Eye Health Needs Assessment

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EXECUTIVE SUMMARY

1. On the good side, fewer people are going blind.

2. On the bad side, there are going to be more of us; getting older, getting fatter (therefore increasing diabetes and cataracts) and therefore the prevalence of eye disease and “burden of disease” will increase.

3. It is the very old (over 80) who have the highest level of severe sight loss. The huge increase in certifications of visual impairment with age is quite striking – there are more in the over 75s than all the ages lower combined.

4. There are significant inequalities in eye health. Those in the poorest 20% have been found to have an almost 80% higher risk for onset of severe visual impairment.

5. People with Learning Disabilities are ten times more likely to have eye problems. It is recommended that enhanced sight tests for people with Learning Disabilities be commissioned in order to address this inequality.

6. In terms of “Burden of Disease”, a measure that combines Quality of Life with number of people affected, top of the list is Age-related Macular Disease, then Refractive Error (sight-impairment which can be corrected by lenses). These two account for 60% of the Burden – followed by cataract (14%), glaucoma (11%), “other” (9%) and diabetic eye disease (6%). It is estimated that 50% of blindness and serious sight loss is avoidable in this country and could be prevented if detected and treated in time.

7. The direct costs to the NHS of visual impairment in Vale of York population are £57 per head, with a further £90 per head indirect costs. The cost of treating eye disease is increasing. There are several steps the CCG could undertake to produce cost savings in the short and long term.

8. There were an estimated 131,000 eye tests in the Vale of York population in 2014/15, of which 54% were NHS, and 46% private funded.

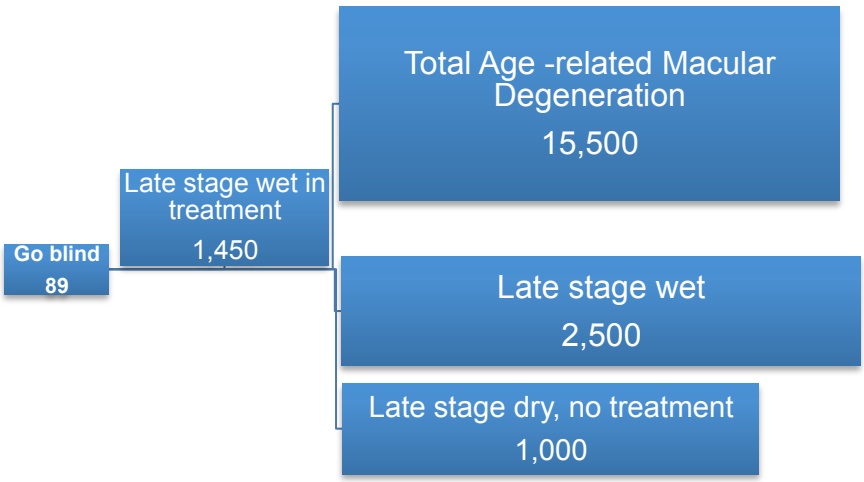
9. The number and rate of people over 60 years having NHS Sight tests is declining in North Yorkshire, York and Humber, which is of concern as most eye diseases become more prevalent with age.

10. The North Yorkshire Diabetic Eye Screening Programme achieved a coverage of 87% of people with diabetes attending to have their eyes screened, which is a very good result. People who need further investigation following the screen now have community-based alternatives in several sites

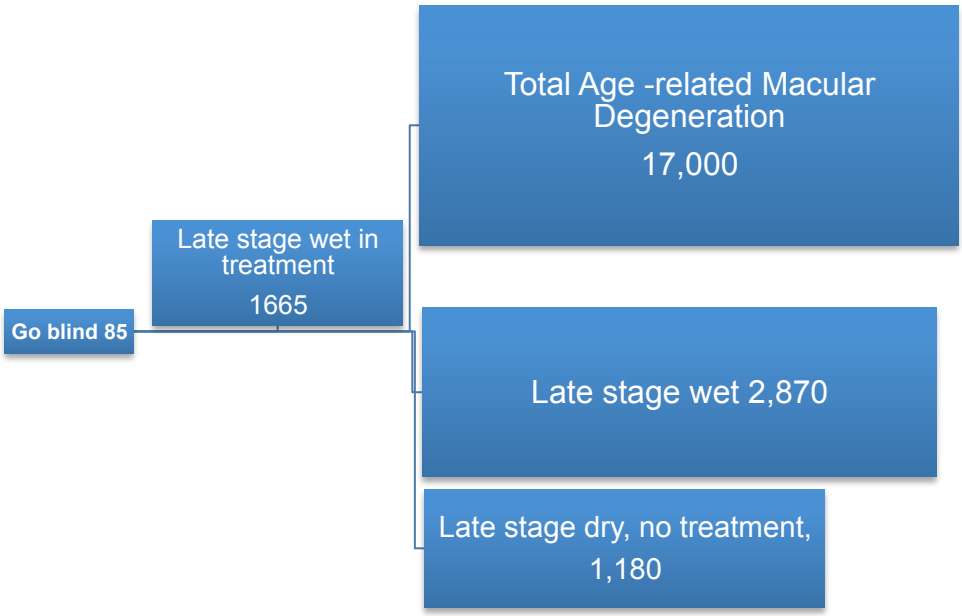
which should take approximately 3000 patients out of the Hospital Eye Services.

11. There are an estimated 15,500 people living with early stage Age-related Macular Degeneration (AMD), and 3,500 with late stage AMD. About 2500 patients are estimated to have late stage wet Age Related Macular Degeneration and this number increases by 100 a year (net).

Actual in 2015



Projected in 2020

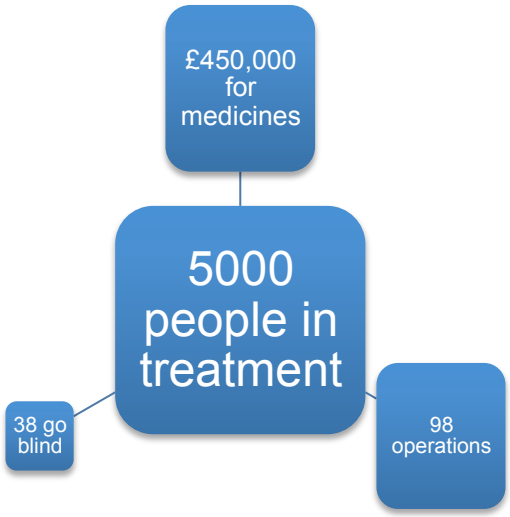


12. From York Hospital data it is estimated that about 1450 people are in active treatment of wet AMD using expensive drugs injected into the eye. The total cost of Vitreous Eye Treatments (for all retinal disease, but mostly AMD) in 14/15 was nearly £7 million. If all other factors remain constant we will see this number increase to 1665 people by 2020, and the treatment costs will rise by an amount difficult to predict due to market forces. There is no treatment for dry AMD at any stage.

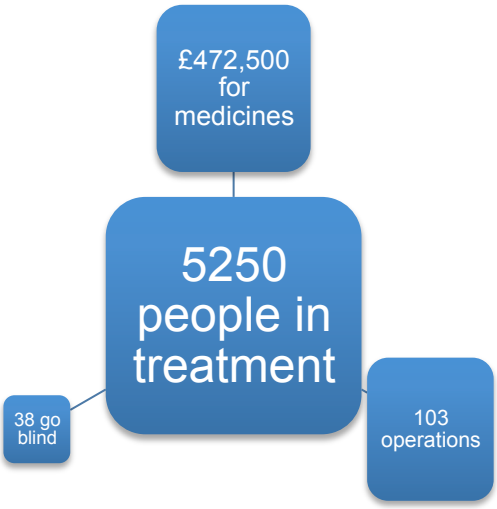
13. Disease modelling estimates that there are currently 3,170 people with glaucoma and a further 6,900 people with raised intraocular pressure in the Vale of York population.

14. There are nearly 5000 people on the glaucoma register held at York Hospital, which means they are being actively managed by acute care. Approximately £450,000 a year is spent on prescriptions of eye drops for the treatment of glaucoma.

Actual in 2015



Projected for 2020

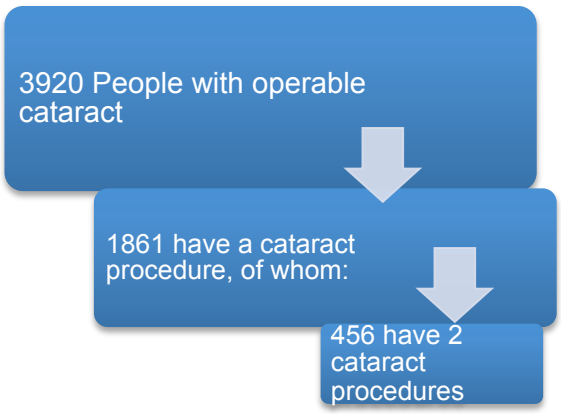


15. Blindness certifications due to glaucoma in Vale of York have shown a large year on year increase against a static position nationally. This is an area that needs further investigation; possibly a look-back exercise or a clinical audit across primary and secondary care.

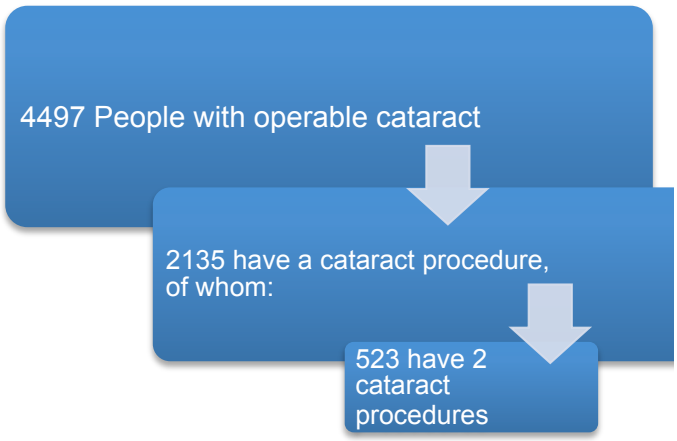
16. There are an estimated 3920 people living with cataract of severity that surgery would be considered. This number is increasing by a net 100 a year.

17. By far the most common surgery on the eye is cataract extraction. The last two complete years there were 3,723 procedures performed, or about 1900 for last year. The projected number for 2020 is 4497.

Actual in 2015



Projected for 2020



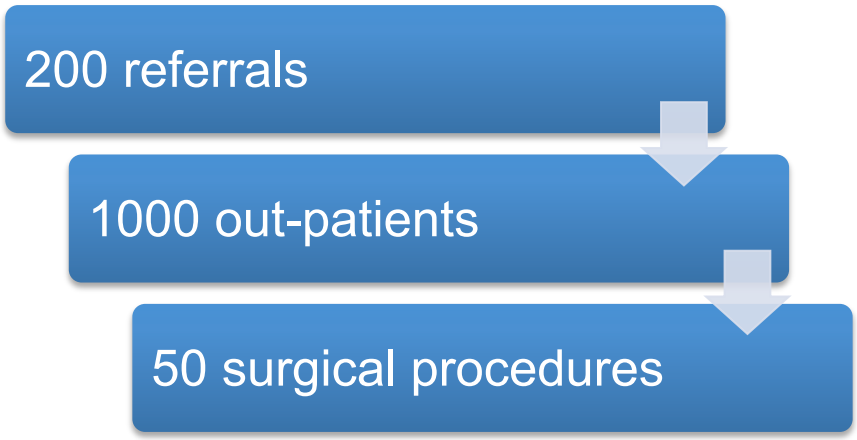
18. Optometrists are an underused resource for health, both specifically for eye health, but also their potential to give general health promotion advice and support.

19. There is no culture of data collection in optometry services, only of submitting claims for activity. This makes evaluation of the effectiveness of optometry interventions a challenge. There is much to be gained from improving communication between optometry and ophthalmology, to improve quality of referral, for feedback and to allow tracking of outcomes.

20. Community Pharmacists are underused resource for eye health. More use could be of Medicines Use Reviews to promote eye health.

21. There is little local data on GP eye care, but it is estimated that over 2% of consultations are about the eye. Without data it is not possible to assess the quality of eye care given in primary care.

22. The “Ballpark” Week for York Hospital Eye Service (Vale of York patients only):



23. Urgent care for eye problems is available 24/7. Attendance at the daily urgent care clinics averages 76 per week (range 45 to 100). A very wide range of problems present – most commonly diagnosed in "acute anterior uveitis" at 15% and posterior vitreous detachment at 13%. Both of these require immediate treatment if sight is to be preserved.

24. Planned care includes a range of procedures; the highest volume procedure was cataract extraction and lens implant – accounting for 70% of all the "episodes" pertaining to the eye.

25. "Oculoplastics" (plastic and reconstructive surgery to the eye and surrounding structures) accounts for 10% of ophthalmology episodes at York Hospital, which is in line with the national picture. The vitreoretinal procedures are also relatively high volume, accounting for 8% of the York workload.

26. Services for low vision include the position of the Eye Clinic Liaison Officer based at York Hospital, to help people come to terms with sight loss by offering advice on living with reduced sight. The NHS and Council social services fund support, and work closely with the voluntary sector.

RECOMMENDATIONS

Key to impact of recommendation:

A = primary prevention of eye disease

B = early detection of sight problems

C = screening for eye disease

D = promoting self-care and independence

E = tackling health inequalities

F = realising short-term cost-savings

G = realising long-term cost savings

H = improving outcomes (reducing sight loss)

I = improving efficiency of health services

To prevent harm (loss of sight) and reduce eye health inequalities

1. All heath and social care professionals to promote eye health using the 10 Top Tips for Healthy Eyes and Good Vision (see Section 5.7) A, D, G

2. Make greater use of optometrists by targeting at risk people for NHS sight tests, and as vehicles for passing on health promotion messages, as above and about the benefits of stopping smoking. Consider adoption of a Healthy Living Optometrist scheme. A, B, C, E, G, H

3. Develop and implement an Enhanced sight test for People with Learning Disabilities to allow more time with optometrist to familiarise patients and their carer with the procedures and equipment at the time of the sight test and also gives time for repeat visits to complete procedures where needed. B, C, D, E, G, H

4. As above but for people with Dementia. D, E, F, H

5. Undertake work to increase take up of sight tests by the Traveller community B, E

6. Support Tobacco Control initiatives. A, E

7. Support eye protection initiatives (from UV rays, home and garden injuries, etc). A, G, H

8. Support initiatives to improve uptake of Measles, Mumps and Rubella (MMR) vaccinations A, G, H

Improving coordination of care

9. Develop and revise the referral pathways in the electronic Referral Support Service (RSS) used by GPs to refer patients for specialist eye care. F, G, H, I

10. Improve information flows between optometrists and Ophthalmology. Ophthalmology to send a copy of the letter sent to the GP, ideally electronically, back to the referring optometrist. Introduce meaningful data collection by optometrists for Community Eye Care Locally Enhanced Services, and undertake joint audits of the services with a view to making service changes if necessary G, H, I

11. Consider whether it is worth commissioning from a single provider using a single IT system. I

12. Explore the cost-effectiveness and feasibility of developing Optometry Enhanced Services for referral refinement of patients with suspecting Age-related Macular Degeneration, thereby diverting patients from secondary care. F, I

13. Explore use of Minor Ailments Scheme for eye conditions in Community Pharmacy and improve joint working and signposting between pharmacy and optometry F, I

14. Consider the pathway revisions which have been made in neighbouring CCGs in Harrogate, Scarborough and East Yorkshire, to prevent geographical inequalities. E

Increasing value for money

15. Institute a review of prescribing practice for glaucoma involving the Drug and Therapeutics Committee or other relevant body. F, G, I

16. It is recommended that Vale of York CCG and York Hospital Eye Service work together to release some existing expenditure to help fund the increasing demand. F, G, I

17. It is recommended that the CCG instruct the provider to use bevacizumab in place of ranibizumab and aflibercept for the treatment of wet Age-related Macular Degeneration and other vascular retinal conditions F, G, I

18. Explore the cost-effectiveness and feasibility of developing Optometry Enhanced Services for referral refinement of patients with suspecting Age-related Macular Degeneration, thereby diverting patients from secondary care. F, I

19. Review use of the Referral Support Service (RSS) and policies in particular thresholds for cataract surgery. F, G, H, I

Improving and assuring quality of care

20. The management of glaucoma is an area that is ripe for interagency audit, and the establishment of a monitoring process examining how vision changes over time. It is recommended that consideration be given to the establishment of a confidential look back exercise on a sample of people who have been Certified (CVI) with glaucoma as the cause, to identify areas for improvement in the system. H, I

21. Investigate why the rate of Certification of Visual Impairment in York is much higher than the rate in North Yorkshire and East Riding other areas for 3 of the recent 4 years. H, I

22. Ensure NHS England quality assures the NHS Newborn & Infant Physical Examination to maximise coverage and completeness of the examination and any required follow up of those children found to have an eye condition. B, C, G, H

23. Develop a comprehensive Child Vision Screening care pathway for 5 – 6 year olds that would provide a best practice framework and allow for audit. A, B, C

24. Monitor the effectiveness of the new community diabetic eye disease investigation sites in diverting activity from the Hospital Eye Service. I

25. Introduce meaningful data collection by optometrists for Community Eye Care Locally Enhanced Services, and audit the services with a view to making service changes if necessary. G, H, I

26. Ophthalmology should set in place a mechanism to give feedback to the optometric practices that refer patients to them. This could simply be a copy of the letter sent to the GP, ideally electronically. H, I.

27. Pharmacists hospital and community), district nurses, GPs, practice nurses and optometrists to review/audit how they teach technique of application of eye drops and eye ointments by patients. I

28. Implement initiative to improve technique of application of eye drops and eye ointments by patients. D, G H, I

1 INTRODUCTION

1.1 Good vision is an important resource for health; it contributes to mobility and communication, essential for physical and mental health. People who are severely visually impaired may be robustly healthy; they may have no active eye disease and not require any type of "treatment". People who lose vision may suffer very poor health depending on their circumstances, if they do not adjust and adapt to the situation. This Needs Assessment covers how we can prevent impaired vision leading to poor health and how we can prevent and treat the conditions of the eye which cause deterioration of vision, which can be disabling and negatively affect quality of life. Current services relating to eye health are described and quantified where possible. The report does not cover the same ground as the report commissioned by Vale of York Clinical Commissioning Group (CCG) from Nous, (hereafter referred to as the Nous Report) but rather is a response to its recommendation to undertake a Needs Assessment.

1.2 Visual impairment (i.e. partial sight or blindness) may be prevented if certain conditions are detected, diagnosed and managed appropriately. The Royal National Institute for Blind People (RNIB) estimates that 53% of blindness might be prevented with suitable intervention and treatment[1].

1.3 The main causes of permanent and severe visual impairment have been identified as age related macular degeneration (AMD), glaucoma and diabetic retinopathy[2]. Cataracts and uncorrected refractive error also cause registrable levels of visual impairment which may be resolved with appropriate treatment.

1.4 This Needs Assessment attempts to determine, using various sources, the state of eye health and scale of need and demand for health and social services, for people in the York area. Because the different organisations work to different boundaries in this report we will present data as appropriate and as available for:

- ✓ Vale of York patients – that is people who are registered with one of the practices in the NHS Vale of York Clinical Commissioning Group (VoYCCG)
- ✓ City of York residents
- ✓ North Yorkshire County Council residents (or the part of North Yorkshire County Council covered by the VoY CCG)
- ✓ East Riding of Yorkshire Council residents (or the part of East Riding Council covered by the VoY CCG)
- ✓ York and North Yorkshire combined (i.e. the old Primary Care Trust boundary)
- ✓ North Yorkshire and the Humber (the NHS England Area Team boundary)

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[1] RNIB, (2008) UK Vision Strategy: Setting the direction for eye health and sight loss services. London: RNIB http://www.vision2020uk.org.uk/UKVisionstrategy/page.asp?section=32&sectionTitle=About+the+Strategy#Download%20the%20UK%20Vision%20Strategy

[2] Bunce C, Xing W and Wormald R (2010) "Causes of Blind and Partial Sight Certifications in England and Wales April 2007 –March 2008". *Eye* 24 1692-1699 http:/www.nature.com/eye

1.5 We combine quantitative information (actual and predicted numbers) from various sources in the RNIB Sight Loss Tool, with local information on service use from the health, social and voluntary sector. Data sources used include:

1. Ophthalmology referral, inpatient, outpatient and Register data, from York Teaching Hospital NHS Foundation Trust
2. Number of NHS Sight Tests, glasses vouchers, optometrists, optometric performers, from NHS England North Yorkshire and Humber Area Team
3. Urgent Eye Clinic data (reason for attendance, date) from a Consultant Ophthalmologist
4. Members, age distribution and degree of visual impairment from York Blind and Partially Sighted Society
5. Population data and projections from City of York Council
6. Number of school children from City of York Council
7. Number of Certification of Visual Impairment from City of York Council
8. Number of children screened with outcome from the School Nursing Service, York Teaching Hospital NHS Foundation Trust
9. Diabetic Retinopathy Screening Programme returns

This combined with local stakeholder views and published research and guidance allows us to come up with an overall assessment of need, and recommendations for consideration by the CCG and other partners in the Health and Wellbeing Boards of the three local authorities.

2 POLICY AND PERFORMANCE DRIVERS

There are multiple policy drivers for improving eye health in York

2.1 National level

2.1.1 UK vision strategy

Published by the UK Vision 2020 strategic advisory group the primary aim of the strategy is to eliminate avoidable blindness by the year 2020[1]. It has three key aims:

- To improve the eye health of the people of the UK
- Eliminate avoidable sight loss and deliver excellent support to those with a visual impairment
- Enhance the inclusion, participation and independence of blind and partially sighted people.

2.1.2 Public Health Outcomes Framework

Indicator 4.12 of the Public Health Outcomes Framework confirms a commitment to reduce avoidable blindness that mirrors the Vision 20:20 UK aim of avoiding preventable blindness by the year 2020.

- 4.12 Proportion of Certificate of Visual Impairment (CVI) registrations that are due to age related macular degeneration (AMD), glaucoma and diabetic retinopathy

The following indicators measure where good vision would reduce risk of harm, as it has been shown that visual impairment is a risk factor for falls in older people[3]:

- 2.24 Falls and Injuries in the over 65s
- 4.14 Hip fractures in the over 65s

The following indicators reflect that good eye health makes a contribution to quality of life:

- 2.23 Self reported wellbeing
- 14.13 Health related quality of life for older people

People with visual impairment are more likely to be depressed[4]. Self-care for other systemic conditions is likely to be affected[5], resulting in poorer health outcomes for these patients than those who are not visually impaired.

[3] Scuffham PA, Legood R, Wilson E, Kennedy-Martin T (2002) "Incidence and Cost of Injurious Falls Associated with Visual Impairment" *Visual Impairment Research* April 2002 4 1-14

[4] Evans JR, Fletcher AE, Wormald RP (2007) "Depression and Anxiety in Visually Impaired Older People" *Ophthalmology* Feb 2007 114(2):283-288

2.1.3 NHS Outcomes Framework 2015/16

Two of the five overarching indicators in the NHS Outcomes Framework can be directly and positively influenced by efficient eye care services:

- Number 2: Enhancing quality of life for people with long term conditions
- Number 4: Ensuring that people have a positive experience of care.

In addition, good eye care services could indirectly influence the following individual indicators by enabling people to self manage their other health conditions:

- 1a Reduction in potential years of life lost from causes amenable to healthcare
- 3.6 Helping older people to recover their independence after illness or surgery

2.2 Vale of York CCG Integrated Operational Plan 2014 – 2019

The two objectives in Strategic Initiative 5 are:

- A sustainable and high quality local hospital providing a centre for urgent and emergency care and planned care for a wide range of conditions and elective operations, maternity and other specialisms within the Vale of York.
- Highly productive elective care delivery based on a jointly transformed acute pathway.

One of the 6 specific services identified for service /pathway review is Ophthalmology Services.

2.3 Budget containment / savings

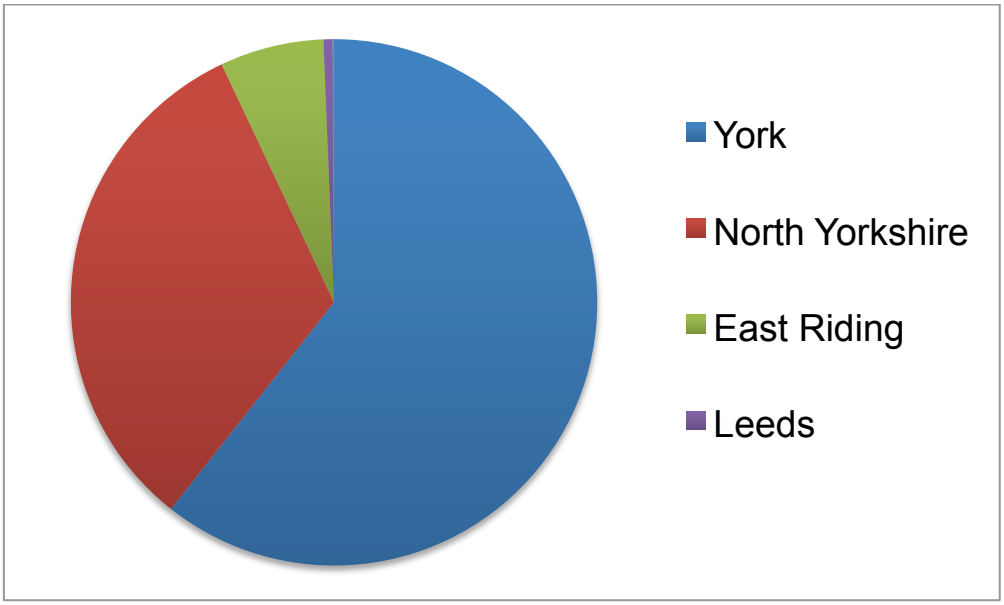
The cost to the NHS of the totality of vision services is about £50 per head per annum. The CCG picks up the majority or these costs, and must at the very least contain the cost in the face of the growing demand. A relatively small proportion of the spend is attributable to NHS England. The costs of the consequences of poor vision in older people which reduces their independence are the responsibility of local authorities, which are facing continued cuts (of about 7% per year to 2019/2020).

[5] Douglas G, Corcoran C and Pavey S. (2006) "Network 1000, Opinions and Circumstances of Visually Impaired People in Britain" Visual Impairment Centre for Teaching and Research (VICTAR) School of Education, University of Birmingham.

3 POPULATION CHARACTERISTICS

3.1 The NHS Vale of York CCG registered population includes residents of City of York, parts of North Yorkshire (Selby, Ryedale and Hambledon), and the Pocklington area of East Riding of Yorkshire, and 1% of the CCG population are Leeds residents.

Figure 1 Proportion of Vale of York CCG registered patients by local authority



Source: HSCIC for CCG Registered patients and ONS mid year 2013 Population

Most of the actual and modelled data available is presented by where people live (the resident population), rather than by the doctor/practice at which they are registered (the CCG registered population). This presents methodological challenges; the relevant population denominators are given below to assist the CCG calculate local numbers for planning purposes.

Table 1 Population denominators relevant to Vale of York CCG

Local Authority	Total Residents (mid-2013)	No. of VoY patients living in that local authority	% of residents who are registered with a VoY GP	Net % residents covered by VoY CCG
York	202,433	213,184	105.31%	100%
North Yorkshire	602,749	113,745	18.87%	19%
East Riding	336,007	22,429	6.68%	7%
Other		2,282		0%
Total VoY		351,622		
N. Yorkshire & Humber Area	1,690,000			

Source: HSCIC for CCG Registered patients and ONS mid year 2013 Population. See Appendix 1.

Technical note:
The following method has been applied to achieve our "Best Guess" total numbers for CCG population.
The Net % resident population coverage, as given in Table 1 is a rough approximation – it is not the true numbers of people, because for instance not every resident of City of York is registered with a Vale of York GP, but on balance the numbers are of the right order to make the Best Guess of the right scale.

The Best Guess number estimate is the sum of:

1. City of York Council predicted numbers X 100%
2. North Yorkshire County Council numbers X 19%
3. East Riding of Yorkshire County Council numbers X 7%

This is not perfect – the correct way to calculate number would be to apply the age specific prevalence rates of the various conditions to the actual age of the CCG age and sex structure, but it is considered that the precision of the Best Guess method described above is perfectly adequate for the purposes to which it will be used.

3.2 Age structure of the population

The age breakdown of the 3 constituent local authorities is given in Table 2.

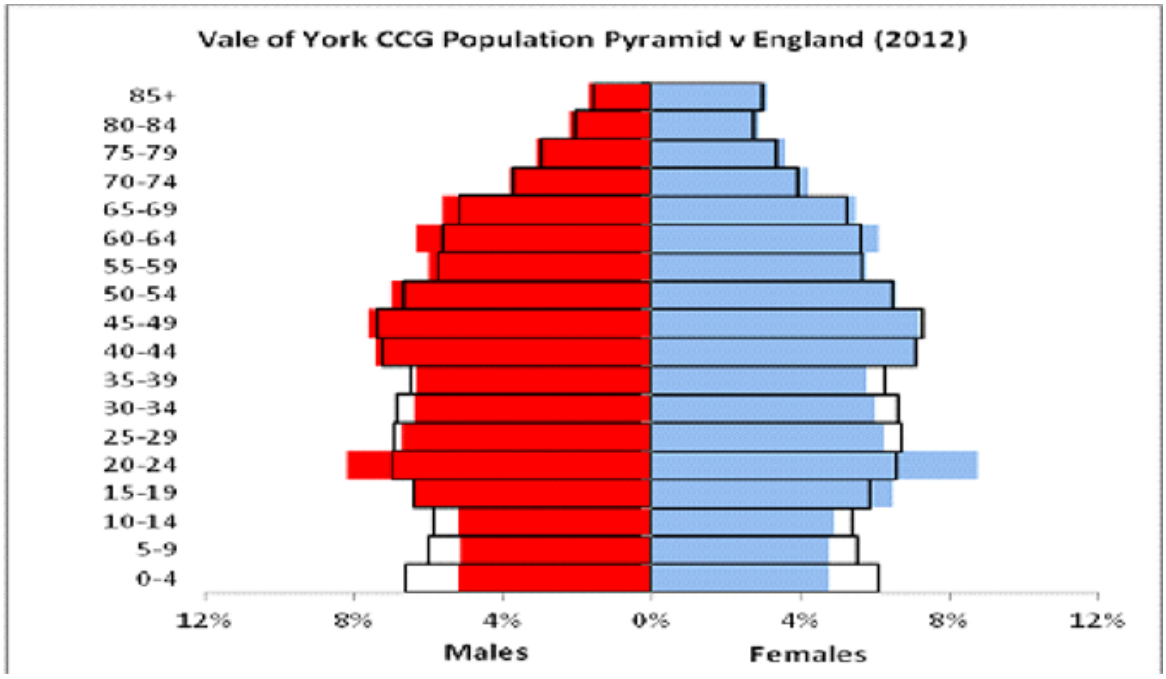
Table 2 Proportion of population by age band by local authority

Age group	York	North Yorkshire	East Riding
0-4	5.4%	5.2%	4.9%
5-17	12.8%	14.7%	14.3%
18-29	**21.1%**	12.5%	11.6%
30-49	26.5%	25.8%	25.9%
50-64	17.4%	21.3%	22.0%
65-74	8.6%	10.9%	11.6%
75-84	5.9%	6.9%	7.1%
85+	2.5%	2.8%	2.7%

Source: RNIB Sight Loss Tool – Custom report produced 11 July 2015

The North Yorkshire and East Riding population are older than York. There is discussion of the "anomaly" in the 18 – 29 year age group on the following page.

Figure 2 Population pyramid for NHS Vale of York registered patients based on mid-year 2012 estimates



Source: City of York JSNA http://www.healthyork.org/the-population-of-york/vale-of-york-clinical-commissioning-group-population.aspx

The population pyramid gives a visual representation of the number of men and women who are Vale of York patients by gender and 5 year age band. As can be seen the pyramid does not look like a pyramid! Youngest is at the bottom of the pyramid, usually with a gradual decrease from about age 50. In the Vale of York population we see a large bar sticking out on each side a quarter of the way up. These are people in their early twenties, the effect of having a large student population in the city of York. The darker outlines show the population profile of the England population for comparison.

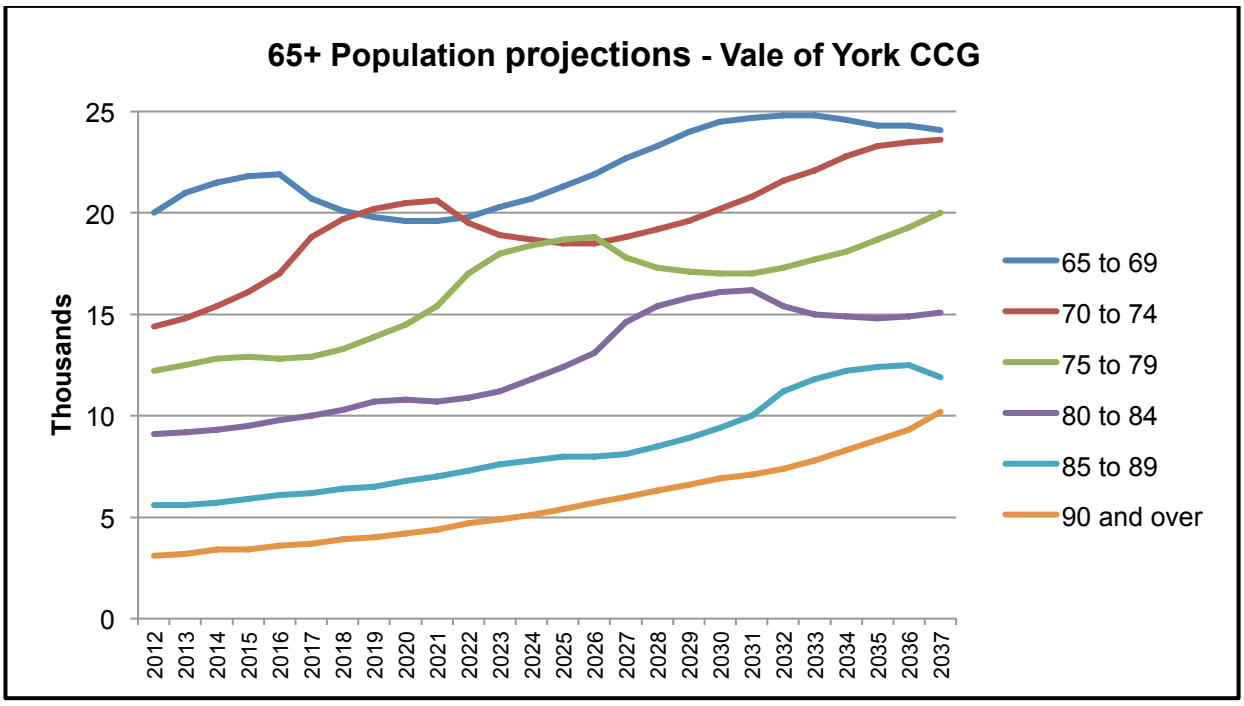
3.3 Projected growth

The population is ageing, not just locally but throughout the UK, as life expectancy continues to increase, and is showing no signs of plateauing off yet.

The of Vale of York population aged 65 and over is projected to grow from 69,400 in 2015 to 82,500 in 2024.

The population aged 85 and over is projected to grow from 9,300 in 2015 to 13,100 in 2024. (These are the actual projections from ONS, not best guess).

Figure 3 **Population projections in 5 year age bands for ages over 65, Vale of York registered population, 2013 to 2037**



Source: ONS 2012-based Subnational Population Projections

3.4 Inequalities, equality and diversity

3.4.1 Minority ethnic groups -York

Between the 2001 and 2011 Censuses the city has become more culturally and religiously diverse with a Black and Minority Ethnic (BME) population of 9.8% (non-White British) compared to 4.9% in 2001. The largest ethnic group in York is the "other white British" followed by Asian British. A relatively large proportion of the number of immigrants to York is from eastern European countries such Poland.

There are ethnic differences in the pattern of eye disease; people of Asian and African-Caribbean descent are at greater risk but knowledge is sketchy, and action even more so; only 46% of these two minority groups know that they are at higher risk of eye disease. Only 10% of Asians are aware and active monitor their eyes because of this. In African-Caribbeans the figure is only 4%. Despite this, they place greater importance on regular sight tests than do those of white descent[6].

3.4.2 Gypsy and Roma Travellers

There is a relatively small Gypsy or Irish Traveller population that moves across northern Yorkshire, and there are a number of pitches in the city of York and in neighbouring Selby. Census 2011 data reveals that fewer Travellers reported their health as either 'Very Good' or 'Good' (75%) compared to the general population of York (84%) and England (81%). Similarly, double the proportion of White: Gypsy or Irish Travellers recognise their health as 'Bad' or 'Very Bad' (8%) compared to York generally (4%). National research indicates reduced life expectancy, higher rates of infant mortality and greater likelihood of ill health within the Traveller community.

A Traveller community in London was surveyed in 2011, covering 38 adults and 58 children, and only one in four of the Travellers had ever had an eye test. Of those who had 80% had been tested in the last two years. There was a lot of uncertainty as to whether children had had their eyes tested or not – some thought they were tested as babies, others thought perhaps in school, but most were unsure. Very few people in the survey sample reported eye problems, only 11%. Of those that did have a problem, 18% reported some vision problems, but had not had an eye test, 27% reported a problem requiring treatment other than glasses and 55% reported an eye problem corrected by glasses[7]. This suggests that perhaps only 5 – 10 % of the Traveller community wear glasses.

Members of the Travelling community in York were asked about eye health at the July meeting of the Travellers Trust. They reported that many of the older generation had never had their eyes tested; they hadn't attended school, and they didn't read and write so had never perceived a problem. It was felt to be different

[6] Britain's Eye Health in Focus. A study of consumer attitudes and behavior towards eye health. College of Optometrists. June 2011.

[7] The Health Needs of Travellers on the Colne Park site in Hillingdon Report. London Gypsy and Traveller Unit. 2005

with the younger generation as vision problems would be picked up in school or opportunistically, for example by a Health Visitor who noticed something, such as child sitting very close to the TV. They felt that it was something the community members never thought about.

3.4.3 Socio-economic prosperity and deprivation

Populations with high levels of deprivation have been shown to be more likely to present with eye disease later than others[8]. This increases the risk of sight loss in deprived areas.

There is a measure known as the *Index of Multiple Deprivation 2010* (IMD 2010) which combines a number of indicators, chosen to cover a range of economic, social and housing issues, into a single deprivation score for each small area in England. The overall IMD 2010 measure for York shows that it is the 3rd least deprived city (out of the 64 cities of similar size in the UK). In other words it's an affluent city, and the surrounding areas in Vale of York are similar:

- York is ranked as the 131st out of 149 most deprived local authority in England
- North Yorkshire is ranked as the 129th out of 149 most deprived local authority in England
- East Riding is ranked as the 122nd out of 149 most deprived local authority in England

However, this overall affluence belies the wide variation that is present. York has one *Lower Level Super Output Area*[9] in the 10% most deprived areas in the country (found in Westfield Ward) and a further 7 areas in the 20% most deprived areas in the country (found in Westfield, Clifton, Hull Road, Heworth and Guildhall wards). York's overall prosperity masks these pockets of deprivation, and the poor economic circumstances of many of the most vulnerable members of society; older single people living on a small pension, disabled people living on reducing benefits, people with long-term mental health problems, carers, young people not in education, employment or training, care leavers and the homeless. About 4,100 children live in poverty. It is worth noting that the difference is earnings between men and women in York equates to men earning £2.94 more per hour than women.

[8] Fraser S, Bunce C, Wormald R, Brunner E (2001) "Deprivation and Late Presentation of Glaucoma: Case-control Study" British Medical Journal March 17 2001 322(7287) 639-643 http://www.jstor.org/stable/25466466

[9] A Lower Level Super Output Area is an area whose boundary is set by Office for National Statistics and contains between 1,000 - 3,000 people in 400 - 1,200 households.

How a person's sight (visual acuity) changed over time was tracked over an eight year period in a recent study – the English Longitudinal Study of Ageing[10]. Decreasing levels of wealth were associated with a decreased optimal vision trajectory (stable excellent or good vision) and were more likely to have a suboptimal trajectory (fair, poor or declining vision). In addition, subjective social status had a significant additional effect beyond that already accounted for by material wealth. These findings demonstrate marked socioeconomic inequalities in both the onset of impaired vision and in the longer term patterning of change in visual acuity in later life.

There is discussion of how socioeconomic circumstances affect uptake of (free) NHS Sight tests - a very clear relationship in the over 60s, with those most deprived less likely to have their sight tested – in section 8.2. Another example of the "Inverse Care Law", where those with the greatest need receive least service, which is found very widely throughout the NHS.

3.4.4 Long-term conditions

People with long-term conditions account for:

- 30% of the population
- 50% of all GP appointments,
- 64% of outpatient appointments,
- 70% of all inpatient bed days,[i]

In total around 70% of the total health and care spend in England is attributed to caring for people with long term conditions, this means 30% of the population accounts for 70% of the spend. The care of individual conditions is often the focus of healthcare delivery, research and training. However, increasingly, as the population in the UK ages, there are more people with multiple morbidity, that is, those with two or more long-term conditions. This poses a big challenge to health and social care, delivery; particularly in an area such as York/ North Yorkshire/ Vale of York where the absolute numbers of the over 65s, and particularly over 85s is increasing.

[10] J Nazroo, Williams J, Matthews K. Onset of, and recovery from, visual impairment: analysis of causes and consequences using the English Longitudinal Study of Ageing. Report to the Thomas Pocklington Trust. August 2015

A Scottish study[11] of GP records examined the distribution of multiple morbidity and the interaction of physical and mental health disorders in relation to age and socioeconomic status.

The key findings were:

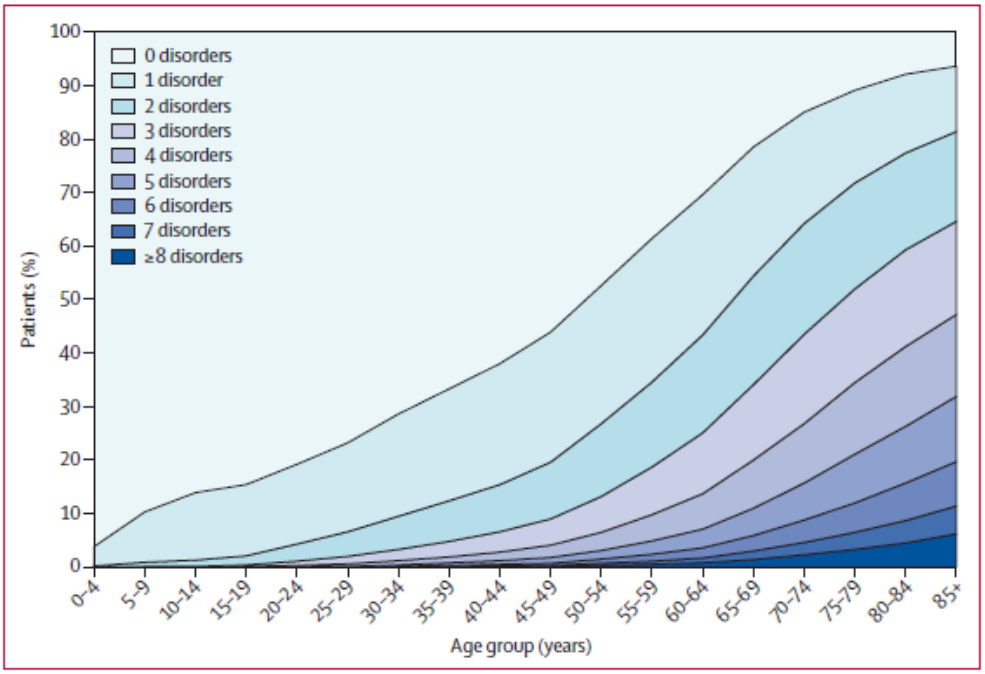
- 42% of all patients had some (any) morbidities,
- 23% of all patients had more than one (i.e. were multi-morbid)
- Onset of multiple morbidity occurred 10-15 years earlier in those living in the most deprived areas compared with those in the most affluent areas,
- Socioeconomic deprivation was particularly associated with multiple morbidity that included mental health disorders.

Multiple morbidity becomes progressively more common with age. Figure 4 below illustrates how morbidities accumulate with age which places a particular challenge on health and social care services. By age 75 roughly 75% of people have 2 or more conditions Problems with vision are common in older people, even without disease, poorly corrected problems with visual acuity, glasses which don't fit well, are broken or misplaced and difficulties judging distance with bifocals can all increase dependency.

The most problematic expression of population ageing is the clinical condition of frailty. Frailty develops as a consequence of age-related decline in many physiological systems, which collectively results in vulnerability to sudden health status changes triggered by minor stressor events. Between a quarter and half of people older than 85 years are estimated to be frail, and these people have a substantially increased risk of falls, disability, long-term care, and death.

[11] Barnett K, Mercer SW, Norbury M, Watt G, Wyke S, Guthrie B. (2012) Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study, Lancet Jul 7; 380(9836):37-43

Figure 4 Number of Chronic Disorders by Age (from Scottish study[11])



Patients with multiple morbidity may be on many different medicines and adjustments and aids such as dosing systems may be required to enable safe and correct use of medicines if vision is impaired.

The most problematic expression of population ageing is the clinical condition of frailty. Frailty develops as a consequence of age-related decline in many physiological systems, which collectively results in vulnerability to sudden health status changes triggered by minor stressor events. Between a quarter and half of people older than 85 years are estimated to be frail, and these people have a substantially increased risk of falls, disability, long-term care, and death.

NHS Vale of York has a higher than average prevalence of patients who are registered with the following long-term conditions: depression, dementia, coronary heart disease, atrial fibrillation (an irregular heart beat), stroke and cancer. It is impossible to tell from these data if the detection of the conditions is better, or if the prevalence is truly higher.

3.4.5 Learning Disability

There is a high prevalence rate of sight loss amongst adults with learning disabilities; they are ten times more likely to be sight impaired or severely sight impaired than the general population. People with severe or profound learning disabilities are most likely to have sight problems. About 60% of people with a learning disability need glasses, and about 30% of people with learning disabilities have a significant impairment of sight. **People with learning disabilities may not know they have a sight problem and may not be able to tell people**. Many people may think the person with a learning disability they know can see perfectly well. There is a high rate of under-detection of sensory impairments, most of which can be treated[12].

The most common cause of visual impairment is refractive error; for many people with learning disabilities a pair of glasses is all that is required to improve their visual function and, by implication, their social function, independence and quality of life. People with learning disabilities may require support to get used to glasses[13]. It is recommended that people with learning disabilities should have a sight test every two years, sometimes more often[14]. Just over half of all people with learning disabilities (52%) had received an eye test in the last twelve months (in 2008)[15].

People with learning disabilities may not easily communicate change in visual function. It may manifest itself in withdrawal or as a change in behaviour, in addition to physical symptoms such as eye rubbing, red eyes, bumping into things, knocking over objects, hesitancy in dimly-lit situations – and it is therefore important that awareness of potential visual problems is raised in healthcare professionals and carers of people with learning disabilities. It is also important that messages are communicated in ways people with learning disabilities, for instance using materials in Easy Read as on the Seeability website *https://www.seeability.org/sharing-knowledge/?book=easy-read-library.*

Recently published research from SeeAbility, the national sight loss and disability charity, has found that nearly four in ten (37 per cent) of pupils attending special schools across the country have no history of eye tests. There are estimated to be 3,104 children in Yorkshire and the Humber missing out on the eye care they need[16].

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[12] NHS Executive, 1998. Signposts for Success in Commissioning and Providing Health Services for People with Learning Disabilities. London, Department of Health.

[13] Emerson E, Robertson J, 2011. The Estimated Prevalence of Visual Impairment among People with Learning Disabilities in the UK.

[14] Public health messages derived from research published by Emerson and Robertson, Centre for Disability Research (CeDR) at Lancaster University. Commissioned by SeeAbility and RNIB and endorsed by Mencap, Vision 2020 UK and the DoH

[15] Emerson E, Hatton C, 2008. People with learning disabilities in England, CeDR Research Report. http://eprints.lancs.ac.uk/9515/

[16] http://www.thenorthernecho.co.uk/news/13768314.Thousands_of_vulnerable_children_missing_out_on_crucial_eyecare__charity_finds/

Optometrists need to spend extra time working with their patients with learning disabilities; in recognition of this an enhanced sight test is described in the "Community Eye Care Pathway for Adults and for Adults and Young People with Learning Disabilities" (see Section 10.3.4). The longer test time gives optometrists more time to familiarise patients and their carer with the procedures and equipment at the time of the sight test and also gives time for repeat visits to complete procedures where needed. This Enhanced Service was developed in Tower Hamlets and Sutton and Merton in London in the late 2000s. The adoption of a similar scheme is recommended in York and North Yorkshire to help improve the health of people with learning disabilities and reduce inequalities.

It is estimated that about 2% of the general population has learning disabilities, and just under half a per cent (0.47%) are in touch with Learning Disability services. The authors of the CeDR report[15] estimate that the number of people known to services is a rough approximation of the number of people with moderate or severe learning disabilities. Applying this to the Vale of York population equates to about 7000 people with learning disabilities, of whom about 1600 are known by services. If 100% of people with moderate or severe learning disabilities were to have access to an Enhanced Eye Test once every two years, this would mean about 800 a year.

4 RISK FACTORS

There are a number of determinants, or risk factors for the development of eye disease and sight loss. These include:

4.1 Smoking

Smoking has been implicated in the development of more than one eye disease.

The link between smoking and Age-Related Macular Degeneration (AMD), the UK's leading cause of sight loss, is as strong as the link between smoking and lung cancer. Smokers not only double their risk of developing AMD, they also tend to develop it earlier than non-smokers do[17]. Furthermore, smoking can make diabetes-related sight problems worse, and has been linked to the development of cataracts[18]. Research has shown that cessation programmes which link sight loss and smoking provide a strong motivation for people to reduce or give up smoking[19].

The smoking prevalence rates in York are lower than the national and regional averages. This is based on Public Health England's *Tobacco Control Profiles* 2012:

- The adult smoking prevalence rate is 18%, lower than the national and regional rates (20% & 23%).
- The rate for persons in routine and manual occupations is 26%, lower than the national and regional rates (30% & 33%).
- The smoking prevalence rate for patients with a long-term condition (LTC) is 15%, lower than the national and regional rates (19% & 18%).
- Across York Local Authority area, the smoking rate for pregnant women at the time of delivery is 13.7%, slightly higher than the national rate (12.7%), but lower than the regional rate (16.5%).
- In local research on a cohort of 165 drug users in York 73% said they had smoked tobacco in the last year.
- Informal feedback from front-line staff as part of a health needs assessment suggests high smoking prevalence rates in the gypsy and traveller community in York.

[17] Thomas Pocklington Trust response to the NHS England's Call to Action – Improving Eye Health and Reducing Sight Loss. 10 September 2014. www.pocklington-trust.org.uk

[18] RNIB, Smoking and Sight Loss. Available at www.rnib.org.uk/eyehealth/lookingafteryoureyes/pages/smoking.aspx

[19] Moradi, P, et al (2007). Teenagers' perceptions of blindness related to smoking: a novel message to a vulnerable group. Br J Ophthalmol; 91:605-607

4.2 Obesity

Obesity has been linked to several eye conditions including cataracts and Age-Related Macular Degeneration. Obesity is strong linked to the development of diabetes and can exacerbate sight deterioration in Diabetic Retinopathy[20]. We are facing a rising tide of obesity locally, as elsewhere in the developed world. The adult obesity prevalence average for England and North Yorkshire County is 23%; within Vale of York it ranges from 20.7% in York to 22.8% in Ryedale and 26.5% Selby. (Source: Active People Survey 2012 via National Obesity Observatory, www.noo.org.uk)

4.3 High Blood Pressure/Hypertension

Hypertension has profound effects on various parts of the eye, particularly the blood supply to the retina. Studies have shown that mild hypertensive retinopathy signs are common and seen in nearly 10% of the general adult non-diabetic population. For people with diabetes, hypertension is one of the major risk factors for development and progression of diabetic retinopathy, and control of blood pressure has been shown in large clinical trials to prevent visual loss from diabetic retinopathy[21].

Several other retinal diseases such as retinal vascular occlusion and age-related macular degeneration may also be related to hypertension; however, there is as yet no evidence that treatment of hypertension prevents vision loss from these conditions[21].

4.4 Substance Misuse

A letter by French ophthalmologists, published in the October 14, 2010 issue of the New England Journal of Medicine, described eye and vision damage related to the use of "poppers"[22]. "Poppers" refers to a group of chemicals known alkyl nitrites, used recreationally to induce quick intoxication and/or enhance sexual pleasure.

[20] RNIB, Obesity and Sight Loss. Available at www.rnib.org.uk/eyehealth/lookingafteryoureyes/pages/obesity.aspx

[21] Bhargava M1, Ikram MK, Wong TY. How does hypertension affect your eyes? 2012. J Hum Hypertens 26(2):71-83. doi: 10.1038/jhh.2011.37. Epub 2011 Apr 21.

[22] Vignal-Clermont et al. Poppers-Associated Retinal Toxicity. N Engl J Med 2010, 363:1583-1585. http://www.nejm.org/doi/full/10.1056/NEJMc1005118?viewType=Print

4.5 Stroke

Damage of a stroke can impact on the visual pathway of the eyes which can result in visual field loss, blurry vision, double vision and moving images. Around 60% of stroke survivors have some sort of visual dysfunction following a stroke[23]. The three risk factors above, plus too much salt in the diet, are the main risk factors for stroke; so tackling them will indirectly improve eye health.

Table 3 Estimated numbers of people living with stroke in local authorities and Vale of York population

	York	North Yorkshire	East Riding	Vale of York best guess
65-74	329	1,281	763	625
75 and over	571	2,014	1,141	1034
Total	900	3,296	1,905	1659

Source: RNIB Sight Loss Data Tool, using HSCIC Registered Blind and Partially Sighted People. Year ending 30 March 2014. Vale of York Best Guess derived from the source data.

4.6 Dementia

As well as the effect of ageing, many diagnosed with Dementia may have eye conditions such as Cataracts or Macular Degeneration; others will have a type of Dementia that impairs their vision by affecting perception of depth, colour and detail. It is estimated that around 2.5% of people over the age of 75 will have Dementia and significant sight loss[24].

[23] Stroke Association. Visual problems after stroke. Available at www.stroke.org.uk/factsheet/visual-problems-after-stroke

[24] Age UK. Spotlight Research, 2008. Available at http://www.ageuk.org.uk/documents/en-gb/for-professionals/research/spotlight%20report%202008_pro.pdf?dtrk=true.

5 PREVENTION

Globally it is estimated that 80% of blindness is avoidable[25], but as many of the problems in other areas of the world don't exist in Britain and many potential solutions have already been implemented; the RNIB estimate that 50% of blindness is avoidable in this country[26]. Obviously rapid intervention with effective treatment of eye disease and eye trauma is key, but there is also preventing eye disease and trauma from arising in the first place.

The evidence base about population level interventions which can be taken to prevent sight loss is mixed. Some is very high quality; namely that for immunisation against rubella and measles to prevent the infection and diabetic eye screening to detect early changes to the back of the eye which can be treated before the retina is irreversibly damaged. On the other hand, interventions aimed at changing people's behaviour, such as getting people who currently don't get their eyes tested to go to the optometrist are less well researched, and interventions of this type which are put in place should always be evaluated to measure the scale of their impact.

5.1 Antenatal and early exposures

Exposure to certain viruses and bacteria while in the uterus can damage eyes of unborn babies. If a pregnant woman catches rubella (German measles) in the first 20 weeks, it can lead to Congenital Rubella Syndrome (CRS) in the baby, which can give rise to cataracts (in addition to deafness, heart defects and brain damage). Since the introduction of the mumps, measles and rubella (MMR) vaccine, CRS is now very rare in the UK, with only eight cases reported between 2002 and 2011. (see more on MMR immunisation in section 5.2, infections).

Syphilis infection during pregnancy can also damage the eyes of the baby, resulting in sight loss, but thankfully there have been no cases of congenital syphilis for many years.

Prematurity and survival of infants with severe and complex conditions can lead to visual impairment, secondary to the associate brain damage rather than damage to eye itself. Decades ago premature infants were treated with high concentrations of oxygen and an unintended consequence of this was retinopathy of the newborn. Again there have been no cases of this for many, many years, as once the cause was identified the practice stopped.

5.2 Infections

As discussed in the previous section, infection with rubella can causes sight loss,

[25] http://www.iapb.org/knowledge/what-is-avoidable-blindness

[26] Access Economics (2009), Future Sight Loss UK 1: Economic Impact of Partial Sight and Blindness in the UK adult population. RNIB

which was one of the reasons for the introduction of the mumps, measles and rubella (MMR) immunisation programme. Unfortunately due to misinformation there was a dip in coverage of immunisation in the 1990s and 2000s, but there have been catch up campaigns for the young people who missed the immunisation when they were babies, and the take up rate is now nearly as good as for the other childhood vaccines. There has only been one confirmed case of rubella in York and North Yorkshire in the last 3 years, but there is no room for complacency. Rubella is highly infectious, and if a pregnant woman catches it, there is a very high risk of Congenital Rubella Syndrome.

Although there have been no cases of congenital syphilis for many years, syphilis in adults can lead to eye problems. When there was an increase in syphilis reported by Yorkshire-based Sexual Health clinics two years ago, a surprising number had been diagnosed in ophthalmology because the people had presented with eye symptoms. Syphilis can provoke glaucoma. Chlamydia and gonorrhea can also cause conjunctivitis, but this is not associated with long-term damage to the eye.

Many bacteria and viruses can cause conjunctivitis, but these infections are not measured (unlike the infections detailed above), and do not tend to lead to eye damage when treated. Chronic infection with the common Herpes simplex (cold sore virus) can rarely cause retinal damage, especially in young people, and with older people it tends to be the shingles virus (Herpes zoster) which can rarely lead to retinal problems. General infection control measures, such as regular hand washing, not touching the eye when infected, and not sharing towels can help prevent spread of infection.

5.3 Tobacco control

Reducing exposure to environmental tobacco smoke is one of the most effective measures that can be undertaken by an individual to reduce their risk of eye disease. So not only stop smoking for smokers, but keeping out of smoky atmospheres will help prevent Age-related Macular Degeneration and cataracts[17,18]. People with diabetes suffer worse damage to their cardiovascular system when they smoke as well, and the vascular (network of blood vessels) part of the eye is no exception.

The tobacco control measures being undertaken in York and North Yorkshire contribute to preventing eye disease.

5.4 Protection from injury

Eye injuries are relatively common, but accurate data on eye injury is hard to come by. We do know that causes of ocular trauma have changed continuously over the decades. The introduction of effective preventative strategies and changes in work practices and lifestyle have led to fewer injuries; there has also been an evolution in the type of injury which means that those sustained are less severe in type and nature than previously. Historically 70% of all serious injuries occurred in the

workplace, generally associated with heavy industry. Appropriate standards for eye protection were introduced and decline of heavy industry further reduced this cause and type of injury. The road traffic accident took over as the most common cause of serious injury in the 1960s, with car occupants suffering penetrating injuries due to windscreen glass. The introduction of laminated windscreens and the seat belt law virtually eliminated this problem. Sport and leisure activities became the main source of serious eye injuries in the 1980s with sports associated eye injuries becoming responsible for most cases of hospitalised eye trauma. These injuries were mostly blunt in nature, which meant a better prognosis than the previously more common intra-ocular foreign bodies and penetrating trauma. Recognition of this led to the introduction of preventative strategies and protective devices that meet a British standard (at least for some sports). The home was the most common location for an eye injury of sufficient severity to warrant hospital admission.in 1996[27]. The home has long been recognised as an important area for other types of injury to occur, and the increasingly large elderly population (who spend more time at home) has made this even more likely[28].

In the US, an annual Eye Injury Snapshot is conducted by the American Academy of Ophthalmology and the American Society of Ocular Trauma. The most recent survey reported that more than 40% of eye injuries were caused by activities such as home repairs, gardening, cleaning and cooking. More than 40% of eye injuries every year are related to sports or recreational activities. Among all eye injuries reported in the Eye Injury Snapshot, more than 78 percent of people were not wearing eyewear at the time of injury. Of those reported to be wearing eyewear of some sort at the time of injury (including glasses or contact lenses), only 5% were wearing safety or sports glasses[29]. It is likely that these results are transferrable to the UK, although the popularity of sports differs. Racquet sports and boxing seem to present the greatest risks of serious eye injury. Polycarbonate glasses offer good protection and their use should be promoted, particularly in people who already have some degree of sight loss in one eye[30].

Another priority for prevention is firework safety. An international review found that one in six ocular firework traumas show severe vision loss, mostly in young males. Bystanders are frequently injured. Firework traumas are a preventable cause of severe ocular injury and blindness because countries using restrictive firework legislation, such as the UK, have remarkably lower trauma incidence rates[31].

[27] Desai P *et al*. 1996. Incidence of cases of ocular trauma admitted to hospital and incidence of blinding outcome. Br J Ophthalmol 80: 592-596

[28] MacEwen CJ. Ocular injuries. J.R.Coll.Surg.Edinb., 44, October 1999, 317-23

[29] http://www.geteyesmart.org/eyesmart/living/eye-injuries/preventing.cfm

[30] http://www.geteyesmart.org/eyesmart/living/eye-injuries/sports.cfm

[31] Wisse RPL, Bijisma WR, Stilma JS. Ocular firework trauma: a systematic review on incidence, severity, outcome and prevention. Br J Ophthalmol 2010;94:1586-1591 doi:10.1136/bjo.2009.168419

5.5 Protection from radiation exposure

5.5.1 Ultraviolet radiation

The sun is essential for life as we know it, and is the greatest source of light relevant to our life on this planet. However, it is also the greatest source of ultraviolet radiation relevant to us as well. Although commonly referred to as ultraviolet (UV) light, in fact ultraviolet radiation is invisible, just as are the other forms of electromagnetic radiation not in the visible spectrum such as X-rays and microwaves. Surprisingly, cloud cover doesn't affect UV levels significantly. The risk of UV exposure can be quite high even on hazy or overcast days. This is because UV is invisible radiation, not visible light, and can penetrate clouds.

There are 3 types of UV rays:

- UVC rays. These are the highest-energy UV rays and potentially could be the most harmful to your eyes and skin. Fortunately, the atmosphere's ozone layer blocks virtually all UVC rays.

- UVB rays. These have lower energy than UVC rays, and are filtered partially by the ozone layer, but some still reach the earth's surface. In low doses, UVB radiation stimulates the production of melanin (a skin pigment), causing the skin to darken, creating a suntan. But in higher doses, UVB rays cause sunburn that increases the risk of skin cancer. UVB rays also cause skin discolorations, wrinkles and other signs of premature aging of the skin. UVB rays are thought to help cause growths on the eye's surface that can become unsightly and cause corneal problems as well as distorted vision. In high short-term doses, UVB rays also can cause photokeratitis, a painful inflammation of the cornea. "Snow blindness" is the common term for severe photokeratitis, which causes temporary vision loss usually lasting 24-48 hours. Because the cornea appears to absorb 100 percent of UVB rays, this type of UV radiation is unlikely to cause cataracts and macular degeneration, which instead are linked to UVA exposure[32].

- UVA rays. These are closer to visible light rays and have lower energy than UVB and UVC rays. UVA rays can pass through the cornea and reach the lens and retina inside the eye. Overexposure to UVA radiation has been linked to the development of certain types of cataracts, and research suggests UVA rays may play a role in development of macular degeneration[32].

[32] http://www.allaboutvision.com/sunglasses/spf.htm

5.5.2 “Blue light” or HEV Radiation Risks

As the name suggests, high-energy visible (HEV) radiation, or blue light, is visible. Although HEV rays have longer wavelengths (400-500 nm) and lower energy than UV rays, they penetrate deeply into the eye and can cause retinal damage.

5.5.3 Sensitivities - Children need extra protection

Children are more susceptible to retinal damage from UV rays because the lens of a child is clearer than an adult lens, enabling more UV to penetrate deep into the eye.

The risk of damage to our eyes and skin from solar UV radiation is cumulative, meaning the danger continues to grow as we spend time in the sun throughout our lifetime. This gives even greater weight to ensuring that children’s eyes are protected from the sun. Children generally spend more time outdoors than adults, and because of this some have estimated that up to half of a person's lifetime exposure to UV radiation can occur by age 18.

Certain medications, such as tetracycline (antibiotic), sulfa drugs, oral contraceptives (birth control pills), diuretics (water tablets) and tranquilizers, can increase the body's sensitivity to UV and HEV radiation.

5.5.4 Sun protection (sunglasses, etc.)

To better protect the eyes exposure should be reduced as much as possible by physical means, such as choosing in the shade where possible, or wearing a wide-brimmed hat. When in the sun protecting the eyes with sunglasses with large lenses or a close-fitting wraparound style will protect more of the eye and the skin around it. The amount of UV protection sunglasses provide is unrelated to the color and darkness of the lenses. For example, a light amber-coloured lens can provide the same UV protection as a dark gray lens, but for HEV protection, colour *does* matter. The lenses that block a significant amount of blue light will be bronze, copper or reddish-brown.

Certain contact lenses offer a degree of protection, but not to the parts of the eye which are not covered by the lens, so sunglasses should be worn as well.

Sunglasses have the CE mark or BS EN 1836:2005 mark as this means they offer a safe level of protection.

5.5.5 Artificial UV sources

UV radiation is produced or used by certain processes in the workplace, food manufacture, research facilities, and healthcare premises; it is useful for sterilising equipment e.g. germicidal blue light. Health and safety precautions are essential.

The welding process gives off high-intensity light and goggles should always be worn. Sun beds produce UV rays, and some can produce higher exposures than the midday tropical sun. Goggle use is essential; shutting the eyes is not sufficient.

5.6 Preventing inequalities in eye health

A review of the evidence relating to the causes of *inequalities* in eye health and interventions that sought to reduce inequalities in glaucoma, diabetic retinopathy, Age-related Macular Degeneration (AMD) and cataract health outcomes reported in 2011[33]. The review, which looked at all work that might be applicable to the UK practice setting, identified that the majority of studies into inequality in eye health have concentrated on the needs of those found to have sight loss, rather than on the potential to prevent sight loss through earlier detection. Whilst reports consistently argue for targeted interventions and specific approaches, the research often has differing levels of evaluation and very little research has reported longer-term clinical outcomes.

5.7 Health Promotion messages for Healthy Eyes

The Local Eye Health Network has devised an example of the Health Promotion messages that could be used by a range of healthcare professionals:

10 Top Tips for Healthy Eyes and Good Vision in Adults

1. Be aware of your vision and any changes that appear. Look after your eyes because you only have one set!

2. Get regular eye tests. Don't wait for a vision problem before you go. Be aware of any family history of eye disease, talk to your relatives. Ensure you tell your optician about your family history so he can carry out any extra tests required. An eye test will check not only if you need spectacles but the health of the eyes. Eye tests are free on the NHS to people over 60, or those with family history of glaucoma and people on certain benefits. Your optician can advise you. If you are housebound some opticians will visit you in your home.

3. Keep your glasses clean and in a good state of repair to ensure they fit properly and you achieve maximum vision from your eyes. Poorly fitting or broken glasses can cause trips and falls.

4. Stop smoking. Smoking is directly linked to blindness. Current smokers are 4 times more likely to develop macular degeneration. The risk is as high as that of lung cancer. If you stop smoking, the risk reduces.

[33] Johnson et al, 2011. A review of evidence to evaluate effectiveness of intervention strategies to address inequalities in eye health care. UK: RNIB (RNIB/CEP/01, 2011)

5. Always ensure you have good lighting for reading. There should be good overall room illumination plus more direct light on the reading material. Hold reading material at a comfy distance and if this becomes difficult, consult an optician for an eye test. Good lighting is also vital to ensure good vision in order to prevent falls.

6. Try to obtain good quality print to read. Large print books can be obtained from the library and offer greater clarity of print as well as size. Some electronic devices allow an increase in font size to make reading easier. Sometimes it may be necessary to use a magnifying glass to give an increase in print size to read it more easily.

7. Remember to take breaks if you work on a computer screen for long periods during the day. This also applies to games consoles. This will help to reduce eyestrain and keep vision comfy.

8. Protect your eyes from the sun. Long-term exposure to UV increases the risk of cataract and macular degeneration. Choose good quality sunglasses ensuring they have the CE mark or BS EN 1836:2005 mark as this means they offer a safe level of protection.

9. Protect your eyes from hazards. These maybe at work, through DIY or during sports. Even garden twigs can damage an eye. Try to wear the appropriate eye protection.

10. Eating well with a good diet rich in fruit and vegetables will help to keep the eyes healthy. Drinking plenty of water to keep hydrated will help to prevent sore dry eye.

Source: Local Eye Health Network (North Yorkshire and the Humber)

Eye Health promotion activities should make use of national campaigns such as Eye Health Week which this year was week beginning 21st September. The web site has lots of information for both the public and anyone who wants to support it, www.visionmatters.org.uk.

Eye health can also be promoted by linking into other campaigns for example in East Yorkshire the Falls Team produced a leaflet “10 steps to stay steady” and one of the steps was to get a regular eye test and in Hull the Falls level 1 assessment includes a basic assessment of visual needs with signposting as required. The Stoptober (smoking) campaign which follows Eye Health Week could be linked into the eye health messages. In East Riding and Hull area there has been training for healthcare trainers to understand healthy eye messages and especially the link to smoking.

6 VISUAL IMPAIRMENT

6.1 Definitions of visual impairment

Blindness or severe sight impairment is defined in the National Assistance Act 1948 as “where a person is so blind as to be unable to perform any work for which sight is essential”. In practical terms the Department of Health guidance defines blindness as having vision of less than 3/60 as measured by a traditional Snellen eye test chart. This means that a person who is blind can see less at 3 metres than a normally sighted person could see at 60 metres.

Figure 5 Visual impairment patterns expected in different eye conditions compared to normal vision

Partial sight is defined as where a person is “substantially and permanently handicapped by defective vision caused by congenital defect or illness or injury”. A person with “partial sight” or “sight impairment” can see better than 3/60 but less than 6/60 i.e. can see less at 6 metres than a normally sighted person could see at 60 metres.

Both of the above Snellen vision standards assume that the person has normal peripheral vision. A person may still be classed as partially sighted even if the vision is better than the limits above if their peripheral field is also restricted perhaps due to conditions such as glaucoma or because of a stroke.

6.2 Registration/ Certification

A person is registered as sight impaired or severely sight impaired by an ophthalmologist using the Certificate of Visual Impairment (CVI) that replaced the older BD8 form in 2003. Not all patients who qualify for certification as visually impaired will wish to be registered, especially if they feel that this will reduce their chances of finding work or if they can already access support services without it. Others may simply not wish to be labelled as visually impaired. Certification may

also be overlooked when engaged in resolving the medical issues relating to treatment of eye disease. Because of these factors (and others) the number of certifications is decreasing[2]. At the national level, the 2014 publication[34] of Registered Blind and Partially Sighted statistics showed there had been a decrease in the number of people on the register of blind people since the previous publication in 2011. The number of people registered as blind fell from 156,700 in 2003 to 147,800 in 2011 to 143,400 in 2014; a reduction of eight per cent over the decade. The age band showing the largest decrease in the numbers of people on the register is ages 75 and over; the number of people registered as blind fell from 105,700 in 2003 to 87,900 in 2014; a decrease of 17 per cent.

Understanding CVI Registration

The Certificate of Visual Impairment (CVI) is the document signed by the Ophthalmologist to identify someone as being 'Sight Impaired' or 'Severely Sight Impaired':

'Sight Impaired' – is the formal term used to identify someone who has been assessed by an ophthalmologist as being "substantially and permanently handicapped by defective vision caused by congenital (present at birth) defect, illness or injury".

'Severely Sight Impaired' – is the term used to identify someone who has been assessed by an Ophthalmologist as being "so blind as to be unable to perform any work for which eyesight is essential".

Together, the CVI and the CVI register are both vital steps in ensuring that people with diagnosed sight loss have an opportunity to access support to assist with rehabilitation, benefits and independence. The CVI is issued by the clinician (ophthalmologist) and triggers the statutory response by the local authority. The CVI process involves both health and Social Services, who together need to ensure timely processing of the CVI. The number of patients certified as having visual impairment is the measure by which the success of initiatives to reduce blindness can be measured, as it is the best currently available indicator of vision loss.

[34] Registered Blind and Partially Sighted People Year Ending 31 March 2014 England (NS) http://www.hscic.gov.uk/article/2021/Website-Search?productid=15353&q=Registered+Blind+2014&sort=Relevance&size=10&page=1&area=both#top

6.3 Incidence and prevalence of sight impairment

There two aspects of measurement of blindness/ sight-impaired which are useful for health, social and voluntary services:

- the *new* cases certified or identified in a year (incidence) – see Chapter 8.
- the *total* pool of people who are on the register (prevalence)

Current prevalence of blindness and partial-sight as measured by the CVI Register is given in Table 4 below.

Table 4 Numbers of People Registered as Blind and Partially-sighted in York, 2015 (live data extract)

Age	Blind	Partially-sighted	TOTAL
18 -29	22	17	39
30 - 49	65	61	126
50 - 64	75	59	134
65 -74	57	51	108
75 and over	287	361	648
TOTAL	506	549	1055

Source: City of York Council CVI Register, Accessed 1 July 2015

For comparison below is the national data on number of people registered blind and partially sighted to end March 2014. There is a good match.

Table 5 Numbers of People Registered as Blind and Partially-sighted in York, 31 March 2014 (published national statistics)

Age	Blind	Partially-sighted	TOTAL
0 - 17	5	5	10
18 - 49	85	75	160
50 - 64	70	55	125
65 -74	60	50	110
75 and over	305	365	670
TOTAL	525	550	1075

Source: HSCIC Registered Blind and Partially Sighted People. Year ending 30 March 2014

6.4 Factors related to the development of visual impairment

Age is by far the greatest "risk factor" for visual loss. Table 6 and Figure 6 overleaf show how stark the effect is – there are more registrations in the over 75 age group than in all the younger ages combined. By the time we get into the 90s, men have an estimated prevalence of partial sight of 42%, and women 56%[35].

[35] Evans JR, Fletcher AE, Wormald RPL, Siu-Woon Ng E, Sterling S, Smeeth L, Breeze E, Bulpitt CJ, Nunes M, Jones D, Tulloch A. 'Prevalence of partial sight and blindness in people aged 75 years and older in Britain: results from the MRC trial of assessment and management of older people in the community', British Journal of Ophthalmology, 2002, Vol. 86, pp. 795-800

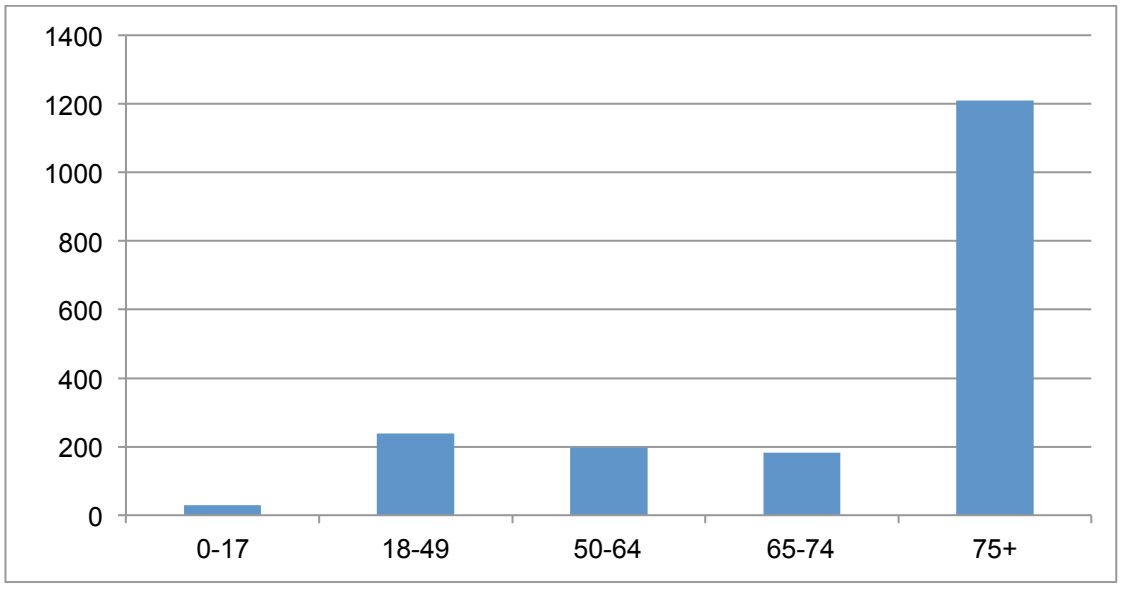
Table 6 Total number of people registered blind or partially sighted by age for local authority and Vale of York best guess

Age group	York	North Yorkshire	East Riding	Vale of York best guess
0-17	10	85	40	29
18-49*	160	350	175	239
50-64	125	315	180	197
65-74**	110	310	205	183
75+	670	2,285	1,515	1210
Overall total	1,075	3,350	2,115	1858

Source: RNIB Sight Loss Data Tool, using HSCIC Registered Blind and Partially Sighted People. Year ending 30 March 2014. Vale of York Best Guess derived from the source data.

Displaying the results of the Best Guess for the Vale of York graphically helps bring home the point – that far and away the largest population group experiencing visual impairment is the very old, as shown in Figure 6.

Figure 6 Age distribution of people registered blind or partially sighted in the Vale of York population



Source: Vale of York Best Guess derived from the source data as in the Table above

The size of the effect of socioeconomic deprivation on visual impairment is also very large. Those in the poorest 20% have been found to have a more than 50% higher risk of onset of moderate visual impairment than those in the wealthiest areas, and an almost 80% higher risk for onset of severe visual impairment[10].

6.5 Impact of visual impairment

The impact of visual impairment is such that it affects most other facets of life resulting in higher costs for health and social care.

Visually impaired people of working age are less likely to be in employment[6]. People with even moderate levels of visual impairment often struggle to do simple everyday tasks such as dressing, or accurate administration of medication and require additional support. Indeed it has been noted in a US study that patients with visual impairment are three times more likely to have difficulty managing their medications than those patients who have normal vision[36]. Older visually impaired people are more likely to become isolated and have depression[5]. The link between visual impairment and reduced psychological wellbeing is now well-established, particularly for older people. Older people with sight loss are also almost three times more likely to experience depression than people with good vision[37]. A contributing factor is the stress caused by living with visual loss which can place strains on relationships, as people become less independent and have to rely on family and friends to meet their support needs.

Sight is key to learning, communication and movement. If someone already has problems in these areas, either permanent or temporary, visual impairment can make all of these more difficult.

Even with only moderate visual impairment, postural stability is reduced as it is estimated that visual information contributes about 50% of the information required for this function[38]. Consequently, older visually impaired people are more likely to fall and have injuries such as hip fractures[3]. A review of 31 studies on the risks and type of injuries associated with sight loss suggest that those with sight loss are 1.7 times more likely to have a fall and 1.9 times more likely to have multiple falls. The estimated medical costs of falls nationally cost on average £269 million[39]. Of the total cost of treating all accidental falls in the UK, 21% was spent on the population with visual impairment.

[36] US Department of Health and Human Services (1998) "National Health Interview Survey, 1994: Second Supplement of Aging" National Centre for Health Statistics, Hyattsville MD.

[37] Burmedi D, Becker S, Heyl V, Wahl HW, and Himmelsback I, 2002. Emotional and social consequences of age-related low vision: a narrative review. Partial sight and blindness research. Vol. 4, No1, pp 47-71

[38] Pyykko I, Jantti P, Aalto H (1990) "Postural Control in Elderly Subjects" Age Ageing 19, 215-241

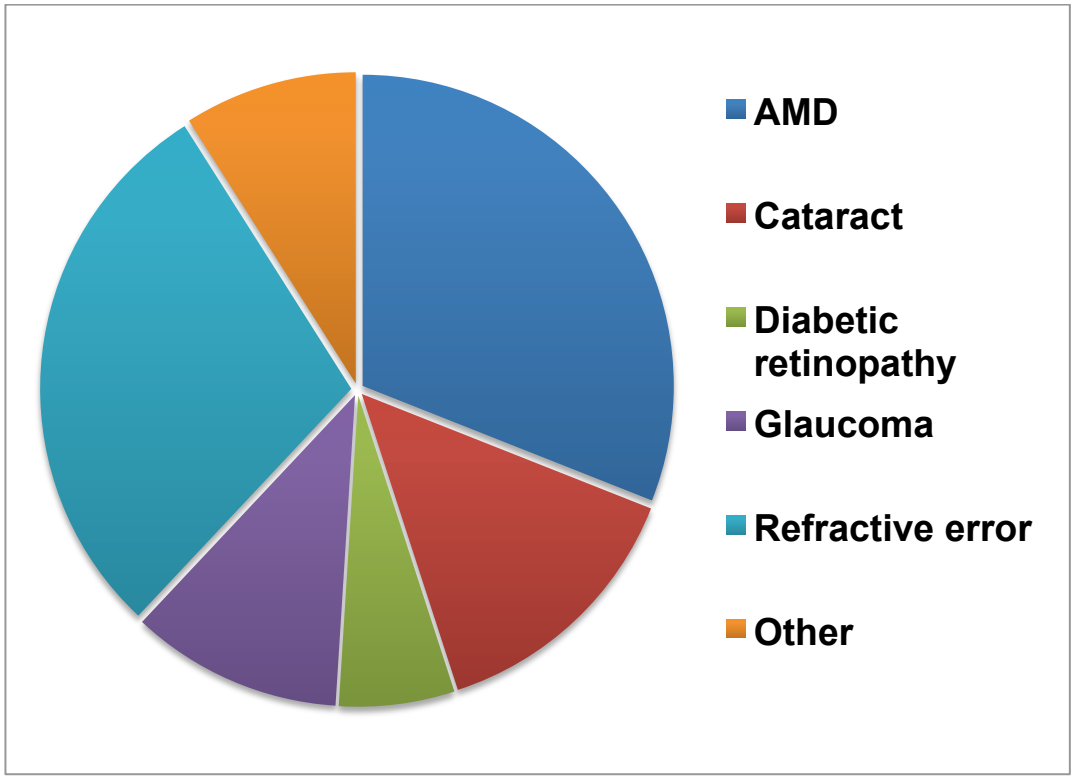
[39] Legood et al., 2002.. Are we blind to injuries in the visually impaired? A review of the literature, Injury Prevention

6.6 Burden Of Disease

People experiencing sight loss will, on average, experience an associated loss in the quality and length of life. Consequently, the total stock of "health capital" will be reduced, which is related to the number of people and the severity of their sight loss. Health economists have derived a measure, the Disability-adjusted Life Year (DALY) based on how very large samples of people, internationally, value their health. This allows comparisons to be made. Figure 7 below shows how the disability-related "Burden of Disease" is distributed in the UK population by conditions causing sight loss.

The conditions are described in depth in Chapter 9, Eye Disease. Refractive Error, inability of the eye to focus, which can be corrected by glasses, gives the largest burden, because it so widespread in the population, even though its effects may be less disabling than, for instance, Age-related Macular Degeneration (AMD) which causes blindness in the elderly, which affects far fewer people but can have a devastating effect.

Figure 7 Burden of disease by cause for the UK population, 2008



Source: Access Economics, Reference 26.

6.7 Costs of visual impairment

The costs of visual impairment are high. For the 1.8 million people who are visually impaired of 2008 it was estimated that the cost to the UK was £22 billion[26]. The direct costs contained in this calculation were predominantly due to hospital care (£1.1

billion) and spending on residential and community care services (£304 million) whilst informal care costs accounted for an additional £2.1 billion. A further £25 million was attributed to the costs of injurious falls, and the cost of devices and adaptations required to facilitate daily living was calculated to be £336.5 million. The burden of disability in terms of reduced quality of life (measured in disability adjusted life years) was estimated at £15.5 billion.

The estimates of costs of visual impairment on the Vale of York population are given below:

Table 7 Total NHS expenditure on visual impairment by local authority and Vale of York best guess (£ millions)

	York	North Yorkshire	East Riding	Vale of York Best Guess
Total NHS spent on problems of vision (millions)	£10.2	£31.0	£16.8	£17.2

	York	North Yorkshire	East Riding	Vale of York Best Guess
Healthcare expenditure per person	£51.57	£51.57	£52.84	£51.66

Source: RNIB Sight Loss Data Tool, using HSCIC Registered Blind and Partially Sighted People. Year ending 30 March 2014. Vale of York Best Guess derived from the source data.

The indirect costs of visual impairment for the Vale of York population are estimated to be about £90 per head (from the source above).

7 THE EYE CARE WORKFORCE AND SERVICES

7.1 Staff

The specialist healthcare staff who deal with eye conditions include:

- **Ophthalmologists** medically qualified doctor with post-graduate speciality training in medical and surgical ophthalmology, who examines, diagnoses and treats diseases of the eye and prescribes medicines and performs surgery.
- **Optometrists** qualified to perform sight tests, examine the eye for abnormalities and disease, diagnose, manage and treat minor eye conditions and refer to secondary care. They give advice on visual problems, prescribe and dispense spectacles, contact lenses and other visual aids.
- **Ophthalmic Medical Practitioners** (OMPs) are medically qualified doctors specialising in eye care. Like optometrists, they examine eyes, test sight, diagnose abnormalities and prescribe suitable corrective lenses.
- **Ophthalmic practitioner** is an umbrella term including optometrists and Ophthalmic Medical Practitioners.
- **Orthoptists** qualified to diagnose, treat and manage defects of vision, binocular vision and eye movements in adults and children.
- **Ophthalmic Nurse** has a general nursing qualification plus specialist training in eye care, assists in surgery and manages under supervision other eye conditions.
- **Ophthalmic "performer"** is the term for the optometrists and OMPs who are listed to perform NHS funded sight tests.
- **Dispensing Optician** qualified to advise on, dispense and supply spectacles and low vision aids and offer advice on aspects of eye care and vision. With an additional qualification can fit contact lenses.
- **Rehabilitation Workers for Vision Impairment** (ROVI) qualified to provide specialist assessments, rehabilitation interventions, training and advice to people with sight loss.
- **Eye Clinic Liaison Officer (ECLO)** a professional based in the Hospital Eye Service to provide support and advice to people experiencing deterioration in vision

7.2 Settings where eye care services are delivered

7.2.1 Primary care

- General practice (GP) surgeries. Many eye problems will initially present to the local practice and the patient will be seen by a GP, Nurse Practitioner or Practice Nurse. Assessment, diagnosis and treatment can be provided, and referral to secondary care or optometrist if required.
- Community pharmacies (local chemists). People with a range of symptoms, usually itchy, dry or sore eyes, will present to a pharmacy. The pharmacist can advise treatment or refer to an optometrist or their GP. In some areas there is a minor ailment service, which can include treatment of a few minor eye conditions.
- Optometrists/Opticians premises – this would be the usual place where people go to have their sight tested and a general eye health check, i.e. NHS

Optometry services (detailed in Section 10). Patients can also get glasses, contact lens and other aids, if required. Some optometrists also offer a range of community eye services, e.g. minor eye conditions and / or some specialist (enhanced) services (see Section 10 later).

- People's own homes/care homes – if people cannot go out unaccompanied an optometrist can make a domiciliary visit to conduct a sight test.

7.2.2 Secondary care (also known as acute care) – this includes:

- Hospitals with Eye Departments (Ophthalmology Departments)
- A&E – Accident and Emergency Departments at any hospital
- Highly specialist services (also known as tertiary centres)
- Outreach from hospitals, e.g. Ophthalmologists or Ophthalmic Medical Practitioners providing care in community settings

7.2.3 Community services **–** this includes

- District nurses who visit people's homes to administer eye drops

7.2.4 Social services

- Local authorities provide social assistance to residents according to their need for care; visual impairment is considered in the assessment
- Local authorities also provide for specialist services for severe sight impairment

7.3 Organisations involved in Eye care

7.3.1 Local Optical Committee (LOC)

This is the official organisation representing all optometrists, dispensing opticians and optical contractors within an area. It is funded by a levy on all NHS eye tests and is run by an executive committee. It is the voice between the local optometry community and the local CCGs, NHS England, secondary care, public health and third sector. In addition it supports local optometry with education and training events. The North Yorkshire LOC covers the whole of North Yorkshire and City of York.

7.3.2 Primary Eyecare North Yorks and Humber Ltd- the LOC Company

Primary Eyecare (North Yorkshire and Humber) Ltd is a provider company - formed by the Local Optical Committees (LOCs) within the North Yorkshire and Humber area to allow commissioners to contract with a single provider for the provision of Community eye services provide by multiple optometry practices. This includes: North Yorkshire LOC, East Riding LOC and North and North East Lincolnshire LOC.

7.3.3 Local Eye Health Network (LEHN) North Yorks and Humber

Local Eye Health Networks were established in 2014.

The LEHN locally covers the North Yorkshire and Humber area. It provides the opportunity for eye health professionals to come together with public health, patients and the voluntary sector to show leadership, identify priorities, and redesign services and pathways to meet patient and population needs. It aims to ensure high quality fully accessible services with improved outcomes for patients. It is driven by a steering group with representatives from all stakeholders and exerts its influences by engaging with a wide range of stakeholders and encouraging collaborative working and disseminating learning across the local area and nationally.

7.4 NHS Optometry Services

These are the NHS eye services the public are most familiar with, delivered in opticians' premises; they are contracted from NHS England under what is known as General Ophthalmic Services. In order to provide NHS-funded sight tests, the optometric practices must hold a General Ophthalmic Services (GOS) contract. Most of these are Mandatory Service Contracts which allow providers with fixed premises to offer NHS tests. Domiciliary sight tests (i.e. in patient's own home), which can also include community settings including residential, and nursing homes, and also day centre are covered by an Additional Services contract. Table 7 below shows the number of individual places one can go to have their sight tested. There are more premises than contractors because some optometrists have more than one premises, especially the big chains who may have several in the area. Details and location of all optometric practices in the Vale of York area are given in Appendix II.

There are 32 places in the Vale of York area where people can go to have their eyes tested. In addition there are 16 domiciliary contractors who will provide sight tests the Vale of York area.

Table 8 Numbers of General Ophthalmic Services (GOS) contractors and premises (July 2015)

Contractors in North Yorkshire & York	Premises in North Yorkshire & York	Premises in Vale of York area	Number of domiciliary contractors N. Yorkshire & York	Number of domiciliary contractors in Vale of York area
89	116	32	18	16

Source: National Performers List held by NHS England

There are 174 “ophthalmic performers” on the North Yorkshire and York Ophthalmic Performers List (July 2015). However this number only reflects those optometrists who are on the *local* list. There will be optometrists coming from nearby areas such as Leeds to work in the North Yorkshire area and these are not captured as they will be on the Leeds list.

There are 45 Dispensing Opticians in the North Yorkshire County and York area – (4 have additional contact lens qualifications) of which 19 (0 have contact lens qualifications) are employed in practices within the Vale of York area.
The data source for these numbers is the Association of British Dispensing Opticians (ABDO) membership, however this is likely to be an underestimate as not all dispensing opticians are members of the ABDO.

7.4.1 Trends in optometry workforce

The number of optometrists is growing nationally and locally. The trends are shown in Table 8. The population coverage rate of ophthalmic practitioners at both England and North Yorkshire level is the same at about 21 per 100,000.

Table 9 Trend in number of Ophthalmic practitioners (includes optometrists and Ophthalmic Medical Practitioners) from 2010 to 2014

	2010	2011	2012	2013	2014	% change
England	10409	10806	11133	11457	11827	+13.6
North Yorkshire and York	155	155	167	174	174	+12

Source: HSCIC.gov.uk to 31st Dec each year.

8 SCREENING AND TESTING FOR VISUAL IMPAIRMENT

8.1 Screening children

Screening children is an important element in the prevention of avoidable sight loss. Vision screening in children aged 5 years is primarily to detect individuals with amblyopia - literally '*blunted sight'*- a form of visual impairment stemming from the brain. The reduced vision affects one eye (or very rarely both eyes) caused by a disturbance to the normal developmental processes in visual neural pathways during the most vulnerable period of early childhood. The most common conditions predisposing to amblyopia are strabismus (squint) and refractive error and it is commonly defined as impaired vision that is not attributable to a structural abnormality of the eye.

Early detection of amblyopia is necessary to avoid permanent visual deficit by allowing treatment to be undertaken within the sensitive period of growth and change in the visual system[40]. Amblyopia is a common childhood disorder (a rough estimate of 2% is useful for planning purposes - the range in studies has been from 1 to 4%) and has been found to be a common disorder in adult populations, particularly those which have not undergone childhood vision screening[40].

8.1.1 National recommendations

The screening programmes recommended by the British and Irish Orthoptics Society BIOS) at different ages are shown in Table 9.

Table 10 Recommended eye screening in target groups by the British and Irish Orthoptics Society

Target population	Recommendation
Very low birth weight and premature babies	Specialist ophthalmic examination to detect retinopathy of prematurity[41]
All newborns and 6-8 week old infants	NHS Newborn & Infant Physical Examination (NIPE) New-born and 6-8 week physical examination of the eye, including red reflex to detect media opacities (particular congenital cataract) and eye anomalies.[42]
All children between 4 and 5 years of age	Screening for reduced visual acuity (primarily amblyopia but may also detect uncorrected refractive

[40] Soledo AL & Rahi JS, Vision screening in children aged 4 – 5 years. External review against programme appraisal criteria for the UK National Screening Committee (UKNSC). 2013.

[41] UK retinopathy of prematurity guidelines 2008, http://www.rcpch.ac.uk/improving-child-health/clinical-guidelines-and-standards/published-rcpch/clinical-guidelines-and-sta#rop

[42] *https://www.gov.uk/guidance/newborn-and-infant-physical-examination-screening-programme-overview*

	error and strabismus affecting visual acuity) Orthoptic-Led Service - Delivered by orthoptists or by professionals trained, supported and audited by orthoptists. http://www.screening.nhs.uk/vision-child

Source: BIOS Guidelines on Visual Screening in Children, Published August 2014

The NIPE and the 6-8 week child health examination are usually done by the GP. These are both commissioned by NHS England, and NHS England should ensure maximum coverage of both of these important screening opportunities since this allows early detection and intervention.

The UK National Screening Committee (NSC) supports Vision Screening of children aged between 4 and 5 (2013,to be reviewed 16/17). In May 2005 the NSC Sub-Group published their report with the following recommendations:

- Children should be screened for visual impairment between four and five years of age
- Screening should by undertaken by Orthoptists or by professionals trained and supported by Orthoptists
- The gold standard vision test is a linear LogMAR test
- If the child does not achieve 0.2 (6/9.5) in either eye despite good cooperation, referral is indicated.

8.1.2 The York School Vision Testing programme

In York school vision testing is undertaken in Reception, in the term of the child's 5th birthday. Specially trained School Health Technicians (SHTs) test the child's vision at 3 meters, one eye at a time, using the Crowded LogMAR Test. A protocol is in place to determine when a referral is necessary. All children failing the initial screening are sent for full assessment to the Orthoptics Department at York Teaching Hospital. The results for the most recent completed year for York school in York are given in Table 11.

Table 11 Child vision screening in York primary schools, 14/15 school year

Number screened	1576
Not screened as they had glasses	42
Refused	1
Unable to cooperate due to behavioural issues (e.g. autism)	6
TOTAL	1625

Source: School Health Service, York Teaching Hospital NHS Foundation Trust

So the total coverage of the programme last year would seem to be 97%, and adding those wearing glasses 99.5%. However, there is movement in and out of the schools so the recorded number of individual children attending reception classes varies; in 2014/15 it was 2007 in January 2015 and 2001 children in May 2015

(Source City of York Council, Business Intelligence Hub on 29/06/15). This does not include children home-schooled, of which there are 3 registered, nor pupils of private schools, some of whom will not be York residents (rough estimate 100 York reception age children). So if we make a conservative estimate that there would be about 2100 unique individuals in the cohort, the coverage is only 75%. As reported in Section 3.4.5 we know that children in special schools miss out in some areas; in York one of the orthoptists visits Hob Moor Oaks to undertake the screening of children with special educational needs, as opposed to a School Health Technician as a wider range of tests and skills is needed.

City of York Council is responsible for commissioning the 5-19 Healthy Child Programme which, from 1 April 2016, will be delivered as part of a new integrated 0-19 Healthy Child Service to be provided by the Council. Plans are being put in place to transfer the staff and services from York Teaching Hospital NHS Trust to City of York Council supported by the development of a new operating model for delivery of health visiting and school nursing services.

It is considered that in view of the fact that child vision screening at between 5 and 6 years is recommended by the UK National Screening Committee (NSC) the school nursing service support for screening should be included in the new operating model as a priority. The role of the school nursing service will be to work with the Orthoptics service at York Hospital and with schools to maximise uptake of the screening and actively participate in promoting the importance of good eye health with children and their parents/carers.

8.1.3 Secondary screening by Orthoptics

All children who fail school screening are referred on to the Orthoptic service, which is based in the Hospital Eye Service (HES) at York Hospital. The outcomes of the referrals in 12/13 and 13/14, when service also covered children in Selby and Tadcaster schools, are given below.

Table 12 Outcomes of referrals to Orthoptics at York Hospital

	Sept 2012-Jul 2013		Sept 2013 - Jul 2014	
Total No. Referrals to HES	253		267	
Already under HES	6		8	
Declined/When to opticians	18		21	
Total No. appointments sent	229		237	
Total Secondary Screened by HES	198	80%	199	84%
Did Not Attend	31	14%	38	16%

Of those Secondary Screened	198		199	
Discharged, no abnormality	44	22%	37	19%
Failed Secondary Screen	151	76%	160	80%
Failed but declined refraction	1	0.5%	1	0.5%
Went to (High Street) opticians	2	1%	1	0.5%
Of the Screening fails	151		160	
Prescribed glasses	116	71%	130	81%
No glasses	35	23%	30	19%
No glasses - follow ups	35		30	
Intermittent or Constant exotropia	1		4	
Esotropia	4			
Refractive error - under observation, no glasses	28		23	

and one each of nystagmus, pale discs, congenital superior oblique palsy and "Marcus Gunn pupil".

Source: Orthoptics service, York Teaching Hospital Foundation NHS Trust

Some parents opt to take their child to the opticians (High Street optometrists) and a percentage of these are then referred to the Orthoptics service if they require treatment other than glasses. Referrals are triaged, so that those children with apparent poorer vision are seen more quickly. The service aims to see all children within 4 weeks of referral. The appointment is a joint orthoptist and optometry assessment, with full cycloplegic refraction (using eye drops), which is the only way to do an accurate glasses check in children. A decision is made on whether to prescribe glasses and what strength. Any child who passes their secondary screening and who has no significant refractive error is discharged and yearly NHS Sight Tests are recommended with a High Street Optometrist.

If glasses are required the parent is given a HES (Hospital Eye Service) voucher to take to a High Street opticians to get glasses made up and the child is reviewed by an Orthoptist 6 – 8 weeks after prescription to see how vision is progressing; a period of refractive adaptation is given and if the vision is failing to improve treatment will be started, Occlusion therapy (use of an eye patch). If there are any concerns regarding structural abnormalities of the eye or reduced vision with no obvious cause then an appointment is arrange with an Ophthalmologist.

Some areas have implemented a Community Optometry pathway for children failing their vision screening as an alternative to hospital care. This is discussed in Section 10.3.

All health care staff working with children have a responsibility to raise the importance of regular eye and dental checks and encourage parents /carers to access mainstream eye and dental care services periodically and as recommended.

Child vision screening at 5 years should not be seen as all that is required. While routine Sight Tests are not recommended by the Royal College of Ophthalmologists or the National Screening Committee, children growing up should have their eyes tested when any concern about their vision arises, perhaps when starting new activities such as sports. A national survey carried out by the College of Optometrists reported in 2013 that a quarter of parents (of children of all ages) said their child had never had a sight test and almost one in ten parents either couldn't recall when their child last had a sight test, or said it was more than ten years ago[6].

8.2 Sight tests - opportunistic screening for treatable eye disease

8.2.1 NHS Sight Tests

In recognition of the impact of visual impairment, the NHS funds sight tests (eye examinations) for children (under 16 or in full-time education up to 19 years), the over 60s and people on certain means-tested benefits (i.e. low income) in addition to those at high risk of, or suffering from, certain eye diseases[43]. Optometrists are paid for undertaking these tests by contract with NHS England, under the terms of General Ophthalmic Services (GOS). Sight test for adults who do not fall into one of the exemption categories are private, and the optometrist charges the patient directly for this.

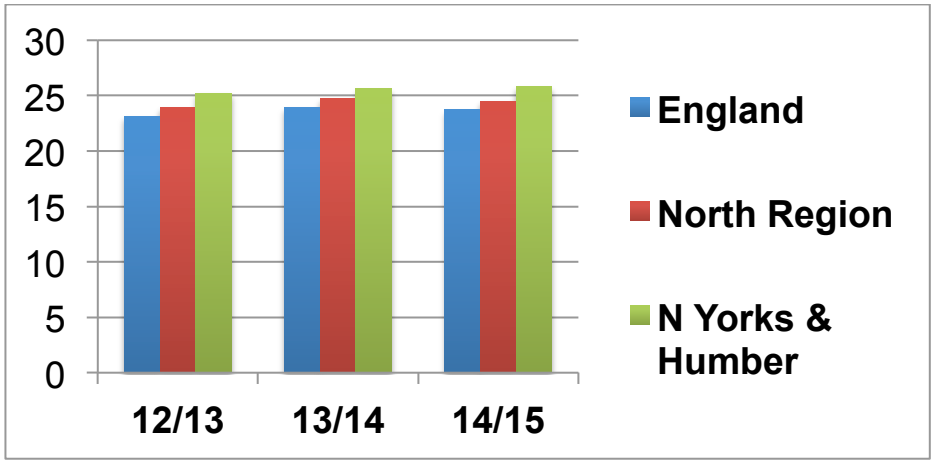
8.2.2 Trends in numbers of sight tests

There were 12.7 million NHS sight tests performed in England in 2014/15 according to GOS claims. Data on private sight tests is not collected, so the best we have is estimates based on extrapolations from the Sight Tests Volume and Workforce Survey: Great Britain: 2005-06, Department of Health. For 2012 there were estimated to be 5.3 million private tests, making the total number of eye tests 17.9 million in 2012.

The number of NHS sight tests has been rising quite considerably; in 2002/03 there were 9.7 million, so over the last 12 years the number of tests has risen by 3 million. National there was a slight drop (0.2%) in the number of tests, this is the first time this has happened in the last 12 years and the reason is unclear.

[43] Shickle D & Farragher TM. (2015) Geographical inequalities in uptake of NHS-funded eye examinations: small area analysis of Leeds, UK. Journal of Public Health, Vol 37(2) 337-345.

Figure 8 Trends in rate of NHS Sight Test from 12/13 to 14/15 (rate per 100 population)



Source: HSCIC.gov.uk for 13/14 and 14/15. Data for 2012/13 for North region and North Yorkshire and Humber is compiled data from previous SHA and PCT sources.

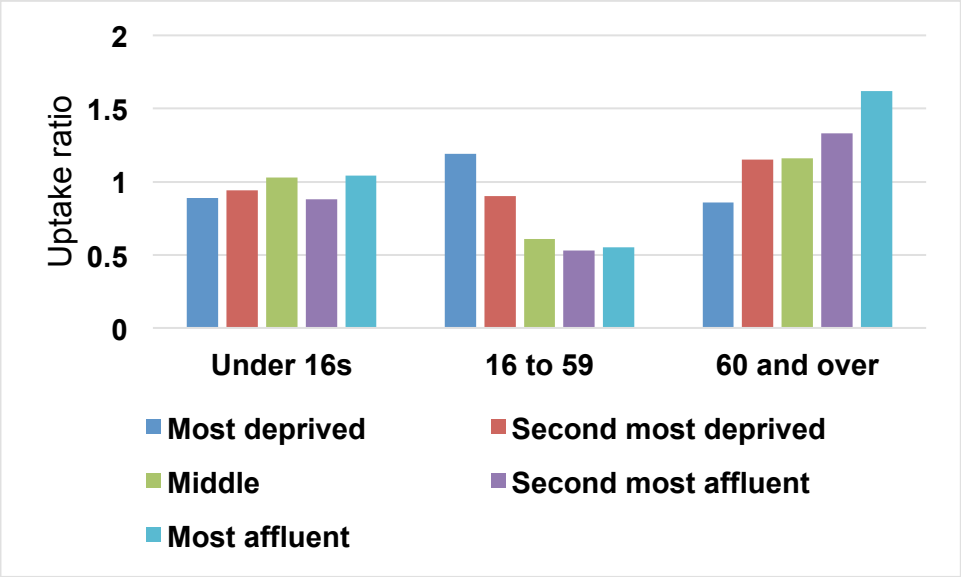
In North Yorkshire and the Humber (the lowest geographical level to which data is broken down) there were 430,763 NHS sight tests undertaken in 2014/15, and no drop was noted, in fact a 0.1% increase on the previous year. As the Vale of York population is 21% of North Yorkshire and the Humber, our best guess would be that there were 89,500 NHS Sight tests in Vale of York residents.

If we apply the ratio that was calculated in 2012 to the most recent local data, we would estimate that that there were 41,800 private sight tests, giving a total of roughly 131,000 eye tests.

A matter of concern is that NHS sight tests in the over 60 year olds have been declining. Not only are actual numbers of eye tests falling, but due to the rising elderly population the rate has dropped even further, from 64.1 per 100 in 12/13, to 57.5 in 13/14 and 55.3 in 14/15. This is a concern as many eye conditions are more prevalent in this age group, and this rate should be increasing. Happily the situation is different in children under 16, where NHS Sight Tests are increasing. The absolute numbers have gone from 70,200 in 12/13, to 72,500 in 13/14 to 82,700 in 14/15 in North Yorkshire and Humber.

Attendance for sight tests across the socio-economic spectrum varies, with those in the most deprived groups less likely to attend – even though the tests are free. Analysis of NHS Sight Test data from Leeds in 2011 showed that people living in the most affluent 20% of the population were more likely to have an NHS Sight Test than those living in the most economically deprived areas. This held true for both for the main age groups eligible to free tests (children and the 60 and over age group), but especially the over 60s where those in the least deprived 20% of the population were 71% more likely to attend than those in the poorest 20%. The 16 – 59 year old group is only those in receipt of free tests (not the private tests which make up the majority of this age group) – so is heavily skewed to those on low incomes[43].

Figure 9 Uptake ratio of NHS Sight Tests by deprivation group (Leeds)



Source: Data extracted from a study of geographic inequalities in Sight Tests in Leeds, Reference 43.

In addition to the detection of refractive error (i.e. need for glasses) the sight test is used as a tool for opportunistic detection of eye diseases e.g. glaucoma. However, most people do not attend a sight test for prevention, they go because they have symptoms such as changes in sight. If they don't have problems with their sight they don't believe that there is anything wrong with the eyes[44]. Subtle disease changes may not produce noticeable symptoms in the early stages so routine sight tests, in the absence of more formal targeted screening programmes, are essential in the detection and early treatment of eye conditions. **Research by the Royal National Institute for Blind People (RNIB) suggests that 50% of cases of blindness and serious sight loss could be prevented if detected and treated in time[1].**

8.3 Diabetic Eye Screening (DES)

Refer to section 9.5 for information on Diabetic Eye Disease definition, prevalence and treatment.

The National Screening Committee recommends that all people with a diagnosis of diabetes aged 12 years and over should be screened annually for the presence of retinopathy and /or maculopathy[45]. It also recommends screening of women with gestational diabetes (diabetes in pregnancy).

[44] McLaughlan B & Edwards A. (2010) Understanding the purpose of an eye test among people aged 60 and over in the UK. Optom Pract. Vol 11(4) 179-188
[45] http://legacy.screening.nhs.uk/screening-recommendations.php

Diabetic Eye Screening Programmes evolved locally in the 1990s, but over the years there have been great strides made in ensuring they all meet certain quality standards, and from 2013 we have seen the implementation of the national Common Pathway, ensuring all programmes have the same elements.

8.3.1 Coverage of the North Yorkshire Diabetic Eye Screening Programme

The North Yorkshire Diabetic Eye Screening Programme covers all patients registered with Vale of York CCG, and all or part of the population registered with 7 other CCGs. The programme uses a dispersed model; a fully mobile service delivered in all GP practices across North Yorkshire and York that can accommodate the service. In addition the Programme uses some Hospital and Health Centre rooms for patients needing ambulance transport. Digital images are then sent to the Diabetic Eye Screening office at York Hospital for grading into stage of disease.

The programme is commissioned by NHS England and provided by York Teaching Hospital Foundation Trust. There a direct link between the screening programme and 7 hospital eye services to which the programme refers people for treatment services. The “big 4” Hospital Eye Services are York, Harrogate, Scarborough and Airedale, but for the purposes of this report and Vale of York patients, York Hospital is the most relevant service.

The programme covered a total of 40,470 people with diabetes in the 14/15 year, of which 34,188 were in the pool for annual screening. The remaining 6,282 people were divided thus: 644 patients who opted out of screening, 209 were deemed medically unfit and about 5,500 patients were in some form of treatment with the Hospital Eye Services.

8.3.2 Performance of the local eye screening programme

The National Diabetic Eye Screening Programme (NDESP), gives a minimum standard of 70%, and an achievable standard of 80%, for attendance for screening; the North Yorkshire programme reported that 87.3% attended to have their eyes screened, which is a very good result. However the programme is not being complacent and it is reviewing patients who have never been screened and working collaboratively with other diabetes services to try to drive up coverage.

The results of the screening in 14/15 were that 59% of people with diabetes had no retinopathy, 33% of people with diabetes had background retinopathy (R1), 2.9% have “pre-proliferative” (R2) and 0.3% have “proliferative retinopathy” (R3).

This compares to national estimates of 28% background and 3.3% for pre and proliferative combined.

Proliferative retinopathy needs urgent treatment if sight is to be preserved. Pre-proliferative retinopathy also needs treatment, but this is non-urgent. In addition, nearly 5% of the images are un-gradable due to the person having a cataract or

other problem that makes getting a clear photo impossible. These people need to be seen by the Hospital Eye Service.

The NDESP sets standards for timeliness of consultation, these are:

	Minimum	Achievable
Urgent (Retinopathy grade 3)		
Seen within 2 weeks	60%	95%
Seen within 4 weeks	80%	95%
Non-urgent (Retinopathy grades 2, and 1 with maculopathy)		
Seen within 13 weeks	70%	95%
Seen within 18 weeks	95%	95%

In the 14/15 year 81 individuals were found to need urgent referral because they had proliferative retinopathy, 49 (60%) were seen with 2 weeks, and by 4 weeks this was up to 64 people (79%), so the standard was just met for 2 weeks and missed for 4 weeks. This was due to logistical reasons, which are discussed in more detail in Section 9.5.3 – interventions in Diabetic Eye Disease.

8.3.3 New developments in the local eye screening programme

Historically everyone found with R1M1 (background retinopathy with maculopathy) was sent to a hospital eye service – this group constitutes about 75% of the non-urgent referrals. However, there has very recently started a community-based alternative for people who would have been sent to the hospital - further diagnostic tests, notably Slit-lamp biomicrosocopy and Optical Coherence Tomography (OCT) are available in several community sites as well as the mobile service. This should take approximately 3000 patients out of the Hospital Eye Services, and will free up significant capacity at York Hospital, although the 25% who remain are the most complex of the patients with maculopathy.

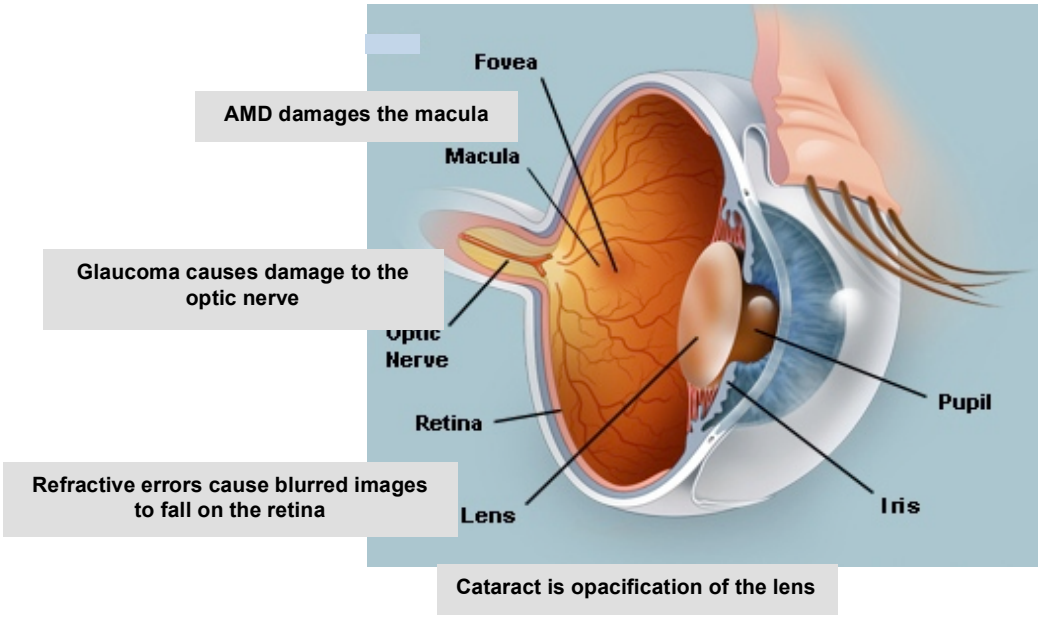
The North Yorkshire DES Programme had an external Quality Assessment visit in August 2012. The report commended the programme on the “Effective delivery of a very local model of service provision that presents many operational challenges”. The only concern the Team had was that the programme did not have a robust Disaster Recovery Plan in place to deal with a catastrophic loss of the IT infrastructure. This has since been addressed and all the Quality Team’s recommendations for screening have been incorporated.

9 EYE DISEASE

9.1 Incidence, Prevalence and Treatment of Eye Disease

The diagram below shows the parts of the eye are that are affected by the diseases described in this section.

Figure 10 Anatomy of the eye and the parts affected by specific eye conditions



The three main eye diseases, if we consider all ages, which can result in blindness or partial sight if not diagnosed and treated in time are age related macular degeneration (AMD), glaucoma and diabetic retinopathy. For the first time in at least five decades, diabetic retinopathy/maculopathy is no longer the leading cause of certifiable blindness among ***working age*** adults in England and Wales, having been overtaken by inherited retinal disorders. This change may be related to factors including the introduction of nationwide diabetic retinopathy screening programmes in England and Wales and improved control of diabetes. Inherited retinal disease, (i.e. genetic) now represents the commonest cause of certification in the working age population[46].

Disease is commonly measured in two ways:

- Incidence is the new cases arising in year
- Prevalence is the total people living with condition (at any one time)

Standard measures of preventable sight loss are included in the Public Health Outcomes Framework indicators. They measure new cases of Certifications of

[46] Liew G, Michaelides M, Bunce (2013) "A comparison of the causes of blindness certifications in England and Wales in working age adults (16–64 years), 1999–2000 with 2009–2010. Ophthalmology *BMJ Open* 2014;4:e004015 doi:10.1136/bmjopen-2013-004015

Visual Impairment – an approximation of the incidence of blindness (refer to earlier discussion on why people might not want be registered blind in Section 6.2). Also included is the incidence of blindness due to each of the three main conditions:

- 4.12i - Crude rate of sight loss due to age related macular degeneration (AMD) in those aged 65+ per 100,000 population[47].
- 4.12ii - Crude rate of sight loss due to glaucoma in those aged 40+ per 100,000 population
- 4.12iii - Crude rate of sight loss due to diabetic eye disease in those aged 12+ per 100,000 population
- 4.12iv - Crude rate of sight loss certifications per 100,000 population

Technical note:
In order to keep the main messages clear we have not presented the confidence intervals here. A confidence interval is a range of values that is used to quantify the imprecision in the estimate of a particular indicator. Specifically that which results from random variation in the measurement of the indicator. They are available in the *Public Health Outcomes Framework data*.

In Table 13 below we give the fourth indicator first, that is the total incidence rate of blindness due to the 3 conditions, as we give the individual disease measures in the section for those diseases.

Table 13 Rate and Count of Certification of Visual Impairment (due to conditions deemed to be preventable) per 100,000 for Vale of York relevant local authorities 13/14

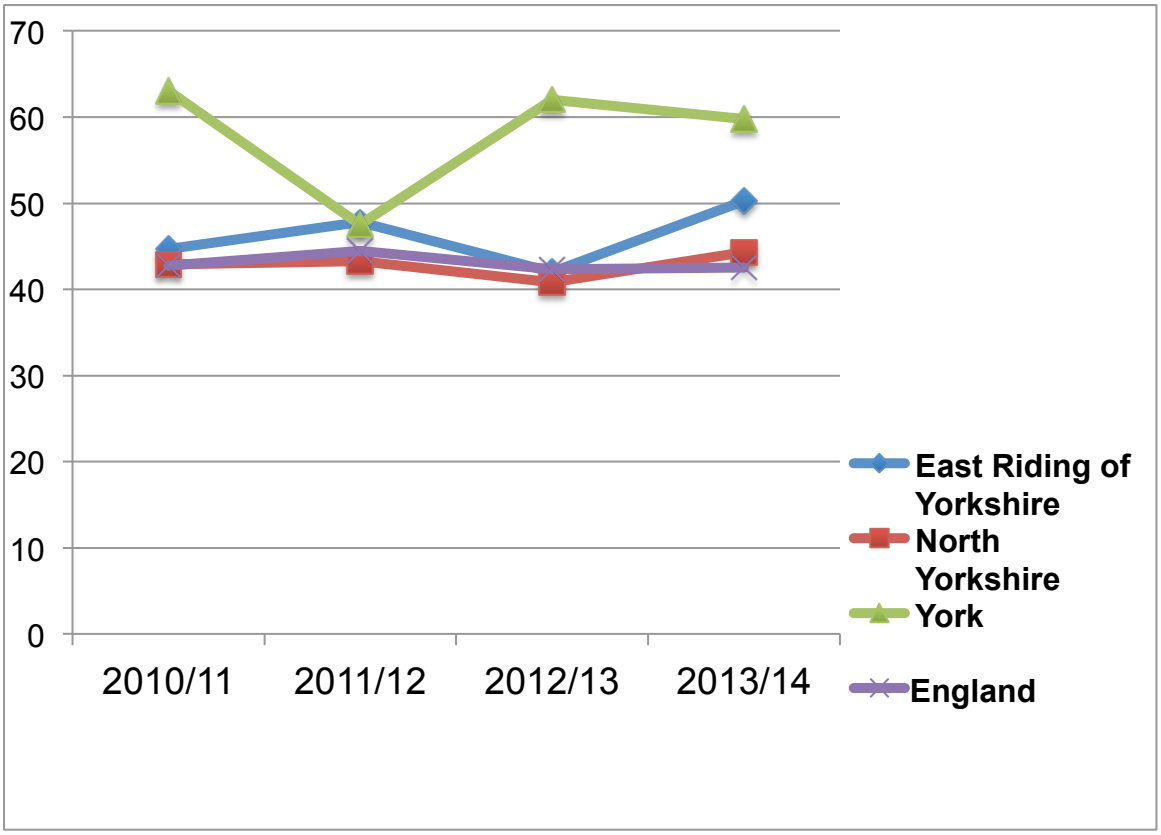
Area	Number (count)	Rate per 100,000	Compared to England
York	121	60	higher
North Yorkshire	267	43	similar
East Riding of Yorkshire	169	50	similar
England	22,911	43	

Source: Public Health Outcomes Framework, Public Health England, accessed September 2015

A significantly higher than average rate of sight loss certifications is found in City of York. To explore this further, time trends were examined for the 4 years in which data are available, and it can be seen in Figure 11 overleaf that the rate in York is much higher than the other areas for 3 of the 4 years, but that it dips back down to the average in 2011/12. Various enquiries into why this might be the case have not led to any conclusions. This is an area for further investigation.

[47] http://www.phoutcomes.info/public-health-outcomes-framework#gid/1000044/pat/43/ati/102/page/6/par/X25003AF/are/E06000014/iid/41201/age/27/sex/4

Figure 11 Time trend for Rate of Certification of Visual Impairment (due to conditions deemed to be preventable) per 100,000 population for Vale of York relevant local authorities from 2010/11 to 2013/14



Source: Public Health Outcomes Framework, Public Health England, July 2015

For North Yorkshire, East Riding and England the trend lines were fairly flat, i.e. there was no such variation.

9.2 Macular Degeneration/ Age-related Macular Degeneration (AMD)

9.2.1 Description

Patients with AMD lose their central vision so tasks that involve detail such as reading and face recognition become difficult if not impossible. Peripheral vision is usually preserved. There are two types of AMD, commonly known as “dry” and “wet”.

In dry AMD ageing causes the development of “drusen”, which are yellow deposits in the retina. This disrupts the retinal cells leading to breakdown in function and gradual loss of central vision. There is no suitable treatment for dry AMD at present.

In wet AMD, the changes in the macular area of the retina promote the development of new blood vessels (neovascularisation). These blood vessels are more fragile and prone to rupture leading to leakage of fluid into the retina causing severe loss of

central vision often accompanied by distortion. Excessive fluid may lead to localised detachment of the retina. When fluid subsides a scar usually remains. Vision loss is much more rapid than in the dry type. A protein, Vascular Endothelial Growth Factor (VEGF) has been found to be implicated in the growth of the new vessels. In some cases treatment by injection with an anti-VEGF agent such as ranibizumab can reduce loss of vision. See 9.2.3 below on treatment.

Age related macular degeneration (AMD) is the leading cause of certifiable visual loss in the UK. 53% of the certifications for blind and partial sight in 2010-11 were attributed to this cause.

9.2.2 Incidence and prevalence of AMD

There is no accurate data on the number of people developing AMD in any one year, but we have got information on the number of people whose AMD is so advanced that it results in them being certified as visually impaired. Data on Certifications throughout the country is collated by Moorfields Eye Hospital and used to make comparisons between areas. This data has been included in the Public Health Outcome Framework for the last 4 years, as one of the measures deemed amenable to healthcare.

The incidence of sight loss due to age related macular degeneration (AMD) in those aged over 65 years[48] for the areas most relevant to Vale of York CCG are given below.

Table 14 Crude rate of Certification of Visual Impairment due to age-related macular degeneration in those aged 65+ per 100,000 population over 65, 2013/14

Area	Number (count)	Rate per 100,000	Compared to England
York	56	157	higher
North Yorkshire	137	103	similar
East Riding of Yorkshire	95	121	similar
Best guess Vale of York	89	133	similar
England	11,050	118	

Source: Public Health Outcomes Framework, Public Health England, accessed September 2015

Data on the local prevalence is available from two sources:

[48] http://www.phoutcomes.info/public-health-outcomes-framework#gid/1000044/pat/43/ati/102/page/6/par/X25003AF/are/E06000014/iid/41201/age/27/sex/4

1. modelled estimates from the RNIB Sight Loss Data Tool (including calculated best guess for Vale of York population
2. live data extract from the Register held at York Teaching Hospital Foundation Trust, Vale of York patients only

Table 15 Prevalence of Age-related Macular Degeneration as modelled from the RNIB Sight Loss Tool

Estimated number of people with AMD

In 2015	York	North Yorkshire	East Riding	Vale of York Best Guess
Early stage AMD	8,374	30,733	17,941	15,469
Late stage dry AMD	679	2,434	1,395	1,310
Late stage wet AMD	1,399	4,973	2,853	2,544
Total late stage AMD (any type)	1,970	7,027	4,033	3,587

Estimated number of people with AMD

In 2020	York	North Yorkshire	East Riding	Vale of York Best Guess
Early stage AMD	9,184	34,565	20,270	17,170
Late stage dry AMD	750	2,792	1,616	1,394
Late stage wet AMD	1,550	5,738	3,320	2,872
Total late stage AMD (any type)	2,182	8,093	4,688	4,047

Source: RNIB Sight Loss Data Tool, using HSCIC Registered Blind and Partially Sighted People. Year ending 30 March 2014. Vale of York Best Guess derived from the source data.

From the model we can see that the number of people with late stage AMD in the Vale of York is increasing by about one hundred (net) per year.

The number of people on York Hospital's Macular Degeneration Register was 1450 on the 1st August 2015. It is likely that all those on the hospital register are wet AMD, as it is the only sort for which there is a treatment currently, this would be 57% of those predicted to have the condition. It all factors affecting proportion of people in treatment stay the same, this means that of our net 100 gain each year, there would be a net gain of 60 to the treatment pool, so by 2020 we could expect to find 1750 in treatment.

9.2.3 Intervention / Treatment

There is no effective treatment for dry AMD and therefore patients are just monitored by optometrists when patients attend for routine sight testing. Patients are referred to Ophthalmology if wet AMD develops concurrently with the dry or if the level of vision is reduced such that referral for CVI registration or hospital low vision aid services is required.

Optometrists refer patients when they suspect or cannot exclude that the patient may have wet AMD. There is quite a high false positive rate, estimated to be more than 50%. There may be ways of improving the specificity (i.e. reducing false positives) by optometrists being trained in using Optical Coherence Tomography (OCT) scanners.

When wet AMD develops prompt treatment using an anti-VEGF (vascular endothelial growth factor) agent is appropriate, and National Institute of Health and Care Excellence (NICE) recommended[49]. Anti-VEFG drugs act to bind growth factors, preventing the development of new blood vessels in the macula. These drugs are injected intra-ocularly (into the eye). Ranibizumab (brand name Lucentis) was licensed for UK use in June 2008, and is administered according to a protocol from the Royal College of Ophthalmology (RCOphth).

Ophthalmologists initiate Lucentis with three injections at 4 week intervals, followed by a maintenance phase in which they monitor patients. After the loading doses, treatment is continued as 4 weekly intervals if the lesion persists, and continues to respond to treatment. The RCOphth advise that patients should continue treatment and follow-up for up to and beyond 2 years.

Aflibercept (brand name Eylea) is very similar to ranibizumab, and was approved by NICE in 2013. Eylea is, according to the license, longer acting so requires fewer visits and fewer injections, thus reducing cost and risk to patient compared to Lucentis.

Bevacizumab (brand name Avastin™) is a similar, cheaper drug, which has been in use since 2003, originally developed for use in colorectal cancer. This is not licensed for intraocular use, but the Royal College of Ophthalmologists released a statement in 2011 stating that Avastin and Lucentis were equally effective in the treatment of AMD, and that there was no convincing evidence of a clinically significant difference in the safety profile of the two. When it released this statement it recommended that Avastin should be the default treatment for AMD and they estimated that if this policy

[49] Ranibizumab and pegaptanib for the treatment of age-related macular degeneration. NICE technology appraisal guidance 155. Issued: August 2008 last modified: May 2012 www.nice.org.uk/guidance.nice.org.uk/ta155

were implemented it would save NHS England in excess of £100 million. A Cochrane review published in 2014 concluded that there was no significant clinical or research evidence to support preferential use of either Avastin or Lucentis in neovascular AMD[50].

NICE states that patients must meet the following criteria to be eligible for treatment with ranibizumab (Lucentis):

- the best-corrected visual acuity is between 6/12 and 6/96;
- there is no permanent structural damage to the central fovea;
- the lesion size is less than or equal to 12 disc areas in greatest linear dimension;
- there is evidence of recent presumed disease progression.

Only a minority of wet AMD will fulfill treatment criteria. Even in treated patients, there are high rates of complications, and also of subsequent recurrence.
The actual number of people in treatment recorded by York Hospital is 57% of the modelled prevalence of late stage AMD. It is not possible from the extracted data to determine the number of unique individuals receiving treatment for AMD, nor the frequency of treatment sessions, i.e. how many times individual patients attend for treatment

The following factors will affect numbers in treatment to a greater or lesser extent:

- Not all patients/ eyes being amenable to treatment- the proportion of these that are amenable to treatment by anti VEGF is unclear.
- Incomplete diagnosis, which may be due to:
    - Not every person with sight loss being aware of the loss, or attributing it to other disease, therefore failing to report the symptoms
    - Older people not attending for Sight Tests
- York Hospital's data is not complete, i.e. not all cases of people with AMD are being entered on the Register, or are being coded as patients of other CCGs
- People with wet AMD amenable to anti VEGF not receiving treatment (ever) – this could be because their choice, or it could be lack of access
- People with wet AMD have completed treatment, i.e. they have reached the stage where further treatment would not provide benefit.
- On the other hand some people may be receiving treatment that would not yet be considered late stage in the model.

Bearing in mind all these factors and therefore the very large margin of error, it is estimated that if current trends continue we would expect to see between 50 and 65 net new patients in treatment at York Hospital per year.

[50] The use of Avastin (bevacizumab) in age related macular degeneration. Updated Statement from The Royal College of Ophthalmologists, 15 December 2015.

9.2.4 Cost of treatment of AMD

The total cost of Vitreous Eye Treatments (for all retinal disease) in 14/15 was nearly £7 million. The plan for 15/16 is £7,389,000 but is already projected to exceed this budget. At the crudest level, £7 million for 1450 patients averages at £4,828 per patient. So the CCG will have to find an extra £250,000 just to "stand still" if all other factors remain constant – particularly treatment threshold.

Table 16 Actual and planned expenditure on treatment of Age related Macular Degeneration by Vale of York CCG, 2014 – 2016.

	Plan 2015/16		Actual 2014/15	
	Sum of Activity	Sum of Cost	Sum of Activity	Sum of Cost
Assessments	9,536	£1,783,161	9,195	£1,719,465
Procedures	8,781	£1,246,946	7,681	£1,093,081
XD46Z - Eylea	4,924	£2,579,931	4,819	£2,525,156
XD46Z - Lucentis	3,858	£2,063,785	2,862	£1,531,170
Grand Total	27,098	£7,673,823	24,557	£6,868,872

Source: Vale of York Clinical Commissioning Group

If the cost of Avastin is 10% of the cost of the two currently used treatments, the drug cost for the planned level of activity would be £464,372, thereby saving over £4 million. It is recommended that the CCG instruct the provider to use bevacizumab in place of ranibizumab and aflibercept. It would also be useful to review the treatment threshold.

9.2.5 Factors affecting the development of AMD

Age and ethnicity

The prevalence of AMD increases with age (hence the name). The development of AMD is much lower in black populations than white.

Smoking and other lifestyle factors

The onset of AMD has been associated with oxidative stress. Along with smoking, obesity, poor diet and chronic hypertension have been shown to increase oxidative stress and hence also the risk of AMD[51,52]. Smokers are four times more likely to develop AMD than non-smokers[53].

[51] Hogg Ruth (2012) "Healthy Lifestyle Equals Healthier Eyes" (2012) Optometry Today April 6th 2012 41-4

[52] Rughani Sonal (2012) "The Vital Role of Optometry in Disease Detection" Optometry Today March 9th 41-4

[53] Tan JS, Mitchell P, Kifley A, Flood V, Smith W, Wang JJ (2007) "Smoking and the Long Term Incidence of Age-Related Macular Degeneration: The Blue Mountains Eye Study" Archives of Ophthalmology August 2007 125(8):1089-95

9.2.6 Intervention and prevention

As always the best course is prevention. Studies have shown that specific nutrients in the diet can be useful in slowing the progression of dry AMD[54]. These recommendations are similar to what might be expected for a healthy diet in general. For these reasons, stop smoking initiatives and effective interventions bringing about a healthy diet are the most likely interventions to help reduce the incidence and slow the progression of AMD.

9.2.7 Local optometry services

Fast referral is essential to obtain the best possible outcome from treatment intervention. Optometrists in many areas work in partnership with local hospitals and operate a fast track referral scheme for wet AMD. In Vale or York the community optometrist alerts triage by telephone and the patient is sent to the next wet AMD clinic. The optometrists would prefer a Fax referral mechanism. A gap within the current system is that community optometrists do not get feedback from Ophthalmology. This means that the optometrist doesn't know what has happened to the patient, and relies on the patient telling them, when or if they should ever go back in for another Sight Test.

[54] Age Related Eye Disease Study Research Group (AREDS) (2001) "A Randomised, Placebo Controlled, Clinical Trial of High Dose Supplementation with Vitamins C and E, Beta Carotene and Zinc for Age-Related Macular Degeneration and Vision Loss: AREDS Report No. 8" Archives of Ophthalmology 119:1417-1436

9.3 Glaucoma

9.3.1 Description

Glaucoma refers to a group of conditions characterised by visual field loss, and pathological changes in the optic nerve head. This means people lose their peripheral vision. There may also be raised pressure in the eye, known as intra-ocular pressure (IOP) as in Chronic Open Angle Glaucoma (COAG), which is the commonest form of the condition. In England about 480,000 people have the condition. Glaucoma often affects both eyes, but one eye may develop it quicker than the other. Sight loss in glaucoma is not reversible.

Ocular hypertension (OHT) is the condition of raised intra-ocular pressure in people who do not have any sign of glaucomatous damage at the optic nerve head or visual field loss. Patients diagnosed with OHT still require on-going monitoring as they have significantly increased risk of developing COAG later in life[55]. Recommended treatment is based on risk calculation taking into account central corneal thickness and age[56].

Glaucoma suspects may have early signs of optic nerve damage but may not yet exhibit field loss. They may or may not have raised intraocular pressure. The onset of glaucoma is gradual. The early signs are often subtle and may not be not easily identified in a single visit to an optometrist (optician). Patients who are suspected of having glaucoma often require at least two review visits to establish a diagnosis.

9.3.2 Factors affecting development of glaucoma

Ageing

The prevalence of COAG is related to increasing age[57].

Ethnicity

Among white Europeans, about one in fifty people above 40 years old and one in ten people above 75 years old has chronic open-angle glaucoma. It is approximately three times more prevalent amongst black populations of similar age[58]. However, the increase in prevalence with age is steeper in Caucasians than for other ethnic backgrounds.

[55] Meleros Felipe A, Weinreb Robert N (2009) "Estimating Risk of Developing Glaucoma" The Open Ophthalmology Journal 2009 3 50-53

[56] NICE Guidelines [CG85] Glaucoma: Diagnosis and management of chronic open angle glaucoma and ocular hypertension (2009). www.nice.org.uk. Accessed 25 June 2015.

[57] Rudnicka AR, My-Isa S, Owen CG, Cook DG, Ashby D. (2006) "Variations in Primary Open Angle Glaucoma Prevalence by Age, Gender and Ethnicity: A Bayesian Meta-analysis". *Investigative Ophthalmology and Vision Science* October 2006, 47(10):4254-61

[58] Tielsch JM, Sommer A, Katz J. Racial variations in the prevalence of openangle glaucoma. The Baltimore eye survey. *JAMA* 1991; 266:369 – 74.

Family history

There is an increased risk of developing COAG if there is a close relative who has the condition[59].

Social and lifestyle factors

Patients from deprived areas have been shown to present later than those in relatively affluent areas and are therefore more likely to experience visual loss[60]. As the causation of glaucoma is thought to be at least partly vascular in nature it might be expected that smoking and obesity may affect the incidence of glaucoma. However, studies show no consistent association between smoking and open-angle glaucoma[61].

9.3.3 Incidence and Prevalence of glaucoma

There is no accurate data on the number of people developing glaucoma in any one year, but we have got information on the number of people whose glaucoma is so advanced that it results in them being certified as visually impaired. Data on Certifications throughout the country is collated by Moorfields Eye Hospital and used to make comparisons between areas. This data is included in the Public Health Outcome Framework (Indicator 4.12ii); Vale of York (City of York and East Riding of Yorkshire) have significantly higher rates, which is of some concern.

Table 17 Crude rate of certification of visual impairment due to glaucoma per 100,000 population over 40 years of age, 2013/14

Area	Number (count)	Rate per 100,000	Compared to England
York	27	28	higher
North Yorkshire	43	12	similar
East Riding of Yorkshire	42	21	higher
Best guess Vale of York	38	28	higher
England	3,432	13	N/A

Source: Public Health Outcomes Framework, Public Health England, accessed September 2015[62]. http://www.phoutcomes.info/public-health-outcomes-framework#page/9/gid/1000044/pat/6/par/E12000003/ati/102/are/E06000014/iid/41202/age/232/sex/4

[59] Leske MC, Wu SY, Hennis A, Honkanen R, Nemesure B, BES Study Group (2008) "Risk Factors for Incident Open Angle Glaucoma: The Barbados Eye Studies" Ophthalmology 2008 Jan; 115(1):85-93

[60] Fraser S, Bunce C, Wormald R, Brunner E (2001) "Deprivation and Late Presentation of Glaucoma: Case-control Study" British Medical Journal March 17 2001 322(7287) 639-643 http://www.jstor.org/stable/25466466.

[61] http://www.ncbi.nlm.nih.gov/books/NBK44312/#A7671

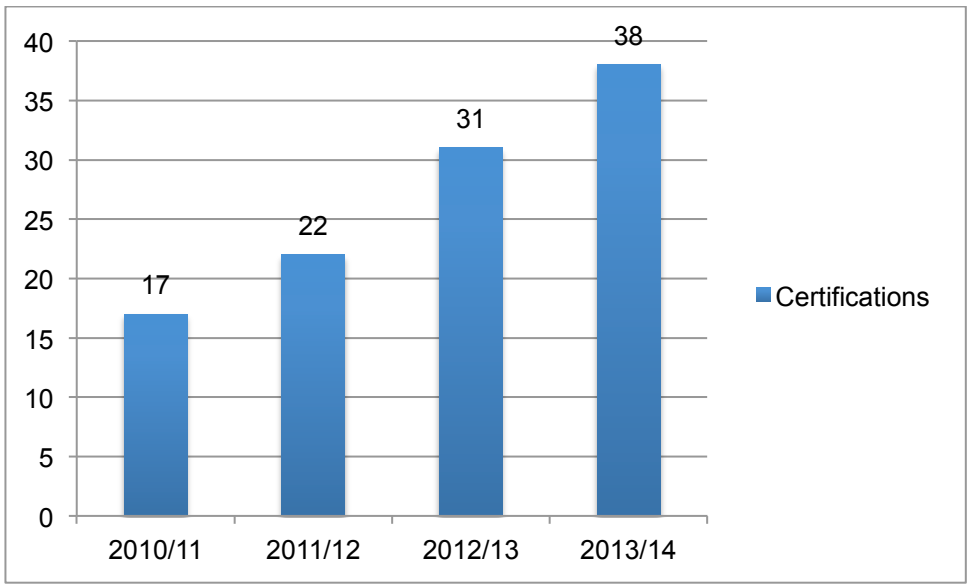
[62] http://www.phoutcomes.info/public-health-outcomes-framework#page/9/gid/1000044/pat/6/par/E12000003/ati/102/are/E06000014/iid/41202/age/232/sex/4

One should be cautious in the interpretation of these statistics, because they are crude rates, which is to say they are not “standardised for age in 5 year bands”, which would be the correct form of epidemiological analysis. Some very rough standardisastion is achieved by only counting the certifications in people aged over 40 and using the population over 40 as the denominator. However, as North Yorkshire and East Riding have a higher proportion of older people than York, one would expect that, if anything the crude rate would be higher in North Yorkshire.

To explore this further we have referred to the data from the Public Health Outcome Framework over the last 4 years. In Figure 12 below we can see the very clear increase year on year.

This is an area that needs further investigation; possibly a look-back exercise or a clinical audit across primary and secondary care.

Figure 12 Trend in Certifications of Visual Impairment due to Glaucoma for the Vale of York “Best Guess” population, from 2010/11 to 2013/14



Source: Public Health Outcomes Framework, Public Health England, accessed September 2015

Data on the local prevalence of glaucoma is available from two sources,

1. modelled estimates from the RNIB Sight Loss Data Tool (including calculated best guess for Vale of York population
2. live data extract from the Register held at York Teaching Hospital Foundation Trust, Vale of York patients only

Table 18 Prevalence of Glaucoma as modelled from RNIB Sight Loss Tool with Best Guess calculation

Estimated number of people with glaucoma in 2015

	York	North Yorkshire	East Riding	Vale of York Best Guess
Number of people with glaucoma	1,764	6,095	3,540	3170
Number of people with ocular hypertension	3,840	13,267	7,706	6,900

Estimated number of people with glaucoma in 2020

	York	North Yorkshire	East Riding	Vale of York Best Guess
Number of people with glaucoma	1,851	6,303	3,694	3,307
Number of people with ocular hypertension	4,029	13,722	8,042	7,762

Source: RNIB Sight Loss Data Tool, using HSCIC Registered Blind and Partially Sighted People. Year ending 30 March 2014. Vale of York Best Guess derived from the source data.

Table 19 Prevalence of Glaucoma on the York Hospital Register

Categories	Number	Duplicates
Glaucoma	4298	
High Risk Glaucoma	165	45 also on the Glaucoma register
Low Risk Glaucoma	512	43 also on the Glaucoma register
		2 on the High and Low risk register (but not the Glaucoma)
Net number of people with Glaucoma	4889	

As there are nearly 5,000 cases of glaucoma registered at the Hospital - the estimated prevalence is only 3170 in the model above, but it is likely the Hospital register will include a proportion of those people who would be classified as having ocular hypertension in the RNIB Tool estimate of nearly 7,000).

9.3.4 Intervention / Treatment

There are no specific interventions that can prevent glaucoma except perhaps the general lifestyle advice one would give to prevent a range of other conditions, such as cardiovascular disease and diabetes.

Early detection and treatment of raised intra-ocular pressure (IOP) is the first step to preventing deterioration of vision. The NHS Sight test includes routine IOP screening in patients aged over 40 and patients of this age with a family history of the disease are entitled to free NHS Sight Tests. All the successful interventions aimed at increasing take up of Sight Tests will improve detection. The usual practice (in York and elsewhere) is to refer patients who have intraocular pressure greater than 21mmHg to Hospital Eye Services. The Royal College of Ophthalmologists report that typically a patient will have their initial referral to Ophthalmology and 40 follow-up visits over the course of their life[63].

The most common form of glaucoma is chronic open-angle glaucoma (COAG). This is usually treated medically with eye drops, of which there are 5 major types of drug:

- prostaglandin analogues (the NICE recommended first-line treatment)[56]
- beta-blockers
- carbonic anhydrase inhibitors
- sympathomimetics
- miotics

Prescribing data for drugs to treat glaucoma (BNF Chapter 11 – The Eye, section 11.6 Glaucoma) for Vale of York patients was analysed for the 3 years 2012/13, 2013/14 and 2014/15. This source only covers drugs prescribed by GPs, not that given in hospitals.

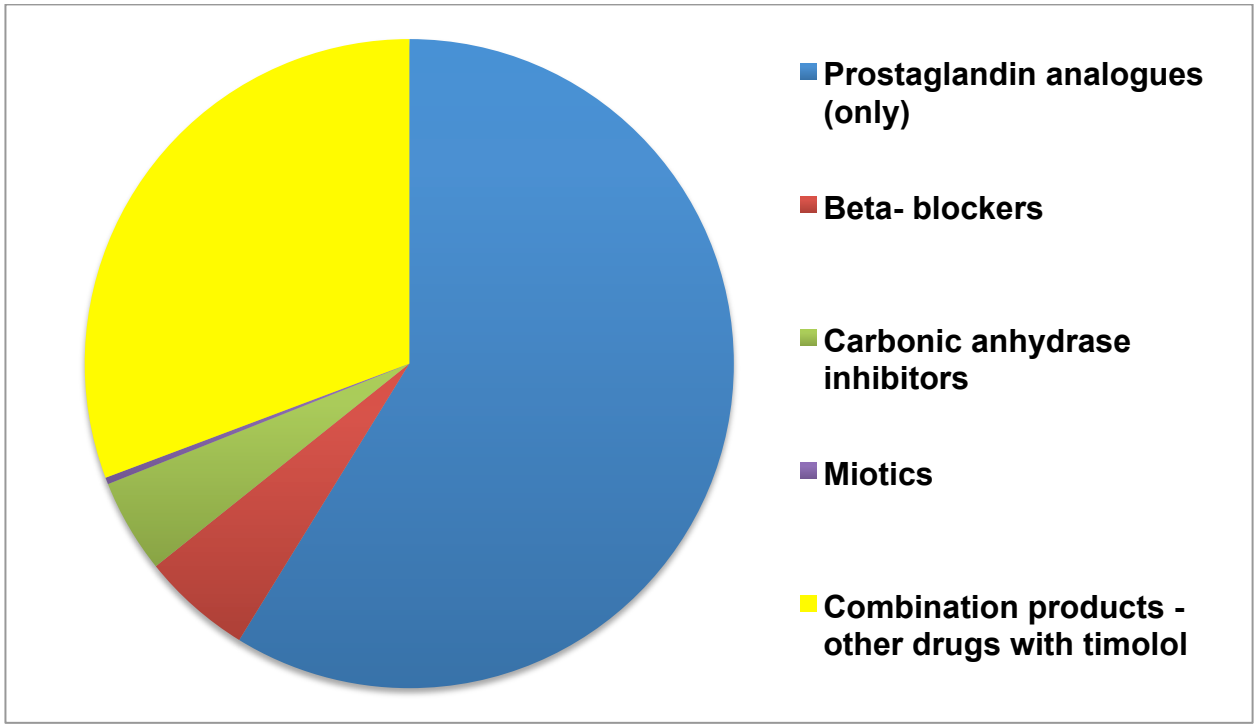
Nearly 50,000 items are prescribed each year and the total spend on all medicinal products to treat glaucoma over the 3 years was £1,346,047, or about £450,000 per year. This could be considered to be:

- roughly £100 a year per patient known to the Hospital
- roughly £65 a year per patient modelled to have glaucoma and intraocular pressure combined

Figure 13 overleaf shows the breakdown of expenditure by class of drug. Prostaglandin analogues account for 59% of the spend, with the next largest group being the combination drugs. These eye drops consist of another drug (such as a prostaglandin analogue) plus the beta blocker timolol. The first 3 types of drugs are the commonly used ones in Vale of York, with sympathomimetics and miotics together amounting to less than half a per cent (<00.5%) of the total drug expenditure.

[63] Commissioning Guide: Glaucoma (long version). Draft for consultaion. March 2015, Royal College of Ophthalmologists.

Figure 13 Class of drug used in the treatment of glaucoma on Vale of York patients April 2012 to March 2015, by expenditure



Source: Prescribing data provided by Yorkshire and Humber Commissioning Support Unit

Detailed examination of this data reveals some interesting findings; cost variations over time (and not always the cost going up), different costs to different practices in the same year, different costs to one practice in different years, but even within the same year for a different number of items.

- *Example A* - A carbonic anhydrase inhibitor (one of the –azides) 250mg, 17 items in 12/13 cost £421. The same practice, same drug, same dose, 17 items in 14/15 cost £604. That's a 30% rise in cost in two years.
- *Example B* - A combination drug, 50mcg/5mg/ml, 65 items in 12/13 cost was £1,239 to Practice O or £19 per item. In 13/14 the same product, same practice cost £562 or £8.65 per item. That's a halving in one year.
- *Example C* – the same combination drug as above Example B, but in the branded formulation, in 12/13 £2392 for 104 items, or £21 per item.
- *Example D* - A prostaglandin analogue (one of the –prosts) 100mcg/ml, 50 items, to Practice J cost £1,108, or £22 per item. Same drug, same dose, same year (14/15) cost Practice T £768.63 or £15 per item. That's a 32% variation.

It is recommended that the Drugs and Therapeutic Committee examine this area of prescribing, perhaps with the Hospital Eye Service.

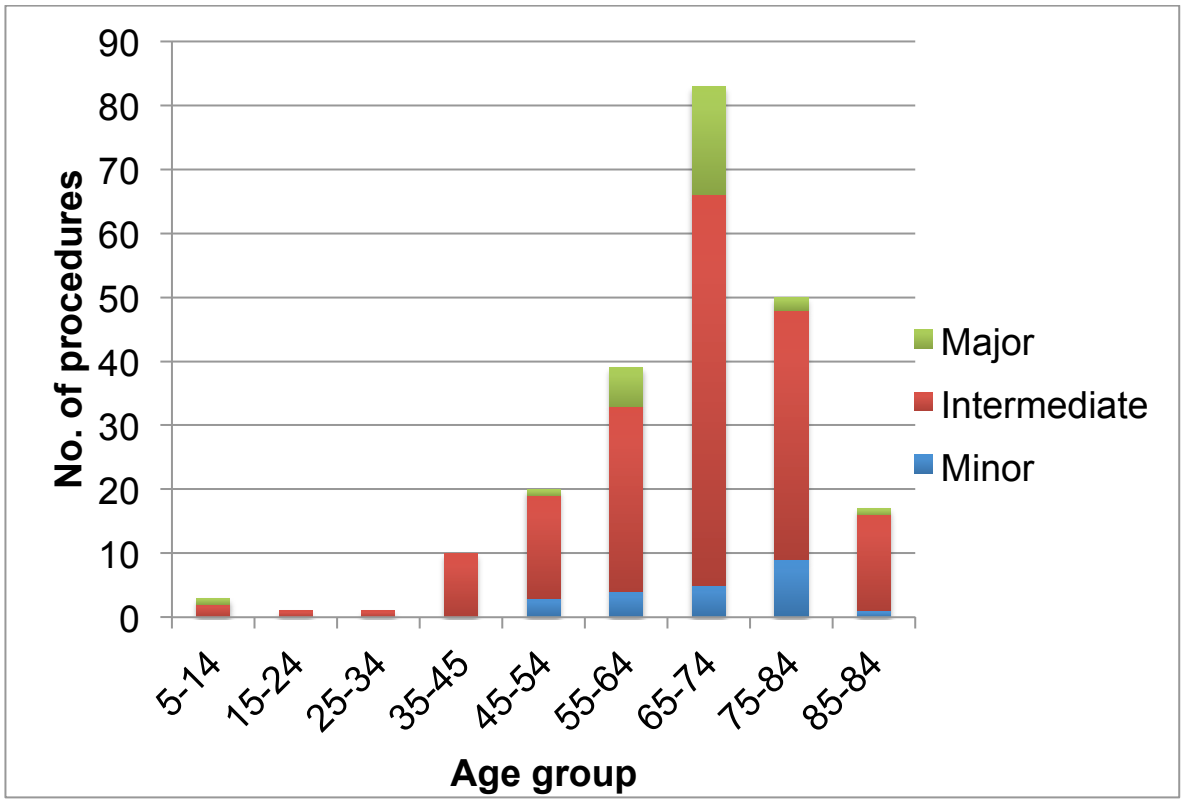
Glaucoma can rarely present as an acute condition, primary angle-closure glaucoma, which needs immediate treatment if sight is to be protected. Treatment

options include medical, either by eye drops or intravenous (IV) injection, laser treatment (laser iridotomy i.e. making holes in the iris) and surgical options, e.g. trabeculoplasty.

Sometimes surgery is undertaken for the other forms of glaucoma if there is insufficient response to medication. This includes laser treatment (laser trabeculoplasty or cyclodiode laser treatment) or surgery, commonly trabeculoplasty, which involves removal of part of the trabecular network of the eye to assist drainage thereby reducing the pressure. There are other less common procedures. NICE recommends offering patients with advanced COAG additional drugs during surgery.

In 2013/14 and 2014/15 there were a total of 196 procedures for glaucoma undertaken, HRG codes BZ17Z (Major), BZ18Z (Intermediate) and BZ19Z (Minor). These are broken down by age group and complexity in Figure 14 below.

Figure 14 Age group of patient and complexity of Glaucoma procedures undertaken at York Teaching Hospital NHS Foundation Trust, Vale of York residents only, 2013/14 and 2014/15



Source: Ophthalmology data provided by YTFT Information Team on 3 August 2015

9.3.4 Local services

Generally, initial detection relies on the opportunistic case finding ability of routine sight testing. The National Patient Safety Agency reported in 2009[64] that a number of patients had suffered visual loss when follow-up appointments in Hospital Eye Services were delayed, and this prompted many areas, including York and North Yorkshire to introduce a community optometry local enhanced service (described in Section 10.3.1). These schemes involve undertaking an additional repeat measurement with a different technique in the optometric practice with the intention of decreasing the number of false positive referrals to the hospital eye service but are not part of the care of patients with diagnosed glaucoma.

Management of people with glaucoma should be with acute care rather than primary care – i.e. hospital rather than GP. The GP's role is to prescribe the medicines recommended by the Ophthalmologist, and make sure people are complying with medication, at least to the extent that that is possible, and to check periodically that the patient has attended the Hospital Eye Service.

Glaucoma patients should be routinely reviewed in outpatients (the glaucoma monitoring clinic). This is often managed by the Hospital Eye Service's own optometrists. However, not all patients are suitable for this as they may have other conditions which complicate the assessment and require an Ophthalmologist. Rarely a person is discharged if they are very frail or further monitoring of their glaucoma will not change their treatment. Unfortunately the data provided by York Hospital does not allow us to see the number of unique individuals, nor how often they attend.

The management of glaucoma is an area that is ripe for interagency audit, and the establishment of a monitoring process examining how vision changes over time. It is recommended that consideration be given to the establishment of a confidential enquiry /look back exercise to a sample of people who have been Certified (CVI) to identify areas for improvement in the system.

[64] National Patient Safety Agency 2009. Rapid Response Report NPSA/2009/RRR004: Preventing delay to follow up for patients with glaucoma.

9.4 Cataract

9.4.1 Description

A cataract is the development of irregularities in the structure of the crystalline lens that leads to a reduction of transparency. There are several different types, which produce slightly different symptoms, for instance blurring, glare and loss of contrast. Most cataracts are age-related and cause no physical harm to the eye. Prevalence estimates vary widely depending on the criteria used to define a cataract, for instance degree of opacity of the lens. In terms of needs assessment we are more concerned with the degree to which the cataract impacts on a patient's quality of life and how keen they are to have it removed.

The National Eye Health model (as used in the RNIB Sight Loss Data Tool) was designed to estimate the prevalence of surgical cataracts, i.e. cataracts that were affecting the patient's vision sufficiently to consider surgery.

9.4.2 Local prevalence

Data on the local prevalence of cataract (deemed to be severe enough to consider surgery) is available from modelled estimates from the RNIB Sight Loss Data Tool (including calculated best guess for Vale of York population).

The model, as shown in Table 20 below, shows the number of people living with a cataract in the CCG area showing a net increase of about 100 per year over the next 5 years.

Table 20 Prevalence of Cataract as modelled from RNIB Sight Loss Tool with Best Guess calculation

Estimated number of people living with cataract

In 2015	York	North Yorkshire	East Riding	Vale of York Best Guess
Number of people living with cataract	2,139	7,683	4,441	3,920

Estimated number of people living with cataract

In 2020	York	North Yorkshire	East Riding	Vale of York Best Guess
Number of people living with cataract	2,405	8,979	5,251	4,479

Source: RNIB Sight Loss Data Tool, using HSCIC Registered Blind and Partially Sighted People. Year ending 30 March 2014. Vale of York Best Guess derived from the source data.

9.4.3 Interventions and prevention

9.4.3.1 Decision to have surgery

The only effective intervention is cataract extraction by surgery. Before a patient and their doctor decide whether that is the right route from at any given point in time, the patient should fully understand the procedure, its benefits and its risks. According to the VoY CCG's online Referral Support Service (RSS) the patient should only be referred for surgery if they accept a 1 – 2 % risk of complication, including visual loss. Patients are sent to the Optometrist Cataract Referral Refinement Scheme, which Vale of York CCG commissions from local optometrists. Cataract referral pathways such as these have been found to significantly improve the number of patients who have surgery on referral to secondary care by filtering out patients who do not wish to have surgery in advance[65].

Guidance for people with Learning Disabilities with cataract is available in Easy Read on the Seeability website

The current Local Enhanced Service commenced in 2011 and is offered by the majority of optometric practices in the Vale of York area.

The aim was to reduce the number/percentage of patients who are referred to hospital but who then do not proceed to surgery (i.e. to increase the conversion rate). Under the Cataract Referral Refinement scheme, the Optometrist undertakes the following:

i) Diagnose cataract

ii) Provide patient with information leaflet, as supplied by the Commissioner

iii) Assess patient's suitability and willingness to undergo cataract surgery, including counselling on the risks and benefits of surgery, in accordance with the inclusion/exclusion criteria

iv) Use of the 'Cataract Score' to support decision-making, and which should not replace clinical judgement regarding appropriateness of referral. This form is not required if the patient fulfils the visual criteria.

v) Complete referral form and fax it to the patient Choice Office where the range of providers is discussed with the patient and the referral sent to the relevant provider.

The expected outcome was 90% conversion to surgery from the service.

The Nous Report suggested that the conversion rate for referral for cataract was 99%, however a source in the Ophthalmology Department said that this did not seem correct. It is not known how many patients opt not to have surgery after this

[65] Lash SC, Prendiville CP, Smason A, Lewis K, Munneke R, Parkin BT (2006) "Optometrist Referrals for Cataract and "Action on Cataracts" Guidelines: Are Optometrists Following Them and Are They Effective?" Ophthalmic and Physiological Optics 2006 September;26(5)464-7

optometrist intervention. There has been no formal evaluation, audit or collection of patient feedback from this service. This is clearly an area in need of management; establishing information to be collected by which parties, tracking patients and recording outcomes, with two-way flow of information.

9.4.3.2 Criteria for surgery

The CCG will only fund surgery if certain criteria are met including objective loss of visual performance, subjective loss when the patient experience dim light, glare or difficulty accomplishing everyday activities, and consideration is given to other factors, such as deafness, immobility, living alone or caring responsibilities. There has recently been discussion about amending the policy threshold, e.g. around visual acuity or the cataract scoring form.

Since 2010, many commissioners in England have sought to limit access to surgery, particularly second-eye surgery, as a means of reducing costs to manage budgetary restrictions. Between 2010 and 2013, there was a decrease in the national (English) rate of admission for cataract surgery.

Second eye surgery will be decided in the ophthalmology clinic or at follow up. Nationally about 40% of people undergo cataract surgery on both eyes.

There is an almost three fold variation in rate of cataract surgery in England, from 285 to 804 per 100,000, which cannot be fully explained by variation in risk factors for the development of cataract[63]. There are no recent estimates of expected cataract surgery rates based on need. The Royal College of Ophthalmologists have used the average rate based on Hospital Episode Statistics from 2011 to suggest that a rate of 530 per 100,000 or 3200 per 100,000 over 65 years would be a reasonable level to expect. For Vale of York this would be 1,855 cataract procedures per year. The actual rate for the last 2 years (13/14 and 14/15) has been uncannily close to this, at 1862 procedures.

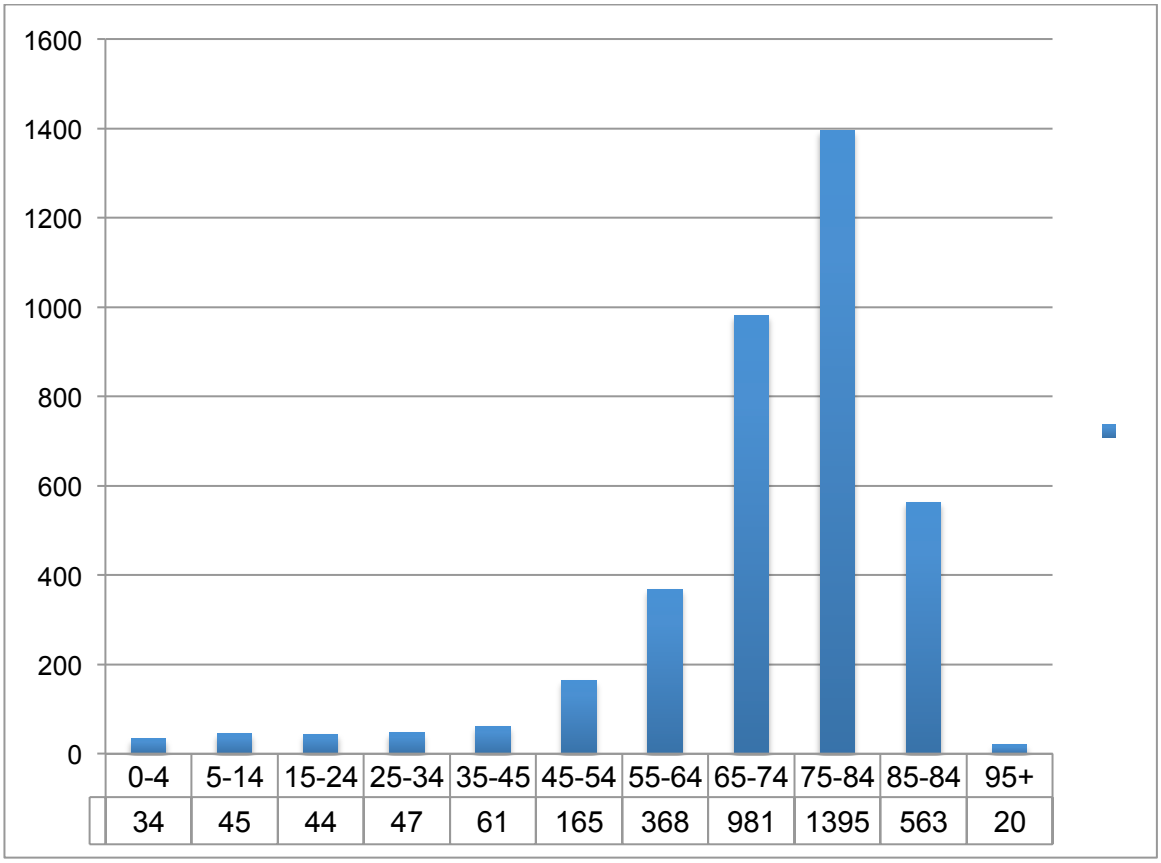
Unlike many other areas of healthcare, the English Longitudinal Study of Ageing found that wealth / deprivation was not related to likelihood of having cataract surgery, and neither was private insurance coverage. In contrast, patients reporting receiving a recommendation for cataract surgery by a medical professional increased the likelihood of undergoing treatment by a very large amount, more than five times the rate of those who did not receive such a recommendation even after controlling for other factors[10].

9.4.4 Surgery

During surgery the clouded natural lens is removed and clear vision restored with an implanted artificial lens. The commonest procedure used in York Hospital (and elsewhere in the country) is phacoemulsification (breaking up the cataract using

sound waves) cataract extraction and insertion of lens, procedure codes C712 and C751. Data covering April 2013 to March 2015, for Vale of York patients only, was provided by York Hospital. Over this two-year period there were 3,723 procedures undertaken, or about 35 a week, for all 52 weeks of the year. The age breakdown of patients having this procedure performed is given in Figure 15 below. Please note that this distribution is of procedures, not patients, so if a patient has 2 procedures, i.e. both eyes done, they will appear twice in the total. In this time period 912 individuals had 2 cataract procedures, (and 3 were recorded as having 3 procedures, obviously an error). Of course we do not know how many of the patients having one procedure in this period had already had one done prior to April 2013, nor indeed after the end of March 2015. But we can say that in a two year period a third of patients will have had cataract procedures on both eyes.

Figure 15 Age distribution of cataract procedures (C712 and C751) undertaken by YTFT on Vale of York patients, April 2013 to March 2015



0-4	5-14	15-24	25-34	35-45	45-54	55-64	65-74	75-84	85-84	95+
34	45	44	47	61	165	368	981	1395	563	20

Source: Ophthalmology data provided by YTFT Information Team on 3 August 2015

9.4.5 Post-operative follow up

Not all patients who have had cataract surgery require follow up at the Hospital Eye Service. A local CCG (Scarborough and Ryedale) is running a pilot whereby post-op cataract patients are managed by optometrists and re-referred back in for second eye if required, as well as having their new prescriptions and glasses if required.

York Hospital Register has a category "Post Cataract", which had 869 registrants on 1st August 2015. These are people who have had cataract surgery, and need some form of further follow up by Ophthalmology, although because of the way the Register is used, the follow up may not necessarily be related to the cataract.

9.4.6 Factors affecting the development of cataract and scope for prevention

Ageing

The prevalence of cataract increases with age[66]. Sadly this risk factor is not amenable to change

Smoking and other exposures

Smoking has been implicated in increased prevalence of nuclear and posterior subcapsular cataracts[67] as has increased ultraviolet (UVB) exposure such as may be found in frequent sunbed use or foreign travel[68].

Associated conditions

Patients with diabetes have approximately twice the risk of developing a cataract[69] and the risk is increased if the blood sugar level is poorly controlled[70]. The Blue Mountain and Beaver Dam eye studies noted increased cataract prevalence amongst patients with diabetes[66]. In fact under the age of 60, diabetes carries a relative risk of 3 to 4 times that of the non-diabetic population. Glaucoma has been recognised for several decades as being associated with cataract formation in some people, and it is possible the surgery for glaucoma can cause cataract.

[66] Frost A, Hopper C, Frankel S, Peters TJ, Durant J, Sparrow J (2001)"The Population Requirement for Cataract Extraction: A Cross-Sectional Study" Eye 2001 December 15(6):745-53

[67] Kelly SP, Thornton J, Edwards R, Sahu A, Harrison R (2005) "Smoking and Cataract: Review of Causal Association" Journal of Refractive Surgery 2005 December; 31(12):2395-404

[68] Klein BE, Klein R, Lee KE "Incidence of Age–Related Cataract over a 10 Year Interval: The Beaver Dam Eye Study" Ophthalmology 2002 November; 109(11):2052-7

[69] Rowe NG, Mitchell PG, Cumming RG, Wans jj. Diabetes, fasting blood glucose and age-related cataract: the Blue Mountains Eye Study. Ophthalmic Epidemiol 2000;7(2):103-14.

[70] Leske MC, Wu Sy, Hennis A, Connell AM, Hyman L, Schachat A. Diabetes, hypertension, and central obesity as cataract risk factors in a black population. The Barbados Eye Study. Ophthalmology 1999;106(1):35-41

Medical

Several drugs have the potential to cause cataract, the most important of these being steroids[71]. Prolonged use of topical (on the skin e.g. ointments), inhaled and systemic (tablets or injections) steroids for conditions such as rheumatoid arthritis and chronic obstructive pulmonary disease is associated with dense cataract formation.

Strategies to increase protection from UV radiation, and tobacco control strategies could be helpful in reducing the incidence and progression of cataract (see Section 5 Prevention).

[71] http://www.nhs.uk/Conditions/Corticosteroid-(drugs)/Pages/Sideeffects.aspx

9.5 Diabetic Eye Disease (Diabetic Retinopathy)

9.5.1 Description of diabetic eye disease

Diabetic retinopathy is a process of change in the very small blood vessels at the back of the eye (the retina); new blood vessels start growing on the surface of the retina. The majority of people with diabetes do not have any retinopathy. However, a minority have macular oedema or proliferative retinopathy that, untreated, may lead to visual impairment (sight-threatening retinopathy). Diabetic retinal disease is the commonest cause of visual impairment in patients with type 1 diabetes, but not in type 2, where cataract takes over as the most common cause. This is not to say that people with Type 2 do not suffer retinopathy because indeed they do, and it can cause sight loss, it is just that cataract is *more* prevalent.

Diabetic retinopathy is the leading cause of blindness in the working age population in the developed world, but was recently taken over in Britain by genetic causes of blindness such as retinitis pigmentosa.

The development of the condition starts as background retinopathy which is very common when a person has had diabetes for a number of years, but can progress – the blood vessels may bleed and proliferate (i.e. grow) – this gives proliferative retinopathy. Another part of the process is that the vessels may swell up and leak fluid, which affects the central part of the retina – the macula. This gives rise to diabetic maculopathy. If left untreated, it can lead to sight loss, but with prompt identification and treatment of the disease, these effects can be reduced or avoided completely.

There are around 2.5 million people with diabetes in England and diabetic retinopathy is the commonest complication. Surveys show that at any one time, up to 10% of people with diabetes will have retinopathy requiring follow up or treatment by an eye specialist and reported baseline retinopathy levels are present in 39% of men and 35% of women with newly diagnosed Type 2 diabetes. A study in Scotland showed that 0.21% of people with diabetes have a chance of going blind, and 0.064% will go blind every year. If these figures are applied to England, this means that an estimated 4,800 people have the chance of going blind and 1,280 people would go blind if there was no systematic screening programme in place. Through screening, for every 2 people treated to prevent blindness, the sight of 1 person will be saved.

9.5.2 Prevalence of diabetes

The prevalence of diabetes in the Vale of York population over 17 years of age is 15,070 according to GP records as submitted as the Quality and Outcomes Framework (QOF) returns to the Health and Social Care Information Centre

(HSCIC). It is estimated that there will be an additional 3,600 people with diabetes who are not yet diagnosed, according to the Diabetes Prevalence Model using data from Health Survey for England[72].

The North Yorkshire Diabetic Eye Screening Programme covers the population living in North Yorkshire and York; technically it covers patients of the practices registered n the 7 CCGs in the area. In the 14/15 year there were over 40,000 individuals on the Register. As reported in Section 8.3.2, 33% of people with diabetes have background retinopathy, and 3.2% have non-proliferative and proliferative retinopathy (combined). Applying this to the Vale of York population, there will be 4,975 people with background retinopathy, and about 480 people with proliferative or non-proliferative retinopathy.

Number and rate of people losing their sight, according to Certificates of Visual Impairment (CVI) issued, due to Diabetic Eye Disease in the Vale of York area is shown below in three different ways. N.B. Where the count is less than 5 the Health and Social Care Information Centre suppress the data. "Similar" in this context means that the difference in rate is not statistically significant.

Table 21 Crude rate of sight loss due to diabetic eye disease in those aged 12+ per 100,000 population, 2013/14

Area	Number (count)	Rate per 100,000	Compared to England
York	8	4.50	similar
North Yorkshire	14	2.66	similar
East Riding of Yorkshire	11	3.72	similar
Best guess Vale of York	11	3.82	similar
England	1563	3.39	N/A

Source: Public Health Outcomes Framework, Public Health England, accessed September 2015

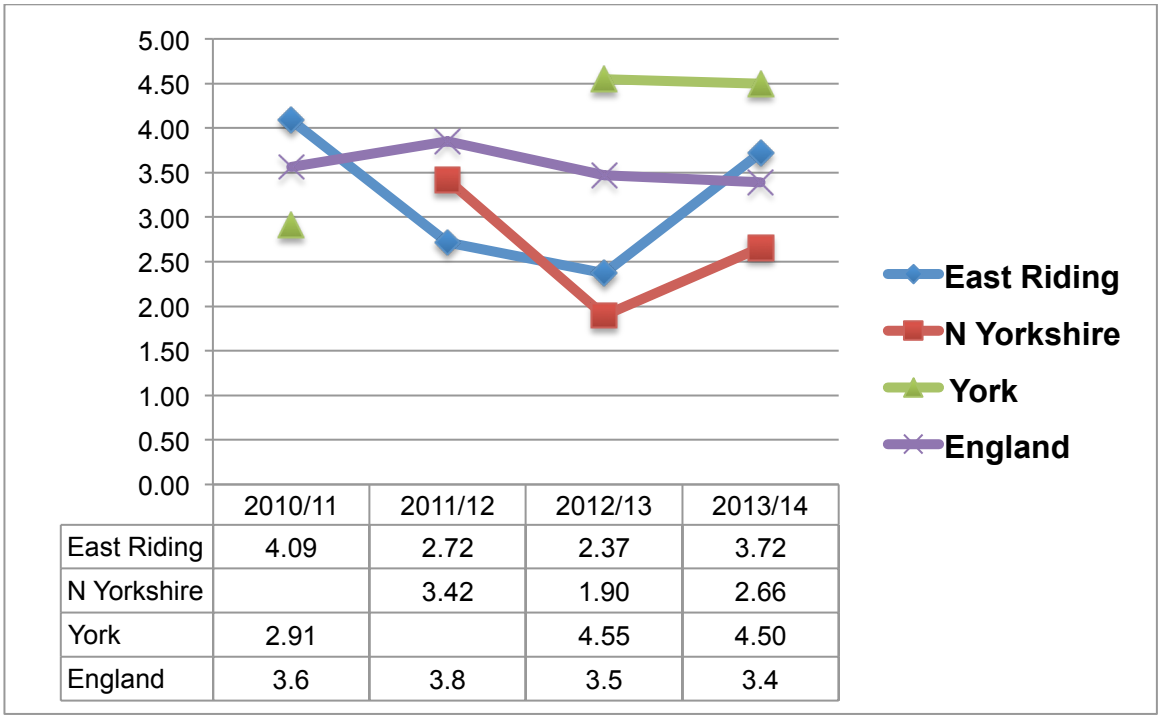
[72] Cardiovascular disease profile, Diabetes. Public Health England, March 2015 *http://www.yhpho.org.uk/ncvincvd/pdfs/Diabetes/03Q_Diabetes.pdf*

Table 22 Number of people losing their sight due to diabetic eye disease by local authority 2010/11 to 2013/14

	East Riding of Yorkshire	North Yorkshire	York	Grand Total
2010/11	12	<5	5	17
2011/12	8	18	<5	26
2012/13	7	10	8	25
2013/14	11	14	8	33
Grand Total	38	42	21	101

Source: Public Health Outcomes Framework, Public Health England, accessed September 2015

Figure 16 Trend in rate of people losing their sight due to diabetic eye disease by local authority and England 2010/11 to 2013/14



	2010/11	2011/12	2012/13	2013/14
East Riding	4.09	2.72	2.37	3.72
N Yorkshire		3.42	1.90	2.66
York	2.91		4.55	4.50
England	3.6	3.8	3.5	3.4

Source: Public Health Outcomes Framework, Public Health England, accessed September 2015

The overall message from the data is that overall number of people with diabetes losing their sight is very small (thankfully) and therefore year-to-year we see large variations, but the overall trend is more or less static, with a very slow decline detectable at the national level. Whilst this rate of decrease may seem disappointing considering that Diabetic Eye Screening Programmes have been in place for 15 to 20 years now, it is in fact doing considerably better than these data would suggest as the prevalence of diabetes is increasing. There are currently estimated to be 18,705 people with diabetes in the Vale of York (registered) population[73] (6.6% of the

[73] http://www.yhpho.org.uk/DEFAULT.aspx?RID=154049, accessed 14 September 2015

population) although the number of people diagnosed and registered with diabetes is some 3600 less than this. If current trends continue, the national prevalence of diabetes is projected to be 9.5% by 2030, due to ageing, changing ethnic mix (South Asians in particularly have a greater propensity to develop diabetes) and increasing obesity. This means that by 2030 there will be in excess of 30,000 people with diabetes in the Vale of York population.

York Hospital Register listed 2752 people with diabetes; these are the people from the screening programme who have been identified with some degree of retinopathy who need closer follow up and perhaps treatment. However, as discussed elsewhere the non-systematic way in which the register has been assembled mean that it is of little use for population needs assessment.

9.5.3 Interventions and prevention

Type 1 diabetes cannot be prevented, but up to 80 per cent of cases of Type 2 diabetes can be delayed or prevented by making lifestyle changes. The situation is complex as it's the combination of our genes and our lifestyle that influences the development of Type 2 diabetes, but maintaining a healthy weight, being active and eating a healthy diet all contribute to reducing the risk of diabetes.

York and Selby have a wide range of leisure activities aimed at those who do not see themselves as "sporty" but want to be more active, including Health Walks, led cycle rides, back to swimming and a very wide range of taster sessions. All of these can delay the development of diabetes and help achieve good blood glucose control once diabetes has developed.

Major international trials have found risk factors that increase the chances of developing diabetic retinopathy, including:

- Poor glucose control
- High blood pressure
- Raised serum lipid levels (e.g. type of cholesterol)
- Smoking
- The length of time a person has had diabetes[74]

In patients under age 11 it takes 5 to 6 years for retinopathy to progress. The rate starts progressing during puberty; in those 12 years and over it takes one to two years,

9.5.4 Detection of and intervention for the condition

Unlike other eye diseases, there is a National UK Screening programme for diabetic eye disease (see section 8.3 in the Screening chapter). The programme means that those people registered with a GP who have diabetes are invited to attend for annual screening in which images of the eye are taken and examined for signs of the

[74] http://www.eadesp.co.uk/faqs.html

disease. The detection of referable retinopathy or an inability to obtain gradable screening images triggers referral to the hospital eye service. If disease is detected, people are referred for treatment.

The main treatment for diabetic retinopathy is some form of vitreoretinal procedure, either just laser treatment, or with an operation (vitrectomy) undertaken in advanced cases. If the condition does not respond to laser treatment, intravitreal injections of a steroid (triamcinolone) are made. There are also treatments using anti-VEGF agents e.g. ranibizumab (Lucentis) which NICE has recommended as an option for treating visual impairment caused by macular oedema, but only if treatment with laser photocoagulation has not been beneficial, or when laser photocoagulation is not suitable because of the extent of macular haemorrhage and only if the manufacturer provides ranibizumab with the discount agreed in the patient access scheme revised in the context of NICE technology appraisal guidance 274[75]. Earlier sections (see 9.2.3) discuss the possible change to using bevacizumab.

As reported in section 8.3 North Yorkshire DES Programme has been struggling to meet the minimum standard for getting people into treatment when they have been found to require treatment especially the urgent cases (R3 retinopathy) who are supposed to be seen within 2 weeks. The reasons for this are felt to be:

- two weeks is very short notice for people who, on the whole, have not prioritised diabetes high in their "to do" list (poor control is linked to the development of retinopathy)
- stable, treated "veteran" patients may not feel any urgency to get treated within two weeks (as opposed to, say, 4 weeks).
- small numbers, so subject to wide variation, 1 or 2 patients either way can make a very big % difference

In the case of the "non-urgent" referrals (for R2 retinopathy) for which the target is 13 weeks, the delays are less related to patient availability and more to clinic capacity. The clinics are already full with follow-ups, and accommodating doctors' leave and sickness means clinics are sometimes cancelled. It is a balancing act between seeing patients to meet the 13 week wait and not cancelling patients who are already booked and may have waited 9 months, and are at unknown risk.

Increasing capacity with a limited number of appropriately trained consultant staff is difficult – especially as there is so much demand for new treatments which are more labour intensive (e.g. needing monthly treatment with antiVEGF Lucentis injections) and it is the same staff who treat diabetic eye disease who also treat AMD and retinal vein occlusion patients, for which demand is growing.

Potential solutions include:

[75] https://www.nice.org.uk/guidance/ta274

- the surveillance clinics with OCT scanners being established in the community will mean that fewer patients will be referred from the North Yorkshire DES Programme, and some stable patients who have been treated in hospital surveillance clinics can be transferred.
- scope for some “virtual clinics” for R2 retinopathy. The Hospital Eye Service could organise “wide-field” photo virtual and human-virtual clinics. These virtual clinics allow a doctor to see slightly more patients than they would normally see, but also means that e.g. optometrists or DES Programme approved screener-graders could be trained to review the images.

9.5.5 Vitreoretinal procedures

These are procedures to the structures at the back of the eye, i.e. the retina and the jelly-like material that fills the chamber (the vitreous humour). They are undertaken for diabetic eye disease leading to vitreous haemorrhage (bleeding into the usually clear gel) and proliferative retinopathy (as discussed in Section 8.3) but also for various other conditions including retinal detachment, epiretinal membrane, a macular hole, endophthalmitis (infection in the eye), removal of foreign body, including retrieval of the lens nucleus following complicated cataract surgery.

The activity data from York Hospital does not separate the procedure by cause of the damage, merely by the procedure, so it is not possible to say how much of the activity shown in Table 23 is due to diabetic eye disease. It is likely that York Hospital could easily extract the number of vitreoretinal procedures are undertaken on Vale of York patients that are diabetes-related. There were 255 vitreoretinal procedures performed on Vale of York patients in 13/14 and 14/15 combined. The most common procedure by far was C729, which is a “vitrectomy by pars plana approach”, this procedure is creating the opening which will then be used in a number of other procedures and it was undertaken in 94% (239 of the 255) of the total procedures. The procedures are grouped into four categories depending on complexity, with category 4 being the most complex.

In the table we also show the complex cataract surgery which required a vitreoretinal approach – there were 8 procedures in this category, which when combined with the cataract procedures undertaken, 3,723, as given in section 9.4.4, we obtain a rate of 2 in every thousand (0.2%) requiring a complex procedure to retrieve the lens during or following the cataract surgery.

Table 23 Vitreoretinal procedures by type and by age group for Vale of York patients 13/14 and 14/15 combined

Procedure code and age group	Enhanced Cataract Surgery	Vitreous Retinal Procedures - category 1	Vitreous Retinal Procedures - category 2	Vitreous Retinal Procedures - category 3	Vitreous Retinal Procedures - category 4	Grand Total
C792	8		70	143	18	239
15-24				6	1	7
25-34	1		3	7		11
35-45			5	7	1	13
45-54	1		6	24	2	33
55-64			16	33	2	51
65-74	3		19	52	8	82
75-84	2		17	11	3	33
85-84	1		4	3	1	9
C795		2	5			7
45-54			1			1
65-74			3			3
75-84		1	1			2
85-84		1				1
C822		3	1	2		6
15-24		1				1
45-54		1				1
55-64				1		1
65-74			1	1		2
85-84		1				1
C851		3				3
75-84		3				3
Grand Total	8	8	76	145	18	255

Source: Ophthalmology data provided by YTFT Information Team on 3 August 2015

9.6 Uncorrected refractive error

9.6.1 Description

Refractive error can be defined as an error in focussing light by the eye which often causes blurred vision. It can affect both distance and/ or near vision and is caused by the physical shape and structure of the eye. It can change over time the most common of these being the natural loss of focussing with age called presbyopia. Other conditions are hyperopia (or long sight), myopia (or short sight) and astigmatism where the front eye shape is oval rather than round.

Correction of refractive error is beneficial at all stages of life. In childhood, visual development can be adversely affected if refractive errors are left uncorrected, especially if the error is different between eyes or the child has strabismus (squint) as these conditions can give rise to amblyopia in the longer term. Amblyopia occurs where vision cannot achieve normal levels in the affected eye even if spectacles are prescribed later in life. Not wearing spectacles when they are needed also leads to reduced academic attainment and may limit future career options.

For people of working age the visual demands of modern occupations mean that a good level of eyesight is required e.g. for VDU work or driving.

Older people often experience changes in refractive error related to the onset of conditions such as cataract. Poorly corrected / uncorrected refractive error has been associated with falls in the elderly.

At all ages the onset of change may be gradual so it may not be immediately realised that vision levels are reduced or no longer sufficient for driving. Hence, routine eye examinations are a required to ensure all errors are detected.

9.6.2 Local prevalence

It is estimated that 6% of children at age 6-7 years and 10% of children at age 12-13 may have a refractive error[76]. Not all of these children will present with symptoms or be found at school entry screening[77].

In adults, there is little data for those aged between 18 and 30 years. For adults aged 30-70 years 40% will have a refractive error[78]. Although those that regularly

[76] O'Donoghue L, McClelland JF, Logan NS, Rudnicka AR, Owen CG, Saunders KJ (2010) "Refractive Error and Visual Impairment in School Children in Northern Ireland" British Journal of Ophthalmology 2010 doi10.1136/bjo2009.176040

[77] O'Donoghue L, Rudnicka AR, McClelland JF, Logan NS, Saunders KJ (2012) "Visual Acuity Measures do not Reliably Detect Childhood Refractive Errors: An Epidemiological Study" PLoS ONE 7(3):e34441 doi 10.1371/journal.pone.0034441

visit the optometrist may already have glasses, they may not always wear them when needed. There is likely to be significant levels of refractive error present in the remainder of the population who do not have regular sight tests.

It is estimated that 50% of preventable visual impairment in the older population is due to refractive error and cataracts. Of this, approximately one quarter is due to refractive error[79]. Taking into account the overall prevalence of visual impairment this would indicate that 1-4% of the over 60 population has vision of less than 6/18, and 2-7% have vision of less than 6/12 because they either don't have or don't wear appropriate spectacles.

Some of these people will already have spectacles or contact lenses and others may not. In the older population we can isolate those who are likely to be uncorrected from those already wearing spectacles.

9.6.3 Interventions and prevention

Although it used to be thought that there was nothing to be done to prevent refractive error from occurring; recent epidemiological studies indicate environmental effects can influence the development of short-sightedness (myopia). It is now clear that myopia results from the interaction of environmental and genetic factors. In Singapore an increase in the prevalence of myopia in young adults has risen from 26% to 43% over a decade, reaching 65% in university graduates. Within the Singaporean population, both the prevalence and degree of myopia correlate with the time spent in full time education.2

However by correcting the refractive error in children we can prevent amblyopia occurring, thus maximsing the child's potential vision in the future. This is one of the principal aims of orthoptics. In groups less likely to access NHS Sight Tests the window of opportunity for correction may be lost causing further inequalities in health status. This is one of the principal arguments for universal screening of children while they are in school, and demonstrates the importance of making sure that efforts are made to capture all children for screening, **particularly those with erratic attendance.**

Fortunately corrective lenses, i.e. eyeglasses or contact lenses are an easy way to correct refractive errors. Again, in the groups less likely to wear glasses health inequalities will widen.

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[78] Hyams SW, Pokotilo E, Shkurko G (1977)"Prevalence of Refractive Errors in Adults Over 40: A Survey of 8102 Eyes" British Journal of Ophthalmology 1977 61 428-48

[79] Tate R, Smeeth L, Evans J, Fletcher A, Owens C, Rudnicka A (2005) "The Prevalence of Visual Impairment in the UK: A Review of the Literature" London RNIB

Different types of lens options, frame design and lens coatings for various purposes helps people maximise their vision.

There are two different types of eyeglass lens designs: **single vision**, a lens that focuses for one distance and maybe worn for distance or near vision, and **multifocal**, designed to correct both distance vision and near vision. **Bifocals** have a correction for close work on the bottom half of the lens and another for seeing at a distance on the top. **Trifocals** are lenses with three different lens corrections — distance vision, intermediate vision, and near vision — in one set of eyeglasses. **Progressive lenses** (e.g. Varifocals) function generally the same way as bifocals or trifocals; however, they have a smooth transition between distance and near focal areas instead of visible dividing lines. While the invisible transition of progressive lenses may be more aesthetically pleasing, the focal areas are relatively small because more lens space is used for the transitional areas. Progressive lenses cause more distortion than other types of lenses, making them more difficult to wear for approximately 10 percent of the population. All multifocal lenses can distort depth perception, which may make it more likely for a person to fall.

When a person is found to need corrective eyewear after an NHS eye test, a voucher is issued to any eligible patient. The vouchers offer help towards the cost of a pair of glasses of the patient's choice. There is no longer a set range they have to choose from. The patient receives more money for more complex lenses. The vouchers range in value from £37.50 to £207.20 (2012 prices). Of the people attending for a Sight Test, nearly two thirds (64%) received a new or changed prescription. The average interval between tests (all ages combined) is 27 months. For adults of working age the figure is 30 months[80].

About two thirds of adults in Britain wear some form of corrective eyewear. In an on-line survey 51% of 18 to 29 years olds, 55% of people in their 30s, 65% of people in their 40s and 93% of people over 50 wore corrective eyewear. Those replying to an on-line survey are not likely to be completely representative of the whole population and in acknowledgement of that the survey supplemented the online version with

[80] Optics at a glance 2012. Optical Confederation, November 2013.

telephone calls to people in minority ethnic groups. They found that while a third of those of white ethnic origin do not wear any form of corrective eyewear, this increases to 46% in Asian people and 47% of African-Caribbean people[80].

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9.6.4 Local services

Sight tests are the only way to reliably detect and prescribe lenses that can fully correct refractive errors. The vast majority of NHS sight tests are carried out by community optometrists under General Ophthalmic Services (see section 8.2 and section 10 following). A small number are undertaken by Ophthalmic Medical Practitioners (doctors trained to do sight tests, usually working as locums in community optometrists). All people aged under 16 and over 60 years of age are automatically entitled to free NHS tests. Between these ages NHS sight tests may be obtained only if a person has diabetes or glaucoma or a close relative with glaucoma, if they are in receipt of some government benefits e.g. tax or pension credits or if they require a prescription for complex lenses, for instance in extreme myopia.

Eligibility for free NHS Sight Tests are given in section 10.1.1. NHS sight tests currently account for an estimated 70% of all eye examinations[80].

10 EYE CARE IN PRIMARY CARE – OPTOMETRISTS

10.1 Sight Tests

According to the Sight Testing (Examination and Prescription) Regulations, it is the optometrist's duty to perform, for the purpose of detecting signs of injury, disease or abnormality in the eye or elsewhere:- an examination of the external surface of the eye, and an intra-ocular examination. Optometrists have a duty of care to refer patients to other appropriate professionals – usually ophthalmologists – where disease or abnormality of the eye is detected.

Nationally, just over half of the population (52%) view sight tests as 'very important' with women more likely than men to view them that way (59% compared to 45%). However, five per cent of people over 40 said they had not been for a sight test for at least 10 years or could not recall when they last went. This rises to 11% of people from ethnic minorities questioned, a particular concern as people from some ethnic minorities are at increased risk of particular eye conditions. A quarter of parents (25%) said their child had never had a sight test and almost one in ten parents either couldn't recall when their child last had a sight test, or said it was more than ten years ago[6].

10.1.1 NHS Sight test eligibility

NHS Sight tests are available free to those

- aged under 16, or under 19 and in full-time education
- aged 60 or over
- registered blind or partially sighted
- diagnosed with diabetes or glaucoma
- aged 40 or over and a parent, sibling or child of a person with glaucoma or have been advised by an ophthalmologist that you are at risk of glaucoma
- eligible for an NHS complex lens voucher
- a prisoner or on leave from prison

There are also a range of means-tested benefits which bring entitlement:

Income Support, Job Seeker's Allowance, Income-based Employment and Support Allowance, Universal Credit,

Possession of: a valid NHS Tax Credit Exemption Certificate, or an NHS Certificate for full help with health costs (HC2)

10.1.2 NHS Sight tests from mobile settings

An optometrist can visit the following places to undertake an NHS Sight Test

- home – for people who are unable to leave home unattended due to physical or mental illness or disability
- a residential/care home - for people who are unable to leave their home unattended due to physical or mental illness or disability
- a day centre – if getting to an optometrist is not possible because of physical or mental illness or disability or there are communication difficulties in communicating their health needs unaided

It is worthy of note that schools, whether mainstream or special schools do not qualify as a setting where optometrists can undertake mobile Sight Tests, even though they may have pupils who fulfil the criteria for the three settings above, and would benefit from being in a familiar setting with the support workers they are used to, and who are experienced in communicating with them.

10.2 Referral pathways

Nationally 5% of NHS Sight Tests result in referral to GP or hospital (figure not broken down)[80].

Optometrists in North Yorkshire and York send most of their hospital referrals to the Choice team where they are assessed by administrative triage first. Children, cataracts, urgent referrals and those already assessed by an optometrist in the Local Enhanced Scheme (LES) are directed to secondary care. The remainder such as those from non-accredited optometrists and GPs are subject to clinical triage and referred into the LES or into secondary care or back to the GP. If the referral is an emergency then the optometrists referral maybe by telephone direct to the ophthalmologist on call for assessment and appointment. If the referral is urgent but not requiring same day treatment then referral is by Fax to the GP. All optometrists have an NHS net address so there is possibility of electronic referral.

Referrals to local pharmacies should be considered for certain conditions. See later sections 10.4 and 12.1.

10.3 Existing Community Optometry local services

10.3.1 Community Eye Care Local Enhanced Service for Routine Referrals
This Local Enhanced Service (LES) covers two services under the one contract:

1. A Minor Eye Conditions Scheme (MECS)
2. Repeat intraocular pressure (IOP) reading and/or visual fields assessment for suspected glaucoma.

The current version of the LES was commissioned in 2011 and at its inception 63 practices across North Yorkshire and York were contracted. All optometrists were accredited using both online learning and practical assessment.

Service aims are:

> To optimize the flexibilities and scope enabled by the new *GOS Contracts Regulations 2008* by commissioning enhanced services over and above the sight test from a wider range of service providers.
>
> Improve the quality and cost effectiveness of referrals from Primary to Secondary Care Outpatient Services.
>
> Invest in care services to bring care closer to people's homes, helping to avoid hospital referral and treatments where possible and ensure that Hospital Eye Service capacity and resources are protected for when care can only be provided there (*Healthier Lives,* NHS North Yorkshire and York).
>
> To help reduce Hospital Eye Service outpatient follow-up care to deliver the aim to have "no waiting" for patients needing acute hospital care
>
> To help support delivery of the 18 week performance target for ophthalmology treatment
>
> To align with and support the implementation of Primary Care Trust (PCT) commissioned local or direct enhanced service schemes that specifically include, or extend to, the routine referral of various eye conditions.
>
> To align with and support the implementation of PCT referral guidance

The Minor Eye Condition Scheme accepts referrals initiated by GPs, non-accredited optometrists and self-referring patients for the assessment and appropriate management advice for routine non-urgent eye conditions such as:

- Dry Age-Related Macular degeneration
- Blurred Vision
- Floaters and flashes
- Visual field loss
- Headaches to rule out eyes conditions as a cause
- Non-penetrating foreign bodies
- Red eyes, dry eyes and conjunctivitis

- Lid disease such as blepharitis
- Diplopia
- Pigmentary changes in fundus including peripheral degenerations, choroiditis, macula changes and choroidal naevi. This must only be performed using a fundus camera.

Under the MEC Scheme referrals for eye conditions are received into the "Choice Office" and booked into an accredited practice. Those that cannot be treated in primary care such as cataracts or conditions already assessed by an accredited practice as "not treatable in primary care" are sent to the secondary care provider of the patient's choice. Other referrals such as those from non-accredited optometrists with inadequate information and GPs are assessed by a team of 2 triage optometrists who decide if the referral is suitable for the community service or referral to secondary care. Appointments in the Optometry service must be offered within 2 days of referral receipt and patient seen within the week. Self-referrals are assessed directly by the community optometry practice. Exits from the MEC Scheme can be by:

- discharge,
- referral to GP,
- referral to secondary care (Ophthalmology)
- return for further follow-up by the optometrist.

The second Locally Enhanced Service is for patients who are found to have raised intraocular pressure (IOP) by the "puff of air" test, during a routine sight test. If during a test the patient is found to have an IOP greater than 21mmHg (millimetres of mercury – the standard measure of blood pressure and other body pressures) they need to undergo further assessment as part of refinement process for the detection of glaucoma by repeat pressure reading using a different technique (applanation tonometry) and repeat visual field assessment before deciding on referral. Patients seen at a non-accredited practice will be referred by the "Choice Office" to an accredited practice for assessment. Exits from the Repeat IOP service are:

- if tests are positive for glaucoma, referral to secondary care (Ophthalmology) for assessment, diagnosis and treatment initiation.
- if the tests are negative, i.e. the IOP is below 21 and there is no loss of visual field the patient is discharged and will go back to the usual sight test invitation by the optometrist.

There were 392 claims for the glaucoma service in 13/14 and 192 first half of 14/15. As it is not recorded or collected we cannot say how many were positive and how many negative, nor anything about disease progression. The Ophthalmology Department do not feedback to optometrists on those referred in – an area for improvement discussed elsewhere.

Neither service has been subjected to formal audit and there has been no patient feedback obtained.

The report from Nous[81] presented activity and cost data for 13/14 and projected 14/15. There was a total of 3987 claims in 13/14, and 3856 projected for 14/15. The data was from activity claims, not patient data, and therefore there are limitations to what we can derive from the data. It would seem that most patients (two thirds) are dealt with within the service, or referred back to the GP; only a third are referred on to secondary care. Most patients are dealt with in just one optometry visit, as only 10% of claims are for a follow-up visit to the Optometrist.

10.3.2 Low vision Local Enhanced Service

If the patient is found to require a low vision assessment then the optometrist refers the patient to an accredited optometrist in the community low vision service (see section 14.4).

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10.3.3 Cataract Referral Refinement Local Enhanced Service

The current Local Enhanced Service commenced in 2011 and is offered by the majority of optometric practices in the Vale of York area. The aim was to reduce the number/percentage of patients who are referred to hospital but who then do not proceed to surgery, i.e. to increase the "conversion rate". (see section 9.4.3.1).

10.4 Making better use of optometrists

Optometrists are an underused resource for health. Fewer than half of UK adults (45%) would turn to an optometrist in the first instance to find the cause of an eye problem[6]. Optometry practices should their review their marketing, and consider how they attract groups which are currently underserved, and how they should adapt the standard offer to meet the needs of special groups with special needs, such as becoming dementia-friendly, and adopting the "Safe Place Scheme" as has been rolled out in local community pharmacies throughout North Yorkshire[82].

Local Optometry practices could work in closer collaboration with their local community pharmacies and should seek to establish relationships. Pharmacies have contact with numerous patients who attend to collect medications and may not be receiving regular eye care. Pharmacists should stress the importance of having Sight Tests for people with certain medical conditions, and could feedback intelligence on why people are not attending as often as they should to help optometrists market to those groups. In East Yorkshire a joint training evening was held for optometry and pharmacy where the (pharmacy) Minor Ailments Scheme

[81] Data Analysis Report. NHS Vale of York CCG Eye Care Review. Nous Group. January 2014 (*sic*). It was actually 2015.

[82] See http://cpny.co.uk/our-news/cpny-dementia-and-safe-places-training-events/

explained to optometrists and the Minor Eye Conditions Scheme to pharmacists and training, with supporting materials, was given on eye health messages to both professions.

Optometrists could be used to promote a variety of health messages and used in stop smoking campaigns in particular because of the strength of association with Age-related Macular Degeneration. In Dudley a pilot has been set up to create Healthy Living Optometry Practices where staff have been trained to give out health messages[83].

The current commissioned Community Services (Minor Eye Conditions, Intraocular Pressures and Cataracts) were developed some years ago, and are in need of revision, particularly around:

- data collection: basic demographic data,
- details of the intervention(s) done and outcome
- consideration of where to share this data, e.g. GP, Ophthalmology Department and commissioners.

Areas to explore with a view to commissioning new local service are listed in the section following. Vale of York CCG should consider the pathway revisions which have been made in neighbouring CCGs in Harrogate, Scarborough and East Yorkshire, to prevent geographical inequalities, and also consider whether it is worth commissioning from a single provider using a single IT system.

10.4.1 Glaucoma service

Over 30% of glaucoma-related NHS Hospital Eye Service (HES)attendances are related to Ocular Hypertension and suspected glaucoma, and much of this workload could be commissioned in the community under appropriately governanced contracting. This approach has the potential to relieve the HES of significant workload and to assist with current chronic HES under capacity[84].

10.4.2 Age-related Macular Degeneration

A possible area for development is examination of people suspected of having AMD using Optical Coherence Tomography (OCT). An increasing number of optometrists have invested in purchasing an OCT machine, so it would be feasible to run a trial, and see the extent to which cases could be excluded to reduce the number of “false positives” being sent to the Hospital Eye Service.

[83] See http://dudleyloc.co.uk/hlo/

[84] Commissioning Guide: Glaucoma (Long Version) Royal College of Ophthalmologists. March 2015.

10.4.3 Learning Disability service

A new Community Service should be established for people with Learning Disability. The pathway produced by Local Optical Committee Support Unit[85] is a good model, which has been used successfully in a pilot in 3 areas in London. Should such a service be developed for Vale of York patients, it is crucial to include the 3 points above in the planning and implementation.

10.4.4 Child vision screening follow up

Another Community Service pathway produced by the (national) Local Optical Committee Support Unit is that for children failing the Vision Screening undertaken in school[86]. In this pathway the child is sent to the Community Optometrist, where in addition to the GOS Sight Test, further investigations would be undertaken by the optometrist:

- Measure unaided vision with crowded LogMAR test with patch on either eye
- Cover test (distance and near) and stereopsis
- Cycloplegic refraction 25 minutes after instillation of G. Cyclopentolate 1%
- Fundal examination – either BIO 20D or 90D or direct ophthalmoscopy

just as would be done in secondary care if the child were referred there.

The merits of instituting such a scheme would need careful consideration. Is there judged to be a problem with the hospital orthoptist-based service? Is it at capacity? Is it more expensive than it would be if the Community Optometrist pathway were introduced?

10.4.5 Traveller service

It is suggested that work be undertaken to increase the take up of eye tests by the Traveller community in North Yorkshire and York. The (York) Travellers' Trust is very keen to explore how uptake might be improved, by for instance developing a special relationship with an optician, or having a health support worker accompany the Traveller on their first visit to an optician.

[85] Community Eye Care for Adults & Young People with Learning Disabilities Pathway, Local Optical Committee Support Unit. Revised November 2013. http://www.pcc-cic.org.uk/external?url=http://www.locsu.co.uk/communications/news/?article=164

[86] Children's Vision Enhanced Service Pathway. Local Optical Committee Support Unit, July 2008, Revised 2012. http://www.locsu.co.uk/uploads/enhanced_pathways_2012/locsu_childrens_vision_pathway_rev_june_2012_1.pdf

11 EYE CARE IN PRIMARY CARE – GPS

Eye consultations make up a significant proportion of all GP consultations; in 1971 a rate of about one in 50 was reported[87]. This translates to roughly four cases seen a week per GP, with a similar rate being reported in 1987, but some GPs reported 10 or more consultations about eye problems per week[88].

However, there is significant anecdotal evidence among doctors, and also published studies[89], that ophthalmology education in the UK is inadequate. This has left many non-ophthalmologists with a poor understanding and confidence in assessing acute eye problems.

A survey of the management of eye disease in the community was carried out in two general practices over a three-month period over 20 years ago. During this time there were 238 consultations by patients with ocular symptoms, making up 2.3% of all consultations and giving an annual consultation rate for eye disease of 66 per 1000 persons at risk. The four commonest diagnoses were bacterial conjunctivitis, allergic conjunctivitis, meibomian cyst, and blepharitis, and these accounted for more than 70% of the consultations. A variety of topical and systemic treatments were used, with topical chloramphenicol prescribed in 55% of consultations. Referral to a hospital eye department resulted from 35 consultations, giving a referral rate of 15% of all eye consultations[90].

A large study of 1062 acute eye cases showed that viral conjunctivitis was the most common misdiagnosis made by GPs. In the same study, 11 patients were identified as having a "preventable severe adverse outcome" which included permanent visual loss. Ten out of these 11 cases were initially misdiagnosed as conjunctivitis[91].

A much more recent initiative devised a simple kit of 5 aids to diagnosis (pen torch with blue filter, hand-held visual acuity chart, pinhole, source of red, saline eye drops, fluorescein strips in a small plastic box) and card of the red flag symptoms requiring

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[87] Morrell D. Expressions of morbidity in general practice. BMJ 1971; 2(5759):454.

[88] Wilson A. The red eye: a general practice survey. J R Coll Gen Pract 1987; 37(295): 62-4

[89] Shuttleworth G, Marsh G. How effective is undergraduate and postgraduate teaching in ophthalmology? Eye 1997; 11(5): 744-50

[90] McDonnell PJ (1988), "How do General Practitioners Manage Eye Disease in the Community?" *British Journal of Ophthalmology*, Vol. 72: 733-736

[91] Statham MO, Sharma A, Pane AR. Misdiagnosis of acute eye diseases by primary health care providers: incidence and implications. Med J Aust 2008; 189(7): 402-4.

urgent ophthalmology review); this was found to greatly increased GP confidence and make the referrals more appropriate[92].

As previously discussed in section 9.3.4, it is GPs who have to prescribe the medicines used to treat eye conditions, even those under the care of the hospital. Treatment of glaucoma is far and away the biggest cost because it is treatment for life, whereas treatments for infections and other short-lived conditions will only take a few days or weeks.

GPs and practice nurses should periodically check the advice and techniques they teach patients on the administration of eye drops and ointments is up-to-date.

[92] Teo MAL, Improving acute eye consultations in general practice: a practical approach. BMJ Qual Improv Report 2014, doi:10.1136/bmjqualityu206617.w2852

12 EYE CARE IN PRIMARY CARE – COMMUNITY PHARMACIES

Community pharmacies ("chemists") are often the first port-of-call for people with minor eye conditions such as irritated, itchy, dry or sore eyes, which may be due to hay fever or other allergic reaction, infection and the pharmacist can advise on a range of over-the-counter products, or signpost to their GP (or A&E if an emergency).

12.1 Minor ailments scheme

There is currently (September 2015) a pilot minor ailment service being trialed in Vale of York, covering four pharmacies. The service specification covers them to provide treatment for conjunctivitis (chloramphenicol drops or ointment) and eye symptoms associated with hay fever or allergy (sodium cromoglycate eye drops). When the results of the pilot are reviewed decisions can be taken about whether to continue, roll out and possibly revise the conditions covered.

12.2 Use of Medicines

Part of a pharmacist's role is to check the patient understands how to use the prescribed medication.

Drugs are most commonly administered to the eye by topical application of eye drops or eye ointments. Eye drop dispenser devices are available to aid the instillation of eye drops from plastic bottles and are particularly useful for visually impaired people or those who are physical limited for instance by arthritis[93].

Community pharmacies could work in close collaboration with their local Optometry practices. Pharmacies have contact with numerous patients who attend to collected medications who may not be receiving regular eye care, so there is potential to promote healthy eye messages.

When undertaking Medicines Use Reviews they should ensure questions are asked around eye drops use and actions taken, such as:

- Can you read the labelling for dosage? Large print maybe required.
- If they have several drops can they identify which is which?
- Do you understand what the eye drops are for? Explain simply.
- Can you (or your carer) show me how you instil the drops? The technique should be checked periodically.
- Would you like a demonstration to help you or do you need a device to help? One of the commonest causes of poor compliance is when the carer who has administered the eye drops dies.

[93] British National Formulary (BNF 66 September 2013 – March 2014), Chapter 11 Eye.

13 EYE CARE IN SECONDARY CARE

13.1 Acute (hospital-based) care

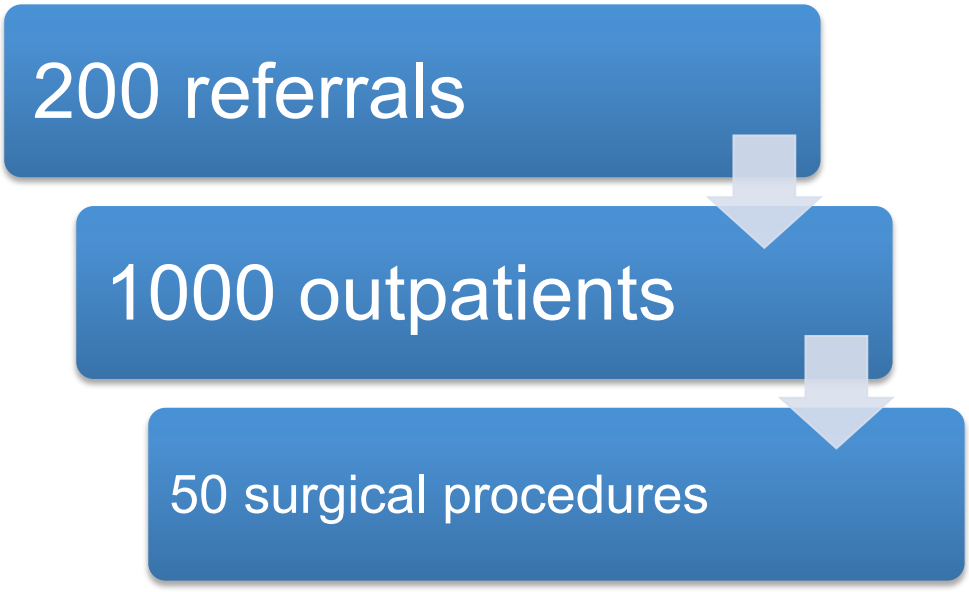
Although this needs assessment is chiefly about preserving vision, people with symptoms including pain/discomfort in the eyes and surrounding tissues, watering eyes, double-vision (diplopia) and disfigurement need care by specialist staff, including ophthalmologists. With their medical skills they can identify possible cancers and occasionally diagnose a life threatening condition by eye examination such as a brain tumour or malignant hypertension. Many of their patients are unlikely to suffer sight loss as conditions such as uveitis are treated early and well.

13.2 Activity and cost

We will look at acute care activity in terms of "unplanned" (which is also classified in the NHS as "non-elective" or what the lay person might think of as urgent or "emergency" care) and planned care activity, including the vast majority of surgical procedures. We can also breakdown activity into outpatients (clinics) or inpatients - which includes day case and admissions requiring an overnight stay in hospital.

Most patients are referred to hospital eye services by their GP. The month-to- month referral / demand does not vary very much, but the month–to- month capacity to see the patients does vary when there is a limited capacity of specialist staff. 95% of outpatient care for Vale of York patients is provided by York Hospital. For inpatient care York Hospital's share is 89%. Based on data from York Hospital the workload for the typical week is shown below:

The "Ballpark" Week for York Hospital (Vale of York patients only):



Over the two year period from April 2013 to end of March 2015 there were 23,122 referrals to York Hospital's Eye Service for Vale of York patients, or about 11,500 a year – that's 32 a day for all 365 days of the year, or 44 new patients to be processed every weekday. In this period here were 107,448 outpatient attendances, making it 53,724 outpatient attendances a year, or about 1000 a week, and there were 5273 in-patient procedures, 2,637 procedures a year. Table 24 illustrates the proportional spend on hospital eye services for 2013/14 and 2014/15, and how there has been a 10% shift to outpatient procedures from follow-up clinic attendances. The extent to which this is due to real increase in number of procedures undertaken and change in coding practice has not been investigated.

Table 24 Vale of York CCG expenditure on hospital eye services (all providers) April 2013 to March 2015

	2013/14	%	2014/15	%
Inpatient				
Day case	£2,455,904	90%	£2,514,483	92%
Other elective	£112,879	4%	£103,617	4%
Non-elective	£144,998	5%	£110,764	4%
Sub-total	**£2,713,781**	**35%**	**£2,728,864**	**33%**
Outpatient				
First attendances	£1,069,715	21%	£1,097,078	20%
Follow-up attendances	£2,484,909	48%	£2,107,163	39%
Procedures	£1,584,693	31%	£2,243,667	41%
Non face to face	£2,806	0%	£5,774	0%
Sub-total	**£5,142,123**	**65%**	**£5,453,682**	**67%**
Grand Total	**£7,855,904**	**100%**	**£8,182,546**	**100%**

Source: Vale of York CCG

13.3 Urgent eye conditions and care in York

People with injuries to the eye and acute conditions present themselves to Accident and Emergency (A&E), or are referred there by their GP, GP Out-of-hours service or optometrist because they need access to diagnostic equipment and treatment facilities not available in the community. The A&E doctors can deal with 90% of presentations, but the remainder need specialist Ophthalmology management.
York Hospital provides 24/7 specialist Ophthalmology for urgent conditions. This takes the form of a daily consultant led clinic with middle grade doctor support, for eye conditions that need urgent medical attention. Triage nurses take most of the calls 9 - 5pm Monday to Friday. Middle grade doctors take the calls out-of-hours. Accident and Emergency can book patients into the Clinic directly. The Clinic runs in the morning, including Bank Holidays using on-call medical staff and designated nurses. Out-of-hours theatres are opened when needed. Non-elective inpatient

care makes up 4 to 5% of the CCG expenditure on inpatient care. From the data that is available on non-elective care from York Hospital in the 14/15 financial year, there were 41 procedures, with a total cost of £97,365.

In York the referrer (doctor or optometrist) has the choice of;

- Phoning the triage nurse 9-5pm or on-call doctor out-of-hours.
- Faxing the referral for triage by a consultant the same day
- Faxing a letter to the GP to decide how to deal with it (mainly for opticians)

Table 25 Urgent Eye Clinic activity at York Hospital, includes total patients from all areas, data from August 2013 to August 2014

	1st Attendance	Follow Up	Total
Average Weekly Attendance	76	52	128
Minimum	45	19	64
Maximum	100	73	160

Source: Consultant Ophthalmologist, York Teaching Hospital Foundation Trust

It is important to note that the Urgent Eye Clinic is a specialist clinic; trained doctors or experienced ophthalmic nurses will have already have seen the patient and feel that specialist advice is required. Sometimes the outcome of the referral is that no abnormality was detected – but this has been determined by a specialist after thorough examination using appropriate diagnostic aids, such as fundoscopy, gonioscopy and slit lamp. The table below gives the frequency of conditions diagnosed at the Clinic (conditions less than 2.0% not shown). Top of the list is Acute Anterior Uveitis – inflammation in the front chamber of the eye - which will require rapid treatment with topical steroids (eye drops) and pain relief.

Table 26 Diagnoses of presentations at the Urgent Eye Clinic in York – Conditions greater than 2% frequency, based on sample covering 2009-2015

Condition	**%**	**Condition**	**%**
Acute Anterior Uveitis	15.1		
Posterior Vitreous Detachment	13.0	Viral conjunctivitis	3.4
Contact Lens-related keratitis	8.6	Migraine	3.3
No abnormality detected*	5.9	Recurrent erosion	3.2
Herpes Simples Keratitis	5.4	Episcleritis	2.9
Herpes Zoster Ophthalmica	5.3	Blunt trauma	2.9

Corneal foreign body	4.5	Retinal tear	2.7
Marginal ulcer	4.2	Wet ARMD	2.5
Post-op cataract	3.7	Corneal ulcer	2.4
Blepharitis	3.5	Vitreous haemorrhage	2.2
Corneal abrasion	3.4	Chemical injury	2.1

Source: Consultant Ophthalmologist, York Teaching Hospital NHS Foundation Trust

13.4 Planned care

13.4.1 Outpatients

People are usually referred to outpatient clinics by their General Practitioner, with a small number of other routes, e.g. straight from an optometrist. At York Hospital (for Vale of York patients only) there were 107,449 attendances in the two years 13/14 and 14/15. It is very difficult to quantify how many went where for what, because the data is not recorded in that way. When a person is sent to a clinic it is for specialist review and investigation initially, there is often not a diagnosis – the person with symptoms goes to get a diagnosis (hopefully). Then there are the other types of clinic where people go when they have a diagnosis, but go for on-going monitoring and adjustment of treatment when necessary, such as for glaucoma when as we reported in section 9.3 the person will be going for the rest of their life.

The names of the clinics are not helpful when being used to assess needs, as most feature the name of the consultant, or discipline, e.g. orthoptics, and probably the day of the week, while others contain the name of the place and others describe what is being done, e.g. Fluorescin Angiography. There are 411 Clinic Names in the dataset, far and away the highest attendance is at Fullfield Daily Clinic with over 5,000 attendances per year, while other clinics have only 1 attendance recorded in the whole 2 year period.

The Ophthalmology Department keeps a “live” Register of many diagnosed conditions, so each patient who has a condition, such as glaucoma, will be registered if they are still under the care of the ophthalmologist. A limitation of the Register is that it was not created in a systematic way; each Consultant looked through his or her clinic lists and put people into a category based on reason for follow up. A patient may be on more than one Register, so if a patient with glaucoma also has diabetic eye disease she will be on both Registers, which is as it should be if it is to be used for purposes such as needs assessment. If she has a cataract procedure she will only appear on the Cataract Register if there is some kind problem that needs post-op follow up. However, apart from removing patients as they die, there is no process of “cleaning” the Register and removing patients from a particular category if they remain under the care of Ophthalmology. So she may

have been originally seen post-cataract, but now seen for a completely different eye condition, such as AMD. Patients who are diabetic (which is a large proportion of any adult secondary care caseload now, as diabetes is so prevalent) may or may not have been put on the Register, and may be on the Register for a diabetes-related condition or not. The diabetes-related condition could be cataract or diabetic retinopathy.

The creation of the Register was a useful exercise for quantifying the reasons why people attending for follow up were originally followed up – but as time goes by it becomes less useful. The total number of registrations (on 1st August 2015) was 14,449, and the number of registration by category is shown in Table 27.

Despite the limitations, the Register is helpful for our purposes; for instance it gives an indication that of the thousands of cataract procedures which have been carried out since the Register was created, only 869 required some kind of (hospital) follow up after the operation. In the case of glaucoma, once a person has glaucoma it is with them for life, so we would not want them to be removed from a population Register. Whether every patient with glaucoma is referred to secondary care (as opposed to being managed entirely in primary care) has not been examined. As discussed in the glaucoma section (9.3.3), there is duplication on the Register, (e.g. registered as Glaucoma and "High Risk Glaucoma") so in actuality there are 4889 unique individuals with glaucoma on the York Hospital Register.

Table 27 On Ophthalmology Registers at York Hospital August 2015 (reason for follow-up)

Reason for follow up by Ophthalmology	Total = 14,449
Glaucoma	4298
Glaucoma High Risk	165
Glaucoma Low Risk	512
Diabetes	2752
Macular degeneration	1450
Decision on treatment requires serial ophthalmic examination	1000
Post Cataract	869
Amblyopia or potential amblyopia	782
Vascular Occlusion	447
Strabismus in child	384
Uveitis or scleritis or immunosuppression	243
Malignancy or potential malignancy	196
Research / audit	216
Monitoring of vision /refraction in preverbal children	150
Infection or injury to cornea	131
Complex contact lens wear	123
Post op VR procedure	119
Keratoconus	112
Corneal graft patient	101
Treatment with ocular steroids	96
Diplopia	83
Loss of vision requiring investigation	48
Severe ocular surface problem	42
Neurosurgeons request	28
Thyroid eye disease	25
Ocular toxic drug monitoring	23
Ocular trauma - severe	15
Vitreous haemorrhage	15
Retinal detachment - untreated	3
Other	21

Source: York Teaching Hospital NHS Foundation Trust, data extract 1 August 2015.

13.4.2 Surgery

As surgical specialties go, Ophthalmology is high volume and quick turnaround. National data from 2006 showed the average length of stay in hospital to be less than a day (0.3 days). In York 94% of the Ophthalmology inpatient workload is day case. The highest volume procedure was cataract extraction and lens implant, including the various other cataract procedures, at 3,702 in two years – accounting for 70% of all the "episodes" pertaining to the eye (see more on cataract surgery in section 9.4.4).

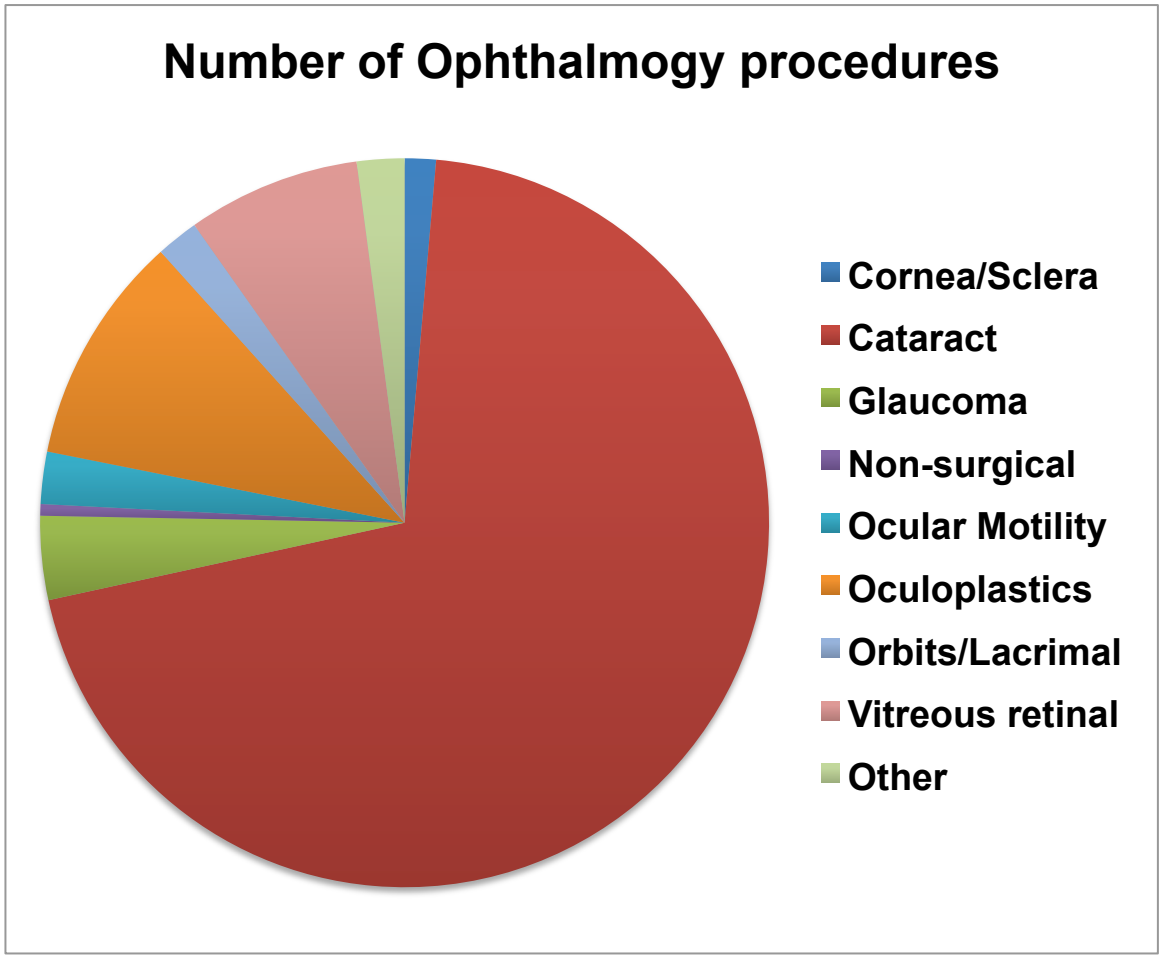
The total number of procedures done on Vale of York patients in the two years covering 1 April 2013 to 31 March 2015 was 5,273 i.e. in excess of two and a half thousand per year. The breakdown by type of procedure (technically the HRG description code) is shown in Figure 17 overleaf.

A major contributor to the eye surgical workload, which has not been previously covered in this Eye Health Needs Assessment, is oculoplastics i.e. plastic surgery relating to the orbit (the bony structure around the eye), the lids, tear duct system, eye brow and cheek, including reconstructive surgery. In York Hospital it accounts for 10% of ophthalmology episodes, 538 procedures in two years, which is in line with the national picture. There are thresholds for some of these procedures.

The vitreoretinal procedures are also relatively high volume[94] at national level, and account for 8% of the York workload (see section 9.5.5 for more on vitreoretinal procedures).

[94] HRG4. HFMA Briefing. Contributing to the debate on NHS Financing, March 2008. NHS Information Centre.

Figure 17 Number and HRG Description of the In-patient procedures conducted at York Teaching Hospital NHS Foundation Trust, April 2013 to end March 2015, Vale of York patients only. Total = 5273.



Source: Ophthalmology data provided by YTFT Information Team on 3 August 2015

A report just published (October 2015) by Monitor, with the Royal College of Ophthalmology, assessed national and international evidence, and estimates that if every NHS provider followed the good operational practices adopted by the highest performers at each stage of their elective ophthalmology care pathways, they could save 13% to 20% of today's spending[95].

It is recommended that Vale of York CCG and York Hospital Eye Service work together to release some existing expenditure to help fund the increasing demand as detailed elsewhere in this report.

[95] Helping NHS providers improve productivity in elective care. Monitor. Publication code IRRES 15/15. October 2015.

14 LOW VISION

14.1 Low vision strategies

Low Vision services will be required from the onset of visual impairment throughout a person's life, and having easy access to Low Vision services is essential to preserve people's independence, health and wellbeing. The aim of any Low Vision strategy is to ensure that residual vision can be optimised and the emotional aspect of vision loss is recognised. Strategies include providing access to low vision aids (LVAs) and appliances, adjusting the visual environment (for example, lighting), and providing specialised training and counselling. Low vision services are designed to ease the rehabilitative process as advice and support provide vital assistance for people with low vision to cope with practical and emotional issues and help plan for the future[96].

14.2 Hospital-based low vision services

Having an Eye Clinic Liaison Officer or ECLO (also known as Sight Loss Adviser or Vision Support Officer) is one of the most effective ways of supporting patients in the hospital setting, often when they have first been given a diagnosis. ECLOs are key in helping patients understand the impact of their diagnosis and providing them with emotional and practical support for their next steps[97]. The ECLO role, provided by York Blind and Partially Sighted Society (funded by the CCG and York Hospital) is an essential service within the Eye Department of York Hospital. It ensures people with low vision (and those who have lost all of their vision) are enabled to access services in the community. It bridges the gap between the medical and social/ community services and ensures that people receive the right information at the right time. Without this service people with low vision would be faced with leaving the hospital with no knowledge of the immense range of support services available. The Hospital also has low vision aids such as magnifiers available.

14.3 Role of Optometry practices in low vision.

Most optometry practices offer a basic low vision service in the form of sale of simple magnifiers. They also refer into secondary care for low vision assessments. There tends to be poor referral into the (optometry) Community Low Vision service by practices not offering the service which is described below. This may be due to lack of awareness or commercial concerns referring to another optometry competitor.

14.4 Community Low Vision service

This service was commissioned by North Yorkshire and York PCT in 2011 and had 21 optometric practices across the patch registered at inception with 26 optometrists trained. 6 practices were within Vale of York.

[96] Masey H (1996) "The support and information needs of newly visually impaired people", Royal National Institute for the Blind

[97] http://www.rnib.org.uk/ecloinformation

Service Aims:

i) To provide patients with a choice for accessing low vision services.
ii) To provide patients with deteriorating vision more convenient community based low vision services
iii) To provide a complementary service to the Low Vision Service provided by York Hospitals NHS Trust.

iv) To provide the appropriate advice, assessment and treatment to patients covered under this agreement. This may be assisted by the involvement of Social Services Rehabilitation Officers.

v) Patients whose vision is not sufficiently poor for legal classification yet even with normal spectacle correction experience difficulties with visual aspects of daily life are also included within this scheme.

Referrals are accepted from secondary care, optometrists, GP, Choice office, social services, self-referral and the voluntary sector. The providers were all supplied with a basic range of low vision aids to dispense on loan to patients. Patients must have sight test result no more than 6 months old. Follow up may be by telephone or visit if required. All optometrists received training in low vision assessments.

A recent review of the service for year 2014/15 produced the following results:

- 21 practices responded to the survey
- 6 practices no longer offered the service.
- of the 15 that were still active, 7 were within the Vale of York area
- 445 patients were seen in the whole scheme, 144 were Vale of York patients
- of the 144 Vale of York patients
    - 142 dispensed with low vision aids
    - 24 attended for follow-up visits.

Source of referral was not completed for many of them but it appears to be, in order, (i) referral from the resident optometrist in the practice, (ii) the Choice Office and (iii) social services. Most popular type of low vision aid is the illuminated stand magnifier in varying powers depending on patient need.

14.5 Educational support for sight-impaired children

The number of children requiring support form Children's Services at City of York Council continues to grow, although the causes of sight impairment have changed. Some of the historical causes of blindness have now been greatly reduced or all but eradicated:

- rubella infection in the mother while pregnant caused a range of congenital malformations in the unborn child including damage to the eye (see section 5 on Prevention).
- medical treatment with high-level oxygen therapy in very premature babies caused irreversible damage.

The main cause of blindness in children is now due to neurological damage, rather than damage to the eye.

All children who are sight-impaired are in mainstream education with suitable adaptations using new technology – there is no special "school for the blind". Those children who are sight-impaired and have other problems, for example due to learning disabilities or autism are dealt with on a case-by-case basis. When autism is also present in a child with visual impairment it presents a particular challenge for healthcare professionals who may not know how to communicate with the children. Education services have a good working relationship with York Blind and Partially Sighted Society Equipment and Information Centre and ECLO service.

14.6 Deaf blind

There are a small number of children with Multiple Sensory Impairment (MSI); most have profound complex needs due to neurological damage, and the blindness is caused by brain damage rather than eye problems. The "Helen Keller like" case is very, very rare, and there is not likely to be even one case in the Vale of York population. These children are managed case-by-case. There are no MSI teachers in York, one child accesses out-of-area services (by parental choice).

14.7 Support for general wellbeing of people who are sight-impaired

The wellbeing of people who are sight-impaired depends upon many factors. Not least of these is the ability to have confidence and to be able to live independently. York Blind and Partially Sighted Society offer the following activities, all designed to help people in terms of their long-term rehabilitation, health and wellbeing.

- Finding your Feet Courses, (2-3 day courses in a group setting, where participants learn about many different services, share experiences with other people in a similar situation, thus gaining peer support, improved confidence and coping strategies. These courses, designed by RNIB/Action have been proved to have a long-term beneficial effect.

- Leisure, Learning and Social activities – groups include Audio Book Group, Crafts, Walking, Games, Healthy Eating and Cooking, Singing, Discussion and a weekly Exercise Class (running for 6 years).

- A Support Group for people with Macular Degeneration attended by 40 people every 2 months.
- SocialEyes, a group for people of working age to engage with peer support.

Recent research undertaken by the Social Policy Unit in York University identified group work as being an important element of rehabilitation process[98].

Disabled people as a section of the population, do not currently enjoy the same access to exercise facilities or green space as the general population[99]. This gives rise to inequalities.

In an effort to reduce inequalities and promote inclusion, York has had a Physical Disability Sports programme running since 2013 and people with visual impairment (and other sensory impairments) have been targeted with inclusive sport offers. From April 14 – March 15, 50 new people came for the first time to a taster activity or to join a new club with throughput figures of 323 attendances. These people participated in the Inclusive Walk programme, Multi-Sport Activity Club, Cycling and predominantly through one of the city's newest Visually Impaired Tennis sessions with 10 regular participants. The sport has now been recognised by the Tennis Foundation, which means that there is now the opportunity to create the first international tournament.

*The **York Disability Tennis Network** web site features a York Player Kelly Cronin who has been B1 (completely blind) National Champion since 2013 and recently won the singles at the Regional Visually Impaired Tournament at Newcastle in May 2015. Kelly is an active advocate of the sport.*
http://www.ydtn.org.uk/YorkDisabilityTennisNetwork/VisuallyImpaired/yorkclub.html

*The **York St. John University Goalball Club** has 10 visually impaired regulars each week. Sessions are on a Saturday from 12noon at York St. John University Sports Hall.*
https://www.facebook.com/yorkgoalballclub/info?tab=page_info

[98] Vision Rehabilitation Services: What is the evidence? Final Report, Rabiee P et al. Social Policy Research Unit, Working Paper No. TPT 2639. University of York. February 2015

[99] Department of Health, 2005. Improving the lives of disabled people. Available at www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4101751. Accessed 18/06/2012.

14.8 Social care for adults with sight impairment

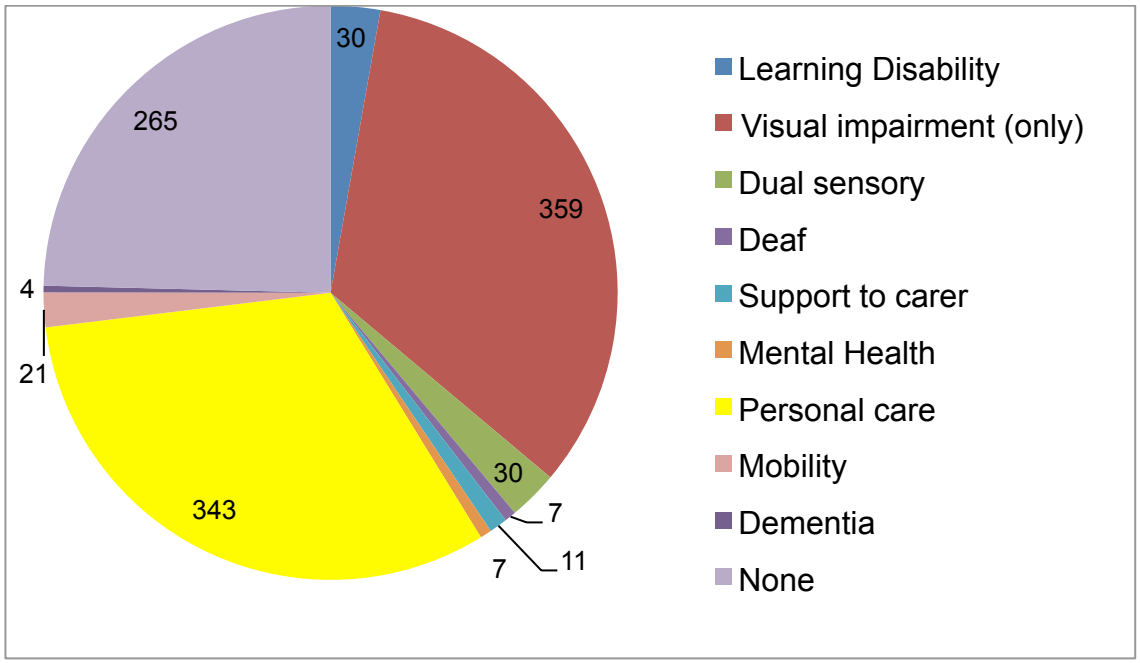
Only severe and uncorrectable vision loss is registered as Certificate of Visual Impairment (CVI) however there are people with sight loss not registrable, but severe enough to have a significant impact on the person's ability to function independently. In these cases a social care assessment would be offered, because under the Care Act 2014, the person who presents with social care need may request an assessment. Following assessment the outcome would probably be to provide advice and information, and equipment to prevent, reduce or delay risks to health.

In York Council there is an in-house Social Care worker responsible for CVI registrations, giving of advice about the benefits of being registered, provision of simple equipment to promote independence and referral on to Rehabilitation services. The Council has a contract with Wilberforce Trust to employ a Rehabilitation Officer for Visual Impairment for "habilitation" of its residents with visual impairment.

There were 1105 people registered as blind or partially sighted with social services in June 2015. However not all of these people use or require support, 265 have no support need. 359 people are recorded as having a support need primarily due to visual impairment. Of course people have other needs, and particularly as so many of those on the CVI Register are older, their **primary** need for support may be for other reasons, the commonest reason being Personal Care, as shown in Figure 18 overleaf.

There are a total of 490 CVI registered people who are in receipt of one or more services, of which 301 people are blind and 189 people are partially sighted. The principal services provided overall are Blue badges, Community Support and Assistive Technology. The number of recipients of the various services and their CVI classification (i.e. blind or partially-sighted) are given in Table 27. One person may receive several services, for instance be in receipt of Direct Payments to pay for their care package, and have OT Equipment and Adaptations and some assistive technology.

Figure 18 Primary support reason for those registered blind or Partially Sighted with City of York Council Social Services



Source: Strategic Intelligence Hub, City of York Council, Accessed 29 June 2015

Table 27 City of York Social Service Provision by CVI Registration, 2015

Service Group	Blind	Partially-sighted	Total
Blue badge	244	135	379
Direct payments (customer)	26	9	35
Community support	155	71	226
Residential and nursing	64	29	93
LD Transitions	1	2	3
OT Equipment and Adaptations	42	43	80
Professional support	30	26	56
Assistive technology	124	131	255
Total	686	446	1,132

Source: Strategic Intelligence Hub, City of York Council, Accessed 29 June 2015

14.9 Voluntary sector provided services

14.9.1 York Blind and Partially Sighted Society

York Blind and Partially Sighted Society (YBPSS) provides, under contract, the Eye Clinic Liaison Officer (ECLO) service at York Hospital. This is a recognised quality service meeting the high standards set by the RNIB. The purpose of the service is to identify people who need help and support at as early a stage as possible, and refer them on to relevant organisations including York Blind and Partially Sighted Society. The ECLO sees approximately 700 new patients every year as well as supporting others. The ECLO also processes the CVI certifications.

YBPSS is a user-led service, and a membership organisation. Everyone newly registered as blind/ severely sight-impaired or partially sighted/ sight-impaired becomes an automatic member of the society and receives an information pack and a regular quarterly newsletter in a format of their choice. People may opt out of this if they wish. The society also provides services for people who are not registered, ensuring that anyone who is struggling to manage sight loss receives the support they need. [Registration is only for permanent sight loss, but people who have temporary sight loss, for example, while they are in treatment are also supported]. There are currently 1097 members of the society and the breakdown in terms of registration is shown in figure 19.

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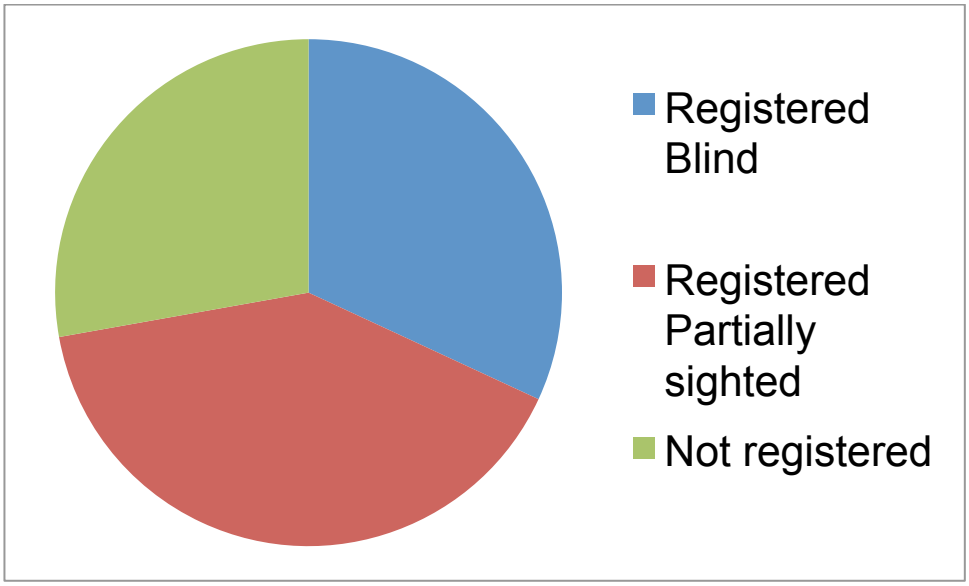
Figure 19 Members of York Blind and Partially Sighted Society in 2014/15 by registration category of sight impairment



Source: York Blind and Partially Sighted Society, data compiled July 2015

Table 28 Age distribution of the members of York Blind and Partially Sighted Society in 2014/15

Age group	Number of members	% in age group
Under 25	42	4%
25 – 64	201	18%
65 – 79	212	19%
80 – 89	342	32%
90 – 99	212	19%
100+	20	2%
Unknown	68	6%
TOTAL	1097	

Source: York Blind and Partially Sighted Society, data compiled July 2015

The "typical" member of YBPS is a woman in her eighties, as shown above in Table 28, they even have 20 members who are over 100 years old.

YBPSS have an Equipment and Information Centre in the centre of York which displays around 300 different pieces of equipment, for 'hands on' trial. Equipment, practical and emotional support, advice and access to services is available for anyone with a visual impairment, on a drop-in basis, Monday to Friday 10am to 3pm. Carers and supporters are also welcome to use the service. Equipment can be purchased on a not for profit basis. Where special adjustments are needed, for example in terms of setting up an accessible telephone or using a magnifier people are offered this service. For anyone unable to visit the Centre a volunteer can take demonstration equipment to their home.

The Equipment and Information centre receives nearly 2000 visitors a year. Specialist support is provided through reading assessments, introductions to new technology, effective use of lighting, low vision aids, including CCTVs, talking book equipment etc. The society aims to be the focal point of contact for anyone who has needs relating to sight loss. Through the reading assessments provided they can give advice and guidance on suitable magnifiers, lighting, and use of different sizes of print, use of typoscopes and other techniques, alternative methods of reading such as Kindle, USB-devices for Talking Books, large print and audio information plus basic advice on computing.

Other services include:

- A volunteer visiting service with 65 volunteers visiting people in their own homes
- A range of activities (see wellbeing section)
- A quarterly newsletter sent free of charge to everyone on their database
- Open days where companies are encouraged to bring equipment not available on a permanent basis in the Equipment centre
- Specialist courses such as Finding your Feet, Access to Employment, etc.
- Peer support and volunteering opportunities

- Social inclusion work, involving visually impaired people with local issues of concern such as A-boards.

14.9.2 Wilberforce Trust

The Wilberforce Trust is York's oldest charity and supports and delivers services to people with a visual impairment. This includes a Low Vision assessment by an optometrist plus rehab officer assessment; about 100 a year are undertaken. The patients pay for any Low Vision aids they require, but if they are on benefit they are referred to York Blind and Partially Sighted Society for free Low Vision aids.

The Trust participates in the Eyecare Forum of York and other areas - about 25 members who meet bi-monthly to share and address issues facing their organisations and the people they serve are. They also have attendance from some of the national organisations in order to either lobby for support or to hear about any new developments.

An administrator at Wilberforce Trust maintains a matrix of support organisations - the services they provide and where - is regularly updated. Contact the Wilberforce Trust for details.

GLOSSARY AND ABBREVIATIONS

ABDO	Association of British Dispensing Opticians
Acute care	Hospital-based care, Inpatients, Outpatients, Accident and Emergency
A&E	Accident and Emergency (department)
Anti-VEGF	Anti- Vascular Endothelial Growth Factor – a treatment for wet Age-related Macular Degeneration and diabetic retinopathy/maculopathy
Applanation tonometry	A form of contact tonometry used to measure intra ocular pressure in the eye
ARMD, also AMD	Age-related Macular Degeneration – can be wet or dry
Blephartis	Common eye condition where the eyelids become inflamed and swollen
Blind	Often referred to as severely visually impaired. In UK the following is definition triggers registration for blindness 1. Those below 3/60 (equivalent to 20/400 in US notation) Snellen (most people below 3/60 are severely sight impaired). 2. Those better than 3/60 but below 6/60 Snellen (people who have a very contracted field of vision only). 3. Those 6/60 Snellen or above (people in this group who have a contracted field of vision especially if the contraction is in the lower part of the field).
BS EN 1836:2005 mark	British Standard - A mark to show that sunglasses will give a good measure of protection against UV light
Cataracts	Clouding in the lens of the eye leading to decreased vision.
CCG	Clinical Commissioning Group – the NHS body which holds the local healthcare budget and commissions secondary (hospital) care
CE mark	A mark to show that sunglasses will give a good measure of protection against UV light
Choice Office	The office where “Choose and Book” is administered
Choroidal naevi	Freckle at the back of the eye

Choroiditis	Inflammation of one of the outer coats of the eye
Contact Tonometer	See applanation tonometer
CSDP Act 1970	The Chronically Sick and Disabled Persons Act 1970 - DHSS (70)12
CVI	Certificate of Visual Impairment
Cycloplegic	Cycloplegic refraction involves temporarily paralyzing some of the muscles in the eye (with eye drops); sometimes used when testing the vision of young children.
DALY	Disability-adjusted life year. A measure of Quality of Life
Diabetic retinopathy	Changes at the back of the eye caused by diabetes.
Diabetic retinopathy screening (now commonly known as Diabetic Eye Screening)	Screening programme offered to everyone over age 12 with diabetes to assess for diabetic changes at the back of the eye.
DIY	Do It Yourself – manual tasks carried out by untrained persons in the home and garden
Domiciliary	Domiciliary services are those delivered in the patient's home
DRS / DES	Diabetic retinopathy screening / Diabetic eye screening
Esotropia	Esotropia is a form of strabismus, or "squint," in which one or both eyes turns inward, and can give the affected individual a "cross-eyed" appearance
Exotropia	Exotropia is a form of strabismus, or "squint," in which one or both eyes turns outward, giving appearance of looking in different directions
Eye tests	The term popularly used for the suite of tests an optometrist would perform during an NHS Sight Test.
FFA	Fundus Flourescein Angiography - a test used in the diagnosis of Age-related Macular Degeneration
Fundus	The back of the eye
Fundus camera	A camera taking a photograph of the back of the eye (the fundus)
GP	General Practitioner, or family doctor
General Ophthalmic Services	A form of contract which is required for optometrists with fixed premises to offer NHS sight tests

Glaucoma	is a term for a group of eye disorders which result in damage to the optic nerve at the back of the eye. This is most often due to increased pressure in the eye.
GOS	General Ophthalmic Services
HRG	Health Related Group – a way of classifying hospital activity e.g. a Vitreous retinal HRG.
IOP	Intra-ocular pressure – the pressure inside the eyeball, which is raised in people with glaucoma
IT	Information Technology, i.e. the computer systems and associated networks which allow capture and movement of data
JSNA	Joint Strategic Needs Assessment. A published, updated assessment of the health needs of the population; local Health & Wellbeing Boards have a duty to produce one. In York it is a web resource found at http://www.healthyork.org.
LES	Local (or Locally) Enhanced Service - an addition to the standard contracted services (by primary care providers).
Local Eye Health Network	These networks were established by each of the (27) Area Teams of NHS England in 2013 to have a key role in developing eye health in primary, secondary and social care to achieve better outcomes.
Long term condition	Condition for which there is currently no cure and is managed by drugs and other treatments
Low vision	Often used to suggest severe sight impairment or blindness, but is more accurately used to indicate when a person's sight cannot necessarily be corrected with glasses or contact lens.
LVA	Low Vision Aid
Macular Degeneration	See AMD
mmHG	Millimetres of mercury (Hg) – the standard measure used for blood pressure and intraocular pressure
MMR	Measles, Mumps and Rubella vaccine. Prevents rubella (commonly known as German measles), which can cause blindness if pregnant women are infected with rubella virus. Also prevents measles; measles infection can cause visual loss.
MSI	Multiple Sensory Impairment or Deaf blind

NEHEM	National Eye Health Epidemiological Model
NHS North Yorkshire and York	The name of the Primary Care Trust which covered this geographical area until it was abolished on 31 March 2013.
NHSE	NHS England – the NHS body which holds the healthcare budget for specialised commissioning, national screening programmes (including Diabetic Eye Screening) and contracting independent contractors: GPs and optometrists (and dentists and community pharmacists). It is divided into Areas – the relevant area for VoY CCG is North Yorkshire (includes York) and the Humber.
OCT	Optical Coherence Tomography. A non-invasive imaging test that uses light waves to take cross-section pictures of the retina (similar to an ultrasound, but using light instead of sound waves).
Oculoplastics	Plastic surgery relating to the orbit (the bony structure around the eye, the lids, tear duct (lacrimal system), eye brow, cheek, including reconstructive surgery.
ONS	Office for National Statistics – source of official statistics relating to population, the economy and society. www.ons.gov.uk/ons
Ophthalmologist	A medical doctor who specialises in conditions of the eye, with specialist medical and surgical skills to diagnose and treat eye disease.
Ophthalmic Medical Practitioner (OMP)	A medical doctor who specialises in eye care. Can examine eyes, test sight, diagnose abnormalities and prescribe corrective lenses.
Ophthalmic Practitioner	An umbrella term encompassing optometrist and ophthalmic medical practitioner
Optician	Dispensing and optometric. Dispensing opticians are trained to dispense glasses. Optometric opticians are optometrists (see below).
Optometrist	Eye Health professional trained to perform sight tests, examine eyes, treat minor eye conditions, prescribe corrective lenses and refer to medical staff.
Orthoptics	The investigation and treatment of disorders of binocular vision and defects of eye movement.
Orthoptist	A member of the multidisciplinary eye care team who specialises in eye movement, lazy eye, squint and contributes to the care of adults and children with vision

	problems.
PCT	Primary Care Trust – the NHS commissioning organisation which was abolished in 2013, with former responsibilities and commissioning budgets transferred to NHS England, Clinical Commissioning Groups and local authorities.
Primary Care	Includes GPs and their teams, optometrists community pharmacies and dentists, although often used to refer to GP services only.
RCGP	Royal College of General Practitioners
RCOphth	Royal College of Ophthalmology
Refractive error	An error in the focusing of light by the eye, due to the shape of the eye. Could be due to the length of the eyeball, changes in the shape of the cornea or ageing of the lens.
ROVI	Rehabilitation Officer in Visual Impairment (also known as Rehabilitation Worker in Visual Impairment)
Sight-impaired	Able to see at 3m, but not at 6m what the normally sighted person sees at 60m
Severely sight-impaired	Defined as having a central visual acuity of less than 3/60 (unable to see a 3m what the normally sighted person sees at 60m)
Slit Lamp Biomicroscopy	This is a technique used to view the eye structure with a microscope. A very narrow band of intense light is shone into the eye to better illuminate the structures.
Strabismus	Squint. When a person cannot align both eyes simultaneously under normal conditions.
Visual impairment	A decreased ability to see, not fixable by usual means (e.g. glasses)

APPENDIX I - METHOD FOR RESIDENCE OF LOCAL AUTHORITY FOR VALE OF YORK REGISTERED PATIENTS

- Used list of the 30 Vale of York CCG practices and aggregated all the Lower Super Output Areas (LSOA) of residence of the patients.

- Used look up from LSOA to local authority using ONS file - PCD11_OA11_LSOA11_MSOA11_LAD11_EW_LU

- Local Authority Populations used are 2013 mid year estimates

APPENDIX II - LIST AND LOCATION OF OPTOMETRISTS IN VALE OF YORK AREA, AND SURROUNDING AREAS

Practice Premises	Address	Post Codes	Telephone No.
A S Yager Opticians	32 Ropergate Pontefract	WF8 1LY	01977 702565
A Taylor Opticians Ltd.	Mount Pleasant House, 24 Main Street Bentham	LA2 7LA	01524 32915
Acomb Specsavers Ltd	1b Front Street Acomb	YO24 3BW	01904 520050
Airedale Eyecare Ltd	37 Main Street Crosshills Keighley	BD20 8TA	01535 35856
Alexander Optometrists	152 High Street Northallerton	DL7 8JX	01609 760606
Asda Stores Ltd.	Asda Opticians Jockey Lane Monks Cross York	YO32 9LF	01904 689412
Asda Stores Ltd.	Bower Road, Harrogate	HG1 5DE	01423 524243
Baker Eyecare Services Ltd - Luke Baker	t/a City Eyewear 24 Ivegate Bradford	BD1 1SW	01274 729393
Beech Tree Eyecare LTD	68 Doncaster Road Selby North Yorkshire	YO8 9AJ	01757 704300
Bingham & Wilson Opticians	19 Brook Street Selby	YO8 4AL	01757 703367
Binnington & Thurling Opticians	17 Micklegate, York	YO1 6JH	01904 653297
Boots Opticians (C Turner)	9 Gowthorpe Selby	YO8 4HE	01757 701848
Boots Opticians Ltd.	84 High Street Northallerton	DL7 8LF	01609 772150
Boots Opticians Ltd.	203-204 High Street Northallerton North Yorkshire	DL7 8LW	01609 777461
Boots Opticians Ltd.	100-101 Westborough Scarborough	YO11 1LN	01723 500661

Boots Opticians Ltd.	52 High Street Skipton	BD23 1JP	01756 790988
Boots Opticians Ltd.	7-8 Stirling Road Clifton Moor Centre York	YO30 4XZ	01904 690337
Boots Opticians Ltd.	48 Coney Street York	YO1 1NH	01904 642617
Boots Opticians Ltd.	26-28 Cambridge Street Harrogate	HG1 1RY	01423 530335
Boots Opticians Ltd.	Monks Cross, York	YO32 9GX	01904 636457
Boots Opticians Ltd.	27 Market Place West, Ripon	HG4 1BN	01765 605071
Catherine Veen Opticians Ltd	16 Victoria Avenue Harrogate	HG1 1EB	01423 520888
Christopher Nixon Limited	35 High Street Starbeck Harrogate	HG2 7LQ	01423 885764
Clifford Benjamin Ltd.	23 Newmarket Street Skipton	BD23 2JE	01756 792933
Community Eyecare UK Ltd. T/A Vision Call	c/o Alexander Sloan 144 West George Street Glasgow	G2 2HG	
Complete Price Eyewear Ltd T/A The Outside Clinic	Old Town Court 10 -14 High Street Old Town Swindon Wiltshire	SN1 3EP	01793 642200
Concept Eye Clinic	110/112 Shields Road Byker Newcastle upon Tyne	NE6 1DS	0191 2760242
Cooper & Barr Ltd.	35 High Street Stokesley Middlesborough	TS9 5AD	01642 710832
Cooper & Barr Ltd.	21 Market Place, Thirsk	YO7 1HD	01845 202007
Cooper & Leatherbarrow	15 Finkle Street Richmond North Yorkshire	DL10 4QA	01748 823402
Coverdale Opticians	53 Walmgate York	YO1 9TY	01904 631793
Cowen & Morgan	22 Westgate Ripon	HG4 2BQ	01765 600561

Darryl Taylor Optometrists	84 High Street Knaresborough	HG5 0EA	01423 862142
David Dowley Eyecare	50 York Road Acomb York	YO24 4LZ	01904 788811
Dollond & Aitchison Ltd.	22 Parliament Street York	YO1 8RS	01904 638827
Emma Kenyon	71 Grove Lane Headingley Leeds	LS6 4EQ	07736448750
Eye Deal Optical	One Life Centre Linthorpe Road Middlesbrough	TS1 3QY	07805 904918
Eyecare Anywhere - B Watson	105 Haigh Moor Road, West Ardsley, Wakefield	WF3 1EG	01132 530904 07743 730129
Eyecatchers (Harrogate) Ltd	87A Skipton Road Harrogate	HG1 4LF	01423 568083
T/A Homecall Opticians	Eyecore Ltd - Hazrat Kazmi, 33 Gladstone Street, Bradford	BD3 9PQ	
EyeKit - P Park	Elmwood Main Street, Ulleskelf, Tadcaster, Yorks	LS24 9DU	01937 835766
Harrogate Visionplus Ltd	18 Beulah Street Harrogate	HG1 1QH	01423 564515
Hauxley Enterprises Ltd	T/A Glen Opticians 10-12 Bondgate Helmsley York	YO62 5BR	01439 770929
Hauxley Enterprises Ltd.	T/A Glen Opticians 21 Wheelgate Malton	YO17 7HT	01653 600058
Haxby Opticians Ltd	6 Ryedale Court Haxby York	YO32 3SA	01904 766217
Healthcall Optical Services Ltd	Unit 5 Titan Court La Porte way Luton	LU4 8EF	01582 723793
Home - Visit Eyecare Ltd	T/A Loftus Optical 24 Zetland Road Loftus Cleveland	TS13 4PW	01287 644211

Hunmanby Opticians	24 Bridlington Street Hunmanby	YO14 0JR	01723 890011
I-care at home opticians	7 Wenlock Drive Escrick York	YO19 6JB	07808163318
Integrated Optical Ltd.	T/A Cotler Opticians 25 Finkle Street Selby	YO8 4DJ	01757 705582
J Exley Opticians Ltd	7 Otley Street Skipton	BD23 1DY	01756 792416
James Bontoft Optometrists Ltd	14 Newtown Barnoldswick	BB18 5UQ	01282 853223
Jarrod Headley Opticians	21 Chapletown, Pudsey	LS25 7RZ	0113 2576300
Jevons and Siddall Ltd	6 Miller Court Axminster Drive Brighouse	HD6 4FP	01484 720888
JR Tomlinson Ltd	Westfield House The Mires North Newbald York	YO43 4SE	07976 567487
K Malyn Opticians	Market Place Easingwold York	YO61 3AG	01347 824131
K & G Optical	65 High Street, Knaresborough, N Yorks	HG5 0HB	01423 799997
K&D Vision Ltd T/A The Vale Opticians	Fountains View 1 High Street Boroughbridge	YO51 9AW	01423 323450
Kingston-White Opticians	2 Park Place Knaresborough	HG5 0ER	01423 867550
KJ Read	6 Hawkshead Close York	YO24 2YF	07717 192012
Knaresborough Locum Services Ltd	2 Park Place Knaresborough North Yorkshire	HG5 0ER	01423 867550
Lakeland Home Visioncare Ltd	Esthwaite Low Bigghins Carnforth Lancashire	LA6 2DH	01524 230701
Langton Optometrists-The Filey Practice	17b West Avenue Filey North Yorkshire	YO14 9AA	01723 512100

Local Eyes	4 Newborough Scarborough	YO11 1NA	01723 364045
M Procter Ltd	16 Parliament Street Harrogate	HG1 2QZ	01423 531700
Malton H&F Ltd	Specsavers 10 Castlegate Malton	YO17 7DT	01653 692784
McBride Opticians	33 Bishopthorpe Road York	YO23 1NA	01904 611553
McBride Opticians	4 South Parade Northallerton	DL7 8SE	01609 772989
Moorhouse Opticians Ltd.	14 Westgate Tadcaster	LS24 9JB	01937 832257
Moorhouse Opticians Ltd.	5 Finkle Hill Sherburn in Elmet Leeds	LS25 6EB	01977 683166
T/A Henry J Rose	Mytholmroyd Optical Ltd, 275 Anlaby Road, Hull	HU3 2SE	01422 885944
Newcastle 2 Domicilliary Specsavers Ltd - Alan Gregory	Alan Gregory, 10 Winter Close, Yarm, Cleveland	TS15 9TY	
Northallerton Specsavers Ltd	120 High Street Northallerton	DL7 8PQ	01609 760500
Laura May Ltd	3 Craven Court High Street Skipton	BD23 1DG	01756 796800
Optica Eye Clinic Ltd	9B Boulevard West Farm Avenue Longbenton Tyne & Wear	NE12 8GA	0191 266 9185
Optical Express	16 Parliament Street York North Yorkshire	YO1 8SG	01904 621628
Optikal Eyecare Ltd	54 High Street Idle Bradford	BD10 8NN	01274 615030
Orkney Opticians	1 High Street Leyburn	DL8 5AQ	01969 623001
Pagan & McQuade Hartlepool Ltd (T/A Brown & Humphries)	42 Huntriss Row Scarboprough	YO11 2EF	01723 361957
Pagan and McQuade (Scarborough) Ltd	108 Westborough Scarborough	YO11 1LD	01723 371250

Page Opticians - Easingwold	134 Long Street Easingwold York	YO61 3JA	01347 822172
Page and Smith- Harrogate	28 Montpellier Parade Harrogate	HG1 2TG	01423 562616
Peacock & Row Ltd	Peacock & Row Opticians Moss's Arcade Ripon North Yorkshire	HG4 1AG	01765 603484
PS Rutter	7 Southend Bedale	DL8 2BJ	01677 424142
Raymond D White	Suite 1 63 Harrogate Road Chapel Allerton Leeds	LS7 3PQ	01132 666333
Vision Express UK ltd	3-4 Wellington Road Whitby	YO21 1DY	01947 603358
Vision Express UK ltd	55 Micklegate Selby	YO8 0EA	01757 702712
Ripon Visionplus Ltd	18 Fishergate Ripon	HG4 1DY	01765 694777
Robinsons Opticians Ltd	9 Newbiggin Malton North Yorkshire	YO17 0JF	01653 696949
Robinsons Opticians Ltd	14 Eastgate Square Pickering	YO18 7DP	01757 472737
Row Opticians - Thirsk	4 Millgate Thirsk	YO7 1AN	01845 523093
RPCO Ltd.	30 York Road Acomb York	YO24 4LZ	01904 784040
S & CL Wilkinson	10 King Street Richmond	DL10 4HP	01748 823133
Samantha Parker Optometrist	Unit 2 13 Market Place Knaresborough	HG5 8AL	01423 866475
Scarborough Visionplus Ltd	94 Westborough Scarborough	YO11 1LD	01723 501990
Scrivens Opticians	13 Market Place Thirsk	YO7 1HQ	01845 525996
Scrivens Opticians Ltd.	8 The Arcade Market Place East Ripon	HG4 1BT	01765 602820

Scrivens Opticians Ltd.	40 Market Place Malton	YO17 0LX	01653 692052
Scrivens Opticians Ltd.	128 High Street, Northallerton	DL7 8PQ	01609 775772
See You at Home Ltd	24 Archbell Avenue, Brighouse, HD6 3SU	HD6 3SU	01484 722595
Selby Specsavers Ltd	12-14 Gowthorpe Selby	YO8 4ET	01757 293050
Skipton Visionplus Ltd	14 Swadford Street Skipton	BD23 1RD	01756 702520
Specs 4 You	Unit 9 Denton Park Shopping Centre West Denton Way Newcastle Upon Tyne	NE5 2QZ	0191 264 6770
Swaledale Vision Plus Ltd	Specsavers Opticians 2-4 Kings Street Richmond N Yorks	DL10 4HP	01748 829 960
Tesco Opticians	Askham Bar Tadcaster Road York	YO24 1LW	01621 727438 0345 6779755
Tesco Opticians	York Extra Stirling Rd Clifton Moor Centre York N Yorks	YO30 4XZ	01904 819247
The Eyecare Centre	N.P Sher Ltd. 1 Kirkgate Settle	BD24 9DX	01729 822356
The Spinnaker Optical Ltd.	T/A Gogglebox 108 High Street Northallerton	DL7 5PP	01609 777225
The Vale Opticians	Fountains View 1 High Street Boroughbridge	YO51 9AW	01423 323450
Vision Care at Home North West Ltd	Unit 5c Kayley Industrial Estate Richmond Street Ashton Under Lyne Lancashire	OL7 0AU	0161 339 8985
Vision Express (UK) Ltd	Harrogate Vision Express 5-5A Prospect Crescent Harrogate	HG1 1RH	01423 523477

Vision Express (Uk) Ltd	8-10 Parliament Street York	YO1 8SE	01904 541104
Vision Express (UK) Ltd	1 Barhouse 112 Westborough Scarborough	YO11 1LP	01723 507667
Vision Express (UK)Ltd	t/a Vision Express 2 Sheep Street Skipton N Yorks		01756 793203
Vision Value	21 Parliament Street York	YO1 8SG	01904 637763
Vision Value Selby	10 Gowthorpe Selby	YO8 4ET	01757 213773
Walsh Office Eyecare Ltd	7 King George Avenue Horsforth Leeds	LS18 5ND	08450 1707225
Whitby Vision Plus Ltd	9 New Quay Road Whitby	YO21 1DH	01947 824020
York Visionplus Ltd	15 Low Ousegate York	YO1 9QX	01904 655611
Yorkshire Eyecare	20 Nab Lane Shipley West Yorkshire	BD18 4HJ	0800 2289922