Diabetic RetinaScreen Statistical Bulletin 2018-2019

This report was amended in August 2024. Tables 4, 6 and 7 and Figures 5, 6, and 7 were amended after we found that an update in our computer software had led to an error in the way we were counting screening outcomes.

A screening 'outcome' is the result a person gets from their screening test.

Please note this doesn't affect the results our screening participants received; all participants who went on for follow up investigation received the necessary care. It's the way we counted people after they had received diagnosis and treatment that is affected by the error.

We have put extra monitoring in place to ensure that updates to our computer software won't affect the way we count our screening outcomes in future.

An tSeirbhís Náisiúnta Scagthástála
National Screening Service

Diabetic RetinaScreen
An Clár Náisiúnta Scagthástála Reitiní do Dhiaibéitigh
The National Diabetic Retinal Screening Programme

Contents

Programme performance

The figures reported relate to clients invited by the Diabetic RetinaScreen programme for screening between 01 January 2018 and 31 December 2019. A number of these clients may have been screened in early 2020.

Programme standards, against which the performance is measured, are based on the *Standards for Quality Assurance in Diabetic Retinopathy Screening*.[1]

The data presented demonstrates the value of the programme, with a large number of patients receiving sight-saving pan-retinal laser for proliferative diabetic retinopathy. In addition, injections and focal laser treatment for maculopathy are provided for many. The programme has been a significant factor in the improvement of overall diabetic care in Ireland.

Eligible population by gender and age group

Table 1 outlines the population eligible for screening on the Diabetic RetinaScreen register on 31 December 2019, and is comprised of men, women and children aged 12 years and older with Type 1 and Type 2 diabetes. The data for previous years have been published online (https://www2.healthservice.hse.ie/organisation/nss/publications-archive/).[2,3] Of the total, 104,683 (58 per cent) were male and 75,035 (42 per cent) were female. This gender ratio is consistent with international experience.[4] The register was compiled from national health schemes, such as the medical card scheme, Drugs Payment Scheme and Long-Term Illness Scheme. The register is continuously updated by GPs who can register people with diabetes with the programme.

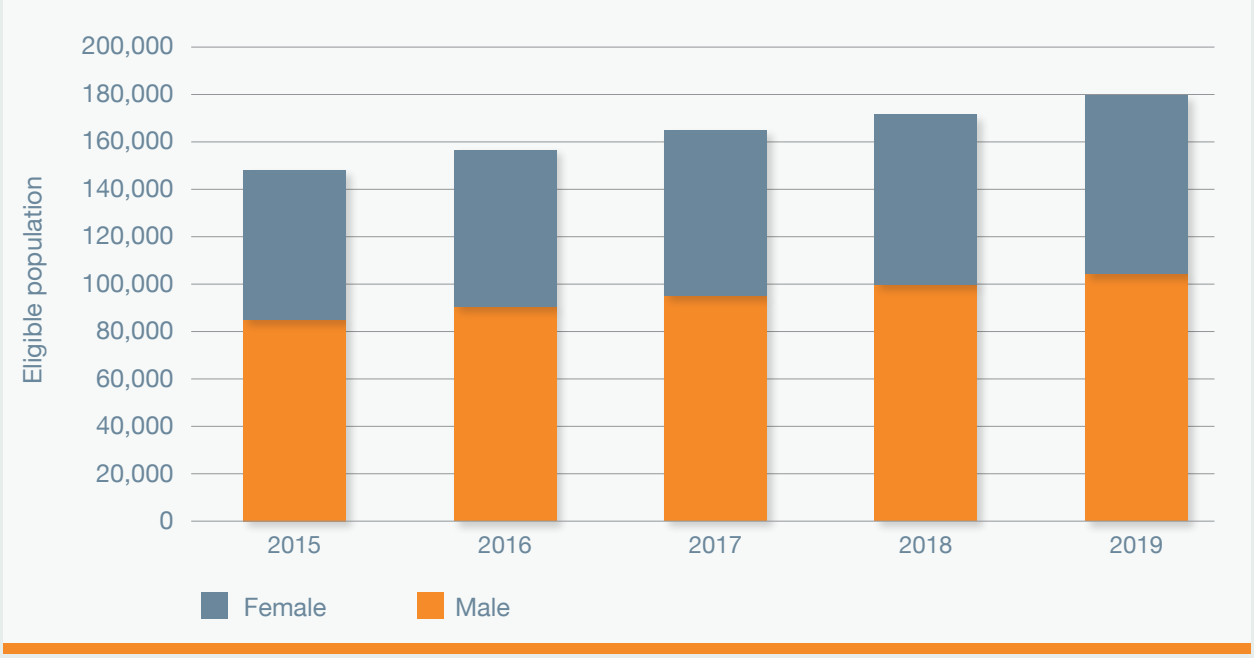
Figure 1 shows the growth in number of clients on the register since 2015. At the end of 2018 there were 171,558 men and women on the Diabetic RetinaScreen register. At the end of 2019, there were 179,718 men and women on the register. This represents a 5 per cent year-on-year increase in eligible people.

Table 1. Eligible population by gender and age group on the Diabetic RetinaScreen register*

Age	Male	Female	Totals
12-19	972	856	1,828
20-24	889	864	1,753
25-29	1,081	1,049	2,130
30-34	1,365	1,474	2,839
35-39	2,162	2,476	4,638
40-44	3,588	3,467	7,055
45-49	5,599	4,201	9,800
50-54	7,974	4,950	12,924
55-59	10,314	6,502	16,816
60-64	12,462	7,706	20,168
65-69	14,509	8,822	23,331
70-74	15,367	9,745	25,112
75-79	12,832	8,739	21,571
80-84	8,831	7,045	15,876
85+	6,738	7,139	13,877
Total	**104,683**	**75,035**	**179,718**

* *Eligible population as of 31st December 2019.*

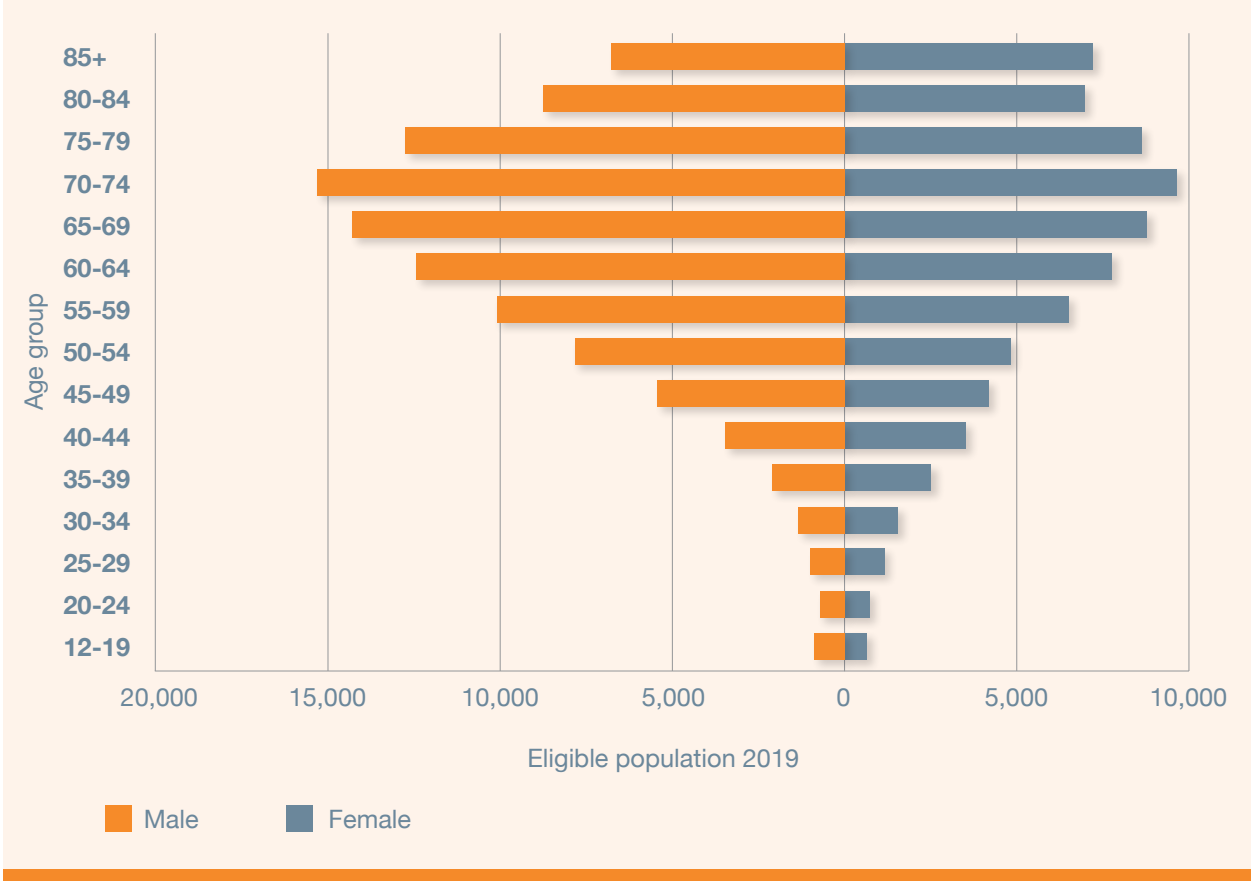
Figure 1: Eligible population on the Diabetic RetinaScreen register by year and gender



Eligible population pyramid

The population pyramid in Figure 2 shows the age distribution of known eligible clients on the Diabetic RetinaScreen register. The population pyramid highlights that diabetes mellitus is age related, with the 70-74 age group accounting for the greatest proportion of the eligible population for both males (8.6 per cent) and females (5.4 per cent). The population pyramid also highlights the gender ratio already discussed above.

Figure 2. Eligible population pyramid as of 31st December 2019



**Eligible population as of 31st December 2019*

Screening participation

During 2018 and 2019, 40,330 and 39,513 people respectively were sent a letter to participate in the programme (Table 2). These numbers include clients who have been newly registered with the programme following notification to the programme of a diagnosis of diabetes, aswell as clients who have previously been sent a letter to participate but have yet to respond. The programme issued a minimum of two letters in each screening year following registration. Participation refers to the proportion of people who attended a screening appointment out of all the eligible people who we contacted that year (i.e. people who were invited to consent to take part in DRS and people who had already consented to take part who were offered an appointment). Acceptance is the proportion of people who attended a screening appointment out of all the people who had consented to take part in DRS and were offered an appointment.

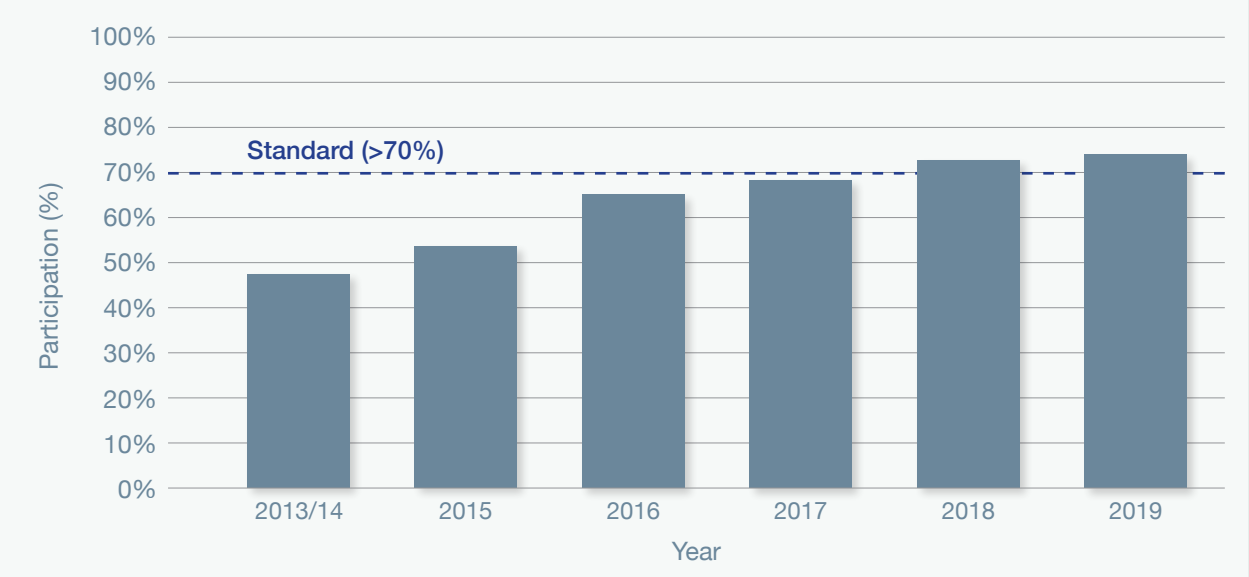
During 2018 and 2019, 14,205 and 15,105 eligible clients respectively consented to take part in the programme. Following consent, clients are offered a screening appointment at a designated location. In addition, clients who have attended previously (and were not in treatment) are offered a screening appointment in the following year. There was almost an 8 per cent increase in eligible clients invited for screening between 2018 and 2019, rising from 114,196 to 123,028. A similar increase (9 per cent) was seen in the numbers screened during both years, rising from 101,655 in 2018 to 110,850 in 2019. In 2018, 72.4 per cent (101,655 of 140,321) of the total eligible cohort who had been contacted attended for screening. Participation increased to 75.2 per cent (110,850 of 147,436) in 2019. Participation has increased year on year since the programme began (Figure 3).

Table 2. Overall screening activity*

	2018	2019	% change	QA standard
Clients sent consent letter*	40,330	39,513		
Clients consenting to take part in the programme	14,205	15,105		
Total clients contacted/invited in the period	140,321	147,436	+5.1%	
Eligible clients offered a screening appointment	114,196	123,028	+7.7%	
Clients attended for screening	101,655	110,850	+9.0%	
Participation	72.4%	75.2%	+2.8%	> 70%
Overall acceptance	89.0%	90.1%	+1.1%	
Clients who opted out of the programme	1,089	2,282		

** Includes new registrants, and clients who were re-invited having not responded in a previous round.*

Figure 3. Screening participation by screening year

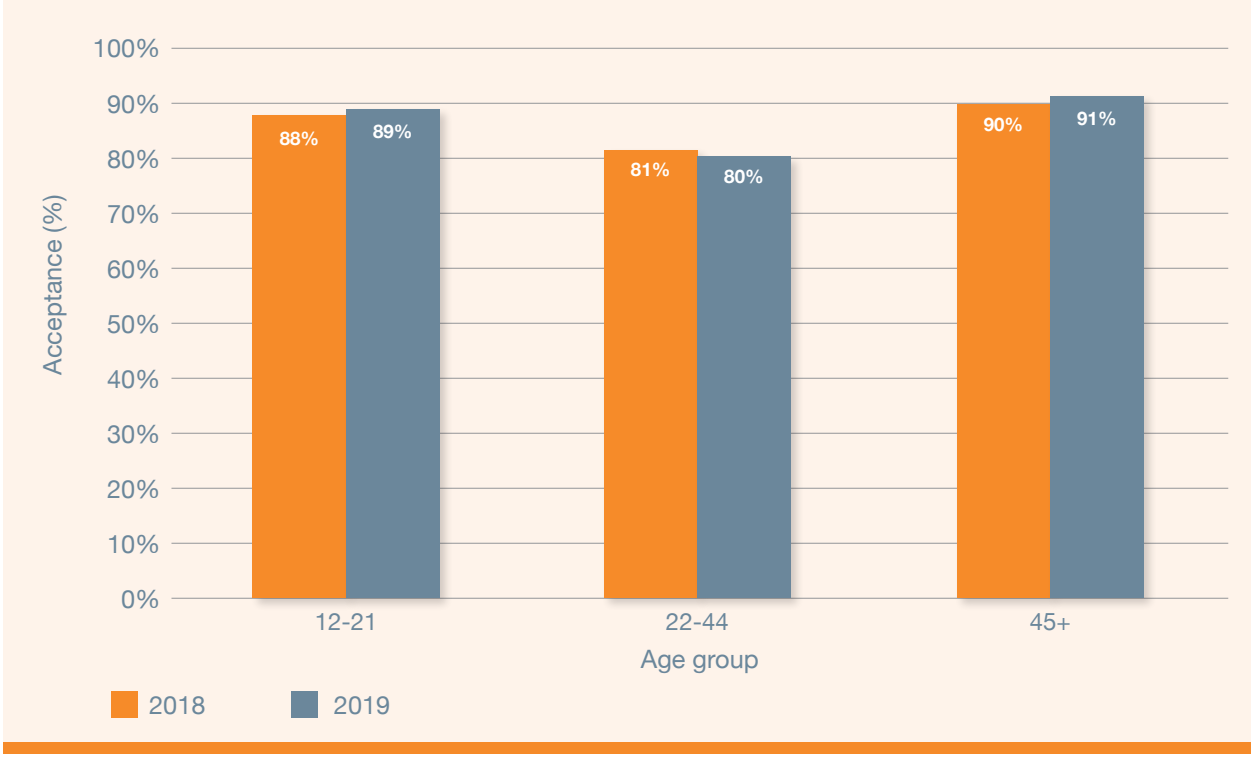


Acceptance of screening by consented clients

Acceptance by age group

Acceptance of screening relates to those who have provided consent to participate and have attended a screening appointment. Overall acceptance in 2018 and 2019 was 89.0 per cent and 90.1 per cent respectively (Table 2). Acceptance of screening in the youngest (12-21-year-olds) and the oldest age groups (45 years plus) was slightly higher in 2019 compared to 2018 (Figure 4, Table 3).

Figure 4. Acceptance of consented clients by age group and year



Acceptance by gender and age group

Acceptance of screening in 2018 and 2019 was slightly higher overall for males than for females (90.1 per cent compared to 87.4 per cent in 2018), (91.4 per cent compared to 88.3 per cent in 2019). As in previous years, acceptance was higher among females in the younger age groups, and higher in males in the 45 plus age groups (Table 3).

Table 3. Acceptance of eligible clients by year, age group and gender

	2018		2019		2018		2019		2018		2019	
Age group	12-21				22-44				45+			
Sex	M	F	M	F	M	F	M	F	M	F	M	F
Eligible invited	1,163	1,071	1,199	1,110	5,294	4,669	5,634	4,995	60,616	41,288	65,299	44,652
Screened	1,007	956	1,046	1,006	4,289	3,744	4,580	3,960	55,166	36,405	60,269	39,858
Acceptance	86.6%	89.3%	87.2%	90.6%	81.0%	80.2%	81.3%	79.3%	91.0%	88.2%	92.3%	89.3%

Screening outcomes

During both 2018 and 2019, nearly 70 per cent of screened clients had no retinopathy detected. Fewer than 1 in 4 clients had background retinopathy in 2018 (23.7 per cent) and 2019 (23.7 per cent), and smaller numbers had pre-proliferative and proliferative retinopathy (Table 4). A considerable amount of non-diabetic eye disease (NDED) was detected and referred appropriately.

While not established to act as a general eye screening service, detection of incidental eye disease has played a role in preventing and treating vision impairment by non-diabetic causes, including cataract, macular degeneration and glaucoma.

Table 4. Screening outcomes by year

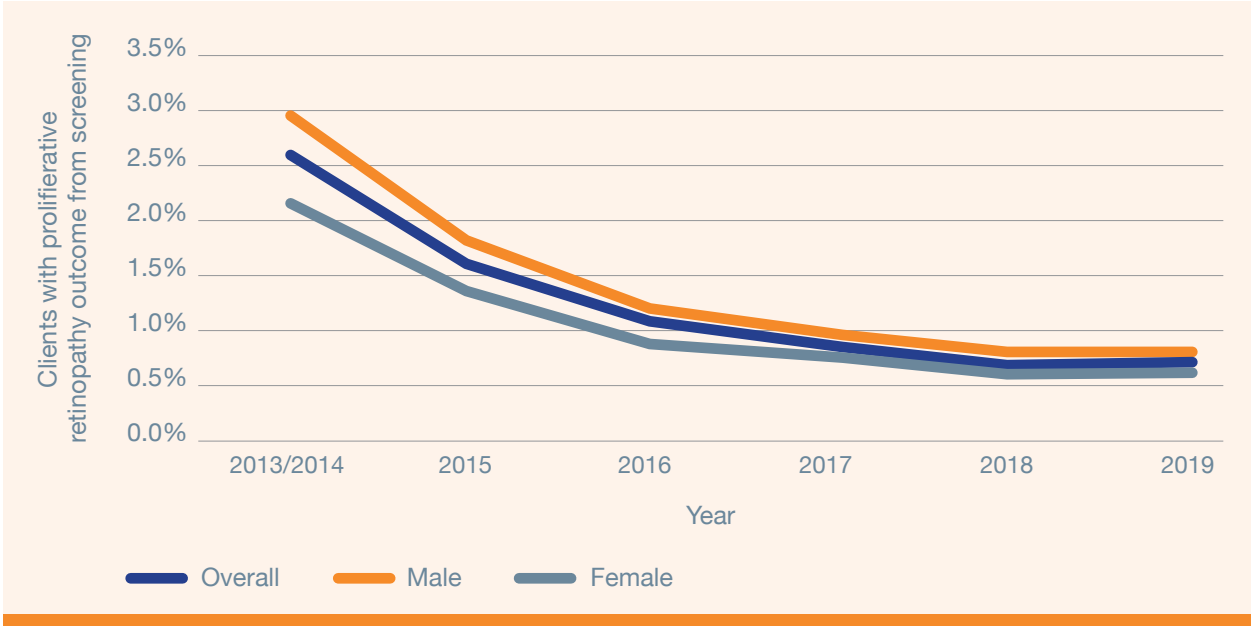
	2018	2019	QA Standard
Number of clients attending for screening	101,655	110,850	
Number of clients screened with an ungradable image	2,029	1,539	
% Clients screened with an ungradable image	2.0%	1.4%	< 7%
No Retinopathy detected	70,863	77,367	
% No Retinopathy detected	69.7%	69.8%	
Background Retinopathy	24,061	26,235	
% Background Retinopathy	23.7%	23.7%	
Pre-proliferative Retinopathy	669	867	
% Pre-proliferative Retinopathy	0.7%	0.8%	
Proliferative Retinopathy	726	802	
% Proliferative Retinopathy	0.7%	0.7%	
Non-diabetic eye disease	2,979	3,518	
% Non-diabetic eye disease	2.9%	3.2%	
ARMD*	328	522	
% ARMD*	0.3%	0.5%	

** Age-related macular degeneration (ARMD)*

In 2018 the proportion of clients screened with an ungradable image was 2.0 per cent with a decrease in 2019 to 1.4 per cent (Table 4). Since the inception of the programme in 2013, this metric has been consistently well within the QA standard of <7 per cent.

Since the beginning of the programme the detection of proliferative retinopathy has reduced year on year with a plateauing in 2018 and 2019 (Figure 5).

Figure 5. Clients with proliferative retinopathy outcome from screening 2013 to 2019



Screening outcomes by year, age and gender

In screened clients above the age of 22 years, the rate of background retinopathy was higher among males than females across both screening years (Table 5). For both males and females, the rate of background retinopathy was highest among 22- to 44-year-olds. Likewise pre-proliferative and proliferative retinopathy was highest in this age group. The youngest age group (12 to 21 years) had the highest rate of no retinopathy across both screening years. Rates of ARMD were low and ARMD was mainly detected among older clients. All grades of retinopathy may include patients with maculopathy. These can be referable (M1) or non-referable (M0). The proportion of clients aged over 22 years with proliferative retinopathy detected decreased considerably since the inception of the programme up until 2018. The rate of clients aged 22-44 years with this sight-threatening retinopathy increased slightly in 2019 (Figure 6). This demonstrates the success of the programme in detecting and treating preventable sight-loss among people with diabetes. The client numbers in the 12 to 21 age group are too low from which to draw any inference.

Table 5. Screening outcomes based on final grade by year, age and gender

	2018		2019		2018		2019		2018		2019	
Age group	12-21		12-21		22-44		22-44		45+		45+	
Sex	M	F	M	F	M	F	M	F	M	F	M	F
Attending for screening	1,007	956	1,046	1,006	4,289	3,744	4,580	3,960	55,166	36,405	60,269	39,858
Screened with an ungradeable image	8	~	~	~	23	29	18	10	1,148	816	834	672
Screened with an ungradeable image rate	0.8%	0.4%	0.2%	0.2%	0.5%	0.8%	0.4%	0.3%	2.1%	2.2%	1.4%	1.7%
No Retinopathy detected	816	728	823	763	2,528	2,387	2,657	2,539	38,034	26,299	41,631	28,847
No Retinopathy detection rate	81.0%	76.2%	78.7%	75.8%	58.9%	63.8%	58.0%	64.1%	68.9%	72.2%	69.1%	72.4%
Background Retinopathy detected	176	217	215	233	1,556	1,214	1,686	1,269	13,327	7,561	14,573	8,249
Background Retinopathy detection rate	17.5%	22.7%	20.6%	23.2%	36.3%	32.4%	36.8%	32.1%	24.2%	20.8%	24.2%	20.7%
Pre-proliferative Retinopathy detected	~	~	~	~	75	40	90	44	386	164	480	247
Pre-proliferative Retinopathy detection rate	0.1%	0.2%	0.3%	0.2%	1.8%	1.1%	2.0%	1.1%	0.7%	0.5%	0.8%	0.6%
Proliferative Retinopathy detected	~	~	~	~	78	46	83	67	409	185	444	201
Proliferative Retinopathy detection rate	0.3%	0.1%	0.1%	0.2%	1.8%	1.2%	1.8%	1.7%	0.7%	0.5%	0.7%	0.5%
Non-diabetic eye disease detected	~	~	~	~	29	25	44	29	1,690	1,230	2,036	1,396
Non-diabetic eye disease detection rate	0.1%	0.3%	0.2%	0.4%	0.7%	0.7%	1.0%	0.7%	3.1%	3.4%	3.4%	3.5%
ARMD detected	~	~	0	0	0	~	~	~	172	150	271	246
ARMD detection rate	0.2%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.3%	0.4%	0.5%	0.6%

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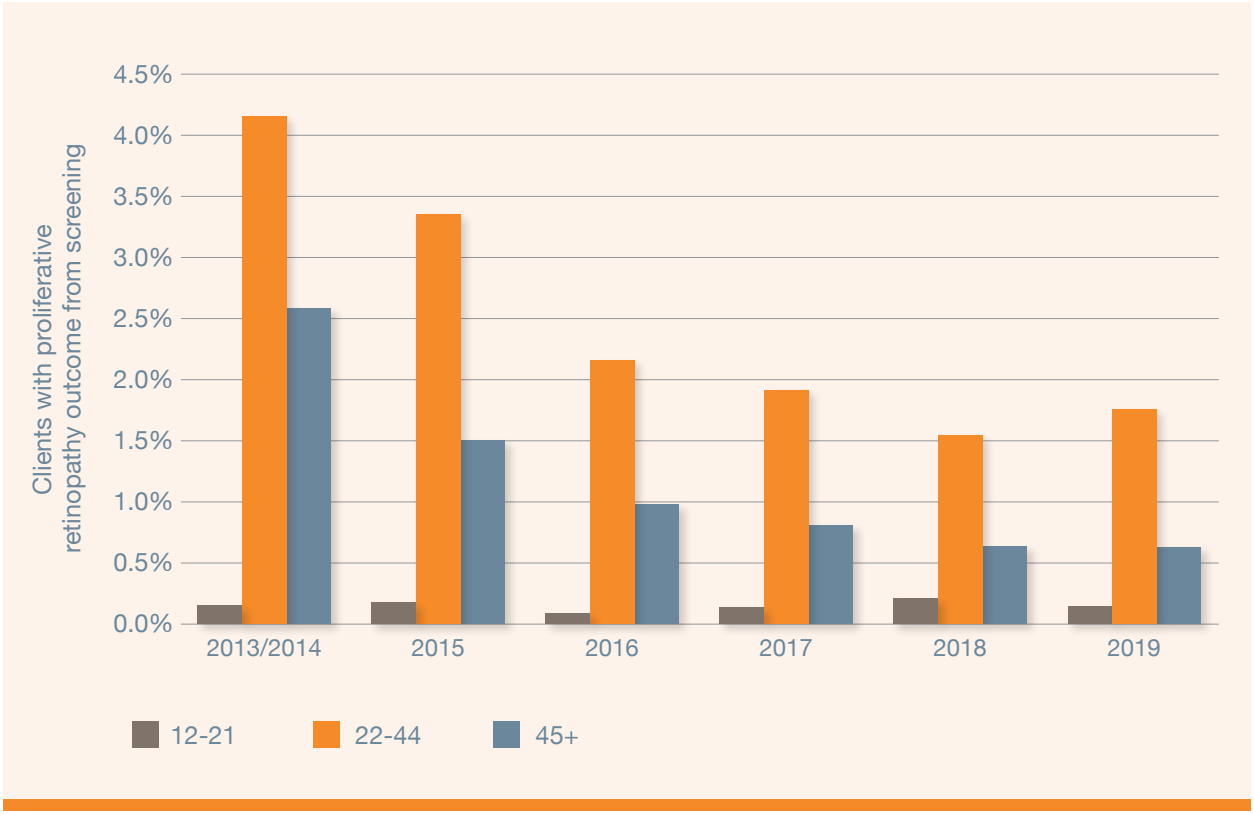
Figure 6: Rate of proliferative retinopathy by age group and year



Referral rates to ophthalmology based on outcomes from screening by year

In 2018 and 2019, 90.5 per cent and 90.4 per cent respectively of screened clients had an outcome of return to routine annual recall (Table 6), compared to 89.7 per cent and 91.4 in 2016 and 2017.

During 2018 and 2019, 1 per cent and 1.2 per cent respectively were referred for urgent treatment (for diabetic retinopathy and non-diabetic eye disease (NDED))(Figure 7). Routine referrals to ophthalmology were 3.5 per cent in both screening years (Table 6).

We identify potential non-diabetic disease ocular conditions as part of the programme and these are referred to our ophthalmology clinics for confirmatory diagnosis and onward referral to ophthalmologists. Urgent NDED referral is reserved for obvious active age-related macular degeneration (ARMD).

The low rates of slit-lamp referral indicate a robust process of image acquisition and grading. In the event of grading not being possible at the initial screening event, a referral is made for a slit-lamp appointment to check for diabetic retinopathy. In 2018 and 2019, this was 1.9 and 1.1 per cent respectively (Table 6).

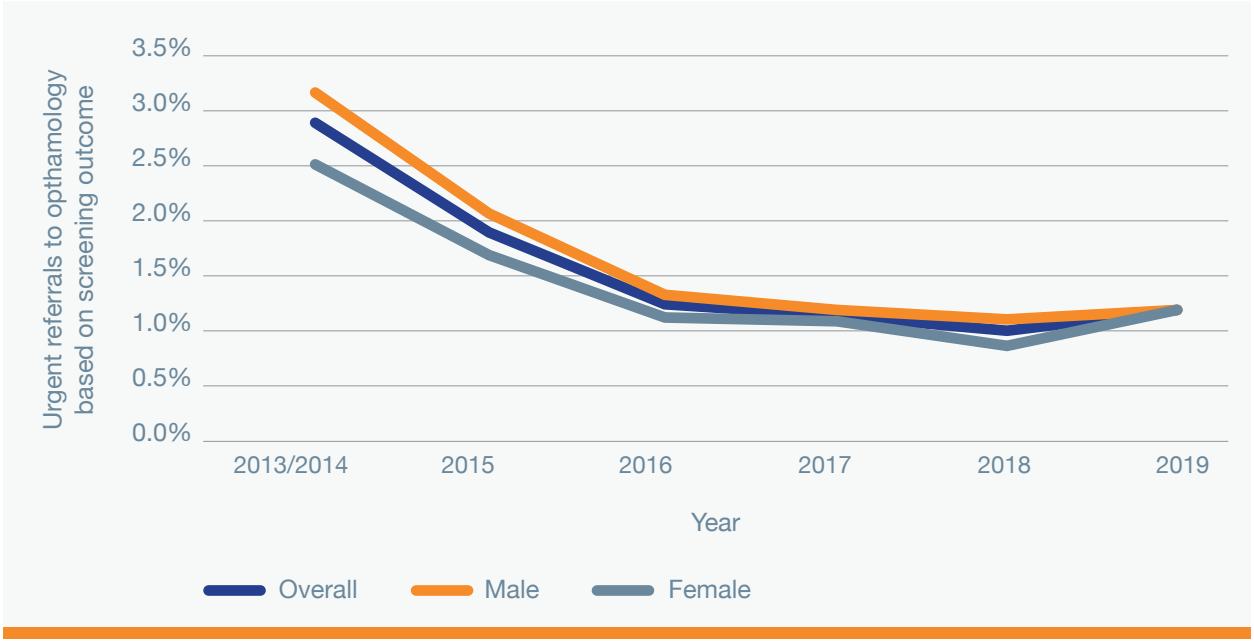
If a grade is not possible using slit-lamp, then a clinical examination is performed to attempt to give a screening grade prior to the decision to refer for treatment.

Table 6. Referral rates to ophthalmology based on outcomes from screening by year

	2018	2019
Number of clients attending for screening	101,655	110,850
Annual recall	91,986	100,239
Annual recall rate	90.5%	90.4%
Routine referral to ophthalmology	3,564	3,874
Routine referral rate	3.5%	3.5%
Urgent referral to ophthalmology	700	778
Urgent referral rate	0.7%	0.7%
Referral to slit-lamp	1,928	1,191
Slit lamp referral rate	1.9%	1.1%
Referral to digital surveillance	115	470
Digital surveillance referral rate	0.1%	0.4%
NDED* urgent referral to ophthalmology	346	573
% NDED* urgent referral to ophthalmology	0.3%	0.5%
NDED* routine referral to ophthalmology	3,006	3,689
% NDED* routine referral to ophthalmology	3.0%	3.3%
Other outcome	10	36
% Other outcome	0.0%	0.0%

* *Non-diabetic eye disease (NDED)*

Figure 7. Urgent referrals (for diabetic retinopathy and NDED) to ophthalmology based on screening outcomes* by year and gender



* *Including NDED*

Referral rates to treatment by year, age and gender

Rates of NDED requiring urgent referral to ophthalmology were highest among older clients (aged 45 years and over) with active macular degeneration. While some of these clients were under an existing care plan, a significant number were able to enter an appropriate care pathway following referral, which is an important additional benefit of the programme. A similar pattern was observed for rates of NDED routine referral to ophthalmology (Table 7). The rate of urgent diabetic eye disease referral to ophthalmology was highest among screened males and females aged 22-44 years in both screening years. The same pattern of age and gender was found for routine referral to ophthalmology.

Table 7. Referral rates to treatment based on outcomes from screening by year, age and gender

	2018		2019		2018		2019		2018		2019	
Age group	12-21		12-21		22-44		22-44		45+		45+	
Sex	M	F	M	F	M	F	M	F	M	F	M	F
Attending for screening	1,007	956	1,046	1,006	4,289	3,744	4,580	3,960	55,166	36,405	60,269	39,858
Annual recall	983	933	1,018	980	3,836	3,436	4,028	3,624	49,757	32,964	54,449	36,028
Annual recall rate	97.6%	97.6%	97.3%	97.4%	89.4%	91.8%	88.0%	91.5%	90.2%	90.6%	90.3%	90.4%
NDED urgent referral to Ophthalmology	~	~	0	0	0	~	~	~	192	148	306	262
NDED urgent referral to Ophthalmology rate	0.2%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.4%	0.4%	0.5%	0.7%
NDED routine referral to Ophthalmology	~	~	~	~	36	25	47	29	1,703	1,236	2,131	1,469
NDED routine referral to Ophthalmology rate	0.1%	0.4%	0.2%	0.4%	0.8%	0.7%	1.0%	0.7%	3.1%	3.4%	3.5%	3.7%
Urgent referral to Ophthalmology	~	~	~	~	77	46	81	67	393	176	428	195
Urgent referral rate	0.3%	0.1%	0.1%	0.2%	1.8%	1.2%	1.8%	1.7%	0.7%	0.5%	0.7%	0.5%
Routine referral to Ophthalmology	10	14	21	18	306	204	338	191	1,966	1,059	2,066	1,234
Routine referral rate	1.0%	1.5%	2.0%	1.8%	7.1%	5.5%	7.4%	4.8%	3.6%	2.9%	3.4%	3.1%
Referral to slit lamp	8	~	~	~	17	23	12	7	1,083	793	635	533
Slit lamp referral rate	0.8%	0.3%	0.1%	0.2%	0.4%	0.6%	0.3%	0.2%	2.0%	2.2%	1.0%	1.3%
Referral to digital surveillance	0	0	~	~	17	7	71	38	63	28	235	124
Digital surveillance referral rate	0.0%	0.0%	0.2%	0.0%	0.4%	0.2%	1.6%	1.0%	0.1%	0.1%	0.4%	0.3%
Other outcome	0	0	~	0	0	0	~	~	9	~	19	13
Other outcome rate	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%

~ corresponds to <5

References

1. *Standards for Quality Assurance in Diabetic Retinopathy Screening,* National Screening Service, First edition 2013, Revision 5.0, published 2019. ISBN 978-1-907487-11-8.

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An tSeirbhís Náisiúnta Scagthástála
National Screening Service

Diabetic RetinaScreen
An Clár Náisiúnta Scagthástála Reitiní do Dhiaibéitigh
The National Diabetic Retinal Screening Programme