

Supplementary Materials

Determinants of non-attendance at face-to-face and telemedicine ophthalmic consultations

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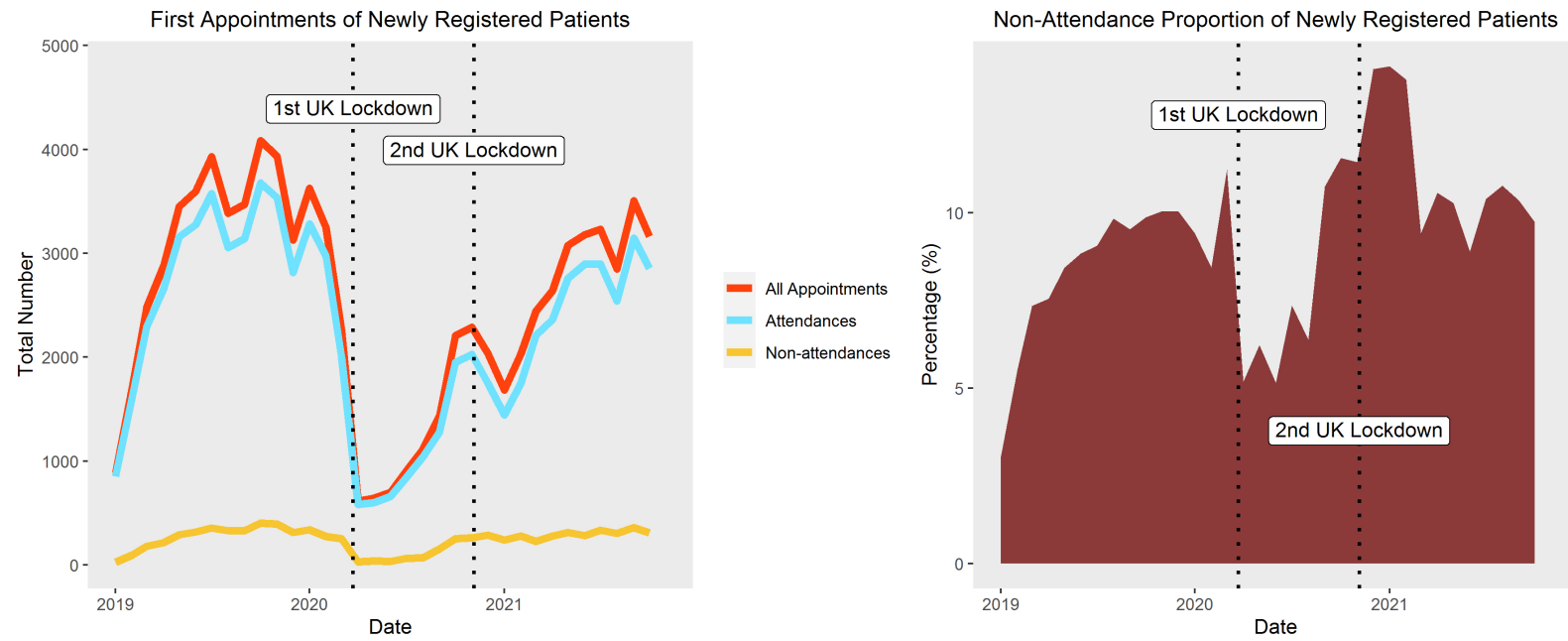
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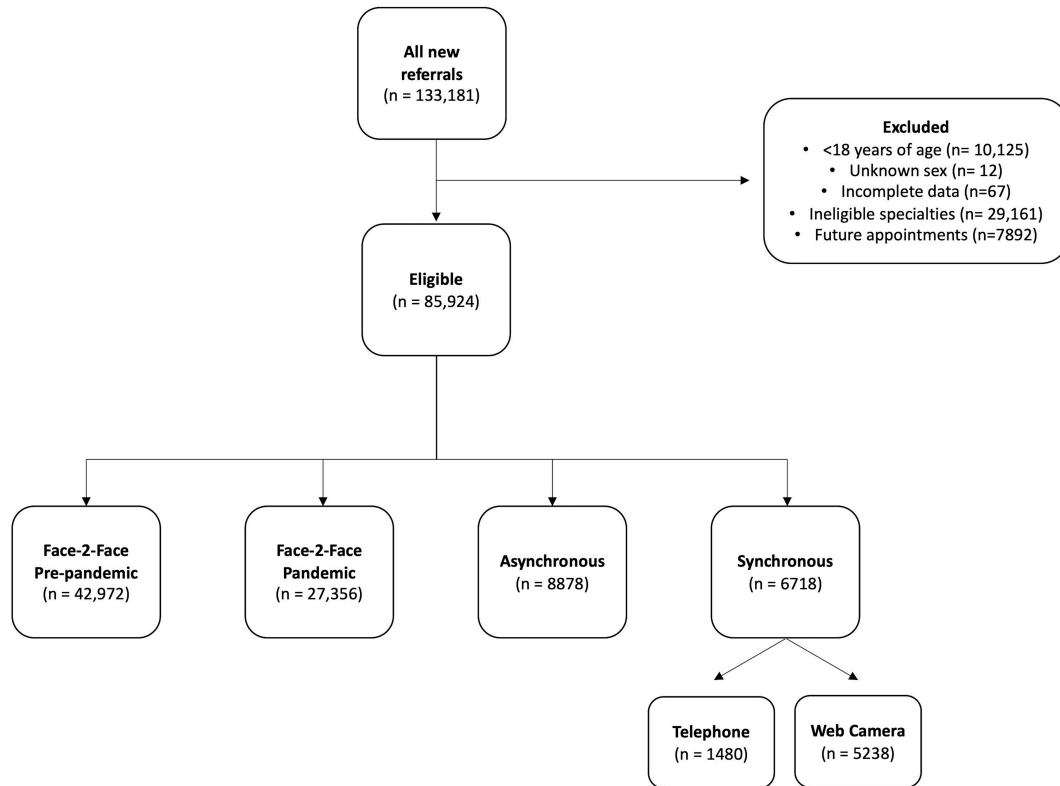
Methods

Index of Multiple Deprivation (IMD) was derived from the patient's residential postcode and cross-referenced to national data tables for 2019 provided by the UK Ministry of Housing, Communities & Local Government[1]. The Digital Exclusion Risk Index (DERI) covers twelve indicators across three equally-weighted domains - deprivation (33%), age (33%) and home broadband access and speed (33%) (full data available here: <https://github.com/GreaterManchesterODA/Digital-Exclusion-Risk-Index>)[2]. We suspected and statistically confirmed collinearity between the DERI and IMD (Pearson $r = 0.68$) and therefore opted to solely use the broadband component of the DERI. This comprises three indicators: i) the proportion of homes unable to receive a 30MBit/s connection, ii) the proportion of connections receiving less than 10MBit/s broadband and iii) the average download speed. The broadband component of the DERI did not correlate with IMD ($r=0.04$).

All analyses were conducted in R version 4.1.0 (R Core Team, 2021. R Foundation for Statistical Computing, Vienna, Austria). Multiple imputation was conducted using the `mice` package and visualisations were generated using the `ggplot` and `jtools` packages. Reporting is in line with the guidelines set by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) and its extension, the REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) statements (Checklist: Supplementary materials) [3,4].



Supplementary Figure 1: Distribution of first appointments of newly registered patients by attendance status across the study period.



Supplementary Figure 2: Flow diagram illustrating the reasons for exclusion/ineligibility and division into mode of healthcare delivery. Pre-pandemic is defined as the period between January 1st 2019 and March 23rd 2021 inclusive, the date of the first UK lockdown. Pandemic is defined as March 24th 2021 to October 31st 2021 inclusive.

Supplementary Table 1: Pairwise comparisons of baseline characteristics by delivery mode.

Characteristic		F2F Pre-Pandemic	F2F Pandemic	Asynchronous	Synchronous – Telephone	Synchronous – Audiovisual
Sex	F2F Pre-Pandemic	□□	□□	□□	□□	□□
	F2F Pandemic	1	□□	□□	□□	□□
	Asynchronous	<0.001	0.0124	□□	□□	□□
	Synchronous – Telephone	0.51	0.20	0.0030	□□	□□
	Synchronous – Webcam	<0.001	<0.001	<0.001	1	□□
Age	F2F Pre-Pandemic	□□	□□	□□	□□	□□
	F2F Pandemic	<0.001	□□	□□	□□	□□
	Asynchronous	<0.001	<0.001	□□	□□	□□
	Synchronous – Telephone	<0.001	<0.001	<0.001	□□	□□
	Synchronous – Webcam	<0.001	<0.001	<0.001	<0.001	□□
Asian (South) ethnicity	F2F Pre-Pandemic	□□	□□	□□	□□	□□
	F2F Pandemic	<0.001	□□	□□	□□	□□
	Asynchronous	<0.001	<0.001	□□	□□	□□
	Synchronous – Telephone	0.0360	1	1	□□	□□
	Synchronous – Webcam	<0.001	0.0083	1	1	□□
Black ethnicity	F2F Pre-Pandemic	□□	□□	□□	□□	□□
	F2F Pandemic	<0.001	□□	□□	□□	□□
	Asynchronous	1	<0.001	□□	□□	□□
	Synchronous – Telephone	0.0014	1	0.0016	□□	□□
	Synchronous – Webcam	<0.001	0.08	<0.001	1	□□
Other ethnicity	F2F Pre-Pandemic	□□	□□	□□	□□	□□
	F2F Pandemic	<0.001	□□	□□	□□	□□
	Asynchronous	<0.001	<0.001	□□	□□	□□
	Synchronous – Telephone	<0.001	<0.001	1	□□	□□
	Synchronous – Webcam	<0.001	<0.001	<0.001	<0.001	□□
White ethnicity	F2F Pre-Pandemic	□□	□□	□□	□□	□□
	F2F Pandemic	<0.001	□□	□□	□□	□□

	Asynchronous	<0.001	1	□□	□□	□□
	Synchronous – Telephone	<0.001	<0.001	<0.001	□□	□□
	Synchronous – Webcamera	<0.001	0.33	1	<0.001	□□
Unknown ethnicity	F2F Pre-Pandemic	□□	□□	□□	□□	□□
	F2F Pandemic	<0.001	□□	□□	□□	□□
	Asynchronous	<0.001	<0.001	□□	□□	□□
	Synchronous – Telephone	<0.001	<0.001	<0.001	□□	□□
	Synchronous – Webcamera	0.0019	<0.001	<0.001	<0.001	□□
SES	F2F Pre-Pandemic	□□	□□	□□	□□	□□
	F2F Pandemic	1	□□	□□	□□	□□
	Asynchronous	0.0028	0.0271	□□	□□	□□
	Synchronous – Telephone	0.0013	0.0035	0.37	□□	□□
	Synchronous – Webcamera	<0.001	<0.001	<0.001	0.15	□□
Non-attendance	F2F Pre-Pandemic	□□	□□	□□	□□	□□
	F2F Pandemic	<0.001	□□	□□	□□	□□
	Asynchronous	<0.001	0.0051	□□	□□	□□
	Synchronous – Telephone	1	1	0.19	□□	□□
	Synchronous – Webcamera	<0.001	<0.001	<0.001	0.0207	□□

Supplementary Table 2. Baseline characteristics of the cohort failing to self-report ethnicity.

	Characteristic	Unknown N=53,787	Reported N=32,137	p-value
Sex n (%)	Female	29,551 (54.9%)	17,185 (53.5%)	<0.001
Age median (IQR)	Years	56 (14.5)	53 (15.5)	<0.001
SES ² median (IQR)	Decile (1=most deprived)	5 (2)	5 (2)	0.016
Broadband Access ³ median (IQR)	Index (1=most at risk of digital exclusion)	3.40 (0.2)	3.41(0.2)	<0.001
Interpreter n (%)	Yes	451 (0.8%)	281 (0.9%)	0.61
Diabetes n (%)**	Yes	2,992 (5.6%)	1,200 (3.7%)	<0.001
Time of Appointment n (%)	Early Morning	24,015 (44.6%)	14,548 (45.2%)	<0.001
	Late Morning	4,749 (8.8%)	2,711 (8.4%)	
	Early Afternoon	19,748 (36.7%)	11,275 (35.1%)	
	Late Afternoon	5,275 (9.8%)	3,603 (11.2%)	
Sight-Impaired n (%)	Yes	318 (0.6%)	172 (0.5%)	0.31
Previous cancellation n (%)	No	44,067 (81.9%)	28,195 (87.7%)	<0.001
	By hospital	7,037 (13.1%)	2,743 (8.5%)	
	By patient	2,683 (5.0%)	1,199 (3.7%)	
Specialty n (%)	Adnexal	5,484 (10.2%)	1,538 (4.8%)	<0.001
	Cataract	10,034 (18.7%)	5,085 (15.8%)	
	General	18,559 (34.5%)	16,654 (51.8%)	
	Glaucoma	8,672 (16.1%)	3,304 (10.3%)	
	Medical Retina	11,038 (20.5%)	5,556 (17.2%)	
Attendance status n (%)	Non-attendance	5,948 (11.1%)	2,340 (7.3%)	<0.001

Supplementary Table 3: Adjusted odds ratios for non-attendance derived from multivariable logistic regression stratified by delivery mode with multiple imputation (predominantly ethnicity, but also SES and Broadband)

		Pre-pandemic F2F		Pandemic F2F		Asynchronous		Synchronous (telephone)		Synchronous (audiovisual)	
		OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	(decade)	0.92 (0.90-0.94)	<0.001	0.90 (0.88-0.92)	<0.001	0.90 (0.86-0.95)	<0.001	0.83 (0.73-0.95)	0.0063	1.05 (0.98-1.13)	0.14
Sex	Female	Reference		Reference		Reference		Reference		Reference	
	Male	1.17 (1.09-1.25)	<0.001	1.11 (1.02-1.20)	0.0119	1.27 (1.11-1.45)	<0.001	1.26 (0.88-1.82)	0.20	1.31 (1.05-1.63)	0.0161
Ethnicity	White	Reference		Reference		Reference		Reference		Reference	
	Asian (South)	1.05 (0.91-1.21)	0.49	1.14 (0.91-1.43)	0.23	1.44 (1.01-2.04)	0.0416	1.49 (0.48-4.57)	0.47	2.43 (1.32-4.48)	0.0052
	Black	1.28 (1.08-1.51)	0.0058	1.69 (1.30-2.20)	<0.001	1.02 (0.76-1.39)	0.88	2.58 (0.70-9.46)	0.14	4.62 (2.27-9.42)	<0.001
	Other	1.37 (1.23-1.53)	<0.001	2.04 (1.66-2.50)	<0.001	2.41 (1.90-3.06)	<0.001	2.67 (1.03-6.93)	0.0440	1.67 (1.00-2.79)	0.0050
SES (greater deprivation)	Per decile decrease	1.11 (1.10-1.13)	<0.001	1.08 (1.06-1.10)	<0.001	1.07 (1.04-1.11)	<0.001	1.03 (0.95-1.12)	0.47	1.16 (1.10-1.23)	<0.001
Broadband	Index	0.94 (0.86-1.01)	0.10	0.99 (0.90-1.09)	0.84	0.94 (0.80-1.11)	0.46	0.81 (0.52-1.26)	0.34	1.06 (0.84-1.34)	0.56
Interpreter	No	Reference		Reference		Reference		Reference		Reference	
	Yes	0.52 (0.34-0.79)	0.0023	1.09 (0.72-1.67)	0.68	1.26 (0.62-2.54)	0.52	2.55 (0.75-8.73)	0.13	0.70 (0.10-5.25)	0.73
Diabetes mellitus	No	Reference		Reference		Reference		Reference		Reference	
	Yes	0.88 (0.75-1.04)	0.13	0.58 (0.48-0.70)	<0.001	0.53 (0.41-0.67)	<0.001	1.48 (0.31-7.08)	0.62	*	0.50

Subspecialty	Adnexal	Reference		Reference		*		Reference		Reference	
	Cataract	1.46 (1.24-1.72)	< 0.001	1.00 (0.86-1.17)	0.98	*		1.20 (0.55-2.61)	0.65	1.16 (0.68-1.97)	0.59
	General	1.31 (1.14-1.52)	< 0.001	0.45 (0.38-0.51)	< 0.001	*		1.38 (0.62-3.08)	0.43	0.55 (0.44-0.71)	< 0.001
	Glaucoma	1.64 (1.38-1.95)	< 0.001	0.96 (0.80-1.15)	0.65	Reference		*		*	
	MR	2.08 (1.74-2.37)	< 0.001	1.40 (1.21-1.61)	< 0.001	2.39 (2.06-2.77)	< 0.001	*		*	
Registered sight-impaired	No	Reference		Reference		Reference		Reference		Reference	
	Yes	0.34 (0.18-0.64)	< 0.001	0.50 (0.28-0.90)	0.0208	0.59 (0.14-2.57)	0.49	*	*	*	
Appointment time	Early afternoon	Reference		Reference		Reference		Reference		Reference	
	Early morning	1.09 (1.01-1.17)	0.0196	1.05 (0.97-1.15)	0.22	1.15 (0.97-1.36)	0.11	0.83 (0.51-1.35)	0.44	0.92 (0.71-1.18)	0.50
	Late morning	0.72 (0.61-0.85)	< 0.001	0.97 (0.83-1.13)	0.68	1.03 (0.82-1.28)	0.82	0.59 (0.26-1.34)	0.21	0.74 (0.51-1.08)	0.12
	Late afternoon	0.63 (0.54-0.74)	< 0.001	0.58 (0.47-0.73)	< 0.001	1.18 (0.95-1.46)	0.13	1.66 (1.08-2.56)	0.0221	0.59 (0.41-0.83)	0.0028
Previous cancellation	No	Reference		Reference		Reference		Reference			
	By the hospital	1.32 (1.19-1.47)	< 0.001	1.91 (1.72-2.12)	< 0.001	2.08 (1.71-2.52)	< 0.001	0.40 (0.21-0.75)	0.0042	2.19 (1.61-2.98)	< 0.001
	By the patient	1.88 (1.63-2.15)	< 0.001	1.84 (1.56-2.18)	< 0.001	1.59 (1.26-2.01)	< 0.001	1.37 (0.65-2.91)	0.41	1.63 (0.90-2.98)	0.11

*Either no cases or very few leading to unstable estimates.

F2F: Face-to-face, OR: Odds ratio, SES: Socioeconomic status, MR: Medical retina.

References

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