

Screening for Diabetic Retinopathy –Successes, failures and challenges

Dinesh Nagi

Pinderfields Hospital

The Mid Yorkshire NHS Trust

Wakefield



Glasgow

Edinburgh

Liverpool
Manchester

Leeds

Hull

Wakefield

Birmingham

Cardiff
Bristol

London

Dover

Yorkshire

To a Yorkshireman, the cricket, the food, the ale, the scenery and the people of his broad-acred county are the finer all round than those in any of the smaller counties that make up the rest of England.....

It is the land that bred talents like the Brontes, J B Priestley, David Hockney; men of action like captain Cook; cricketers like Len Hutton, Fred Trueman and Geoffrey Boycott.

It is a land that seem to demand achievement

Organisation

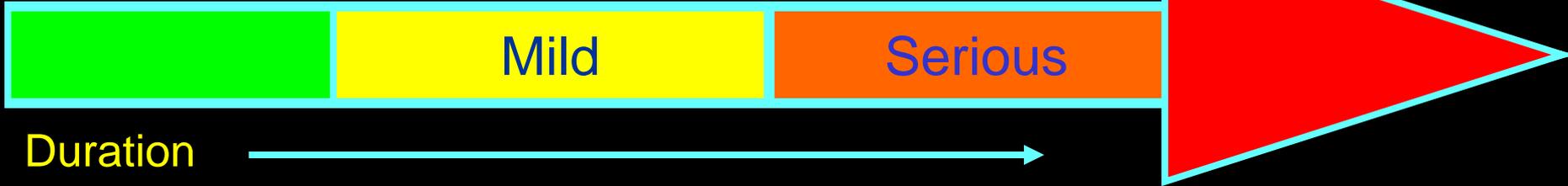
- Back ground to the National Screening Programme
- ABCD Survey of Retinal Screening
- Perspective on Current state of Services, including some local audit
- Successes, “failures” and Challenges
- Conclusions

Prevention of Blindness

Diabetes
Diagnosis

Diabetic
retinopathy

Visual
impairment



Mild

Serious

Duration

**Primary
Prevention**

**Secondary
Prevention**

**Tertiary
Prevention**

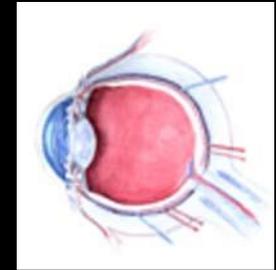
Background to the National Programme

- Different Modalities of Screening
- Population coverage patchy and screening not available to all.
- Use of Non-mydriatic Cameras
- The Allied Dunbar Foundation
- 1994 Exeter Meeting: Clinical Leads proposed First Set of Quality standards

Back ground Cont.

- In 1997; Discussions between NSC and DUK, led to the National Programme of Screening led by Sir Muir-Gray
- English National Project Group with Various sub groups including a Research Group.
- Appointment of Current Officers of the National Screening Programme based in Cheltenham

Minimum Grading Classification



Grading criteria – minimum data set:

Retinopathy (R)

Level 0

None

Level 1

Background microaneurysm(s)

retinal haemorrhage(s) ± any exudate

Level 2

Pre-proliferative venous beading

venous loop or reduplication

intraretinal microvascular abnormality (IRMA)

multiple deep, round or blot haemorrhages

(CWS - careful search for above features)

Level 3

Proliferative new vessels on disc (NVD)

new vessels elsewhere (NVE)

pre-retinal or vitreous haemorrhage

pre-retinal fibrosis ± tractional retinal

detachment

Maculopathy (M)

exudate within 1 disc diameter (DD) of the centre of the fovea

circinate or group of exudates within the macula

retinal thickening within 1DD of the centre of the fovea (if

stereo available) any microaneurysm or haemorrhage within 1DD

of the centre of the fovea only if associated with a best VA of ≤

6/12 (if no stereo)

Photocoagulation (P)

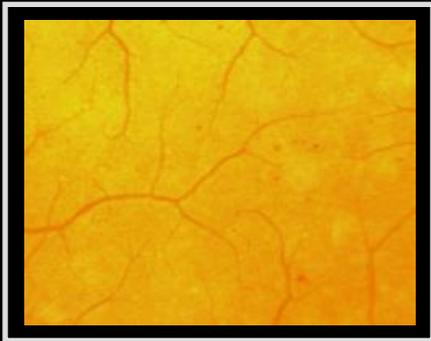
focal/grid to macula

peripheral scatter

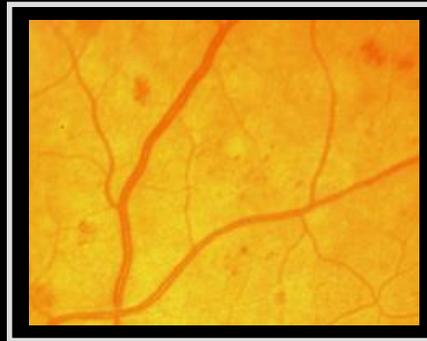
Unclassifiable (U)

Ungradable/unobtainable

Example retinopathy lesions



**Microaneurysms (MA):
Level 20 (R1)**



**MA + haemorrhages:
Level 35 (R1)**



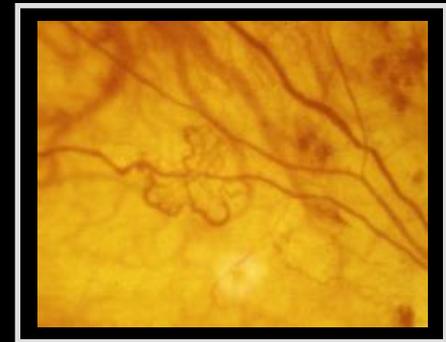
**MA + hard exudate:
Level 35 (R1 M1)**



**HMA+, IRMA, VB:
Levels 43-47 (R2)**



**HMA + beading +
IRMA: Level 53 (R2)**



**Proliferative:
Levels 61+ (R3)**

The First ABCD Survey 2000

The First NSC Survey (2003)

- Approximately half of the PCT's in England were covered by a screening programme
- Only a 2/3 of the existing programmes were centrally organised
- Only 1/3 monitor the programme against the NSC guidelines
- The modality of screening was variable
- The uptake of offer for screening is variable

NSC Survey in 2003 (cont.)

- In majority of programmes the Lead is provided by Diabetologist or Ophthalmologist
- Some programmes claim to monitor themselves against NSC guidelines, but few produce actual annual report.
- Data on referral time in screen positive and on laser Rx was not easily available
- Data on Visual Outcome was available only in a minority of programmes
- Geographical mapping did not allow any clear picture

State of Screening in 2005 (NSC)

1	Early planning for a formal systematic screening still under way
2	Advanced planning started, screening activity started from a central place, but missing some key features of systematic screening service
3	Systematic screening underway on a significant scale

Progress do date	1	2	3
Number of Programmes	36	54	15

A National Survey of the Current State of Screening Services for Diabetic Retinopathy

**ABCD-DUK Survey of Specialist Diabetes Services
2006**

**Working Group: Charlotte Gosden, Richard
Holt, Bridget Turner, June James, Chris
Walton, Peter Winocour, Dinesh Nagi,
Rhys Williams**

ABCD-DUK Survey of Retinopathy Screening 2006

The aims:

1. To ascertain the progress made in the implementation of retinal screening service
2. Explore any barriers or difficulties faced by the programmes during the implementation of this particular service

ABCD-DUK Survey of Retinopathy Screening 2006

- 73 questions which covered demography, infrastructure, call & recall, and adherence to NSC guidance
- The process of retinal photography including population coverage etc.
- We explored if robust mechanisms were in place for deal with screen positive patients.
- Current levels of resource allocation and Leadership issues.

ABCD-DUK Survey of Retinopathy Screening 2006

Methodology

- A Web-based survey – piloted in early 2006 amongst ABCD-DUK committee (opinion taker).
- Between May 2006-Feb 2007
- All 105 Screening units in England were contacted.

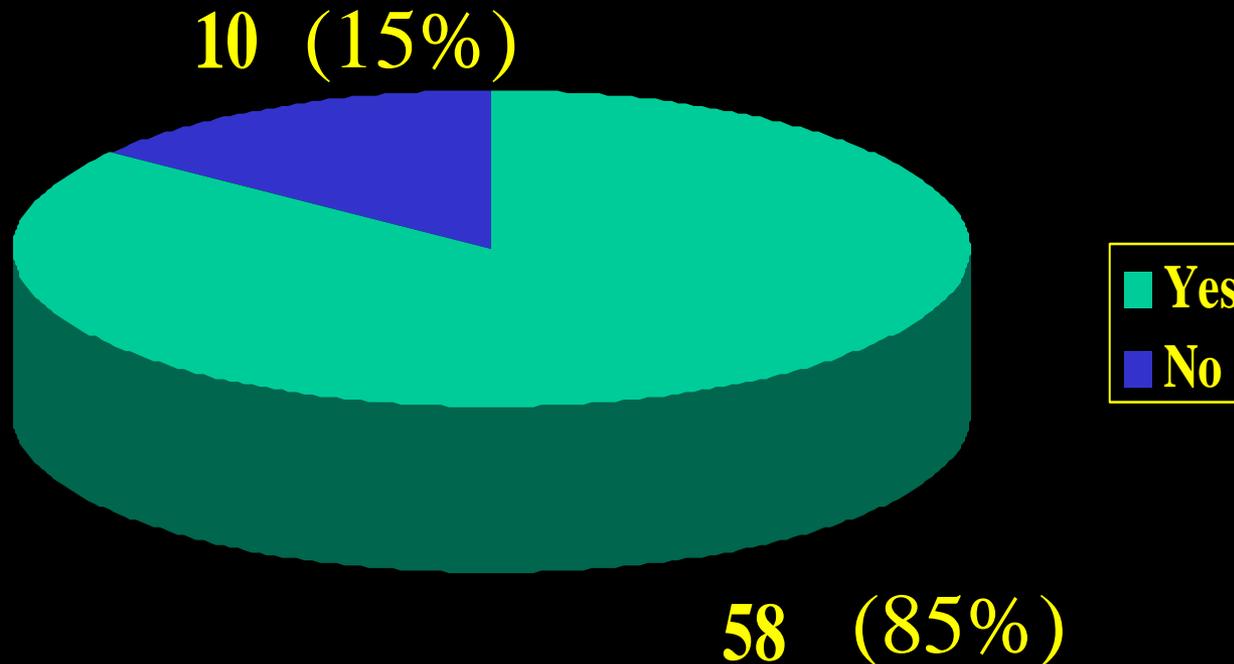
ABCD-DUK Survey of Retinopathy Screening 2006

Results

- Response rate – $68/115 = 64.7\%$ response rate from retinal Screening Units in England.
- Scotland $5/15 = 33\%$
- Wales 100% response (1/1)
- Northern Ireland (0/1)
- Data is presented for England Only

(1) Infrastructure for retinal Screening

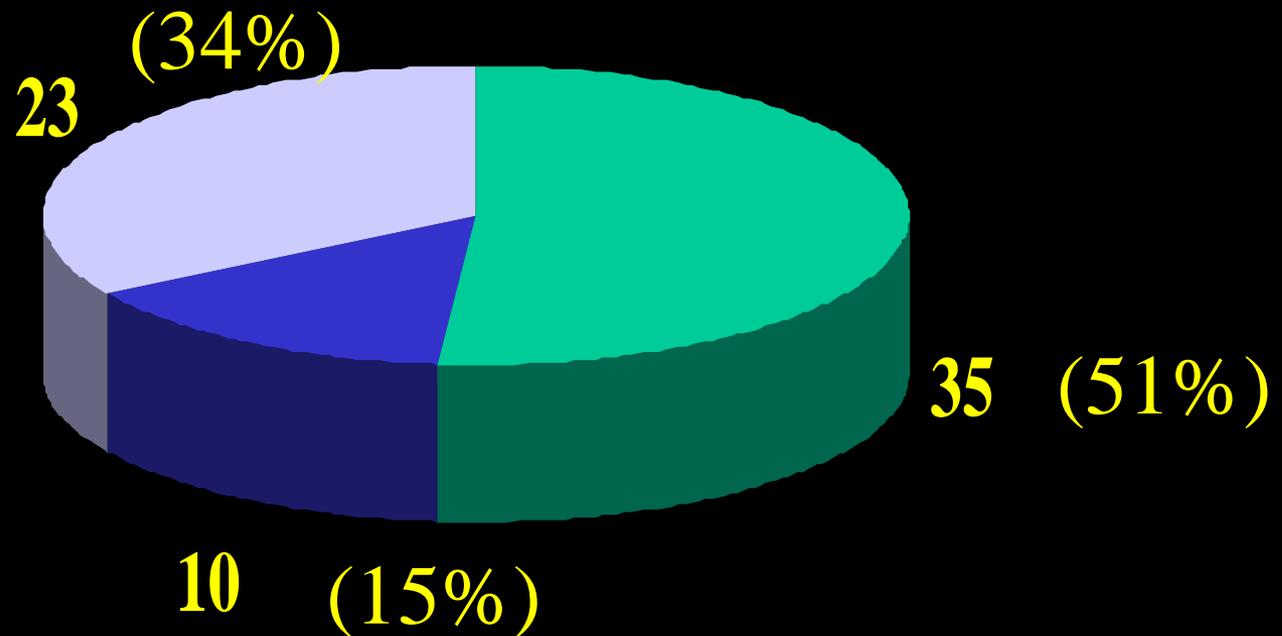
Co-ordination of Screening Programmes



- A majority have an established service and 73% programmes have made significant progress since the start.

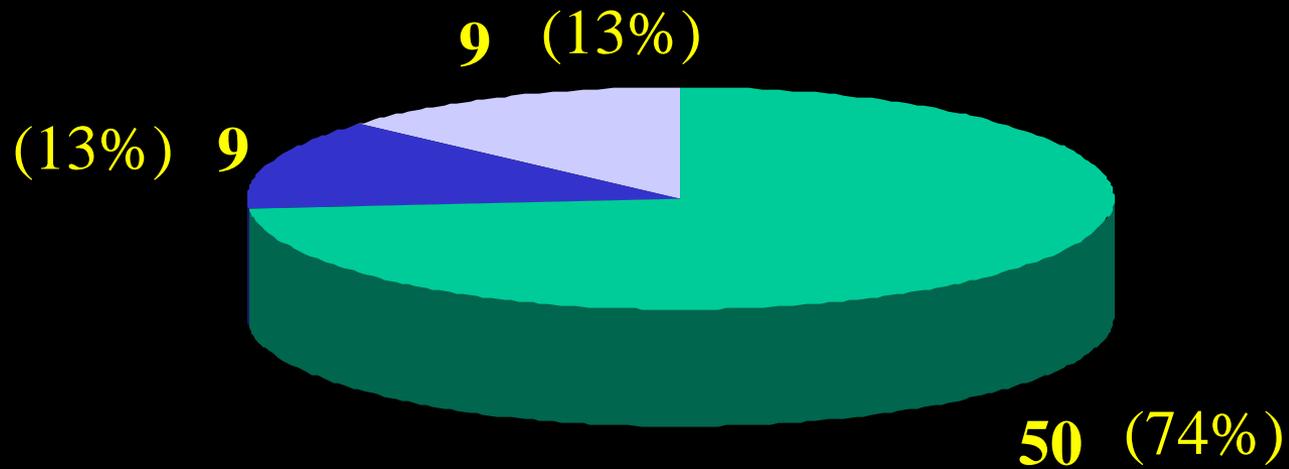
Location of the Programme

■ Fixed ■ Mobile ■ mixed



Guidelines Followed

■ NSC ■ NICE ■ Other



ABCD-DUK Survey of Retinopathy Screening 2006

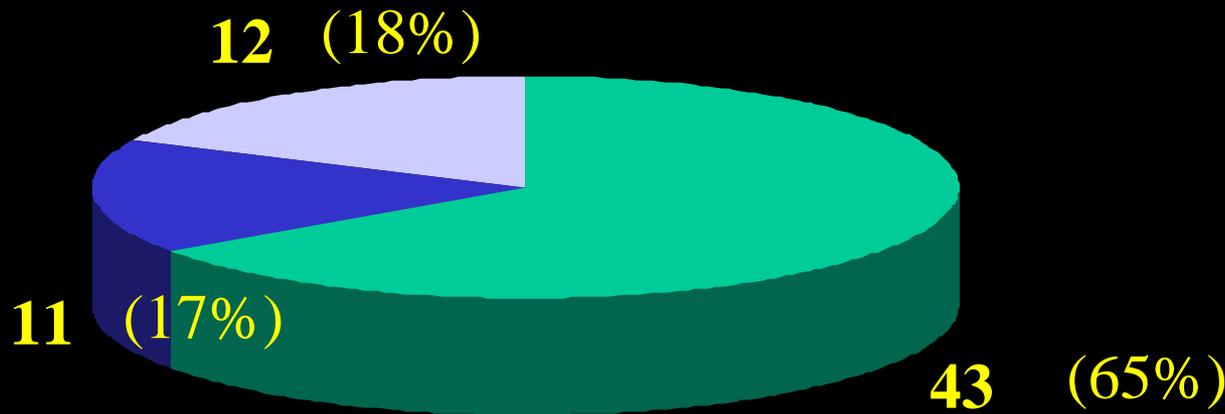
(2) Process of Retinal Screening

- 83% provide “Call & recall” through a centrally located electronic register.
- 73% follow the NSC guidance in implementation and delivery of the service

(3) Results of Retinal Screening

Population Coverage
(1) Offered Screening

■ Yes ■ No ■ Don't Know

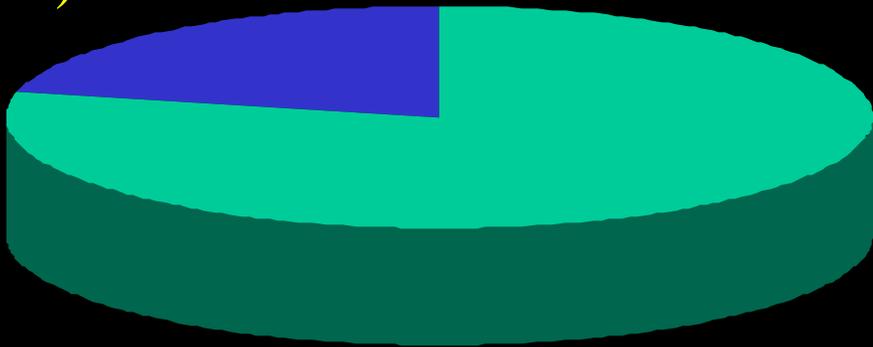


Response Identical for Figures Screening Attended

Population Coverage (1) Offered Screening

■ > 80% ■ <80%

(21%) 9



33 (69%)

100 % =6

98% =3

95% =1

90% =8

88% =1

87% =1

86% =1

85% =1

84% =1

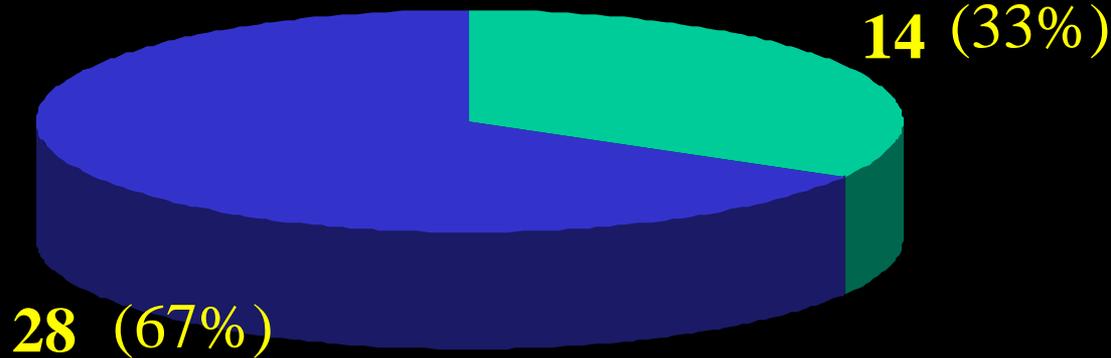
82% =2

80% =7

For Remainder (30-75%)

Population Coverage (1) Attended Screening

■ > 80% ■ <80%



100 % =0
97% =1
94% =1
92% =1
90% =1
85% =2
84% =1
82% =3
80% =3

For Remainder (20-79) %

Screening Interval for Various Programmes

Screening Interval	Number of programmes
12 months	55
12-24 months	8
24 months	2
Variable	2

33/64 Programmes have mechanism to recall
at 6 months if needed

ABCD-DUK Survey of Retinopathy Screening 2006

(4) Grading of Retinal Photos

Retinal Screener Graders	53
Ophthalmologists	38
Diabetologist	15
Optometrist	20
Others	7

ABCD-DUK Survey of Retinopathy Screening 2006

(5) Dealing with Screen +ve

- Many Units work closely with Ophthalmology Units
- However, processing of screen +ve remain a cause for concern.
 - Fast track referrals
 - Feedback to the Screening units after assessment has taken place
 - Feedback on Laser treatment

ABCD-DUK Survey of Retinopathy Screening 2006

(6) IT and Software Issues

- Majority (63%) of Programmes have purchased the PaSA listed software for running the screening service
- Others use either local or other available software

Software Systems for Programmes

Software Provider	No
Digital Health Care	22
Orion	17
Clinisys	3
Diabeta	7
Others	19

ABCD-DUK Survey of Retinopathy Screening 2006

(7) Quality Assurance and reporting

- Despite using PaSA recommended software, programmes continue to experience difficulties to provide the annual QA report to the expected detail

ABCD-DUK Survey of Retinopathy Screening 2006

(8) Resource Allocation

- 66% of programmes have reported that resource allocation is inadequate to sustain a high quality service.
- A few programmes highlighted the lack of infrastructure and IT support.

ABCD-DUK Survey of Retinopathy Screening 2006: Any other issues

“Funding withdrawn, not able to accelerate to 100% coverage”

“Wait up to 4 months for review of positive images”

“We are overloading Ophthalmology”

“Repeated cancellation of Ophthalmic clinics”

“Insufficient funds to achieve the 12 month target”

ABCD-DUK Survey of Retinopathy Screening 2006

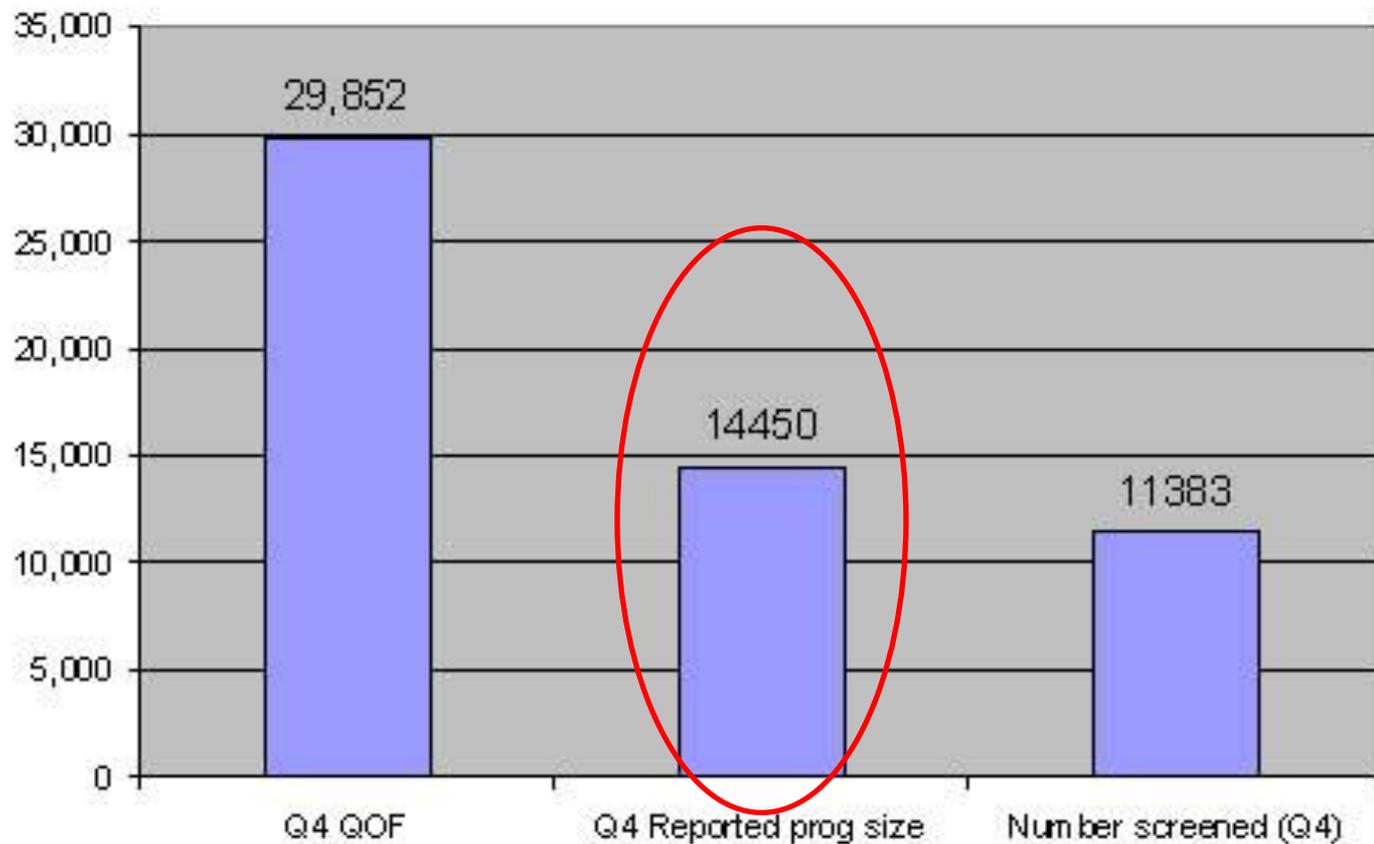
(9) Strengths

- The National Programme for reducing Visual Loss is up and running
- Significant Progress has been made by most programmes
- Retinal Screening Units are striving to work effectively with Ophthalmic services to deal with screen +ve patients

The problems with screening

- Identification of people with diabetes and in tracking exclusions
- quality of photography and grading
- **Inadequate audit and reporting from ophthalmology on outcomes**
- **Lack of data to show that screening IS leading to reduction in loss of sight: CRUCIAL TO RESOLVE**

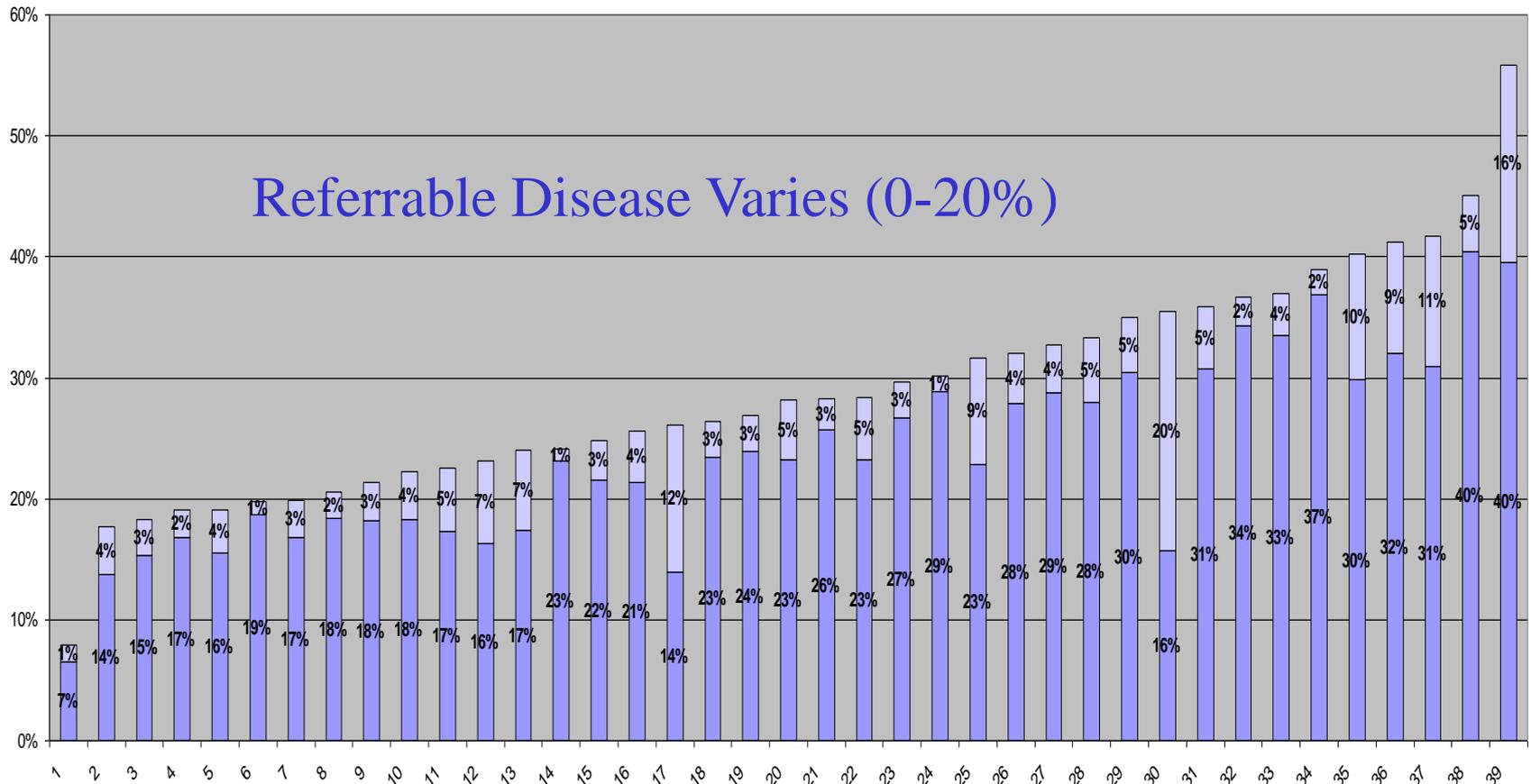
Programme size: Poor Coverage



Variable grading outcomes

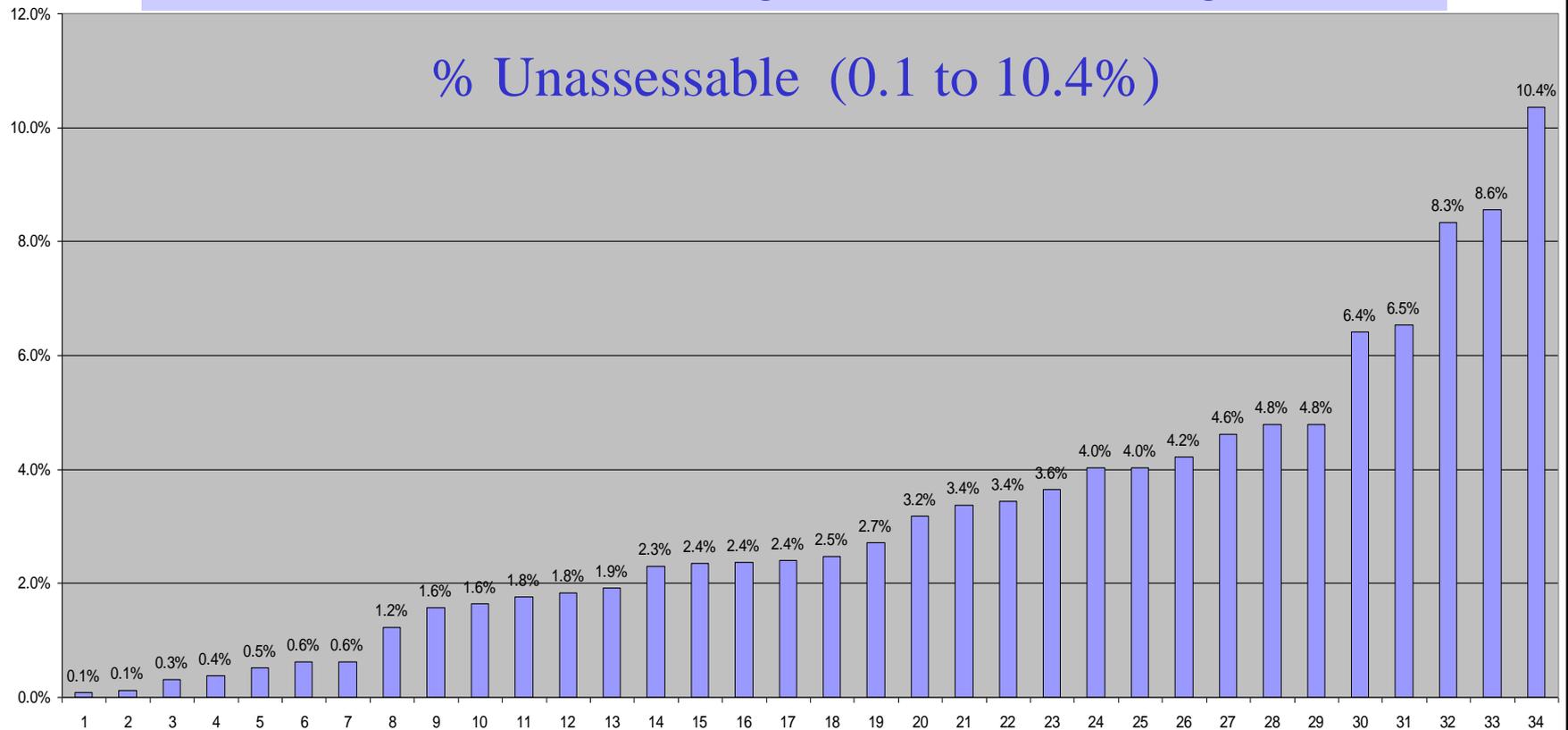
Diabetic Retinopathy excluding unobtainable and unassessable

□ Referrable DR
 ■ Non-referrable DR



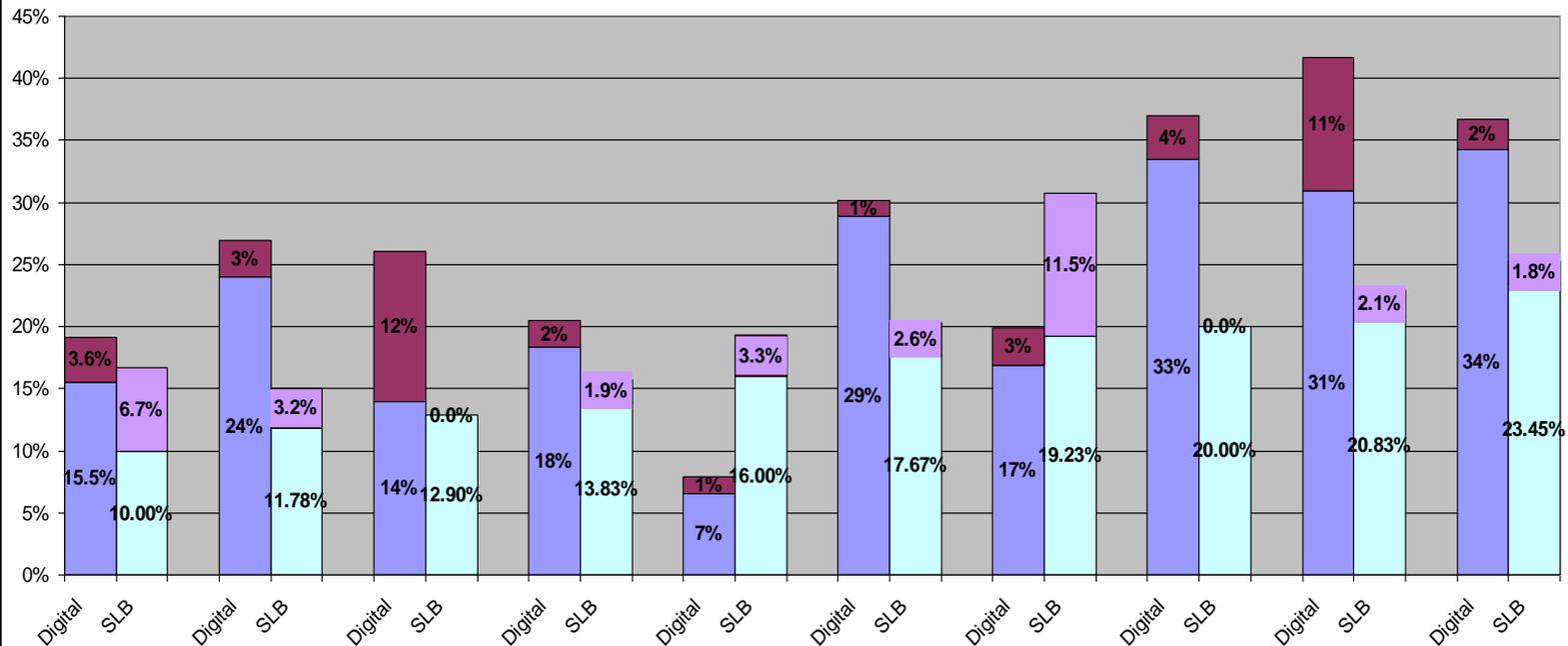
Variable quality of photography

% Unassessable in 34 Programmes (excluding outliers)



Inconsistent data on slit-lamp bio assessments

Diabetic retinopathy levels from 10 programmes following digital photography and slit lamp biomicroscopy assessment (tip of columns equals referable retinopathy)



Dealing with Screen Positives (based on results of screening)

- Considerable delay in appointments
- Repeated cancellation of Ophthalmic clinics
- Lack of Feedback from Ophthalmology
- Patients getting lost in Ophthalmology

Patients lost in ophthalmology

- Screening programme believed that once referred the patient remained in ophthalmology
- Ophthalmology confirmed that they did discharge patients once treated and stable –
- but did not inform the screening programme of this fact – or of the outcomes.
- No Audit data or little feedback to the programmes

*An Audit on the Management of Screen
Positive Patients referred from DRSS to
the Ophthalmology Department*

Quality Standards - NSC

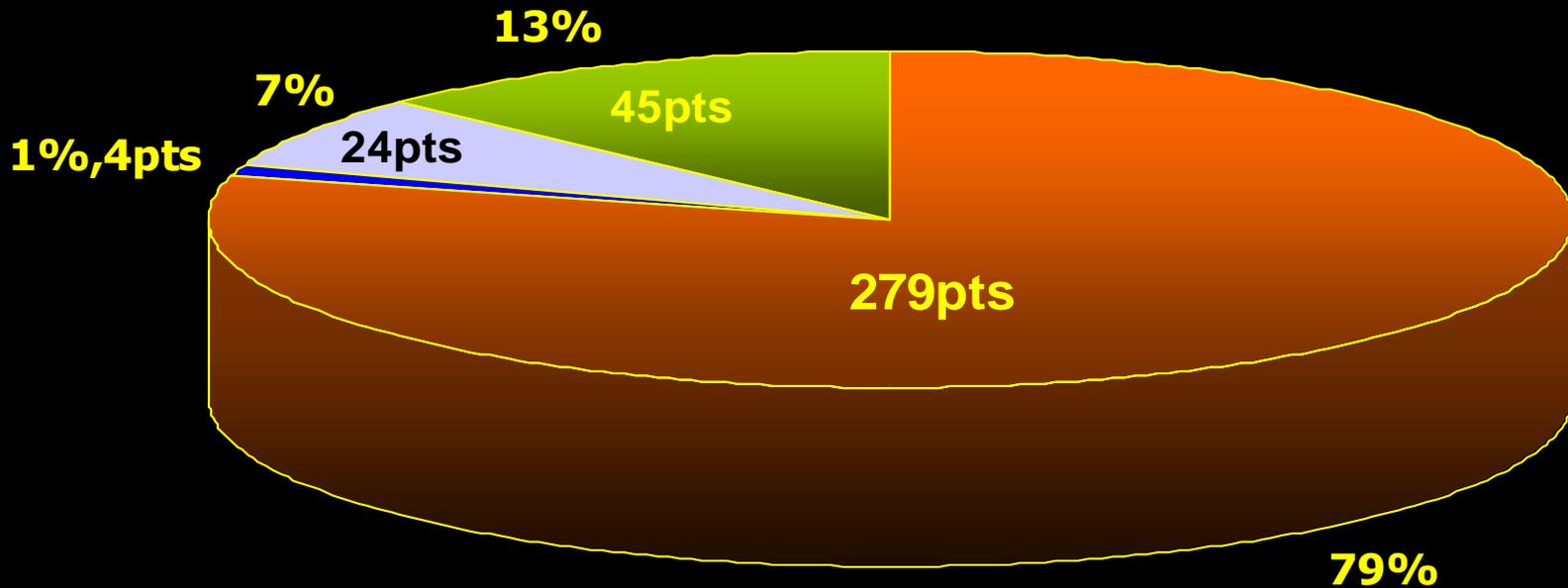
- The National Screening Committee (NSC) Service objectives and QA standards 5/1/07:
- Standards 10, 11, 12 and 13 Release 4 Jan 2007
<http://nscretinopathy.org.uk/>
- An audit to assess compliance with these standards is a useful indicator of the effectiveness of the service

Results

- Number referred from DRS 479 pts
- Number of notes reviewed 479 pts (100%)
- Non DR referrals 127 pts (27%)
- DR referrals 352 pts (73%)
- Total DNA/Cancelled 58 pts (16%)
- Number DR cases assessed 294 pts (84%)
by Ophthalmology

Severity of Diabetic Retinopathy referred to Ophthalmology

n = 352



M1

P1

R2

R3

Quality Standard - 10

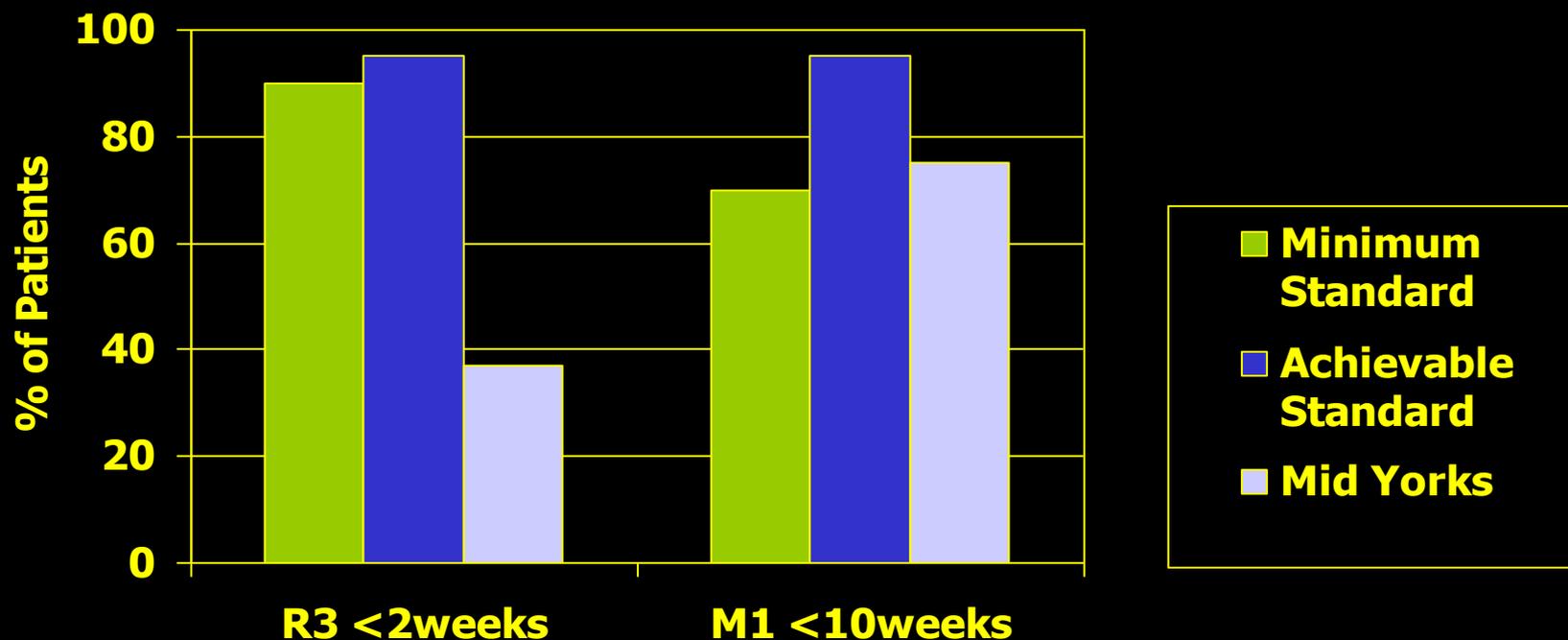
Timely consultation of all screen positives

	Mid Yorks All DR pts (n = 352)	Mid Yorks Excluding DNAs (n = 294)	Minimum Standard	Achievable Standard
R3 (fast-track)	33%	45%	70% < 2weeks	95% < 2weeks
R2	75%	82%	70% < 13weeks	95% < 13weeks
M1	77%	91%	70% < 13weeks	95% < 13weeks
All grades	78%	94%	100% < 18weeks	

Time between listing and first laser treatment (11)

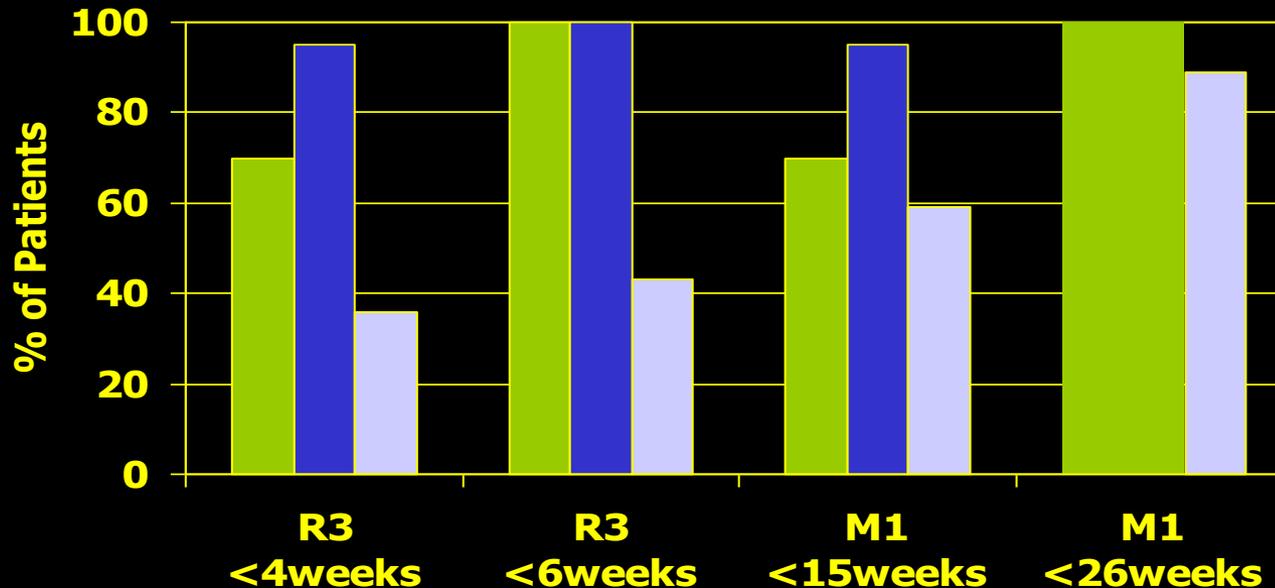
19 patients graded R3 were listed for laser (19/45)- 42%

59 patients graded M1 were listed for laser (59/279) -21%



Time between screening event and first laser treatment (12)

14 patients (31%) graded R3 and 37 patients (8%) graded M1 at screening were listed for laser treatment at first visit to ophthalmology and received laser treatment



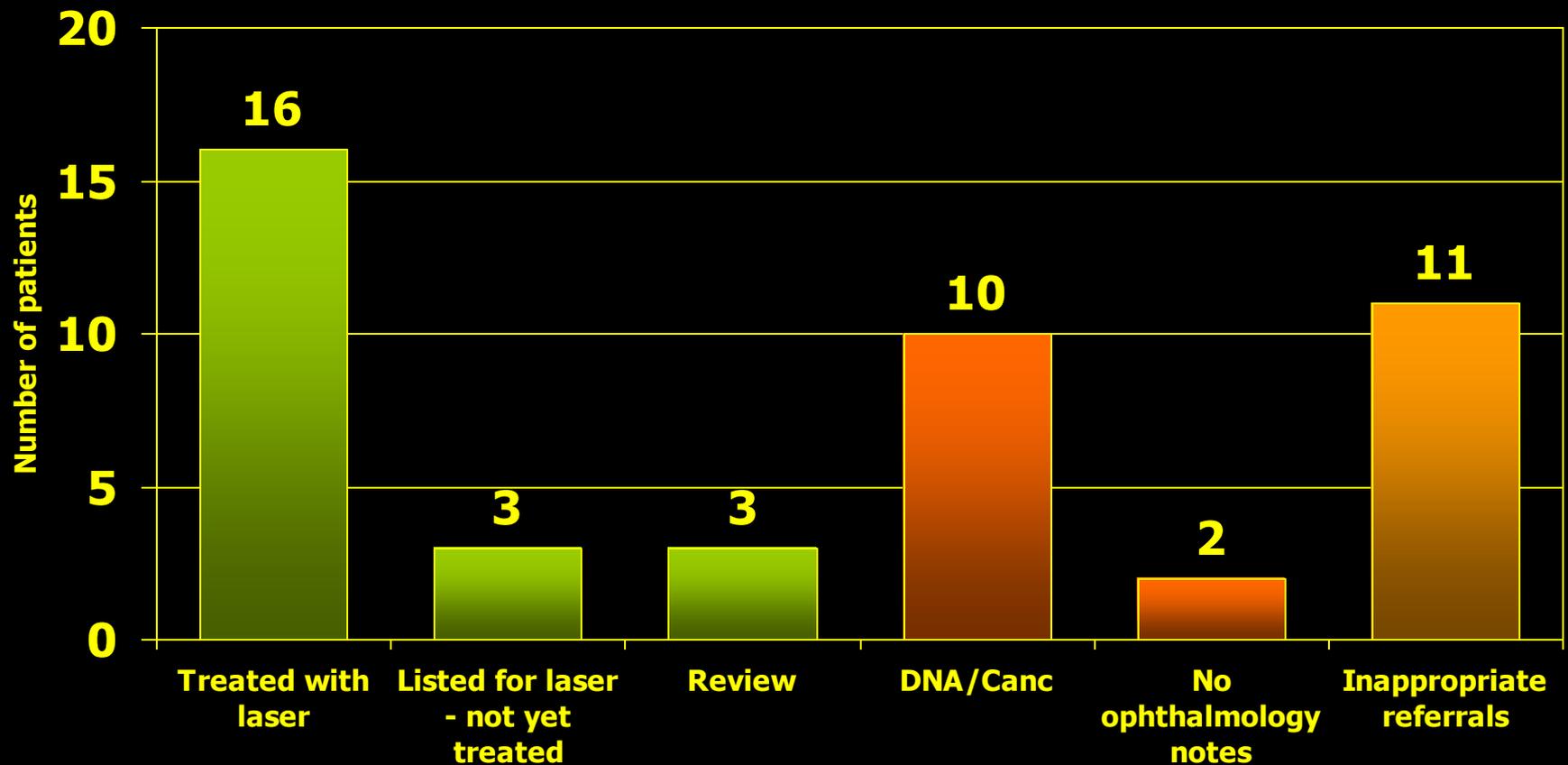
■ Minimum Standard

■ Achievable Standard

■ Mid Yorks

Outcome of R3 patients

$n = 45$



DNA and Cancellation Rate

Overall DNA Rate (*Standard < 10%*)

- **58 patients (16%) were not seen for an Ophthalmology assessment**
- **A further 25 patients (7%) failed to attend their first appointment but were subsequently seen – impacts on target times**

Combined Cancellation and DNA rate for:	Minimum Standard [all programmes]	Achievable Standard [top quartile]	Mid Yorks
R3 within 1 month	< 10%	< 5%	27%
R2 within 6 months	< 10%	< 5%	8%
M1 within 6 months	< 10%	< 5%	15%

Recommendations

1. Improvement in integration between DRSS and Ophthalmology department
2. Consistency of approach to diagnosis and treatment within Ophthalmology
3. Quality assurance in Ophthalmology for consultation, listing and laser treatment
4. Changes in treatment protocols
5. Need for DNA-tracking
6. Need for computerised audit tool

Action plans-

Improved integration

- Feedback forms
- MDT meetings
 - Monthly meetings between DRSS staff and Ophthalmologists and diabetologist
 - Management of patients (especially lasered patients)
 - Logistic issues

Successes of National Programme

- Standardisation of Camera software, methodology etc
- Identifying Resources needed to set up the programmes
- Getting screening into the National Target and PCT “must do” list
- Explicit Standards to all components
- Comprehensive QA System (EQA visits)
- Training programme for screeners and Graders (City & Guilds)
- Helping GP’s earn their QOF points!

Failures (Challenges)

- Insufficient Resources to meet Training and QA
- Poor Quality Commissioning (no Allowance for QA or Ophthalmology)
- No control over QA within Ophthalmology
- Continuous Software issues with inability to integrate and produce annual reports
- Failure to integrate screening into diabetes services

Failures (Challenges)

- Destruction of Small Programmes even though these were providing good services
- Failure to effectively engage Optometrist
- Priceless opportunity to carry out Multi centre research programme
- At present no effective monitoring of outcomes: i.e visual loss

Good screening starts with Good commissioning....

- Good commissioning should be designed to ensure that the **OUTCOMES** of an activity are desirable ...and that they can be proved...
-Need for evidence.

What is the intended outcome?

- A measured and measurable reduction in sight loss predominantly due to diabetic retinopathy.
10% (min) - 40% (achievable) within 5 years of the start of the programme (Standard 1)
- We need data locally on how many people have lost sight predominantly due to diabetic retinopathy on annual basis
- How does one gather that information and from where?

Registrations have been rising!

- The numbers recorded as SI or SSI predominantly due to DR per 100,000 has increased between April 1990 – March 1991 and April 1999 – March 2000, with incidence for the over 65s more than doubling.
- C.2300 in a single year
- Under-registration(45%?) still a problem.
- If 45% then actual SI/SSI = c. 4050 people.

Can we expect better outcome in 2010 – 2011?

- If good quality screening and data monitoring have been commissioned....
- With a clear process for reviewing outcomes and adjusting performance....
- We should see a clear reduction in registrations nationally

Collaboration is the key to success

- Commissioners and Public Health
- PCTs with GPs
- Public Health and Programmes
- Programmes and Ophthalmology

Working together...

WE WILL REDUCE THE LOSS OF SIGHT

Conclusions

- Screening programme has focussed minds and perhaps will help better co-ordination of diabetes care
- Local Leadership is identified as crucial issue
- Diabetologist need to get more involved in screening programmes
- Integration of Diabetes and Eye services
- Major issue is failure to address systemic risk factors hence lost opportunity

Acknowledgements

- Wakefield Retinal Screening Team
- Amanda Rowley
- Dr Sobha Sivaprasad
- Fiona O'Leary
- Steve Aldington

Acknowledgements

