The RCOphth National Ophthalmology Database study of cataract surgery: Assessment of posterior capsule rupture for the gender of the operating surgeon

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Aim:

To investigate posterior capsule rupture (PCR) rates for the operating surgeon gender, for surgery performed in the traditional NHS and the Independent Sector (ISTC).

Methods:

Eligible operations were performed between 01/04/2016 and 31/03/2022 in centres supplying data to the national cataract audit for ≥50 eligible operations with data for patients' gender, age at surgery, anterior chamber depth and preoperative visual acuity. Expected PCR was calculated using the new RCOphth NOD PCR model (publication pending). Data for surgeons with at least 50 operations was used to estimate the median surgeon expected rate used as the comparator in the estimation of case complexity adjusted rates. Adjusted rates were calculating using:

Adjusted rate = median surgeon expected rate * (observed rate / expected rate)

Results:

952,044 operations were performed in 75 NHS and 58 ISTC centres by 3,066 surgeons, 1,165 (38.0%) female and 1,901 (62.0%) male.

Female surgeons performed (**Table 1**):

- 218,669 (23.0%) operations (82.0% NHS vs 18.0% ISTC)
- 63 (5.4%) female surgeons had data from the ISTC
- 65,418 (29.9%) were performed by 716 (61.5%) trainees

Male surgeons performed (**Table 2**):

- 733,375 (77.0%) operations (55.6% NHS vs 44.4% ISTC)
- 294 (15.5%) male surgeons had data from the ISTC
- 97,735 (13.3%) operations were performed by 919 (48.3%) trainee surgeons

All 133 centres had data for surgery performed by male surgeons, and 125 (94.0%) centres had data for surgery performed by a female surgeon (**Figure 1**).

PCR:

For female surgeons, the observed, expected and adjusted PCR rates were 1.32%, 1.32% and 1.28%.

For male surgeons, the observed, expected and adjusted PCR rates were 0.91%, 1.05% and 1.12%.

For both female and male surgeons, the observed PCR rate was around 3 times higher, and the expected rates around 2 times higher for their operations in the NHS than in the ISTC.

For both female and male surgeons, the observed and expected rates were lower for weekend surgery, longer time periods after primary medical qualification and higher volume surgeons (**Tables 1 and 2**).

Table 1: Number and percentage of operation with PCR rates for female surgeons

Female surgeons	Number operations	% operations	Observed PCR	Expected PCR	Adjusted PCR
All operations	218,669	100.0	1.32	1.32	1.28
Operations from the NHS	179,360	82.0	1.50	1.44	1.34
Operations from the ISTC	39,309	18.0	0.55	0.78	0.91
Operations on weekdays	204,682	93.6	1.34	1.34	1.29
Operations at weekends	13,987	6.4	1.13	1.07	1.36
Years since primary medical qualification					
≤3 years	1,453	0.7	3.10	2.61	1.53
>3 to ≤7 years	22,841	10.5	1.88	2.27	1.07
>7 to ≤10 years	20,097	9.2	1.95	2.00	1.25
>10 to ≤20 years	65,461	29.9	1.50	1.32	1.47
>20 years	108,817	49.8	0.97	0.98	1.27
Surgeons with ≥50 operations in NHS and ISTC (N = 23 surgeons)					
NHS	6,959	27.8	0.92	1.00	1.08
ISTC	18,055	72.2	0.60	0.70	1.14
Surgeon with number of operations					
≤250 (N = 921 surgeons)	64,842	29.7	2.10	1.80	1.51
251 to 1,000 (N = 221 surgeons)	101,707	46.5	1.26	1.24	1.32
1001 to 2,000 (N = 15 surgeons)	20,382	9.3	0.61	1.01	0.78
>2,000 (N = 8 surgeons)	31,738	14.5	0.41	0.82	0.65

Figure 1: The percentage of operations performed in each centre by female and male surgeons

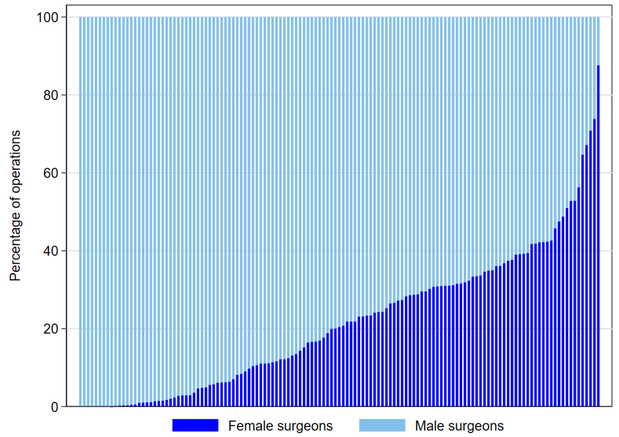


Table 2: Number and percentage of operation and PCR rates for male surgeons

Male surgeons	Number operations	% operations	Observed PCR	Expected PCR	Adjusted PCR
All operations	733,515	100.0	0.91	1.05	1.12
Operations from the NHS	407,460	55.6	1.28	1.31	1.26
Operations from the ISTC	325,915	44.4	0.45	0.73	0.80
Operations on weekdays	658,860	89.8	0.93	1.07	1.12
Operations at weekends	74,515	10.2	0.75	0.91	1.06
Years since primary medical qualification					
≤3 years	2,568	0.4	3.62	2.77	1.68
>3 to ≤7 years	32,029	4.4	2.14	2.33	1.18
>7 to ≤10 years	35,918	4.9	1.66	2.05	1.05
>10 to ≤20 years	203,064	27.7	1.02	1.06	1.23
>20 years	459,796	62.7	0.71	0.88	1.04
Surgeons with ≥50 operations in NHS and ISTC (N = 143 surgeons)					
NHS	55,179	25.6	0.73	1.02	1.00
ISTC	160,378	74.4	0.46	0.73	0.80
Surgeon with number of operations					
≤250 (N = 1,265 surgeons)	90,352	12.3	2.14	1.73	1.59
251 to 1,000 (N = 504 surgeons)	249,765	34.1	1.14	1.18	1.24
1001 to 2,000 (N = 82 surgeons)	109,289	14.9	0.68	0.91	0.96
>2,000 (N = 50 surgeons)	283,969	38.7	0.42	0.79	0.68

Conclusions:

The observed and expected PCR rates were higher in the NHS than ISTC for both female and male surgeons, consistent with NHS cases being of greater complexity. The PCR rates were slightly lower for male surgeons, which is most easily explained by the higher proportion of male surgeons' operations from the ISTC, more male surgeons performing higher volume surgery, and a lower proportion of cases performed by male trainees compared to females. Further research investigating the interaction between surgeon years since qualification and case volume per year is needed.

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