RCOphth

NOD
National Ophthalmology Database Audit

National Ophthalmology Database Audit

The First Report of Age-related Macular Degeneration Audit (AMD)

Patients starting treatment for neovascular AMD in the 2020 NHS year (01 April 2020 to 31 March 2021)

2023

The Royal College of Ophthalmologists (RCOphth) is the professional body for eye doctors, who are medically qualified and have undergone or are undergoing specialist training in the treatment and management of eye disease, including surgery. As an independent charity, we pride ourselves on providing impartial and clinically based evidence, putting patient care and safety at the heart of everything we do. Ophthalmologists are at the forefront of eye health services because of their extensive training and experience. The Royal College of Ophthalmologists received its Royal Charter in 1988 and has a membership of over 4,000 surgeons of all grades. We are not a regulatory body, but we work collaboratively with government, health and charity organisations to recommend and support improvements in the coordination and management of eye care both nationally and regionally.

The ROYAL COLLEGE of OPHTHALMOLOGISTS

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Forewords

This report reflects the desire and willingness of ophthalmologists throughout the United Kingdom to quality assure the care they provide for many thousands of patients who have the rapidly progressive "wet" form of age-related macular degeneration (AMD).

It is perhaps surprising to recall that it was less than twenty years ago that intraocular injection of drugs to supress the formation of new blood vessels under the retina was found to be an effective treatment for "wet" AMD. Although this represented a major advance in the management of this condition, treatment must begin quickly, patients require repeated injections, the treatment itself is not without risk, and there are major resource costs. It is therefore essential that national scale real-world data is audited on a regular basis to assess the quality of the treatment being provided.

Martin McKibbin, the RCOphth AMD Project Clinical Lead, and his team should be congratulated for receiving data from 75 centres across the four home nations. Their analysis shows that the majority of patients completed their initial loading phase of three injections within 10 weeks. However, there is variation between centres and scope for improvement. It is reassuring to note that the treatment appears to be safe, with an endophthalmitis rate of one per 5,000 injections.

The audit's finding that patients who present with "good" vision usually retain this 12 months later, but those with "poor" baseline vision rarely experience significant improvement is an important public health lesson, signalling a need to better educate the older population on the need to seek rapid advice if they notice a change in their eyesight. Monitoring change over time is an essential component of both quality assurance and quality improvement. Recognising this, the RCOphth is committed to continuing the work of the AMD audit.

As Chair of the National Ophthalmology Database Steering Committee, I would like to thank:

- all the centres that participated with the audit,
- the members of the AMD project delivery team, namely Beth Barnes, Paul Donachie, Marta Gruszka-Goh, Martin McKibbin, Charlotte Norridge and Lynne Sander
- all those who funded this work including Bayer, Novartis, Roche and the Macular Society.

Mr Mike Burdon, FRCOphth (Hons)
NOD Steering Group Chair, The Royal College of Ophthalmologists

Forewords

The Macular Society is delighted to welcome this important report.

Age-related macular degeneration is the biggest cause of sight loss in the developed world and incidence is rising as our population grows older. As AMD is such a significant public health concern it is essential that the NHS has a thorough understanding of the quality of the care it is providing. The insight provided by the National Ophthalmology Database Audit will help bring even better care to people affected by such a devastating condition and ensure that the NHS uses its precious resources most effectively. The recommendations for patients are very valuable and will help empower people to manage their condition to get the best possible outcomes.

We congratulate the team that has brought the project this far in the face of some daunting challenges, not least the securing of funding, and we are grateful to all the clinicians and hospital Trusts that have contributed to the audit. We were very pleased to be able to support the work and look forward to its future development.

Cathy Yelf
Chief Executive, Macular Society

Summary of Key Points

1. For the first annual report, the NOD AMD Audit received data from 75 centres in England, Northern Ireland, Scotland, Wales and Guernsey. Analysis involved 20,452 eyes from 18,362 patients starting treatment in 2020 at 63 centres.

2. More than 90% of eyes retained "stable" vision at the end of the first year of treatment. Almost 20% of eyes experienced a significant improvement in vision and 40% had "good" vision (close to driving standard) after the first year of treatment.

3. Visual acuity outcomes after one year of treatment were associated with baseline acuity and first or second treated eye status. The median visual acuity at the start of treatment was 10 letters better in second treated eyes.

4. "Good" visual acuity was retained in most eyes with "good" acuity at the start of treatment but eyes with "poor" acuity at baseline rarely achieved "good" visual acuity after 12 months. This highlights the importance of prompt referral, initial assessment, diagnosis and treatment.

5. When information about the initial referral from primary care was available, more than 50% of patients started treatment within a month of referral.

6. The initial loading phase of three injections at monthly intervals was completed within 10 weeks in 65% of eyes and within 12 weeks in 73%.

7. The median number of injections per eye during the first year of treatment was seven. When the profession of the member of staff giving the injection was recorded, almost 70% of injections were given by non-medical staff.

8. The relative contribution of baseline characteristics and care processes to visual acuity outcomes is not yet known. Future modelling to adjust visual acuity outcomes and take account of baseline characteristics will help identify the key care processes.

9. Treatment appeared to be safe, with a low incidence of presumed infectious endophthalmitis (approximately one case per 6,500 injections).

10. Visual acuity at the start and end of the first year of treatment, key care processes and the proportion of injections given by non-medical professionals varied between centres. The Audit results will enable centres to compare local processes and outcomes with peers and identify any necessary changes to the local care pathway that may help achieve better outcomes.

11. Real-world outcomes can be used to help patients and their carers make an informed decision around treatment when neovascular or "wet" AMD (NvAMD) is first diagnosed, especially with lower levels of visual acuity at the start of treatment.

12. Data quality was generally above the quality target of 75% for most items but varied between centres. Ongoing engagement with the EMR providers is required to permit collection of all the fields in the dataset for the Audit as part of routine clinical care and to enable centres to mandate local collection of key data items as needed.

13. Loss to follow-up before the end of the first year of treatment is high but also varies between centres. As a result, the Audit may not receive data that could be informative. Additional analyses, to include the data from the patients that were lost to follow-up is possible but outside the scope of the Audit.

14. The impact of the COVID-19 pandemic on initial referral, the care pathway, data quality and visual acuity outcomes for eyes starting treatment in 2020 is not known but comparison with prior years suggests that there was little impact on data quality and key care processes for the eyes starting treatment.

1. Introduction

Age-related macular degeneration (AMD) remains the primary cause of sight-impairment certification. Without treatment, AMD leads to irreversible sight impairment, difficulty with many aspects of daily living and loss of independence.[1] For the "wet" or neovascular form of late AMD (NvAMD), guidance from The National Institute for Health and Care Excellence (NICE) recommends treatment with intravitreal injection of drugs that block the action of vascular endothelial growth factor (VEGF) (NICE guideline NG82). Treatment is usually given with an initial loading phase of monthly intravitreal injections, followed by further treatment according to disease activity in an ongoing maintenance phase. For the year 2022-23, commissioning guidance estimates that the drug costs of anti-VEGF therapies in England for NvAMD alone will exceed £670 million.

Both clinical trial data and real-world experience confirm that treatment reduces the risk of further visual loss and provides the opportunity for modest visual gains, helping patients to retain independence.[2-5] Visual acuity change and state after treatment are associated with patient-factors, lesion characteristics and the care pathway.[6-9] Eyes with better levels of vision at the start of treatment are less likely to experience an improvement in vision but are more likely to retain "good" vision. The best outcomes are typically seen with early presentation to a community optometrist, prompt referral, diagnosis and treatment in secondary care and with a care pathway that encourages adherence and persistence with treatment.

A feasibility audit from 2017, commissioned by the Healthcare Quality Improvement Partnership (HQIP), described outcomes for more than 9,000 patients starting treatment for NvAMD at 32 NHS providers (AMD Audit Feasibility Report, January 2017). Significant differences in visual acuity outcomes after 12 months of treatment were identified between providers. However, differences in the baseline characteristics of the patient populations and care delivery processes were also noted making it impossible to determine the cause of the apparent variation in outcomes and to identify best practice. Since then, other datasets have reported variation in treatment outcomes, but have begun to determine the relative contribution of baseline ocular and patient characteristics and key clinical care processes.[3,10,11] By reporting and sharing data on baseline features, care processes and visual acuity outcomes, the NOD AMD Audit will enable organisations to compare data with peers, identify best practice and reduce variation in clinical outcomes.

2. Audit Framework

The data in this first report for the NOD AMD Audit covers treatment for NvAMD recorded as part of routine clinical care. The focus of the report concerns eyes starting treatment in the 2020 NHS year, with results for eyes starting treatment in the 2018 and 2019 NHS years provided in appendices for context. Results are produced for 65 centres in total, 58 with data for the 2018 NHS year, 59 with data for the 2019 NHS year and 63 with data for the 2020 NHS year. The data from these 65 centres was recorded within the following:

- Medisoft EMR in use at 61 contributing centres (including 20 using mediSIGHT)
- OpenEyes EMR in use at three centres
- Both Medisoft and OpenEyes EMR in use at one centre

Key care processes, visual acuity and safety outcomes are reported for eyes starting treatment between 01 April 2020 and 31 March 2021 which corresponds to the 2020 NHS year.

All eyes with a recorded diagnosis of NvAMD starting treatment in the 2020 NHS year were eligible for inclusion. Excluded were eyes with any prior treatment for NvAMD (before 2020 NHS year), eyes receiving a clinical trial drug, and eyes from patients aged <55 years at the start of treatment

Participating RCOphth NOD centres are identified by name and allocated an audit number used in appendix tables, Appendix 4 (page 52).

3. Aims

Clinical audit is a quality improvement tool that enables commissioners, providers of care and people receiving care to measure and, where necessary, to improve local healthcare systems. The aims of clinical audit are to improve the quality and efficiency of the care pathway and to reduce unwanted variation in performance.

As part of clinical audit, routinely collected healthcare data is analysed to provide benchmarks for the delivery of care and clinical outcomes. By enabling comparison of performance with peers and against national standards, clinical audit can drive change in service models and enable implementation of best practice.

The Audit reports key care processes, visual acuity and safety outcomes for providers of NHS-funded NvAMD treatment.

Key care processes include:

- starting treatment, when appropriate, within 14 days of referral from primary care
- completion of the initial loading phase of three monthly injections within 10 weeks
- follow-up delays of more than 14 days within the first 12 months of treatment

Visual acuity outcomes include:

- crude and partially-adjusted visual acuity change from baseline to 12 months, taking account of age and visual acuity at the start of treatment
- the proportion of eyes with "good" visual acuity (≥ 70 ETDRS letters) after one year of treatment

Safety outcomes include:

- the incidence of intraocular inflammation or presumed infectious endophthalmitis within 42 days of a prior intravitreal injection

Secondary aims will be developed throughout the life of the Audit and will include, for example, baseline visual acuity as an indicator of access to treatment, the number of injections in the first and subsequent years and non-persistence with treatment.

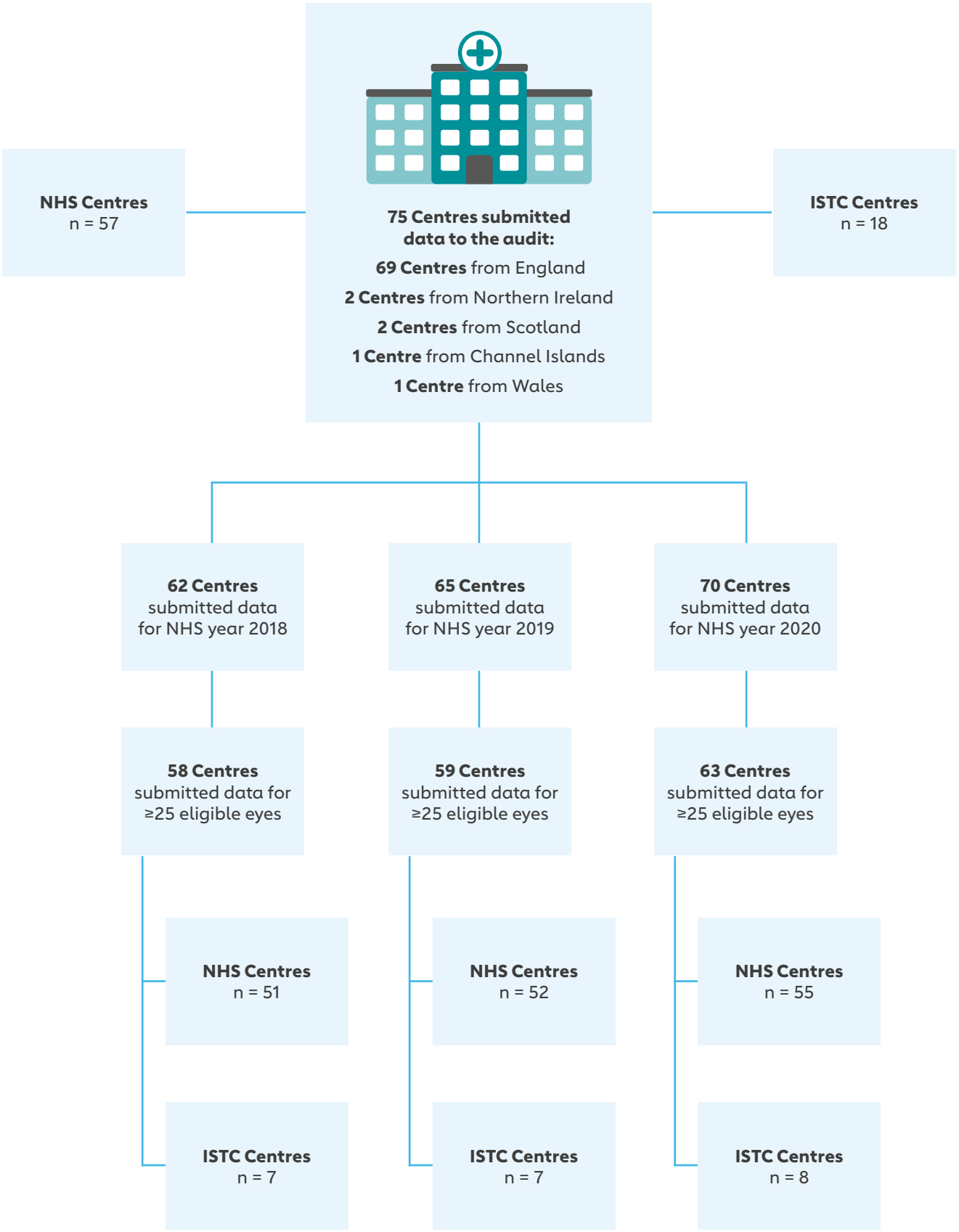
The first report of the Audit will provide the opportunity for AMD treatment providers to compare local outcomes with peers and to implement changes to the care pathway where necessary. This the first stage in quality improvement. Future reports are expected to show reduced variation in the delivery of care and improved outcomes.

4. NHS Trust / Health Board / Health and Social Care / Independent Sector Provider Participation

The Audit brief is to include all NHS or publicly funded independent NvAMD treatment where permission for data from the institution was provided by Clinical Leads / Medical Directors and Caldicott Guardians or a Governance equivalent for centres where Caldicott Guardian approval does not apply.

At the time of the first data extraction in the second quarter of 2022, data was submitted from 75 centres representing 57 NHS Trusts or Health boards and 18 independent sector treatment (ISTC) sites from three ISTC organisations. Most centres were in England (69) with two centres in Northern Ireland, two centres in Scotland, one centre in Wales and one from the Channel Islands. Five centres only supplied data for patients starting treatment after the 2020 NHS year, and seven centres submitted data for <25 eligible eyes in the 2020 NHS year, although two of them did submit data for at least 25 eligible eyes in the 2018 or 2019 NHS year. Results are producible for 63 centres for the 2020 NHS year, 59 for the 2019 NHS year and 58 for the 2018 NHS year from a total of 65 centres with sufficient eyes starting treatment in one of these years, Figure 1 (page 12).

Figure 1: The number of centres at different stages of analysis



5. Methodology

5.1 Context of the data collection:

The focus of this first annual report is on eyes starting treatment for NvAMD in the 2020 NHS year. Given that this NHS year covered the start of the COVID-19 pandemic in the UK, data is also reported, when available, for the 2018 and 2019 NHS years. The impact of the pandemic on initial presentation, time to diagnosis, adherence to planned treatment and the treatment pathway after March 2020 are not known. During the early phase of the pandemic, guidance from The Royal College of Ophthalmologists recommended that treatment for NvAMD should continue, given the risk of visual loss without treatment. To minimise the time that patients spent within the organisations and the risks of COVID-19 transmission, the care pathway may have been amended, with a greater focus on treatment at fixed intervals, rather than based on an assessment of disease activity. This may have affected both process and acuity outcomes. Recording of visual acuity may also have been reduced, affecting the apparent data quality.

The report follows an analysis of data recorded into electronic medical record (EMR) systems as part of routine clinical care in participating organisations providing NHS treatment for NvAMD. All of the organisations providing data for this report used either the Medisoft or mediSIGHT software from Medisoft Limited or the OpenEyes software from the Apperta Foundation. In the future, it is anticipated that more organisations will participate in the Audit, given national EMR roll-outs across Northern Ireland, Scotland and Wales. Organisations using other commercial EMRs, such as Hive or Kaleidoscope from EPIC systems corporation, and custom EMRs are also encouraged to participate and to submit pilot data to confirm compatibility with planned, future analyses.

Participation in national audits is encouraged by The Royal College of Ophthalmologists and participation in the NOD AMD audit is recommended in commissioning guidance (New Guidance for Commissioning Age Related Macular Degeneration Services).

Prior NICE guidance on the diagnosis and management of AMD included recommendations to ensure early referral, prompt initial assessment, diagnosis and treatment. These recommendations helped to inform the choice of process measures for the Audit. Data relating to other recommendations, especially around the provision of information and support, is typically not collected within the EMR as part of the routine clinical service but may be available through patient reported experience measures planned for the future.

5.2 Data quality and completeness

The data made available by the organisations participating in the Audit is collected within structured EMR systems as part of routine clinical care. No additional data entry is required due to the integration of EMR systems into eye care services. This integration supports the NHS digital agenda and encourages the shift to electronic working.

Most, but not all, of the data fields listed in the AMD Audit Clinical Data Set are available within current versions of the available commercial EMRs. Following a gap analysis in 2021, progress has been made in liaising with EMR providers to include the AMD Audit data fields in future versions of their EMRs. For some data fields, such as the presence of postoperative complications following treatment, the EMRs can enable mandatory data recording as part of routine care. However, other data fields are present within the EMR but providers often do not have the option to mandate data entry and improve data quality. This applies to visual acuity recording at the start of treatment and at milestone or annual visits. Date of referral is currently available in the mediSIGHT and Medisoft EMRs only and recording the indication for the referral is available within the mediSIGHT EMR. Planned follow-up interval is

available in both Medisoft and mediSIGHT and planned for version 7 of the OpenEyes EMR. No external validation of data quality and completeness is possible or available.

Variation in data quality and completeness between centres may reflect differences in the use of paper and electronic records or patient pathways within organisations or the use of an older version of each EMR.

Data quality flags are added to outcome data when the recording of any data required to calculate the outcome fell below the target of 75%.

5.3 Small numbers policy

Organisations with <25 eligible eyes treated within the NHS year have not been included in this report. For estimates of vision, data from centres with <25 eligible eyes with a visual acuity measurement are also not included and, for follow up data, no results are produced for centres with <25 eligible eyes within the follow up time period. The number of eyes required for a result to be produced will be reviewed annually and increased when suitable, as the Audit becomes more established. A low number was selected for this report as the focus was the 2020 NHS year which was affected by service disruption, due to the COVID-19 pandemic.

5.4. Limitations of the data

The RCOphth NOD includes data for anti-VEGF injections for the treatment of NvAMD in either or both of the first and second treated eyes. The first recorded injection could be in either the patient's first or second treated eye, unless immediate sequential bilateral intravitreal treatment (ISBIVT) was performed. In some cases, data for the first treated eye may be missing. This may arise for example if the first treated eye commenced and concluded treatment prior to the centre's adoption of electronic data collection, or with the first eye being treated at another centre. At present the RCOphth NOD cannot link patients' data if collected at different centres. Similarly, if a patient were to change centres during treatment, the Audit could not identify prior treatment and would identify the first record of treatment at the new centre as a new eye starting treatment. For these reasons, no results on time between eyes starting treatment are provided in this report.

Patient's age, and the calculation of the index of multiple deprivation data rely on data entered directly onto the provider's Patient Administration System (PAS), which links into EMR systems; hence, if these data are not recorded in the PAS, it is not present in the data extract for EMR enabled centres with PAS connections. Deprivation data was available for most operations recorded on the Medisoft EMR system but not for the other sources of data. The RCOphth NOD is working with providers of other EMR systems to facilitate the inclusion of deprivation data during extraction.

Date of referral can be recorded in both the Medisoft and mediSIGHT EMRs. This may be done when a referral for suspected NvAMD is received from primary care. Extraction of historic data can help to identify if the referral relates to a first or second treated eye for new patients or for those who are no longer in active review. For patients being actively treated in the first eye, routine collection of symptoms, visual acuity data and optical coherence tomography (OCT) images for the fellow eye will often help to identify second eye disease. In this situation, there will be no data around referral from primary care.

Several NHS Trusts provided treatment at more than one location but within the same parent organisation and geographical area. For example, Moorfields Eye Hospital NHS Foundation Trust provides NvAMD treatment at multiple centres, both within and outside the parent NHS Trust. A mixture of aggregate and location or centre level data is reported in this situation. Multiple-site independent sector organisations provide treatment at a number of different geographical locations and, in this situation, data is reported separately for each location.

Loss to follow-up is an issue for visual acuity outcomes. The focus of this first annual report is on eyes starting treatment in the 2020 NHS year and visual acuity outcome data after 12 months is reported for these eyes. In subsequent reports for future years, the aim is to report not only 12 month outcomes for eyes treated in a given year but 24 month and longer outcomes for eyes treated in prior years. The prior AMD feasibility audit had follow-up data to 12 months for around 87% of treated eyes but loss to follow-up accelerated rapidly in the second year. Other series have reported similar rates of loss to follow-up among patients with NvAMD and other chronic ocular diseases.[13,14] Loss to follow-up may be the result of treatment failure, treatment burden, co-morbidity, planned discharge, death or moving to another part of the country. A significant minority of patients have a period of non-persistence with treatment for at least six months. Re-presentation after non-persistence is often associated with a decrease in visual acuity.[12] Longer treatment intervals in the maintenance phase of treatment may also mean that data for annual, milestone visits is not captured within the permitted visit window. Although death data is available for some EMRs, no date of death is included within the extraction. Therefore, conclusions cannot be made about loss to follow up due to death of the patient.

Delayed follow-up may be the result of patient factors, such as co-morbidity, holiday, arranging travel to a clinic or other commitments, or provider factors, such as clinic administration and lack of capacity. Extended follow-up delays and non-adherence with treatment are associated with sub-optimal visual acuity outcomes. The planned follow-up interval is often, but not always, recorded within the available EMRs. For centres offering a two-stop service, with assessment and treatment on different days, the recorded follow-up may be for treatment, not for the next assessment date.

Visual acuity change and state after treatment for NvAMD are associated with patient factors, lesion characteristics and care processes.[6-9] Age and visual acuity at the start of treatment are the strongest predictors of visual acuity outcomes.[9] In this report, crude and partially adjusted visual acuity change are reported. Fully adjusted visual acuity change will be included in future reports as the model matures.

It is acknowledged that high-contrast visual acuity is not equivalent to visual function in the real world and does not take account of problems with daily living activities secondary to distortion, loss of colour contrast, delayed dark adaptation and a central scotoma. However, high-contrast visual acuity is the traditional means of assessing visual function in both primary and secondary care. Planned patient reported experience and outcome measures may help to record the impact of treatment on a range of daily living activities.

As well as visual acuity outcomes, clinical trials often report the impact of treatment on disease activity. This is usually inferred by the presence or absence of intra-retinal or sub-retinal fluid and retinal haemorrhage on retinal imaging or clinical examination. While an assessment of disease activity forms part of the routine follow-up of patients with NvAMD, recording of activity and retinal thickness within the available EMRs is less good. Plans to automate the integration of the results of OCT imaging into EMRs will aid the future adoption of disease activity as a secondary outcome for the Audit.

5.5. Data extraction

Centre participation is confirmed by agreement from the institution's Caldicott Guardian/ Medical Director or Governance equivalent and Clinical Lead for Ophthalmology. There are two sources of data included in the prospective first year of the National NvAMD Audit, 61 centres used the Medisoft EMR, three centres used the OpenEyes EMR and one centre used both systems.

5.6. Data cleaning

The analysis set was restricted to those eyes with data which appeared to be likely to be reliable. The injection set of data included "number of previous injections". For a treatment naïve eye, these should then be 0, 1, 2, 3, 4 etc. For some eyes the first injection in the data was a number greater than 0 but then incremented as one would expect, so 7, 8, 9, 10. Treatment for these eyes most likely started in

another organisation or before the introduction of the EMR in that centre and these were excluded from the data analyses. Similarly, there were other eyes for which the number of injections was not consecutive and this may have been where patients had been treated in another centre. The eyes of these patients were also excluded.

5.7. Dataset

A minimum NvAMD dataset has been defined for purposes of the Audit.

The project delivery team for the Audit is supported by a multi-disciplinary advisory group, with four consultant ophthalmologists, other healthcare professionals and patient representatives. Through a webinar and a subsequent online survey, members of the Macular Society helped in the selection of process measures and outcomes that were important to patients as well as clinicians. The choice was also informed by the tools and resources in the NICE Age-related Macular Degeneration guideline (NG82), although not all of these recommendations can be assessed within the data currently recorded as part of routine clinical care.

5.8. Definitions

5.8.1. Profession of injector

Within the NHS, intravitreal injections for NvAMD and other retinal diseases are most often administered by non-medical staff with the supervision of a qualified ophthalmologist. Typically, this will be by trained eye clinic or theatre nurses but also by optometrists, orthoptists and other healthcare practitioners. Within the EMRs, the profession of the treating healthcare practitioner is identifiable from their job title and, for medical staff, from a General Medical Council number. In this report, the proportion of injections given by medical and non-medical staff is detailed. In the event of uncertainty, the profession is listed as Unknown.

5.8.2. Key care processes

NHS providers of NvAMD treatment may not have direct control on when patients first present to primary care after the onset of symptoms, but organisations can control several care processes that appear to influence outcomes and which may also improve the patient experience and encourage persistence with treatment.

The NICE guideline (NG82) on the management of AMD recognises the importance of early diagnosis and prompt treatment to prevent sight loss. Starting treatment within 14 days of referral from primary care is recommended. Analysis of several real-world datasets has shown better visual acuity outcomes in eyes receiving the initial loading phase of treatment quickly and for patients with both good adherence to and persistence with the treatment plan.[3,8,12] While completion of the initial three injections within eight weeks may be possible, the choice of a 10-week target allows some leeway and the difference is unlikely to be important clinically. Patient preference information input into the choice of care processes suggested that follow-up delays are a feature of the care pathway in some organisations. Prolonged delays and non-adherence with the planned treatment pathway are associated with worse visual outcomes. The extracted data does not make clear whether the follow-up delays were the result of patient factors, lack of capacity or communication around the date of the follow-up appointment.

5.8.3. Visual Acuity (VA)

VA definitions used were designed to maximise the usefulness of the available data with specified 'time windows' for baseline and follow up measurements and criteria for preferred choices in terms of corrected VA, unaided VA and pinhole corrected VA.

Visual acuity is assumed to have been recorded with habitual spectacle or contact lens correction. Acuities recorded in Snellen format were converted to LogMAR. Visual acuities of count fingers or worse

were converted to ETDRS letter score of zero (LogMAR 1.7). In this report, visual acuity at baseline and after treatment is presented in ETDRS letters. A change of five ETDRS letters is identical to 0.1 LogMAR. Visual acuity conversions between ETDRS, LogMAR and Snellen can be found in Appendix 6 (page 55).

Baseline visual acuity was considered to have been recorded when a measurement was recorded on the day that treatment started, or at any point in the 14 days before the start of treatment. Similarly, visual acuity at completion of the loading phase was deemed to be valid if occurring within 14 days of completing the loading phase. For visual acuity at months one to 13 (matching to 4-week blocks used in standard treatment protocols), visual acuity was considered with the same ± 14-day threshold. Visual acuity at one year was considered to have been recorded when a measurement was recorded one year after the start of treatment +/- 56 days.

5.8.4. Intraocular inflammation and presumed infectious endophthalmitis
Presumed infectious endophthalmitis (PIE) was defined if any of the following occurred within 42 days of an anti-VEGF injection: a post-injection record of endophthalmitis as a complication or new diagnosis, or a surgical record of vitreous biopsy and/or anterior chamber tap or an injection of intravitreal ceftazidime or vancomycin. This approach is required as recording the presence or absence of PIE as a postoperative treatment complication may not be mandatory within the EMR.

Minor complications, such as a foreign-body sensation or sub-conjunctival haemorrhage (bruising) after intravitreal injection are common but resolve spontaneously. Intravitreal injection of treatment for NvAMD may also lead to intraocular inflammation (IOI). This can vary in terms of severity and impact. Poor adherence to good manufacturing technique or to injection under aseptic conditions may increase the risk of presumed infectious endophthalmitis (PIE). Unlike sterile IOI, PIE occurs following introduction of bacteria into the vitreous. Without prompt treatment, the impact on vision can be devastating. The term PIE includes both the scenario where no bacteria were found on microscopy or culture of intraocular fluids and when bacteria were isolated. Most organisations would expect the incidence of PIE to be less than one in 3,000 injections.

Both PIE and IOI may originate after treatment in one organisation but may be managed by staff at a second organisation. For the AMD Audit, it is not currently possible to match records for patients with initial and subsequent treatment in different organisations.

Other possible complications of intravitreal injections such as cataract and retinal detachment were not included as safety markers. Development of cataract and worsening visual impairment is often associated with the total number of prior intravitreal injections, or other surgical procedures, rather than being a complication of a single injection. Similarly, retinal detachment is more often a complication of posterior vitreous detachment and an indirect complication of intravitreal injections.

5.8.5. Partial adjustment of the impact of baseline visual acuity and age on visual acuity change at one year
Baseline visual acuity and age of the patient are widely known to influence the potential VA improvement after one year of anti-VEGF treatment. A simple linear regression model created from data for the 2018, 2019 and 2020 NHS years was used to partially adjust the expected change in VA at one year, for the purposes of this report. A fully adjusted model is planned to be created in the future.

5.8.6. Loss to follow-up
Loss to follow up was defined based on the last clinical date available for the eye. If this date was less than one year +14 days from starting treatment and the eye had no visual acuity measurement at one year, the eye was considered lost to follow up. All eyes with visual acuity data at one year were considered not lost to follow up, even if their last clinical date was before one year. This type of delineation is required due to different treatment protocols in place between centres, different timelines patients can follow, potential delays to follow up and that during the 2020 NHS year there was severe

service disruption due to the COVID-19 pandemic. Baseline characteristics of patients lost to follow up were compared to the baseline characteristics of eyes completing one year of treatment.

5.8.7. First and second treated eyes

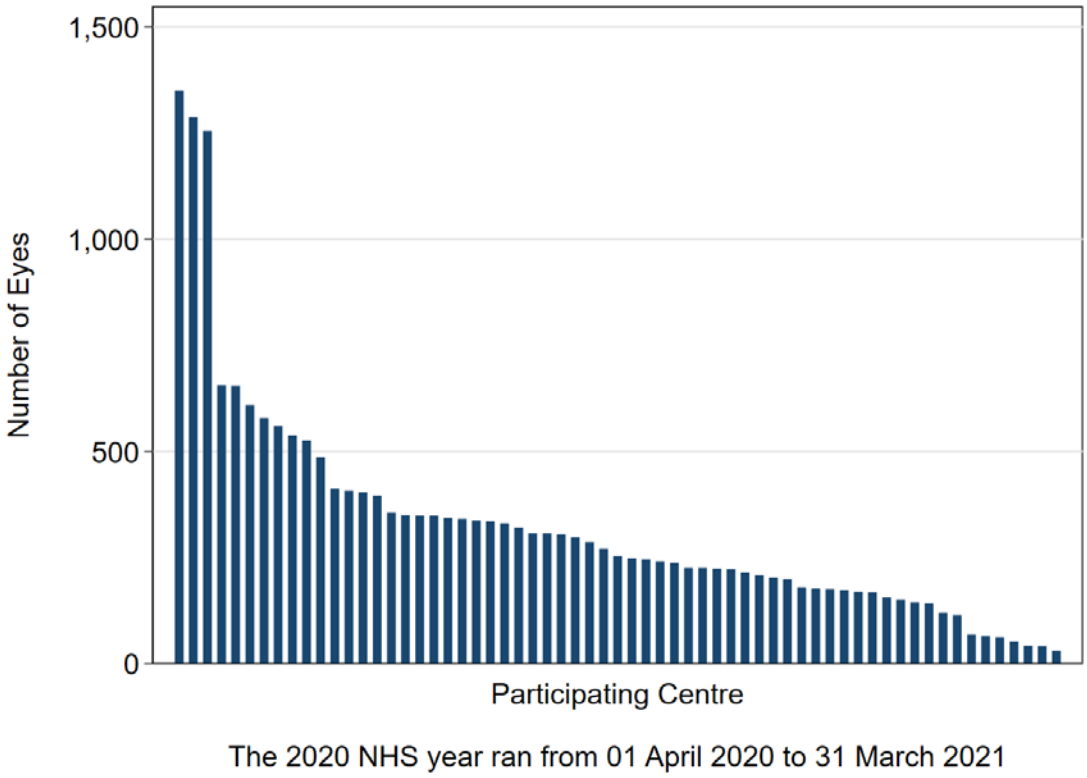
NvAMD often affects both eyes, either at the same time or sequentially. Active surveillance of the second eye may identify disease during treatment of the first eye. In this situation, the disease in the second eye may be detected at an early stage, often before the onset of any symptoms and there would not be an associated referral from primary care. Alternatively, disease in the second eye may be identified when there is no longer active treatment or review of the first eye. In this situation, the prior experience of the patient will often lead to recognition of the importance of symptoms and earlier presentation.

6. Eligibility for Analysis

6.1. Participation

For the 2020 NHS year, data for 22,507 eyes starting treatment was submitted to the Audit from 70 centres, of which 20,504 (91.1%) were eligible for analysis. All data from seven centres (52 eyes) were excluded due to <25 eligible eyes in these centres. Eligible for reporting were 20,452 eyes from 18,362 patients commencing treatment in the 2020 NHS year from 63 centres. The number of eyes eligible from each centre varied considerably, where the median number of eyes per centre was 356 (IQR; 253 – 654), Figure 2 (page 19) and Appendix 7 (page 56).

Figure 2: The number of eligible eyes commencing treatment in the 2020 NHS year for each participating centre – ordered by frequency for each centre

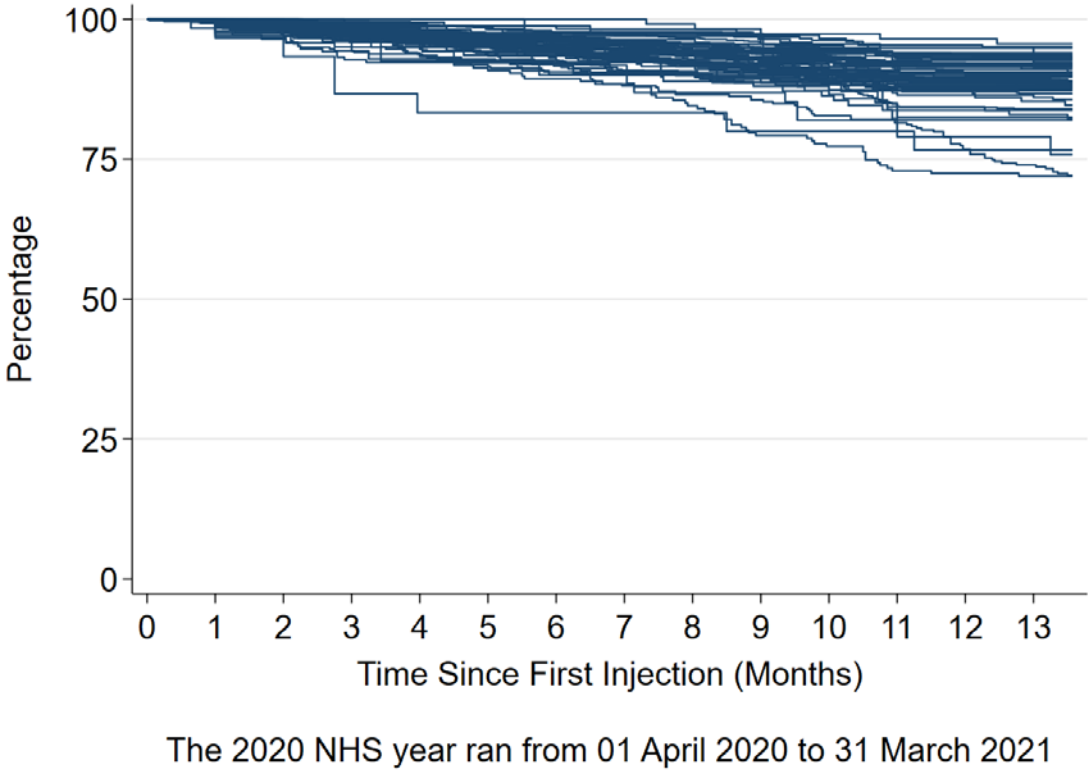


6.2. Follow-up to month 12 including deaths, treatment permanently discontinued or discharged

Of the 20,452 eligible eyes, 2,347 (11.5%) eyes were lost to follow up by one year since their first injection. For 1,892 (80.6%) of the eyes lost to follow up, the reason for discontinuing treatment was not recorded. There were 455 eyes with a recorded re-treatment decision on their final visit before loss to follow up. Of these 455 eyes, 137 (30.1%) eyes had an active clinical reason to permanently stop treatment, 34 (7.5%) eyes were recorded as being under observation and 284 (62.4%) eyes were recorded as continuing treatment at their final visit. There were no patients recorded as declining further treatment.

The percentage of eyes lost to follow up within one year of treatment varied between centres (range; 4.4% to 34.1%), Figure 3 (page 20).

Figure 3: The percentage of eyes lost to follow up within one year from first injection by participating centre



Patients lost to follow-up before month 12 (2,347 eyes) were slightly older at the start of treatment, with a median age of 83.9 years (IQR; 77.4 to 88.7 years), compared to those who were not lost to follow up with a median age of 80.8 years (IQR; 74.7 to 86.0 years). Those lost to follow up also had a lower median baseline VA of 50 ETDRS letters (IQR; 35 to 65 letters) compared to those not lost to follow up with a median of 60 ETDRS letters (IQR; 45 to 70 letters).

7. Data Quality

7.1. Data quality for recording of the date of referral before the start of treatment

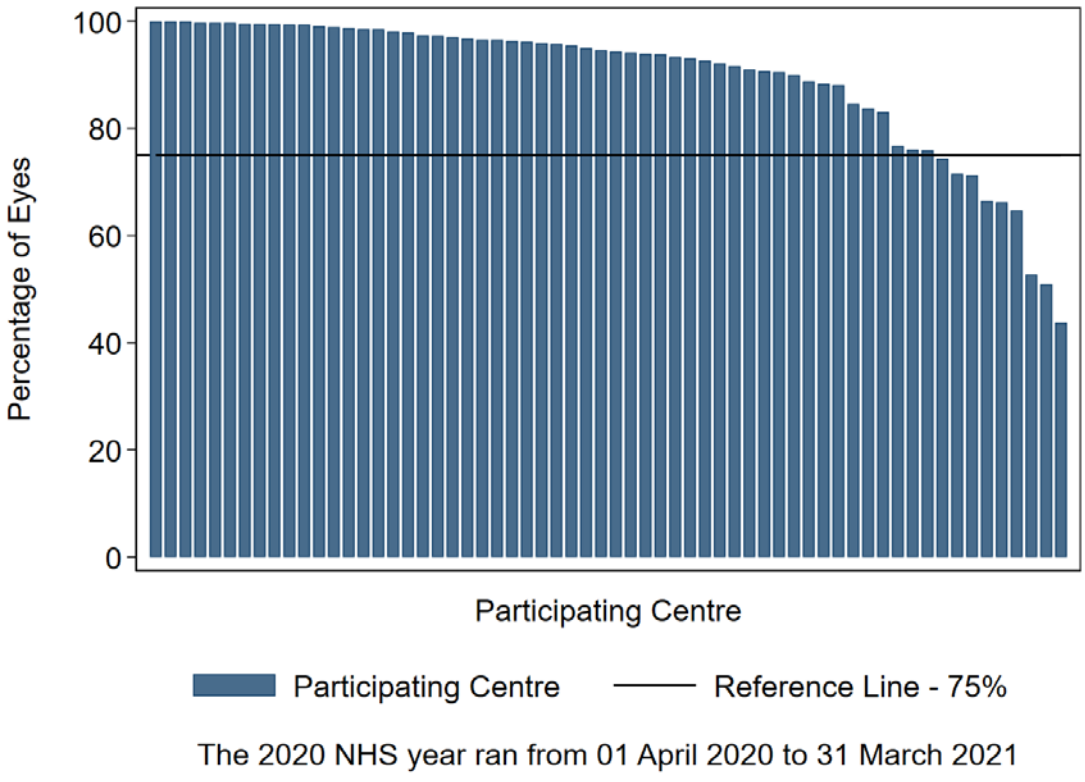
Of the 20,452 eyes starting treatment in the 2020 NHS year, information on the date of or reason for the referral was available for 7,601 (37.2%) eyes, of which 1,134 (14.9%) eyes had suspected NvAMD recorded as the reason for referral, 445 (5.9%) had a referral due to another ocular disease and 6,022 (79.2%) eyes had a date of referral but no reason for referral.

7.2. Data quality for visual acuity recording at baseline

From the 20,452 eligible eyes, a valid baseline VA was recorded for 18,587 (90.9%) eyes within 14 days prior to their first injection. For the 1,865 eyes without a baseline VA within 14 days, 567 (30.4%) eyes had a VA within 15 and 28 days prior to their first anti-VEGF injection, 765 (41.0%) had a VA measurement more than 28 days prior to the first injection and 533 (28.6%) had no VA measurement recorded.

There was a wide variation in the percentage of eyes with a baseline VA measurement between contributing centres. There was one (1.6%) centre with <50% of eyes with a baseline VA recorded, 53 (84.1%) centres had a valid baseline VA for ≥75% eyes and 30 (47.6%) centres had valid baseline VA for ≥95% of eyes (including three centres with 100% of eyes with valid baseline VA measurements), Figure 4 (page 21).

Figure 4: The percentage of treated eyes supplied to the Audit with a valid baseline VA by participating centre – ordered by the percentage of eyes with baseline VA data



For comparison, the overall percentage of eyes with a valid baseline VA were 91.7% and 89.3% for the 2018 and 2019 NHS years, respectively. The percentage of eligible eyes with a baseline VA measurement for each centre and for the 2018, 2019 and 2020 NHS years is shown in Appendix 11 (page 64).

From the 18,587 eyes with an audit defined baseline VA measurement, 20 eyes from one centre were excluded from baseline VA estimates due to the centre having <25 eligible eyes with a baseline VA measurement. Eyes included in the assessment of baseline VA measurement are 18,567 eyes from 62 centres.

7.3. Data quality for recording of the planned follow-up interval

Planned follow-up interval is not a mandatory field in some of the EMRs and may be recorded as a surgeon default value. Recording of the intended follow-up interval was variable and may have been affected by changes to clinical practice related to the COVID-19 pandemic. It is plausible that service disruption and changing circumstances due to the COVID-19 pandemic could have affected patients scheduled follow up intervals to such an extent that the data recorded for follow up intervals does not represent the actual situation during the 2020 NHS year. Ongoing discussions with EMR providers are expected to improve capture of the planned follow-up interval and aid with identification of delayed follow-up. Due to these reasons no results for delay to follow up are reported. For future reports information could be included, providing the recording of the planned follow-up interval data improves.

7.4. Data quality for recording postoperative complications

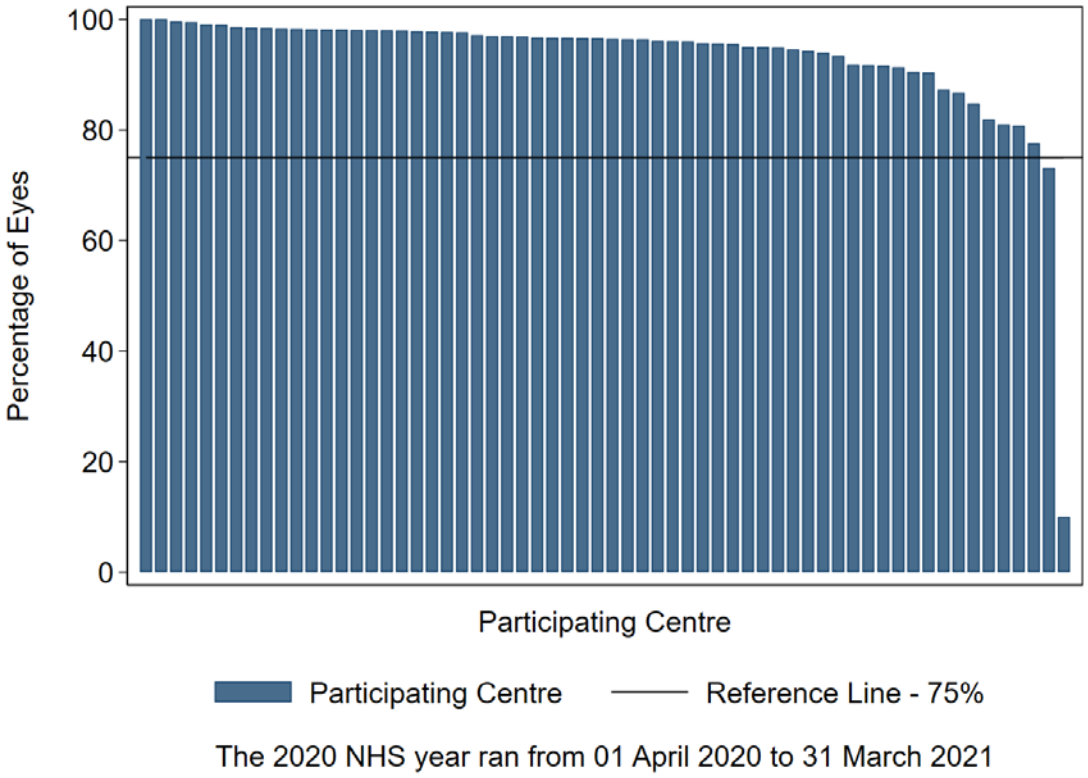
Recording the absence or presence of ocular postoperative complications is not mandatory within current versions of some of the EMRs, unlike the absence or presence of systemic postoperative complications. Ongoing discussions with EMR providers are expected to improve capture of ocular postoperative complications of treatment. Data quality for the recording of the postoperative complications will be included in future reports for the Audit.

7.5. Data quality for visual acuity recording after 12 months

From the 20,452 eligible eyes, 2,347 eyes were lost to follow up within the first year. One centre had <25 eyes after loss to follow up so a further 23 eyes were removed from analysis at 12 months. This left 18,082 eyes from 62 centres remaining in the sample at one year. Of these, visual acuity measurements were recorded for 16,962 (93.8%) eyes, and was missing for 1,120 (6.2%) eyes. For comparison, the percentage of eyes with a recorded VA measurement at one year were 91.7% and 82.3% for the 2018 and 2019 NHS years, respectively. The percentage of eyes with a recorded VA measurement at one year for contributing centres and each audit year is in Appendix 11 (page 64).

There was a wide variation in the percentage of eyes with VA recorded at one year between contributing centres (range; 10.0% to 100.0%). There was one (1.6%) centre with <50% of eyes, 60 (96.8%) centres with ≥75% of eyes and 42 (67.7%) centres with ≥95% of eyes with VA recorded at one year (including two centres with 100% of eyes with VA recorded at one year), Figure 5 (page 23) and Appendix 10 (page 61).

Figure 5: Percentage of eyes with VA at one year – ordered by the percentage of eyes with data at one year



Overall, the percentage of eyes with a recorded VA measurement at one year was 93.7% for first treated eyes, 95.4% for second treated eyes and 91.8% for eyes in ISBIVT patients.

From the 16,962 eyes with a recorded VA measurement at one year, 23 eyes from one centre were excluded from the estimate of vision at one year due to the centres having <25 eligible eyes with a VA at one year measurement. Eligible for assessing vision at one year are 16,939 eyes from 61 contributing centres.

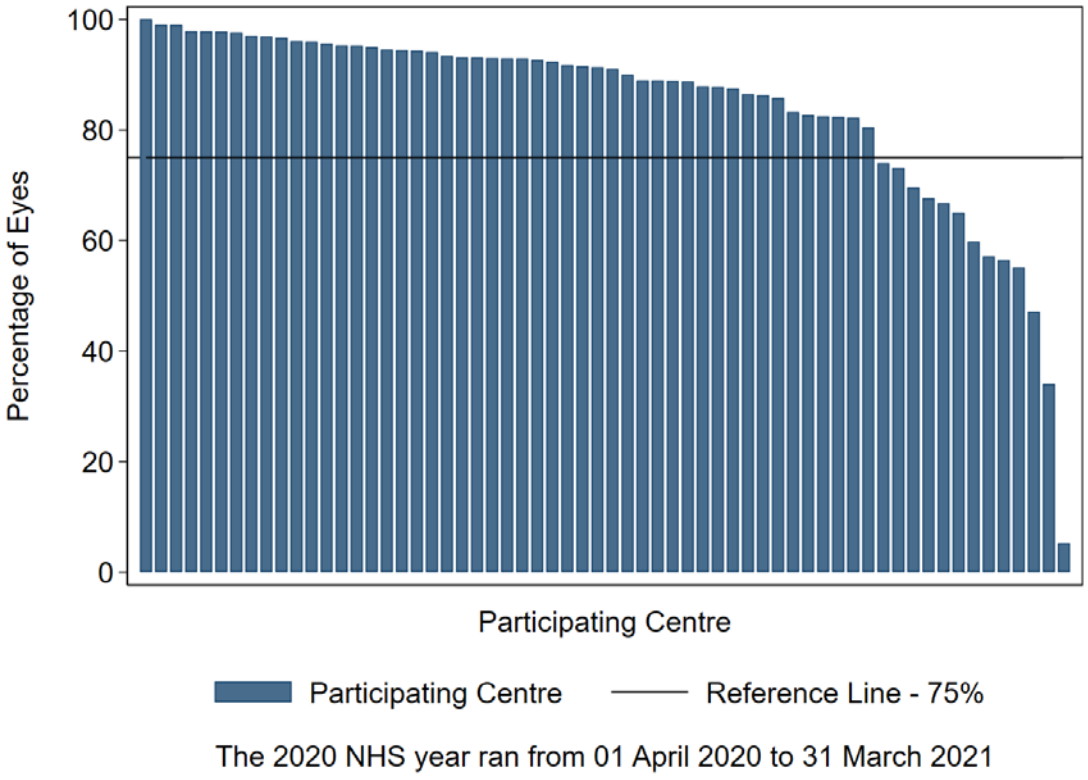
7.6. Data quality for change in visual acuity at 12 months

Of the 18,082 eyes remaining in the sample at one year, no baseline VA measurement was recorded for 872 (4.8%) eyes and no VA data at one year was recorded for 1,586 (8.8%) eyes. Therefore, 15,624 (86.4%) eyes had VA data at both baseline and one year which is required for change in VA assessment. For comparison, the percentage of eyes with valid change in VA measurements at one year were 84.6% and 74.7% for the 2018 and 2019 NHS years, respectively.

The percentage of treated eyes with both baseline VA and one year VA measurements varied across participating centres, where three (4.8%) centres had <50% of their completing the year sample with VA data at baseline and one year, 49 (79.0%) centres had ≥75% of their sample with this data and 16 (25.8%) centres had ≥95% of their sample with this data (including one centre with 100% of their sample with data at baseline and one year), Figure 6 (page 24) and Appendix 10 (page 61).

A further 28 eyes from two centres were removed from results for change in VA due to having <25 eyes with valid change in VA measurements. This left 15,596 eyes eligible for change in VA analysis from 60 centres.

Figure 6: Percentage of eyes with change in visual acuity data from baseline to one year for participating centres – ordered by the percentage of eyes with visual acuity change data



8. Results

8.1. Baseline characteristics for patients and eyes

This report includes data from 20,452 eligible eyes from 18,362 individual patients starting treatment in the 2020 NHS year. Baseline characteristics included:

- 11,034 (60.1%) patients were female
- The sex was not recorded for 412 (2.2%) patients
- The ethnicity was not recorded for 6,982 (38.0%) patients
- Of those with recorded ethnicity, 86.4% were recorded as Caucasian
- Patient characteristics were very similar for first treated and second treated eyes, Appendix 9 (page 60)

Results for first treated, second treated and immediate sequential bilateral intravitreal treatment eyes are described below.

First treated eye;

- First eye treatment was performed for 13,608 (66.5%) eyes
- The median age at the time of the first treated eye was 80.7 years (IQR; 74.3 – 86.0 years)

Second treated eye;

- Second eye treatment was performed for 4,164 (20.4%) eyes
- The median age at the time of the second treated eye was 82.4 years (IQR; 76.8 – 87.4 years)

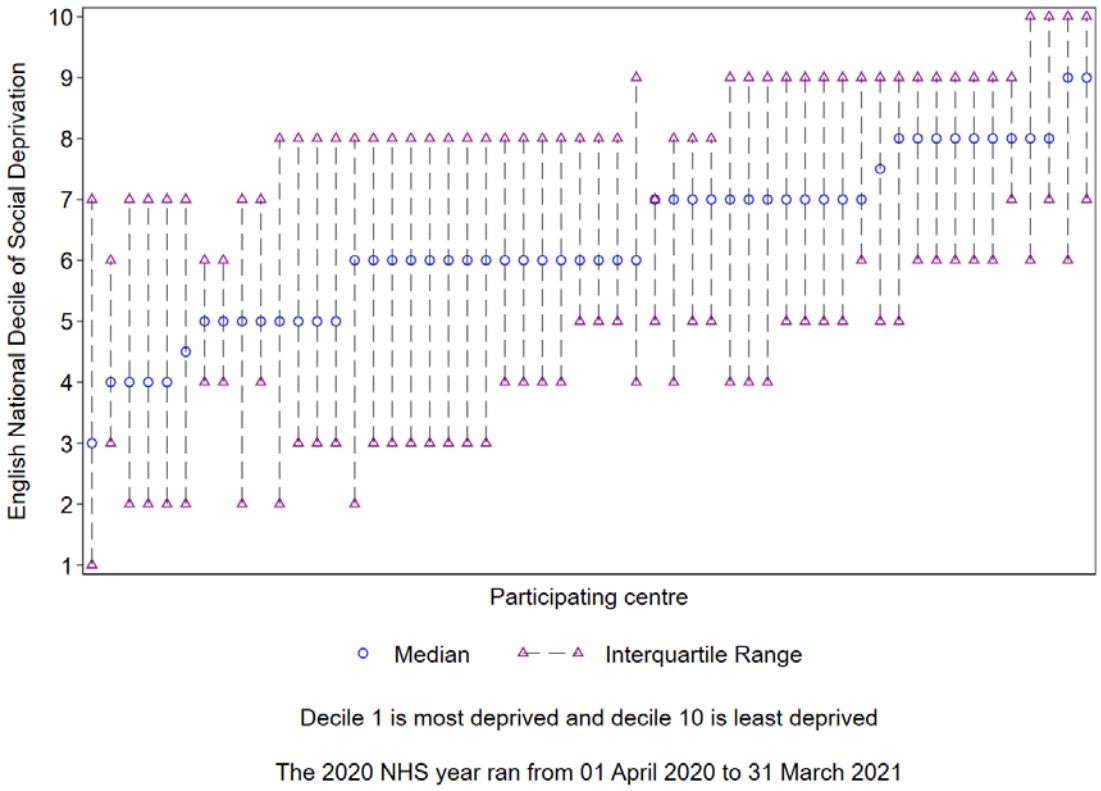
Immediate sequential bilateral intravitreal treatment;

- ISBIVT was performed for 1,340 patients in 61 centres
- The median age was 81.2 years (IQR; 75.5 – 86.7 years)
- 462 (34.5%) patients were male, 846 (63.1%) were female and the sex was not recorded for 32 (2.4%) patients

The English index of multiple deprivation was calculated for 13,049 (99.2%) patients from 54 participating English centres with data recorded on the Medisoft EMR. All centres, except five, treated patients in the most deprived national decile of social deprivation (decile 1) and all bar four centres treated patients in the least deprived national decile of social deprivation (decile 10). There was notable variation in the median English national decile of social deprivation between centres, Figure 7 (page 26).

The index of multiple deprivation was not calculatable for centres using the OpenEyes EMR, although that should be possible in future submissions. Results for social deprivation are only produced for English centres as different indices are used in different nations and too few centres in Northern Ireland, Wales and Scotland submitted data to be representative of results for these nations.

Figure 7: Median and IQR national deciles of social deprivation by participating centre – ordered by median national decile within each centre



8.2. Baseline visual acuity

Eyes included in the assessment of baseline VA measurement are 18,567 eyes from 62 centres.

The median baseline VA was 60 ETDRS letters (IQR: 45 to 70 letters). For 3,192 (17.2%) eyes, the baseline VA was <35 letters, for 5,352 (28.8%) eyes 36-55 letters, for 4,913 (26.5%) eyes 56-69 letters and for 5,110 (27.5%) eyes ≥70 letters. There were 13,777 (74.2%) eyes with a baseline VA between 25-70 letters (the former NICE guidelines for treatment- 6/12 to 6/96 Snellen). There were 1,537 (8.3%) with a baseline VA <25 letters and 3,253 (17.5%) eyes with a baseline VA >70 letters.

There was variation in baseline VA between contributing centres, where one (1.6%) centre had a median baseline VA of <35 ETDRS letters, 17 (27.4%) centres had a median baseline VA of 35-55 ETDRS letters and 44 (71.0%) centres had a median baseline VA of 56-69 ETDRS letters. No centres had a median baseline VA of ≥70 ETDRS letters, Figure 8 (page 27) and Appendix 10 (page 61).

For first and second treated eyes (excluding ISBIVT patients) the median baseline VA for the first treated eye was 10 ETDRS letters worse than for the second treated eye. This indicates that first eye treatment may be undertaken at a more advanced stage of visual loss than second eye treatment, or that second treated eyes are diagnosed and treated at an earlier stage of disease development.

For the 1,340 ISBIVT patients, 1,218 (90.9%) had baseline VA measurements for both eyes where the median difference in the VA between left and right eyes was zero ETDRS letters (IQR: -10 to +15 letters), Table 1 (page 27).

Figure 8: Median and IQR for baseline VA by participating centre – ordered by median baseline VA

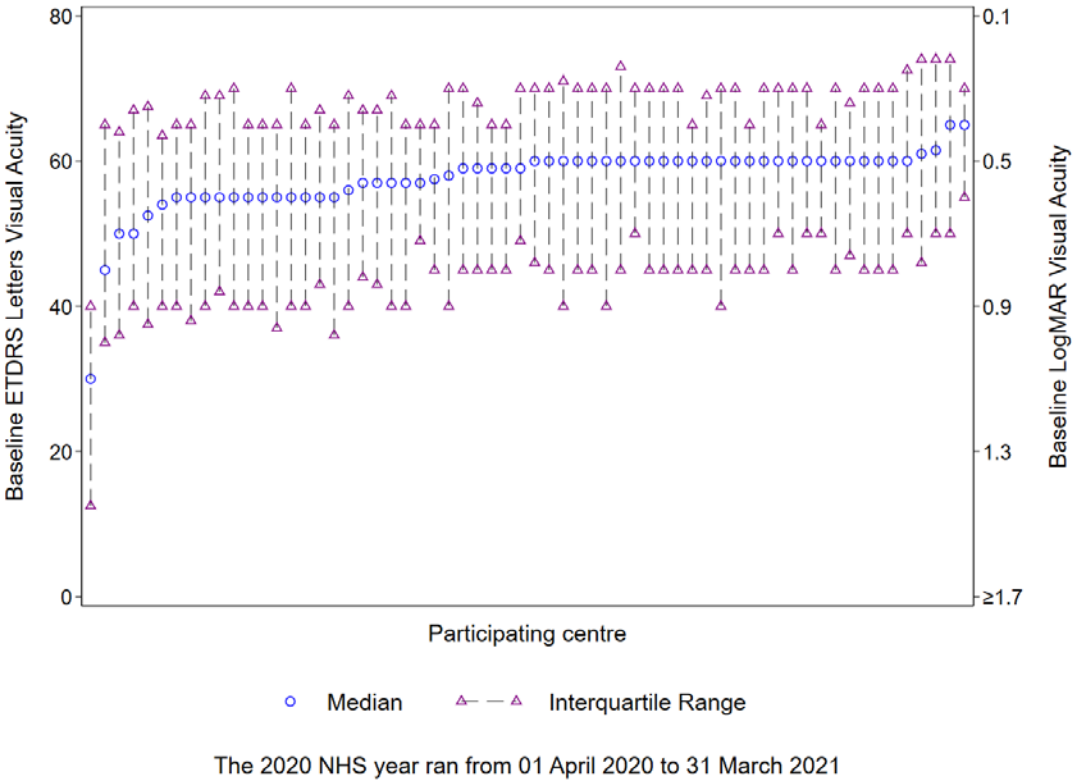


Table 1: Baseline visual acuity for first treated, second treated and ISBIVT eyes

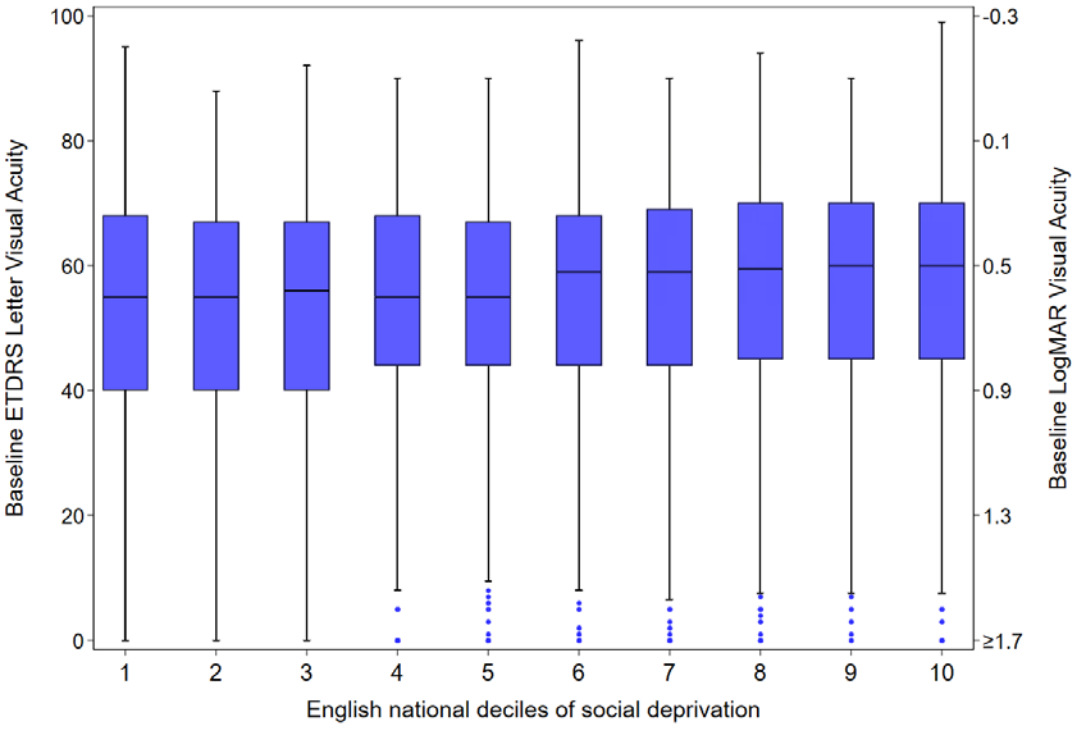
	Number of eligible eyes	Median VA	IQR	Proportion with good VA (≥70 letters)
First treated eyes	12,339	55	40 to 69	23.9%
Second treated eyes	3,789	65	52 to 70	38.7%
ISBIVT eyes	2,439	60	45 to 70	28.3%
Overall	**18,567**	**60**	**45 to 70**	**27.5%**

8.3. Baseline visual acuity and socio-economic deprivation

Social deprivation is recognised as an influential factor on the ability of individuals to access care for a variety of conditions. Here we have used baseline VA as a proxy for the severity of NvAMD to assess whether deprivation is related to timely access to treatment before symptoms of vision loss become advanced.

Variation is observed across the Index of Multiple Deprivation (IMD) for 11,715 patients treated in English centres with data on the Medisoft EMR systems and is demonstrated in Figure 9 (page 28). There is evidence of slight variation between higher levels of deprivation and worse baseline VA. For example, 28.1% of the eyes in the least deprived group (decile 10) had visual acuity ≥70 letters, compared to only 24.0% and 22.8% in the two most deprived groups (deciles 1 and 2, respectively), Table 2 (page 29). The median VA for the most deprived decile was 55 ETDRS letters (IQR; 40 to 68 letters) and the median VA for the least deprived decile was 60 ETDRS letters (IQR; 45 to 70 letters).

Figure 9: Box plots of baseline VA by English national deciles of social deprivation



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

Table 2: Baseline visual acuity and social deprivation for English centres, where decile 1 is the most deprived decile and decile 10 the least

		Baseline visual acuity (ETDRS letters)			
Decile of social deprivation	N	≤35	36 – 55	56 – 69	≥70
1 (most deprived)	870	17.7	32.6	25.6	24.0
2	794	21.3	29.5	26.4	22.8
3	903	18.5	30.8	28.5	22.3
4	1,051	17.1	34.6	23.7	24.5
5	1,163	17.2	32.8	27.2	22.8
6	1,293	17.2	30.1	28.8	23.9
7	1,317	17.6	30.4	27.1	24.9
8	1,378	16.1	30.6	27.8	25.5
9	1,393	15.7	30.5	28.3	25.5
10 (least deprived)	1,553	16.7	29.1	26.1	28.1
Overall	**11,715**	**17.3**	**31.0**	**27.0**	**24.7**

8.4. Key care processes

8.4.1. Starting treatment within 14 days of referral from primary care

For the 7,601 eyes with referral data, there were 1,903 (25.0%) eyes receiving their first anti-VEGF injection within 14 days, there were 997 (13.1%) eyes starting treatment within 28 days of referral and 4,701 (61.9%) eyes who started treatment more than 28 days after referral. The time between referrals varied dramatically for eyes (IQR; 14 to 658 days).

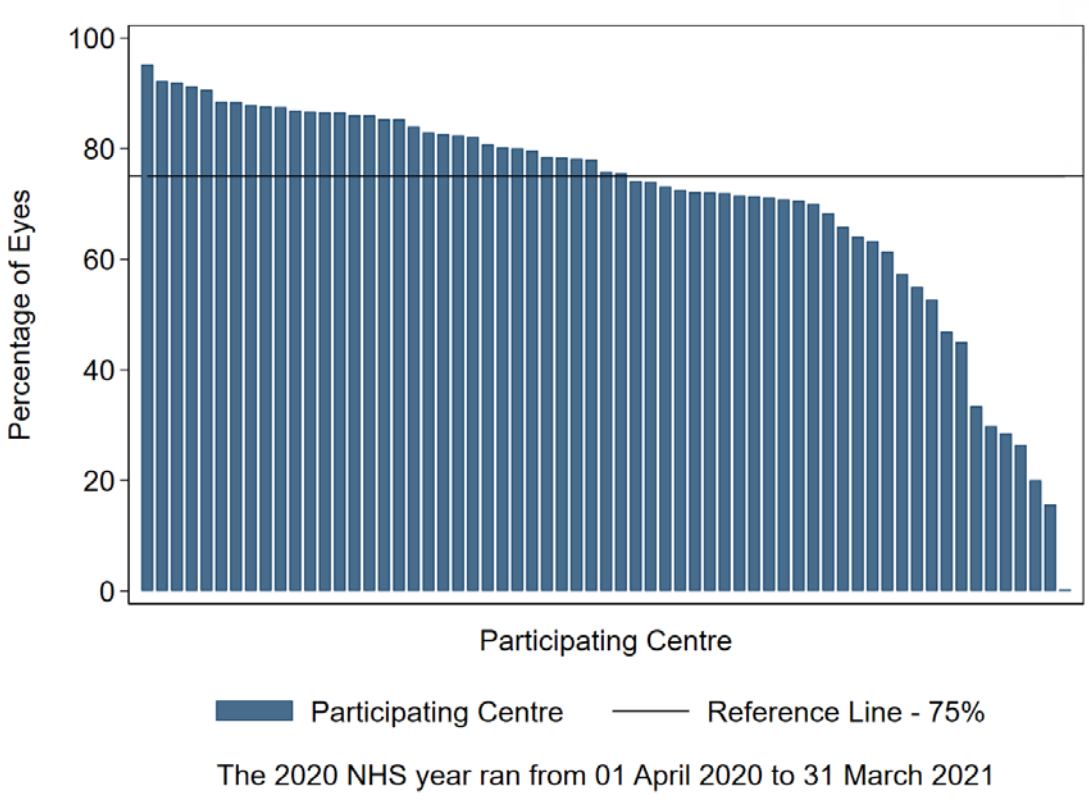
8.4.2. Completion of the initial loading phase of treatment within 10 weeks

For the 20,452 eyes that started treatment in the 2020 NHS year, 13,379 (65.4%) eyes completed the initial loading phase of three anti-VEGF injections within 10 weeks of the first injection. A further 1,623 (7.9%) eyes completed the loading phase within 10 to 12 weeks from the first injection, 1,710 (8.4%) eyes completed the loading phase within 12 to 16 weeks. There were 2,471 (12.1%) eyes who took more than 16 weeks to receive their first three anti-VEGF injections and a further 1,269 (6.2%) eyes who received fewer than three injections.

There was variation between participating centres in the percentage of eyes completing the loading phase within 10 weeks of starting treatment (range; 0.3% to 95.2%). There were nine (14.3%) centres with <50% eyes, 33 (52.4%) centres with ≥75% and one (1.6%) centre with ≥95% eyes completing the loading phase within 10 weeks, Figure 10 (page 30) and Appendix 12 (page 67).

Overall, the percentage of eyes completing the loading phase within 10 weeks was 66.9% for first treated eyes, 68.4% for second treated eyes and 53.3% for ISBIVT eyes.

Figure 10: Percentage of eyes completing loading phase within 10 weeks since starting treatment – ordered by the percentage of eyes completing the loading phase



8.5. Treatment over a year

8.5.1. Injections over a year

During the first year of treatment, 2,347 (11.5%) eyes did not complete one year of treatment and are classified as lost to follow up, with eyes being lost to follow up at different points across the first year of treatment, Figure 11 (page 31).

For the 20,452 eyes starting treatment for NvAMD in the 2020 NHS year a total of 129,066 injections were administered. The proportion of injections administered for each anti-VEGF medicine was 73.8% with aflibercept (Eylea), 23.5% with ranibizumab (Lucentis), with 2.7% bevacizumab (Avastin) and with <0.1% brolucizumab (Beovu).

For all eyes the median number of anti-VEGF injections over a year was 7.0 (IQR; 5.0 to 8.0). The minimum number of injections per eye was 1.0 and maximum 14.0. Between centres, the median value for the median number of anti-VEGF injections each centre administered ranged between 4.0 and 9.0 between the participating centre, Figure 12 (page 32).

Doctors administered 37,846 (29.3%) injections, nurses administered 75,740 (58.7%) injections, other healthcare professionals administered 7,973 (6.2%) injections, and for 7,507 (5.8%) injections, the profession of the person administering the injection was not recorded.

The rate of anti-VEGF injections given by different professions varied by centres and ranged from 0.2%-100.0% for doctors, 0.0%-99.2% for nurses, 0.0%-43.3% other healthcare professionals and 0.0%-92.4% for not recorded profession, Figure 13 (page 32) and Appendix 14 (page 73).

Figure 11: The number of eyes not lost to follow up for each 4-week block equating to a month over the first year of treatment

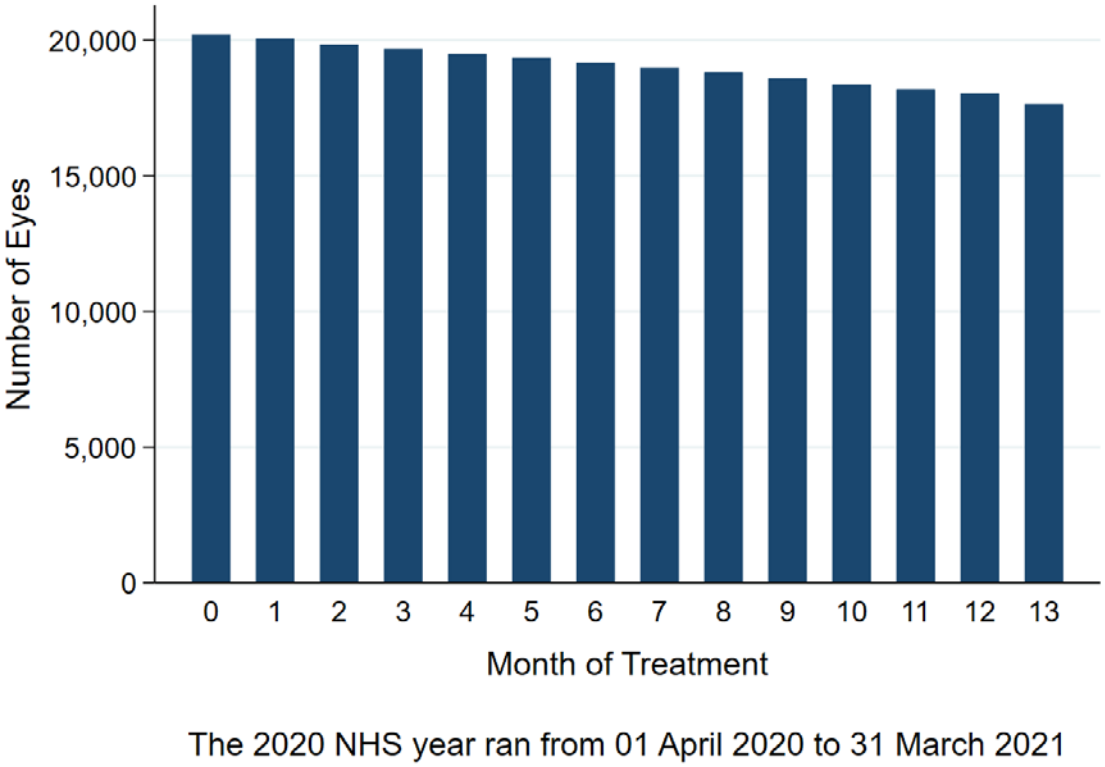


Figure 12: Median number of anti-VEGF injections over a year by participating centre

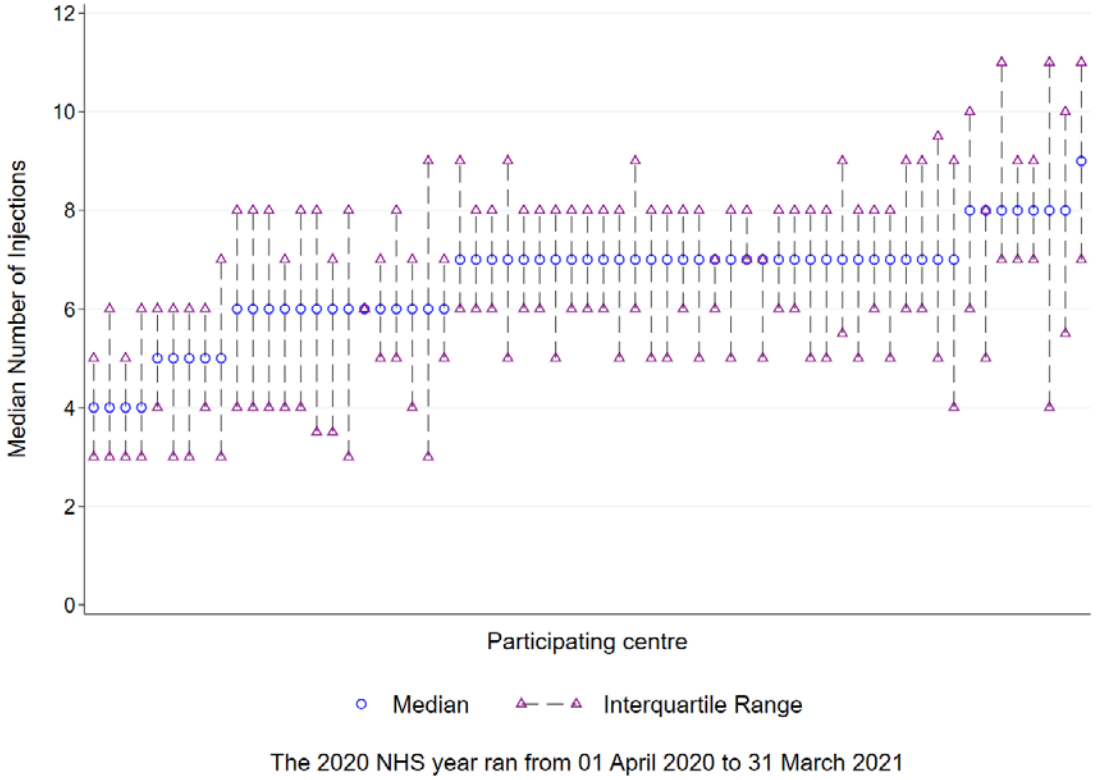
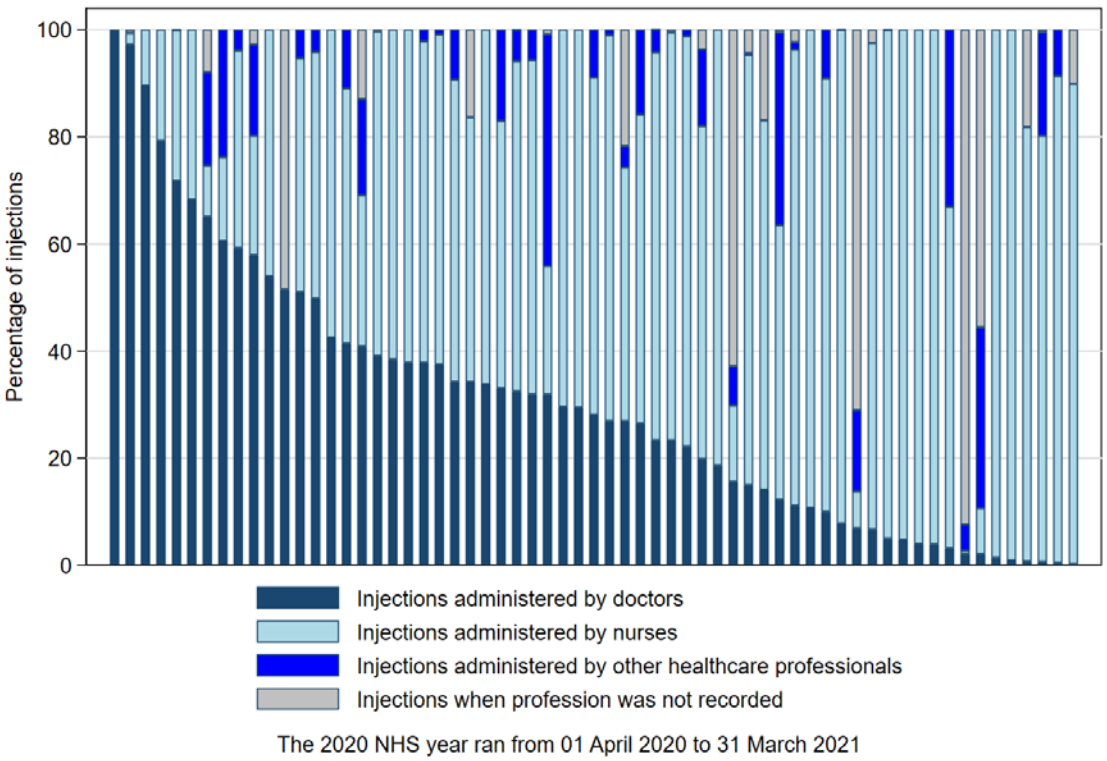


Figure 13: Percentage of anti-VEGF injections administered over a year by injector profession and participating centre



8.5.2. Visual Acuity during the first year of treatment

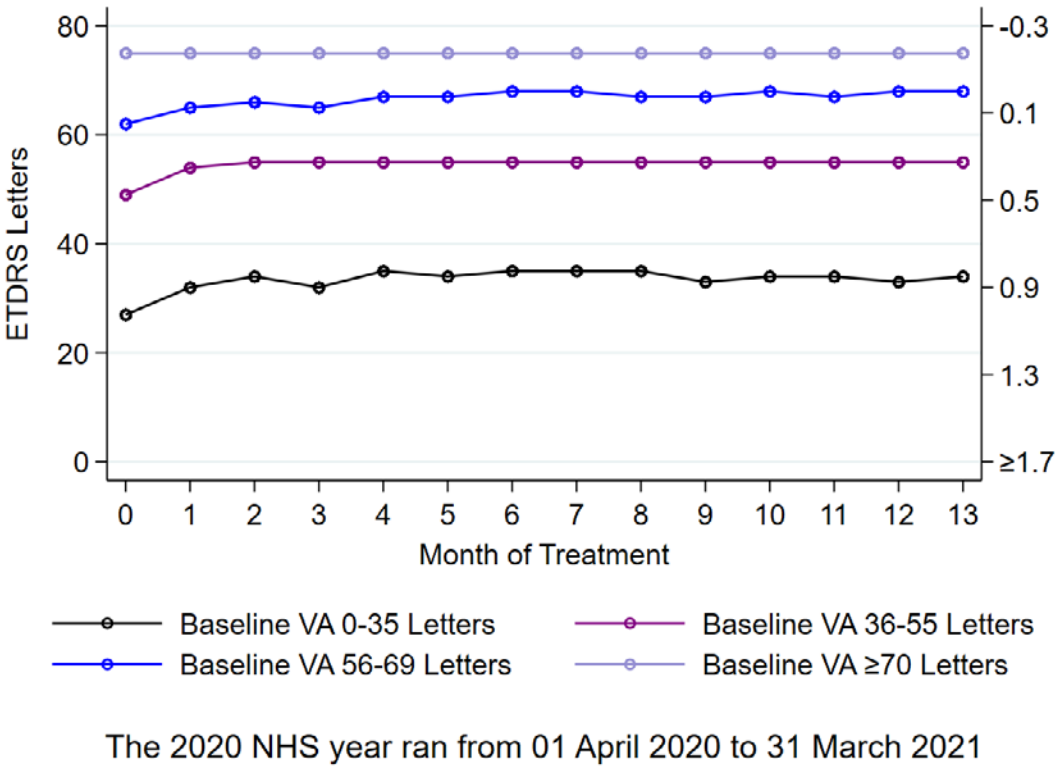
There are 18,497 eyes with 131,809 VA measurements from 63 centres included in the 'first year of treatment' analysis. Typically, the visual acuity improved during the initial loading phase of monthly treatment and then stabilised during the subsequent maintenance phase.

Eyes with "good" visual acuity at baseline (≥ 70 ETDRS letters) did not achieve improved acuity but retained a "good" visual acuity state. In contrast, eyes with "poor" visual acuity at the start of treatment (≤35 letters) typically experienced a gain in visual acuity but rarely achieved a "good" visual acuity state, Figure 14 (page 33). The starting vision tended to dictate the ability to gain vision over the year of treatment with eyes with lower VA more likely to do so, Appendix 15e-h (page 81). This highlights the importance of ensuring that local pathways for referral, assessment and initial treatment are efficient. The data may also help to inform discussions about the likely benefits of treatment in patients who present with "poor" visual acuity.

Generally, second treated eyes started treatment with better vision than first treated eye. However, all the treated eyes (first, second and ISBIVT) followed similar distribution pattern over the first year of treatment, Figures 15 (page 34). As first treated eyes tended to have worse visual acuity at the start of treatment, they had more potential to gain letters, Appendix 15d (page 80).

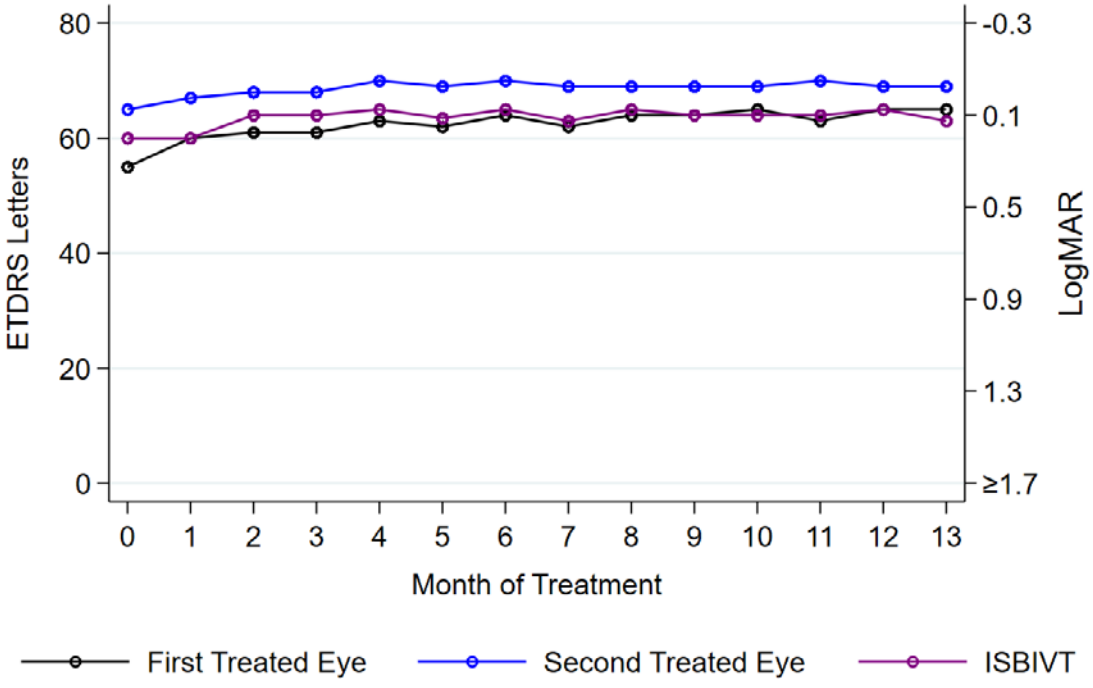
The eyes from patients older than 85 years started treatment with worse vision, however all the age groups followed similar distribution over the first year of treatment, Figures 16 (page 34). Change in vision over the year of treatment was similar for all the age groups, Appendix 15j (page 86).

Figure 14: The median VA over the first year of treatment by baseline VA



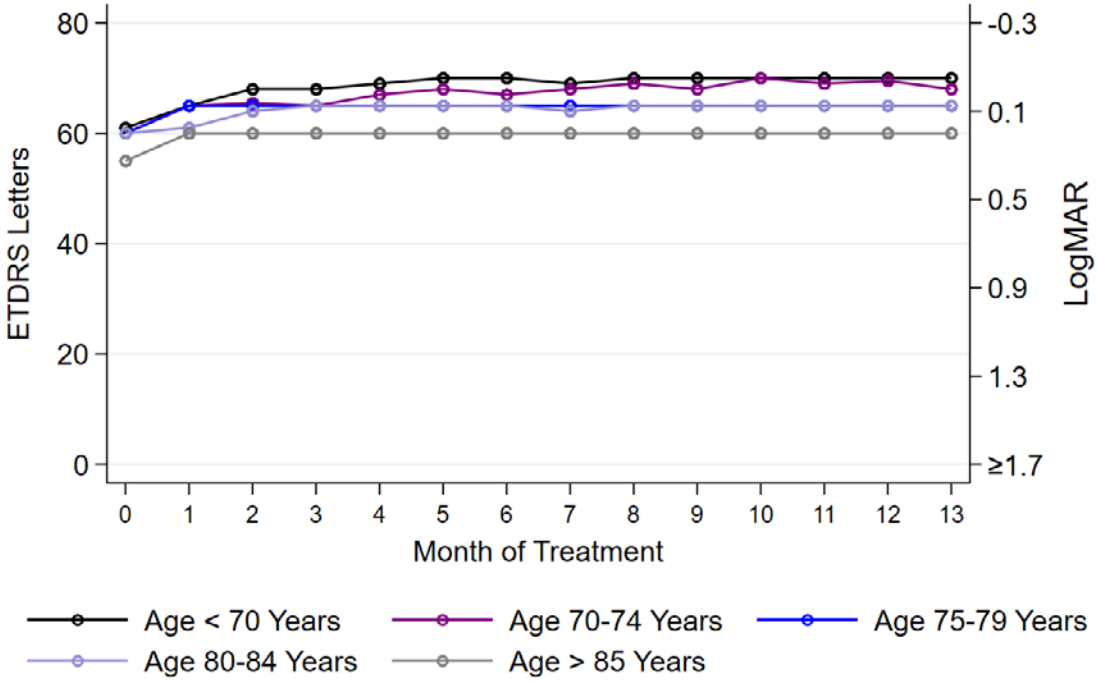
The 2020 NHS year ran from 01 April 2020 to 31 March 2021

Figure 15: The median VA over the first year of treatment by treated eye



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

Figure 16: The median VA over the first year of treatment by age



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

8.6. Outcomes at one year

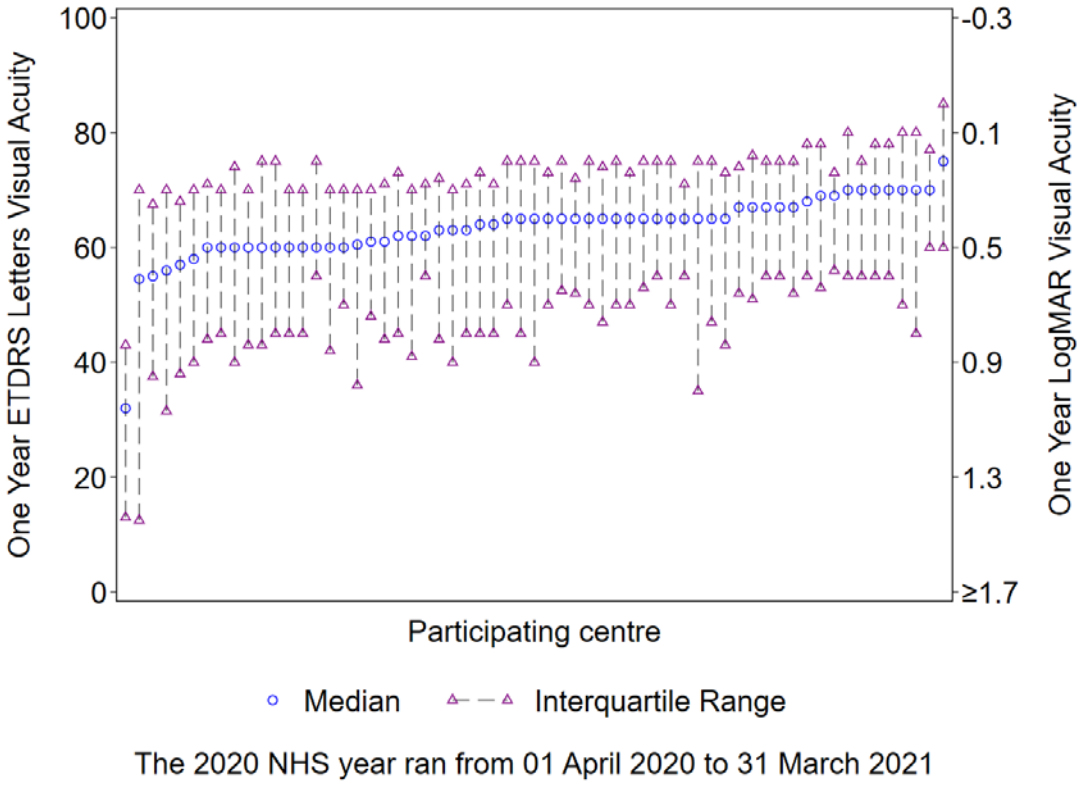
8.6.1 Visual Acuity at one year

For 16,939 eyes with VA data at one year, the median VA was 65 ETDRS letters (IQR: 47 to 75 letters). The VA at one year was ≤35 letters in 2,658 (15.7%) eyes, between 36 - 55 letters in 3,495 (20.6%) eyes, between 56 - 69 letters in 3,926 (23.2%) eyes and ≥70 letters in 6,860 (40.5%) eyes.

There was variation in the median one-year VA between contributing centres (range; 32 to 75 letters), where one (1.6%) centre had a median one-year VA of ≤35 ETDRS letters, two (3.3%) centres had a median one-year VA of 36 - 55 ETDRS letters and 50 (82.0%) centres had a median one-year VA of 56 - 69 ETDRS letters. Eight (13.1%) centres had a median one-year VA of ≥70 ETDRS letters, Figure 17 (page 35) and Appendix 10 (page 61).

Overall, VA outcomes were as expected, though data completeness remains an area for improvement and results for centres with small numbers will be subject to significant statistical uncertainty and potential bias.

Figure 17: Median and IQR visual acuity at one year for participating centre



8.6.2. Change in visual acuity

For the 15,596 eyes with valid change in VA data, the median change in VA from baseline was a 3 ETDRS letter gain (IQR; 5 letter loss to 10 letter gain). The VA change was reasonably stable between participating centres and for all centres, the median VA at one year was the same or better than the median VA at baseline Figure 18 (page 36).

Generally, treatment with anti-VEGF injections resulted in patients maintaining their baseline visual acuity or experiencing a slight improvement. A loss of ≥15 ETDRS letters (3 LogMAR lines) was experienced by 1,550 (9.9%) eyes, a loss of 6 to 14 ETDRS letters was experienced by 1,636 (10.5%) eyes. A change of ±5 ETDRS letters (±1 LogMAR line) was experienced by 6,493 (41.6%) eyes, a gain of 6 to 14 ETDRS letters by 2,938 (18.8%) eyes, and a gain of ≥15 ETDRS letters (+3 LogMAR lines) by 2,979 (19.1%) eyes, Figure 19 (page 37).

Figure 18: Median and IQR change in visual acuity from baseline to one year for participating centres – ordered by median change in visual acuity within each centre

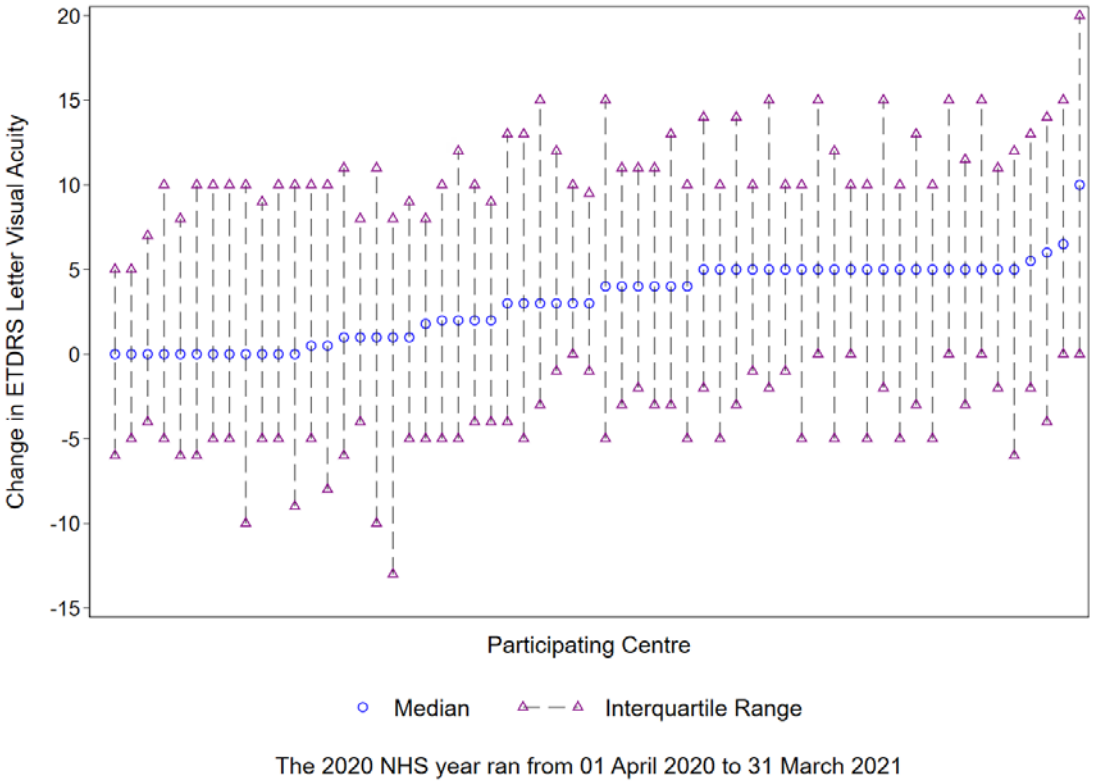
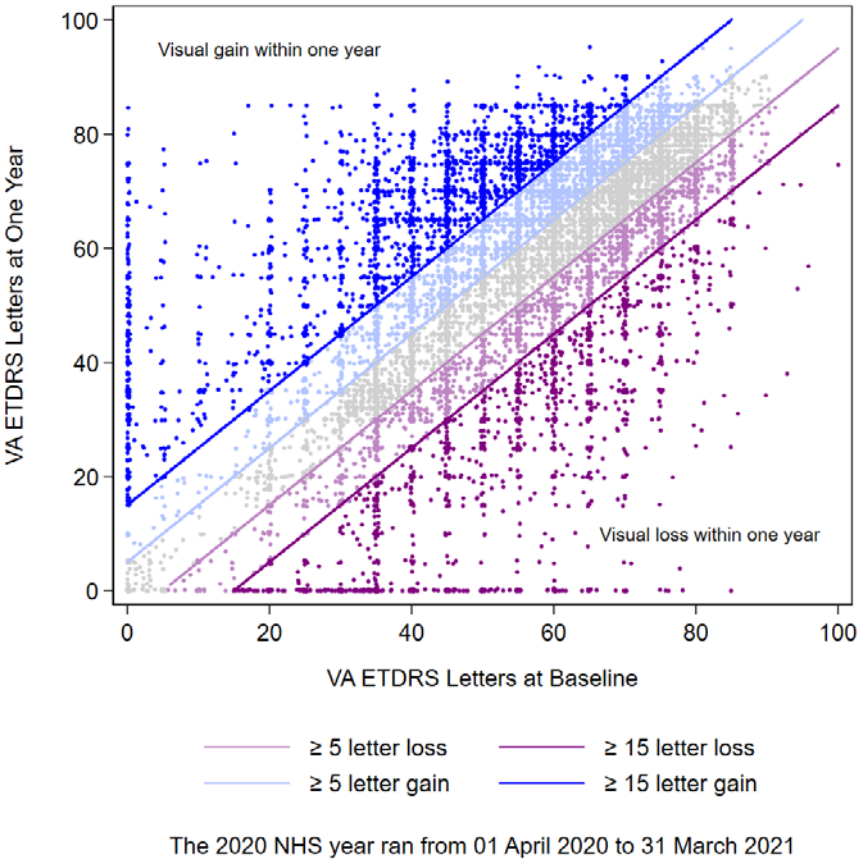


Figure 19: Visual acuity at baseline and visual acuity at one year



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

8.6.3. Good visual acuity state at 12 months

For the 15,596 eyes with both baseline and 12 month visual acuity recorded, the proportion with a good visual acuity (≥70 ETDRS letters) after the first year of treatment was 40.9%. Good visual acuity state at 12 months was more common in eyes with better levels of acuity at baseline.

The percentage of eyes with 'good' vision at one year varied between centres ranging from 6.4% to 64.9%, Appendix 13 (page 70).

For the eyes with a baseline VA of ≥70 letters, 76.5% of eyes maintained this level of vision at one year from the start of treatment. For the eyes with baseline acuity ≤35 letters, only 4.9% achieved a good visual acuity after 12 months of treatment, though almost half achieved some level of visual improvement.

For the 3,302 second treated eyes, there was a higher proportion of eyes with vision ≥70 letters at one year (47.9%) compared to first treated eyes (39.2%) and ISBIVT eyes (38.5%).

For 1,918 eyes from people aged <70 years at the start of treatment, 54.0% had 'good' vision at one year, which was higher than all other age categories. The proportion of eyes achieving vision ≥70 ETDRS letters at one year decreased for each increase in age category, Table 3 (page 38).

Table 3: The percentage of eyes with a one-year visual acuity at certain levels of ETDRS letters according to baseline visual acuity, treated eye and age category

Row %		One Year ETDRS Letter Visual Acuity			
Baseline ETDRS Visual Acuity	Number of eyes	≤35	36 – 55	56 – 69	≥70
≤35	2,352	53.6	33.4	8.1	4.9
36 – 55	4,458	11.7	43.5	25.4	19.5
56 – 69	4,291	3.2	16.0	35.2	45.7
≥70	4,495	2.5	5.1	17.2	76.5
Treated Eye					
First Eyes	10,276	13.7	24.5	22.6	39.2
Second Eyes	3,302	9.0	19.9	23.2	47.9
ISBIVT Eyes	2,018	13.2	22.8	25.5	38.5
Age Category					
<70	1,918	8.7	18.5	18.8	54.0
70 – 74	2,120	9.3	20.8	21.3	48.6
75 – 79	3,216	11.3	21.6	22.9	44.2
80 – 84	3,773	13.0	22.9	24.3	39.9
≥85	4,569	16.4	28.1	25.0	30.4
Overall	**15,596**	**12.6**	**23.3**	**23.1**	**40.9**

8.6.4. Modelling for partially adjusted visual acuity outcomes

Unadjusted and partially adjusted median change in visual acuity measurements are shown for 60 centres in Figure 20 (page 39), accounting for baseline VA and age of the patient. Differences between adjusted and unadjusted estimates are evident and indicate a need for a fully adjusted model to be created in future audit years, Figure 21 (page 39). The partial adjustment values can be seen for contributing centres in Appendix 13 (page 70).

Figure 20: Partially adjusted VA change by participating centre

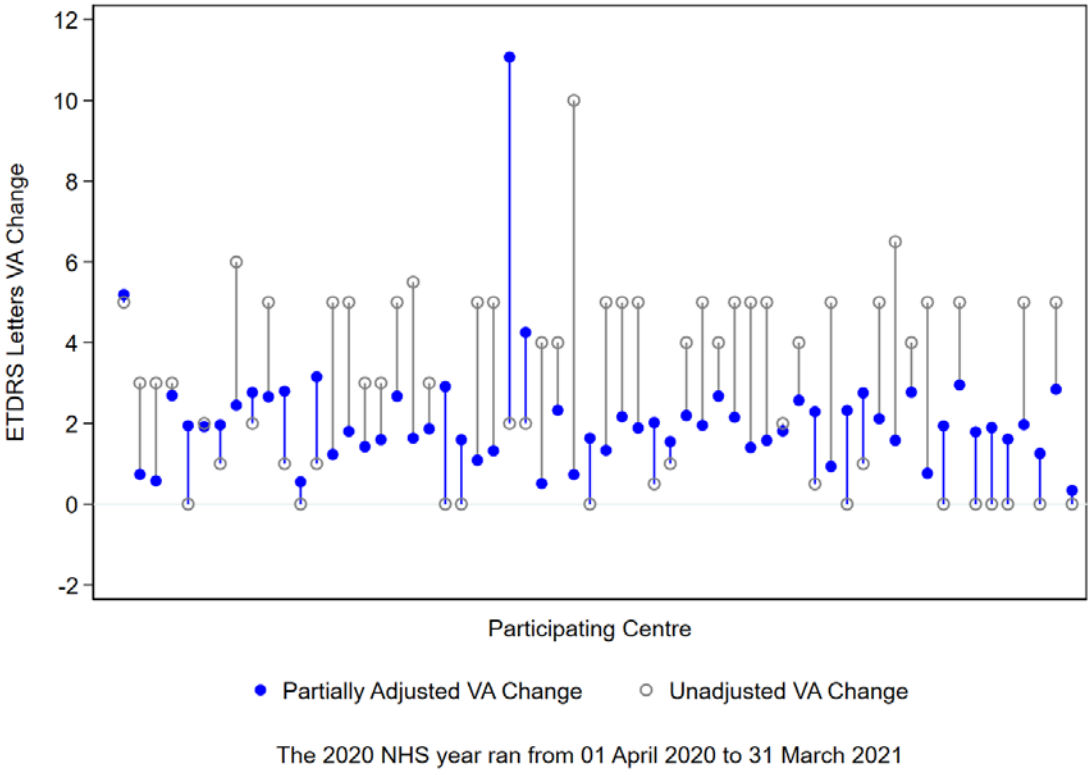
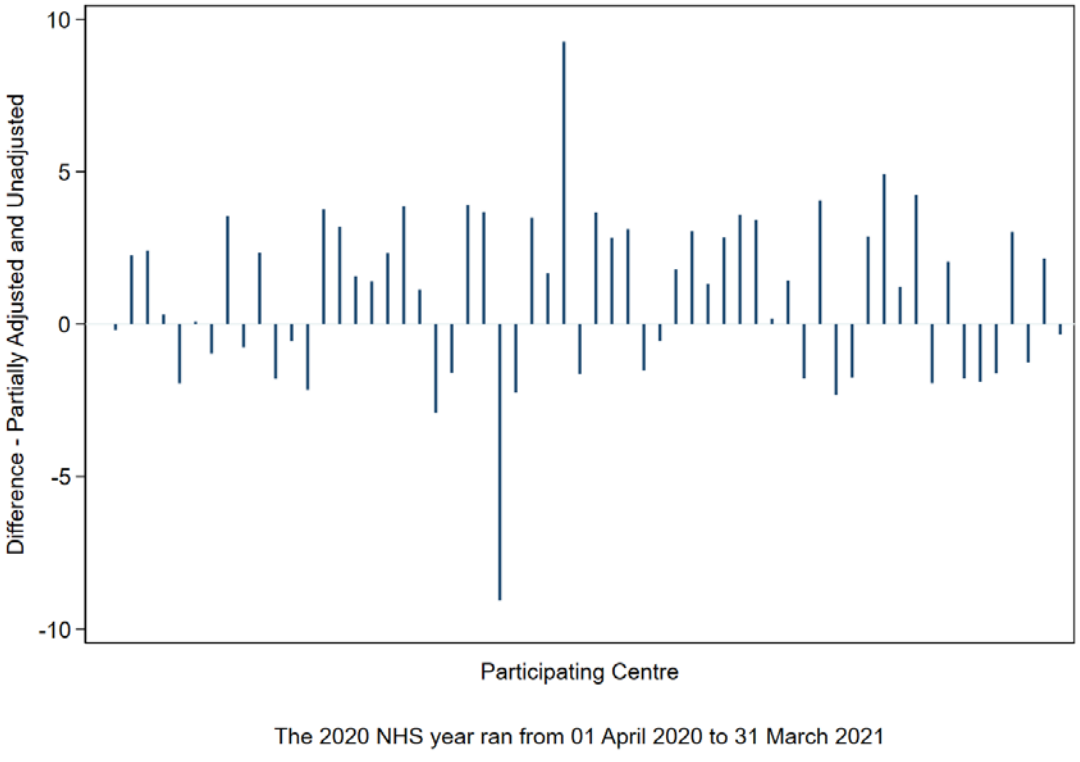


Figure 21: Partially adjusted and Crude VA change difference by participating centre



8.7. Safety outcomes: intraocular inflammation and presumed infectious endophthalmitis after intravitreal injection

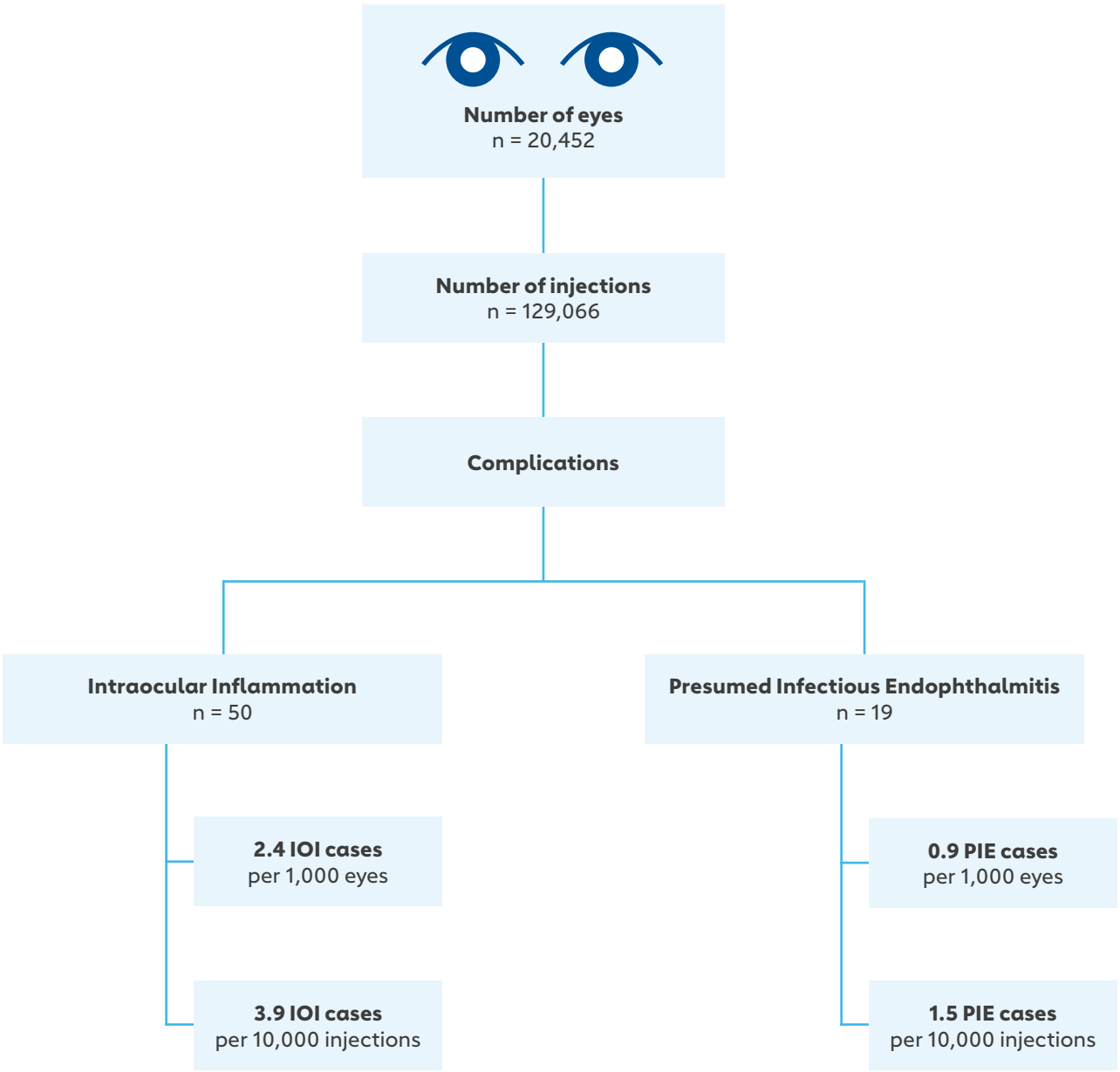
For the 20,452 eyes starting treatment in the 2020 NHS year receiving 129,066 injections, there were 50 cases of intraocular inflammation (IOI) in 46 eyes belonging to 44 patients. This gives a rate of 2.4 IOI cases per 1,000 eyes per year and 3.9 IOI cases per 10,000 injections. Of 63 centres, 37(58.7%) centres had zero cases of IOI. There were 26 centres who had at least one case of IOI (range; 1 to 5 cases) and three centres with ≥4 cases of IOI. For the 20,452 eyes starting treatment in the 2020 NHS year there were 19 cases of presumed infectious endophthalmitis (PIE) from 19 eyes belonging to 19 patients. This gives a rate of 0.9 endophthalmitis cases per 1,000 eyes per year of treatment and 1.5 PIE cases per 10,000 injections. Of 63 centres, 51 (81.0%) centres had zero cases of PIE. There were 12 centres who had at least one case of PIE (range; 1 to 4 cases) and two centres with ≥3 cases of PIE, Figure 22 (page 41).

8.8. Concomitant ocular diseases

For the 20,452 eyes eligible for analysis, another ocular co-pathology was recorded for 8,079 (39.5%) of eyes. The most frequently recorded concomitant ocular diseases were the presence of other macular pathology, diabetic retinopathy, other retinal vascular pathology and glaucoma which were recorded for 7.9%, 6.6%, 5.6% and 4.6% of eyes, respectively, Appendix 16 (page 87).

For 7,848 (38.4%) eyes cataract surgery had been performed before they started treatment for NvAMD. For 5,037 (24.6%) eyes cataract surgery was performed during the first year of treatment for NvAMD, and for 7,567 (37.0%) eyes there was no record of cataract surgery prior to or during treatment for NvAMD.

Figure 22: Flow chart of safety outcomes over the first year for eyes starting treatment in the 2020 NHS year

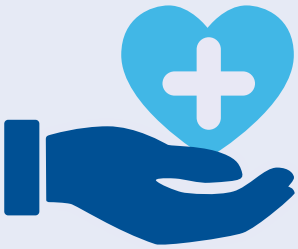


9. Recommendations

9.1 Recommendations for Patients

- Patients, carers and those with an interest in macular degeneration treatment are encouraged to access information about the pathways and outcomes of treatment at their local providers and to view the information online at the National Ophthalmology Database Audit website
- Patients and carers should discuss the expected benefits and risks of treatment for "wet" AMD with their local treatment provider and ask about the expected outcome of treatment for eyes with certain levels of vision at the start of treatment
- Patients and carers whose local AMD treatment provider is not participating in the NOD AMD Audit should encourage the clinical staff to participate and ask for information on how local care pathways and outcomes compare to national benchmarks
- Patients interested in finding out more about macular degeneration, treatments and patient support should access further information online or by phone. The Macular Society and the Royal National Institute of Blind People provide both information and support

9.2 Recommendations for Providers of Treatment of Neovascular AMD

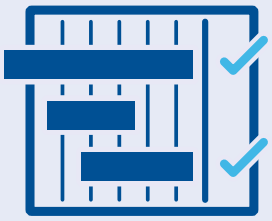


- All providers of NHS-funded treatment for neovascular AMD are encouraged to demonstrate commitment to high quality care and good professional practice through participation in the NOD AMD Audit
- In line with the NHS digital agenda, providers should use electronic data collection to improve data completeness and utilise EMR audit tools for continuous real time monitoring of results for early detection and correction of possible issues
- Providers should use the NOD AMD Audit for quality improvement by comparing local results against those from peers, either locally regionally or nationally and to act on specific areas of the care pathway that may need improvement
- Clinical staff working in non-participating centres should approach their senior management teams and emphasise the importance of participation, pointing out the benefits in terms of quality assurance, quality improvement, accountability, public perception and validation to commissioners of the service being provided
- Data quality for the NOD AMD Audit is an issue, especially recording of referral information, visual acuity and planned follow-up. Providers may need

to liaise with their EMR providers to customise the local EMR and enable mandatory recording of specific items of data and to inform local colleagues of any changes intended to improve data quality

- Real-world outcomes from the AMD Audit should be used to help patients and their carers make an informed choice about the likely impact of treatment, particularly in eyes with "poor" baseline visual acuity

9.3 Recommendations for Commissioners



- Service specification contracts should require quality assurance and improvement and submission of full data to the NOD AMD Audit
- Where AMD treatment is provided by a number of different organisations within an Integrated Care Board, commissioners are encouraged to facilitate a review of care pathways and outcomes across the different providers and to adopt best practice
- Visual acuity outcomes that take account of difference in baseline characteristics may be most useful indicators of a good clinical service
- Eyes with better vision at the start of treatment typically have better vision after the first year of treatment, highlighting the need for prompt referral from primary care and early assessment, diagnosis and treatment by providers of secondary care

9.4 Recommendations for the Regulators

- Regulators should expect all providers of NHS-funded treatment to participate in all national audits, with NOD Audit results made available to them when inspecting organisations that either commission or provide treatment for neovascular age-related macular degeneration
- Regulators should encourage the collection of real-world data into electronic medical records as part of routine clinical care

10. Conclusions

- The first report of the NOD AMD Audit provides assurance that delivery of NHS-funded treatment for NvAMD is of good quality overall
- Participation in the first data extraction included providers of treatment in all four nations and the Channel Islands, both NHS Trust and independent sector treatment centres
- Regular treatment over the initial 12 months helped ensure that most eyes avoided a "significant" decrease in vision and 20% of eyes experienced a "significant" increase in visual acuity
- Data quality, baseline visual acuity, care processes and treatment outcomes showed variation between treatment providers
- The relative contributions of baseline characteristics and key clinical care processes to visual acuity outcomes after the first year of treatment and beyond is not yet known
- Treatment for NvAMD continued during the first year of the COVID-19 pandemic but the associated service disruption on diagnosis and treatment of eyes with a new diagnosis in the year 2020/21 is also unknown

11. Future of the audit

- The second data extraction, planned for May 2023, is expected to include data from a greater number of participating centres, especially given the national EMR roll-out in Northern Ireland, Scotland and Wales. The second extraction aims to report 12-month outcomes for eyes starting treatment in the 2021 NHS year, and 24-month outcomes for eyes starting treatment in the 2020 NHS year
- A model to allow for full adjustment of visual acuity outcomes will be developed. The aim is to create a model using the data submitted in 2023, which could help to identify the clinical care processes that are key to achieving the best outcomes
- The RCOphth NOD project delivery team will continue to engage with EMR providers to improve data quality through the addition of missing data fields and by enabling mandatory key fields at centres where data quality is poor
- Definitions used for time windows for an eligible baseline VA, completion of the loading phase and eligible VA at one year will be reviewed once more centres are participating and services return to a more standard setting after COVID-19 recovery. Similarly, the minimum number of eyes required for a result to be produced will be reviewed

12. Acknowledgements

We would like to acknowledge the support and guidance we have received from the RCOphth NOD AMD Audit Advisory Group members, the NOD Steering Group members, the RCOphth Executive Committee, Informatics and Audit Subcommittee and the Lay Advisory Group. Their guidance has helped us to ensure that the Audit has relevance for not only the professional readership but also patients, their relatives and carers. We thank all the members for reviewing this report.

We also acknowledge the support of all the NHS Trusts and ISTCS participating in the audit and thank our medical and non-medical colleagues for the considerable time and effort devoted to conscientious electronic data collection as they go about caring for their patients. All participating centres are acknowledged in Appendix 2 (page 48).

It is with deep regret that we note the death of our friend and colleague Robert Johnston, who sadly died in September 2016. Without his inspirational vision, determination and career long commitment to quality improvement in ophthalmology this work would not have been possible.

13. Funding

The RCOphth NOD Age-related Macular Degeneration (AMD) Audit is currently funded by the Macular Society, Novartis, Roche and Bayer. The project has been supported by an unrestricted, hands-off grant provided by Bayer plc. Bayer has had no involvement in the development, implementation or outputs of the project. The National Ophthalmology Database Age-related Macular Degeneration audit commenced in April 2021 and is an ongoing initiative. Novartis has been proud to sponsor the Age-related Macular Degeneration audit between its commencement until the end of December 2022. We are grateful for the donations received from these organisations.

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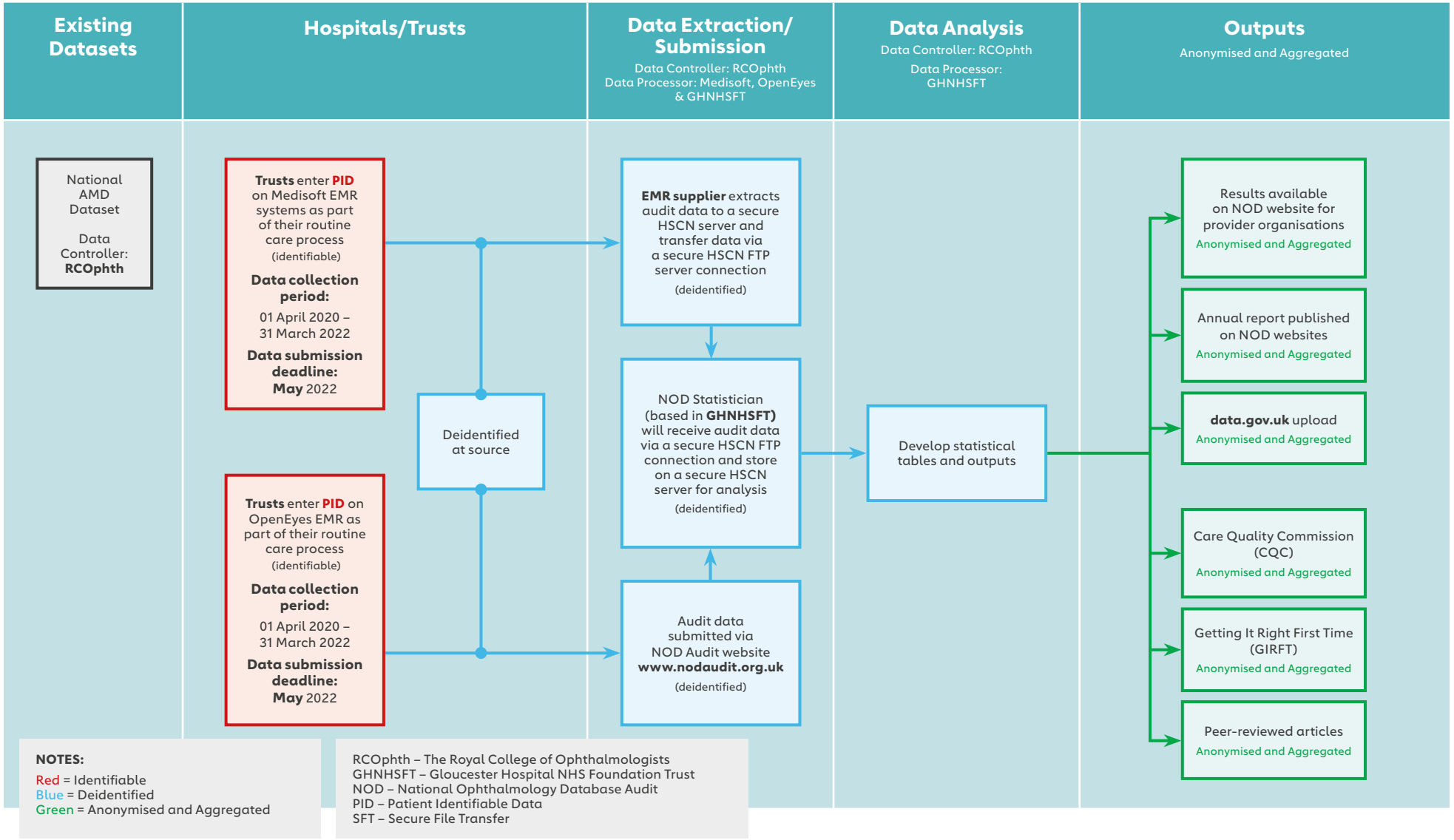
Appendix 1: Data Flow

National Ophthalmology Database AMD Audit – Data Flow



Appendix 2: Participating AMD treatment providers

Category	Organisation name	EMR	Notes
Centres included in the Year 1 report	Barking, Havering and Redbridge University Hospitals NHS Trust	Medisoft	
	Barts Health NHS Trust	Medisoft	
	Belfast Health and Social Care Trust	Medisoft	
	Bradford Teaching Hospitals NHS Foundation Trust	Medisoft	
	Calderdale and Huddersfield NHS Foundation Trust	Medisoft	
	Chesterfield Royal Hospital NHS Foundation Trust	Medisoft	
	County Durham and Darlington NHS Foundation Trust	Medisoft	
	East Cheshire NHS Trust	Medisoft	
	East Sussex Healthcare NHS Trust	Medisoft	
	Epsom and St Helier University Hospitals NHS Trust	Medisoft	
	Gloucestershire Hospitals NHS Foundation Trust	Medisoft	
	Great Western Hospitals NHS Foundation Trust	Medisoft	
	Guy's and St Thomas' NHS Foundation Trust	OpenEyes	
	Harrogate and District NHS Foundation Trust	Medisoft	
	Hull University Teaching Hospitals NHS Trust	Medisoft	
	Hywel Dda University Local Health Board	Medisoft	
	Isle of Wight NHS Trust	Medisoft	
	Kettering General Hospital NHS Foundation Trust	Medisoft	
	King's College Hospital NHS Foundation Trust	Medisoft	
	Kingston Hospital NHS Foundation Trust	OpenEyes	This centre submitted data only for patients starting treatment after the 2020 NHS year
	Leeds Teaching Hospitals NHS Trust	Medisoft	
	Liverpool University Hospitals NHS Foundation Trust	Medisoft	
	London North West University Healthcare NHS Trust	Medisoft	This centre submitted data for <25 eligible eyes in the 2020 NHS year
	Manchester University NHS Foundation Trust	Medisoft	
	Medical specialists group Guernsey	Medisoft	
	Mid and South Essex NHS Foundation Trust	Medisoft	
	Mid Cheshire Hospitals NHS Foundation Trust	Medisoft	
	Moorfields Eye Centre at Bedfordshire Hospitals NHS Foundation Trust	Medisoft	
	Moorfields Eye Hospital NHS Foundation Trust	Medisoft and OpenEyes	
	NHS Grampian	Medisoft	
	NHS Tayside	Medisoft	
	North Middlesex University Hospital NHS Trust	Medisoft	
	North West Anglia NHS Foundation Trust	Medisoft	
	Northern Care Alliance NHS Foundation Trust	OpenEyes	
	Optegra Eye Health Care (Birmingham Eye Hospital)	Medisoft	This centre submitted data for <25 eligible eyes in the 2020 NHS year
	Optegra Eye Health Care (Central London Eye Hospital)	Medisoft	This centre submitted data for <25 eligible eyes in the 2020 NHS year

Appendix 2 table continued: Participating AMD treatment providers in England, Northern Ireland, Scotland, Wales and Guernsey

Category	Organisation name	EMR	Notes
	Optegra Eye Health Care (Hampshire Eye Hospital)	Medisoft	This centre submitted data for <25 eligible eyes in the 2020 NHS year
	Optegra Eye Health Care (Manchester Eye Hospital)	Medisoft	
	Optegra Eye Health Care (North London Eye Hospital)	Medisoft	This centre submitted data for <25 eligible eyes in the 2020 NHS year
	Optegra Eye Health Care (Surrey Eye Hospital)	Medisoft	This centre submitted data for <25 eligible eyes in the 2020 NHS year
	Optegra Eye Health Care (Yorkshire Eye Hospital)	Medisoft	
	Oxford University Hospitals NHS Foundation Trust	Medisoft	
	Practice Plus Group Hospital, Southampton	Medisoft	This centre submitted data only for patients starting treatment after the 2020 NHS year
	Practice Plus Group Ophthalmology, Rochdale	Medisoft	
	Practice Plus Group Surgical Centre, Gillingham	Medisoft	
	Royal Berkshire NHS Foundation Trust	Medisoft	
	Royal Cornwall Hospitals NHS Trust	Medisoft	
	Royal Devon University Healthcare NHS Foundation Trust	Medisoft	
	Royal Free London NHS Foundation Trust	Medisoft	
	Royal United Hospitals Bath NHS Foundation Trust	Medisoft	
	Salisbury NHS Foundation Trust	Medisoft	
	Somerset NHS Foundation Trust	Medisoft	
	South Warwickshire University NHS Foundation Trust	Medisoft	
	SpaMedica – Birmingham	Medisoft	
	SpaMedica – Chelmsford	Medisoft	This centre submitted data only for patients starting treatment after the 2020 NHS year
	SpaMedica – Coventry	Medisoft	
	SpaMedica – Manchester	Medisoft	
	SpaMedica – Newark	Medisoft	This centre submitted data only for patients starting treatment after the 2020 NHS year
	SpaMedica – Newcastle Under Lyme	Medisoft	This centre submitted data for <25 eligible eyes in the 2020 NHS year
	SpaMedica – Romford	Medisoft	This centre submitted data only for patients starting treatment after the 2020 NHS year
	SpaMedica – West Lancashire	Medisoft	
	Surrey and Sussex Healthcare NHS Trust	Medisoft	
	The Hillingdon Hospitals NHS Foundation Trust	Medisoft	
	The Mid Yorkshire Hospitals NHS Trust	Medisoft	
	The Newcastle upon Tyne Hospitals NHS Foundation Trust	Medisoft	
	The Princess Alexandra Hospital NHS Trust	Medisoft	
	University Hospital Southampton NHS Foundation Trust	Medisoft	
	University Hospitals Birmingham NHS Foundation Trust	Medisoft	
	University Hospitals Bristol and Weston NHS Foundation Trust	Medisoft	
	Warrington and Halton Teaching Hospitals NHS Foundation Trust	Medisoft	

Appendix 2 table continued: Participating AMD treatment providers in England, Northern Ireland, Scotland, Wales and Guernsey

Category	Organisation name	EMR	Notes
	West Suffolk NHS Foundation Trust	OpenEyes	
	Western Health and Social Care Trust	Medisoft	
	Wirral University Teaching Hospital NHS Foundation Trust	Medisoft	
	Wrightington, Wigan and Leigh NHS Foundation Trust	Medisoft	
	Yeovil District Hospital NHS Foundation Trust	Medisoft	

Appendix 3: Interpreting the graphs

Among the results there are seven types of graphs;

1. Bar charts – These are either horizontally or vertically aligned depending on the data being plotted. One axis displays the categorical element, usually contributing centre and when bar charts are sub-divided by another category, the length of each bar indicates the quantity of interest for the sub-category as read from the numeric axis. Some vertically aligned bar charts have horizontal dashed reference lines at specific points on the y-axis, these relate to cut-off points used in the reporting of results, for example 75%. Each bar chart is ordered (sorted) by a quantity being plotted, i.e. percentage. Figure 2 (page 19) is an example of a bar chart.

2. Box and Whisker plots – The spread for the variable of interest is shown where the central line is the median or 'middle' value. The box outlines the inter quartile range (25% and 75% centiles), and the horizontal lines above and below the inter quartile range display either the position of the furthest value or a value at a 'reasonable' stretch from the middle. Extreme values are the dots beyond that (known as outliers). Figure 9 (page 28) is an example of a Box and Whisker plot.

3. Median and IQR plots – These display for each contributing centre, the median and IQR for a numeric quantity as read from the vertical axis. These estimates indicate variation between centres and when not including the range, these graphs allow magnification on the y-axis and a clearer view of the distribution of the median and IQR across contributing centres. Each of these graphs are ordered (sorted) by a quantity being plotted, i.e. the median. Figure 7 (page 26) is an example of a Median and IQR graph.

4. Scatter plots – The display data for two quantitative variables or quantitative variables at two time points. Figure 19 (page 37) is an example of a scatter plot.

5. Kaplan-Meier curves – These are a graphical representation of a time to event (often survival or failure). They display the probability of surviving or failing up until a given time. In this report lost to follow up is considered as the failure and remaining under follow up as the survival. Figure 3 (page 20) is an example of a Kaplan-Meier curve where the event is loss to follow up.

6. Median over time graphs – These display the median value of a quantitative variable at each specified time point, for example visual acuity. Different groups can be displayed with the median for each group at each specified time point plotted and joined with a line to show the trend over time. Figure 14 (page 33) is an example of a Median over time graph.

7. Difference after partial adjustment graphs – These display the difference between unadjusted and adjusted outcome measures and read on the y axis. These estimates demonstrate the difference between the observed values and the expected values based on different factors. Figure 20 (page 39) is an example of a difference after partial adjustment plot. Figure 21 (page 39) is also an example of this, while centred around zero.

Appendix 4: RCOphth NOD centre number

Appendix tables with results for named centres;

On all tables that display results for contributing centres, the centres are ordered by the number allocated to them in the RCOphth NOD database, where a number is created for a centre in the first RCOphth NOD audit year they submit sufficient data to report in either the cataract or AMD annual reports. This numbering system allows a reader to see which RCOphth NOD audit year a centre first had sufficient data to report.

For contributing centres that have participated in the National Cataract Audit they already have an RCOphth NOD annual report centre number, this applies to all centre numbers from 1 to 160, where:

Centres 1 – 56 are the centres that were included in the first Cataract audit year report, where centre 1 had the most operations and centre 56 the fewest. Centres 57 – 87 are the centres first appearing in the second Cataract audit year report, where centre 57 had the most operations and centre 87 the fewest. Centres 88 – 108 are the centres first appearing in the third Cataract audit year report, where centre 88 had the most operations and centre 108 the fewest. Centres 109 – 122 are the centres first appearing in the fourth Cataract audit year report, where centre 109 has the most operations and centre 122 the fewest. Centres 124 – 159 are the centres first appearing in the fifth Cataract audit year, where centre 124 has the most operations and centre 159 the fewest. Centre 160 is the centre first contributing data in Cataract audit year 5 with data for historic time periods, and no results for the fifth Cataract audit year due to <50 eligible operations for the 2020 NHS year. This number is equivalent to a ranking within the Audit year of first submission, based on the total number of eligible operations contributed by each centre, where the lowest number is allocated to the centre with the most operations.

Centres 161 to 188 are the centres who will first appear in the sixth Cataract audit year. Centres 189 to 205 are centres that have not appeared in any Cataract audit year report whose first submission is for the AMD audit year one report with data for at least 25 eligible eyes.

On tables that include equivalent results for previous NHS years, the centres who have a result for an NHS year before they first contributed sufficient data are the centres who have submitted historic data for time periods before the first audit year they contributed to. Some centre numbers have become redundant due to mergers of NHS Trusts or one NHS Trust taking over the ophthalmology service in another NHS Trust and some centres have contributed data to an audit year and not done so in subsequent audit years.

Appendix 5: Glossary

Abbreviation	Description
AMD	Age-related Macular Degeneration
Anti-VEGF	Drug blocking the action of vascular endothelial growth factor
CF	Count Fingers – a measure of visual acuity
CI	Confidence Interval
CNS	Central Nervous System
COVID-19	Coronavirus Disease 2019
EMR	Electronic Medical Record
ETDRS	The Early Treatment Diabetic Retinopathy Study
HM	Hand Movements – a measure of visual acuity
HQIP	Healthcare Quality Improvement Partnership
IMD	Index of Multiple Deprivation
IOI	Intraocular Inflammation
IQR	Inter Quartile Range
ISCIVT	Immediate Sequential Bilateral Intravitreal Treatment
LogMAR	Logarithm of the Minimum Angle of Resolution
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NOD	National Ophthalmology Database
NPL	No perception of light – a measure of visual acuity
NvAMD	Neovascular Age-related Macular Degeneration
OCT	Optical Coherence Tomography
PAS	Patient Administration System
PIE	Presumed Infectious Endophthalmitis
PHVA	Pin hole visual acuity – The pinhole is an eye shield with several small holes which allow light rays to reach the retina without the interference of optical problems of the eye. It is used to test visual acuity.
PL	Perception of light – a measure of visual acuity
PREMs	Patient recorded experience measures
RCOphth	The Royal College of Ophthalmologists
UDVA	Uncorrected Distance Visual Acuity

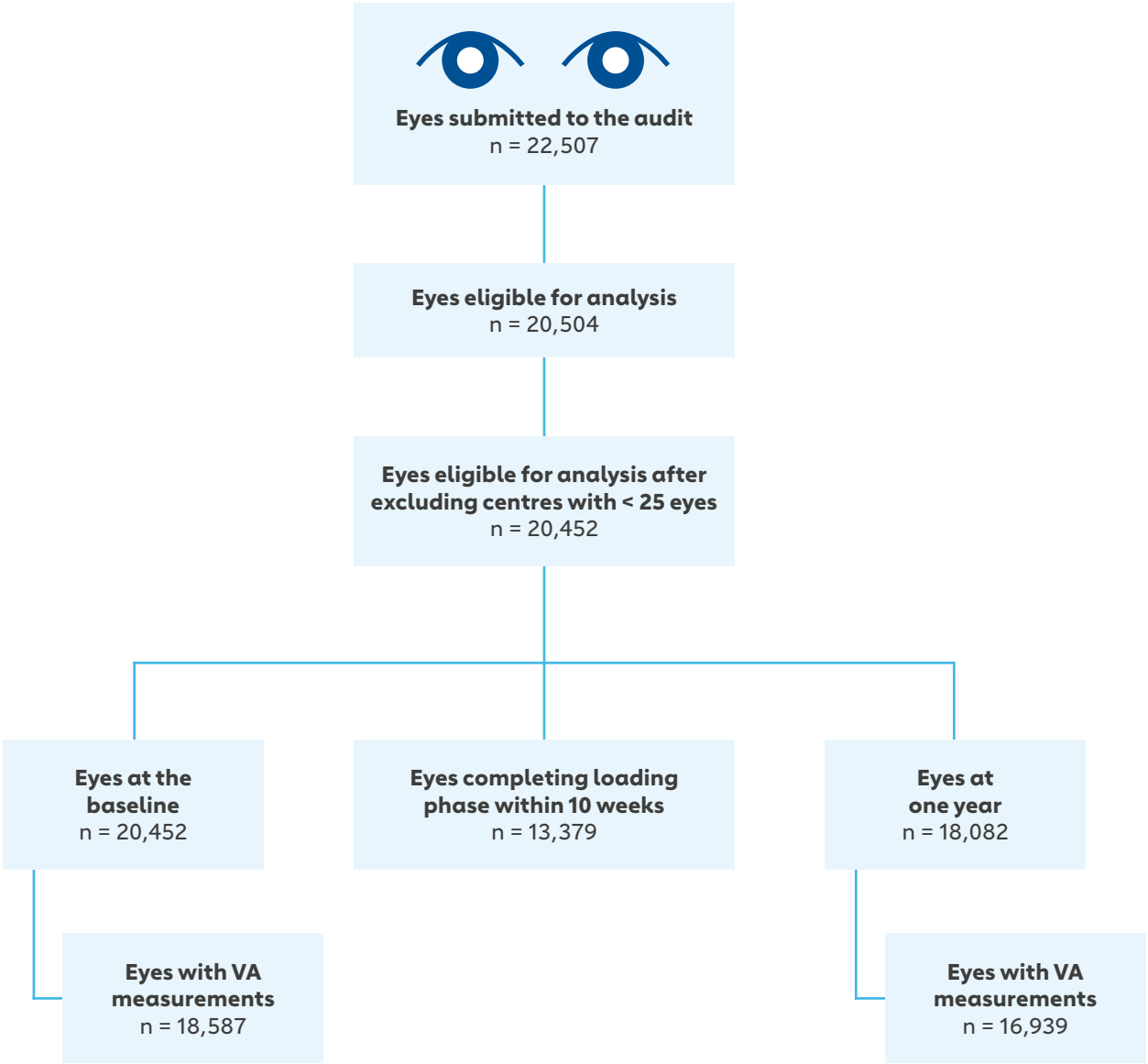
Appendix 5 continued: Glossary

Abbreviation	Description
UK	United Kingdom
VA	Visual acuity is traditionally measured by the ability to distinguish letters or numbers at a given distance according to a fixed standard. We have reported VA using ETDRS letters. A "normal" ETDRS letter visual acuity would be 85 ETDRS letters and the number increases as vision improves. 70 ETDRS letters would be at the boundary for driving a car and is described here as 'good' vision. 35 ETDRS letters would be at the level of registrable severe sight impairment.
VEGF	Vascular Endothelial Growth Factor
WHO	World Health Organisation

Appendix 6: Conversions between ETDRS Letters, LogMAR and approximate Snellen equivalent

EDTRS Letters	LogMAR Value	Snellen	VA Interpretation
100	-0.30	6/3	"Good" VA
95	-0.20	6/3.75	
90	-0.10	6/5	
85	0.00	6/6	
80	0.10	6/7.5	
75	0.20	6/9	
70	0.30	6/12	
65	0.40	6/15	
60	0.50	6/18	
55	0.60	6/24	
50	0.70	6/30	
45	0.80	6/36	
40	0.90	6/48	
35	1.00	6/60	"Poor" VA
30	1.10	5/60 or 6/76	
25	1.20	4/60 or 6/96	
20	1.30	3/60 or 6/120	
15	1.40	6/152	
10	1.50	6/192	
5	1.60		
0	1.70		

Appendix 7: The number of eyes at different stages of analysis



Appendix 8: The number of eligible eyes and the number of injections administered

Centre name	Centre number	Date of First Injection during the Audit period	Number of Eligible Eyes	Number of patients	Number of injections administered	Median number of Injections
Moorfields Eye Hospital NHS Foundation Trust	1	01-Apr-20	1,287	1,170	9,260	7.0
The Newcastle upon Tyne Hospitals NHS Foundation Trust	2	06-Apr-20	655	603	4,243	7.0
Leeds Teaching Hospitals NHS Trust	4	06-Apr-20	335	308	2,170	7.0
Oxford University Hospitals NHS Foundation Trust	6	02-Apr-20	348	325	2,362	7.0
University Hospitals Bristol and Weston NHS Foundation Trust	7	03-Apr-20	526	489	3,398	7.0
Gloucestershire Hospitals NHS Foundation Trust	8	01-Apr-20	403	374	3,099	8.0
University Hospital Southampton NHS Foundation Trust	11	02-Apr-20	412	382	2,811	7.0
Royal Berkshire NHS Foundation Trust	12	01-Apr-20	407	375	2,713	7.0
Calderdale and Huddersfield NHS Foundation Trust	13	01-Apr-20	297	278	1,972	7.0
Mid Cheshire Hospitals NHS Foundation Trust	14	21-Apr-20	179	172	1,176	7.0
The Mid Yorkshire Hospitals NHS Trust	15	01-Apr-20	307	283	2,164	7.0
Epsom and St Helier University Hospitals NHS Trust	17	07-Apr-20	223	216	1,353	7.0
Barts Health NHS Trust	18	24-Apr-20	144	135	902	7.0
Bradford Teaching Hospitals NHS Foundation Trust	20	03-Apr-20	176	157	1,081	6.0
Moorfields Eye Centre at Bedfordshire Hospitals NHS Foundation Trust	21	02-Apr-20	167	156	1,059	7.0
University Hospitals Birmingham NHS Foundation Trust	23	01-Apr-20	341	306	2,400	7.0
Royal Cornwall Hospitals NHS Trust	25	02-Apr-20	348	320	2,345	7.0
Manchester University NHS Foundation Trust	26	01-Apr-20	537	498	3,781	7.0
King's College Hospital NHS Foundation Trust	27	03-Apr-20	559	500	3,091	6.0
The Hillingdon Hospitals NHS Foundation Trust	30	07-Apr-20	114	99	854	7.0
Liverpool University Hospitals NHS Foundation Trust	31	02-Apr-20	578	533	3,403	6.0
Royal United Hospitals Bath NHS Foundation Trust	32	06-Apr-20	225	212	1,598	7.0
Chesterfield Royal Hospital NHS Foundation Trust	33	09-Apr-20	237	221	1,204	5.0
Mid and South Essex NHS Foundation Trust	34	01-Apr-20	208	193	907	4.0
Harrogate and District NHS Foundation Trust	35	08-Apr-20	142	131	1,111	7.0
North West Anglia NHS Foundation Trust	36	02-Apr-20	330	300	2,089	7.0

Appendix 8 table continued: The number of eligible eyes and the number of injections administered

Centre name	Centre number	Date of First Injection during the Audit period	Number of Eligible Eyes	Number of patients	Number of injections administered	Median number of Injections
Royal Devon University Healthcare NHS Foundation Trust	37	01-Apr-20	168	149	1,188	7.0
Wirral University Teaching Hospital NHS Foundation Trust	39	02-Apr-20	286	262	1,325	4.0
South Warwickshire University NHS Foundation Trust	40	01-Apr-20	214	198	1,629	8.0
Isle of Wight NHS Trust	41	02-Apr-20	119	108	536	4.0
Wrightington, Wigan and Leigh NHS Foundation Trust	43	09-Apr-20	173	165	959	6.0
Warrington and Halton Teaching Hospitals NHS Foundation Trust	44	07-Apr-20	198	184	1,289	7.0
Barking, Havering and Redbridge University Hospitals NHS Trust	47	01-Apr-20	203	189	1,346	7.0
Royal Free London NHS Foundation Trust	48	01-Apr-20	320	291	1,744	6.0
Salisbury NHS Foundation Trust	51	07-Apr-20	175	158	1,105	7.0
Yeovil District Hospital NHS Foundation Trust	56	20-Apr-20	156	133	1,006	7.0
SpaMedica – Manchester	57	09-Apr-20	40	36	304	8.0
East Sussex Healthcare NHS Trust	59	01-Apr-20	395	365	2,626	7.0
County Durham and Darlington NHS Foundation Trust	67	02-Apr-20	222	204	1,617	8.0
Great Western Hospitals NHS Foundation Trust	78	02-Apr-20	245	230	1,633	8.0
The Princess Alexandra Hospital NHS Trust	80	01-Apr-20	150	139	721	5.0
Practice Plus Group Surgical Centre, Gillingham	91	02-Apr-20	64	58	324	5.0
Practice Plus Group Ophthalmology, Rochdale	95	03-Apr-20	486	427	2,977	6.0
North Middlesex University Hospital NHS Trust	98	09-Apr-20	41	38	237	6.0
Surrey and Sussex Healthcare NHS Trust	101	02-Apr-20	248	226	1,575	7.0
SpaMedica – Birmingham	104	06-Apr-20	609	472	4,013	7.0
East Cheshire NHS Trust	108	08-Apr-20	349	265	1,274	4.0
Guy's and St Thomas' NHS Foundation Trust	110	02-Apr-20	356	321	2,137	6.0
SpaMedica – West Lancashire	113	07-Apr-20	68	62	497	7.0
Somerset NHS Foundation Trust	114	01-Apr-20	307	277	1,698	6.0
Medical specialists group Guernsey	115	01-Apr-20	62	57	382	6.0
Hywel Dda University Local Health Board	116	01-Apr-20	1,255	1,035	7,558	6.0
Kettering General Hospital NHS Foundation Trust	120	01-Apr-20	253	223	1,400	6.0

Appendix 8 table continued: The number of eligible eyes and the number of injections administered

Centre name	Centre number	Date of First Injection during the Audit period	Number of Eligible Eyes	Number of patients	Number of injections administered	Median number of Injections
Optegra Eye Health Care (Manchester Eye Hospital)	131	21-Apr-20	225	207	1,910	8.0
Optegra Eye Health Care (Yorkshire Eye Hospital)	134	27-Apr-20	30	28	208	7.0
SpaMedica – Coventry	140	24-Sep-20	52	47	412	8.0
West Suffolk NHS Foundation Trust	154	09-Jun-20	1,350	1,118	8,047	6.0
Northern Care Alliance NHS Foundation Trust	155	28-Jul-20	304	280	1,421	5.0
Belfast Health and Social Care Trust	189	01-Apr-20	654	589	3,108	5.0
NHS Grampian	190	02-Apr-20	343	303	2,291	7.0
Hull University Teaching Hospitals NHS Trust	191	02-Apr-20	337	313	2,926	9.0
NHS Tayside	192	07-Apr-20	270	249	1,543	6.0
Western Health and Social Care Trust	193	08-Apr-20	240	220	1,554	7.0
Total	**N/A**	**01-Apr-20**	**20,452**	**18,362**	**129,066**	**7.0**

Appendix 9: The number of treated eyes at each participating organisation by NHS year, proportion of first and second treated eyes and other baseline characteristics

a) First treated eyes

	2018 NHS year	2019 NHS year	2020 NHS year
Number of Patients	12,092	13,016	13,608
Patient age in Years			
Median	81.0	81.1	80.7
IQR	74.8 – 86.3	74.9 – 86.4	74.3 – 86.0
Percentage of Patients			
Males	37.9	39.4	38.8
Females	60.6	58.6	58.9
Sex Not Recorded	1.5	2.1	2.3
With Diabetes Mellitus	16.0	14.3	12.8

b) Second treated eyes

	2018 NHS year	2019 NHS year	2020 NHS year
Number of Patients	3,566	3,699	4,164
Patient age in Years			
Median	82.7	82.5	82.3
IQR	77.1 – 87.4	76.7 – 87.3	76.6 – 87.3
Percentage of Patients			
Males	33.8	35.2	34.4
Females	64.4	62.8	63.8
Sex Not Recorded	1.8	2.0	1.9
With Diabetes Mellitus	17.8	17.6	16.0

c) ISBIVT treated eyes

	2018 NHS year	2019 NHS year	2020 NHS year
Number of Patients	789	886	1,340
Patient age in Years			
Median	82.7	81.8	81.2
IQR	76.8 – 87.7	74.9 – 86.7	75.5 – 86.7
Percentage of Patients			
Males	32.2	32.8	34.5
Females	66.5	65.1	63.1
Sex Not Recorded	1.3	2.0	2.4
With Diabetes Mellitus	12.2	14.6	12.9

Appendix 10: The percentage of eyes with visual acuity measurements and median visual acuity at baseline and at one year

Centre name	Centre number	Baseline				One Year				Percentage with Change of VA data
		Number eligible eyes	Percentage with VA data	Median VA	Percentage with VA ≥70 letters	Number eyes eligible at one year	Percentage with VA data	Median VA	Percentage with VA ≥70 letters	
Moorfields Eye Hospital NHS Foundation Trust	1	1,287	96.3	60.0	31.3	1,200	96.7	67.0	44.8	92.9
The Newcastle upon Tyne Hospitals NHS Foundation Trust	2	655	94.4	60.0	31.9	580	95.0	65.0	45.5	89.0*
Leeds Teaching Hospitals NHS Trust	4	335	94.6	60.0	31.2	312	96.5	65.0	35.6	91.3
Oxford University Hospitals NHS Foundation Trust	6	348	99.7	55.0	27.4	330	97.0	60.0	37.9	96.7
University Hospitals Bristol and Weston NHS Foundation Trust	7	526	83.1	60.0	35.5	460	96.1	70.0	48.9	80.4
Gloucestershire Hospitals NHS Foundation Trust	8	403	93.1	55.0	24.8	363	98.3	65.0	36.9	91.7
University Hospital Southampton NHS Foundation Trust	11	412	93.9	55.0	18.3	378	96.6	65.0	39.7	91.5
Royal Berkshire NHS Foundation Trust	12	407	97.3	57.5	14.1	360	96.7	65.0	42.5	94.4
Calderdale and Huddersfield NHS Foundation Trust	13	297	100.0	60.0	24.2	260	96.9	65.0	41.5	96.9
Mid Cheshire Hospitals NHS Foundation Trust	14	179	90.5	60.0	20.4	160	95.6	67.0	45.0	87.5
The Mid Yorkshire Hospitals NHS Trust	15	307	94.1	57.0	19.7	274	98.2	65.0	39.1	93.1
Epsom and St Helier University Hospitals NHS Trust	17	223	99.6	60.0	23.4	207	99.5	60.0	39.1	99.0
Barts Health NHS Trust	18	144	96.5	59.0	14.4	116	90.5	60.0	37.1	88.8
Bradford Teaching Hospitals NHS Foundation Trust	20	176	95.5	60.0	33.9	157	98.1	65.0	41.4	93.0
Moorfields Eye Centre at Bedfordshire Hospitals NHS Foundation Trust	21	167	91.0	60.0	27.0	148	94.6	67.0	46.6	85.8
University Hospitals Birmingham NHS Foundation Trust	23	341	99.4	55.0	20.9	303	93.4	62.0	31.0	93.1
Royal Cornwall Hospitals NHS Trust	25	348	99.7	55.0	24.8	317	97.8	64.0	36.6	97.8
Manchester University NHS Foundation Trust	26	537	88.1	60.0	28.1	474	96.6	63.0	33.1	86.3
King's College Hospital NHS Foundation Trust	27	559	98.9	60.0	31.3	494	95.5	60.0	41.1	94.5
The Hillingdon Hospitals NHS Foundation Trust	30	114	93.9	50.0	20.6	109	99.1	58.0	28.4	92.7
Liverpool University Hospitals NHS Foundation Trust	31	578	71.3*	57.0	21.4	496	91.3	61.0	26.6	66.7*
Royal United Hospitals Bath NHS Foundation Trust	32	225	66.2*	59.0	18.8	204	99.0	65.0	39.7	67.6*
Chesterfield Royal Hospital NHS Foundation Trust	33	237	95.8	60.0	26.0	212	96.7	60.0	33.5	92.9

Appendix 10 table continued: The percentage of eyes with visual acuity measurements and median visual acuity at baseline and at one year

Centre name	Centre number	Baseline				One Year				Percentage with Change of VA data
		Number eligible eyes	Percentage with VA data	Median VA	Percentage with VA ≥70 letters	Number eyes eligible at one year	Percentage with VA data	Median VA	Percentage with VA ≥70 letters	
Mid and South Essex NHS Foundation Trust	34	208	100.0	54.0	6.7	149	73.2*	57.0	16.8	73.2*
Harrogate and District NHS Foundation Trust	35	142	76.8	56.0	22.0	127	98.4	62.0	26.0	74.0*
North West Anglia NHS Foundation Trust	36	330	90.0	55.0	16.5	292	90.4	63.0	30.8	82.2
Royal Devon University Healthcare NHS Foundation Trust	37	168	74.4*	65.0	45.6	158	91.8	70.0	46.2	69.6*
Wirral University Teaching Hospital NHS Foundation Trust	39	286	88.8	59.0	22.4	259	98.1	60.5	33.6	86.5
South Warwickshire University NHS Foundation Trust	40	214	99.5	60.0	33.3	185	97.8	65.0	44.3	97.8
Isle of Wight NHS Trust	41	119	64.7*	60.0	35.1	98	86.7	60.0	22.4	55.1*
Wrightington, Wigan and Leigh NHS Foundation Trust	43	173	96.5	55.0	16.8	157	94.9	60.0	25.5	92.4
Warrington and Halton Teaching Hospitals NHS Foundation Trust	44	198	96.0	60.0	30.5	174	98.3	68.0	45.4	96.0
Barking, Havering and Redbridge University Hospitals NHS Trust	47	203	66.5*	57.0	8.9	177	81.9	65.0	31.6	56.5*
Royal Free London NHS Foundation Trust	48	320	50.9*	55.0	23.9	278	91.7	60.0	37.1	47.1*
Salisbury NHS Foundation Trust	51	175	99.4	60.0	20.7	166	98.2	65.0	42.8	97.6
Yeovil District Hospital NHS Foundation Trust	56	156	100.0	60.0	28.2	140	95.0	67.0	42.9	95.0
SpaMedica – Manchester	57	40	95.0	59.0	26.3	36	91.7	69.0	41.7	88.9
East Sussex Healthcare NHS Trust	59	395	91.6	60.0	34.0	346	97.7	70.0	54.0	91.0
County Durham and Darlington NHS Foundation Trust	67	222	99.1	60.0	33.6	203	98.0	70.0	55.7	97.0
Great Western Hospitals NHS Foundation Trust	78	245	75.9	57.0	23.7	214	77.6	65.0	28.0	59.8*
The Princess Alexandra Hospital NHS Trust	80	150	90.7	55.0	21.3	127	97.6	56.0	29.9	89.0
Practice Plus Group Surgical Centre, Gillingham	91	64	43.8*	52.5	25.0	47	87.2	60.0	29.8	34.0*
Practice Plus Group Ophthalmology, Rochdale	95	486	98.8	55.0	19.4	443	96.4	61.0	33.4	95.3
North Middlesex University Hospital NHS Trust	98	41	92.7	45.0	21.1	33	97.0	54.5	27.3	87.9
Surrey and Sussex Healthcare NHS Trust	101	248	88.3	55.0	13.7	228	94.3	63.0	34.2	82.5
SpaMedica – Birmingham	104	609	99.5	59.0	26.9	509	99.6	60.0	30.8	99.0
East Cheshire NHS Trust	108	349	52.7*	55.0	28.8	230	10.0*	65.0	4.8	5.2*
Guy's and St Thomas' NHS Foundation Trust	110	356	99.7	61.0	36.6	305	96.4	70.0	48.9	96.1

Appendix 10 table continued: The percentage of eyes with visual acuity measurements and median visual acuity at baseline and at one year

Centre name	Centre number	Baseline				One Year				Percentage with Change of VA data
		Number eligible eyes	Percentage with VA data	Median VA	Percentage with VA ≥70 letters	Number eyes eligible at one year	Percentage with VA data	Median VA	Percentage with VA ≥70 letters	
SpaMedica – West Lancashire	113	68	98.5	58.0	28.4	63	100.0	65.0	41.3	100.0
Somerset NHS Foundation Trust	114	307	83.7	60.0	22.6	283	98.2	60.0	26.9	82.7
Medical specialists group Guernsey	115	62	96.8	60.0	36.7	50	94.0	70.0	48.0	90.0
Hywel Dda University Local Health Board	116	1,255	92.1	60.0	34.1	1,141	96.1	64.0	36.6	87.8
Kettering General Hospital NHS Foundation Trust	120	253	84.6	50.0	10.3	215	98.6	55.0	19.5	83.3
Optegra Eye Health Care (Manchester Eye Hospital)	131	225	93.3	61.5	38.1	203	98.5	75.0	64.5	94.1
Optegra Eye Health Care (Yorkshire Eye Hospital)	134	30	66.7*	64.0	35.0	**	**	**	**	**
SpaMedica – Coventry	140	52	98.1	57.0	17.6	46	100.0	62.0	37.0	97.8
West Suffolk NHS Foundation Trust	154	1,350	98.5	65.0	40.2	1,220	95.7	67.0	42.8	94.3
Northern Care Alliance NHS Foundation Trust	155	304	76.0	30.0	4.3	265	80.8	32.0	4.5	64.9*
Belfast Health and Social Care Trust	189	654	96.2	60.0	34.8	545	84.8	65.0	36.1	82.4
NHS Grampian	190	343	97.1	60.0	27.0	296	98.0	70.0	53.4	95.6
Hull University Teaching Hospitals NHS Trust	191	337	97.3	60.0	29.9	303	96.0	65.0	43.2	93.4
NHS Tayside	192	270	71.5*	60.0	30.6	247	81.0	65.0	35.2	57.1*
Western Health and Social Care Trust	193	240	97.9	60.0	29.8	210	97.1	69.0	48.1	95.2
Total	**N/A**	**20,452**	**90.9**	**60.0**	**17.5**	**18,082**	**93.8**	**65.0**	**40.5**	**86.4**

* Estimate below the NOD AMD 75% data quality target.
** No estimate was produced for centres with <25 eligible eyes in the qualifying time period.

Appendix 11: The percentage of eligible eyes with visual acuity data at baseline and at one year for centres in the 2018, 2019 and 2020 NHS years

Centre name	Centre number	The percentage of eligible eyes with a baseline VA			The percentage of eligible eyes with VA at 1 year		
		2018	2019	2020	2018	2019	2020
Moorfields Eye Hospital NHS Foundation Trust	1	98.3	97.9	96.3	92.6	78.4	96.7
The Newcastle upon Tyne Hospitals NHS Foundation Trust	2	93.6	93.2	94.4	94.8	84.8	95.0
Leeds Teaching Hospitals NHS Trust	4	95.3	89.4	94.6	95.6	79.1	96.5
Oxford University Hospitals NHS Foundation Trust	6	97.4	99.0	99.7	92.7	87.0	97.0
University Hospitals Bristol and Weston NHS Foundation Trust	7	86.9	89.0	83.1	95.1	82.1	96.1
Gloucestershire Hospitals NHS Foundation Trust	8	99.1	97.9	93.1	96.6	82.3	98.3
University Hospital Southampton NHS Foundation Trust	11	98.7	97.8	93.9	96.3	87.4	96.6
Royal Berkshire NHS Foundation Trust	12	85.1	89.8	97.3	95.2	91.1	96.7
Calderdale and Huddersfield NHS Foundation Trust	13	99.3	100.0	100.0	95.4	85.4	96.9
Mid Cheshire Hospitals NHS Foundation Trust	14	95.1	96.0	90.5	94.8	91.5	95.6
The Mid Yorkshire Hospitals NHS Trust	15	98.8	98.6	94.1	96.0	83.5	98.2
Epsom and St Helier University Hospitals NHS Trust	17	96.7	99.3	99.6	97.3	87.5	99.5
Barts Health NHS Trust	18	71.1*	72.9*	96.5	80.8	69.1*	90.5
Bradford Teaching Hospitals NHS Foundation Trust	20	100.0	98.5	95.5	94.4	74.8	98.1
Moorfields Eye Centre at Bedfordshire Hospitals NHS Foundation Trust	21	100.0	96.0	91.0	95.6	75.5	94.6
University Hospitals Birmingham NHS Foundation Trust	23	97.5	98.8	99.4	88.7	78.6	93.4
Royal Cornwall Hospitals NHS Trust	25	99.7	100.0	99.7	98.9	90.9	97.8
Manchester University NHS Foundation Trust	26	98.5	94.6	88.1	96.5	80.3	96.6
King's College Hospital NHS Foundation Trust	27	90.6	88.0	98.9	92.8	88.7	95.5
The Hillingdon Hospitals NHS Foundation Trust	30	81.5	82.4	93.9	85.9	89.1	99.1
Liverpool University Hospitals NHS Foundation Trust	31	70.1*	73.9*	71.3*	91.6	77.4	91.3
Royal United Hospitals Bath NHS Foundation Trust	32	42.7*	24.4*	66.2*	96.8	91.7	99.0
Chesterfield Royal Hospital NHS Foundation Trust	33	98.0	98.6	95.8	96.1	84.9	96.7
Mid and South Essex NHS Foundation Trust	34	98.6	96.5	100.0	67.6*	72.3*	73.2*

Appendix 11 table continued: The percentage of eligible eyes with visual acuity data at baseline and at one year for centres in the 2018, 2019 and 2020 NHS years

Centre name	Centre number	The percentage of eligible eyes with a baseline VA			The percentage of eligible eyes with VA at 1 year		
		2018	2019	2020	2018	2019	2020
North West Anglia NHS Foundation Trust	36	78.3	89.0	90.0	94.2	87.8	90.4
Royal Devon University Healthcare NHS Foundation Trust	37	68.4*	55.1*	74.4*	89.1	70.6*	91.8
Wirral University Teaching Hospital NHS Foundation Trust	39	83.9	80.6	88.8	96.3	88.7	98.1
South Warwickshire University NHS Foundation Trust	40	98.6	99.6	99.5	95.4	91.1	97.8
Isle of Wight NHS Trust	41	30.5*	15.3*	64.7*	19.8*	73.0*	86.7
Wrightington, Wigan and Leigh NHS Foundation Trust	43	91.7	90.9	96.5	95.2	78.1	94.9
Warrington and Halton Teaching Hospitals NHS Foundation Trust	44	94.7	87.6	96.0	93.2	75.6	98.3
Barking, Havering and Redbridge University Hospitals NHS Trust	47	83.7	83.8	66.5*	81.1	57.0*	81.9
Royal Free London NHS Foundation Trust	48	99.3	40.6*	50.9*	72.1*	85.6	91.7
Salisbury NHS Foundation Trust	51	98.1	99.5	99.4	96.4	90.1	98.2
Yeovil District Hospital NHS Foundation Trust	56	100.0	100.0	100.0	96.9	91.9	95.0
SpaMedica – Manchester	57	100.0	100.0	95.0	97.4	98.4	91.7
East Sussex Healthcare NHS Trust	59	99.3	90.3	91.6	96.9	89.6	97.7
County Durham and Darlington NHS Foundation Trust	67	84.2	100.0	99.1	97.7	87.1	98.0
Great Western Hospitals NHS Foundation Trust	78	52.6*	58.6*	75.9	91.6	70.9*	77.6
The Princess Alexandra Hospital NHS Trust	80	96.3	99.0	90.7	94.7	67.8*	97.6
Practice Plus Group Surgical Centre, Gillingham	91	38.5*	45.0*	43.8*	95.5	66.1*	87.2
Practice Plus Group Ophthalmology, Rochdale	95	97.8	98.2	98.8	96.0	96.3	96.4
North Middlesex University Hospital NHS Trust	98	97.4	98.8	92.7	85.1	78.7	97.0
Surrey and Sussex Healthcare NHS Trust	101	94.4	86.8	88.3	62.8*	76.2	94.3
SpaMedica – Birmingham	104	**	**	99.5	**	**	99.6
East Cheshire NHS Trust	108	**	**	52.7*	**	**	10.0*
Guy's and St Thomas' NHS Foundation Trust	110	**	80.0	99.7	**	81.5	96.4
SpaMedica – West Lancashire	113	100.0	100.0	98.5	96.7	97.1	100.0
Somerset NHS Foundation Trust	114	95.5	95.4	83.7	91.4	77.3	98.2
Medical specialists group Guernsey	115	94.4	88.5	96.8	92.2	90.9	94.0

Appendix 11 table continued: The percentage of eligible eyes with visual acuity data at baseline and at one year for centres in the 2018, 2019 and 2020 NHS years

Centre name	Centre number	The percentage of eligible eyes with a baseline VA			The percentage of eligible eyes with VA at 1 year		
		2018	2019	2020	2018	2019	2020
Hywel Dda University Local Health Board	116	44.4*	45.7*	92.1	8.9*	93.6	96.1
Kettering General Hospital NHS Foundation Trust	120	96.7	99.0	84.6	8.7*	88.7	98.6
Optegra Eye Health Care (Manchester Eye Hospital)	131	95.5	92.0	93.3	93.6	86.7	98.5
Optegra Eye Health Care (Yorkshire Eye Hospital)	134	48.9*	43.4*	66.7*	41.2*	77.8	**
Optegra Eye Health Care (Surrey Eye Hospital)	139	97.4	**	**	**	**	**
SpaMedica – Coventry	140	**	**	98.1	**	**	100.0
Optegra Eye Health Care (North London Eye Hospital)	142	**	55.2*	**	**	**	**
West Suffolk NHS Foundation Trust	154	**	**	98.5	**	**	95.7
Northern Care Alliance NHS Foundation Trust	155	**	**	76.0	**	**	80.8
Belfast Health and Social Care Trust	189	100.0	99.5	96.2	90.3	55.0	84.8
NHS Grampian	190	98.2	98.4	97.1	95.3	88.0	98.0
Hull University Teaching Hospitals NHS Trust	191	98.4	99.1	97.3	96.1	86.1	96.0
NHS Tayside	192	68.6*	72.3*	71.5*	92.2	81.0	81.0
Western Health and Social Care Trust	193	99.6	98.6	97.9	85.0	87.8	97.1
Total	**N/A**	**91.1**	**89.7**	**90.9**	**91.7**	**82.3**	**93.8**

* Estimate below the NOD AMD 75% data quality target.
** No estimate was produced for centres with <25 eligible eyes in the qualifying time period.

Appendix 12: The percentage of eligible eyes completing the loading phase within 10 weeks, 12 weeks and 16 weeks for each participating centre in the 2018, 2019 and 2020 NHS years

Centre name	Centre number	2018 NHS year				2019 NHS year				2020 NHS year			
		Completing the loading phase within				Completing the loading phase within				Completing the loading phase within			
		N	10 weeks	12 weeks	16 weeks	N	10 weeks	12 weeks	16 weeks	N	10 weeks	12 weeks	16 weeks
Moorfields Eye Hospital NHS Foundation Trust	1	1,116	73.4	82.6	89.3	1,323	67.9	76.6	83.2	1,286	70.6	78.6	87.9
The Newcastle upon Tyne Hospitals NHS Foundation Trust	2	746	81.1	87.1	91.0	677	70.5	79.9	83.5	655	80.8	86.0	90.7
Leeds Teaching Hospitals NHS Trust	4	383	72.6	83.0	88.0	378	66.9	77.0	86.0	335	71.9	82.1	86.6
Oxford University Hospitals NHS Foundation Trust	6	427	79.2	86.9	91.3	421	75.5	81.0	86.7	348	78.4	83.6	89.7
University Hospitals Bristol and Weston NHS Foundation Trust	7	571	70.9	86.7	90.7	598	63.5	80.1	87.5	526	74.1	84.4	91.3
Gloucestershire Hospitals NHS Foundation Trust	8	534	80.1	87.1	91.0	522	71.8	79.3	86.0	403	82.9	88.1	92.6
University Hospital Southampton NHS Foundation Trust	11	526	76.2	87.8	93.2	505	57.8	74.1	85.9	412	79.6	86.7	92.7
Royal Berkshire NHS Foundation Trust	12	436	76.6	89.0	94.3	450	75.6	86.9	93.3	407	78.4	87.2	93.1
Calderdale and Huddersfield NHS Foundation Trust	13	289	78.5	90.0	93.8	314	74.2	82.8	87.9	297	72.1	84.8	90.6
Mid Cheshire Hospitals NHS Foundation Trust	14	204	81.9	88.2	91.2	174	83.9	87.9	93.1	179	86.0	88.3	92.7
The Mid Yorkshire Hospitals NHS Trust	15	343	91.5	95.3	96.5	293	83.6	91.5	94.5	307	92.2	93.5	95.8
Epsom and St Helier University Hospitals NHS Trust	17	240	87.5	90.8	94.6	288	83.7	86.1	88.2	223	86.5	91.0	94.2
Barts Health NHS Trust	18	187	77.5	85.6	92.5	181	70.7	76.2	81.2	144	71.5	77.8	83.3
Bradford Teaching Hospitals NHS Foundation Trust	20	191	79.6	82.2	84.8	198	67.7	71.7	78.8	176	82.4	83.0	89.2
Moorfields Eye Centre at Bedfordshire Hospitals NHS Foundation Trust	21	151	81.5	90.1	95.4	176	76.7	83.0	87.5	167	82.6	88.6	94.0
University Hospitals Birmingham NHS Foundation Trust	23	560	70.9	81.4	88.8	591	67.0	75.8	82.4	341	80.1	88.3	91.8
Royal Cornwall Hospitals NHS Trust	25	374	91.7	94.4	97.1	389	85.3	91.5	93.8	348	88.5	92.5	94.3
Manchester University NHS Foundation Trust	26	613	76.8	86.3	90.5	703	72.5	81.4	87.3	537	75.8	84.9	90.5
King's College Hospital NHS Foundation Trust	27	680	56.9	65.7	71.0	615	60.7	67.8	73.7	559	78.0	83.2	89.4
The Hillingdon Hospitals NHS Foundation Trust	30	157	83.4	89.8	92.4	165	70.9	78.2	83.6	114	61.4	79.8	95.6
Liverpool University Hospitals NHS Foundation Trust	31	642	72.4	83.2	89.9	548	67.0	76.3	83.6	578	68.3	77.9	86.0
Royal United Hospitals Bath NHS Foundation Trust	32	241	86.3	88.0	90.0	234	91.0	92.3	93.6	225	86.7	91.6	92.9
Chesterfield Royal Hospital NHS Foundation Trust	33	254	86.6	89.4	90.9	211	71.1	79.1	84.4	237	72.2	80.2	88.6

Appendix 12 table continued: The percentage of eligible eyes completing the loading phase within 10 weeks, 12 weeks and 16 weeks for each participating centre in the 2018, 2019 and 2020 NHS years

Centre name	Centre number	2018 NHS year				2019 NHS year				2020 NHS year			
		Completing the loading phase within				Completing the loading phase within				Completing the loading phase within			
		N	10 weeks	12 weeks	16 weeks	N	10 weeks	12 weeks	16 weeks	N	10 weeks	12 weeks	16 weeks
Mid and South Essex NHS Foundation Trust	34	208	74.5	87.5	92.8	202	73.8	84.7	91.6	208	71.2	79.8	90.9
Harrogate and District NHS Foundation Trust	35	141	87.2	90.8	94.3	169	79.9	85.8	89.3	142	73.9	83.1	93.7
North West Anglia NHS Foundation Trust	36	382	84.8	90.3	92.7	419	69.7	81.9	88.1	330	82.1	88.2	93.0
Royal Devon University Healthcare NHS Foundation Trust	37	133	90.2	96.2	96.2	187	85.0	93.6	95.7	168	86.9	96.4	97.0
Wirral University Teaching Hospital NHS Foundation Trust	39	279	87.5	92.5	93.9	258	87.6	89.9	92.2	286	91.3	93.7	95.5
South Warwickshire University NHS Foundation Trust	40	216	78.7	84.7	87.0	236	73.3	78.0	86.0	214	90.7	93.0	95.3
Isle of Wight NHS Trust	41	131	64.1	69.5	78.6	124	55.6	75.0	77.4	119	78.2	81.5	84.9
Wrightington, Wigan and Leigh NHS Foundation Trust	43	133	83.5	90.2	91.7	165	85.5	89.7	90.9	173	87.9	90.2	93.1
Warrington and Halton Teaching Hospitals NHS Foundation Trust	44	208	50.0	74.0	84.6	193	37.3	64.8	75.6	198	29.8	70.2	85.9
Barking, Havering and Redbridge University Hospitals NHS Trust	47	215	88.4	91.2	93.5	253	70.8	79.1	86.2	203	71.4	82.3	89.2
Royal Free London NHS Foundation Trust	48	136	64.0	69.9	75.7	160	24.4	30.6	42.5	320	45.0	51.9	64.1
Salisbury NHS Foundation Trust	51	213	82.6	87.3	89.7	186	72.6	79.6	86.6	175	73.1	79.4	85.7
Yeovil District Hospital NHS Foundation Trust	56	146	86.3	88.4	92.5	160	88.8	90.6	94.4	156	84.0	85.9	90.4
SpaMedica – Manchester	57	41	78.0	85.4	90.2	71	81.7	88.7	91.5	40	87.5	95.0	97.5
East Sussex Healthcare NHS Trust	59	418	83.3	88.5	90.4	462	71.6	78.6	83.1	395	87.6	91.1	93.9
County Durham and Darlington NHS Foundation Trust	67	285	81.1	89.8	94.0	282	78.7	82.6	86.9	222	80.2	87.8	92.3
Great Western Hospitals NHS Foundation Trust	78	253	90.5	93.3	95.7	302	87.4	89.4	92.1	245	85.3	88.2	92.2
The Princess Alexandra Hospital NHS Trust	80	187	59.4	71.7	82.4	193	56.0	65.3	73.1	150	52.7	60.7	73.3
Practice Plus Group Surgical Centre, Gillingham	91	52	59.6	71.2	86.5	80	42.5	58.8	77.5	64	64.1	76.6	87.5
Practice Plus Group Ophthalmology, Rochdale	95	372	89.2	95.4	96.5	489	89.6	93.9	95.3	486	92.0	94.7	96.7
North Middlesex University Hospital NHS Trust	98	76	73.7	81.6	86.8	82	63.4	75.6	84.1	41	65.9	82.9	87.8
Surrey and Sussex Healthcare NHS Trust	101	213	81.7	87.8	90.1	243	73.3	78.2	81.5	248	63.3	75.8	82.7
SpaMedica – Birmingham	104	**	**	**	**	**	**	**	**	609	20.0	24.3	63.2
East Cheshire NHS Trust	108	**	**	**	**	**	**	**	**	349	0.3	1.4	10.3

Appendix 12 table continued: The percentage of eligible eyes completing the loading phase within 10 weeks, 12 weeks and 16 weeks for each participating centre in the 2018, 2019 and 2020 NHS years

Centre name	Centre number	2018 NHS year				2019 NHS year				2020 NHS year			
		Completing the loading phase within				Completing the loading phase within				Completing the loading phase within			
		N	10 weeks	12 weeks	16 weeks	N	10 weeks	12 weeks	16 weeks	N	10 weeks	12 weeks	16 weeks
Guy's and St Thomas' NHS Foundation Trust	110	**	**	**	**	81	32.1	39.5	51.9	356	57.3	64.9	74.2
SpaMedica – West Lancashire	113	36	72.2	80.6	86.1	111	82.0	89.2	93.7	68	85.3	89.7	92.6
Somerset NHS Foundation Trust	114	245	7.3	17.1	32.7	711	7.2	17.2	34.2	307	15.6	47.9	59.0
Medical specialists group Guernsey	115	54	85.2	94.4	94.4	52	76.9	84.6	86.5	62	72.6	83.9	90.3
Hywel Dda University Local Health Board	116	**	**	**	**	293	0.3	0.3	1.7	1,255	33.4	41.2	56.7
Kettering General Hospital NHS Foundation Trust	120	91	63.7	74.7	75.8	195	4.1	5.1	11.8	253	26.5	37.9	51.0
Optegra Eye Health Care (Manchester Eye Hospital)	131	333	55.3	62.5	69.1	201	60.2	63.7	69.2	225	88.4	92.0	94.2
Optegra Eye Health Care (Yorkshire Eye Hospital)	134	47	59.6	68.1	74.5	53	52.8	71.7	75.5	30	70.0	86.7	93.3
Optegra Eye Health Care (Surrey Eye Hospital)	139	38	68.4	68.4	71.1	**	**	**	**	**	**	**	**
SpaMedica – Coventry	140	**	**	**	**	**	**	**	**	52	86.5	90.4	96.2
Optegra Eye Health Care (North London Eye Hospital)	142	**	**	**	**	29	37.9	48.3	65.5	**	**	**	**
West Suffolk NHS Foundation Trust	154	**	**	**	**	**	**	**	**	1,350	28.5	38.3	52.7
Northern Care Alliance NHS Foundation Trust	155	**	**	**	**	**	**	**	**	304	71.1	78.3	83.6
Belfast Health and Social Care Trust	189	748	4.0	19.4	56.8	601	9.3	40.6	61.7	654	46.9	59.2	72.0
NHS Grampian	190	382	65.7	80.4	88.0	377	60.2	75.1	82.2	343	75.5	84.3	88.6
Hull University Teaching Hospitals NHS Trust	191	377	90.5	94.2	95.2	324	83.0	91.4	96.0	337	86.1	92.0	94.4
NHS Tayside	192	296	93.6	94.9	95.9	314	88.5	91.4	92.4	270	95.2	96.3	97.0
Western Health and Social Care Trust	193	239	27.2	55.2	83.7	276	30.4	53.3	76.4	240	55.0	80.0	89.2
Total	**N/A**	**17,189**	**72.6**	**81.2**	**87.4**	**18,487**	**64.6**	**73.8**	**80.6**	**20,452**	**65.4**	**73.3**	**81.7**

* Estimate below the NOD AMD 75% data quality target.
** No estimate was produced for centres with <25 eligible eyes in the qualifying time period.

Appendix 13: Visual acuity outcomes for each participating centre in the 2020 NHS year

Partial adjustments were made using a simple linear regression created from data for the 2018, 2019 and 2020 NHS years for change in VA with baseline VA and age covariates only

Centre name	Centre number	Number of Eyes	Unadjusted VA change Median (Mean)	Partially Adjusted VA Change Median (Mean)	Percentage with VA ≥70 letters
Moorfields Eye Hospital NHS Foundation Trust	1	1,115	5.0 (5.6)	2.8 (8.8)	46.3%
The Newcastle upon Tyne Hospitals NHS Foundation Trust	2	516	5.0 (3.3)	2.0 (5.5)	47.5%
Leeds Teaching Hospitals NHS Trust	4	285	2.0 (3.3)	1.8 (5.5)	37.2%
Oxford University Hospitals NHS Foundation Trust	6	319	0.0 (2.4)	2.3 (9.9)	39.2%
University Hospitals Bristol and Weston NHS Foundation Trust	7	370	5.0 (5.0)	0.8 (7.7)	50.8%
Gloucestershire Hospitals NHS Foundation Trust	8	333	5.0 (5.1)	2.1 (9.9)	39.0%
University Hospital Southampton NHS Foundation Trust	11	346	4.0 (4.3)	2.8 (6.6)	40.5%
Royal Berkshire NHS Foundation Trust	12	340	6.5 (6.5)	1.6 (7.7)	44.1%
Calderdale and Huddersfield NHS Foundation Trust	13	252	5.0 (4.1)	2.0 (8.8)	42.9%
Mid Cheshire Hospitals NHS Foundation Trust	14	140	5.5 (4.3)	1.6 (4.4)	47.1%
The Mid Yorkshire Hospitals NHS Trust	15	255	4.0 (4.7)	2.7 (0.0)	40.4%
Epsom and St Helier University Hospitals NHS Trust	17	205	5.0 (3.1)	1.9 (9.9)	39.0%
Barts Health NHS Trust	18	103	5.0 (3.5)	2.7 (1.1)	41.7%
Bradford Teaching Hospitals NHS Foundation Trust	20	146	0.0 (1.7)	1.6 (9.9)	42.5%
Moorfields Eye Centre at Bedfordshire Hospitals NHS Foundation Trust	21	127	5.0 (6.0)	1.2 (2.2)	48.8%
University Hospitals Birmingham NHS Foundation Trust	23	282	5.0 (4.6)	2.2 (0.0)	33.3%
Royal Cornwall Hospitals NHS Trust	25	310	0.5 (2.3)	2.3 (8.8)	37.4%
Manchester University NHS Foundation Trust	26	409	0.0 (0.8)	1.9 (7.7)	33.7%
King's College Hospital NHS Foundation Trust	27	467	0.0 (1.5)	1.9 (8.8)	43.5%
The Hillingdon Hospitals NHS Foundation Trust	30	101	2.0 (3.9)	2.8 (1.1)	29.7%
Liverpool University Hospitals NHS Foundation Trust	31	331	1.0 (1.9)	2.8 (1.1)	27.5%
Royal United Hospitals Bath NHS Foundation Trust	32	138	5.0 (6.2)	2.7 (9.9)	44.2%
Chesterfield Royal Hospital NHS Foundation Trust	33	197	0.0 (1.4)	1.6 (4.4)	35.0%

Appendix 13 table continued: Visual acuity outcomes for each participating centre in the 2020 NHS year

Centre name	Centre number	Number of Eyes	Unadjusted VA change Median (Mean)	Partially Adjusted VA Change Median (Mean)	Percentage with VA ≥70 letters
Mid and South Essex NHS Foundation Trust	34	109	1.0 (-0.3)	2.8 (3.3)	22.9%
Harrogate and District NHS Foundation Trust	35	94	1.0 (2.0)	2.0 (1.1)	27.7%
North West Anglia NHS Foundation Trust	36	240	4.0 (2.4)	2.2 (4.4)	35.4%
Royal Devon University Healthcare NHS Foundation Trust	37	110	0.0 (1.0)	0.6 (1.1)	51.8%
Wirral University Teaching Hospital NHS Foundation Trust	39	224	0.5 (-0.1)	2.0 (0.0)	35.3%
South Warwickshire University NHS Foundation Trust	40	181	4.0 (2.0)	0.5 (4.4)	45.3%
Isle of Wight NHS Trust	41	54	0.0 (-0.1)	1.9 (4.4)	29.6%
Wrightington, Wigan and Leigh NHS Foundation Trust	43	145	0.0 (1.6)	2.9 (3.3)	26.2%
Warrington and Halton Teaching Hospitals NHS Foundation Trust	44	167	5.0 (4.9)	1.3 (8.8)	46.7%
Barking, Havering and Redbridge University Hospitals NHS Trust	47	100	6.0 (2.5)	2.5 (3.3)	40.0%
Royal Free London NHS Foundation Trust	48	131	3.0 (3.6)	1.4 (0.0)	38.9%
Salisbury NHS Foundation Trust	51	162	5.0 (1.3)	1.1 (7.7)	43.2%
Yeovil District Hospital NHS Foundation Trust	56	133	3.0 (4.1)	1.6 (3.3)	45.1%
SpaMedica – Manchester	57	32	3.0 (4.4)	0.7 (0.0)	46.9%
East Sussex Healthcare NHS Trust	59	315	5.0 (5.1)	0.9 (5.5)	53.3%
County Durham and Darlington NHS Foundation Trust	67	197	5.0 (4.6)	1.3 (0.0)	56.3%
Great Western Hospitals NHS Foundation Trust	78	128	5.0 (5.4)	1.8 (2.2)	38.3%
The Princess Alexandra Hospital NHS Trust	80	113	1.0 (0.0)	3.2 (1.1)	31.0%
Practice Plus Group Ophthalmology, Rochdale	95	422	5.0 (4.2)	3.0 (0.0)	34.8%
North Middlesex University Hospital NHS Trust	98	29	5.0 (4.3)	5.2 (2.2)	31.0%
Surrey and Sussex Healthcare NHS Trust	101	188	4.0 (4.1)	2.3 (3.3)	38.3%
SpaMedica - Birmingham	104	504	0.0 (0.0)	1.6 (1.1)	31.0%
Guy's and St Thomas' NHS Foundation Trust	110	293	4.0 (3.7)	2.6 (5.5)	50.9%
SpaMedica – West Lancashire	113	63	2.0 (1.3)	1.9 (8.8)	41.3%
Somerset NHS Foundation Trust	114	234	1.0 (1.2)	1.5 (4.4)	29.1%
Medical specialists group Guernsey	115	45	3.0 (2.4)	0.6 (3.3)	48.9%

Appendix 13 table continued: Visual acuity outcomes for each participating centre in the 2020 NHS year

Centre name	Centre number	Number of Eyes	Unadjusted VA change Median (Mean)	Partially Adjusted VA Change Median (Mean)	Percentage with VA ≥70 letters
Hywel Dda University Local Health Board	116	1,002	0.0 (0.1)	1.3 (0.0)	37.7%
Kettering General Hospital NHS Foundation Trust	120	179	2.0 (3.0)	4.3 (4.4)	22.3%
Optegra Eye Health Care (Manchester Eye Hospital)	131	191	10.0 (9.1)	0.7 (2.2)	64.9%
SpaMedica – Coventry	140	45	3.0 (3.8)	2.7 (0.0)	37.8%
West Suffolk NHS Foundation Trust	154	1,151	0.0 (-0.2)	0.3 (4.4)	44.8%
Northern Care Alliance NHS Foundation Trust	155	173	2.0 (2.6)	11.1 (2.2)	6.4%
Belfast Health and Social Care Trust	189	449	0.0 (-0.7)	1.8 (6.6)	42.3%
NHS Grampian	190	283	5.0 (6.1)	1.4 (3.3)	54.4%
Hull University Teaching Hospitals NHS Trust	191	283	5.0 (3.6)	1.6 (5.5)	45.2%
NHS Tayside	192	141	3.0 (2.3)	1.9 (3.3)	46.1%
Western Health and Social Care Trust	193	200	5.0 (6.7)	2.2 (0.0)	49.5%
Total	**N/A**	**15,597**	**3.0 (2.9)**	**1.9 (7.7)**	**40.9%**

Appendix 14: Median number of injections to month 12 and the profession of the injector at each participating organisation

Centre name	Centre number	Number of injections	Median number of injections	Percentage of injections given by			
				Doctors	Nurses	Other healthcare professionals	Not recorded
Moorfields Eye Hospital NHS Foundation Trust	1	9,260	7.0	11.1	85.2	1.4	2.3
The Newcastle upon Tyne Hospitals NHS Foundation Trust	2	4,243	7.0	22.2	76.6	1.2	0.0
Leeds Teaching Hospitals NHS Trust	4	2,170	7.0	41.4	47.6	10.9	0.0
Oxford University Hospitals NHS Foundation Trust	6	2,362	7.0	40.9	28.2	17.9	13.0
University Hospitals Bristol and Weston NHS Foundation Trust	7	3,398	7.0	34.3	56.4	9.3	0.0
Gloucestershire Hospitals NHS Foundation Trust	8	3,099	8.0	33.0	50.0	17.0	0.0
University Hospital Southampton NHS Foundation Trust	11	2,811	7.0	65.1	9.6	17.4	7.9
Royal Berkshire NHS Foundation Trust	12	2,713	7.0	57.9	22.3	17.0	2.8
Calderdale and Huddersfield NHS Foundation Trust	13	1,972	7.0	31.9	24.0	43.3	0.8
Mid Cheshire Hospitals NHS Foundation Trust	14	1,176	7.0	71.8	28.1	0.1	0.0
The Mid Yorkshire Hospitals NHS Trust	15	2,164	7.0	4.8	95.2	0.0	0.0
Epsom and St Helier University Hospitals NHS Trust	17	1,354	7.0	37.8	62.2	0.0	0.0
Barts Health NHS Trust	18	902	7.0	26.9	72.1	1.0	0.0
Bradford Teaching Hospitals NHS Foundation Trust	20	1,081	6.0	1.4	98.6	0.0	0.0
Moorfields Eye Centre at Bedfordshire Hospitals NHS Foundation Trust	21	1,059	7.0	4.0	96.0	0.0	0.0
University Hospitals Birmingham NHS Foundation Trust	23	2,400	7.0	49.8	46.0	4.2	0.0
Royal Cornwall Hospitals NHS Trust	25	2,345	7.0	7.8	92.2	0.0	0.0
Manchester University NHS Foundation Trust	26	3,781	7.0	6.6	90.8	0.0	2.5
King's College Hospital NHS Foundation Trust	27	3,091	6.0	54.0	46.0	0.0	0.0
The Hillingdon Hospitals NHS Foundation Trust	30	854	7.0	26.5	57.7	15.8	0.0
Liverpool University Hospitals NHS Foundation Trust	31	3,403	6.0	23.3	76.2	0.0	0.5
Royal United Hospitals Bath NHS Foundation Trust	32	1,598	7.0	26.9	47.4	4.0	21.7
Chesterfield Royal Hospital NHS Foundation Trust	33	1,204	5.0	89.5	10.5	0.0	0.0

Appendix 14 table continued: Median number of injections to month 12 and the profession of the injector at each participating organisation

Centre name	Centre number	Number of injections	Median number of injections	Percentage of injections given by			
				Doctors	Nurses	Other healthcare professionals	Not recorded
Mid and South Essex NHS Foundation Trust	34	907	4.0	29.5	70.5	0.0	0.0
Harrogate and District NHS Foundation Trust	35	1,111	7.0	32.5	61.7	5.8	0.1
North West Anglia NHS Foundation Trust	36	2,089	7.0	59.3	36.9	3.9	0.0
Royal Devon University Healthcare NHS Foundation Trust	37	1,188	7.0	18.6	81.4	0.0	0.0
Wirral University Teaching Hospital NHS Foundation Trust	39	1,325	4.0	29.4	70.6	0.0	0.0
South Warwickshire University NHS Foundation Trust	40	1,629	8.0	3.9	96.1	0.0	0.0
Isle of Wight NHS Trust	41	536	4.0	51.5	0.0	0.0	48.5
Wrightington, Wigan and Leigh NHS Foundation Trust	43	959	6.0	31.9	62.5	5.6	0.0
Warrington and Halton Teaching Hospitals NHS Foundation Trust	44	1,289	7.0	0.5	90.9	8.6	0.0
Barking, Havering and Redbridge University Hospitals NHS Trust	47	1,346	7.0	37.8	60.0	2.2	0.0
Royal Free London NHS Foundation Trust	48	1,744	6.0	15.0	80.3	0.3	4.4
Salisbury NHS Foundation Trust	51	1,105	7.0	60.5	15.7	23.8	0.0
Yeovil District Hospital NHS Foundation Trust	56	1,006	7.0	68.3	31.7	0.0	0.0
SpaMedica – Manchester	57	304	8.0	6.9	6.9	15.1	71.1
East Sussex Healthcare NHS Trust	59	2,626	7.0	12.2	51.3	35.9	0.5
County Durham and Darlington NHS Foundation Trust	67	1,617	8.0	37.5	61.6	0.9	0.0
Great Western Hospitals NHS Foundation Trust	78	1,633	8.0	10.0	80.9	9.1	0.0
The Princess Alexandra Hospital NHS Trust	80	721	5.0	14.0	69.1	0.0	16.9
Practice Plus Group Surgical Centre, Gillingham	91	324	5.0	97.2	2.2	0.0	0.6
Practice Plus Group Ophthalmology, Rochdale	95	2,977	6.0	0.7	81.2	0.0	18.2
North Middlesex University Hospital NHS Trust	98	237	6.0	33.8	66.2	0.0	0.0
Surrey and Sussex Healthcare NHS Trust	101	1,575	7.0	39.1	60.6	0.0	0.3
SpaMedica – Birmingham	104	4,013	7.0	2.1	0.7	4.8	92.4
East Cheshire NHS Trust	108	1,274	4.0	51.0	43.6	5.3	0.0
Guy's and St Thomas' NHS Foundation Trust	110	2,137	6.0	3.1	63.8	33.0	0.0

Appendix 14 table continued: Median number of injections to month 12 and the profession of the injector at each participating organisation

Centre name	Centre number	Number of injections	Median number of injections	Percentage of injections given by			
				Doctors	Nurses	Other healthcare professionals	Not recorded
SpaMedica – West Lancashire	113	497	7.0	2.0	8.7	33.8	55.5
Somerset NHS Foundation Trust	114	1,698	6.0	0.6	79.6	19.3	0.5
Medical specialists group Guernsey	115	382	6.0	100.0	0.0	0.0	0.0
Hywel Dda University Local Health Board	116	7,558	6.0	23.3	72.5	4.2	0.0
Kettering General Hospital NHS Foundation Trust	120	1,400	6.0	42.4	57.6	0.0	0.0
Optegra Eye Health Care (Manchester Eye Hospital)	131	1,910	8.0	10.7	89.3	0.0	0.0
Optegra Eye Health Care (Yorkshire Eye Hospital)	134	208	7.0	38.5	61.5	0.0	0.0
SpaMedica – Coventry	140	412	8.0	15.5	14.3	7.3	62.9
West Suffolk NHS Foundation Trust	154	8,047	6.0	79.3	20.7	0.0	0.0
Northern Care Alliance NHS Foundation Trust	155	1,421	5.0	0.8	99.2	0.0	0.0
Belfast Health and Social Care Trust	189	3,108	5.0	28.1	63.0	8.9	0.0
NHS Grampian	190	2,291	7.0	19.8	62.2	14.2	3.7
Hull University Teaching Hospitals NHS Trust	191	2,926	9.0	34.2	49.5	0.0	16.3
NHS Tayside	192	1,543	6.0	0.2	89.7	0.0	10.1
Western Health and Social Care Trust	193	1,554	7.0	5.0	95.0	0.1	0.0
Total		**129,066**	**7.0**	**29.3**	**58.7**	**6.2**	**5.8**

Appendix 15: Visual acuity over one year of treatment

a) Visual acuity over the first year of treatment for first, second and ISBIVT

	First treated eyes		Second treated		ISBIVT/Bilateral		Overall	
Treatment month	N	Median VA	N	Median VA	N	Median VA	N	Median VA
Baseline	10,906	55.0	3,445	65.0	2,237	60.0	16,588	60.0
1	7,347	60.0	2,583	67.0	1,304	60.0	11,234	62.0
2	7,517	61.0	2,546	68.0	1,494	64.0	11,557	64.0
3	4,969	61.0	1,708	68.0	897	64.0	7,574	64.0
4	7,151	63.0	2,339	70.0	1,313	65.0	10,803	65.0
5	5,049	62.0	1,733	69.0	952	63.5	7,734	65.0
6	6,080	64.0	1,984	70.0	1,263	65.0	9,327	65.0
7	5,387	62.0	1,872	69.0	979	63.0	8,238	65.0
8	5,412	64.0	1,850	69.0	1,094	65.0	8,356	65.0
9	5,407	64.0	1,760	69.0	1,041	64.0	8,208	65.0
10	5,151	65.0	1,771	69.0	1,090	64.0	8,012	65.0
11	5,121	63.0	1,758	70.0	977	64.0	7,856	65.0
12	5,098	65.0	1,712	69.0	1,069	65.0	7,879	65.0
13	5,471	65.0	1,919	69.0	1,053	63.0	8,443	65.0
Overall	**86,066**	**61.0**	**28,980**	**63.0**	**16,763**	**68.0**	**131,809**	**64.0**

Appendix 15 table continued: Visual acuity over one year of treatment

b) Visual acuity over the first year of treatment by baseline VA for first, second and ISBIVT eyes

		First treated eyes		Second treated		ISBIVT/Bilateral		Overall	
Treatment month	Baseline VA	N	Median VA	N	Median VA	N	Median VA	N	Median VA
Baseline	<35	2,134	26.0	321	30.0	364	30.0	2,820	27.0
	36-55	3,353	48.0	812	50.0	613	47.0	4,783	49.0
	56-69	2,805	62.0	975	64.0	617	62.0	4,404	62.0
	≥70	2,614	75.0	1,337	75.0	643	75.0	4,601	75.0
1	<35	1,467	32.0	231	32.0	216	30.0	1,915	32.0
	36-55	2,302	53.0	607	55.0	372	53.0	3,283	54.0
	56-69	1,896	65.0	729	65.0	378	65.0	3,005	65.0
	≥70	1,682	75.0	1,016	75.0	338	75.0	3,037	75.0
2	<35	1,442	35.0	228	35.0	245	32.0	1,916	34.0
	36-55	2,309	55.0	580	55.0	399	54.0	3,292	55.0
	56-69	1,942	66.0	720	67.0	415	65.0	3,081	66.0
	≥70	1,824	75.0	1,018	75.0	435	75.0	3,279	75.0
3	<35	943	32.0	149	32.0	150	31.0	1,243	32.0
	36-55	1,502	55.0	397	54.0	227	55.0	2,129	55.0
	56-69	1,270	65.0	488	67.0	261	65.0	2,019	65.0
	≥70	1,254	75.0	674	75.0	259	75.0	2,190	75.0
4	<35	1,273	35.0	186	33.0	206	32.5	1,665	35.0
	36-55	2,194	55.0	531	55.0	347	53.0	3,075	55.0
	56-69	1,931	67.0	679	68.0	367	65.0	2,984	67.0
	≥70	1,753	75.0	943	75.0	393	75.0	3,092	75.0
5	<35	956	35.0	148	33.0	156	33.0	1,260	34.0
	36-55	1,565	55.0	409	55.0	265	55.0	2,241	55.0
	56-69	1,305	67.0	482	68.0	253	65.0	2,043	67.0
	≥70	1,223	75.0	694	75.0	278	75.0	2,199	75.0

Appendix 15 table continued: Visual acuity over one year of treatment

b) Visual acuity over the first year of treatment by baseline VA for first, second and ISBIVT eyes

		First treated eyes		Second treated		ISBIVT/Bilateral		Overall	
Treatment month	Baseline VA	N	Median VA	N	Median VA	N	Median VA	N	Median VA
6	<35	1,063	35.0	144	32.0	199	30.0	1,406	35.0
	36-55	1,876	55.0	465	55.0	321	55.0	2,666	55.0
	56-69	1,627	67.0	567	69.0	364	65.0	2,562	68.0
	≥70	1,514	75.0	808	75.0	379	75.0	2,701	75.0
17	<35	1,020	35.0	161	35.0	163	32.0	1,344	35.0
	36-55	1,649	55.0	426	55.0	274	55.0	2,350	55.0
	56-69	1,421	68.0	527	67.0	273	66.0	2,227	68.0
	≥70	1,297	75.0	758	75.0	269	75.0	2,327	75.0
8	<35	951	35.0	145	31.0	163	34.0	1,259	35.0
	36-55	1,652	55.0	419	55.0	302	55.0	2,376	55.0
	56-69	1,464	68.0	525	67.0	317	65.0	2,311	67.0
	≥70	1,345	75.0	761	75.0	312	75.0	2,419	75.0
9	<35	885	35.0	148	32.0	159	31.0	1,192	33.0
	36-55	1,737	55.0	405	54.0	275	55.0	2,420	55.0
	56-69	1,406	68.0	505	68.0	310	65.0	2,224	67.0
	≥70	1,379	75.0	702	75.0	297	75.0	2,378	75.0
10	<35	876	35.0	143	30.0	195	32.0	1,214	34.0
	36-55	1,548	55.0	380	55.0	281	53.0	2,212	55.0
	56-69	1,430	69.0	518	67.0	304	65.0	2,254	68.0
	≥70	1,297	75.0	730	75.0	310	75.0	2,340	75.0
11	<35	863	35.0	120	32.0	151	33.0	1,134	34.0
	36-55	1,638	55.0	384	54.0	272	55.0	2,296	55.0
	56-69	1,398	67.0	539	66.0	276	67.0	2,217	67.0
	≥70	1,222	75.0	715	75.0	278	75.0	2,217	75.0

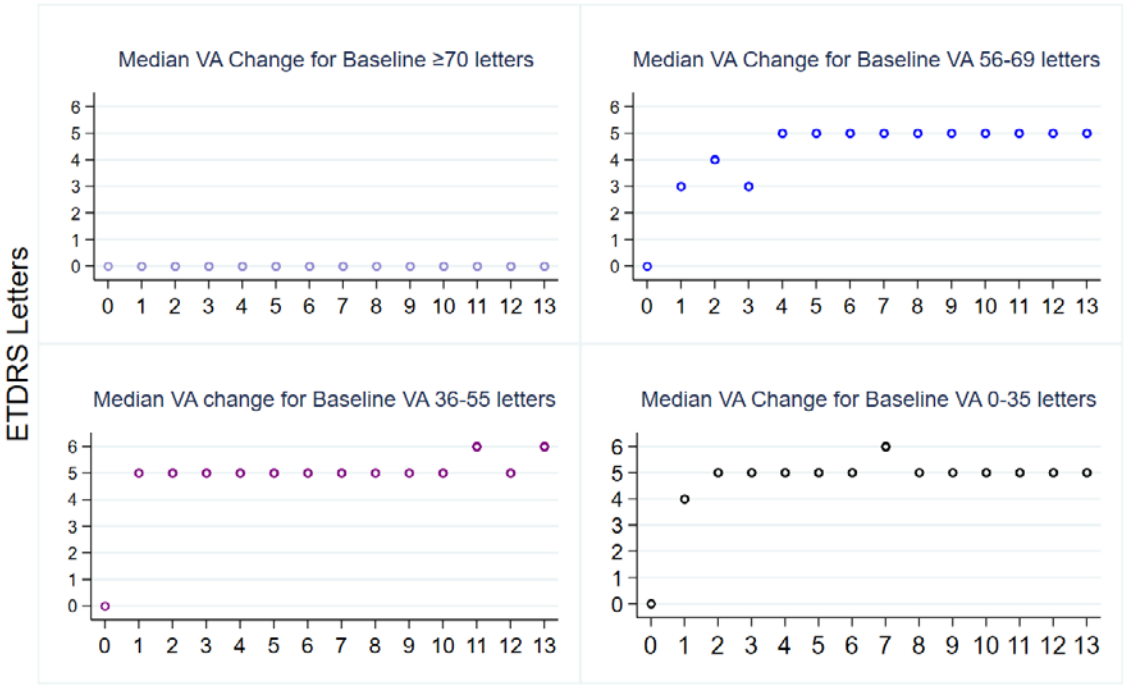
Appendix 15 table continued: Visual acuity over one year of treatment

b) Visual acuity over the first year of treatment by baseline VA for first, second and ISBIVT eyes

		First treated eyes		Second treated		ISBIVT/Bilateral		Overall	
12	<35	865	35.0	147	30.0	158	31.0	1,170	33.0
	36-55	1,536	55.0	393	55.0	263	51.0	2,194	55.0
	56-69	1,368	69.0	478	68.0	313	65.0	2,160	68.0
	≥70	1,329	75.0	694	75.0	335	74.0	2,358	75.0
13	<35	879	35.0	140	30.0	168	31.0	1,187	34.0
	36-55	1,710	55.0	408	53.0	306	54.5	2,427	55.0
	56-69	1,517	69.0	585	67.0	276	65.0	2,383	68.0
	≥70	1,365	75.0	786	75.0	303	74.0	2,456	75.0
Overall	**<35**	**15,617**	**33.0**	**2,411**	**31.0**	**2,693**	**31.0**	**20,721**	**32.0**
	36-55	**26,571**	**54.0**	**6,616**	**54.0**	**4,517**	**52.0**	**37,704**	**54.0**
	56-69	**22,780**	**65.0**	**8,317**	**65.0**	**4,724**	**65.0**	**35,821**	**65.0**
	≥70	**21,098**	**75.0**	**11,636**	**75.0**	**4,829**	**75.0**	**37,563**	**75.0**

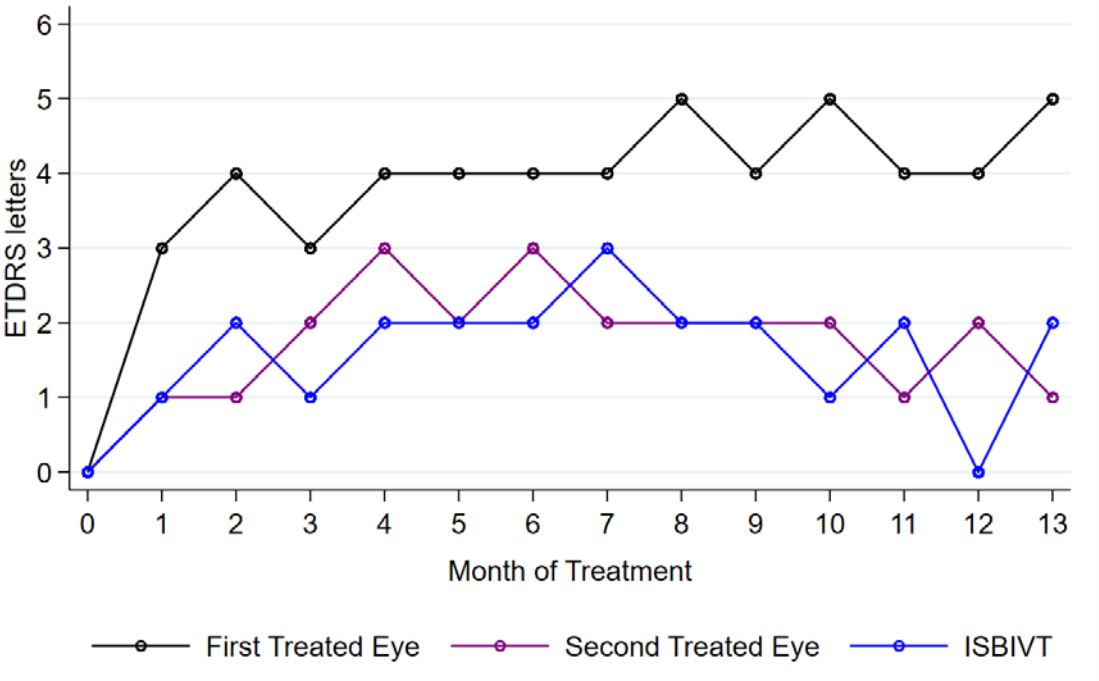
Appendix 15 table continued: Visual acuity over one year of treatment

c) Median change in visual acuity from baseline over the first year of treatment for baseline visual acuity levels



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

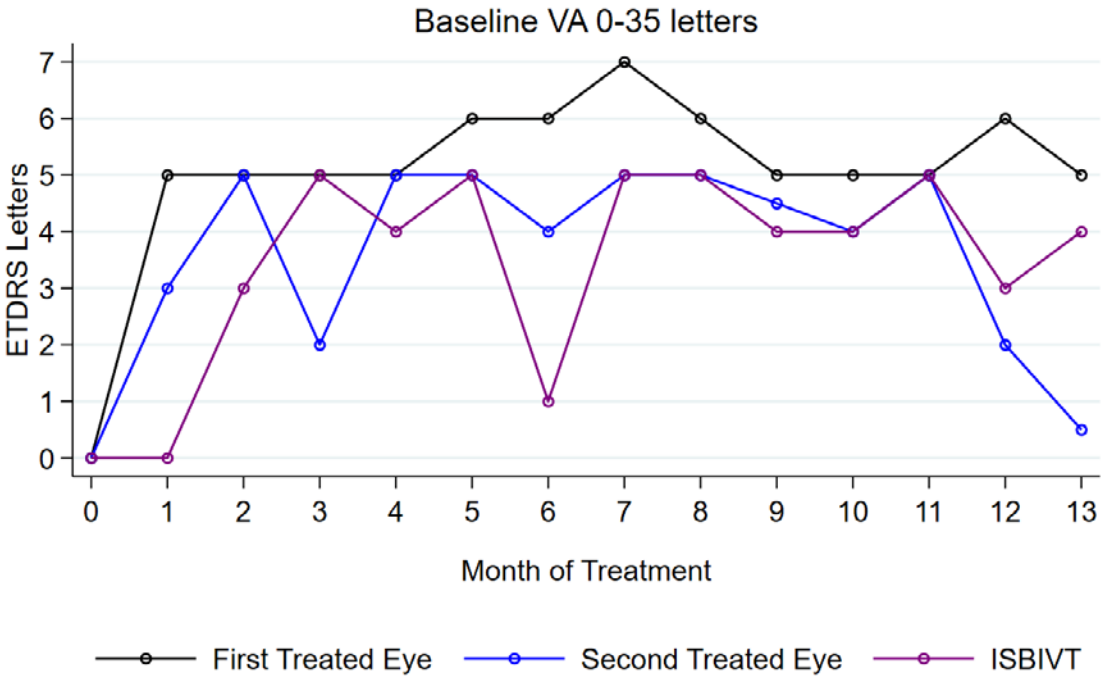
d) Median change in visual acuity from baseline over the first year of treatment for first treated, second and ISBIVT eyes



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

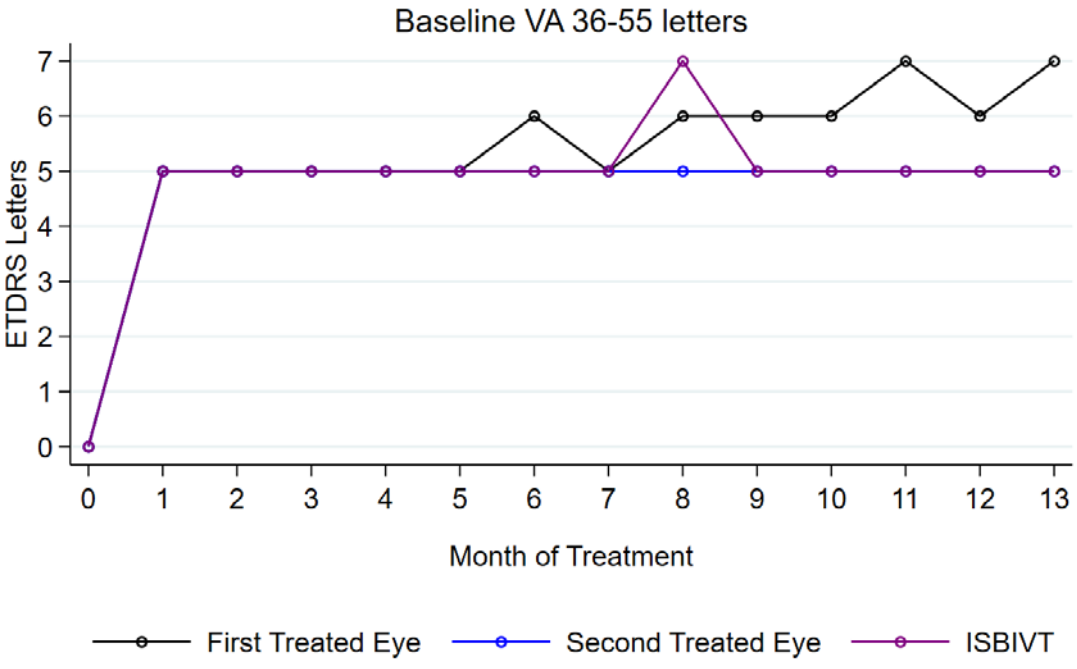
Appendix 15 table continued: Visual acuity over one year of treatment

e) Median change in visual acuity from baseline over the first year of treatment for first, second and ISBIVT eyes with a baseline VA of 0-35 letters



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

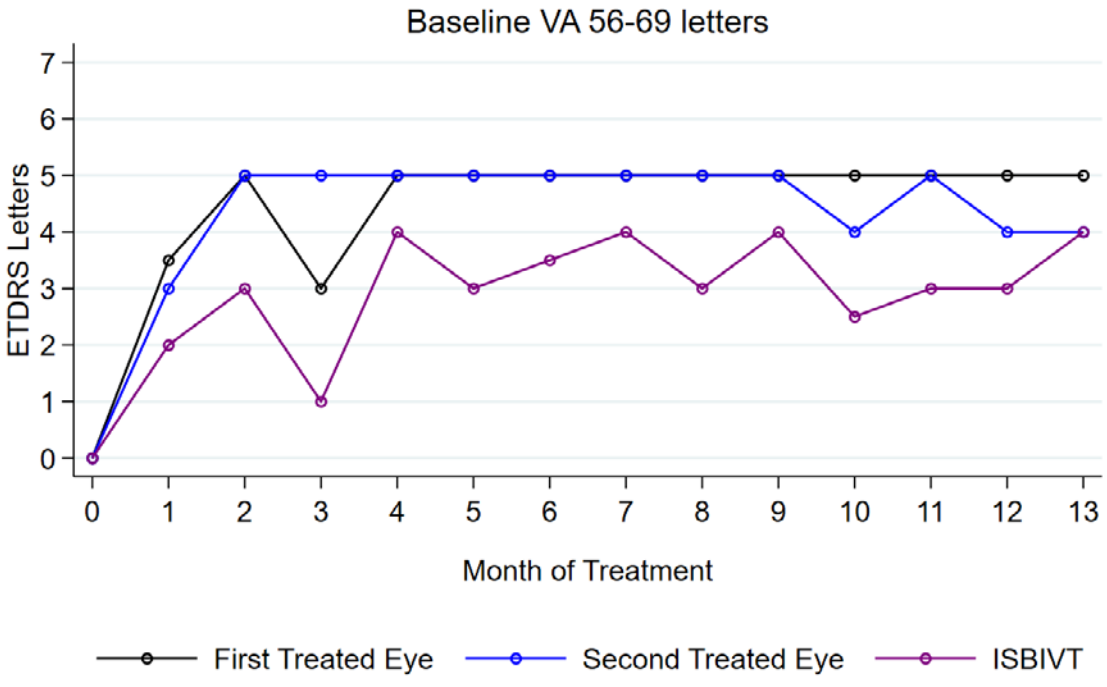
f) Median change in visual acuity from baseline over the first year of treatment for first, second treated ISBIVT eyes with a baseline VA of 36-55 letters



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

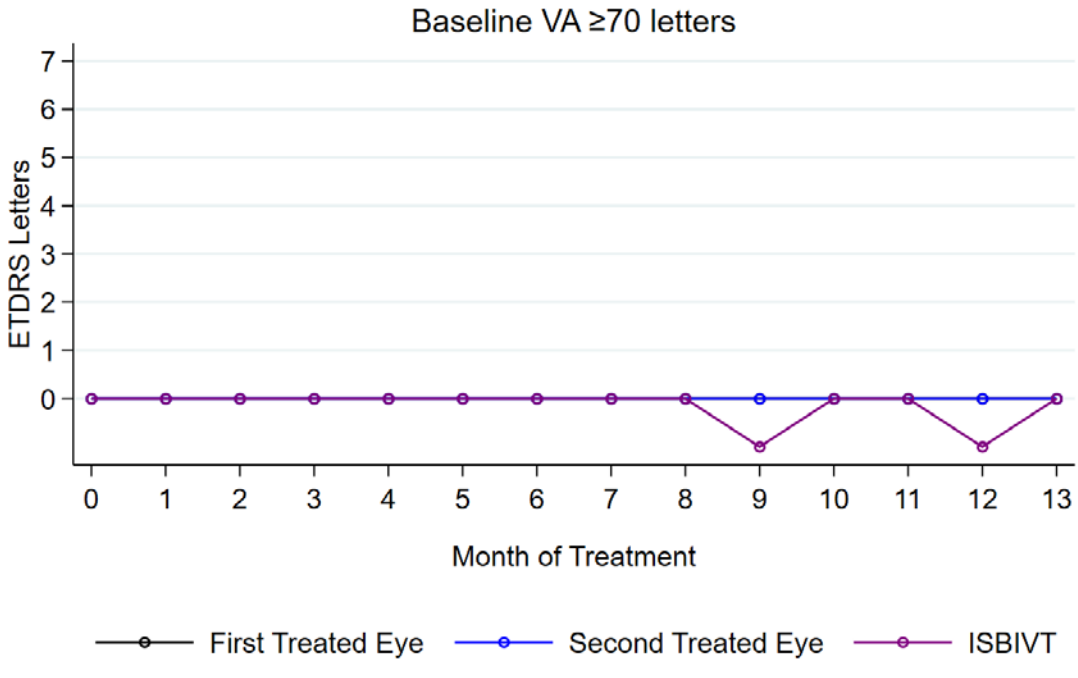
Appendix 15 table continued: Visual acuity over one year of treatment

g) Median change in visual acuity from baseline over the first year of treatment for first, second and ISBIVT eyes with a baseline VA of 56-69 letters



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

h) Median change in visual acuity from baseline over the first year of treatment for first, second and ISBIVT eyes with a baseline VA of 70 or more letters



The 2020 NHS year ran from 01 April 2020 to 31 March 2021

Appendix 15 table continued: Visual acuity over one year of treatment

i) Visual acuity over the first year of treatment by age

		First treated eyes		Second treated		ISBIVT/Bilateral		Overall	
Treatment	Age in years	N	Median VA	N	Median VA	N	Median VA	N	Median VA
Baseline	<70	1,464	60.0	285	67.0	242	65.0	1,991	61.0
	70-74	1,500	60.0	377	66.0	292	60.0	2,169	60.0
	75-79	2,235	58.0	657	67.0	465	60.0	3,357	60.0
	80-85	2,523	55.0	866	65.0	504	58.0	3,893	60.0
	≥85	3,184	54.0	1,260	60.0	734	59.0	5,178	55.0
1	<70	1,048	65.0	225	69.0	170	70.0	1,443	65.0
	70-74	1,038	65.0	281	70.0	181	62.0	1,500	65.0
	75-79	1,510	61.0	499	70.0	281	62.0	2,290	65.0
	80-85	1,699	60.0	646	68.0	284	60.0	2,629	61.0
	≥85	2,052	55.0	932	65.0	388	59.5	3,372	60.0
2	<70	1,025	66.0	221	70.0	175	69.0	1,421	68.0
	70-74	1,088	65.0	283	70.0	185	68.0	1,556	65.5
	75-79	1,550	64.0	484	70.0	324	65.0	2,358	65.0
	80-85	1,717	60.0	658	70.0	337	65.0	2,712	64.0
	≥85	2,137	57.0	900	65.0	473	60.0	3,510	60.0
3	<70	756	67.0	157	70.0	122	69.5	1,035	68.0
	70-74	659	65.0	197	73.0	122	60.5	978	65.0
	75-79	1,006	64.0	309	70.0	175	63.0	1,490	65.0
	80-85	1,135	61.0	443	70.0	202	64.5	1,780	65.0
	≥85	1,413	55.0	602	65.0	276	60.0	2,291	60.0
4	<70	960	67.0	195	72.0	146	70.0	1,301	69.0
	70-74	1,039	65.0	266	70.0	161	68.0	1,466	67.0
	75-79	1,502	65.0	436	70.0	285	65.0	2,223	65.0
	80-85	1,678	63.0	598	70.0	322	62.5	2,598	65.0
	≥85	1,972	58.0	844	65.0	399	60.0	3,215	60.0

Appendix 15 table continued: Visual acuity over one year of treatment

i) Visual acuity over the first year of treatment by age

		First treated eyes		Second treated		ISBIVT/Bilateral		Overall	
Treatment	Age in years	N	Median VA	N	Median VA	N	Median VA	N	Median VA
5	<70	741	67.0	152	72.0	132	70.0	1,025	70.0
	70-74	715	65.0	198	71.0	136	64.0	1,049	68.0
	75-79	1,030	64.0	324	70.0	185	65.0	1,539	65.0
	80-85	1,154	61.0	467	69.0	194	63.5	1,815	65.0
	≥85	1,409	57.0	592	65.0	305	60.0	2,306	60.0
6	<70	821	69.0	167	74.0	136	69.0	1,124	70.0
	70-74	918	65.0	222	70.0	172	65.0	1,312	67.0
	75-79	1,260	65.0	390	70.0	275	65.0	1,925	65.0
	80-85	1,471	61.0	512	70.0	298	65.0	2,281	65.0
	≥85	1,610	59.0	693	65.0	382	60.0	2,685	60.0
7	<70	766	67.0	153	71.0	116	70.0	1,035	69.0
	70-74	741	67.0	208	70.0	134	65.0	1,083	68.0
	75-79	1,151	65.0	369	70.0	182	64.0	1,702	65.0
	80-85	1,217	61.0	502	70.0	240	61.5	1,959	64.0
	≥85	1,512	56.5	640	65.0	307	60.0	2,459	60.0
8	<70	776	69.0	160	73.0	130	70.0	1,066	70.0
	70-74	803	67.0	218	70.0	157	68.0	1,178	69.0
	75-79	1,154	65.0	377	70.0	257	63.0	1,788	65.0
	80-85	1,291	63.0	473	70.0	234	65.0	1,998	65.0
	≥85	1,388	58.0	622	65.0	316	60.0	2,326	60.0
9	<70	784	69.0	144	73.0	112	70.0	1,040	70.0
	70-74	773	66.0	204	73.5	150	65.0	1,127	68.0
	75-79	1,115	65.0	336	70.0	192	65.0	1,643	65.0
	80-85	1,276	63.0	493	70.0	252	64.0	2,021	65.0
	≥85	1,459	60.0	583	65.0	335	60.0	2,377	60.0

Appendix 15 table continued: Visual acuity over one year of treatment

i) Visual acuity over the first year of treatment by age

		First treated eyes		Second treated		ISBIVT/Bilateral		Overall	
Treatment	Age in years	N	Median VA	N	Median VA	N	Median VA	N	Median VA
10	<70	716	69.0	158	72.0	104	69.0	978	70.0
	70-74	778	68.5	197	70.0	154	66.5	1,129	70.0
	75-79	1,135	65.0	364	70.0	249	65.0	1,748	65.0
	80-85	1,201	63.0	457	70.0	272	63.0	1,930	65.0
	≥85	1,321	60.0	595	65.0	311	60.0	2,227	60.0
11	<70	721	69.0	151	73.0	116	70.5	988	70.0
	70-74	742	67.0	206	75.0	130	69.0	1,078	69.0
	75-79	1,069	65.0	349	70.0	198	65.0	1,616	65.0
	80-85	1,221	63.0	461	70.0	233	62.0	1,915	65.0
	≥85	1,368	58.0	591	65.0	300	59.5	2,259	60.0
12	<70	719	69.0	153	75.0	100	70.0	972	70.0
	70-74	750	68.5	204	70.0	134	69.5	1,088	69.5
	75-79	1,101	65.0	329	70.0	247	65.0	1,677	65.0
	80-85	1,193	65.0	457	69.0	268	64.5	1,918	65.0
	≥85	1,335	59.0	569	65.0	320	60.0	2,224	60.0
13	<70	788	70.0	156	70.0	116	70.0	1,060	70.0
	70-74	810	68.0	227	70.0	140	65.0	1,177	68.0
	75-79	1,157	65.0	383	70.0	211	65.0	1,751	65.0
	80-85	1,310	65.0	508	70.0	260	64.0	2,078	65.0
	≥85	1,406	59.0	645	65.0	326	59.5	2,377	60.0
Overall	**<70**	**12,085**	**66.0**	**2,477**	**70.0**	**1,917**	**70.0**	**16,479**	**68.0**
	70-74	**12,354**	**65.0**	**3,288**	**70.0**	**2,248**	**65.0**	**17,890**	**65.0**
	75-79	**17,975**	**64.0**	**5,606**	**70.0**	**3,526**	**65.0**	**27,107**	**65.0**
	80-85	**20,086**	**60.0**	**7,541**	**69.0**	**3,900**	**62.0**	**31,527**	**64.0**
	≥85	**23,566**	**56.0**	**10,068**	**65.0**	**5,172**	**60.0**	**38,806**	**60.0**

Appendix 15 table continued: Visual acuity over one year of treatment

j) Median change in visual acuity from baseline over the first year of treatment for age at the start of treatment

The 2020 NHS year ran from 01 April 2020 to 31 March 2021

Appendix 16: The percentage of eyes with each ocular co-pathology / concomitant eye disease for the 2018, 2019 and 2020 NHS years

Ocular co-pathology / concomitant eye disease	2018 NHS year	2019 NHS year	2020 NHS year
Other macular pathology	9.3	8.4	7.9
Diabetic retinopathy	6.5	6.0	6.6
Other retinal vascular pathology	5.8	5.7	5.6
Glaucoma	5.1	5.1	4.6
Corneal pathology	1.7	1.9	3.7
Previous vitrectomy surgery	1.4	1.6	1.7
High myopia	1.6	1.6	1.4
Optic nerve / CNS disease	2.1	2.2	1.9
Amblyopia	0.7	0.8	0.6
No fundal view / Vitreous opacity	0.8	0.9	0.6
Pseudoexfoliation / Phacodonesis	0.3	0.4	0.4
Uveitis / Synechiae	0.4	0.5	0.3
Previous trabeculectomy surgery	0.4	0.5	0.3
Unspecified 'other' co-pathology	32.1	34.8	32.5

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