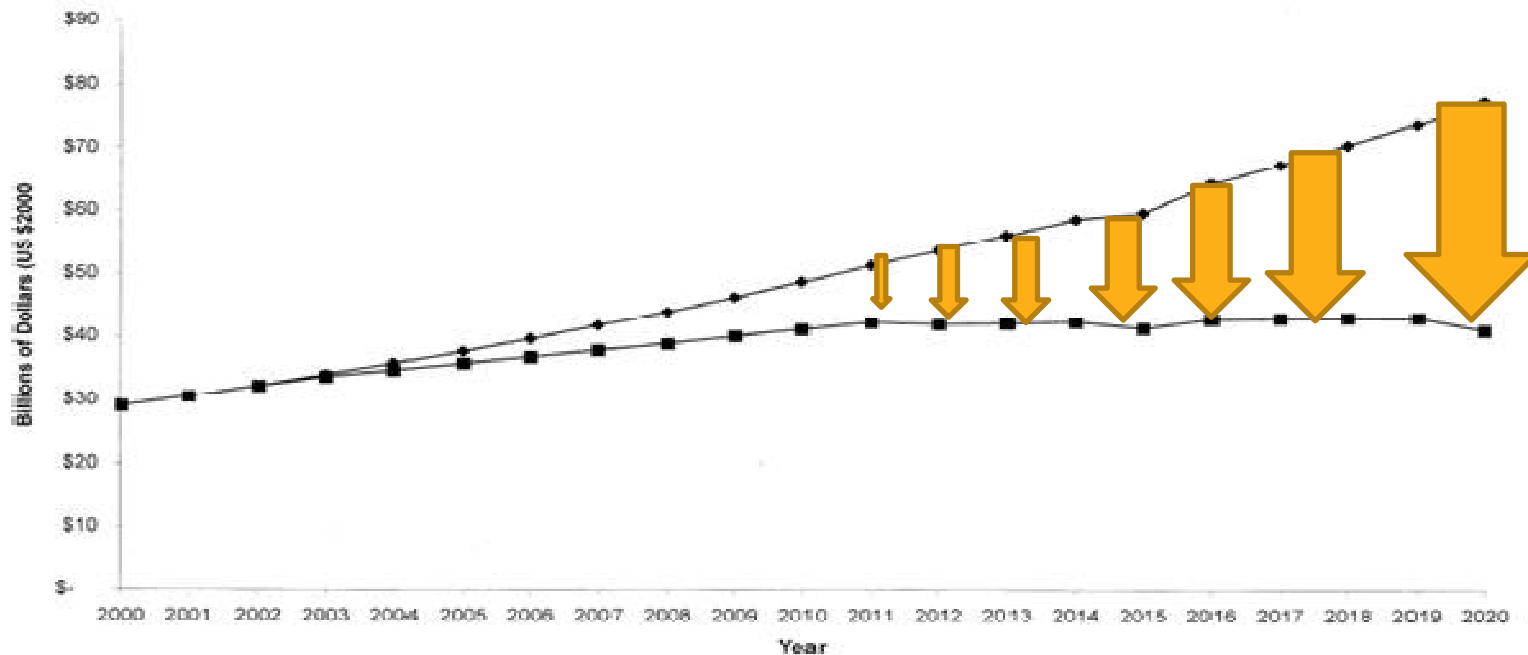
- Large numbers of young economically active patients
- Screening

- **Cataract**

- Large Cohort
- Treatable

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Part 2: The Cost of Avoidance of Blindness and Vision Impairment



■ FIGURE 2. Annual economic productivity loss due to blindness for all age groups and including formal care with and without VISION 2020 (economic productivity loss without VISION 2020 initiative [filled diamonds]; economic productivity loss with VISION 2020 initiative [open squares]).

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Cost of Avoidance of Blindness and Vision Impairment due to Diabetes

Assumptions

- ***“Epidemiology of blindness attributable to diabetes in Scotland: change over 20 years in a defined population” (H.N Hall, D.J. Chinn, A. Sinclair and C.J. Styles, doi: 10.1111/dme,12223)***

- Although possibly conservative, the number of cases of mild, moderate VI and blindness have been taken from the Cost of Sight loss report

- Using ratios of the base case

(Blind :Moderate VI :Mild VI = 1: 2.96: 7.91)

- **Without** screening, blindness rates were 54.49 per 100,000 diabetics.

Blind: **54.49**

Moderate VI: **161.3**

Mild VI: **431.01**

- **With** screening, blindness rates were 25.05 per 100,000 diabetics.

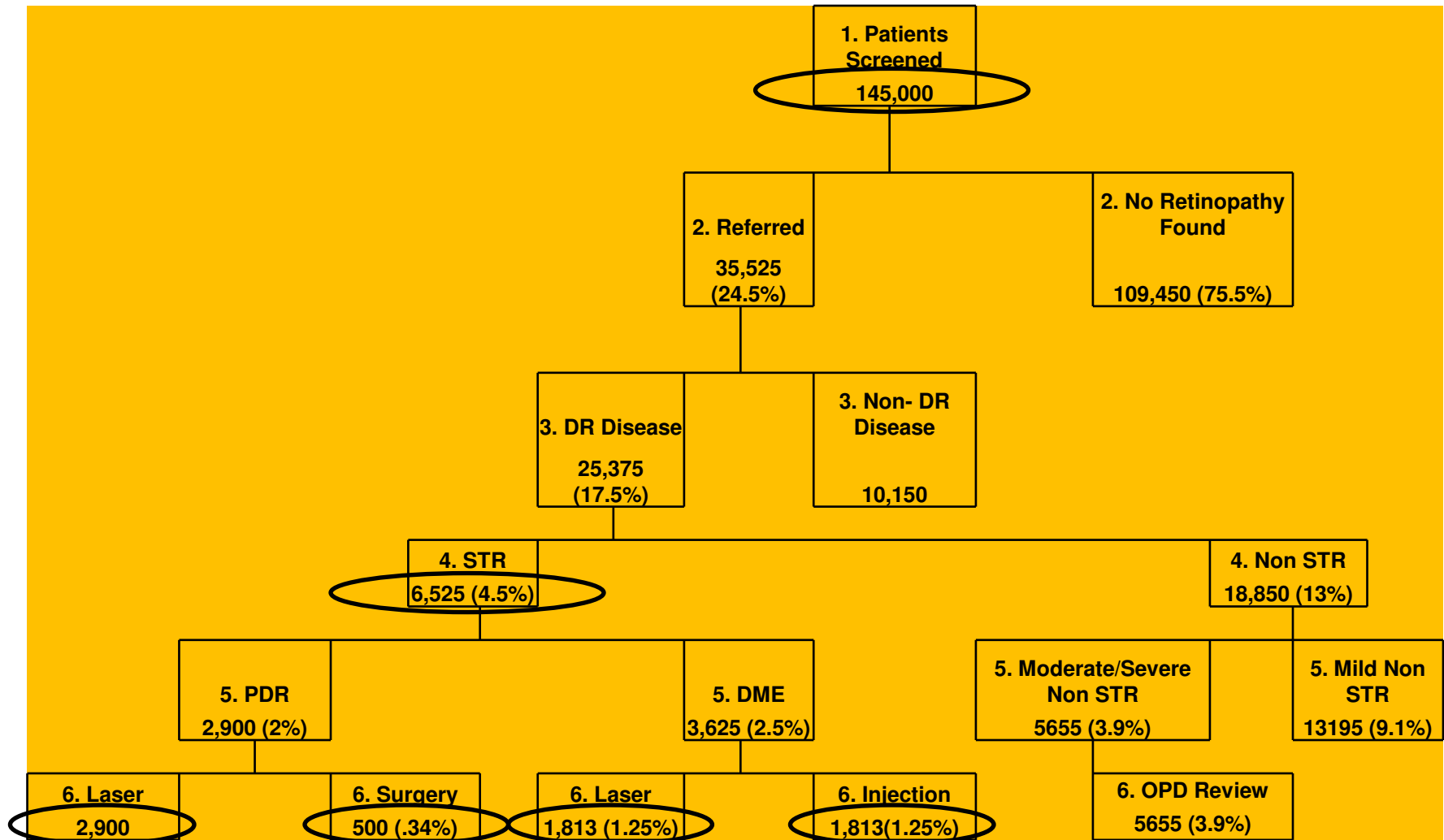
Blind: **25.05**

Moderate VI: **74.148**

Mild VI: **198.145**

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National Diabetic Retinopathy Care Pathway



Current Treatments DMO

- Current standard of care is laser photocoagulation
 - ETDRS
 - Aim is to delay progression of visual loss
 - Evidence does not indicate regain of vision
- Expanding evidence base demonstrating the benefit of using anti-VEGF therapies
 - Significant visual gain demonstrated
 - Robust evidence to support the use of Ranibizumab
 - Low-risk treatments
 - However, absence of longer-term outcomes

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Evidence

- **Ranibizumab (Lucentis, Novartis)**
 - READ-2
 - RESOLVE
 - RESTORE
 - RISE and RIDE
 - DRCR-Net
- **Bevacizumab (Avastin, Roche)**
 - BOLT
- **Aflibercept (Eylea)**
 - Da Vinci study
- **Flucinolone**
 - FAME study

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Implications for clinicians

- Anti-VEGF - significant advantage
 - Now treatment of choice
 - Ranibizumab – most robust evidence, NICE approved
 - Bevacizumab cheaper but not licensed for intraocular use
 - Direct head to head trials awaited
- Still a role for laser
 - Focal areas of leakage
 - Non-centre involving DMO
 - No benefit combined with Ranibizumab

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Implications for Policy makers

- Best Evidence Based Treatment Algorithm continually evolving
- Duration of anti-VEGF therapy required undefined
 - Longer follow up data required
- Planning for service provision challenging

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Treatment Schedule Assumptions- PDR

- **Proliferative Diabetic Retinopathy (2%= 2,900 patients)**
 - ***Panretinal Photocoagulation***
 - 4 monthly OPD review
 - Average number of sessions required= 3 per year for 2 years

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Treatment schedule assumptions - DMO

- **Centre involving Diabetic Macular Oedema (1.25%= 1,813 patients: bilaterality 30%)**
 - ***Intravitreal Ranibizumab***
 - Monthly OPD review
 - Average number of injections: Year 1= 7, Year 2= 4, Year 3= 3

RESTORE 2 year extension

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Impact Of Screening Programme

Patients beginning treatment due to Screening	2014	Review/OPD visits	
PDR Laser ¹	1909	PDR Laser ¹	5148
PDR Surgery ²	329	PDR Surgery ²	2214
DME Laser ³	1197	DME Laser ³	2151
DME injection ⁴	751	DME injection ⁴	11309
Total Number of Patients beginning Treatment	4186	Moderate to Severe Non- STR ⁵	9020
Moderate to Severe Non- STR- OPD visits only-No treatment ⁵	3723	Total Number of review/OPD visits	29841

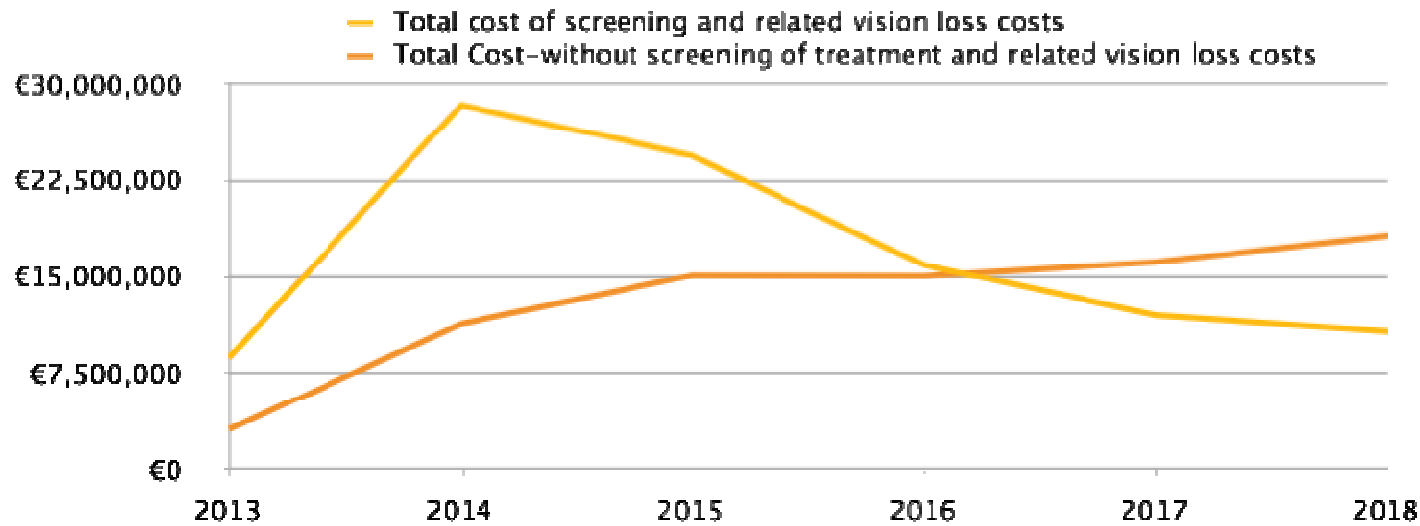
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Impact of screening

- ***“Epidemiology of blindness attributable to diabetes in Scotland: change over 20 years in a defined population” (H.N Hall, D.J. Chinn, A. Sinclair and C.J. Styles, doi: 10.1111/dme,12223).***
- Mean incidence of blindness attributable to diabetes
 - **54.49 cases per 100,000** diabetic individuals between 2000 to 2005
 - DR screening programme established in Scotland in 2006
 - **25.05 cases per 100,000** individuals between 2006 and 2009

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Financial Impact of Full Implementation of Diabetic Retinopathy Care Programme



	2013	2014	2015	2016	2017	2018	Total
Total cost of screening and related vision loss costs	€8,683,371	€28,317,211	€24,338,440	€15,858,639	€11,962,585	€10,710,221	€99,870,466
Total Cost-without screening of treatment and related vision loss costs	€3,076,261	€11,300,734	€15,038,494	€15,008,062	€16,101,561	€18,173,224	€78,698,336
Incremental Cost/Savings	€5,607,110	€17,016,477	€9,299,946	€850,576	-€4,138,976	-€7,463,000	€21,172,130
Cases of blindness avoided	21	43	43	43	43	43	235
Cases of Moderate VI avoided	63	126	126	126	126	126	695
Cases of Mild VI avoided	169	338	338	338	338	338	1857

In Ireland

- We estimate that **235 cases of blindness due to diabetes could potentially be avoided** with the introduction of the screening programme and availability of treatment
- We estimate that we will avoid **~2,500 cases of Vision impairment**
- The estimated financial cost of blindness of **€21,270 per annum** per individual
- If you factor in likely impact on Vision Impairment cohort (197,000). Financial cost saving ($€1,717 \times (2,500) =$ **€4.3 million over 4.5 years**)
- Net cost of approx **€21 million over 4.5 years** when the financial cost of blindness and visual impairment is taken into account

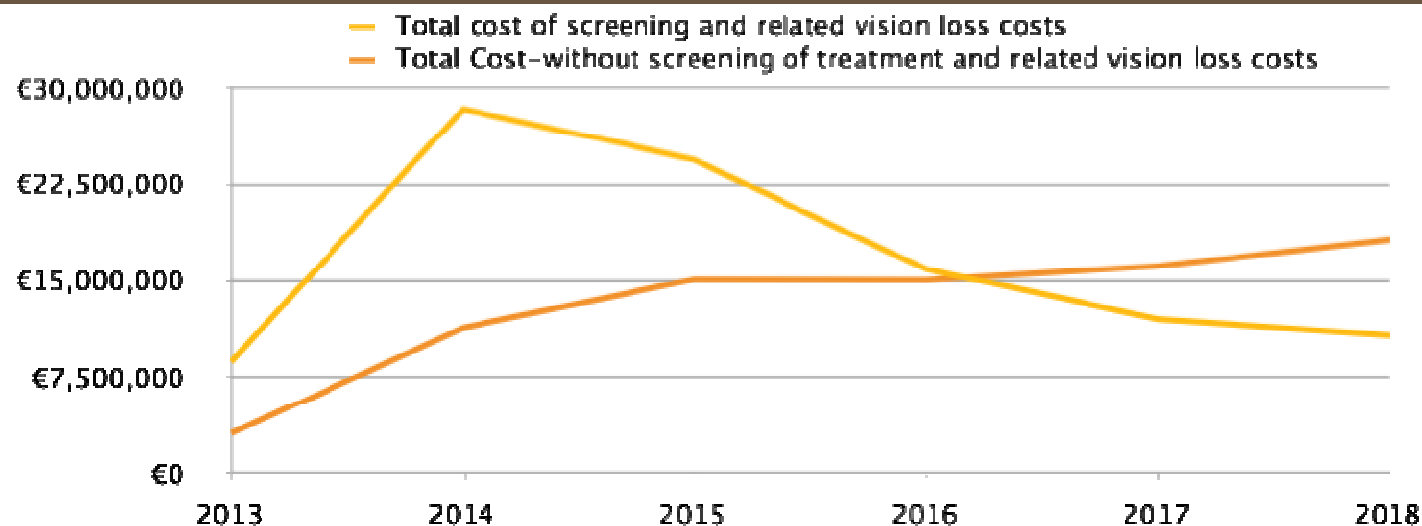
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Limitations

- Economic estimates are based on a number of assumptions:
 - Epidemiological data in the UK/US is representative
 - Resources available to effectively deliver proposed care pathway
- Reduced incidence of blindness is attributable to implementation of screening and effective treatment
 - Improved glycaemic control also a contributing factor

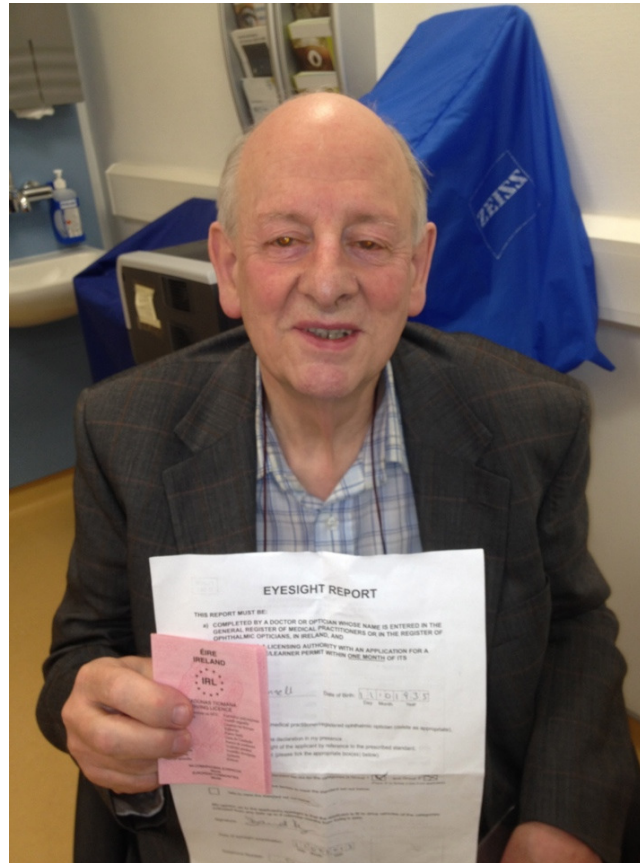
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What it means for 1,857 People



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Pathway to Vision 2020: National Vision Strategy

- Full agenda of **eye health** for children and adults
- Maximising **equity, quality and safety**
- All services and supports will be provided on a **person-centred** basis adopting a life-course approach
- People with sight loss will be able to live **fulfilled lives**.
- Services will be provided using **seamless pathways** traversing health care, social care and the voluntary sector

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Pathway to Vision 2020: National Vision Strategy

- Resource allocation and service design will be guided by **evidence-based approaches**
- **Research** will serve as a key enabler to improve outcomes and the quality of care provided
- The **strategic development** of eye health and support care in Ireland will be aligned with the wider Public Health policy framework

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Conclusions

- Vision loss is a serious health issue and affects over 220,000 people annually
- The average financial cost of blindness is €21,288 per annum, while the average economic cost is €62,230
- The total cost of vision loss is estimated to reach
 - €2.5 billion by 2020
 - €1.1 billion of which is due to blindness (yet only 5% of the vision impaired population are blind)
- The Financial Cost (to the Departments of Health, Social Protection and Finance) will reach € 366 million

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Conclusions

- Diabetic Retinopathy Screening Programme
 - 235 cases of blindness and more than 2,000 cases of vision impairment could be avoided at a net spend of €21.1 million over 5.5 years
- This is a net average cost of €145 over 5.5 years per diabetic patient
- We should replicate this data for Age Related Macular Degeneration as evidenced by Danish and US studies and Glaucoma
- A National Vision Strategy will be Economically Viable as well as Preventing Blindness and Vision Impairment

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Thank You

