



EYE HEALTH NEEDS ASSESSMENT

for

**NHS ENGLAND (CHESHIRE,
WARRINGTON AND WIRRAL)**

**LOCAL PROFESSIONAL NETWORK FOR
EYE HEALTH**

February 2015



CONTENTS

Aim.....	6
Recommendations.....	6
1. Introduction.....	8
1.1. Eye Health.....	8
1.2. Definition of a Health Needs Assessment.....	8
1.3. Aim and Objectives of the Eye Health Needs Assessment.....	8
1.4. Population.....	9
1.5. Scope.....	9
1.6. Limitations.....	9
2. Impact of Visual Impairment.....	10
2.1. Impact on the Individual.....	10
2.2. Cost to the Economy.....	10
3. Policy Drivers.....	10
3.1. UK Vision Strategy.....	10
3.2. Public Health Outcomes Framework.....	10
3.3. NHS Outcomes Framework 2014/15.....	10
3.4. Quality Innovation Productivity and Prevention (QIPP) Programme.....	11
3.5. Joint Strategic Needs Assessment.....	11
4. Eye Health Conditions.....	12
4.1. Definitions of Blindness and Partial Sight.....	12
4.2. Blindness.....	12
4.3. Partial Sight.....	13
4.4. AMD.....	14
4.4.1. Description.....	14
4.4.2. Factors affecting the development of AMD.....	15

4.4.3. Intervention and prevention.....	15
4.5. Glaucoma.....	15
4.5.1. Description.....	15
4.5.2. Factors affecting the development of glaucoma.....	16
4.5.3. Intervention and prevention.....	16
4.6. Cataracts.....	17
4.6.1. Description.....	17
4.6.2. Factors affecting the development of cataracts.....	17
4.6.3. Intervention and prevention.....	17
4.7. Uncorrected refractive error.....	17
4.7.1. Description.....	17
4.7.2. Intervention and prevention.....	18
4.8. Diabetic Retinopathy.....	18
4.8.1. Description.....	18
4.8.2. Factors affecting the development of diabetic retinopathy.....	18
4.8.3 Intervention and prevention.....	18
5. Methodology.....	20
5.1. Literature.....	20
5.2. Population.....	20
5.3. Estimates of prevalence of eye disease.....	20
5.4. Activity Data.....	20
6. Area Population Characteristics.....	22
6.1. Age.....	22
6.1.1. Population Estimate and Projections.....	22
6.2. Local Authority Level Data.....	26
6.3. Ethnicity.....	27
6.4. Deprivation.....	28

6.5. Smoking.....	29
6.6. Obesity, Diabetes and Cardiovascular Disease.....	29
6.7. Impacts of eye disease on health.....	29
6.7.1. Dementia.....	29
6.7.2. Falls.....	29
6.7.3. Depression.....	31
7. Prevalence of Eye Disease.....	33
7.1. Visual Impairment.....	33
7.1.1 Prevalence in Cheshire West and Chester, Cheshire East, Warrington and Wirral.....	33
7.1.2. Certificate of Visual Impairment.....	34
7.1.3. Sight Loss.....	35
7.1.4. Appropriate Support.....	36
7.1.5. Additional Disabilities.....	37
7.1.6. All Sight Threatening Conditions.....	37
7.2. AMD.....	38
7.3. Glaucoma.....	41
7.4. Cataract.....	43
7.5. Uncorrected refractive error.....	44
7.6. Diabetic retinopathy.....	45
8. Eyecare Workforce and Local Services.....	48
8.1. Primary Care.....	48
8.1.1 Structure.....	48
8.1.2. Contracts.....	48
8.1.3. Services Provided.....	48
8.1.4. Role of GPs.....	49
8.1.5. Sight tests in screening for treatable eye disease.....	49
8.1.6. Sight test intervals.....	49

8.1.7. Number of ophthalmic practitioners.....	50
8.2. Secondary Care.....	51
8.2.1. Local services for AMD.....	52
8.2.2. Local services for glaucoma.....	53
8.2.3. Local services for cataract.....	54
8.2.4. Local services for uncorrected refractive error.....	55
8.2.5. Local services for diabetic retinopathy.....	56
8.2.6. Local services for other conditions.....	56
9. Costs.....	58
10. Summary, conclusions and recommendations.....	60
10.1. Local prevalence of eye conditions.....	60
10.2. Factors affecting eye conditions.....	61
10.3. Sight loss.....	61
10.4. Preventing sight loss.....	61
10.5. Management.....	62
10.6. Costs.....	62
10.7. Care of people with sight loss.....	62
References.....	64

CHESHIRE, WARRINGTON AND WIRRAL

EYE HEALTH NEEDS ASSESSMENT

AIM

The aim of this assessment is to improve local knowledge of eye health in relation to the perceived needs of the local population and to use this to influence the commissioning of high quality eye care services for Cheshire, Warrington and Wirral, and avoid preventable blindness.

It should be noted that a further Eye Health Needs Assessment has been undertaken for Wirral, which can be found at http://info.wirral.nhs.uk/ourjsna/eye_health_adults.html.

RECOMMENDATIONS

Recommendation 1: Eye health should form part of Local Authority JSNAs to ensure that it is not considered in isolation.

Recommendation 2: Many people in Cheshire, Warrington and Wirral are at risk of sight loss if their conditions are not detected, treated and appropriately managed. Eye health is a significant burden and should be considered in service planning.

Recommendation 3: Age, deprivation and ethnicity profiles should be considered when commissioning and planning eye health services. Lifestyle factors such as smoking and obesity should also be considered.

Recommendation 4: The CVI is to be used as the indicator of success in preventing vision loss. There are differences in CVI registration across the region, so further investigation as to why this is the case may be warranted.

Recommendation 5: Planning of eye health services should be designed to detect eye disease as early as possible, bearing in mind that people from lower socio-economic or certain ethnic groups are less likely to access services in a timely manner. The importance of regular sight tests in detecting eye disease should be promoted. Public health campaigns would help to raise awareness of the common causes of sight loss. Also, further investigation into why the crude rate of preventable sight loss due to AMD is statistically higher in Wirral than the England average may be warranted.

Recommendation 6: Much improved data is required regarding waiting times, clinic capacity and service quality in secondary care. To relieve clinic capacity pressures in the hospital eye service, alternative options could be considered such as community optometry enhanced services. That Cheshire, Warrington and Wirral have, as a whole, more ophthalmic practitioners per 100,000 population than the average for England suggests that this workforce could be well utilised by potentially providing enhanced services in the community, closer to peoples' homes.

Recommendation 7: More detailed analysis of costs at a local level should be undertaken to establish the efficiency and efficacy of services in Cheshire, Warrington and Wirral, and the economic burden of sight loss.

Recommendation 8: ECLO support for Cheshire East would be hugely beneficial for its residents living with sight loss. Further collation of evidence to support the need for an ECLO in Cheshire East could be undertaken. A more detailed report into the nature and quality of other services available for those with a visual impairment would be ideal.

Authors/Contacts:

Rachael O'Connell MPhil BSc (Hons) MCOptom, Optometrist

David Knowles, Chairman, Local Professional Network for Eye Health, Cheshire, Warrington and Wirral Area Team

Comments/queries to be directed to:

David Knowles

david.knowles1@nhs.net

Tel: 07799774905

1.INTRODUCTION

1.1 Eye Health

Sight loss and poor eye health present a major public health burden. In the UK, 1.86 million people are living with sight loss and there will be a 22% increase in this figure by 2020. Whilst this is mainly due to an ageing population (over 80% of sight loss occurs in people over 60 years old), many of the causes of eye disease are preventable. Costs and demands on the NHS are high with direct and indirect costs amounting to around £8 billion in 2013.

The main causes of sight loss have been identified as age related macular degeneration (AMD), glaucoma and diabetic retinopathy (Bunce et al., 2010). Additionally, cataracts and uncorrected refractive error can cause registrable levels of visual impairment (i.e. partial sight or blindness), which may be resolved with appropriate treatment. These eye conditions can either be prevented – or the impact on quality of life decreased – if diagnosed and managed appropriately. The Royal National Institute for the Blind (RNIB) has determined that 53% of blindness may be prevented with suitable intervention and treatment.

1.2 Definition of a Health Needs Assessment

A health needs assessment may be defined as a systematic method for reviewing the current and future health issues facing a population, leading to agreed priorities and resource allocation that will improve health and reduce inequalities (Cavanagh & Chadwick, 2005). A health needs assessment can be the first stage in developing a strategy to address the needs of the local population.

1.3 Aim and objectives of the Eye Health Needs Assessment

The purpose of this Eye Health Needs Assessment and recommended strategy is to identify the main priorities for improving eye health and reducing eye health inequalities in Cheshire, Warrington and Wirral. This will enable appropriate commissioning of suitable eye care services based upon the immediately apparent and projected future needs of the local population alike. By doing so, the impact of eye disease is reduced and preventable blindness avoided.

This will be achieved by meeting the following objectives:

- Collation of evidence in order to improve local knowledge of eye health;
- Mapping of existing services, including information on the use of these and identification of any gaps;
- Identification of inequalities;
- Recommendation of further areas of work for the ongoing assessment of eye health needs across the region.

1.4 Population

The local population is defined as the resident population of the four Local Authority areas of Cheshire East, Cheshire West and Chester, Warrington and Wirral. This is a total population of just over 1.25 million people.

There are six Clinical Commissioning Groups (CCGs) in this area: Eastern Cheshire, West Cheshire, South Cheshire, Vale Royal, Warrington and Wirral.

1.5 Scope

The scope of this Eye Health Needs Assessment is a focus on five major eye conditions:

- Age-related macular degeneration (AMD)
- Glaucoma
- Cataract
- Low vision
- Diabetic retinopathy

1.6 Limitations

This document reviews the needs of specific risk groups within eye care. It utilises existing data to provide an overview of the eye health needs of the local population, and should enable the Local Professional Network for Eye Health to consider immediate commissioning priorities. However, the full range of data in eye health are likely to span a number of providers and require additional resource to gather, assimilate, analyse and interpret. This document highlights key points and recommends further areas of exploration or in-depth analysis to build upon the work commenced herein, which is highlighted in **black, bold text** throughout.

It should be noted that this document concentrates on the eye health needs of adults in the area. Thus, an Eye Health Needs Assessment specifically for children ought to be considered.

2.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.

2.1 Impact on the Individual

People with even moderate levels of visual impairment often struggle to do simple everyday tasks and require additional support in tasks such as dressing or accurate administration of medication.

Visually impaired people of working age are less likely to be in employment. Older visually impaired people are more likely to become isolated and have depression (Evans et al., 2007). In glaucoma patients, the risk of depression increases with the severity of the disease (Skalicky and Goldberg, 2008). 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 (Pyykko et al., 1990). Consequently, older visually impaired people are more likely to fall and have injuries such as hip fractures. Compared to a control group with similar systemic conditions, individuals with glaucoma are three times more likely to have fallen in the twelve months prior (Haymes et al., 2007).

2.2 Cost to the Economy

The costs of visual impairment are staggering. A report by Access Economics (2009) estimated that the cost to the UK for the 1.8 million visually impaired individuals was £22 billion in 2008. 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 £2092 million. 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. Given these estimates, it might be expected that the 17,764 registered sight impaired people could incur annual costs of approximately £220,000 each. This estimate does not include any additional costs related to increases in benefits and costs of care since 2008. Nor does it include the additional educational support that is required for visually impaired children under 16, or the costs of care of those who may have visual impairment but who are not registered.

3.POLICY DRIVERS

3.1 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. It has three key aims:

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

3.2 Public Health Outcomes Framework

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

Improvements in the additional indicators listed below may also be assisted by improvements in eye health. It has been shown that visual impairment is a risk factor for falls in older people (Haymes et al., 2007), and that people with visual impairment are more likely to be depressed (Evans et al., 2007). Additionally, self-care for other systemic conditions is likely to be affected, resulting in poorer health outcomes for these patients than those who are not visually impaired.

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

2.24 Falls and Injuries in those aged over 65

4.14 Hip fractures in those aged over 65

2.23 Self-reported wellbeing

4.13 Health related quality of life for older people

3.3 NHS Outcomes Framework 2014/15

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:** potential years of life lost from causes considered amenable to healthcare
- **3.6:** helping older people to recover their independence after illness or injury

3.4 Quality Innovation Productivity and Prevention (QIPP) Programme

Ophthalmology has been identified by a number of the emerging CCGs as being an area in which they feel may benefit from development under the QIPP programme.

There is scope to optimise use of the available workforce and improve treatment pathways for patients as outlined by the National Eyecare Steering Group 1st Report (Busby 2004).

3.5 Joint Strategic Needs Assessment

The Joint Strategic Needs Assessment (JSNA) is a profile of the local population produced by Local Authorities in partnership with the CCGs and other organisations serving their population. It usually includes projections for the future based on a number of indicators, such as the population size, ethnicity and age breakdown. The JSNA is used then to identify the health and wellbeing needs and inequalities of the local population.

Some Local Authorities have specifically included eye health indicators, whilst others include information on specific conditions that influence the prevalence of eye disease e.g. rates of diabetes and obesity. In addition, the JSNA helps Health and Wellbeing Boards set priorities.

The Local Authorities should work with Local Professional Network to ensure that eye health is included in JSNAs and that the importance of prevention of eye disease is recognised by key stakeholders in Cheshire, Warrington and Wirral.

Local analytical teams could build on the work of this report to include more local data and complete localised population estimates for prevalence of eye disease.

4.EYE HEALTH CONDITIONS

4.1 Definitions of Blindness and Partial Sight

Figure 1 is designed as an aide in understanding how certain diseases affect different parts of the eye.

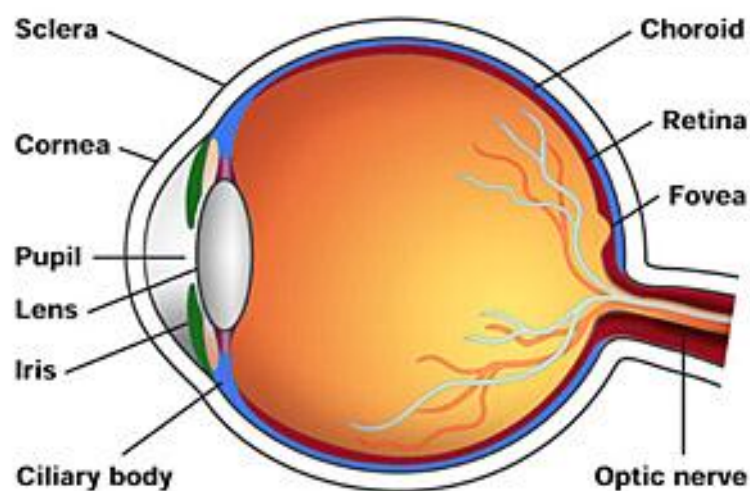


Figure 1: *Anatomy of the eye*

- AMD: damages the macula (in the area of the fovea)
- Glaucoma: damages the optic nerve
- Cataract: opacification of the lens
- Diabetic retinopathy: damage to the blood vessels supplying the retina
- Refractive errors: cause blurred images to fall on the retina

4.2 Blindness

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 2 shows how people with different eye conditions may perceive a scene.



Figure 2: Visual impairment patterns expected in different eye conditions compared to normal vision

4.3 Partial Sight

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 (otherwise known as ‘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 Snellen vision standards for blindness and partial sight 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.

4.4 AMD

4.4.1 Description

AMD is the leading cause of certifiable visual loss in the UK. 52.9 % of the certifications for blind and partial sight in 2010-11 were attributed to this cause (Bunce et al., 2010).

Patients with AMD lose their central vision so tasks that involve detail like reading and face recognition become difficult, if not impossible (as shown in Figure 2). Peripheral vision usually remains intact. 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 ageing 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. This causes severe loss of central vision, which is 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. Injection with an anti VEGF agent Ranibizumab (Lucentis) is currently the most common form of treatment for wet AMD.

4.4.2 Factors affecting the development of AMD

- **Ageing:** the prevalence of AMD increases with advancing age
- **Family history:** People who have/have had a close relative with AMD are more likely to develop the disease themselves than someone who does not (Smith and Mitchell, 1998).
- **Smoking:** Smokers are up to four times more likely to develop AMD than non-smokers (Tan et al., 2007, Evans et al., 2005), and are more likely to develop AMD up to ten years earlier than those who have never smoked (Mitchell et al., 2002). Furthermore, smokers with AMD are more likely to experience the disease progressing faster, and be less responsive to treatment (Lee et al., 2013).
- **Other lifestyle factors:** obesity, poor diet and chronic hypertension have been shown to increase oxidative stress and hence also the risk of AMD (Adams et al., 2011).

4.4.3 Intervention and prevention

Where possible, the best course is prevention. Smoking is known to increase the risk of AMD by four times, hence smoking cessation initiatives are likely to be helpful. In addition, studies have shown that specific nutrients in the diet can be useful in slowing the progression of moderate dry AMD (AREDS 2001). These recommendations are similar to what might be expected for a healthy diet in general. For these reasons, stop smoking initiatives and dietary advice are probably the most likely interventions to help reduce the incidence and slow the progression of AMD. Where 'wet' AMD still occurs, prompt treatment using an anti-VEGF agent such as Lucentis is appropriate.

4.5 Glaucoma

4.5.1 Description

Glaucoma refers to a group of conditions characterised by visual field loss, and pathological changes in the optic nerve head. There may also be raised intra-ocular pressure, such as in chronic open angle glaucoma, which is a common form of the condition. Sight loss in glaucoma is irreversible.

Ocular hypertension refers to patients who have raised intra-ocular pressure but do not have any sign of glaucomatous damage at the optic nerve head, nor visual field loss. Patients diagnosed with ocular hypertension still require ongoing monitoring as they have significantly increased risk of developing chronic open angle glaucoma later in life (Medeiros and Weinreb, 2009).

Glaucoma suspects may have early signs of optic nerve damage but at this stage, may not yet exhibit field loss. They may or may not have raised intra-ocular pressure. The onset of glaucoma is gradual, and as the early signs are often subtle, may not be easily identified in a single visit. Patients who are suspected of having glaucoma often require at least two review visits to establish a diagnosis.

4.5.2 Factors affecting development of glaucoma

- **Ageing:** The prevalence of chronic open angle glaucoma is related to increasing age (Rudnicka et al., 2006).
- **Ethnicity:** Chronic open angle glaucoma is approximately three times more prevalent amongst black rather than Caucasian populations of a similar age (Rudnicka et al., 2006). However, the increase in prevalence with age is steeper in Caucasians than for other ethnic groups.
- **Family History:** There is an increased risk of developing chronic open angle glaucoma if there is a close relative who has/had the condition (Leske et al., 2008)
- **Social and lifestyle factors:** Patients from deprived areas have been shown to present later than those in more affluent areas and are therefore more likely to experience visual loss (Fraser et al., 2001).
- **Co-existing medical conditions:** There is an increased risk of normal tension glaucoma (glaucoma without an elevated intra-ocular pressure) in patients with migraine or vascular dysregulation e.g. Raynaud's syndrome (Drance et al., 2001).

4.5.3 Intervention and Prevention

The majority of the factors identified as having an influence on glaucoma onset in the previous section cannot be modified by intervention. As the condition may not be cured, successful prevention of vision loss relies on adequate control of eye pressure through medication or surgery, and regular monitoring.

It would also be of value to encourage the uptake of sight tests. This would improve the likelihood of disease detection in the absence of a more formal screening programme. Sight tests already generally include routine intra-ocular pressure screening in patients aged over 40, and patients of this age with a family history of the disease are entitled to NHS sight tests under the General Ophthalmic Services (GOS).

4.6 Cataracts

4.6.1 Description

A cataract is the development of irregularities in the structure of the crystalline lens that leads to a reduction of transparency. Cataracts may be classified as nuclear, cortical or subcapsular. Nuclear and cortical cataracts affect the inner core and outer layers of the lens respectively. Subcapsular cataracts occur just below lens surface.

4.6.2 Factors affecting the development of cataracts

- **Ageing:** The prevalence of cataract increases with age (Frost et al., 2001).
- **Smoking and lifestyle factors:** Smoking has been implicated in increased prevalence of nuclear and posterior subcapsular cataracts (Kelly et al., 2005), as has increased UVB exposure such as may be found in frequent sunbed use or foreign travel (Klein et al., 2002). The Blue Mountain and Beaver Dam eye studies also noted increased cataract prevalence amongst patients with diabetes.
- **Medical:** Development of cataract has been linked with steroid use (Klein et al., 2002).

4.6.3 Intervention and prevention

The main intervention is cataract extraction. This is a very successful procedure with less than 2% of cases being reported as having complications by the Royal College of Ophthalmologists. Development strategies for cataract services should include encouraging take up of this procedure. In addition, strategies to reduce smoking could be helpful in reducing the incidence and progression of cataract.

4.7 Uncorrected refractive error

4.7.1 Description

Refractive errors refer to the focusing errors of short and long sight, and astigmatism, which are easily remedied. All of these conditions give rise to blurred images on the retina unless corrected. 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 (anisometropia), or the child has a strabismus (squint) as these conditions can give rise to amblyopia (lazy eye) 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 eye sight 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.

4.7.2 Intervention and prevention

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. Prescription glasses or contact lenses can correct most refractive errors.

4.8 Diabetic Retinopathy

4.8.1 Description

Diabetic retinopathy is a complication of diabetes and is the leading cause of blindness in the working population in the developed world. Diabetic retinopathy, if left untreated, can lead to sight loss which can have a devastating effect on the individual and their families. By promptly identifying and treating 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. Reported baseline retinopathy levels are present in 39% of men and 35% of women with newly diagnosed Type 2 diabetes (McLeod et al., 1988). 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 two people treated to prevent blindness, the sight of one person will be saved.

4.8.2 Factors affecting the development of diabetic retinopathy

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

- Poor glucose control
- Systemic hypertension
- Elevated serum lipid levels
- Smoking (for those with Type 1 diabetes)
- The length of time a person has had diabetes

4.8.3 Intervention and prevention

The main treatment for diabetic retinopathy is laser treatment, with an operation (vitrectomy) undertaken in cases of advanced retinopathy. If the condition does not respond to laser treatment, intravitreal injections of a steroid (triamcinolone) can be made.

Unlike other eye diseases, there is a National UK Screening programme for diabetic eye disease. 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 disease. If disease is detected, people are referred for treatment. It is an extremely effective programme with estimates that it has reduced new cases of blindness cause by diabetic retinopathy by up to 80%: this could mean 1000 people a year in the UK will have their sight saved because of screening.

5.METHODOLOGY

5.1 Literature

Key websites viewed in the literature search include those of NICE, RNIB, College of Optometrists, Royal College of Ophthalmologists and the National Eye Health Epidemiological Model (NEHEM). Literature searches were conducted on Pubmed.

A more detailed literature search may provide more information on the prevalence of eye disease and the optimal commissioning arrangements to treat it.

5.2 Population

The population numbers for 2011 are taken from census data available from the Office for National Statistics (ONS). As all data is collected in a consistent way, the combination of data from the different areas to create a combined population for Cheshire, Warrington and Wirral provides a reasonably robust population estimate. The census data provides near complete coverage of the country's population. The assumptions made within the population projections for 2015 and 2030 are also based on 2011 census data. These are updated annually, but are based on the 2011 interim population projections. Longer term projections are more unreliable than shorter term ones, and so results should be interpreted with some caution.

5.3 Estimates of prevalence of eye disease

The NEHEM has been used to estimate the prevalence of glaucoma, cataract and macular degeneration in the Merseyside population. This replicates the methodology used in both the Greater Manchester and Merseyside Eye Health Needs Assessments, which will allow comparison of needs and provision locally with a neighbouring Area Team, with the possibility to share good practice. The Greater Manchester model considered a number of sources and methods used in other health needs assessments (NHS Bradford and Airedale 2011, NHS Brighton and Hove 2011).

The estimates predicted by NEHEM are based on the 2001 census data, so the population data on which it is based are slightly out of date. However, it is the most robust method available given that research literature on the prevalence of eye disease in the UK population is sparse. The RNIB data sight loss tool was also utilised in some aspects of the report. In addition, profiles produced by Novartis were used in this report.

5.4 Activity Data

Information relating to general ophthalmic services was sourced from the NHS Information Centre (www.ic.nhs.uk). Clinical activity data was obtained from hospital episode statistics.

Further information relating to Locally Enhanced Services and contracts could be obtained from the CCGs.

Audit data could be examined for further information. Each Local Authority could make further use of the RNIB Sight Loss tool to add to the data in this report.

6.AREA POPULATION CHARACTERISTICS

6.1 Age

6.1.1 Population Estimate and Projections

Figures 3, 4, 5 and 6 show the 2015 population estimates and the population projection for 2030 for Central and Eastern Cheshire, Warrington, Wirral and Western Cheshire respectively. These estimates are based on projections provided by the ONS using mid-2004 population estimates as a base.

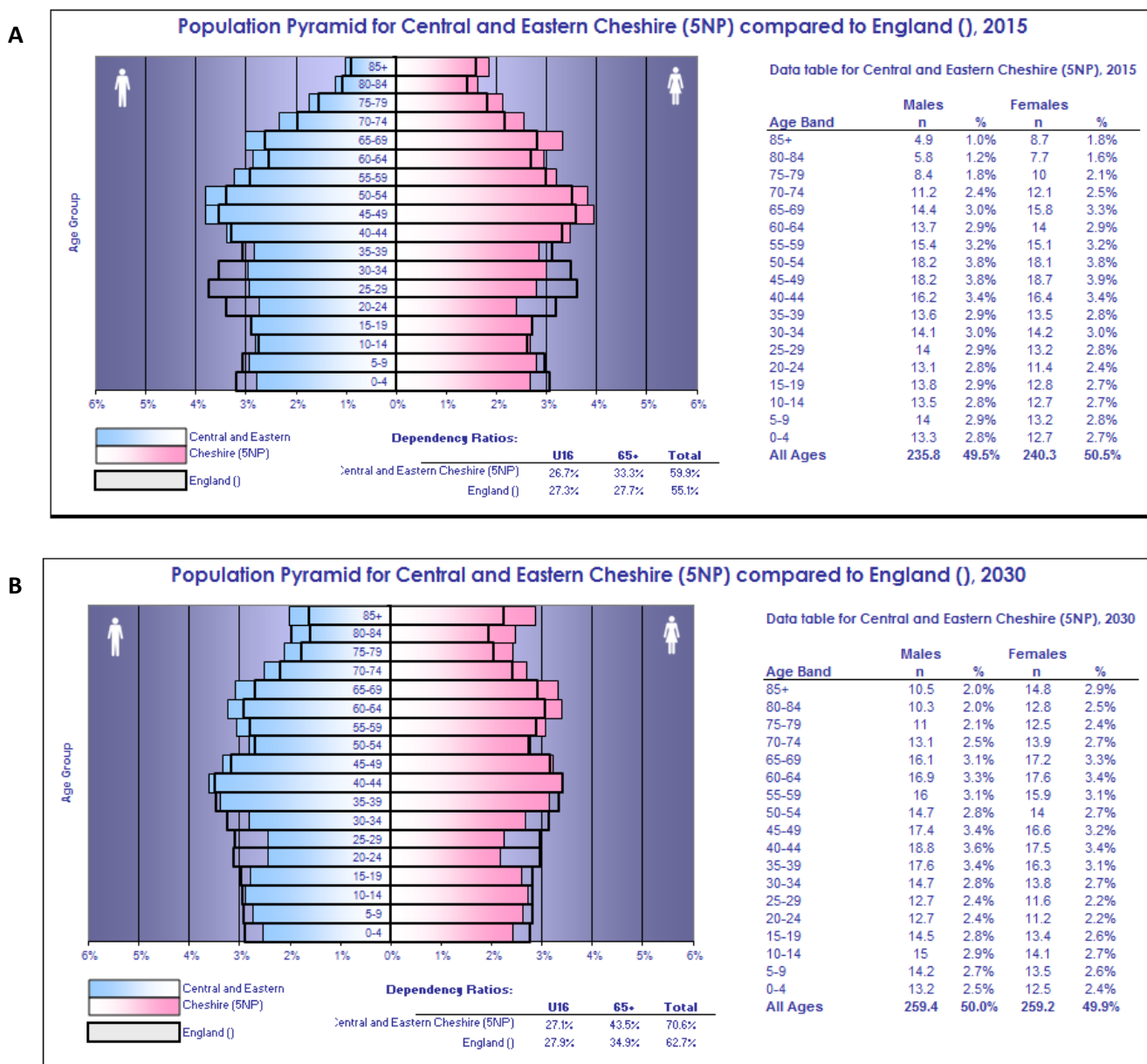
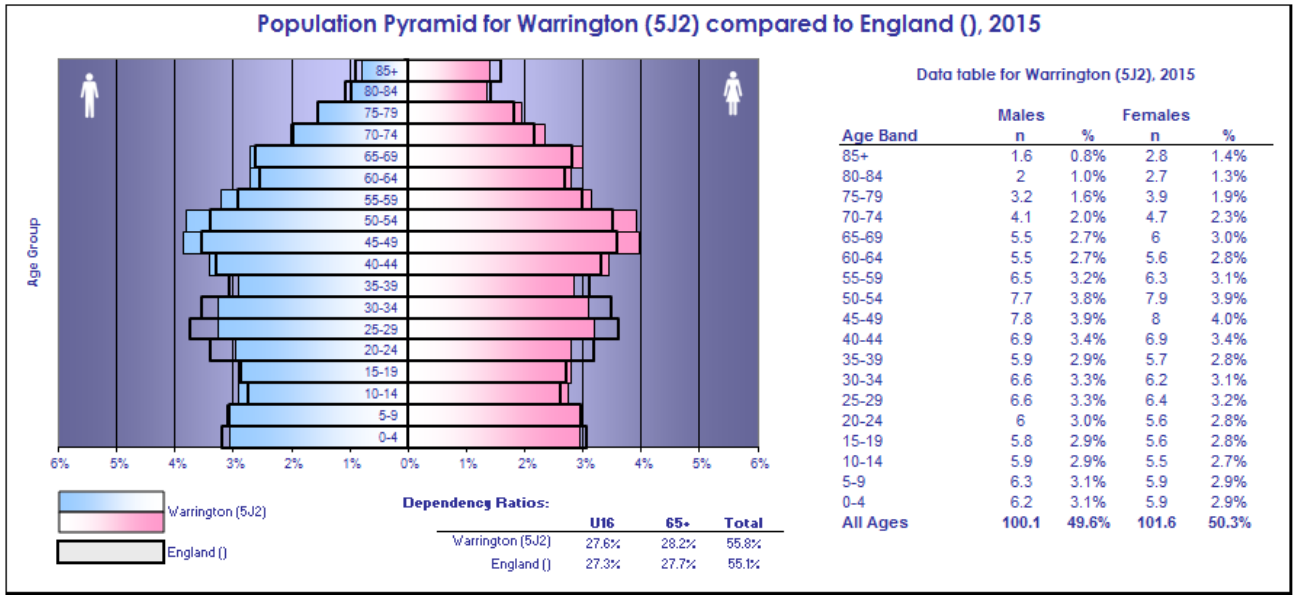


Figure 3: Percentage population split by age in Central and Eastern Cheshire in a) 2015 and b) 2030 compared with England average (bold outlines). Data from ONS using mid-2004 population estimates as a base.

A



B

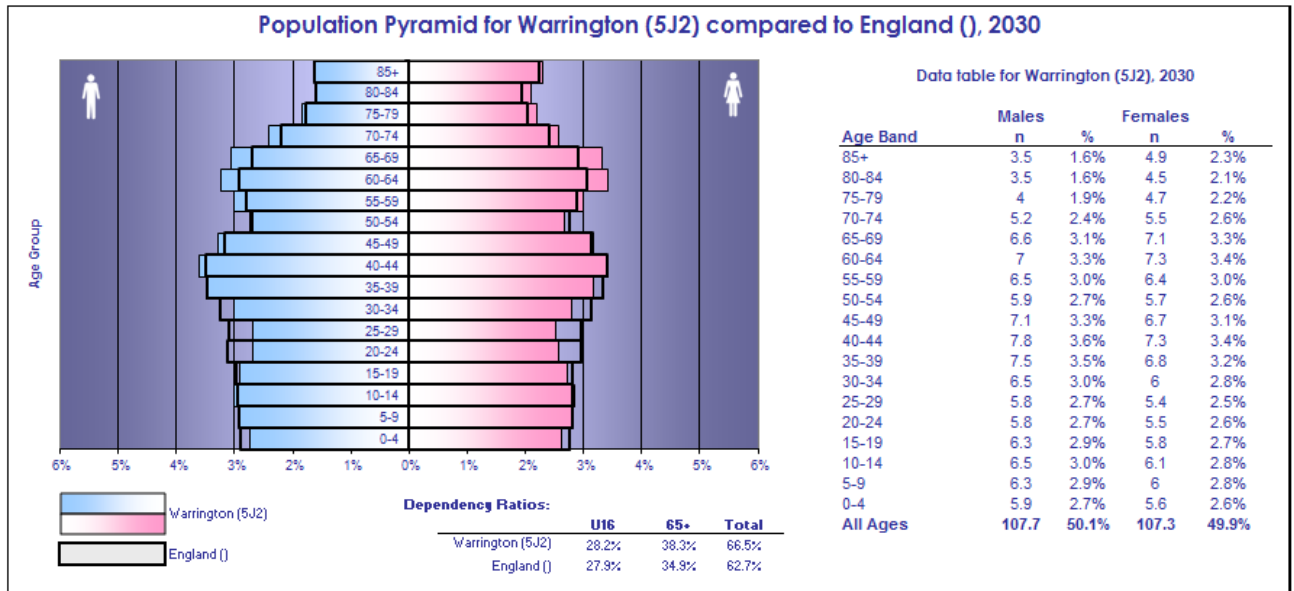
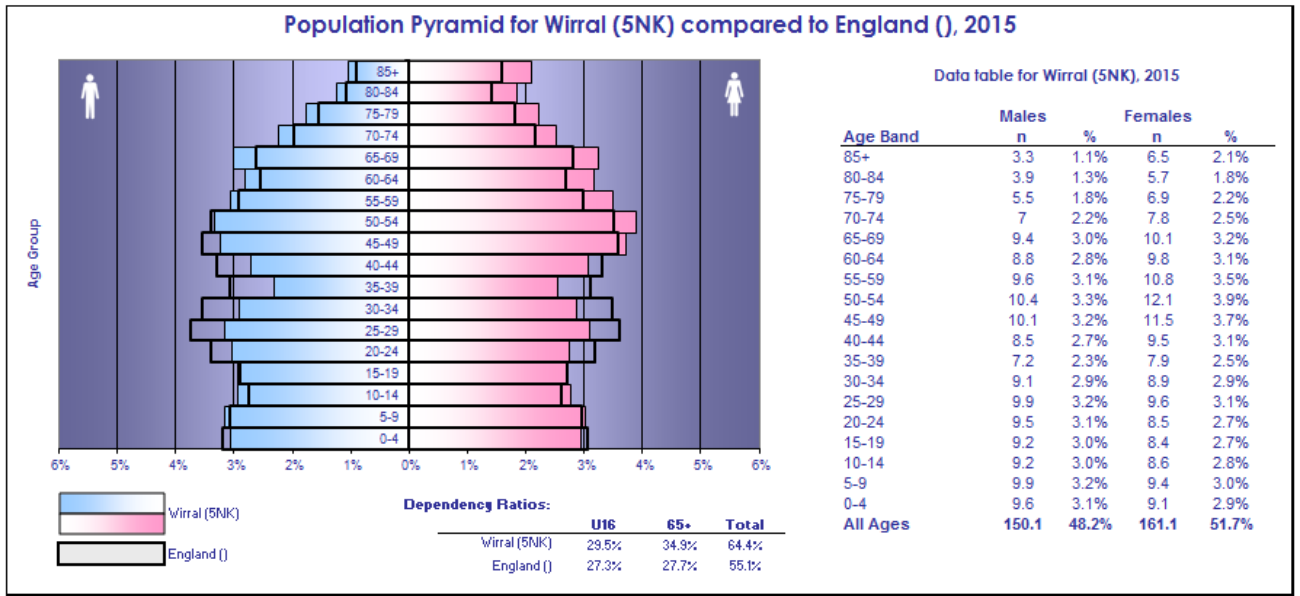


Figure 4: Percentage population split by age in Warrington in a) 2015 and b) 2030 compared with England average (bold outlines). Data from ONS using mid-2004 population estimates as a base.

A



B

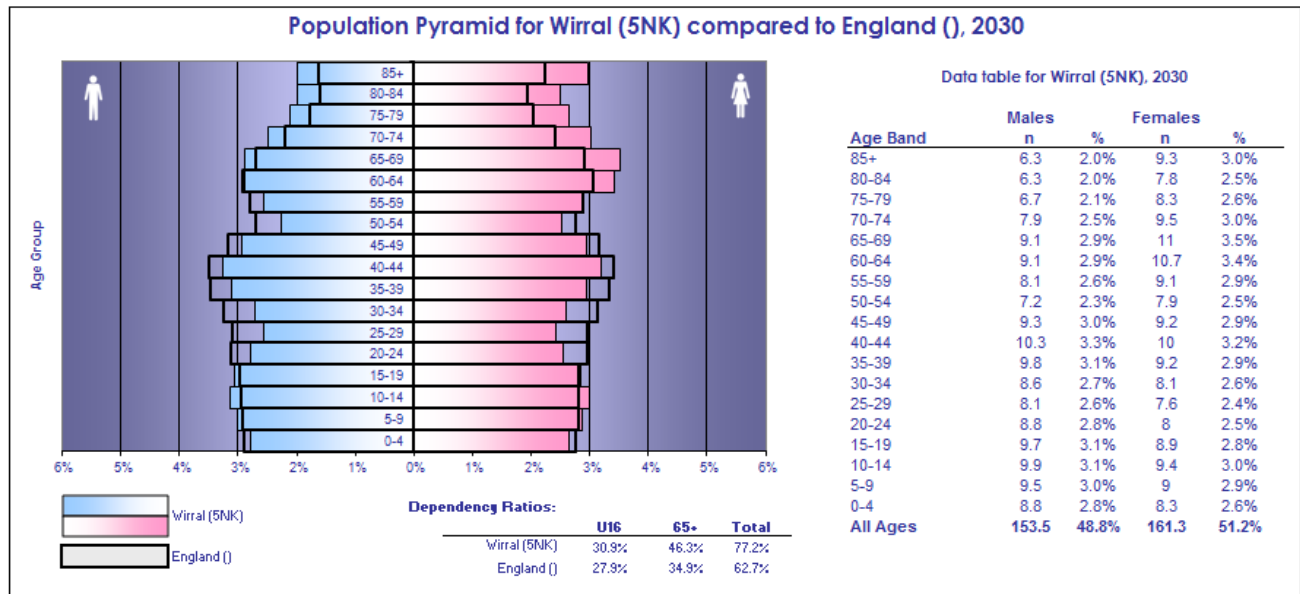


Figure 5: Percentage population split by age in Wirral in a) 2015 and b) 2030 compared with England average (bold outlines). Data from ONS using mid-2004 population estimates as a base.

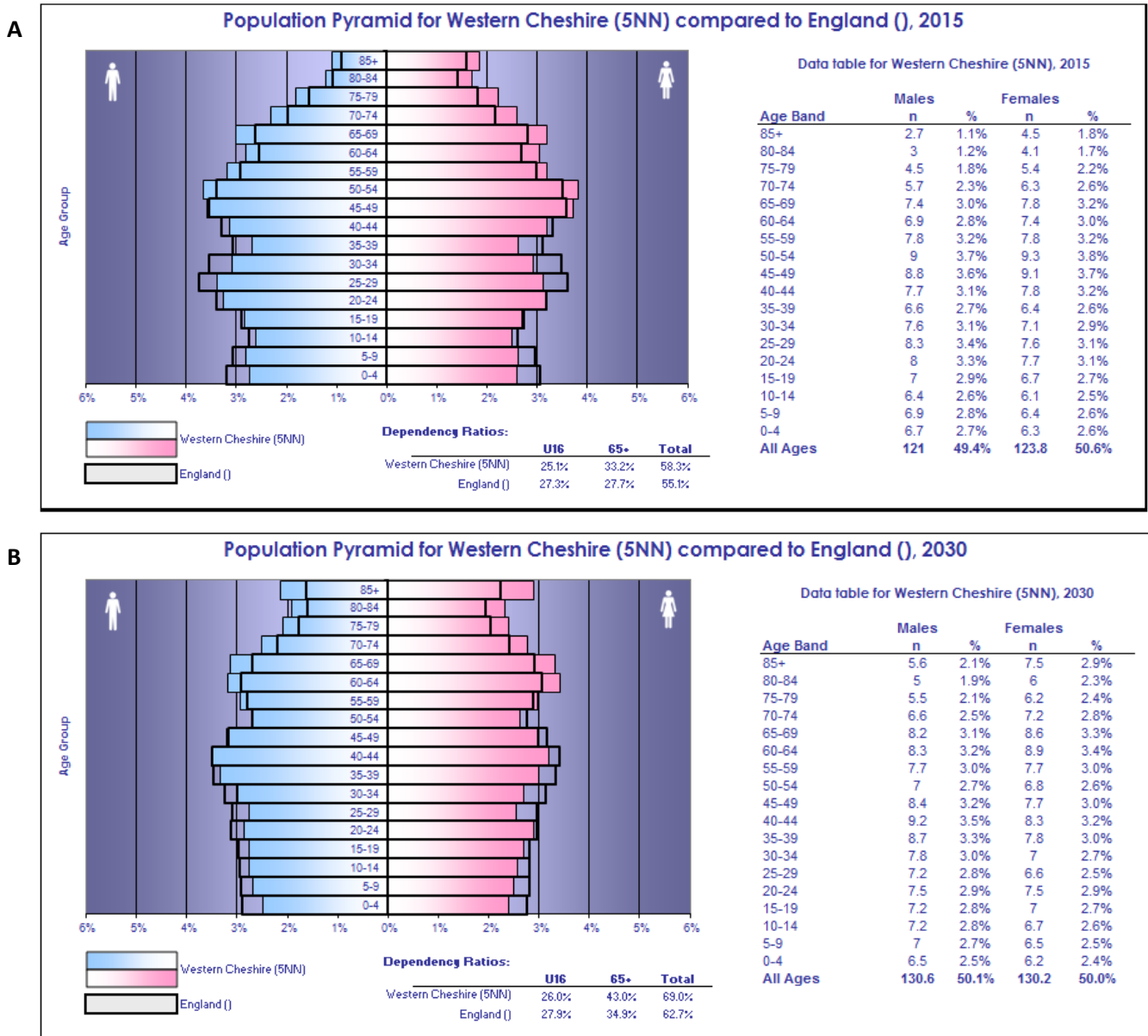


Figure 6: Percentage population split by age in Western Cheshire in a) 2015 and b) 2030 compared with England average (bold outlines). Data from ONS using mid-2004 population estimates as a base.

The population pyramids for Central and Eastern Cheshire, Western Cheshire, Warrington and Wirral collectively show that in both 2015 and 2030, these areas have a greater proportion of older people compared to England as a whole. This trend is generally seen from age 40 upwards (2015) and 55 upwards (2030) across all four areas.

It is also apparent that people are expected to live longer, with an increase in the proportion of those in upper age groups between 2015 and 2030 evident in all three areas. Averaging across Central and Eastern Cheshire, Western Cheshire, Warrington and Wirral, the percentage of people in

the 65+ age groups is expected to increase from 20.0% in 2015 to 25.0% in 2030. For those aged 85+, the percentage is set to jump from 3.0% to 4.7%.

Such projections have important implications for eye health and potential pressures in secondary care. The most common causes of sight loss result from diseases which are age-related – typically affecting those over age 40 – with the likelihood of developing these ocular diseases increasing with advancing age. One in five people aged over 70 are believed to be living with sight loss, with this figure rising to one in two in those aged over 90.

6.2 Local Authority Level Data

Figure 7 shows the percentage population split into three age groups; 0-19, 20-64, and 65+ for each of the four Local Authorities compared to England.



Figure 7: Percentage population split by age in four Local Authority areas compared to England as a whole in 2011 (Data from ONS)

Figure 7 shows that the proportion of people in each age category is relatively similar across the four Local Authorities, and is not too dissimilar to England. There is a maximum difference of only 1.6% in the percentage of those aged 0-19 years (Warrington 24.1%, and both Cheshire East and Cheshire West and Chester 22.5%). This difference rises to 2.6% for the 20-64 years category (Warrington 60.0%, Wirral 57.4%) and 3.1% for those aged 65+ (Warrington 16.0%, Wirral 19.1%).

In 2014, the population in Cheshire West and Chester was estimated to be 330,000 based upon mid-2012 population estimates from ONS. For Cheshire East, Warrington and Wirral, these figures were 372,000, 204,000 and 320,000 respectively.

Based upon similar age profiles evident across the four Local Authorities, the planning of services in a particular locality is likely to be applicable in the other Local Authorities as well.

6.3 Ethnicity

Eleven percent of people from ethnic minorities aged 40 and above had not had a sight test in the last ten years according to a report published by the College of Optometrists (2013). Of those who had not had a sight test in the last two years, 40% stated the reason was because they did not think it was necessary. Yet people from certain ethnic backgrounds are more likely to develop certain eye diseases.

The population is overwhelmingly White across England as a whole (85.5%), and even more so in the Local Authorities of Cheshire East (96.8%), Cheshire West and Chester (97.5%), Warrington (95.9%) and Wirral (97.0%) alike. Figure 8 shows the percentage population split of remaining ethnic groups in England and the above Local Authorities.

For ease of graphical display, all similar ethnic categories have been added together under a broader classification; for example, Asian/Asian British Indian, Asian/Asian British Bangladeshi, Asian/Asian British Pakistani, Asian/Asian British Chinese and Asian/Asian British Other all fall under the category of 'Asian'. This may mask some subtleties of the ethnic composition of Cheshire, Warrington and Wirral populations and should be borne in mind when interpreting the data.



Figure 8: Percentage population split by ethnic minorities in the Cheshire, Warrington and Wirral population (Source: ONS Census data 2011).

In Figure 8, the ethnic diversity of the four Local Authorities appears far less than for England as a whole. For example, the percentage of the total population classed as Asian in England is 7.7% compared to 2.5% in Warrington. However subtleties do exist within the above Local Authorities. Despite the proportion of black people varying only between 0.2 and 0.4%, those classified as Asian vary between 1.3% (Cheshire West and Chester) and 2.5% (Warrington).

People from certain ethnic minority groups are less likely to access ophthalmic services (Woolf, 2003), yet ethnicity is a risk factor for certain eye conditions. Individuals of South Asian and African-Caribbean descent are at greater risk of developing diabetes, which is the leading cause of blindness in those of working age in the UK. In addition, African-Caribbean people are more likely to develop glaucoma. Despite this, almost three quarters of this population did not know of their increased risk (College of Optometrists, 2013).

The ethnic profile of each area should be borne in mind when developing services.

Although people of black/Asian descent account for a small proportion of the total population across Cheshire, Warrington and Wirral, there is still a need to educate this population about the importance of sight tests, particularly due to their increased risk of eye diseases.

Ethnicity is often not captured on optometric patient records but is likely to still be taken into consideration by the optometrist due to its relevance to the examination. As such data is important for public health purposes, improved access to these data recorded in primary care will assist evaluation of uptake and aid prevention strategies.

6.4 Deprivation

People in lower socio-economic groups are less likely to access ophthalmic services, presenting with eye disease at a later stage than others (Fraser et al., 2001, Saidkasimova et al., 2009). Thus, such individuals are at greater risk of sight loss. Three out of four blind or partially sighted people are living in poverty or on its margins (RNIB, 2004).

Homeless people, travelling people and vulnerable migrants have an increased prevalence of short and long term illness compared to the general population. Research in the USA has shown that homeless people have more eye problems than the general population, including uncorrected refractive error, cataract and glaucoma (Shahid et al., 2012). In the UK, data from Vision Care for Homeless People state that 85% of homeless people prefer to access special homelessness services. Furthermore, as only 15% of homeless people receive state benefits, the majority are not eligible for NHS sight tests.

Maps showing an index of deprivation are available for each Local Authority. What is not known is whether people in these areas are accessing services when needed.

Further investigation is needed to find out whether people living in more deprived areas are accessing services. Services available in each Local Authority could be identified and explored.

Further investigation into vulnerable groups and their access to eye services across the region is warranted.

It would be useful to create a map showing the variation of deprivation across Cheshire, Warrington and Wirral, and to indicate where optical practices are located relative to these more deprived areas.

6.5 Smoking

Smoking is a known risk factor for a number of common eye diseases, including AMD and cataract. Indeed, smokers are thought to be approximately three times as likely to develop sight loss from AMD compared to non-smokers (Kelly et al., 2003).

In 2014, the prevalence of smoking in Cheshire, Warrington and Wirral was below the England average of 19.5%. The prevalence in Cheshire West and Chester was 15.0%, and in Cheshire East, Warrington and Wirral, this figure was 16.3%, 17.8% and 18.4% respectively.

6.6 Obesity, Diabetes and Cardiovascular Disease

People who are overweight or obese have been shown to be at greater risk of ocular disease such as AMD, and systemic disease such as diabetes, stroke and hypertension, which in turn may lead to ocular complications and sight loss in the form of diabetic retinopathy or vascular occlusions. Around 60 per cent of stroke survivors have some sort of visual dysfunction following stroke. The most common condition is homonymous hemianopia, a loss of half a person's visual field, which occurs in 30% of all stroke survivors.

Figures for 2014 show that in Cheshire West and Chester, approximately two thirds (68.5%) of adults are overweight, with a quarter (25.5%) of such adults being classed as obese. In Cheshire East 61.2% were overweight and 23.8% obese, in Warrington those overweight and obese reached 70% and 21.7% respectively, and in Wirral 66.4% of adults were overweight, including 18.6% who were obese. The average figures for England were 63.8% for those overweight and 23.0% for those adults classed as obese. Only Cheshire East had a smaller percentage of adults overweight compared to England.

6.7 Impacts of eye disease on health

6.7.1 Dementia

A report by Access Economics (2009) found that at least 123,000 people in the UK have serious sight loss and dementia. Most are aged over 65 and, among everyone of that age, normal ageing of the eye will reduce their vision to some extent. In 2011, it was estimated that the number of adults aged over 75 living with dementia in Cheshire West and Chester, Cheshire East, Warrington and Wirral were 2034, 2465, 991 and 2205 respectively.

As the population ages, an increasing number of people will experience both dementia and sight loss.

6.7.2 Falls

People with sight loss are more likely to experience falls (Haymes et al., 2007). The estimated cost of treating falls nationally is £269 million and approximately one fifth of this cost was spent treating falls amongst those with a visual impairment.

Prevalence rates for people who report falls, or falls that required hospital admission were obtained from POPPI and applied to Census 2011 population data. Methodology was then applied to estimate the number of blind and partially sighted people who suffered a fall and the number of falls that were directly attributable to sight loss (Boyce T, 2013). Falls amongst blind and partially sighted people in Cheshire West and Chester, Cheshire East and Wirral ranged between approximately 1,300 and 1,600. In contrast, the number of falls amongst blind and partially sighted people residing in Warrington was approximately half that figure (total 676). In all aforementioned areas, approximately one tenth of these falls required hospital admission.

Data on falls is a key measure in the Public Health Outcomes Framework as shown in Figure 9.

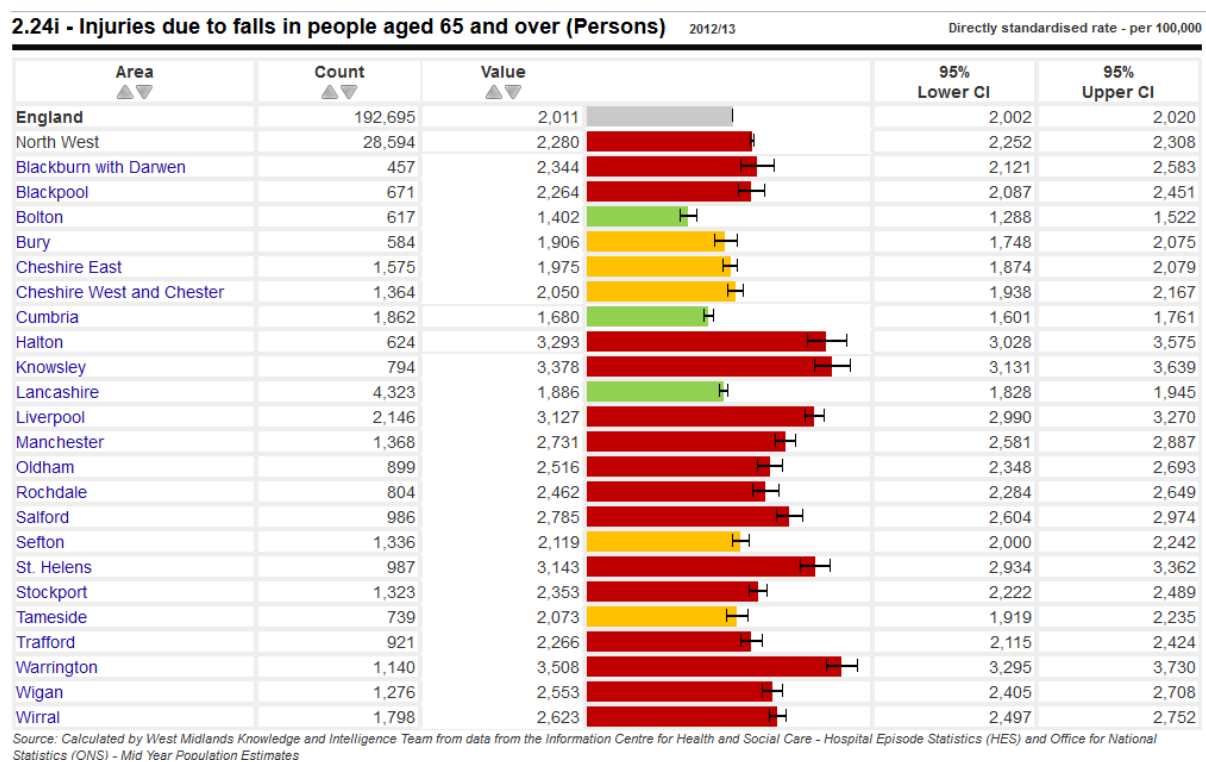


Figure 9: Public Health Outcome Indicator 2.24i for 2012/13 data. This shows the directly standardised age-specific rate of injuries due to falls (per 100,000 population) in each Local Authority in the North West. The confidence intervals (black bars) indicate how precise the estimate is: the longer the bar the less certain the estimate is. Where the bars overlap with bars in other areas indicates that the difference is not statistically significant. A green bar indicates better, yellow similar and red worse than the benchmark of the average for England. Other data in hip fractures is also available. (Source: Public Health Outcomes indicators online).

Higher rates of injuries due to falls that are statistically worse than the benchmark are seen in Warrington and Wirral (Figure 9). In contrast, Cheshire West and Chester, and Cheshire East are similar to the benchmark.

This suggests that work to prevent sight loss may also help prevent falls, although work to support those with visual impairment is also needed.

The RNIB tool can be used by each Local Authority to analyse data relating to the number and cost of falls locally.

6.7.3 Depression

It is well documented that those living with sight loss are more likely to experience low mood and depression, with prevalence of depression amongst the visually impaired elderly thought to range between 25% and 45% (Burmedi D, 2002). The likelihood of depression also increases as the severity of eye disease increases (Skalicky and Goldberg, 2008).

As with falls, data on wellbeing is now recorded as part of the Public Health Outcomes Framework. From the self reported wellbeing survey, low happiness score data for the Local Authorities in the North West is shown in Figure 10.

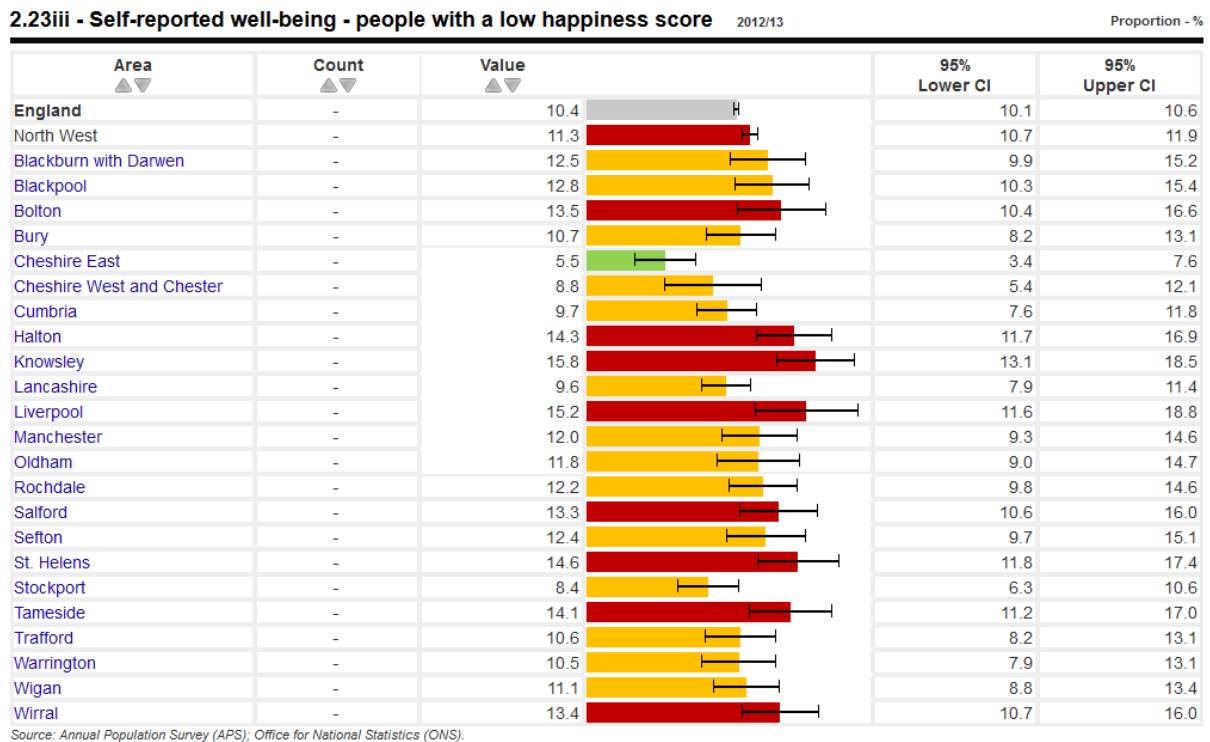


Figure 10: Public Health Outcome Indicator 2.23iii for 2012/13 data. This shows the proportion of adults with a low happiness score in the self reported wellbeing survey in each Local Authority in the North West. The confidence intervals (black bars) indicate how precise the estimate is: the longer the bar the less certain the estimate is. Where the bars overlap with bars in other areas indicates that the difference is not statistically significant. A green bar indicates better, yellow similar and red worse than the benchmark of the average for England. (Source: Public Health Outcomes indicators online).

Figure 10 shows that the proportion of people with a low happiness score throughout Cheshire West and Chester, Cheshire East, Warrington and Wirral is variable. Compared to England as a whole, Cheshire East has a statistically significantly lower proportion of people with a low happiness score, yet Wirral has a statistically significantly higher proportion.

In Wirral in particular, implementations to help prevent sight loss in the first place are likely to have a positive impact on other aspects of health and wellbeing.

7. PREVALENCE OF EYE DISEASE

7.1 Visual Impairment

7.1.1 Prevalence in Cheshire West and Chester, Cheshire East, Warrington and Wirral

Data published for 2008 indicate that there were 1.8 million people with sight loss in the UK (Access Economics 2009). This number is expected to increase by 22% by 2020 and to double to 3.9 million people by 2050.

The most recent data for the year ending 31st March 2014 indicates that 14,385 people in total were registered blind in England, of which 19,995 registrations were in the North West. Table 1 shows the number of people registered blind for the local authorities of Cheshire West and Chester, Cheshire East, Warrington and Wirral as of 31st March 2014.

Local Authorities	0 to 4	5 to 17	18 to 49	50 to 64	65 to 74	75 or over	unknown	total
Cheshire West and Chester	0	230	35	190	160	1370	0	1990
Cheshire East	5	20	110	100	85	665	0	990
Warrington	5	20	75	45	60	255	0	465
Wirral	0	15	125	125	105	690	0	1065

Table 1: The number of people registered blind in different age bands in four Local Authorities in the North West as at 31 March 2014. Data from www.hscic.gov.uk

Given that there were 19,995 people registered blind in the North West, then as shown by Table 1, almost 25% of all blind registrations in this region came from Cheshire West and Chester, Cheshire East, Warrington and Wirral collectively.

At 31st March 2014, a total of 147,715 people were registered partially sighted in England; the North West accounted for 24,000 of such registrations. Table 2 shows the number of people registered partially sighted for the local authorities of Cheshire West and Chester, Cheshire East, Warrington and Wirral as of 31st March 2014.

Local Authority	0 to 4	5 to 17	18 to 49	50 to 64	65 to 74	75 or over	unknown	total
Cheshire West and Chester	10	275	85	180	200	1480	0	2230
Cheshire East	10	55	135	95	115	880	0	1300
Warrington	5	15	80	55	65	365	0	580
Wirral	0	20	140	130	130	795	0	1215

Table 2: The number of people registered partially sighted in different age bands in four Local Authorities in the North West as at 31 March 2014. Data from www.hscic.gov.uk

As previously discussed, there were 24,000 people registered blind in the North West by the end of March 2014. Using data from Table 2, it can be calculated that, similar to blind registrations, almost 25% of all partially sighted registrations in the North West came from Cheshire West and Chester, Cheshire East, Warrington and Wirral collectively.

7.1.2 Certificate of Visual Impairment

A person is registered as sight impaired or severely sight impaired by an ophthalmologist using the CVI which replaced the BD8 form in 2003. Not all patients who qualify for registration/certification as visually impaired 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. In some cultures, there may be concern that the community may treat a stigma such as blindness with pity and rejection (Orticio, 1994). Others may simply not wish to be labelled as visually impaired. These factors amongst others are believed to be contributing to the decrease in the number of certifications (Bunce et al., 2010).

Figure 11 shows data on CVIs for all North West Local Authorities for 2012/13.

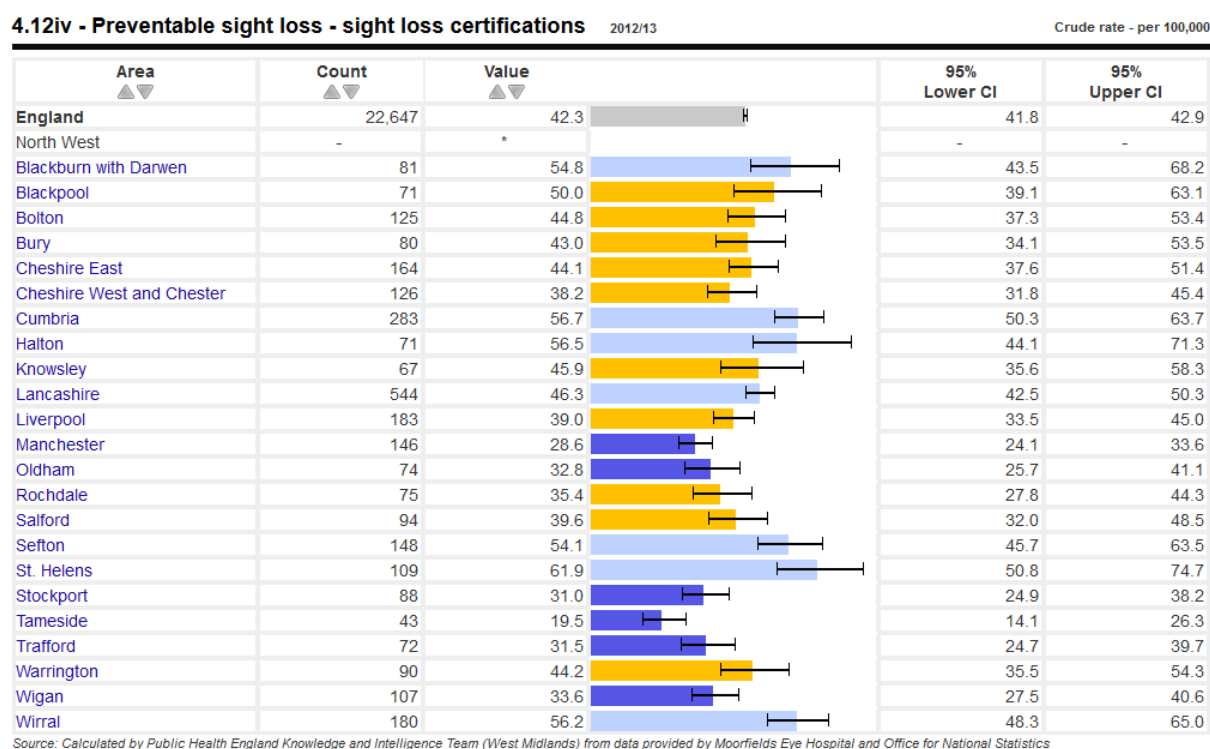


Figure 11: Public Health Outcome Indicator 4.12iv: number of people per 1,000 population in each local authority in the North West with preventable sight loss certifications (2012/13). The confidence intervals (black bars) indicate how precise the estimate is: the longer the bar the less certain the estimate is. Where the bars overlap with bars in other areas indicates that the difference is not statistically significant. A dark blue bar indicates lower, yellow similar and light blue higher than the benchmark of the average for England. (Source: Public Health Outcomes indicators online).

Figure 11 shows that Cheshire East (44.1), Cheshire West and Chester (38.2) and Warrington (44.2) are not statistically different from the England average of 44.5 certifications per 100,000 population. On the other hand, Wirral (56.2) has statistically significantly higher certification rates than the England average.

As previously discussed, the number of people being certified as blind or partially sighted in general is actually decreasing. Between 2010/2011 and 2011/2012, the percentage change in certifications was -1.1% for Cheshire East, and -24.5%, -11.3% and +6.9% for Cheshire West and Chester, Warrington and Wirral respectively.

Further information on CVIs at a Local Authority or CCG level would be beneficial in order to identify whether any inequalities in registration across the local area exist.

Data from POPPI (Projecting Older People Population Information) and PANSI (Projecting Adult Needs and Service Information) could be explored and triangulated against information presented in this HNA. Projections for numbers with moderate to severe impairment, and those with registrable conditions can be made.

7.1.3 Sight Loss

Though the number of people being certified is generally decreasing, the number of those living with sight loss is rising. The prevalence of sight loss in 2011 was estimated to be 3.2% averaged across the above Local Authorities. This is set to rise to 3.8% in 2020 and to 4.5% in 2030. This is consistently a little higher than the data for England, which has a prevalence of 3.0%, 3.4% and 4.5% for 2011, 2020 and 2030 respectively.

It is anticipated that the number of people living with sight loss is set to escalate in coming years. Figure 12 shows the number of people living with sight loss in the four Local Authorities in 2011, and projected number for 2020 and 2030.

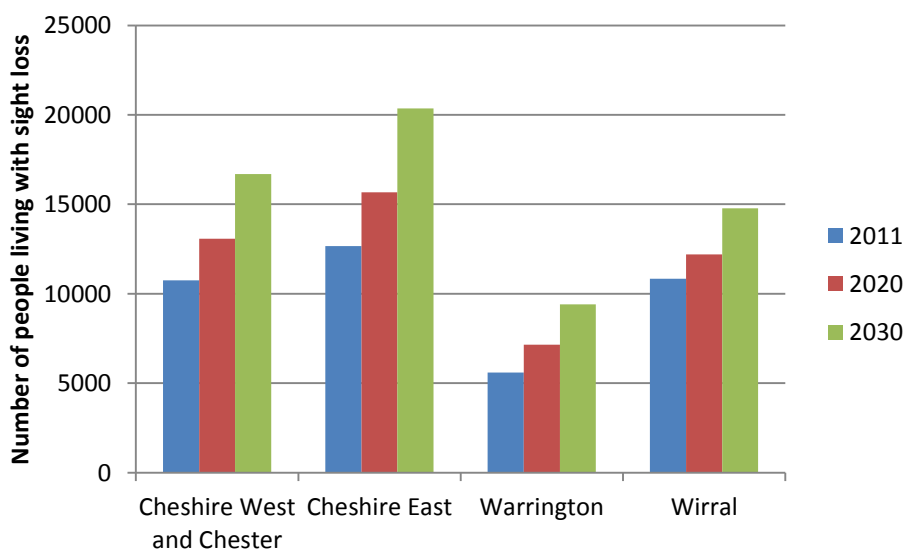


Figure 12: *The number of people living with sight loss in 2011, and estimated numbers for 2020 and 2030 for the four Local Authorities*

Figure 12 shows that in each Local Authority, the number of people living with sight loss is set to jump each decade. Averaging across the Local Authorities, the percentage increase between 2011 and 2020 is expected to be 20.7%, and 27.2% between 2020 and 2030.

7.1.4 Appropriate Support

People living with sight loss need emotional and practical support to help adjust to an often overwhelming and life changing disability. Eye Clinic Liaison Officers (ECLOs) work alongside other professionals in the Ophthalmology Clinic and provide such support to patients newly diagnosed with sight loss and those who return for ongoing treatment alike.

The RNIB estimates that almost a quarter of blind and partially sighted people leave the eye clinic not knowing the name or prognosis of their eye condition. In addition, a survey of registered individuals revealed that over 90% were not offered formal counselling by the eye clinic at the time of registration or later.

ECLOs bridge the gap between health and social care and have the necessary time to spend with patients, which other eye clinic staff often do not. Typically, an ECLO will help maintain a patient's independence, help them to understand what their diagnosis means, provide information on local and national resources, and provide timely referrals to other services regarding, for example, rehabilitation, falls and employment.

As of January 2015, ECLO (or similar Early Intervention Support) was available at major eye clinics in Cheshire West and Chester, Warrington and Wirral. The Countess of Chester has ECLO support, and Arrowe Park and Warrington Hospitals have Early Intervention Support. However, there is a lack of support in Cheshire East (Leighton and Macclesfield Hospitals) and great need. As shown in Figure 12, of the four Local Authorities, Cheshire East had the highest number of people living with sight loss in 2011, and the highest projected number for 2020 and 2030 alike.

External organisations also provide valuable support to people living with sight loss. Such organisations include Wirral Society for the Blind and Partially Sighted, Chester and District Federation of the Blind (Ellesmere Port), Vision Support (Chester and Cheshire) and IRIS (Crewe). Wirral Society for the Blind and Partially Sighted currently has 3,000 members on their database, and RNIB supports 54 Wirral members and 130 Wirral residents with their talking books service.

Further to emotional and practical support, people with sight loss often receive appointments in a format they are unable to read, consequently missing out on essential care and treatment. Simply providing an appointment letter or treatment leaflets in bold, large print format could be enough to enable many patients to read.

It is vital to be able to offer appropriate emotional and practical support to all those living with sight loss, and this need will only increase as the number of people living with sight loss rises.

Further collation of evidence to support the need for an ECLO in Cheshire East could be undertaken. Data regarding the uptake and use of other vision support services could also be collated and analysed to determine whether further promotion of these services is required.

Consideration must be given to an individual's needs, providing letters and information in formats alternative to standard size print.

7.1.5 Additional Disabilities

Many of those who are visually impaired have one or more other disabilities to cope with, which increases the complexity of their health needs. Table 3 displays the number of people in Cheshire, Warrington and Wirral who are registered blind or partially sighted with additional disabilities.

	Total with additional disabilities	Mental Health	Learning Disability	Physical Disability	Deaf with speech	Deaf without speech	Hard of hearing
Blind	2320	145	170	1820	5	5	170
Part. Sight.	2585	125	135	2140	5	0	180
Total	4905	270	305	3960	10	5	350

Table 3: Number of people in Cheshire, Warrington and Wirral registered as blind or partially sighted (part. sight.) with additional disabilities as at 31 March 2014. (Source: Health and Social Care Information Centre www.ic.nhs.uk)

Almost half of the blind and partially sighted population in Cheshire, Warrington and Wirral have an additional disability (49.8%; 4905 of 9835 people). This figure is significantly higher than that of the North West as a whole, which is a little over one third of the blind and partially sighted population (35.8%; 15765 of 43995 people). Therefore, those with a visual impairment in Cheshire, Warrington and Wirral generally have greater health and social care needs than in other parts of the North West.

A higher proportion of visually impaired people in Cheshire, Warrington and Wirral had additional health needs compared to other areas of the North West. This should be taken into consideration when planning eye health services in the area.

Data on patients with learning disabilities could be reviewed to determine how many are registered blind or partially sighted, which could then be compared to prevalence levels. It may be that fewer people are registered than expected.

7.1.6 All Sight Threatening Conditions

Local eye health profiles developed by Novartis have mapped data from the RNIB sight loss data tool to CCG level. Figure 13 shows the number of people per 1,000 population in the six CCGs in the area (Eastern Cheshire, West Cheshire, South Cheshire, Vale Royal, Warrington, and Wirral) compared to England, living with any sight threatening condition. Sight threatening conditions are defined by

RNIB as wet AMD, dry AMD, cataracts, glaucoma, ocular hypertension, background diabetic retinopathy, non proliferative and proliferative diabetic retinopathy.

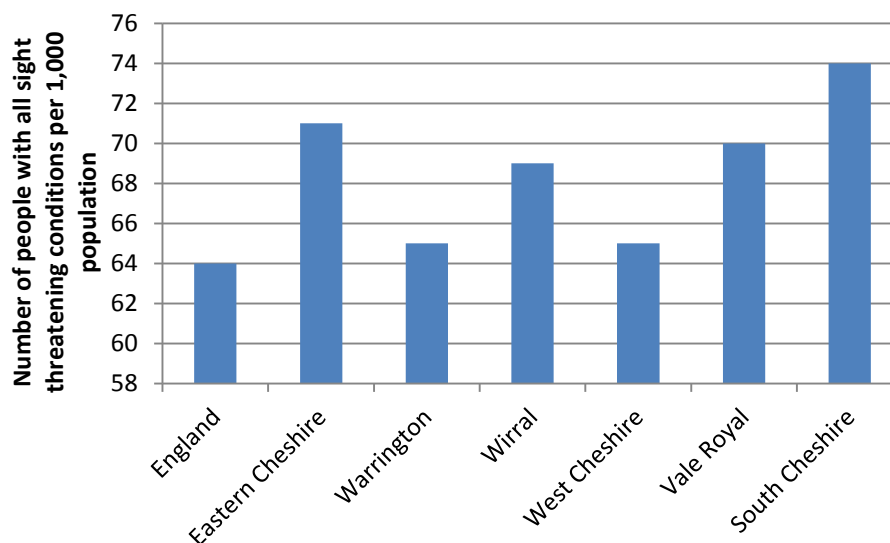


Figure 13: Number of people per 1,000 population with all sight threatening eye conditions (RNIB defined) in 2012/13 living in the six CCGs of Cheshire, Warrington and Wirral compared to England. RNIB reported data as Upper Tier Authorities (UA) which was mapped to Lower Authority (LA). The derived LA data was mapped to the new CCG structure (Source: RNIB Sight Loss Data Tool; Novartis profiles)

Figure 13 shows that all six CCGs have a higher rate of people living with sight threatening conditions compared to England (64 per 1,000 population). This is particularly apparent for South Cheshire (74 per 1,000 population) and Eastern Cheshire (71 per 1,000 population). Eastern Cheshire is also the area in which there is a higher percentage of total population in the 65+ age category (Figure 7).

As Figure 13 encompasses all sight threatening conditions, subtleties may be masked. It may be that one CCG has a significantly higher proportion of people living with a particular sight threatening condition than others. Thus, further investigation is warranted.

7.2 AMD

AMD is the least well known eye condition, with almost 30% of adults saying they had never heard of it. This is in comparison to 95% of people acknowledging an awareness of cataract (College of Optometrists, 2013).

Population estimates from the NEHEM suggest that in 2011, the number of people living with late stage AMD (wet and dry) in Cheshire, Warrington and Wirral was 11,656. This was projected to increase to 12,612 in 2015 and 14,267 by 2020; a percentage increase of 22.4% between 2011 and 2020.

Table 4 shows the total number of cases and prevalence (%) of different categories of AMD in different areas of Cheshire, Warrington and Wirral.

Area	Total AMD: NV AMD + GA + Drusen	NV AMD cases: Wet Cases (prevalence)	Geographic Atrophy cases: Severe Dry Cases (prevalence)	Drusen Cases: Mild – Moderate Dry Cases (prevalence)
Chester	5878	735 (1.72%)	364 (0.85%)	4779 (11.15%)
Warrington	7945	954 (1.55%)	474 (0.77%)	6517 (10.56%)
Wirral	16144	2064 (1.80%)	1031 (0.90%)	13049 (11.41%)
Congleton	4255	517 (1.57%)	257 (0.78%)	3481 (10.59%)
Crewe & Nantwich	5174	635 (1.64%)	315 (0.82%)	4224 (10.92%)
Ellesmere Port & Neston	3746	450 (1.58%)	223 (0.78%)	3073 (10.82%)
Macclesfield	7904	1001 (1.74%)	496 (0.86%)	6407 (11.12%)
Vale Royal	5548	671 (1.58%)	333 (0.78%)	4544 (10.69%)
Total	56594	7027	3493	46074
Cheshire, Warrington & Wirral average prevalence	N/A	1.65%	0.82%	10.91%

Table 4: Total number of cases and prevalence (%) of AMD in Cheshire, Warrington and Wirral using NEHEM population estimates. Prevalence data is in the population aged 50 and above in 2001. Rounding may affect percentages.

Table 4 shows that the percentage of wet AMD cases in Cheshire, Warrington and Wirral is approximately 12% (7027 of 56594 cases). The proportion of these that are amenable to treatment by anti VEGF is unclear. A total of 3493 cases (approximately 6%) have severe dry AMD, which means that almost one fifth of AMD cases are the potentially devastating wet or severe dry type. Those with drusen (mild-moderate dry AMD) may go on to develop severe dry AMD with time. Additionally, it is thought that 10-15% of people with dry AMD eventually develop wet AMD.

Based upon the RNIB sight loss data tool, Figure 14 shows the number of people with wet AMD per 1,000 population across Cheshire, Warrington and Wirral.

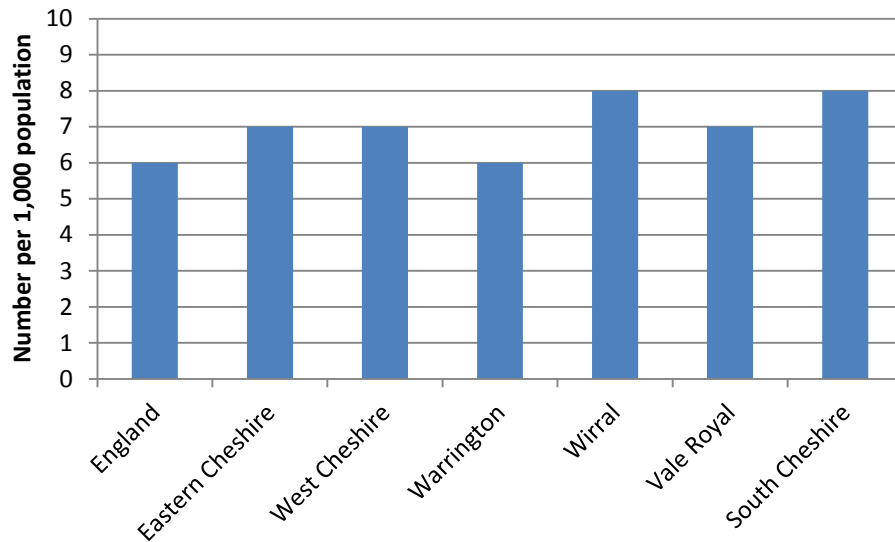


Figure 14: Number of people per 1,000 population in each local CCG with wet AMD. RNIB reported data as Upper Tier Authorities (UA) which was mapped to Lower Authority (LA). The derived LA data was mapped to the new CCG structure (Source: RNIB Sight Loss Data Tool; Novartis profiles).

Data in Figure 14 shows that according to the RNIB sight loss data tool, the estimated number of people with wet AMD per 1,000 population in the six CCGs ranges from 6 (Warrington, equal to England) to 8 (Wirral and South Cheshire).

In other data, the Public Health Outcomes Framework tool estimates the rate of preventable sight loss due to AMD, as shown in Figure 15.

Area	Count	Value	95% Lower CI	95% Upper CI
England	9,453	104.4	102.3	106.5
North West	-	*	-	-
Blackburn with Darwen	24	121.1	77.6	180.1
Blackpool	24	85.9	55.1	127.9
Bolton	45	101.4	74.0	135.7
Bury	25	80.4	52.1	118.7
Cheshire East	75	99.6	78.3	124.8
Cheshire West and Chester	55	86.0	64.8	112.0
Cumbria	105	97.6	79.8	118.2
Halton	31	158.1	107.4	224.5
Knowsley	31	131.0	89.0	185.9
Lancashire	229	103.6	90.6	117.9
Liverpool	86	127.6	102.1	157.6
Manchester	41	84.7	60.7	114.8
Oldham	30	87.5	59.0	124.8
Rochdale	28	86.9	57.7	125.6
Salford	33	96.2	66.2	135.0
Sefton	74	125.1	98.3	157.1
St. Helens	49	148.2	109.7	196.0
Stockport	28	52.6	34.9	76.0
Tameside	19	52.8	31.8	82.4
Trafford	28	74.6	49.6	107.9
Warrington	35	103.0	71.7	143.2
Wigan	36	66.1	46.3	91.5
Wirral	83	131.1	104.4	162.5

Source: Calculated by Public Health England Knowledge and Intelligence Team (West Midlands) from data provided by Moorfields Eye Hospital and Office for National Statistics

Figure 15: Public Health Outcome Indicator 4.12i for 2012/13 data. This shows the crude rate of sight loss (per 100,000 population) due to AMD in each Local Authority in the North West. The confidence intervals (black bars) indicate how precise the estimate is: the longer the bar the less certain the estimate is. Where the bars overlap with bars in other areas indicates that the difference is not statistically significant. A dark blue bar indicates lower, yellow similar and light blue higher than the benchmark of the average for England (Source: Public Health Outcomes online).

Figure 15 shows that similar rates of preventable sight loss due to AMD are seen in Cheshire East (99.6 per 100,000 people), Cheshire West and Chester (86.0 per 100,000) and Warrington (103.0 per 100,000) compared to the England average (104.4 per 100,000). However, significantly higher rates are seen in Wirral (131.1 per 100,000).

More needs to be done to increase awareness of AMD amongst the general population.

Further investigation into why the crude rate of preventable sight loss due to AMD is statistically higher in Wirral than the England average may be warranted.

7.3 Glaucoma

Table 5 shows the total number of cases and prevalence (%) of glaucoma, glaucoma suspects and ocular hypertension in over 30 year olds living in different areas of Cheshire, Warrington and Wirral.

Area	Mean estimated glaucoma cases	Lower 95% Confidence Interval	Higher 95% Confidence Interval	Suspects under 60 years old	Suspects 60+ years old	Total number of suspects	Ocular Hypertension
Chester	1120 (1.47%)	1582 (2.07%)	685 (0.90%)	2471 (5.00%)	1881 (7.00%)	4352 (5.70%)	2441 (3.20%)
Warrington	1550 (1.29%)	2181 (1.81%)	937 (0.78%)	4182 (5.00%)	2580 (7.00%)	6762 (5.61%)	3856 (3.20%)
Wirral	3048 (1.52%)	4314 (2.15%)	1874 (0.93%)	6392 (5.00%)	5107 (7.00%)	11499 (5.73%)	6426 (3.20%)
Congleton	816 (1.37%)	1141 (1.91%)	491 (0.82%)	2015 (5.00%)	1350 (7.00%)	3365 (5.65%)	1907 (3.20%)
Crewe & Nantwich	999 (1.41%)	1406 (1.99%)	609 (0.86%)	2356 (5.00%)	1661 (7.00%)	4017 (5.67%)	2267 (3.20%)
Ellesmere Port & Neston	719 (1.38%)	1017 (1.95%)	439 (0.84%)	1720 (5.00%)	1252 (7.00%)	2971 (5.68%)	1673 (3.20%)
Macclesfield	1505 (1.48%)	2121 (2.08%)	919 (0.90%)	3307 (5.00%)	2499 (7.00%)	5806 (5.70%)	3259 (3.20%)
Vale Royal	1069 (1.36%)	1501 (1.90%)	646 (0.82%)	2670 (5.00%)	1775 (7.00%)	4446 (5.64%)	2521 (3.20%)
Total number and average prevalence	10826 (1.41%)	15263 (1.98%)	6600 (0.86%)	25113 (5.00%)	18105 (7.00%)	43218 (5.67%)	24350 (3.20%)

TABLE 5: Expected number of glaucoma cases in over 30 year olds in Cheshire, Warrington and Wirral using NEHEM population estimates. The confidence intervals indicate how precise the estimate is: the wider the interval the less certain the estimate is. Prevalence figures are shown in brackets.

As seen in Table 5, population estimates from the NEHEM suggest that in 2011, the number of people living with glaucoma in Cheshire, Warrington and Wirral collectively was 10,826. This was projected to increase to 11,945 in 2015 and 12,380 by 2020 (a 14.4% increase between 2011 and 2020). In the same Local Authorities, the number of people living with ocular hypertension was estimated to be 24,350 in 2011 (Table 5), rising to 26,000 and 26,950 in 2015 and 2020 respectively (a 10.7% increase between 2011 and 2020).

However, it is thought that approximately 50% of those living with glaucoma remain undiagnosed, so these figures may be a gross underestimation. Supporting this theory, an equity profile produced by Bradford and Airedale PCT suggests that NEHEM may underestimate the prevalence of glaucoma by 1.5 to 2 times.

Late presentation to eye care services is a major risk factor for glaucoma-related blindness (Chen, 2004). Preventable sight loss due to glaucoma is part of the Public Health Outcomes Framework as shown in Figure 16.

4.12ii - Preventable sight loss - glaucoma 2012/13

Crude rate - per 100,000

Area	Count	Value	95% Lower CI	95% Upper CI
England	3,291	12.5	12.0	12.9
North West	-	*	-	-
Blackburn with Darwen	-	*	-	-
Blackpool	8	10.5	4.5	20.6
Bolton	18	13.3	7.9	21.1
Bury	9	9.6	4.4	18.2
Cheshire East	24	11.5	7.4	17.1
Cheshire West and Chester	15	8.3	4.7	13.8
Cumbria	31	10.7	7.3	15.2
Halton	11	17.4	8.7	31.2
Knowsley	14	19.0	10.4	31.8
Lancashire	58	9.4	7.1	12.2
Liverpool	24	11.5	7.4	17.1
Manchester	22	12.7	8.0	19.3
Oldham	12	11.4	5.9	19.9
Rochdale	11	10.9	5.4	19.5
Salford	17	16.2	9.5	26.0
Sefton	18	11.6	6.9	18.4
St. Helens	18	19.2	11.4	30.4
Stockport	13	8.6	4.6	14.7
Tameside	6	5.4	2.0	11.8
Trafford	9	7.8	3.6	14.8
Warrington	14	13.4	7.3	22.5
Wigan	12	7.3	3.8	12.7
Wirral	28	16.1	10.7	23.3

Source: Calculated by Public Health England Knowledge and Intelligence Team (West Midlands) from data provided by Moorfields Eye Hospital and Office for National Statistics

Figure 16: Number of people per 100,000 population in each Local Authority in the North West with preventable sight loss due to glaucoma in 2012/13. The confidence intervals (black bars) indicate how precise the estimate is: the longer the bar the less certain the estimate is. Where the bars overlap with bars in other areas indicates that the difference is not statistically significant. A dark blue bar indicates lower than, and yellow similar to the benchmark of the average for England (Source: Public Health Outcomes indicators online).

Figure 16 shows that all of the Local Authorities in Cheshire, Warrington and Wirral have similar rates of preventable sight loss from glaucoma compared to the average for England (12.5 per 100,000 population). Cheshire East and Cheshire West and Chester have slightly lower figures (11.5 and 8.3 per 100,000 population respectively), whereas Warrington and Wirral have slightly higher figures (13.4 and 16.1 per 100,000 respectively).

7.4 Cataract

Cataract prevalence as determined by NEHEM is defined as being 'surgical' cataract i.e. a symptomatic cataract such that it is deemed best management to be surgically removed. Cataract surgery is the most commonly performed surgery in the NHS, with a low complication rate of 2% according to the Royal College of Ophthalmologists. The prevalence of asymptomatic cataract is likely to be higher but of less interest as treatment is not warranted.

Table 6 shows NEHEM estimates for cataract across Cheshire, Warrington and Wirral. The high estimate is based on an Australian study, and the low estimate on a UK study.

	Chester	Warrington	Wirral	Congleton	Crewe & Nantwich	Ellesmere Port & Neston	Macclesfield	Vale Royal	Total number & prevalence
High Estimate	4055 (6.92%)	5508 (6.22%)	11078 (7.05%)	2929 (6.41%)	3576 (6.64%)	2600 (6.55%)	5437 (6.85%)	3840 (6.43%)	39023 (6.63%)
Low Estimate	1127 (1.92%)	1460 (1.65%)	3116 (1.98%)	788 (1.72%)	975 (1.81%)	694 (1.75%)	1516 (1.91%)	1032 (1.73%)	10708 (1.81%)

Table 6: Number of cases of surgical cataract in Cheshire, Warrington and Wirral using NEHEM population estimates. The high estimate was taken from an Australian study, and the low estimate from a UK study. Prevalence figures are shown in brackets.

As there is increased UV light in Australia (hence increased cataract formation), it is likely that the high estimates in Table 6 overestimate the number of cases of surgical cataract in Cheshire, Warrington and Wirral. The low estimate, derived from a study in London, is likely to more closely represent the population in question. Nonetheless, the data in Table 6 indicate that there are over 10,000 people living with cataract in Cheshire, Warrington and Wirral, though this figure could be as high as almost 40,000 people.

More often than not, cataract is age-related. Hence, the burden of cataract is likely to increase as our population ages. Strategies to reduce the burden of cataract-related hospital appointments could include more effective utilisation of other health professionals e.g. community optometrists in pre-operative or post-operative care. Furthermore, strategies aimed to reduce smoking could have a positive effect on the prevalence and progression of cataract.

7.5 Uncorrected refractive error

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 (O'Donoghue et al., 2010), yet not all of these children will present with symptoms or be found at school entry screening (O'Donoghue et al., 2012).

In adults, there is little data for those aged between 18 and 30 years. For adults aged 30-70, it is estimated that 40% will have a refractive error (Bourne et al., 2004, Hyams et al., 1977). Those who regularly visit the optometrist will already have spectacles even if they don't always wear them when needed. Just over two thirds (68%) of people attending the optometrist for a sight test have spectacles (Optical Confederation 2011), though this does not rule out significant levels of refractive error being present in the remainder of the population who do not have regular sight tests.

Approximately 50% of preventable visual impairment in the older population is deemed to be related to refractive error and cataract, with approximately one quarter of this figure being due to refractive error alone (Tate, 2005). Taking into account the overall prevalence of visual impairment, this would indicate that 1-4% of those aged 60+ years have 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. This may seem a little low given the value above for the younger adults, however, this is because in studies for older people those that had appropriate spectacles and hence no uncorrected error were not included in the figures. The estimates for younger adults do not take into account the significant proportion that already wear appropriate correction.

The refractive error estimates (corrected and uncorrected) from the aforementioned studies have been applied to the population estimates for Cheshire, Warrington and Wirral to determine the number of children, adults of working age, and adults aged over 60 in the area who may be expected to have a refractive error (Table 7).

	Children 0-15	Working age	Over 60s
Predicted corrected & uncorrected error	12,408 – 20,680 (6-10%)	282,360 (40%)	N/A
Predicted uncorrected error only	N/A	N/A	6,174 – 21,609 (2-7%)

Table 7: Prevalence of refractive error in Cheshire, Warrington and Wirral using population estimates

Table 7 shows that between 12,408 and 20,680 children in the local area may be expected to have a refractive error. As this estimate includes corrected refractive errors, some of these children will be wearing spectacles or contact lenses. For adults aged over 60, the number of people with uncorrected refractive error (i.e. without glasses or contact lenses) is estimated to be between 6,174 and 21,609. The vision of these adults is such that it is not good enough for them to legally drive a car, yet can be easily remedied by spectacles.

7.6 Diabetic retinopathy

The number of people living with diabetes is rising at an alarming rate, believed in part to be due to the current obesity epidemic. In Wirral alone, it was estimated that almost 8% of adults were living with diabetes (diagnosed or undiagnosed) in 2012. If current trends in population change and obesity persist, the prevalence is expected to increase to 8.5% by 2020, and to 9.3% by 2030.

A large cross-sectional analysis of over 90,000 people with diabetes (approximately 5,000 with Type 1) has been carried out using data from their first screening with the community based National Diabetic Retinopathy Screening Service in Wales between 2005 and 2009. The study showed that the prevalence of *any* diabetic retinopathy in Type 1 diabetics was 56%, and sight threatening diabetic retinopathy was 11%. In Type 2 diabetics, 30% presented with some form of diabetic retinopathy, with 3% being sight threatening (Thomas et al., 2015). In line with other studies, the presence of diabetic retinopathy was strongly associated with increased duration of diabetes, and insulin therapy in Type 2 diabetics. Research suggests that at any one time, approximately 10% of people with diabetes will have retinopathy requiring follow up or treatment by an eye specialist (McLeod et al., 1988).

The Public Health Outcomes Framework records preventable sight loss due to diabetic retinopathy as shown in Figure 17.

4.12iii - Preventable sight loss - diabetic eye disease 2012/13

Crude rate - per 100,000

Area	Count	Value	95% Lower CI	95% Upper CI
England	1,592	3.5	3.3	3.6
North West	-	*	-	-
Blackburn with Darwen	6	4.9	1.8	10.7
Blackpool	5	4.1	1.3	9.5
Bolton	12	5.1	2.6	8.9
Bury	-	*	-	-
Cheshire East	9	2.8	1.3	5.3
Cheshire West and Chester	6	2.1	0.8	4.5
Cumbria	30	6.8	4.6	9.8
Halton	-	*	-	-
Knowsley	-	*	-	-
Lancashire	29	2.9	1.9	4.1
Liverpool	11	2.7	1.3	4.8
Manchester	8	1.8	0.8	3.6
Oldham	6	3.2	1.2	7.0
Rochdale	5	2.8	0.9	6.5
Salford	-	*	-	-
Sefton	7	2.9	1.2	6.0
St. Helens	12	7.9	4.1	13.8
Stockport	6	2.5	0.9	5.4
Tameside	7	3.7	1.5	7.7
Trafford	-	*	-	-
Warrington	5	2.9	0.9	6.7
Wigan	10	3.7	1.8	6.7
Wirral	7	2.5	1.0	5.2

Source: Calculated by Public Health England Knowledge and Intelligence Team (West Midlands) from data provided by Moorfields Eye Hospital and Office for National Statistics

Figure 17: Public Health Outcome 4.12iii: Number of people per 100,000 population in each Local Authority in the North West with preventable sight loss due to diabetic eye disease in 2012/13. The confidence intervals (black bars) indicate how precise the estimate is: the longer the bar the less certain the estimate is. Where the bars overlap with bars in other areas indicates that the difference is not statistically significant. A light blue bar indicates higher than, and yellow similar to the benchmark of the average for England. A lack of bar indicates no data in this tool. (Source: Public Health Outcomes indicators online).

Figure 17 shows that in England, on average 3.5 people per 100,000 population lose their sight unnecessarily to diabetic eye disease. Although data for Cheshire East (2.8 per 100,000), Cheshire West and Chester (2.1 per 100,000), Warrington (2.9 per 100,000) and Wirral (2.5 per 100,000) is better than the England average, it is not statistically significantly different.

Across Cheshire, Warrington and Wirral, there is a comprehensive community screening programme for diabetic retinopathy such that everyone on the diabetic register receives an annual invitation to attend for screening.

Data from the RNIB sight loss tool estimates that in Cheshire, Warrington and Wirral, there were 79,814 people living with diabetes in 2011 (22,348 with background retinopathy; 2,554 with non proliferative or proliferative retinopathy). In 2015, this is estimated to increase to a total of 82,164 diabetics (23,006 with background retinopathy; 2,629 with non proliferative or proliferative retinopathy) and in 2020, 85,483 people with diabetes (23,935 with background retinopathy; 2,735 with non proliferative or proliferative retinopathy).

The Novartis profiles on eye health provide data for the percentage of patients with diabetes (on the diabetes register) who have a record of retinal screening in the previous 15 months (QOF clinical

indicator 2011/12), and also the number of CVIs as a result of diabetic eye disease for 2009/10. This is displayed for the CCGs in Cheshire, Warrington and Wirral in Figure 18.

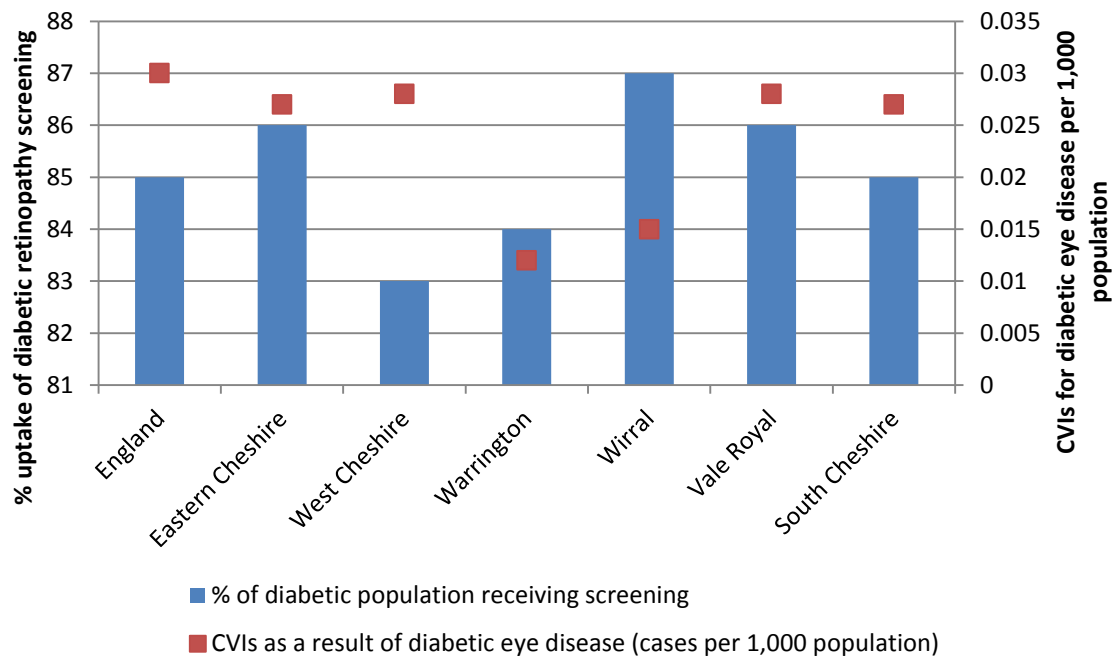


Figure 18: Data for the percentage of patients with diabetes (on the diabetes register) who have a record of retinal screening in the previous 15 months (QOF clinical indicator 2011/12) in each of the local CCGs, plotted against the number of certificates of visual impairment (CVIs) as a result of diabetic eye disease for 2009/10. (Source: Novartis profiles 2013)

Figure 18 shows that in West Cheshire where uptake of diabetic retinopathy screening is lower, the number of CVIs due to diabetic eye disease is consequently higher. Conversely, in Wirral where uptake of screening is higher than the other CCGs, the number of CVIs is comparatively lower. Though Eastern Cheshire and Vale Royal have a relatively high uptake of screening, the number of CVIs is also high. On the other hand, Warrington has a relatively low uptake of screening, yet the lowest rate of CVIs out of the six local CCGs. The reason for this could be that Cheshire East has a higher proportion of its population aged 65 and above compared to Warrington (Figure 4), thus potentially having a diabetic population which has been living with the disease for longer.

It should be noted that the data cover different time spans and so more investigation of this data could be completed at a local level to see if these trends hold true for more recent/comparable data.

More recent data from Q1 in 2013-2014 suggests that the uptake of the Cheshire Diabetic Eye Screening Programme was 80.1%, and 85.1% for the Wirral Diabetic Eye Screening Programme.

Further investigation of data on CVI due to diabetic retinopathy and screening uptake is warranted, especially in the context of different types of provision across Cheshire, Warrington and Wirral.

8. EYECARE WORKFORCE AND LOCAL SERVICES

8.1 Primary Care

8.1.1 Structure

NHS primary eye care services are, in the vast majority of instances, provided by community optometrists. A small number of ophthalmic medical practitioners (OMPs) and GPs also provide services. This provision falls under GOS, whose objective is to provide (generally through high-street opticians' practices), preventative and corrective eye care for children, people aged 60 and over, people on low incomes, and those suffering from or pre-disposed to eye disease.

8.1.2 Contracts

In order to provide NHS funded sight tests, practitioners need to hold a GOS contract. Most of these are Mandatory Service Contracts which allow providers with fixed premises to offer NHS tests. Domiciliary sight tests are carried out in a community setting such as residential and nursing homes and day centres and are covered under an Additional Services contract. All Cheshire, Warrington and Wirral community optometric practices provide GOS services (Table 8).

	Eastern Cheshire	South Cheshire	West Cheshire	Vale Royal	Warrington	Wirral	Total
Total number of GOS contractors	30	23	31	13	21	34	152

Table 8: Number of optometric contractors in Cheshire, Warrington and Wirral (January 2015)

8.1.3 Services provided

Community optometrists (and OMPs) provide both private and GOS tests and prescribe spectacles or contact lenses where these are required. 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. The dispensing of glasses, contact lenses (and in some cases low vision aids) may be carried out by dispensing opticians in addition to optometrists.

Additional data could be gathered on the type of care these contractors provide e.g. cataract direct referral or post-operative care, glaucoma referral refinement and repeat measures, diabetic retinopathy screening.

Data could also be mapped to compare access to services across Cheshire, Warrington and Wirral. Split and location of fixed-site and domiciliary care would also be useful.

8.1.4 Role of GPs

GPs are often the initial point of contact for patients who are concerned about the health of their eyes. This is especially true for minor ailments such as conjunctivitis, blepharitis and meibomian cysts (styes) which account for around 70% of eye complaints dealt with by GPs (McDonnell, 1988). It has been estimated that 1.5% of GP consultations relate to eye problems (Sheldrick et al., 1993). GPs may refer a patient to an optometrist, a GP specialist or onward to ophthalmology.

In most cases, GPs do not have the necessary equipment required to thoroughly examine the eye, in particular for patients presenting with anterior segment concerns (e.g. conjunctivitis, blepharitis, meibomian cysts). Through enhanced services such as a minor eye conditions scheme, optometrists could examine such patients, thus reducing pressure on GP appointments, and reducing often unnecessary onward referral to secondary care.

8.1.5 Sight tests in screening for treatable eye disease

In addition to the detection of refractive error, the sight test is used as a tool for opportunistic detection of eye diseases e.g. glaucoma. This is reflected in the inclusion of disease related exemption categories for GOS sight tests. Sudden or significant changes in sight may prompt a person to attend for an eye test as the first point of contact with health services. However, more 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.

8.1.6 Sight test intervals

Sight tests are available to the entire population regardless of registration with a GP. Individuals eligible for NHS funded sight tests may attend any high street optician. The NHS has a Memorandum of Understanding with the service providers, which specifies minimum intervals between sight tests expected for different categories of patients (Table 9).

Age	Clinical Condition	Interval
Under 16	All patients	1 year
16-59	All patients	2 years
60-69	All patients	2 years
70 and over	All patients	1 year
Any age	Diabetic	1 year
Any age	Glaucoma	2 years
40 and over	Family History of Glaucoma	1 year
40 and over	Ocular Hypertension (not in monitoring scheme)	1 year
Under 7	Corrected refractive error or binocular vision anomaly	6 months
7-16	Binocular vision anomaly or rapidly progressing myopia	6 months

TABLE 9: Recommended minimum intervals between sight tests. Source: NHS Memorandum of Understanding

8.1.7 Number of ophthalmic practitioners

The number of ophthalmic practitioners (optometrists plus ophthalmic medical practitioners) for England, Northern England and Cheshire, Warrington and Wirral is shown in Table 10.

	2008	2009	2010	2011	2012	2013	% change 2008-2013
England	9,540	10,023	10,409	10,806	11,133	11,457	+20.1
Northern England	2633	2763	2873	3,000	3,112	3,198	+21.5
Cheshire, Warrington and Wirral (total)	240	249	266	278	297	309	+28.8
Central & Eastern Cheshire PCT	103	107	117	118	123	124	+20.4
Warrington PCT	44	41	43	46	46	47	+6.8
Western Cheshire PCT	58	62	62	64	63	72	+24.1
Wirral PCT	35	39	44	50	65	66	+88.6

TABLE 10: Number of ophthalmic practitioners (optometrists plus ophthalmic medical practitioners) in England, Northern England and Cheshire, Warrington and Wirral, as at 31 December each year (source ONS statistics; data only available at PCT level for all 6 years data)

As seen in Table 10, there has been a greater percentage change in ophthalmic practitioners (between 2008 and 2013) in Cheshire, Warrington and Wirral collectively (28.8%; 240 practitioners in 2008 and 309 in 2013) compared to the average for England (20.1%). However, there is great variation between PCTs. Warrington PCT saw a percentage increase of 6.8% compared to Wirral PCT with an increase of 88.6%. The number of OMPs in Cheshire, Warrington and Wirral during this time frame was small, with one practising between 2008-2010, two in 2011, four in 2012 and five in 2015.

Table 11 shows the number of ophthalmic practitioners per 100,000 population in England, Northern England, Cheshire, Warrington and Wirral between 2008 and 2013.

	2008	2009	2010	2011	2012	2013	% change 2008-2013
England	18.4	19.2	19.8	20.3	20.8	21.4	+16.3
Northern England	17.7	18.5	19.1	19.9	20.5	21.1	+19.2
Cheshire, Warrington and Wirral (total)	19.8	20.5	21.8	22.7	24.2	25.2	+27.2
Central & Eastern Cheshire PCT	22.4	23.2	25.4	25.5	26.5	26.7	+19.3
Warrington PCT	22.2	20.5	21.4	22.7	22.6	23.1	+4.0
Western Cheshire PCT	24.5	26.2	26.1	27.0	26.5	30.2	+23.2
Wirral PCT	11.1	12.3	13.8	15.6	20.3	20.6	+86.5

Table 11: Number of ophthalmic practitioners per 100,000 population in England, Northern England and Cheshire, Warrington and Wirral, as at 31 Dec each year (source ONS; data only available at PCT level for all 6 years)

Table 11 shows that as of December 2013, the PCTs making up Cheshire, Warrington and Wirral had more ophthalmic practitioners per 100,000 population (25.2) compared to Northern England (21.1) and England (21.4). This is most apparent in Central and Eastern Cheshire PCT (26.7 per 100,000) and

Western Cheshire PCT (30.2 per 100,000) in particular. Wirral PCT has slightly fewer ophthalmic practitioners (20.6 per 100,000) compared to Northern England and England as a whole, though Wirral saw the greatest percentage change between 2008 and 2013 at 86.5% (Cheshire, Warrington and Wirral combined: 27.2%; England 16.3%).

That Cheshire, Warrington and Wirral have, as a whole, more ophthalmic practitioners per 100,000 population that the average for England suggests that this workforce could be well utilised by potentially providing enhanced services in the community, closer to peoples' homes.

8.2 Secondary Care

The associated costs and demands on NHS outpatient services are high, with ophthalmology having the second highest attendances in 2010-11 nationally.

The majority of hospital eye services in each locality are provided by ophthalmologists (eye doctors) in the NHS Trusts or hospitals listed in Table 12. They are supported by ophthalmic nurses, orthoptists (allied health professionals specialising in abnormalities of binocular vision) and hospital optometrists. The number of NHS ophthalmology outpatient attendances in 2012/13 in each Trust or hospital in Cheshire, Warrington and Wirral are shown in Table 12.

Secondary Care Trust/Hospital	Number of Ophthalmology Outpatient Attendances (2012/13)
England	6,418,652
North West Strategic Health Authority	936,672
Cheshire, Warrington and Wirral	167,438
Countess of Chester Hospital	30,197
Warrington & Halton Hospitals	25,140
Wirral University Teaching Hospital	53,010
Mid Cheshire Hospitals	39,891
East Cheshire NHS Trust	18,463
Spire Murrayfield, Wirral	212
Spire Regency, Macclesfield	525

Table 12: Total number of outpatient attendances for ophthalmology services at principal secondary care providers of eye care services in England, the North West and in Cheshire, Warrington and Wirral. It should be noted that attendances are not necessarily from residents of the NHS Cheshire, Warrington and Wirral area (Source: Hospital Episode Statistics: NHS Information Centre)

Table 12 shows that the total number of ophthalmology outpatient attendances in Cheshire, Warrington and Wirral in 2012/13 was 167,438. This was just under one fifth (17.9%) of all ophthalmology outpatient appointments in the North West. Data provided in Table 12 may include patients who attended for more than one appointment.

Table 13 shows the total number of inpatient episodes in the PCTs making up Cheshire, Warrington and Wirral. As with the data in Table 12, the figures may include patients who were an ophthalmology inpatient on more than one occasion.

PCT	Total number of inpatient episodes
Cheshire, Warrington and Wirral (total)	14,639
Western Cheshire	5,398
Central and Eastern Cheshire	2,958
Warrington	2,798
Wirral	3,485

Table 13: Total number of inpatient attendances in 2012/13 for ophthalmology services based on PCT postcode of patient (Source: Hospital Episode Statistics: NHS Information Centre)

8.2.1 Local Services for AMD

Optometrists in many areas work in partnership with local hospitals and operate a fast track referral scheme for wet AMD. Fast referral is essential to obtain the best possible outcome from treatment intervention using anti VEGF agents (NICE 2008). As there is no effective treatment for dry AMD, these cases are usually monitored by optometrists when patients attend for routine sight testing. Patients are referred 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. Because these cases are monitored in this way the total number of cases of dry AMD known to eye care services is unknown.

The proportion of patients seen with wet AMD in secondary care is not clear from local hospital episode statistics. In addition, coding of outpatient data is not detailed enough to allow us to determine the proportion of cases of all types of macular degeneration known to local health services.

An increasing number of optometry practices are acquiring more sophisticated equipment e.g. optical coherence tomographers (OCTs) to aid in the diagnosis and monitoring of ocular disease. Such equipment is routinely used in AMD clinics in secondary care, potentially creating an opportunity for some optometry practices to provide follow up care for wet AMD patients. This is likely to ease the burden and pressure in the AMD service as eye clinics often struggle with capacity (patients with wet AMD often require monthly appointments). The potential for optometrists to carry out a triage service has been explored in different ways across the UK (Amoaku et al., 2012).

More data is needed on AMD treatment in secondary care.

As smoking and poor diet are linked to AMD, smoking cessation programmes and dietary advice (including recommendation or prescription of appropriate supplements) are likely to be key in reducing the incidence and progression of the disease.

Optometrists are well placed in the community, and increasingly own sophisticated diagnostic equipment. Consideration of community optometrists becoming involved in the monitoring of AMD patients may be warranted.

8.2.2 Local services for glaucoma

Generally, initial detection of glaucoma relies on the opportunistic case finding ability of routine sight testing. In some areas, prompted by NICE guideline CG85 (NICE, 2009) and the adverse event report (NPSA, 2009) additional repeat measurement systems in optometric practice have been introduced. The aim of these schemes is to decrease the burden of potential false positive referrals to the hospital eye service by funding repeat measures of initially high intraocular pressure or suspect visual fields. These systems reduce the number of false positive cases reaching the hospital but do not incorporate care of patients already diagnosed with glaucoma. Currently, a glaucoma referral refinement scheme is running throughout the four CCGs of Cheshire, and Wirral. Of these CCGs, all but Western Cheshire allow repeat readings of intraocular pressure and visual fields (Western Cheshire includes intraocular pressure only). At this moment, Warrington is not offering a scheme.

Patients diagnosed with glaucoma are currently exclusively monitored and treated within a hospital setting. They may be monitored by doctors or by other health professionals e.g. specialist nurses or optometrists. It is reported that there is longstanding and increasingly severe pressure on hospital glaucoma services, with many patients experiencing delayed follow ups as eye clinics struggle to keep up with demand (RNIB, 2012, RNIB, 2014). Data for outpatients was not identified in this report due to inaccuracies with coding of conditions treated. However, inpatient data shows that there were 726 episodes for glaucoma across Cheshire, Warrington and Wirral for 2012-13.

A small number of patients with ocular hypertension are currently monitored by accredited community optometrists in the CCGs of Vale Royal, South Cheshire and Western Cheshire. There are currently 17 optical practices taking part, as well as the opportunity for patients to continue with secondary care providers (Leighton hospital, and Victoria Infirmary in Northwich) if they wish.

It is difficult to accurately identify the number of known glaucoma cases across Cheshire, Warrington and Wirral. As patients with glaucoma are entitled to an annual NHS sight test, GOS statistics were considered for 2012-13. Unfortunately, data for people with glaucoma and/or diabetes has been grouped together. There were 20,139 patients with glaucoma and/or diabetes who had a sight test in the area during that year, though the proportion of those with glaucoma is unknown.

More accurate data on the number of people with glaucoma in the area is needed.

Further analysis and audit on glaucoma-related enhanced service activity would also be beneficial, including uptake of these services by optometrists, and cost effectiveness.

Intervention Case Study – Effectiveness of referral refinement in Central and Eastern Cheshire PCT

In April 2009, NICE published its guidance for the diagnosis and management of chronic open angle glaucoma and ocular hypertension. By defining an intraocular pressure above which diagnosis should occur, it effectively set a threshold for referral.

Prior to this, many optometrists themselves had monitored patients with intraocular pressure in the low twenties if there were no other signs of glaucoma. However, NICE now indicated that those

patients with a repeatable pressure by contact tonometry (the gold standard) of above 21mmHg should be investigated by someone suitably qualified.

There was no facility within GOS for repeat testing of patients with high intraocular pressures, so in many cases those with intraocular pressure above 21mmHg on a single reading (often measured using non-contact tonometry) were referred to the hospital eye service for repeat measures and diagnosis if required. Referrals to ophthalmology increased substantially. To address this sudden rise, a funded referral refinement scheme was introduced in the area.

An audit of data from Central and Eastern Cheshire PCT showed that throughout 2012, a total of 622 patients were seen by the referral refinement service in that area. Of these, just under three quarters required a repeat of intraocular pressure only, just under one quarter required a repeat of visual fields only, and less than 5% required both. For those patients undergoing repeat intraocular pressure measurement, there was a deflection rate (avoidance of onward referral to secondary care) of 58%; for those undergoing a repeat visual field examination, this figure was 73%. Preventing unnecessary referrals to secondary care frees up appointment slots for patients who really need them. Furthermore, significant savings to the NHS have been made. Payment to the optometrist for a repeat intraocular pressure reading is £15, and £25 for a repeat visual field examination. This is in comparison to the tariff for a new patient appointment in the hospital eye service set at over £100, and for a follow up over £60.

8.2.3 Local services for cataract

Surgery

As patients undergoing day case procedures such as cataract are 'admitted', they are covered by inpatient data. For the year 2012-13, there was a total of 8,192 inpatient episodes for cataract (senile and other type) across Cheshire, Warrington and Wirral. Taking the low estimate in Table 6 as being a closer representation of this population compared to the high estimate (which is based on data from Australia), then 77% of cases across Cheshire, Warrington and Wirral are treated.

Optometrist referral and post-operative care

Different schemes exist across the area for referral refinement of cataract patients. In Wirral, assessment of cataract patients includes a dilated examination for the existence of other pathology – which assists in counselling the patient regarding the risks and benefits of surgery – and to ensure onward referral for surgery is appropriate. To become accredited, optometrists must undertake the cataract course through WOPEC (a post-graduate centre in Cardiff). Cataract referral pathways such as these have been found to significantly improve the quality of referrals by excluding those who do not wish to proceed to surgery in advance (Lash et al., 2006). In all CCGs of Cheshire, assessment of cataract patients excludes dilation. In this pathway, a form is completed for each patient wishing to be considered for surgery, which provides information such as refraction, visual acuity, severity of symptoms and co-existing eye disease. Warrington does not currently offer a cataract referral pathway.

There is currently no provision of a community post-operative care scheme in Cheshire, Warrington or Wirral, though hospital optometrists are involved in post-operative shared care in eye clinics. Cataract surgery is the most commonly performed surgery on the NHS, and the vast majority of these cases are without complications. Thus, post-operative cataract schemes allow patients to be seen closer to home, and free up outpatient appointments for patients who are in real need. Elsewhere in England, Hinchingsbrooke Hospital has, since 2005, allowed discharge of uncomplicated post-cataract surgery patients on the day of surgery, with a four week post-operative check with an accredited community optometrist. There are no complications in over 95% of cases, and over 98% of patients reported to be 'satisfied' or 'very satisfied' with their care (Newsom, 2013).

As smoking and UV exposure are linked to cataract, smoking cessation programmes and public health campaigns are likely to be key in reducing the incidence and progression of cataract.

More data is needed on local provision of cataract services, including audit and evaluation of cost effectiveness. Post-operative cataract schemes for community optometrists should be considered.

8.2.4 Local services for uncorrected refractive error

The only way to reliably detect and fully correct refractive error is by means of a sight test, following which an optical prescription will be issued if necessary. A report by the College of Optometrists (2013) found that at least 5% of those ages over 40 had not been for a sight test in the last ten years, a figure which rose to 11% amongst those of ethnic minorities. In the same report, 70% of parents cited sight tests as being 'very important' for their children, yet 25% of these parents had never taken their children to have a sight test.

NHS sight tests are carried out by ophthalmic practitioners (optometrists and OMPs) under GOS. Those entitled to an NHS sight test are shown in Table 7, with the exclusion of people age 16-18 (unless in full time education) or 19-59 (unless in receipt of certain benefits e.g. tax credit). NHS sight tests currently account for an estimated 71% of all eye examinations (Optical Confederation, 2011). Table 14 shows the number of NHS tests in Cheshire, Warrington and Wirral per 100,000 population for 2012-13.

	Sight tests per 100,000 population (all persons)
England	23,235
SHA	23,973
Cheshire, Warrington and Wirral	24,582

Table 14: NHS sight tests per 100,000 population (2012/13) for England, North West SHA and Cheshire, Warrington and Wirral www.ic.nhs.uk

Table 14 shows that there were more NHS sight tests carried out across Cheshire, Warrington and Wirral collectively (24,582 per 100,000 population) than the North West SHA average (23,973 per 100,000 population) and England average (23,235 per 100,000 population).

Table 15 shows the number of NHS sight tests carried out across Cheshire, Warrington and Wirral.

	All ages	ST 60 and over	ST 0 - 15 years	ST working age
Total population	1,221,400	308,700	206,800	705,900
Number of ST	28,1458 – 33,5029*	152,769	55,592	73,097 – 126,668*
ST % population	23.0 – 27.4	49.5	26.9	10.4 - 17.9

Table 15: 2012/13 estimates for sight tests carried out in Cheshire, Warrington and Wirral collectively for different age bands. ST = sight tests. Figures indicated * are low estimates (total of NHS tests due to student, income support, HC2, tax credits and JSA) and high estimates (total NHS sight tests minus under 16s/over 60s), multiplied by 29% (proportion of all private sight tests estimated from Optical Confederation data 2011). This assumes that all sight tests in the over 60s and under 16s are NHS tests. Source: www.ic.nhs.uk, RNIB sight loss tool.

When interpreting the data in Table 15, which is one year's worth of data, it should be noted that the average interval between sight tests for adults is approximately two years (Optical Confederation 2011). Children are usually recalled for a sight test every year.

Nationally, there is a high proportion of children and adults alike who have not had a recent sight test. This is also echoed in the data estimated for the local population. Stressing the importance of regular sight tests amongst all ages of the general population must be addressed.

8.2.5 Local services for diabetic retinopathy

Diabetic eye screening is offered to all those aged 12 and over with diabetes (Type 1 and Type 2) every year. There are currently three NHS Diabetic Eye Screening Programmes (DESPs) serving the population of Cheshire, Warrington and Wirral:

- Cheshire DESP – retinal photography is carried out by optometrists in their community practices. These are then graded for retinopathy at Eagle Bridge, Crewe.
- Wirral DESP – both the retinal photography and grading is carried out by optometrists in their community practices.
- Central Merseyside DESP – retinal photography carried out by optometrists in their community practices. Grading is performed in Widnes.

8.2.6 Local services for other conditions

In addition to providing the aforementioned services, Wirral also operate a Low Vision service and a Primary Eyecare Acute Referral Scheme (PEARS). Like the cataract scheme, optometrists wishing to partake in these enhanced services must successfully complete the relevant course at WOPEC.

The low vision service allows patients with sight loss to access low visual aids (e.g. specialist magnifiers) at their local opticians, without needing to visit the hospital. Patients receive an initial consultation and follow up. Thereafter, at the time of their annual sight test, these patients are entitled to a 15 minute annual review of their aids to ensure what they currently have is still optimal for their level of vision.

PEARS allows some minor eye conditions (e.g. flashes and floaters, red eye) to be seen – and where possible, managed – in community practice in a timely manner. Patients can self refer, or be referred by their pharmacist or GP. This scheme is due to be re-launched on 1st April 2015; tier 1 (ophthalmology) and tier 2 (optometry). It is anticipated that optometrists will be managing conditions such as stable glaucoma, ocular hypertension, red eye, and flashes and floaters as part of this scheme.

Western Cheshire CCG are also expected to launch a community ophthalmology service in due course.

There is currently no audit data for these enhanced services in Wirral, though this should be available in the next month or so.

9.COSTS

A report by Access Economics (2009) calculated direct and indirect costs of sight loss nationally to be £6.5 billion in 2008, rising to £7.9 billion by 2013. The main direct healthcare costs associated with eye care are:

Primary Care

- Ophthalmic – primary ophthalmic services
- Prescribing and pharmacy – primary care prescribing relating to ophthalmology

Secondary Care

- Inpatient elective and day cases – all admitted patient care ophthalmology activity which takes place in a hospital setting where the admission is either elective or a day case
- Outpatient – expenditure relating to ophthalmology outpatient attendance or procedures

In 2011-12, total NHS expenditure on problems with vision in Cheshire, Warrington and Wirral was estimated to be £61,819,512, equating to £50.63 spent per person (England average £42.10 per person). In the same year, the proportion of overall budget spent on problems of vision in the area was 2.89% (England average 2.40%). The indirect cost of sight loss during this time in Cheshire, Warrington and Wirral was calculated to be £11,257,000, equating to £90.70 per person (England average £83.39).

It is clear to see that both direct and indirect expenditure related to sight loss and problems with vision is higher in Cheshire, Warrington and Wirral compared to the average for England.

Figure 19 shows the cost per 1,000 population of injuries leading to hospitalisation related to visual impairment in each of the 6 CCGs in Cheshire, Warrington and Wirral in 2011-12.

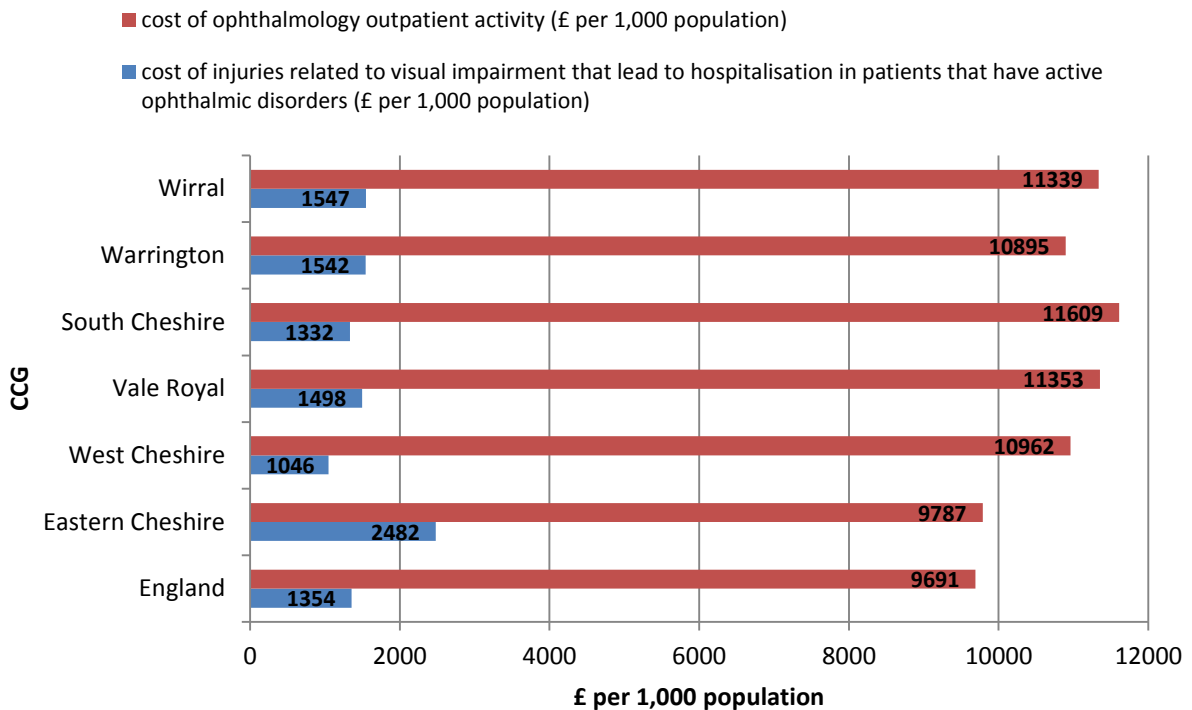


Figure 19: Cost of injuries related to visual impairment and cost of ophthalmology outpatient activity by CCG area in Cheshire, Warrington and Wirral, 2011-12 (Source: Novartis profiles)

Figure 19 shows that the cost of ophthalmology outpatient activity is higher in every CCG in Cheshire, Warrington and Wirral compared to the England average. The cost of injuries related to visual impairment is also higher in all CCGs except for South Cheshire and West Cheshire. This is particularly apparent for Eastern Cheshire, where the cost of injuries related to visual impairment per 1,000 population is £2,482 (compared to £1,354 for the England average). Eastern Cheshire is also one of the areas currently without ECLO support to provide advice and assistance with practical and emotional needs relating to sight loss.

The RNIB Sight Loss tool could help CCGs to examine more specific data on eye health and to attribute a cost to eye disease. This could include not only direct costs, but indirect costs such as falls.

Additional data on costs could be obtained from the Department of Health Programme budgeting and marginal analysis tool.

10.SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Good eye health and appropriate eye care impacts upon other aspects of health and wellbeing. People with sight loss are more likely to require social care and additional support, at significant cost to the economy. Furthermore, almost half of the blind and partially sighted population in Cheshire, Warrington and Wirral have an additional disability, which is significantly higher than the North West as a whole (approximately one third). Therefore, those with a visual impairment in Cheshire, Warrington and Wirral generally have greater health and social care needs than in other parts of the North West.

Specific initiatives to improve eye health should be considered alongside the planning of other health and social care strategies, and in the design of multi-professional services e.g. smoking cessation, falls prevention. Eye health should form part of individual Local Authority JSNAs to ensure that it is considered as part of health and social care planning.

Recommendation 1: Eye health should form part of Local Authority JSNAs to ensure that it is not considered in isolation.

10.1 Local prevalence of eye conditions

The main causes of visual impairment are AMD, glaucoma, cataracts, diabetic retinopathy and uncorrected refractive error.

In 2011, there were an estimated 11,656 cases of late AMD (dry and wet) and some 56,594 cases of AMD overall. The estimated number of glaucoma cases was 10,826. However, there were also 43,218 glaucoma suspects and 24,350 patients with ocular hypertension, both conditions of which require careful monitoring. The estimate for surgical cataract was estimated to range between 10,708 and 39,023.

Recommendation 2: Many people in Cheshire, Warrington and Wirral are at risk of sight loss if their conditions are not detected, treated and appropriately managed. Eye health is a significant burden and should be considered in service planning.

10.2 Factors affecting eye conditions

The prevalence of AMD, glaucoma, cataract, and diabetic retinopathy increases with age. The proportion of people aged 65 and over is expected to increase from 20% in 2015 to 25% in 2030. Hence, the number of cases of the above eye diseases is likely to rise.

The risk of developing AMD and cataract is increased in smokers. Furthermore, poor diet can contribute to the development of AMD.

Some cultures are more genetically pre-disposed to certain ocular and systemic diseases than others. For example, black people are more likely to develop glaucoma, and Asian people are more likely to develop diabetes.

People living in more deprived areas are known to access services later. Consequently, they typically present with eye disease at a later stage and are more likely to develop sight loss because of this.

Recommendation 3: Age, deprivation and ethnicity profiles should be considered when commissioning and planning eye health services. Lifestyle factors such as smoking and obesity should also be considered.

10.3 Sight Loss

As of 31st March 2014, a total of 9,835 people were registered as blind or partially sighted across Cheshire, Warrington and Wirral, which is set to double by 2050. However, the number of people who are eligible for registration is likely to be much greater. Some people may feel they have access to services they require without being formally registered, and others may not wish to be 'labelled' as blind or partially sighted.

Recommendation 4: The CVI is to be used as the indicator of success in preventing vision loss. There are differences in CVI registration across the region, so further investigation as to why this is the case may be warranted.

10.4 Preventing sight loss

Early case detection is key in preventing sight loss. Sight tests are important in case detection, and promoting the importance of sight testing should be considered. Emphasis should be placed on reaching out to people from deprived areas, who have been shown to access services later and present with more advanced disease than those from more affluent backgrounds.

Studies have shown how little people know about common eye disease, including risk factors and symptoms. Thirty percent of people have never heard of AMD (compared with 5% never having heard of cataract). The crude rate of preventable sight loss due to AMD is statistically higher in Wirral than the England average. Public health campaigns through advertising (radio, television, newspapers, billboards) would help to raise awareness of common causes of sight loss. Furthermore, professionals from different backgrounds should work together in disease prevention, such as in smoking cessation programmes.

Recommendation 5: Planning of eye health services should be designed to detect eye disease as early as possible, bearing in mind that people from lower socio-economic or certain ethnic groups are less likely to access services in a timely manner. The importance of regular sight tests in detecting eye disease should be promoted. Public health campaigns would help to raise awareness of the common causes of sight loss. Also, further investigation into why the crude rate of

preventable sight loss due to AMD is statistically higher in Wirral than the England average may be warranted.

10.5 Management

Once eye disease is detected, adequate treatment, regular follow up and management of patients is required to ensure sight loss is minimised. Nationally, there is increased pressure on secondary care, with many patients experiencing cancelled or delayed appointments – and potentially unnecessary sight loss – as hospital departments struggle to cope. Locally, detailed data on waiting times, clinic capacities and service quality was not available due to the complexity and size of the data collection exercise that would be required to achieve this.

Enhanced services carried out by optometrists in the community vary across the region. Wirral currently has a comprehensive offering of services, yet Warrington does not have any. Audit data for these schemes is patchy, if at all existent, although similar schemes running around the country have proven to be a great success. One scheme which has clearly shown benefit locally is the repeated measures (glaucoma referral refinement) in Cheshire and Wirral. In Central and Eastern Cheshire, audit data from 2012 showed a deflection rate (prevention of onward referral to secondary care) of 58% for intraocular pressures and 73% for visual fields.

Recommendation 6: Much improved data is required regarding waiting times, clinic capacity and service quality in secondary care. To relieve clinic capacity pressures in the hospital eye service, alternative options could be considered such as community optometry enhanced services. That Cheshire, Warrington and Wirral have, as a whole, more ophthalmic practitioners per 100,000 population than the average for England suggests that this workforce could be well utilised by potentially providing enhanced services in the community, closer to peoples' homes.

10.6 Costs

Costs related to sight loss and problems with vision are higher in Cheshire, Warrington and Wirral than the national average. In 2011-12, costs related to problems with vision in the region equated to £50.63 per person (England average £42.10). The indirect cost of sight loss during this time was £90.70 per person (England average £83.39).

Recommendation 7: More detailed analysis of costs at a local level should be undertaken to establish the efficiency and efficacy of services in Cheshire, Warrington and Wirral, and the economic burden of sight loss.

10.7 Care of people with sight loss

Not all sight loss is unavoidable and there will always be a need to support those living with visual impairment, at the point of diagnosis and beyond. The RNIB estimates that almost a quarter of blind and partially sighted people leave the eye clinic not knowing the name or prognosis of their eye

condition. In addition, a survey of registered individuals revealed that over 90% were not offered formal counselling by the eye clinic at the time of registration or later.

People with sight loss need help to come to terms with their condition, appropriate practical support, and onward referral to other support services where required. ECLo support is available throughout the region, with the exception of Cheshire East (Leighton and Macclesfield hospitals), and it is in Cheshire East where the highest number of people with sight loss are living.

There are a number of external organisations offering services for the visually impaired such as IRIS (Crewe), Wirral Society for the Blind and Partially Sighted (Birkenhead) and Vision Support (Cheshire).

Recommendation 8: ECLo support for Cheshire East would be hugely beneficial for its residents living with sight loss. Further collation of evidence to support the need for an ECLo in Cheshire East could be undertaken. A more detailed report into the nature and quality of other services available for those with a visual impairment would be ideal.

REFERENCES

Reports

ACCESS ECONOMICS 2009. Future sight loss UK (1): The economic impact of partial sight and blindness in the UK adult population.

BUSBY, D. 2004. First Report of the National Eye Health Steering Group, London: Department of Health DH/Optical policy/Shadow SHA Gateway ref 3170.

CAVANAGH, S., CHADWICK, K. 2005. Health Needs Assessment: A Practical Guide.

COLLEGE OF OPTOMETRISTS 2013. Britain's Eye Health in Focus.

NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE 2008. "Ranibizumab and Pegaptanib for the Treatment of Age-related Macular Degeneration" NICE technology appraisal guidance 155. London: NICE, 2008.

NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE 2009. National Collaborating Centre for Acute Care. "Glaucoma: Diagnosis and Management of Chronic Open Angle Glaucoma and Ocular Hypertension. Clinical Guideline CG85. NICE, London.

NATIONAL PATIENT SAFETY AGENCY 2009. Rapid Response Report NPSA/2009/RRR004. Preventing Delay to Follow Up for Patients with Glaucoma.

OPTICAL CONFEDERATION 2011. Optics at a Glance.

RNIB 2004. Unseen neglect, isolation and household poverty amongst older people with sight loss.

RNIB 2012. Save our sight.

RNIB 2014. Capacity problems in eye clinics.

Websites

<http://www.rnib.org.uk/knowledge-and-research-hub-key-information-and-statistics/sight-loss-data-tool>

Papers

ADAMS, M. K., SIMPSON, J. A., AUNG, K. Z., MAKEYEVA, G. A., GILES, G. G., ENGLISH, D. R., HOPPER, J., GUYMER, R. H., BAIRD, P. N. & ROBMAN, L. D. 2011. Abdominal obesity and age-related macular degeneration. *Am J Epidemiol*, 173, 1246-55.

- AMOAKU, W., BLAKENEY, S., FREEMAN, M., GALE, R., JOHNSTON, R., KELLY, S. P., MCLAUGHLAN, B., SAHU, D. & VARMA, D. 2012. Action on AMD. Optimising patient management: act now to ensure current and continual delivery of best possible patient care. *Eye (Lond)*, 26 Suppl 1, S2-21.
- BOURNE, R. R., DINEEN, B. P., ALI, S. M., NOORUL HUQ, D. M. & JOHNSON, G. J. 2004. Prevalence of refractive error in Bangladeshi adults: results of the National Blindness and Low Vision Survey of Bangladesh. *Ophthalmology*, 111, 1150-60.
- BOYCE T, S. M., JOHNSON S AND SIMKISS P 2013. Projecting numbers of falls related to visual impairment. *British Journal of Healthcare Management* 2013, 19.
- BUNCE, C., XING, W. & WORMALD, R. 2010. Causes of blind and partial sight certifications in England and Wales: April 2007-March 2008. *Eye (Lond)*, 24, 1692-9.
- BURMEDI D, B. S., HEYL V, WAHL HW, 2002. Emotional and social consequences of age-related low vision: a narrative review. *Partial sight and blindness Research*, 4, 47-71.
- CHEN, P. P. 2004. Risk and risk factors for blindness from glaucoma. *Curr Opin Ophthalmol*, 15, 107-11.
- DRANCE, S., ANDERSON, D. R. & SCHULZER, M. 2001. Risk factors for progression of visual field abnormalities in normal-tension glaucoma. *Am J Ophthalmol*, 131, 699-708.
- EVANS, J. R., FLETCHER, A. E. & WORMALD, R. P. 2005. 28,000 Cases of age related macular degeneration causing visual loss in people aged 75 years and above in the United Kingdom may be attributable to smoking. *Br J Ophthalmol*, 89, 550-3.
- EVANS, J. R., FLETCHER, A. E. & WORMALD, R. P. 2007. Depression and anxiety in visually impaired older people. *Ophthalmology*, 114, 283-8.
- FRASER, S., BUNCE, C., WORMALD, R. & BRUNNER, E. 2001. Deprivation and late presentation of glaucoma: case-control study. *BMJ*, 322, 639-43.
- FROST, A., HOPPER, C., FRANKEL, S., PETERS, T. J., DURANT, J. & SPARROW, J. 2001. The population requirement for cataract extraction: a cross-sectional study. *Eye (Lond)*, 15, 745-52.
- HAYMES, S. A., LEBLANC, R. P., NICOLELA, M. T., CHIASSON, L. A. & CHAUHAN, B. C. 2007. Risk of falls and motor vehicle collisions in glaucoma. *Invest Ophthalmol Vis Sci*, 48, 1149-55.
- HYAMS, S. W., POKOTILO, E. & SHKURKO, G. 1977. Prevalence of refractive errors in adults over 40: a survey of 8102 eyes. *Br J Ophthalmol*, 61, 428-32.
- KELLY, S. P., EDWARDS, R., ELTON, P. & MITCHELL, P. 2003. Age related macular degeneration: smoking entails major risk of blindness. *BMJ*, 326, 1458-9; author reply 1459-60.
- KELLY, S. P., THORNTON, J., EDWARDS, R., SAHU, A. & HARRISON, R. 2005. Smoking and cataract: review of causal association. *J Cataract Refract Surg*, 31, 2395-404.
- KLEIN, B. E., KLEIN, R. & LEE, K. E. 2002. Incidence of age-related cataract over a 10-year interval: the Beaver Dam Eye Study. *Ophthalmology*, 109, 2052-7.
- LASH, S. C., PRENDIVILLE, C. P., SAMSON, A., LEWIS, K., MUNNEKE, R. & PARKIN, B. T. 2006. Optometrist referrals for cataract and "Action on Cataracts" guidelines: are optometrists following them and are they effective? *Ophthalmic Physiol Opt*, 26, 464-7.
- LEE, S., SONG, S. J. & YU, H. G. 2013. Current smoking is associated with a poor visual acuity improvement after intravitreal ranibizumab therapy in patients with exudative age-related macular degeneration. *J Korean Med Sci*, 28, 769-74.
- LESKE, M. C., WU, S. Y., HENNIS, A., HONKANEN, R. & NEMESURE, B. 2008. Risk factors for incident open-angle glaucoma: the Barbados Eye Studies. *Ophthalmology*, 115, 85-93.

- MCDONNELL, P. J. 1988. How do general practitioners manage eye disease in the community? *Br J Ophthalmol*, 72, 733-6.
- MCLEOD, B. K., THOMPSON, J. R. & ROSENTHAL, A. R. 1988. The prevalence of retinopathy in the insulin-requiring diabetic patients of an English country town. *Eye (Lond)*, 2 (Pt 4), 424-30.
- MEDEIROS, F. A. & WEINREB, R. N. 2009. Estimating the risk of developing glaucoma. *Open Ophthalmol J*, 3, 50-3.
- MITCHELL, P., WANG, J. J., SMITH, W. & LEEDER, S. R. 2002. Smoking and the 5-year incidence of age-related maculopathy: the Blue Mountains Eye Study. *Arch Ophthalmol*, 120, 1357-63.
- NEWSOM, W., HUSSAIN, U., STEPHENSON, C., HINGORANI, M. 2013. Community optometry working with hospital ophthalmology: the benefits of working together in a shared care cataract pathway. *Optometry in Practice*, 14, 55-60.
- O'DONOGHUE, L., MCCLELLAND, J. F., LOGAN, N. S., RUDNICKA, A. R., OWEN, C. G. & SAUNDERS, K. J. 2010. Refractive error and visual impairment in school children in Northern Ireland. *Br J Ophthalmol*, 94, 1155-9.
- O'DONOGHUE, L., RUDNICKA, A. R., MCCLELLAND, J. F., LOGAN, N. S. & SAUNDERS, K. J. 2012. Visual acuity measures do not reliably detect childhood refractive error--an epidemiological study. *PLoS One*, 7, e34441.
- ORTICIO, L. P. 1994. Do perceptions of blindness affect care? *J Ophthalmic Nurs Technol*, 13, 172-9.
- PYYKKO, I., JANTTI, P. & AALTO, H. 1990. Postural control in elderly subjects. *Age Ageing*, 19, 215-21.
- RUDNICKA, A. R., MT-ISA, S., OWEN, C. G., COOK, D. G. & ASHBY, D. 2006. Variations in primary open-angle glaucoma prevalence by age, gender, and race: a Bayesian meta-analysis. *Invest Ophthalmol Vis Sci*, 47, 4254-61.
- SAIDKASIMOVA, S., MITRY, D., SINGH, J., YORSTON, D. & CHARTERIS, D. G. 2009. Retinal detachment in Scotland is associated with affluence. *Br J Ophthalmol*, 93, 1591-4.
- SHAHID, K., KOLOMEYER, A. M., NAYAK, N. V., SALAMEH, N., PELAEZ, G., KHOURI, A. S., ECK, T. T. & SZIRTH, B. 2012. Ocular telehealth screenings in an urban community. *Telemed J E Health*, 18, 95-100.
- SHELDRIK, J. H., WILSON, A. D., VERNON, S. A. & SHELDRIK, C. M. 1993. Management of ophthalmic disease in general practice. *Br J Gen Pract*, 43, 459-62.
- SKALICKY, S. & GOLDBERG, I. 2008. Depression and quality of life in patients with glaucoma: a cross-sectional analysis using the Geriatric Depression Scale-15, assessment of function related to vision, and the Glaucoma Quality of Life-15. *J Glaucoma*, 17, 546-51.
- SMITH, W. & MITCHELL, P. 1998. Family history and age-related maculopathy: the Blue Mountains Eye Study. *Aust N Z J Ophthalmol*, 26, 203-6.
- TAN, J. S., MITCHELL, P., KIFLEY, A., FLOOD, V., SMITH, W. & WANG, J. J. 2007. Smoking and the long-term incidence of age-related macular degeneration: the Blue Mountains Eye Study. *Arch Ophthalmol*, 125, 1089-95.
- TATE, R., SMEETH, L., EVANS, J., FLETCHER, A., OWENS, C., RUDNICKA, A. 2005. The Presence of Visual Impairment in the UK: A Review of the Literature. London: RNIB.
- THOMAS, R. L., DUNSTAN, F. D., LUZIO, S. D., CHOWDHURY, S. R., NORTH, R. V., HALE, S. L., GIBBINS, R. L. & OWENS, D. R. 2015. Prevalence of diabetic retinopathy within a national diabetic retinopathy screening service. *Br J Ophthalmol*, 99, 64-8.
- WOOLF, D. 2003. An audit of diabetic retinopathy screening in South Wales. *Optician*, 225, 24-28.

