NOD Age-related Macular Degeneration (AMD) Audit Visual Outcomes Statistical Models

Third year of the prospective RCOphth NOD AMD Audit

June 2025

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1 Abbreviations

Abbreviation	Description
AUROC	Area under the receiver operator curve
AMD	Age-related Macular Degeneration
CI	Confidence Interval
ETDRS	Early Treatment Diabetic Retinopathy Study
EMR	Electronic Medical Record
GIRFT	Getting It Right First Time Programme
NHS	National Health Service
NOD	National Ophthalmology Database
RCOphth	The Royal College of Ophthalmologists
UK	United Kingdom
VA	Visual Acuity
VEGF	Vascular Endothelial Growth Factor

2 Acknowledgements and Funding

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 AMD Audit has relevance for not only the professional readership but also patients, their relatives and carers.

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.

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.

Funding

Roche Products Limited have provided funding to support the conduct of this study. Roche Products Limited has had no further involvement in the project. The project has been supported by an unrestricted, hands-off grant provided by Bayer plc. Bayer plc has no involvement whatsoever in the development or implementation of the project. We are grateful for the funding received from these organisations. We also receive ongoing support through subscription fees from participating hospitals.

3 Introduction

The Royal College of Ophthalmologists (RCOphth) is the governing authority for the National Ophthalmology Database Audit (NOD) and conducts The National AMD Audit on data concerning wet AMD treatment. The audit is open to all NHS Trusts and independent sector providers of NHS funded treatment for wet AMD in England, Scotland, Northern Ireland, Wales and the Channel Islands. The data is collected as part of routine clinical care on electronic medical record (EMR) systems or in-house data collection systems and the analysis is performed by the RCOphth NOD Audit statisticians based in Cheltenham General Hospital.

For the RCOphth NOD AMD audit, one aim is to include results using different approaches for assessing and comparing visual acuity (VA) outcomes after one year of treatment. There are two statistical models that were agreed with the RCOphth AMD audit advisory group to build for inclusion in the second audit year annual report. This document provides information for both statistical models. The two models are:

- Achieving ‘good’ VA at one year - assessed by the percentage of eyes with VA ≥70 ETDRS letters at the end of the first year of treatment.
- Experiencing a ‘poor’ VA outcome at one year - assessed by the percentage of eyes with a decrease of ≥10 ETDRS letters between baseline and the end of the first year of treatment.

4 Statistical methods

Data were extracted from centres that participated in the first two NOD AMD Audit years. For both models, the same model fitting approach was adopted using logistic regression with the model estimates applied to the third AMD Audit year results.

The samples were three NHS years of eyes starting treatment in any of the 2020, 2021 or 2022 NHS years (01/04/2020 to 31/03/2023) who all completed their first year of treatment. Eyes were excluded from model samples for the following reasons:

- Not completing the first year of treatment
- Missing baseline and/or one year VA measurements
- Missing age at start of treatment
- Missing patient gender
- All data from a centre with <25 eyes satisfying the above criteria

Univariate analysis used Chi square tests for binary and categorical covariates, and univariate logistic regression for continuous covariates. Variables considered statistically significant from univariate testing at the 10% level were considered in the multivariate model.

Potentially relevant covariates identified from univariate analysis were fitted to logistic regression models using a 5% threshold and stepwise selection from the 'full' model consisting of all variables identified from the univariate analysis to the 'best fitting' model. Robust standard errors were calculated using cluster adjustment where the individual patients were considered as clusters.

Covariates considered in the modelling:

All potentially relevant covariates considered in the univariate analysis are either patient factors or ocular factors, Table 1 Univariate analysis identifies each covariate for consideration in the logistic regression analysis, and this is done separately for both models as the two models use different outcomes. It is possible for a covariate to be significant at the univariate level for one model and not for the other. In this situation, the covariate is considered in the regression analysis for the model where it was significant at the univariate level, and not for the regression analysis where it was not significant at the univariate level.

Table 1: Covariates for consideration in the visual acuity outcomes logistic regression models

Variable	Categorisation	Additional information
Patient variables		
Age at surgery	Continuous	
Gender	Female Male	
Diabetic Status at first injection	Diabetic Not Diabetic	
Eye variables		
First treated eye	No Yes	Immediately sequential Bilateral treatment can be included with “Yes” for both eyes under the assumption that any difference in the outcome likelihood between a first and second treated eye does not apply.
Baseline Visual Acuity (ETDRS Letters)	Continuous	
Completing the Loading Phase in less than 10 weeks	No Yes	
Number of Injections	Integer	The number of injections is an integer over a discreet range.
Cataract Surgery in the treated eye before starting treatment	No Yes	

Cataract surgery in the treated eye during the first 12 months of treatment	No Yes	
Ocular co-pathology		
Diabetic Retinopathy	Absence Presence	
Glaucoma	Absence Presence	Recorded as a clinical diagnosis or when there is a record of medication used to lower intra-ocular pressure
High Myopia	Absence Presence	
Previous Vitrectomy	No Yes	Any previous operation that included a Pars Plana Vitrectomy, plus 'Retinal Detachment' as a recorded ocular co-pathology.

Covariates not considered in the modelling:

There are other possible covariates that were not considered due to issues with the currently supplied data. In the future it may be possible to update the models if the issues with the data for these covariates are resolved.

Covariates not considered:

- Socio-economic deprivation – Not all participating centres currently provide this data and there are different indices of social deprivation in each United Kingdom nation. The separate detailed analysis of the impact of social deprivation on the treatment of wet AMD within England has been performed and presented at RCOphth Congress 2025 by the audit team
- Attrition rate at the end of first year of anti-VEGF treatment – Data not currently provided
- Starting anti-VEGF treatment within 14 days of receipt of referral – There are problems with the recording of this data within the current versions of the available EMRs

- Delayed follow up – There are problems with the recording of this data within the current versions of the available EMRs
- Lesion type, size and other anatomic features – these data are not included in the extracts for the UK AMD Audit

All analysis was conducted using STATA version 18 (StataCorp. 2023. Stata Statistical Software: Release 18. College Station, TX: StataCorp LP).

5 ‘Good’ VA at one year model (VA ≥70 ETDRS letters)

The sample used to create the achieving ‘good’ VA at one year model comprised 46,342 eyes from 40,145 patients in 63 centres. For this sample, the overall observed rate of achieving ‘good’ vision was 41.2%.

For the achieving ‘good’ VA at one year model, the following covariates were not statistically significant from univariate analysis, and not considered in the multivariate model, Table 2:

- Gender
- Cataract surgery within the first 12 months of starting anti-VEGF treatment.

Table 2: Covariates under consideration in the ‘good’ VA at one year model with univariate hypothesis testing on the whole sample. Results are n (column %) for binary and categorical covariates, and median for continuous covariates

	Overall Eyes (N = 46,342)		
	Not Good VA	**Good VA**	**P-value**
Number of eyes	**27,242 (58.8)**	**19,100 (41.2)**	**N/A**
Patient variables			
Age (years) – continuous	82.0	78.0	<0.001
Gender			
Female	16,965	11,784 (41.0)	0.206
Male	10,277	7,316 (41.6)	
Diabetic Status at first injection			
No	23,245	16,631 (41.7)	<0.001
Yes	3,997	2,469 (38.2)	
Eye variables			
1st or 2nd treated eye			
1st treated eye	22,323	14,303 (39.1)	<0.001
2nd treated eye	4,919	4,797 (49.4)	
Baseline Visual Acuity - continuous	50.0	70.0	<0.001
Completing the Loading Phase in less than 10 weeks			
No	8,030	4,661 (36.7)	<0.001

Yes	19,212	14,439 (42.9)	
Number of Injections (chi2)	7.0	7.0	<0.001
Cataract Surgery in the treated eye before starting treatment			
No	21,206	15,452 (42.2)	<0.001
Yes	6,036	3,648 (37.7)	
Cataract surgery in the treated eye during the first 12 months of treatment			
No	19,055	13,571 (41.6)	0.471
Yes	5,041	3,527 (41.2)	
Ocular co-pathology / known risk indicator			
Diabetic retinopathy			
Absent	25,583	18,020 (41.3)	0.050
Present	1,659	1,080 (39.4)	
Glaucoma			
Absent	25,860	18,358 (41.5)	<0.001
Present	1,382	742 (34.)	
High Myopia			
Absent	26,850	18,782 (41.2)	0.051
Present	392	318 (44.8)	
Previous Vitrectomy Surgery			
No	26,528	18,701 (41.4)	<0.001
Yes	714	399 (35.9)	

All statistically significant covariates from the univariate analysis were taken through to model fitting, where the ‘best fitting’ achieving ‘good’ VA at one year model did not include high myopia, presence of diabetic retinopathy and first or second treated eye status.

The final ‘good’ VA at one year model had an area under the receiver operating curve (AUROC) value of 83.0% which is within the range of considered ‘excellent’ AUROC values indicating a good model fit, Figure 1 and the model covariates are shown in Table 3:

Figure 1: AUROC graph for ‘good’ VA at one year outcome model

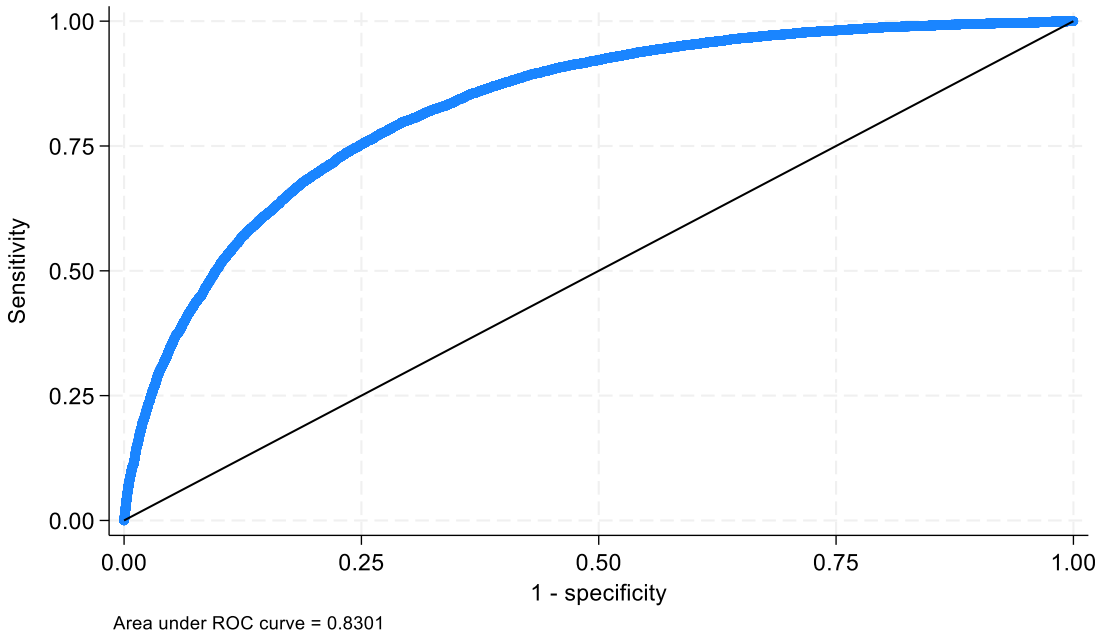


Table 3: 'good' VA at one year model estimates

Covariate	Odds Ratio	Coefficient	P-value	95% CI Odds Ratio
Age at first injection	0.965	-0.036	0.000	0.962 to 0.967
Diabetes Mellitus:				
No	Reference	0.000	N/A	N/A
Yes	0.821	-0.197	0.000	0.769 to 0.876
Baseline VA (ETDRS letters)	1.099	0.094	0.000	1.096 to 1.101
Completing the Loading Phase in less than 10 weeks:				
No	Reference	0.000	N/A	N/A
Yes	1.375	0.318	0.000	1.302 to 1.451
Previous Cataract Surgery:				
No	Reference	0.000	N/A	N/A
Yes	0.868	-0.142	0.000	0.820 to 0.919
Glaucoma				
Absent	Reference	0.000	N/A	N/A
Present	0.865	-0.146	0.009	0.775 to 0.964
Previous Vitrectomy Surgery:				
No	Reference	0.000	N/A	N/A
Yes	0.782	-0.246	0.002	0.670 to 0.912
Number of injections within first year	1.060	0.058	0.000	1.049 to 1.071
Constant	N/A	-3.659	0.000	N/A

Achieving ‘good’ VA at one year model interpretation

Within the model output, when the odds ratio is >1, this indicates that there is an increased chance of achieving ‘good’ VA after one year of treatment. If the odds ratio is <1, it indicates that there is a decreased chance of achieving ‘good’ VA.

For example, eyes completing the loading phase in less than 10 weeks of starting treatment have an odds ratio of 1.375 which indicates that the chance of achieving ‘good’ VA is 37.5% higher than for eyes that do not complete the loading phase in less than 10 weeks.

For continuous covariates such as age and baseline VA the odds ratio is for a one-unit change. For example, the odds ratio for baseline VA is 1.099 indicating that there is a 9.9% increase in the odds for each additional ETDRS letter the eye can read at baseline. The odds ratio for the patients age at the start of treatment <1 (0.965) indicates that for each additional year of age there is a reduction in the odds of achieving ‘good’ VA.

For the number of injections, the odds ratio is for a one-unit change, where the odds ratio for the number of injections administered in the first year of treatment is 1.060, indicating that there is a 6.0% increase in the odds for each additional injection administered.

6 ’Poor’ VA outcome at one year model (decrease of ≥10 ETDRS letters)

Eyes with a baseline visual acuity of ≤25 ETDRS letters are not included in the sample for the ‘poor’ VA at one year modelling and are excluded from this analysis.

The sample used to create the ‘poor’ VA at one year model comprised 37,633 eyes from 32,878 patients in 57 centres. For this sample, the overall observed rate of experiencing ‘poor’ VA at one year was 13.1%.

For the experiencing ‘poor’ VA at one year model, the following covariates were not statistically significant from univariate analysis and were not considered in the multivariate model, Table 4:

- Cataract surgery within the first 12 months of starting anti-VEGF treatment
- First or second treated eye
- Presence of diabetic retinopathy
- Presence of high myopia

Table 4: Covariates under consideration in the 'poor' VA outcome at one year model with univariate hypothesis testing on the whole sample. Results are n (column %) for binary and categorical covariates, and median for continuous covariates

	Overall Eyes (N = 46,342)		
	No Poor VA	**Poor VA**	**P-value**
Number of eyes	**5,877 (86.4)**	**37,383 (13.6)**	**N/A**
Patient variables			
Age (years) – Continuous	81.0	82.0	<0.001
Gender			
Female	23,291	3,603 (13.4)	0.143
Male	14,092	2,274 (13.9)	
Diabetic Status at first injection			
No	32,406	4,938 (13.2)	<0.001
Yes	4,977	939 (15.9)	
Eye variables			
1st or 2nd treated eye			
1st treated eye	29,278	4,600 (13.6)	0.934
2nd treated eye	8,105	1,277 (13.6)	
Baseline Visual Acuity – Continuous	60.0	60.0	<0.001
Completing the Loading Phase in less than 10 weeks			
No	9,755	1,950 (16.7)	<0.001
Yes	27,628	3,927 (12.4)	
Number of Injections (chi2)	7.0	6.0	<0.001
Cataract Surgery in the treated eye before starting treatment			
No	29,718	4,556 (13.3)	0.001
Yes	7,665	1,321 (14.7)	
Cataract surgery in the treated eye during the first 12 months of treatment			
No	26,303	4,156 (13.6)	0.267
Yes	6,931	1,051 (13.2)	

Ocular co-pathology / known risk indicator			
Diabetic retinopathy			
Absent	35,258	5,505 (41.3)	0.051
Present	2,125	372 (39.4)	
Glaucoma			
Absent	35,774	5,568 (13.5)	0.001
Present	1,609	309 (16.1)	
High Myopia			
Absent	36,800	5,802 (13.6)	0.099
Present	583	75 (11.4)	
Previous Vitrectomy Surgery			
No	36,514	5,720 (13.5)	0.104
Yes	869	157 (15.3)	

All statistically significant covariates from the univariate analysis were taken through to model fitting, where the 'best fitting' experiencing 'poor' VA at one year model did not include the patient's gender. The final 'poor' VA at one year model had an area under the receiver operating curve (AUROC) value of 60.2% which is not a particularly good AUROC value indicating limitations with model fit, Figure 2 and the model covariates are shown in Table 5:

Figure 2: AUROC graph for 'poor' VA at one year outcome model

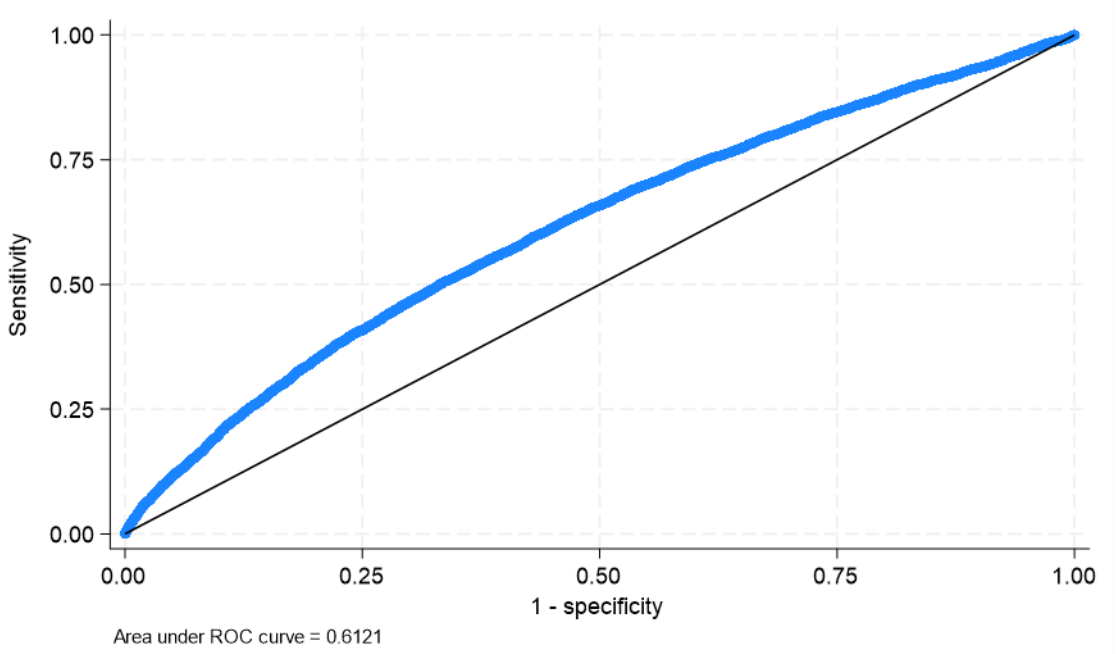


Table 5: 'Poor' VA outcome at one year model estimates

Covariate	Odds Ratio	Coefficient	P-value	95% CI Odds Ratio
Age at first injection	1.020	0.019	<0.001	1.016 to 1.023
Diabetes Mellitus:				
No	Reference	0.000	N/A	N/A
Yes	1.246	0.220	<0.001	1.153 to 1.347
Baseline VA (ETDRS letters)	0.993	-0.007	<0.001	0.991 to 0.995
Completing the Loading Phase in less than 10 weeks:				
No	Reference	0.000	N/A	N/A
Yes	0.877	-0.131	<0.001	0.823 to 0.935
Previous Cataract Surgery:				
No	Reference	0.000	N/A	N/A
Yes	1.138	0.129	<0.001	1.063 to 1.218
Glaucoma				
Absent	Reference	0.000	N/A	N/A
Present	1.159	0.148	0.024	1.020 to 1.317
Previous Vitrectomy Surgery:				
No	Reference	0.000	N/A	N/A
Yes	1.266	0.236	0.008	1.063 to 1.508
Number of injections within first year	0.878	-0.129	<0.001	0.867 to 0.890
Constant	N/A	-2.104	<0.001	N/A

Experiencing 'poor' VA outcome at one year model interpretation:

Within the model output, when the odds ratio is >1, this indicates that there is an increased chance of a decrease of ≥10 ETDRS letters at one year of treatment. If the odds ratio is <1, it indicates that there is a lower chance of a decrease of ≥10 ETDRS letters.

For example, patients with diabetes mellitus have an odds ratio of 1.246 which indicates that the chance of a decrease of ≥10 ETDSRS letters is 12.5% higher than for patients with diabetes mellitus than for patients without diabetes mellitus.

For continuous covariates such as age and baseline VA the odds ratio is for a one-unit change, for example the odds ratio for the patients age at the start of treatment is 1.020, indicating that there is a 2.0% increase in the odds for each additional year of age. As the odds ratio for baseline VA is <1, this indicates that there is a reduction in the odds of a decrease of ≥10 ETDRS letters with each additional ETDRS letter the eye could read at baseline.

For the number of injections administered in the first year of treatment, the odds ratio is <1 indicating that there is a reduction in the odds of a decrease of ≥10 ETDRS letters for each additional injection administered.

7 ‘Good’ and ‘Poor’ VA at one year model summary

The covariates that increase the chance of ‘good’ VA at one year are the same as those that decrease the chance of ‘poor’ VA at one year, and vice versa. This is understandable as increased chance of a ‘good’ VA at one year would reduce the chance of a ‘poor’ VA at one year, Table 5.

Table 5: ‘good’ and ‘poor’ VA one year model covariates that increase or decrease the chance

	‘good’ VA at one year (≥70 ETDRS letters)		‘poor’ VA at one year (decrease of ≥10 ETDRS letters)	
Covariate	**Increase chance**	**Decrease chance**	**Increase chance**	**Decrease chance**
Age at first injection:	Lower age	Higher age	Higher age	Lower age
Diabetes Mellitus:	Absence	Presence	Prescence	Absence
Baseline VA (ETDRS letters):	Better VA	Worse VA	Worse VA	Better VA
Completing the Loading Phase in less than 10 weeks:	Completing	Not completing	Not completing	Completing
Previous Cataract Surgery:	No	Yes	Yes	No
Glaucoma:	Absence	Presence	Presence	Absence
Previous Vitrectomy Surgery:	No	Yes	Yes	No
Number of injections within first year:	More injections	Fewer injections	Fewer injections	More injections

Model output results example

In the annual report, results for participating centres from these models are reported according to the following structure.

The unadjusted percentage is the observed percentage according to the data submitted to the audit. For each centre, this is calculated as the number of eyes achieving or experiencing the VA outcome divided by the number of eyes in the centres sample.

The expected percentage is estimated from the data submitted to the audit by calculating the probability of the VA outcome using the model coefficients for each eye, then summing the probabilities for each centres sample and dividing by the number of eyes in each centres sample. This provides an estimate of the percentage of eyes from each centre expected to have achieved or experienced the VA outcome and is fully dependent on the submitted data.

If a centre is not recording relevant data this will impact on their expected estimates, for example centres not accurately recording the patient's diabetes mellitus status, or if eyes have had previous cataract or vitrectomy surgery would influence the centre's expected VA outcome result. For the process for calculating the expected value for an VA outcome for an individual eye, see Section 9.

The adjusted percentage is an estimate of the VA outcome percentage adjusted for the centres sample. The approach for adjustment re-scales the ratio in terms of a comparator, which is calculated by taking the mean expected VA outcome probability from the three years of data included in the model. The adjusted VA outcome is calculated by multiplying the comparator values by the ratio of the unadjusted/expected. This calculates an adjusted percentage in terms of the underlying unadjusted VA outcome percentage.

For example, when the mean expected probability of eyes achieving 'good' VA is 41.8%, then an adjusted value of 50% would indicate that a centre performed better than overall, and an adjusted value of 33% would indicate that a centre performed worse than overall.

Example graphs for displaying results are shown below in Figure 3 for unadjusted ‘good’ VA at one year, and in Figure 4 for adjusted ‘good’ VA at one year. Confidence intervals are not displayed on the Figure 4 on the advice of the RCOphth AMD Audit advisory group not to include these.

Figure 3: Unadjusted percentage achieving ‘good’ VA at one year (≥70 ETDRS letters) for each participating centre for the 2022 NHS year.

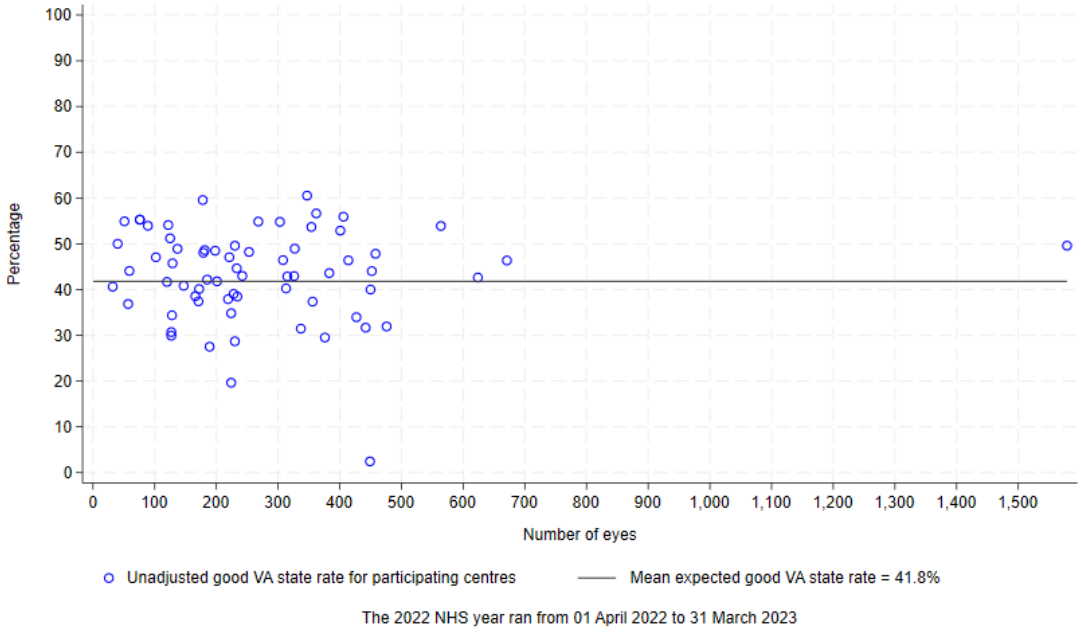
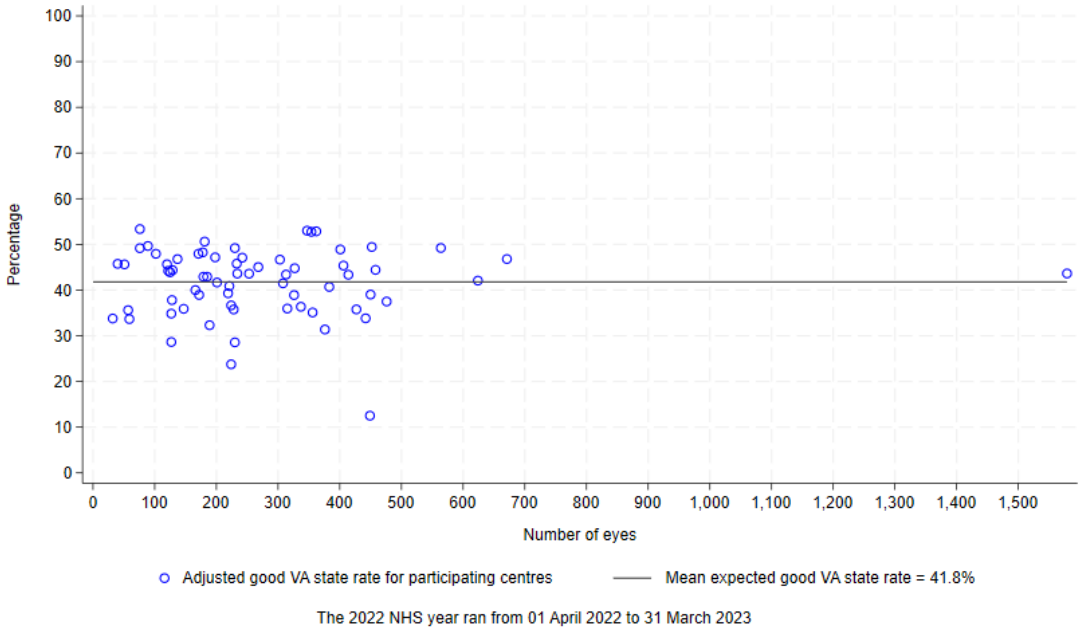


Figure 4: Adjusted percentage achieving 'good' VA at one year (≥70 ETDRS letters) for each participating centre for the 2022 NHS year.



Note, for the 'poor' VA outcome at one-year (decrease of ≥10 ETDRS letters) graphs, the interpretation for both the ratio and adjusted graphs (Figures 3 and 4) would be inverted, as achieving ≥70 ETDRS letters is a positive outcome, while a decrease of ≥10 ETDRS letters is a negative outcome.

8 Possible refinements to the VA outcomes models

The current case complexity adjusted VA outcome models are not a perfect fit to the data and could potentially be improved by the following:

- The comparator value is updated for each audit year using the three most recent NHS years to be the most recent mean expected probability VA outcome.
- There are potentially influencing risk factors that could not be investigated, such as the time between referral and starting treatment.

Any risk model can only be as good as the quality of data collected and it is unlikely that all theoretically plausible risk factors can be investigated, due to data collection, funding and time constraints. The RCOphth NOD is committed to using risk models based on scientific evidence and reflect current practice as accurately as possible. If new risk factors are discovered the RCOphth NOD will attempt with the resources available at that time to account for this new information and when time is available, the RCOphth NOD plan to re-fit the risk models.

9 Visual acuity outcomes case complexity adjustment calculation

Analysis of large data sets of AMD data allows the risk indicators for VA outcome to be identified and quantified through construction of a statistical model. This statistical model can then be 'reversed' for use as a prediction tool to calculate the predicted probability of VA outcome occurring for an individual eye on the basis of the preoperative risk indicators identified in the model. The risk indicators can be thought of as representing a measure of the 'case complexity'.

Details of case complexity adjustment method

The process of converting the VA Outcome ('good' or 'poor') risk model output into an adjusted VA outcome rate per centre is as follows:

The first two steps are on the eye level:

1: Sum the VA outcome model coefficients (including the constant term) relating to the eye to calculate Y, where Y = ∑relevant model coefficients for each eye plus the constant term.

2: Using the logit transformation convert Y to calculate Z, where Z = exp(Y) / (1 + exp(Y)) and exp = the exponential function.

3: For each centre calculate the expected VA Outcome rate (E_{VA}) where E_{VA} = ∑Z / n and

n = the number of eyes in the centre

4: Calculate the observed VA Outcome rate (O_{VA}) where O_{VA} = n_{VA} / n and

n_{VA} = the number of eyes with VA outcome per centre

n = the number of eyes in the centre

5: Calculate the adjusted VA outcome rate (A_{VA}) where

A_{VA} = comparator value multiplied by (O_{VA} / E_{VA})

To convert the adjusted VA outcome rates to the percentage scale, multiply A_{VA} by 100.

The comparator values used in AMD audit year 3 were:

- ‘good’ VA at one year = 41.8%
- ‘poor’ VA at one year = 12.5%

Example for ‘good’ VA at one year:

A baseline injection is given to an 80-year-old patient with diabetes and a baseline visual acuity of 65 letters. This patient completed the loading phase within 10 weeks, does not have glaucoma, has not had either previous cataract surgery or previous vitrectomy surgery, and over their first year of treatment, they receive 7 injections. In this case:

Y = (-0.036*80) + (- 0.197) + (0.094*65) + (0.318) + (0.058*7) + (–3.659) = 0.098.

And Z = exp(0.098) / (1 + exp(0.098)) = 0.052.

Let’s say that 5 eyes are treated in this centre with the following Z values 0.047, 0.048, 0.043, 0.050 and 0.030. For this centre the equivalent sum of the Z values would be ∑Z = 0.218 and their expected VA rate would be E_{GOODVA} = 0.218 / 5 = 0.0436 or 4.36%.

Let’s say that 2 out of 5 eyes in the centre achieved the ‘good’ VA at one year. The observed ‘good’ VA rate would be: O_{GOODVA} = 2 / 5= 0.400 or 40.0%.

For the ‘good’ VA at one year comparator value is 41.8% (the mean expected probability of achieving ‘good’ VA at one-year).

Then the adjusted VA outcome rate would be $_{AGOODVA}$ = 0.418 * (0.40/0.0436) = 0.007 or 0.73%.

Example for ‘poor’ VA at one year;

Follow the same steps outlined above using the ‘poor’ VA at one year model coeficients, the ‘poor’ VA at one year comparator value of 12.5%, and not including any eye with a baseline VA<25 ETDRS letter.

10 Audit reporting destinations

The prospective national AMD audit results are published in annual reports available on the RCOphth NOD website. A data set with results for centres is uploaded to www.data.gov.uk and can be accessed by the Getting It Right First Time Programme (GIRFT). Each year the Care Quality Commission (CQC) are contacted to discover if the CQC would like data from the AMD audit. So far, the CQC have declined this offer for each completed audit year.

Annual reports - Centre adjusted 'good' and 'poor' VA at one-year results are reported on the AMD Centre Level Results spreadsheet downloadable at RCOphth NOD website (www.nodaudit.org.uk). A minimum of 25 eligible eyes per centre is required for inclusion.

Centre observed 'good' VA at one-year results are also available behind a secure log-in for access by relevant staff in participating centres. Date searching functionality is available when the data covers a period longer than the official prospective audit period.

The aim is for clinical staff from participating centres to be able to use these results for internal audits and revalidation.

For data.gov – Once reporting of the data to all sources has been completed a data set with the latest audit results for participating centres is uploaded to www.data.gov.uk.

For GIRFT – Once the data sets have been uploaded to www.data.gov.uk, the GIRFT programme are informed so that the GIRFT team can access the data for their use.