“The Role of OCT (Optical Coherence Tomography) within the Diabetic Retinal Screening Service in identifying referable Diabetic Macular Oedema and looking at correlation for Ethnicity, Postcode, Age and Gender: A Clinical Audit”

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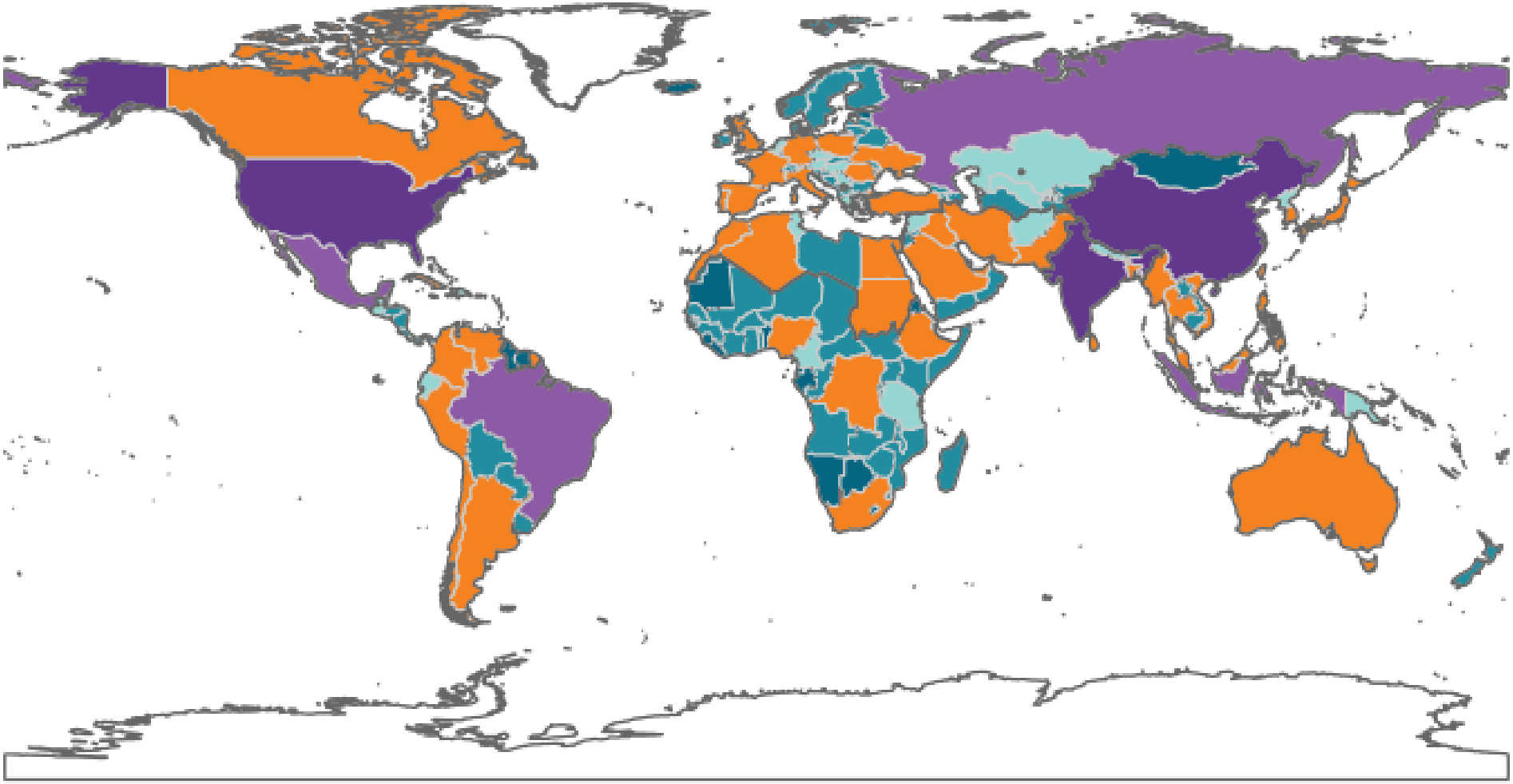
Prevalance of Diabetes

- **In 2014 there was 387 million people worldwide with diabetes**
- **415 million** adults in the world have diabetes.
  by 2040 this will rise to **642 million. (IDF, 2015)**
- **Currently 1 in 11 adults rising to 1 in 10.**
- **Currently world wide prevalence of 7.9%**
- **IDF estimated 46.3% are undiagnosed (1 in 2 people don't know they have it)**
- **77% come from low to middle income countries**
- **52 million people residing in Europe and 2,974,950 diabetes cases in UK**
- **In Scotland in 2014 there were 276,430 people recorded as having diabetes. (Type 1 10.8% and 88.3% Type 2)**

People with diabetes (aged 20 -79) in 1000s (2015)



Background aims of Clinical Audit Project

- To identify referable macular odema in DRS patients referred to ophthalmology
- To streamline DRS referrals into busy, overloaded ophthalmology clinics
- To evaluate the effectiveness of the DRS referral criteria and pathway locally

Background

- Aim of Diabetic Retinopathy Screening is to detect possible sight threatening changes and initiate timely treatment

- Incidence and prevalence of macular oedema increases with duration of diabetes and concurrent retinopathy Alkuraya et al(2005)

- OCT has been found to be more sensitive to detecting Diabetic Macular Oedema than identifying surrogate markers for DMO on fundus photography

Current DRS Ophthalmology Referral Criteria

(Scottish Diabetic Retinopathy Grading Scheme 2007)

- R3 Referable background Diabetic Retinopathy
  - 4> blot haemorrages in both hemi-fields, venous beading or IRMA
- R4 Proliferative Diabetic Retinopathy
  - New Vessels @ Disc or Elsewhere
- M2 Referable Maculopathy
  - Any Blot haemorrhages or exudates < or = 1 DD of centre of fovea

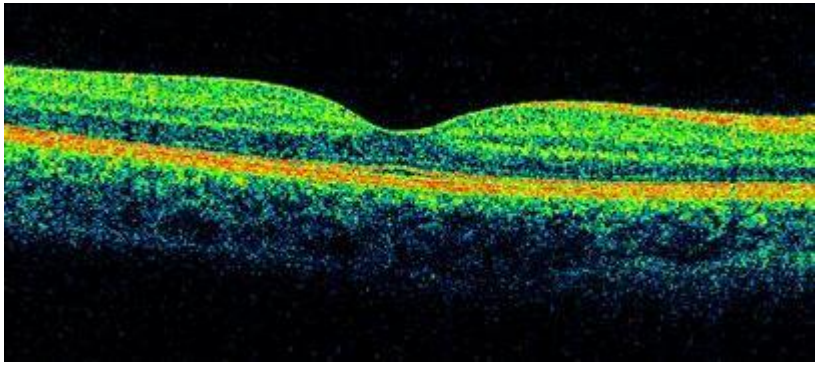
DRS Ophthalmology Referrals

- DRS ophthalmology M2 referrals for audit time frame for all screening sites
  - 3,887
- Total M2 Ophthalmology referrals from the two sites for pilot OCT clinics
  - 1,234
- Clinic 1 – 881 pts
- Clinic 2 - 353 pts

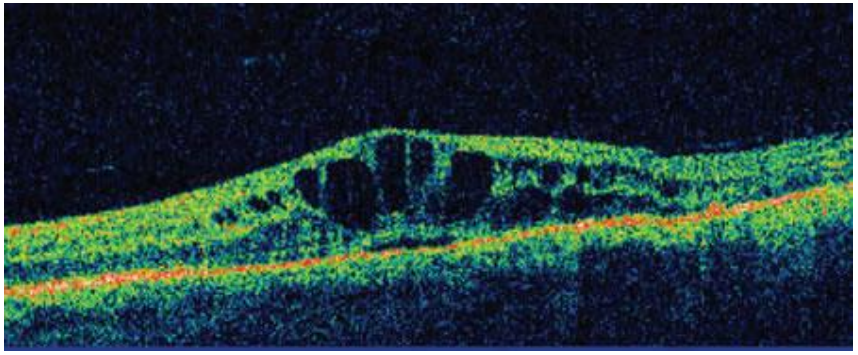
Method

- Retrospective clinical Audit
- Looked specifically at M2 DRS referrals to ophthalmology
- Two Southside clinics – Vic and SGH
- Data review from 01/01/13 to 31/12/14
  - 1,185 appointment episodes
- Refined to 725 episodes (reviews and non attenders removed)
- OCT Scan interpretation by DRS Ophthalmologist

OCT Scan images



- Normal colour OCT scan



OCT scan showing macular oedema

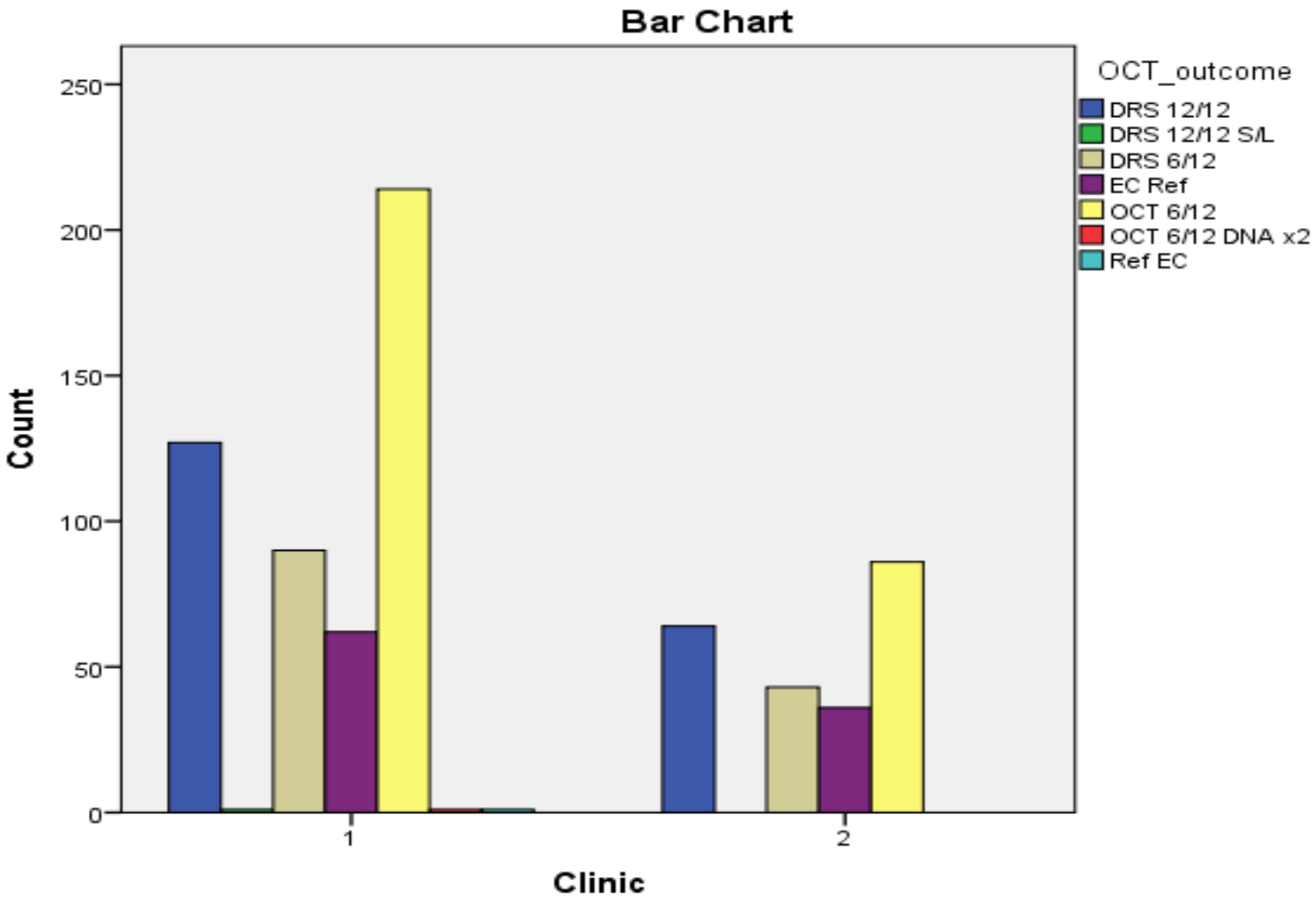
Audit population characteristics

- 725 New referral episodes of M2
- Two Glasgow southside clinics.
- Both Type 1 and Type 2 Diabetes
- Males and Females
- Age range 20yrs – 93yrs
- 18 Ethnic patient groups
- Encompassing 27 postcode areas
- Across 5 Scottish Index of Multiple Deprivation (SIMD) categories

Possible OCT Outcomes

- 6/12 Review in DRS OCT clinic
- 6/12 DRS photography / slit lamp clinic
- 12/12 DRS photography / slit lamp clinic
- Onward referral to secondary care Ophthalmology services for assessment / treatment

OCT clinic outcomes



OCT Outcome results

OCT outcomes were similarly distributed across the 2 clinics.

Patients who didn't attend x2 OCT clinic appointments were reappointed to photography screening

	6/12 OCT	Eye Clinic ref	DRS 6/12	DRS 12/12	Dna x2	Totals
Clinic 1	214	**63**	90	128	1	496
Clinic 2	86	**36**	43	64	0	229
Totals	300	**99**	133	192	1	725

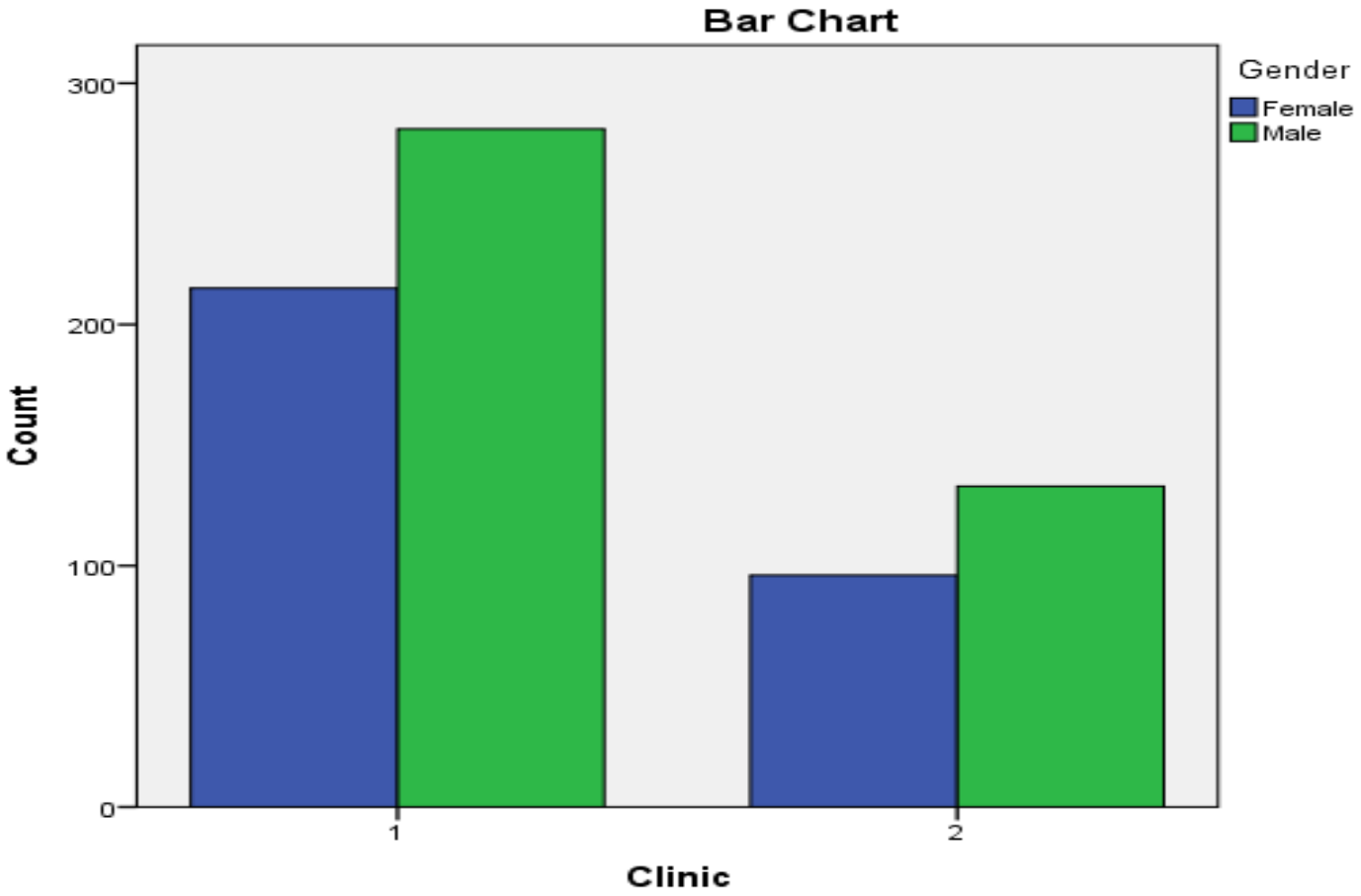
EC referrals from OCT

- DRS retinopathy grade R1 M2 largest group (n=90)
- Visual Acuity Largest group – 6/9 followed by 6/6 and 6/12.
- Exudates were the largest feature group in both eyes
- 61 -70 yrs largest Age group, age 61 yrs specifically
- > males than females referred (M=60, F=39)
- SIMD cat 2 largest group (n= 33)
- White Scottish largest ethnic group (n=62)

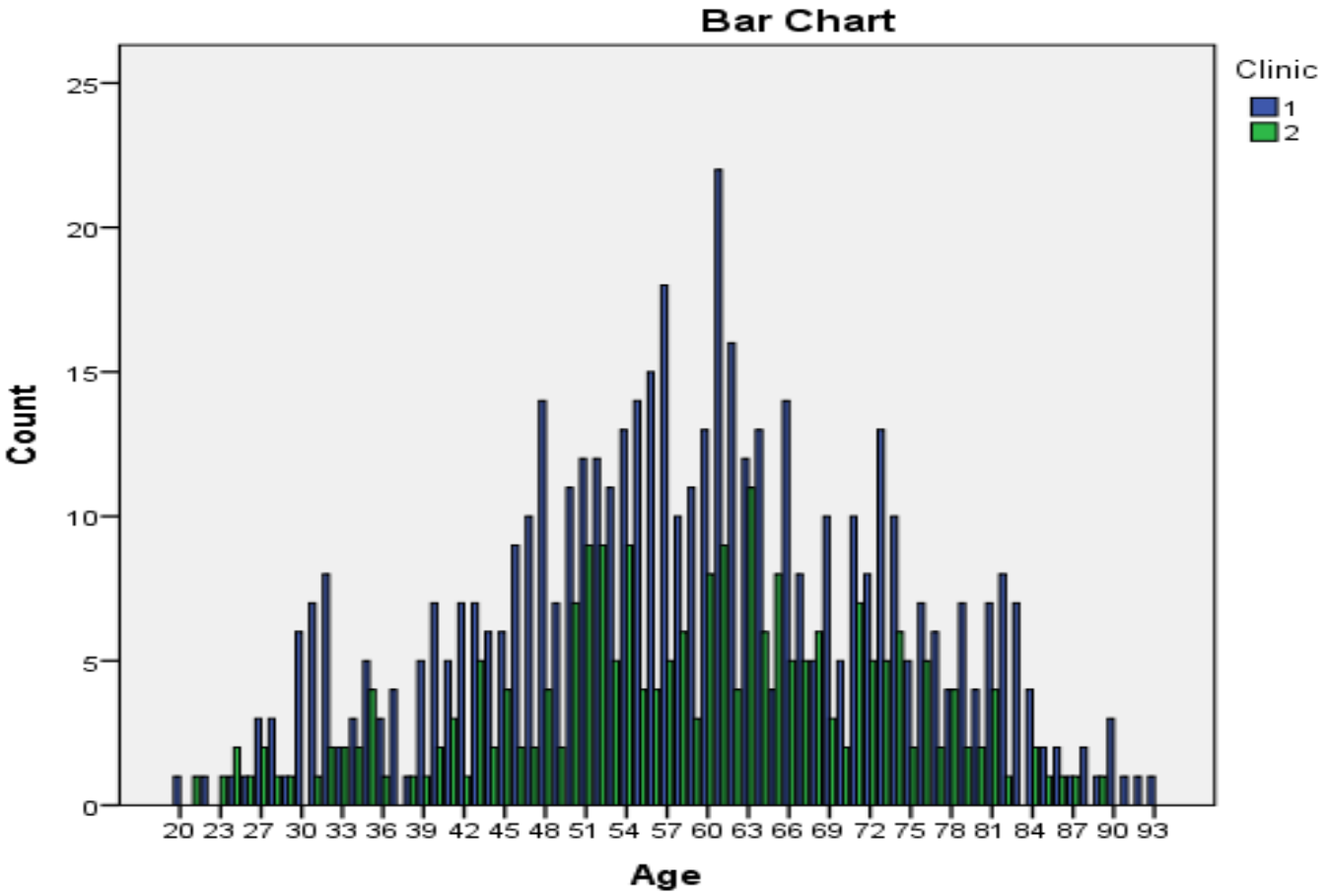
Audit population characteristic results

- White Scottish was largest Ethnic group (n=400)
- OCT outcome distribution similar across both clinics.
- Mean age for both clinics was 58 yrs.
- More males (n=414) than females (n=311) in population,
- Diabetes Type T1= 20.9% T2= 79.1%
- Largest SIMD cat 3 for Clinic 1 (n=215)
- Largest SIMD cat 2 for Clinic 2 (n=135)
- More females in SIMD cat 2 (n=111)
- More males in SIMD cat 3 (n=146)
- SIMD cat 3 had largest population group (n=233)

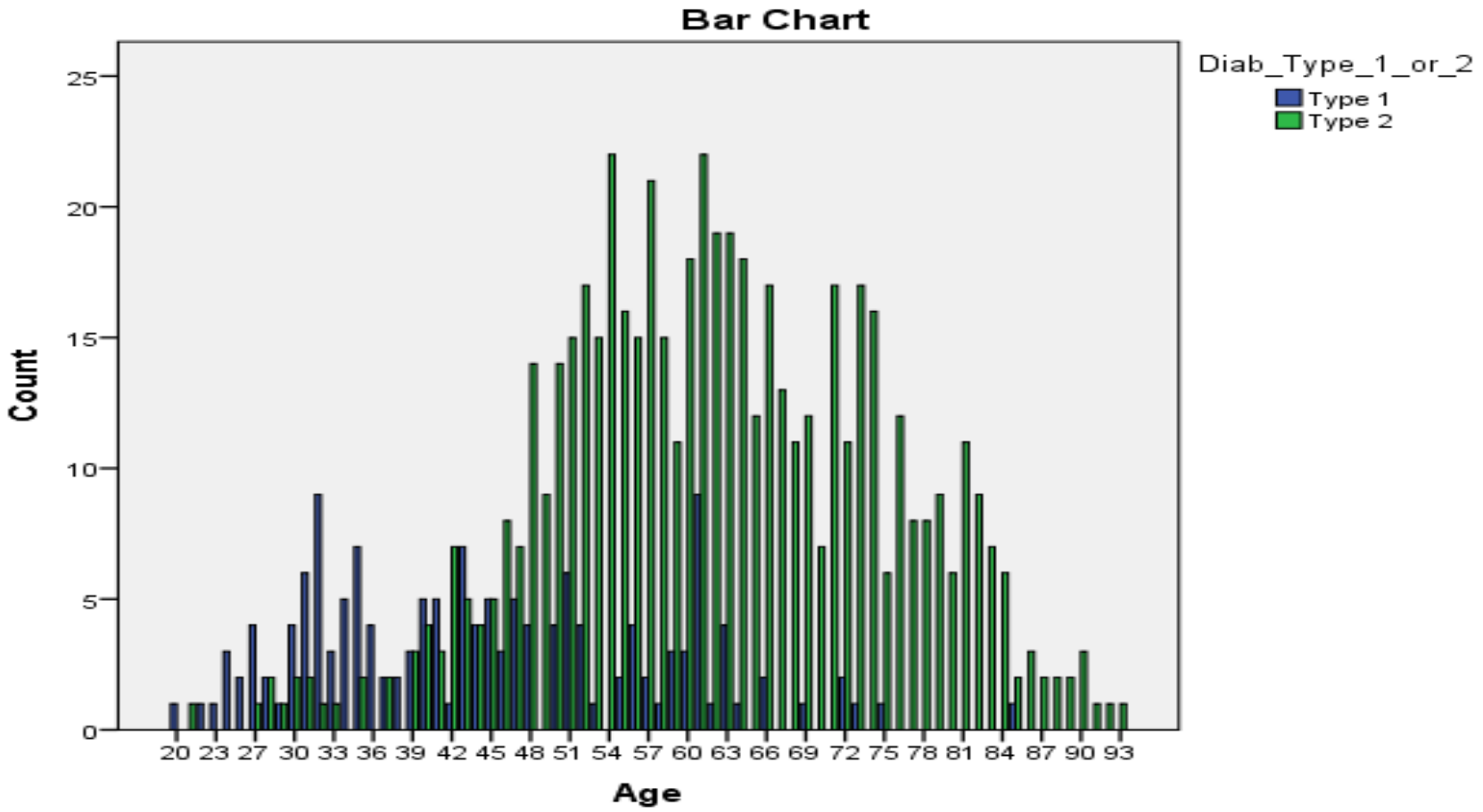
Gender distribution across clinics 1 & 2



Age distribution according to clinic



Age and Diabetes Type distribution

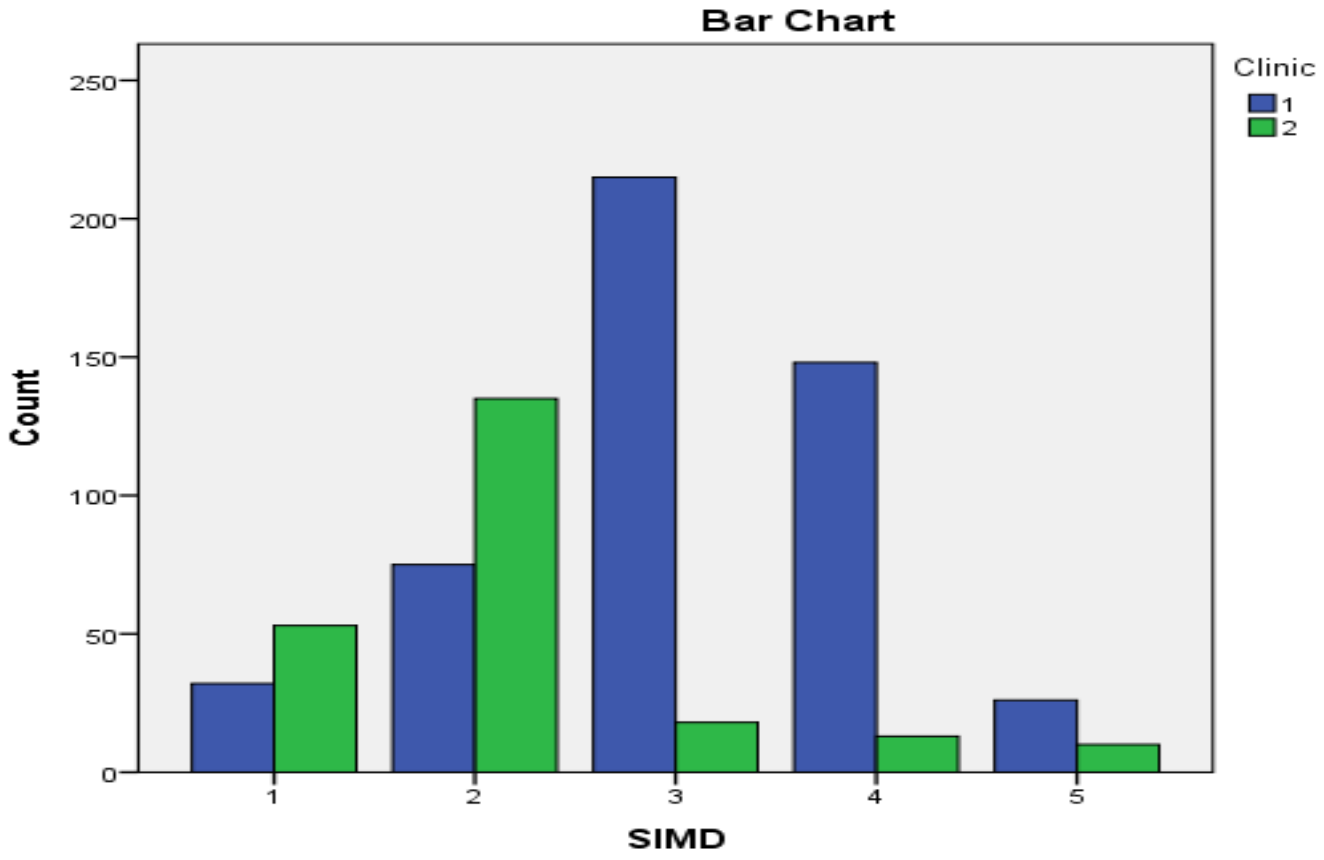


Audit pop. gender and clinic distribution in relation to age groupings

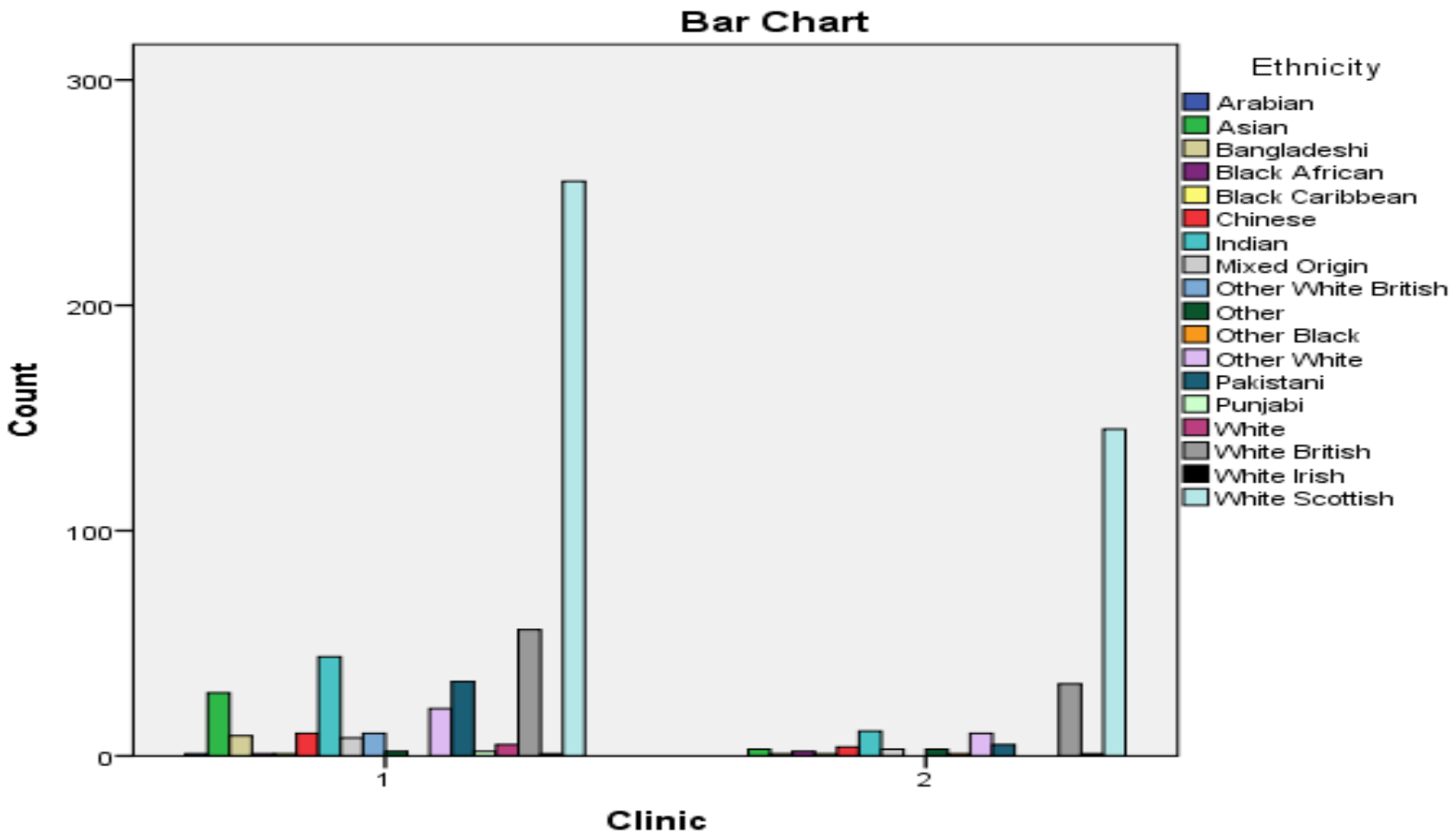
Age 20-30yrs	31-40yrs	41-50yrs	51-60yrs	61-70yrs	71-80yrs	81-90yrs	91-93yrs
F = 7	27	44	**69**	**69**	58	34	3
M = 19	34	70	**122**	99	56	14	0
C1 = 17	45	82	**129**	109	74	37	3
C2 = 9	16	32	**62**	59	40	11	0

Codes: F = Females, M = Males, C1 = Clinic 1 and C2 = Clinic 2

Clinic 1 & 2 distribution in relation to SIMD categories



Ethnicity distribution across clinics 1 & 2



Conclusion

- There was no specific correlation detected for Age, Ethnicity and Gender apart from those already known
- Diabetes population is increasing significantly year on year to epidemic proportions
- Number of diabetes patients with eye problems will also increase due to duration of diabetes and better diabetes diagnosis processes
- Demand for ophthalmic services will increase causing pressure on already congested clinics
- OCT is sensitive at detecting macular oedema
- Introduction of DRS OCT clinics can refine the process of unnecessary referral into already overburdened Ophthalmology clinics.
- Audit showed a reduction to 14% of the original ophthalmology referrals (3,884) and a reduction to 8% of referrals specifically for the two OCT clinic sites (1,234).

Why do we need to consider OCT?

- Diabetes is increasing and so is Diabetic Eye Disease.
- 450 million Diabetics Worldwide (2015)
- 93 million people with diabetes suffer with some sort of eye disease
- More than 1 in 3 people living with diabetes will develop Diabetic Retinopathy

International Diabetes Federation and The Fred Hollows Foundation.
Diabetes eye health: A guide for health care professionals. Brussels, Belgium: International Diabetes Federation, 2015.
www.idf.org/eyecare

- IDF estimated Diabetes prevelance in 2017 to be 8.8%

International Diabetes Federation (IDF) Diabetes Atlas, Eighth edition 2017: Accessed online at www.diabetesatlas.org