Diabetic RetinaScreen Statistical Bulletin

2018-2019

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

The data presented below pertains to the fifth and sixth years of screening for diabetic retinopathy in Ireland. The data for Years 1 to 4 have previously been published online (https://www.diabeticretinascreen.ie/information.129.html#Reports).[2,3] Year 5 took place from 01 January to 31 December 2018, and Year 6 took place from 01 January to 31 December 2019.

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. Of the total, 104,683 (58 per cent) were males compared to 75,035 (42 per cent) females. 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.

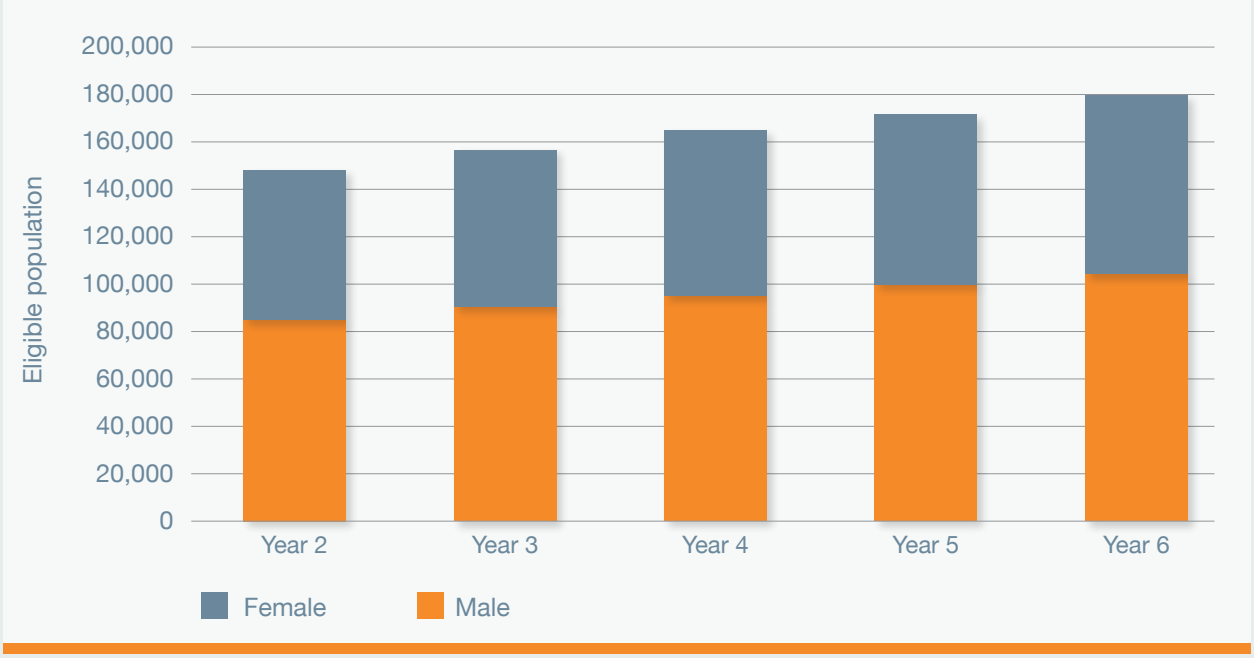
Figure 1 shows the growth in number of clients on the register since Year 2 of the programme. At the end of Year 5 (2018) there were 171,558 men and women on the Diabetic RetinaScreen register. At the end of Year 6 (2019), there were 179,718 men and women on the register. This represents a 5 per cent 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.*

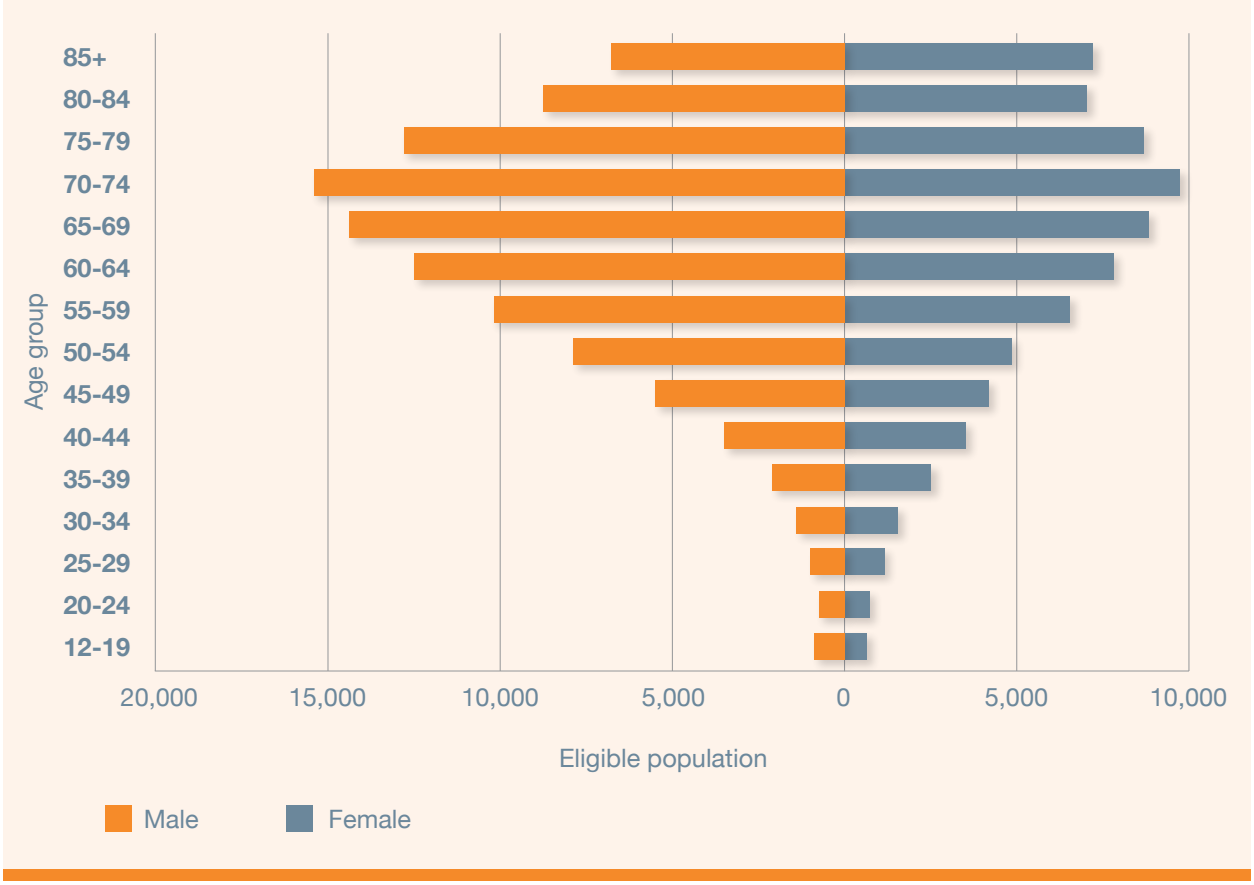
Figure 1: Eligible population on the Diabetic RetinaScreen register by year



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*



**Eligible population as of 31st December 2019*

Screening participation

During Years 5 and 6, 40,330 and 39,513 people respectively were sent a letter to participate in the programme (Table 2). These numbers include both clients who have been newly registered with the programme following notification to the programme of a diagnosis of diabetes, and clients who have previously been sent a letter to participate but have yet to respond. The programme issues a minimum of two letters in each screening year following registration.

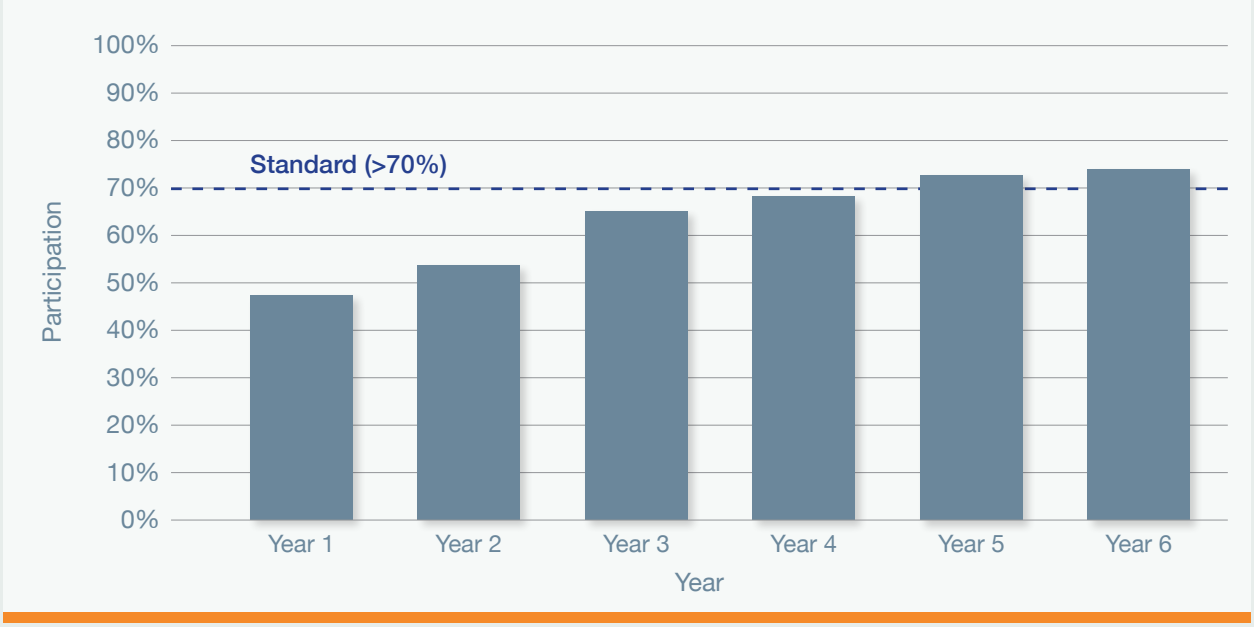
During Years 5 and 6, 14,205 and 15,105 eligible clients respectively consented to take part in the programme. Following consent, clients are offered a screening appointment at a designated location. In addition, clients who have attended previously (and were not in treatment) are offered a screening appointment in the following year. There was almost an 8 per cent increase in eligible clients invited for screening between Years 5 and 6, rising from 114,838 to 123,557. A similar increase (6 per cent) was seen in the numbers screened during both years, rising from 101,693 in Year 5 to 107,898 in Year 6. In Year 5, 72.1 per cent (101,693 of 140,963) of the total eligible cohort who had been contacted attended for screening. Participation increased to 72.9 per cent (107,898 of 147,965) in Year 6. Participation has increased year on year since the programme began (Figure 3).

Table 2. Overall screening activity*

	Year 5 (2018)	Year 6 (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	140,963	147,965	+7.6%	
Eligible clients offered a screening appointment	114,838	123,557		
Clients attended for screening	101,693	107,898	+6.1%	
Participation	72.1%	72.9%	+0.8%	> 70%
Overall acceptance	88.6%	87.3%	-1.3%	
Clients who opted out of the programme	1,100	2,300		

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

Figure 3. Participation in screening by screening year

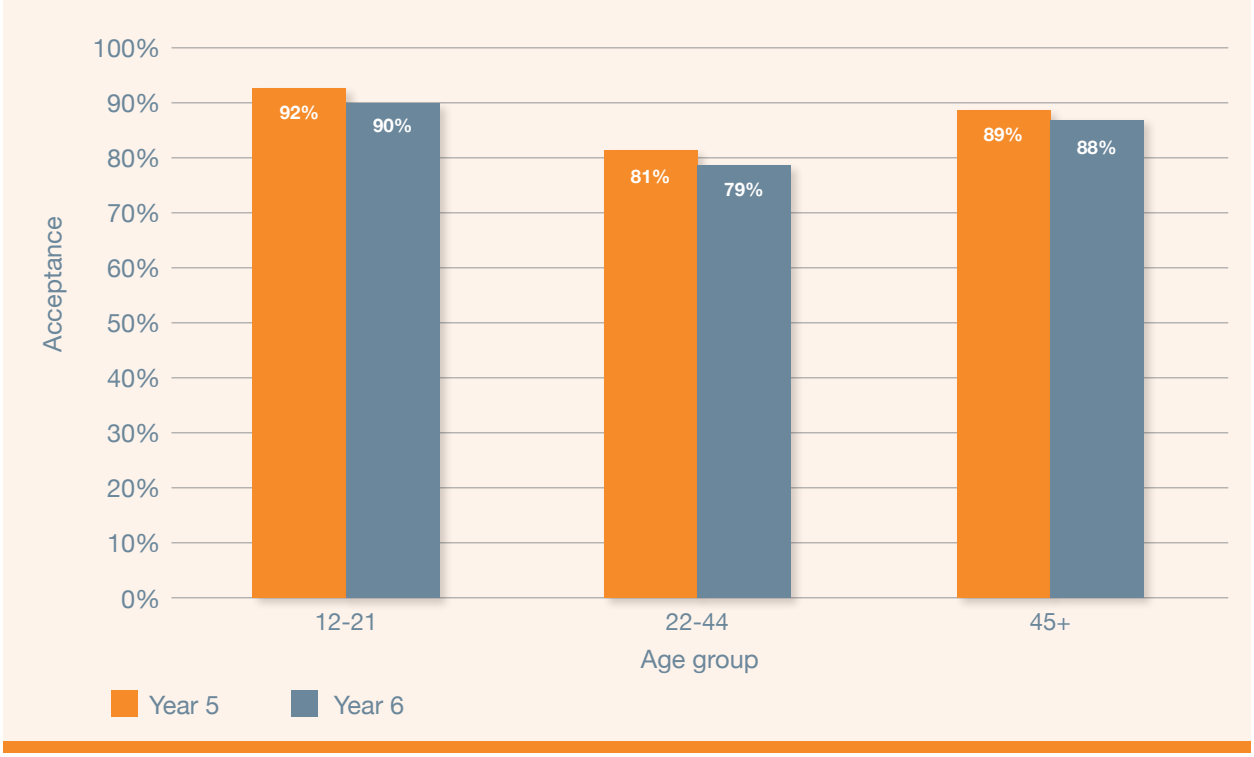


Acceptance of screening by consented clients

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 Years 5 and 6 was 88.6 per cent and 87.3 per cent respectively (Table 2). Acceptance of screening in all age groups was slightly lower in Year 6 compared to Year 5 (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 Years 5 and 6 was slightly higher overall for males than for females (Year 5; 89.2 per cent compared to 87.6 per cent), (Year 6; 88.1 per cent compared to 86.3 per cent). 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

	Year 5		Year 6		Year 5		Year 6		Year 5		Year 6	
Age group	12-21				22-44				45+			
Sex	M	F	M	F	M	F	M	F	M	F	M	F
Eligible invited	1,178	1,087	1,208	1,119	5,386	4,745	5,691	5,058	60,778	41,407	65,403	44,716
Screened	1,078	1,011	1,070	1,032	4,371	3,866	4,440	4,008	54,620	36,510	58,160	38,862
Acceptance	91.5%	93.0%	88.6%	92.2%	81.2%	81.5%	78.0%	79.2%	89.9%	88.2%	88.9%	86.9%

Screening outcomes

During both Years 5 and 6, 74 per cent of screened clients had no retinopathy detected. Fewer than 1 in 4 clients had background retinopathy in Year 5 (23.1 per cent) and Year 6 (23.2 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.

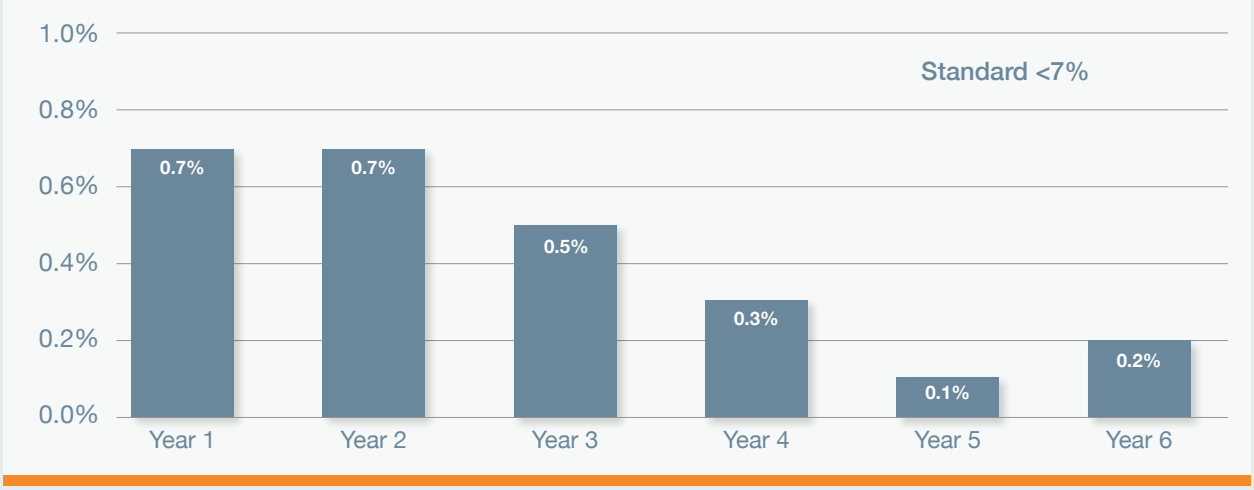
Table 4. Screening outcomes by year

	Year 5	Year 6	QA Standard
Number of clients attending for screening	101,693	107,898	
Number of clients screened with an ungradable image	143	181	
% Clients screened with an ungradable image	0.14%	0.17%	< 7%
No Retinopathy detected	75,230	80,171	
% No Retinopathy detected	74.0%	74.3%	
Background Retinopathy	23,497	25,071	
% Background Retinopathy	23.1%	23.2%	
Pre-proliferative Retinopathy	200	133	
% Pre-proliferative Retinopathy	0.2%	0.1%	
Proliferative Retinopathy	259	271	
% Proliferative Retinopathy	0.3%	0.3%	
Non-diabetic eye disease	2,113	1,732	
% Non-diabetic eye disease	2.1%	1.6%	
ARMD*	251	339	
% ARMD*	0.3%	0.3%	

** Age-related macular degeneration (ARMD)*

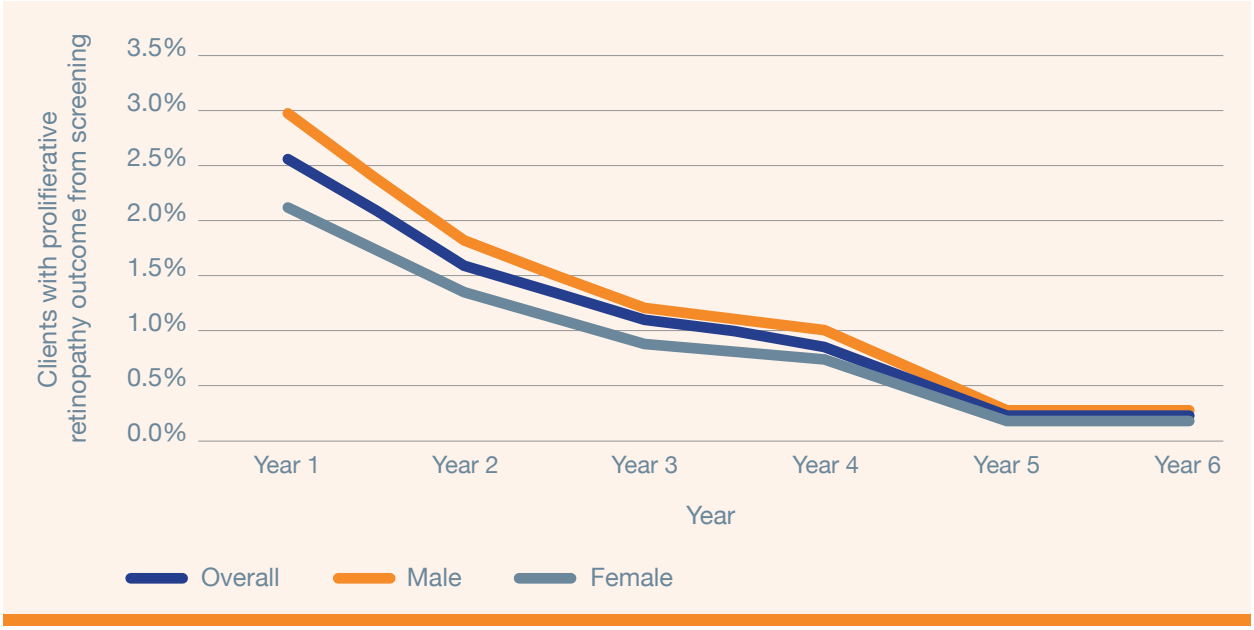
In Year 5 the proportion of clients screened with an ungradable image was very low at 0.14 per cent with an increase in Year 6 to 0.17 per cent (Table 4). Since the inception of the programme in 2013 this metric has been consistently well within the QA standard of <7% (Figure 5).

Figure 5: Proportion of clients with an ungradable image 2013 to 2019



Since the beginning of the programme the detection of proliferative retinopathy has reduced year on year with a plateauing in Years 5 and 6 (Figure 6).

Figure 6. Clients with proliferative retinopathy outcome from screening Years 1 to 6



Screening outcomes by year, age and gender

In screened clients above the age of 22 years, 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) has 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 sight-threatening retinopathy detected has decreased considerably since the inception of the programme (Figure 7). 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

	Year 5		Year 6		Year 5		Year 6		Year 5		Year 6	
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	1,078	1,011	1,070	1,032	4,371	3,866	4,440	4,008	54,620	36,510	58,160	38,862
Screened with an ungradeable image	0	0	0	~	0	~	~	~	84	58	106	71
Screened with an ungradeable image rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.2%
No Retinopathy detected	876	780	853	787	2,743	2,604	2,794	2,699	40,052	27,974	42,831	29,945
No Retinopathy detection rate	81.3%	77.2%	79.7%	76.3%	62.7%	67.4%	62.9%	67.3%	73.3%	76.6%	73.6%	77.1%
Background Retinopathy detected	198	230	217	243	1,560	1,216	1,601	1,263	12,905	7,356	13,855	7,848
Background Retinopathy detection rate	18.4%	22.8%	20.3%	23.6%	35.7%	31.5%	36.1%	31.5%	23.6%	20.2%	23.8%	20.2%
Pre-proliferative Retinopathy detected	0	0	0	0	27	14	7	10	111	48	74	41
Pre-proliferative Retinopathy detection rate	0.0%	0.0%	0.0%	0.0%	0.6%	0.4%	0.2%	0.3%	0.2%	0.1%	0.1%	0.1%
Proliferative Retinopathy detected	~	0	0	0	24	17	18	18	158	59	145	88
Proliferative Retinopathy detection rate	0.0%	0.0%	0.0%	0.0%	0.6%	0.4%	0.4%	0.5%	0.3%	0.2%	0.3%	0.2%
Non-diabetic eye disease detected	~	~	0	~	17	11	17	15	1,190	888	976	708
Non-diabetic eye disease detection rate	0.0%	0.0%	0.0%	0.0%	0.4%	0.3%	0.4%	0.4%	2.2%	2.4%	1.7%	1.8%
ARMD detected	~	0	0	0	0	~	~	~	120	127	173	161
ARMD detection rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.4%	0.3%	0.4%

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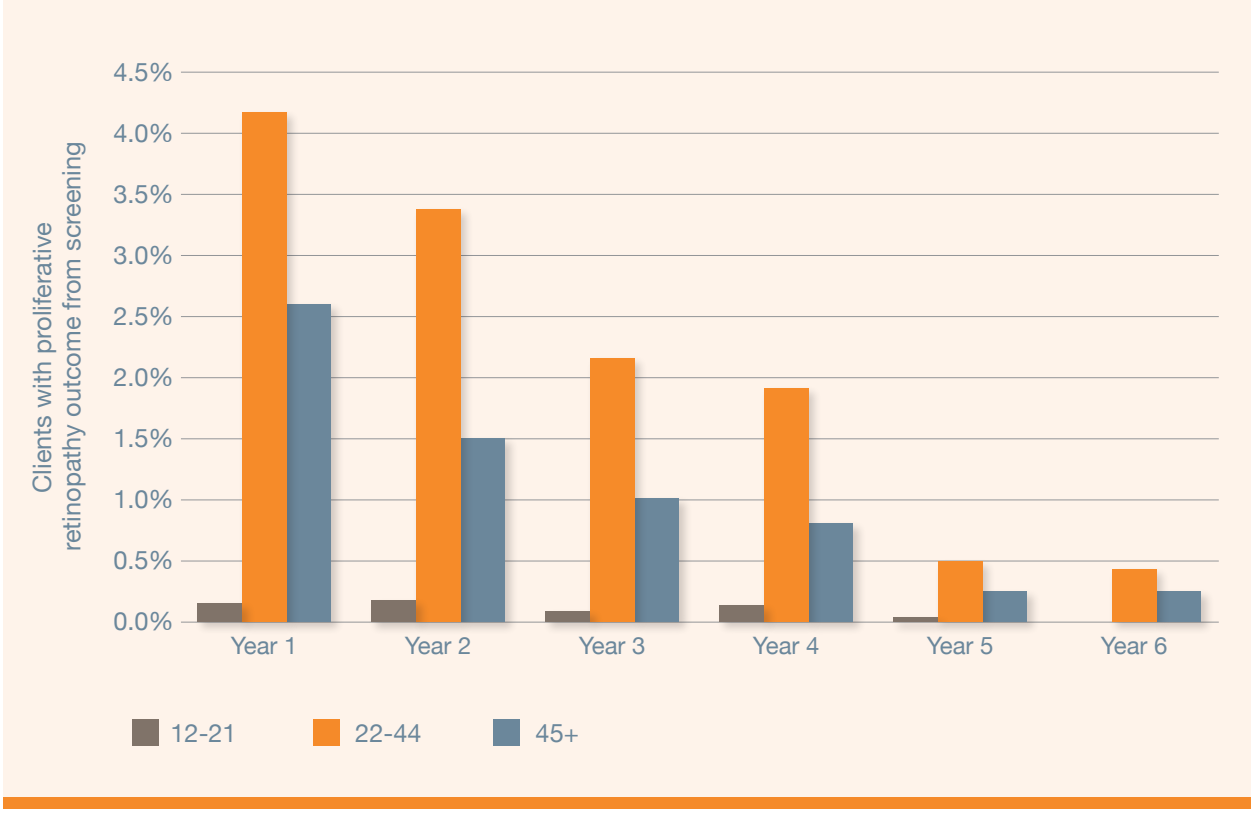
Figure 7: Rate of proliferative retinopathy by age group and year



Referral rates to ophthalmology based on outcomes from screening by year

In Years 5 and 6, 96.0 per cent and 96.3 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 Years 3 and 4. During Years 5 and 6, 0.50 per cent and 0.59 per cent were referred for urgent treatment (Figure 8). Routine referrals to ophthalmology were 1.1 per cent in Year 5 and 0.9 per cent in Year 6.

While participation in the programme has increased since the first screening year, the referral rate to our ophthalmology clinics is reducing. This indicates the higher impact of detected retinopathy in the first four years, with patients now receiving appropriate treatment in a timely manner. The programme expects an ongoing reduction in referral rates as screening is implemented successfully, resulting in a reversion in the incidence of eye disease to the expected annual rate of approximately 2.5 to 3.5 per cent.

We identify potential non-diabetic disease ocular conditions (NDED) 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).

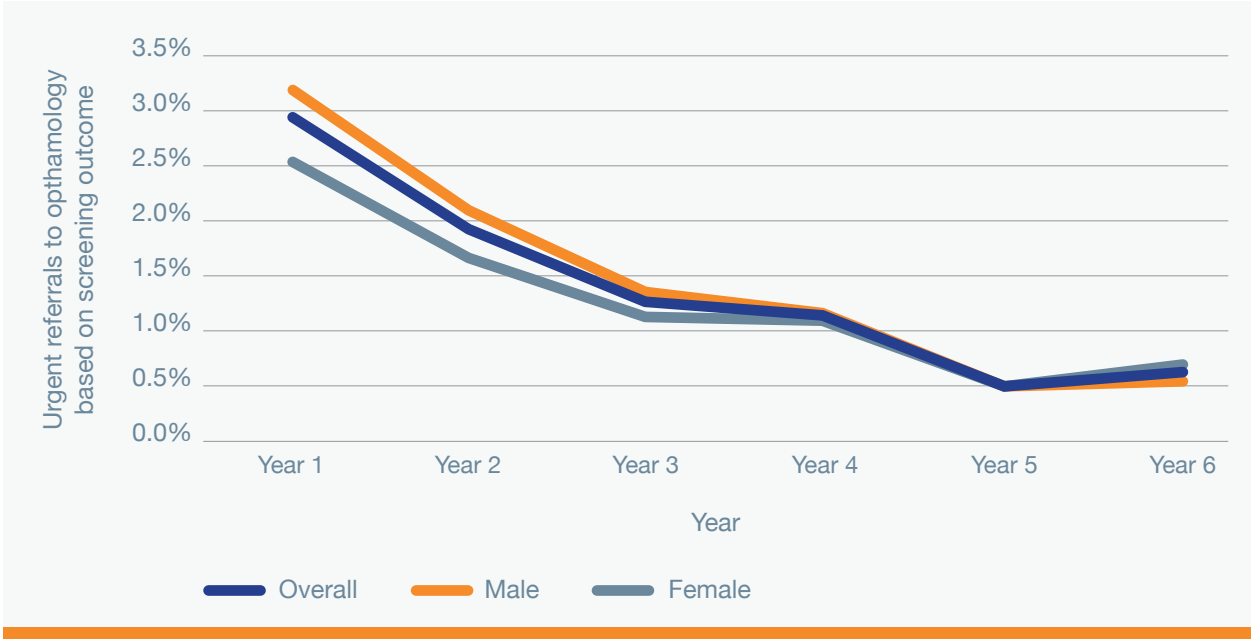
The low rates of slit-lamp referral indicate a robust process of image acquisition and grading. In the event of grading not being possible at the initial screening event, a referral is made for a slit-lamp appointment to check for diabetic retinopathy. In Years 5 and 6 this was 0.6 and 0.2 per cent respectively (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

	Year 5	Year 6
Number of clients attending for screening	101,693	107,898
Annual recall	97,579	103,858
Annual recall rate	95.95%	96.26%
Routine referral to ophthalmology	1,157	970
Routine referral rate	1.14%	0.90%
Urgent referral to ophthalmology	250	259
Urgent referral rate	0.25%	0.24%
Referral to slit-lamp	600	238
Slit lamp referral rate	0.59%	0.22%
Referral to digital surveillance	224	620
Digital surveillance referral rate	0.22%	0.57%
NDED* urgent referral to ophthalmology	255	373
% NDED* urgent referral to ophthalmology	0.25%	0.35%
NDED* routine referral to ophthalmology	1,614	1,551
% NDED* routine referral to ophthalmology	1.59%	1.44%
Other outcome	14	29
% Other outcome	0.01%	0.03%

* *Non-diabetic eye disease (NDED)*

Figure 8. 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

The rate of urgent diabetic eye disease referral to ophthalmology was highest among screened clients aged 22 to 44 years (Table 7). The same pattern of age and gender was found for routine referral to ophthalmology; the prevalence of diabetic retinopathy increases as patients get older and the longer the client has diabetes. The younger patient cohort has lower levels of diabetic retinopathy. Rates of NDED requiring urgent referral to ophthalmology were highest among older clients 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.

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

	Year 5		Year 6		Year 5		Year 6		Year 5		Year 6	
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	1,078	1,011	1,070	1,032	4,371	3,866	4,440	4,008	54,620	36,510	58,160	38,862
Annual recall	1,066	1,002	1,062	1,022	4,180	3,743	4,232	3,872	52,383	34,975	55,984	37,381
Annual recall rate	98.9%	99.1%	99.3%	99.0%	95.6%	96.8%	95.3%	96.6%	95.9%	95.8%	96.3%	96.2%
NDED urgent referral to Ophthalmology	~	0	0	0	0	~	~	~	127	124	198	170
NDED urgent referral to Ophthalmology rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.3%	0.3%	0.4%
NDED routine referral to Ophthalmology	~	~	0	~	13	7	17	13	924	664	875	630
NDED routine referral to Ophthalmology rate	0.0%	0.0%	0.0%	0.1%	0.3%	0.2%	0.4%	0.3%	1.7%	1.8%	1.5%	1.6%
Urgent referral to Ophthalmology	~	0	0	0	24	16	17	18	152	57	136	86
Urgent referral rate	0.0%	0.0%	0.0%	0.0%	0.6%	0.4%	0.4%	0.5%	0.3%	0.2%	0.2%	0.2%
Routine referral to Ophthalmology	5	8	5	6	117	76	78	46	584	364	525	307
Routine referral rate	0.5%	0.8%	0.5%	0.6%	2.7%	2.0%	1.8%	1.2%	1.1%	1.0%	0.9%	0.8%
Referral to slit lamp	~	0	0	0	5	0	0	~	323	270	130	107
Slit lamp referral rate	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.6%	0.7%	0.2%	0.3%
Referral to digital surveillance	~	0	~	~	32	20	93	55	119	51	297	170
Digital surveillance referral rate	0.0%	0.0%	0.0%	0.0%	0.7%	0.5%	2.1%	1.4%	0.2%	0.1%	0.5%	0.4%
Other outcome	0	0	~	0	0	~	~	~	8	5	15	11
Other outcome rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

~ corresponds to <5

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