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# Junior doctors' aspirations for careers in ophthalmology: 40 years of surveys of UK medical graduates

# Trevor W Lambert , Atena Barat and Michael J Goldacre

UK Medical Careers Research Group, Unit of Health-Care Epidemiology, Nuffield Department of Population Health, University of Oxford, Oxford OX3 7LF, UK

Corresponding author: Trevor W Lambert. Email: trevor.lambert@dph.ox.ac.uk

### Summary

**Objective:** Using data from 40 years of national surveys of UK medical graduates, we report on ophthalmology as a career choice.

**Design, setting, and participants:** Self-administered questionnaire surveys of all graduates from all UK medical schools in selected years of qualification between 1974 and 2015.

Main outcome measures: Career specialty preferences of doctors one, three, and five years after graduation; career specialty destinations 10 years after graduation.

**Results:** One year after graduation, ophthalmology was the first career preference of 1.6% of the qualifiers of 1974–83, 2.2% of 1993–2002, and 1.8% of 2005–15. The corresponding percentages three years after graduation were 1.5, 1.8, and 1.2%. Men were more likely than women to choose ophthalmology: among graduates of 2005–15, 2.4% of men and 1.4% of women did so at one year, as did 1.7% of men and 0.7% of women at five years. Seventy per cent of doctors practising as ophthalmologists 10 years after qualification had told us in their first post-qualification year that ophthalmology was their first choice of career.

**Conclusions:** There has been no systematic change in recent years in the proportion of recent medical graduates intending to have a career in ophthalmology when surveyed one year after graduation. However, the proportion at three and five years after graduation was lower than that at year 1. Suggestions for maintaining interest in the specialty include improved career advice, greater early clinical exposure to ophthalmology, and improved access to flexible training. Most practising ophthalmologists had made early decisions that this was their intended career.

### **Keywords**

Ophthalmology career, medical education, specialty choice, UK workforce

# Introduction

Ophthalmology offers doctors a controllable lifestyle, high intellectual content, a good reputation as a specialty, and, in some countries, high earning potential.<sup>1–5</sup> The importance of flexible work hours has been highlighted by female doctors<sup>6,7</sup> while financial

considerations<sup>2</sup> and prestige<sup>8</sup> have been important to the career choices of male doctors.

In 2017, the UK had 3.8 ophthalmologists per 100,000 population,<sup>9</sup> unequally distributed between geographical regions of the country, and 1246 fulltime equivalent consultants and 742 speciality registrars were working in ophthalmology in England.<sup>10</sup> The Royal College of Ophthalmologists, in its 2016 Workforce Census report, highlighted the need for at least 326 extra consultants over the next 10 years.<sup>11</sup> The underpinning reasons included the ageing population, the introduction of new treatments, to reverse the 'current trend of increasing cases of visual loss as a result of delayed assessments/treatments', and unfilled full-time posts mainly due to the lack of suitable applicants.<sup>11</sup> In its 2018 Census,<sup>12</sup> the Royal College of Ophthalmologists reported that many of the relevant indicators had worsened, for example 42 consultant ophthalmologist posts were completely vacant, that is not filled with a substantive or locum consultant, two-thirds of units were dependent on locum appointments, and an estimated extra 230 consultants were needed over the next two years to meet demand. Additionally, 204 extra training posts were needed to meet service and consultant demand. However, part-time working had reduced from 53 to 31% among trainees between 2016 and 2018, and from 52 to 25% among consultants over the same period. The competition ratio for Surgical Training stage 1 posts in ophthalmology in 2018 in England remained comparatively high: 378 applicants for 101 training posts, a ratio of 3.7 compared with an average over all specialties of 1.8.13

Our aim is to update previously reported findings on career choices for ophthalmology,<sup>1</sup> to cover trends, to compare early intentions for careers in ophthalmology with eventual specialty destinations, and to report on some perceptions of UK doctors about ophthalmology careers. In reporting comments, we aimed to identify issues which we deemed to be worthy of particular consideration, and to invite

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readers to consider if the comments raise issues that are likely to apply to ophthalmology in their own departments.

# **Methods**

# Data collection

Since 1974, the UK Medical Careers Research Group has conducted nationwide multi-purpose cohort surveys of newly qualified doctors, repeated them at years 1, 3, and 5 after qualification, and at longer time intervals thereafter. Doctors invited to participate are all graduates from UK medical schools who registered with the General Medical Council. Up to four postal or electronic reminders were sent to non-respondents of each survey year. Further details of the research methods are available elsewhere.<sup>14</sup>

The findings of this paper are based on data from 15 cohorts: the UK medical graduates of 1974, 1977, 1980, 1983, 1993, 1996, 1999, 2000, 2002, 2005, 2008, 2009, 2011, 2012, and 2015. Early career preferences and choices were covered at the first, third, and fifth year after qualification using data from, respectively, 15 cohorts (1974–2015), 12 cohorts (1974–2008 and 2012), and 10 cohorts (1974–80 and 1993–2008). Career specialty destinations were analysed from five cohorts (1993–2002) at 10 years after graduation (2003–12).

### Research instrument

We used multi-purpose postal and electronic questionnaires.

Among other questions, we asked participants 'What is your choice of long-term career?' and invited up to three clinical specialty choices in order of preference. The level of their certainty about their specialty choices was identified by offering the options of 'definite', 'probable', and 'uncertain'. The questionnaires included an invitation for respondents to provide comments on any aspect of their training or work.

## Data analysis

To stabilise individual cohort variations in choices, in most analyses the individual cohorts were aggregated for analysis into three groups: graduates of 1974–83, 1993–2002, and 2005–15.

In our analysis, when respondents gave preferences for more than one specialty, we refer to specialty choices of equal preference as 'tied choices', to contrast with 'untied choices' which were ranked by the respondents in priority order.

Cross-tabulation and chi-squared statistics were used to analyse quantitative data by sex, cohort group, or specialty choice. Linear trends in proportion across cohorts were tested by the Mantel-Haenszel statistic.

In the analysis of 'free text' comments, we searched for direct and indirect references to ophthalmology careers and doctors' perceptions of those careers, throughout the dataset. Three hundred and five relevant comments were retrieved. Thematic analyses with an inductive and iterative approach were used to identify themes.<sup>15</sup> Double coding was independently applied by AB and TWL, and any differences were resolved by discussion.<sup>16</sup> Quotes are reproduced as written, along with the year of qualification, and year of survey.

### **Results**

### Response rates

The response rate, from contactable doctors, in firstyear surveys was 58.1% (40,412/69,533 doctors). Responses to the surveys in years 3 and 5 were 64.6% (31,466/48,678) and 67.2% (24,970/37,168), respectively.

# Early career preferences for ophthalmology: One, three, and five years after graduation (Table 1 and Appendix Table 1)

One year after qualification, ophthalmology was the first career preference of 1.6% of the qualifiers of 1974–83, 2.2% of 1993–2002, and 1.8% of 2005–15. The corresponding percentages three years after qualification were 1.5, 1.8, and 1.2%. Thus, ophthalmology was chosen by a slightly smaller percentage of doctors at year 3 than year 1. As Table 1 shows, the difference between these groups of years was statistically significant but there was no consistent upward or downward trend overall; nonetheless, there was a small decline in choices for ophthalmology in the most recent cohorts.

Supplementary Appendix Table 1 shows the detailed results from individual cohorts. For instance, graduates of 1993 at their first year after qualification had the highest level of choice for ophthalmology (2.8%) compared to other cohorts and survey years.

Figure 1 shows the equivalent percentages of respondents who chose ophthalmology as any choice (i.e. as either their first, second, or third choice of career).

### Choices by gender

Men were more likely than women to express a career preference for ophthalmology: among recent

	Cohorts (years	- Statistical test			
Year after graduation	1974–83 N (%)	1993–2002 N (%)	2005–15 N (%)	All cohorts N (%)	of heterogeneity $(\chi_2^2, p)$
Men and women					
Year I	165 (1.6)	308 (2.2)	279 (1.8)	752 (1.9)	14.7, 0.001
Year 3	150 (1.5)	253 (1.8)	98 (1.2)	501 (1.6)	12.3, 0.002
Year 5	93 (1.3)	213 (1.6)	50 (1.1)	356 (1.4)	8.6, 0.013
Men					
Year I	116 (1.7)	182 (2.9)	136 (2.4)	434 (2.3)	22.5, <0.001
Year 3	109 (1.7)	144 (2.3)	53 (1.8)	306 (2.0)	6.7, 0.03
Year 5	66 (1.4)	129 (2.2)	30 (1.7)	225 (1.8)	9.6, 0.008
Women					
Year I	49 (1.3)	126 (1.6)	143 (1.4)	318 (1.5)	1.8, 0.41
Year 3	41 (1.2)	109 (1.4)	45 (0.9)	195 (1.2)	7.1, 0.02
Year 5	27 (1.1)	84 (1.1)	20 (0.7)	131 (1.0)	5.1, 0.07

**Table I.** Trends in early preferences for eventual career in ophthalmology: percentages of doctors who specified ophthalmology as their first preference of career at years 1, 3, and 5 after graduation.

graduates, 2005–15, 2.4% of men and 1.4% of women did so at one year, as did 1.7% of men and 0.7% of women at year 5. When we considered respondents' choices of ophthalmology as any career choice, whether first, second, or third priority, we found similar contrasts between men and women as we did when considering first choices alone (Figure 1).

# Certainty of career choice (Table 2)

Of the doctors who expressed a first preference for ophthalmology, 41% were definite in their intentions about the choice in year 1, as were 70% in year 3 and 84% in year 5. Doctors choosing ophthalmology three years after graduation, compared to those choosing other surgical specialties at that stage, reported higher levels of confidence and lower degrees of uncertainty about their choice (Table 2).

### Comparing early choice with eventual destinations

a) Looking forward from early preferences to eventual destinations (Table 3). Half the respondents (50%) who expressed a preference for ophthalmology at year 1 eventually worked in it, as did 72 and 87%, respectively, who did so in year 3 and year 5. Intending ophthalmologists who did not eventually work in ophthalmology almost exclusively chose specialties other than surgical ones.

b) Looking backward from destination 10 years after qualification to doctors' earlier choices (Table 4). Nearly three-quarters of practising ophthalmologists (70%) had expressed a preference for this specialty as their first choice in their first post-qualification year. This percentage was higher in successive years after qualification, at 80% in year 3 and 93% at year 5. Results for men and women were almost identical.

# Respondents' comments about ophthalmology as a career

Views on ophthalmology careers are presented as four major themes. Verbatim quotes are given and labelled with the participant's year of graduation and year of survey.

### Theme 1: Careers in ophthalmology

Working hours. Most respondents regarded ophthalmology as family friendly with reasonable and



predictable working hours:

Ophthalmology was a great career choice for me. It is very competitive but the working hours are good and reliable. (1996 qualifier in 2015)

My employer allowed me to work in a flexible way when my children were small...gradually increasing to the present 35 hours a week. (1983 qualifier in 2016)

However, some respondents believed that it is hard to combine flexible working with a fulfilling career in surgical specialties such as ophthalmology. 'Would like to see more part-time work, but am personally aware that I would not have such a fulfilling career surgically if I chose part-time work in Ophthalmology' (1993 qualifier in 1994).

Some commented on conflicts between flexible working and service needs: 'Working part-time worked well for me. However many colleagues are finding it increasingly difficult to continue part-time, as they are being asked to work full-time for service provision' (2015 qualifier in 2016).

Using high technology therapeutic methods. A few doctors described ophthalmology as a 'high-tech' specialty which has undergone rapid innovations and progression: 'It is a very fast moving specialty with new lasers, gadgets and treatments all the time' (1996 qualifier in 2015).

Job satisfaction. Most respondents expressed contentment in ophthalmology:

I would highly recommend ophthalmology. The training is long and competitive but it is a fantastic career choice and really enjoyable. (1999 qualifier in 2012)

I chose this career primarily because of my interest in the subject - it is relatively 'clean' surgery and diverse medical conditions can be seen in out-patient setting....The rewards of cataract surgery (when things go well) are very exciting. We rarely deal with life threatening conditions. (1988 qualifier in 1995)

However, some participants cited demotivating factors (not specific to ophthalmology) that impacted on their personal lives:

If hospitals were better organised, and made it easier to arrange personal lives, e.g. swaps, annual leave, a lot of doctors would be much happier. (2012 qualifier in 2013)

I wish there was greater support for couples to transfer [training locations] when getting married. I am spending a year away from my husband. (2015 qualifier in 2016)

### Theme 2: Training

The majority of respondents reported a good experience which was structured, extensive, and supportive:

'Orientation at start of post, supervision by and access to senior staff and admin support all excellent at [my] hospital' (2008 qualifier in 2011).

Figure 1. Ophthalmology as any choice (blue - men,

Table 2. Comparisor	n of the certainty of choice	e between doctors who	o expressed a first pr	eference for each specia	alty group at years I,	3, and 5 year after gra	luation.
		Year I		Year 3		Year 5	
Gender	Level of certainty of career choice	Ophthalmology N (%)	Other surgical specialties N (%)	Ophthalmology N (%)	Other surgical specialties N (%)	Ophthalmology N (%)	Other surgical specialties N (%)
Male	Definite	175 (40.8)	1706 (38.4)	211 (69.9)	1441 (49.7)	189 (84.4)	1565 (75.8)
	Probable	192 (44.8)	2042 (45.9)	67 (22.2)	1234 (42.6)	30 (13.4)	441 (21.4)
	Uncertain	62 (14.5)	700 (15.7)	24 (7.9)	225 (7.8)	5 (2.2)	59 (2.9)
	Total	429 (100.0)	4448 (100.0)	302 (100.0)**	2900 (100.0)	224 (100.0)*	2065 (100.0)
Female	Definite	124 (39.1)	690 (35.3)	134 (69.1)	489 (49.7)	95 (72.5)	442 (70.8)
	Probable	132 (41.6)	880 (45.0)	44 (22.7)	393 (40.0)	32 (24.4)	147 (23.6)
	Uncertain	61 (19.2)	384 (19.7)	16 (8.2)	101 (10.3)	4 (3.1)	35 (5.6)
	Total	317 (100.0)	1954 (100.0)	194 (100.0)**	983 (100.0)	131 (100.0)	624 (100.0)
All (men	Definite	299 (40.1)	2396 (37.4)	345 (69.6)	1930 (49.7)	284 (80.0)	2007 (74.6)
and women)	Probable	324 (43.4)	2922 (45.6)	111 (22.4)	1627 (41.9)	62 (17.5)	588 (21.9)
	Uncertain	123 (16.5)	1084 (16.9)	40 (8.1)	326 (8.4)	9 (2.5)	94 (3.5)
	Total	746 (100.0)	6402 (100.0)	496 (100.0)**	3883 (100.0)	355 (100.0)	2689 (100.0)

\*indicates p < .05; \*\* indicates p < .001, comparing ophthalmology with other surgical specialties, within each year, for level of certainty.

	Destinations after 10 years				
	Ophthalmology % (N)	Other surgical specialties % (N)	Other destinations % (N)	Total % (N)	
Year I first choice					
Male choosing ophthalmology	51% (77)	3% (5)	45% (68)	100% (150)	
Female choosing ophthalmology	47% (46)	2% (2)	51% (49)	100% (97)	
Total choosing ophthalmology	50% (123)	3% (7)	47% (117)	100% (247)	
Year 3 first choice					
Male choosing ophthalmology	77% (88)	2% (2)	22% (25)	100% (115)	
Female choosing ophthalmology	66% (58)	1% (1)	33% (29)	100% (88)	
Total choosing ophthalmology	72% (146)	1% (3)	27% (54)	100% (203)	
Year 5 first choice					
Male choosing ophthalmology	89% (90)	1% (1)	10% (10)	100% (101)	
Female choosing ophthalmology	83% (54)	0% (0)	17% (11)	100% (65)	
Total choosing ophthalmology	87% (144)	1% (1)	13% (21)	100% (166)	

**Table 3.** Career destinations at 10 years of medical graduates who expressed career preferences for ophthalmology in years 1, 3, and 5 (looking forwards).

The table is based on destinations at 10 years for the graduates of 1993, 1996, 1999, 2000, and 2002.

However, some specialty trainees commented on lack of opportunities for surgical experience:

Training is under strain due to service provision and competition from surgical assistants. (2012 qualifier in 2015)

We would...get pulled out of theatre to do clinics instead, i.e. used for service provision rather than get surgical training. (2000 graduate in 2012)

Some commented that training is now too short:

'Current training is insufficient to turn out fully competent consultants' (1977 qualifier in 2014).

Others would disagree, presumably reflecting different experiences in different locations:

'I have been very fortunate to have had a very thorough training, working in good teaching hospitals, with lots of experience. I also had very good teachers/consultants along the way' (1996 qualifier in 2016).

A small number in the past reported that numerically small specialties such as ophthalmology were given inadequate time at medical school:

'certain topics were not thoroughly covered, despite their importance namely, Ear, Nose and Throat (ENT), Ophthalmology...more time should be dedicated to these important topics' (2005 qualifier in 2006).

### Theme 3: Working conditions

Managerial requirements and budgets were felt by some to dominate:

My impression of one unit is that it is run by managers who have absolutely no concept of the importance of eyesight...to patients. Every single decision that is made appears to be purely for short term cost saving, with no concern for future health implications. (2008 qualifier in 2011)

Career choices	Male % (N)	Female % (N)	Total % (N)
Year I			
Ophthalmology as untied first choice	70% (74)	70% (42)	70% (116)
Ophthalmology as tied first choice	3% (3)	7% (4)	4% (7)
Ophthalmology as second or third choice	5% (5)	0% (0)	3% (5)
Other surgical specialties	10% (11)	3% (2)	8% (13)
Others	12% (13)	20% (12)	15% (25)
Total	100% (106)	100% (60)	100% (166)
Year 3			
Ophthalmology as untied first choice	91% (87)	90% (57)	91% (144)
Ophthalmology as tied first choice	1% (1)	2% (1)	1% (2)
Ophthalmology as second or third choice	3% (3)	0% (0)	2% (3)
Other surgical specialties	4% (4)	2% (1)	3% (5)
Others	1% (1)	6% (4)	3% (5)
Total	100% (96)	100% (63)	100% (159)
Year 5			
Ophthalmology as untied first choice	95% (89)	91% (53)	93% (142)
Ophthalmology as tied first choice	1% (1)	2% (1)	1% (2)
Ophthalmology as second or third choice	0% (0)	2% (1)	1% (1)
Other surgical specialties	1% (1)	2% (1)	1% (2)
Others	3% (3)	3% (2)	4% (5)
Total	100% (94)	100% (58)	100% (152)

Table 4. Original specialty preferences in years 1, 3, and 5 of doctors practising as ophthalmologists in year 10 (looking backwards).

Working in the private sector. Some older ophthalmologists had used their working experience in the private sector to extend their surgical skills:

I have had a very good private practice which has allowed one to explore and be a pioneer in refractive laser surgery. I wouldn't have been able to do this interest without being able to work outside of my National Health Service contract. (1974 qualifier in 2014)

### Theme 4: Health service policies

Some felt ophthalmology careers and training had been negatively affected by National Health Service targets:

... instead of repairing ruptured globes (eyes) in theatre while on call which is an integral part of our training, we are instead made to go and see patients in A and E while the consultant does the case in order to avoid any breaches in the 4 hour waiting target. (2000 qualifier in 2012)

# Discussion

# Main findings

The percentages of doctors expressing a preference for a career in ophthalmology varied, though not substantially, between years of qualification. A slightly reduced percentage of recent graduates (2005–15) than those in the past opted for ophthalmology. In general, the percentage selecting ophthalmology as their first choice decreased as time passed from their graduation (it was lower in the year 3 and 5 responses than in year 1).

A higher percentage of men than women qualifiers expressed a career preference for ophthalmology. However, because, in recent years, there are more women than men medical students and junior doctors, in absolute terms women in the specialty now outnumber men.

Although half the intending ophthalmologists at year 1 later changed their career choice, almost all who specified ophthalmology in year 5 did not subsequently change. Three-quarters of practising ophthalmologists had chosen ophthalmology as their first preference in year 1.

As positive comments, most respondents in ophthalmology told us that the specialty is fascinating and rewarding. Negative perceptions included some who considered that quality of care was (in their view) sometimes sacrificed for quantity, and that there was sometimes insufficient time for training in operative techniques.

# Strengths and limitations

Our surveys are national, large in scale, and longitudinal. Data on early career aspirations are followed up, to identify what the doctors actually do. Recall bias is avoided by using a longitudinal design so that, for example, the association between career specialty destinations and early-career choices is not contaminated by selective recall and *post hoc* rationalisation. The surveys, over 40 years, have provided a large database for studies relevant to medical training and workforce planning. Nevertheless, there are some limitations. Data coverage was restricted to UK-trained medical graduates. Our inferences were based on the views of doctors interested in ophthalmology: understanding the perspectives on ophthalmology of those who did not choose it might have revealed additional information. Respondents were not directly asked specifically for their views about ophthalmology, because our surveys were general purpose, covering all specialties. Hence for our comments we were dependent on opportunism: the open question at the end of surveys was broad, responses to it depended on doctors taking the opportunity to give us their views, and the respondents had no guidance on the likely analytical use to be made of responses.<sup>17</sup>

### Comparison with other studies

The fact that interest in ophthalmology declined with the passage of time after graduation has been found in some other specialties that are chosen by a small minority of graduates, such as dermatology.<sup>18</sup> It is possible that early career aspirations are idealised rather than realistic as newly qualified doctors may have little self-knowledge and clinical experience.<sup>19</sup> Therefore, the decline in interest in ophthalmology over the early years after graduation can be interpreted as a normal stage of the career development process.

Consistent with our results, a recent review which examined the effect of regulation changes on medical training reported that the dominant opinions about the reduction of working hours were negative.<sup>20</sup> This issue was highlighted for surgical trainings (such as ophthalmology) which rely highly on operative experiences.<sup>21</sup>

Our findings of gender variation has been reported in other surveys which found that, though women form a majority of medical students, they suffer attrition during surgical training<sup>22</sup> and in ophthalmology have been less likely than men to reach senior positions.<sup>23</sup> Past evidence has been that female doctors do not progress as far and as fast in their careers as male doctors.<sup>24</sup> This issue was attributed to their working pattern<sup>24</sup> as women were more likely to seek less-than-full-time opportunities, often for childcare reasons.<sup>25</sup> Given that ophthalmology is an appealing specialty choice for its controllable lifestyle,<sup>26</sup> it is harder to explain the relative lack of women choosing ophthalmology among recent graduates. However, the Royal College of Ophthalmologists in 2018 reported that female doctors in the specialty now constitute 47% of trainees and 31% of consultants,<sup>12</sup> up from 32 and 26%, respectively, in 2016, so the makeup of the profession is changing.

Previous studies report conflicting results about the effect of management changes on ophthalmology training programmes. A study of 539 UK ophthalmology trainees reported that the number of operations undertaken by trainees after organisational changes remained constant or showed a marginal increase.<sup>27</sup> However, this research did not assess all surgical experience (e.g. the level of responsibility of trainees during an operation or the degree of difficulty of an operation). Further, the results were based on self-reported data rather than using an objective tool for evaluating surgical skills. Another survey of 40 trainee ophthalmologists from the four largest UK deaneries (training areas) reported regional variations in surgical training; half the doctors were not confident about their surgical skills at the end of their training.<sup>28</sup> A recent review did not find any detrimental impact of restricted working hours on medical education and patient safety, despite identified negative attitudes.<sup>20</sup>

# Conclusions

The current shortage of trained ophthalmologists is not attributable to any recent decline in career preferences or loss from training of doctors from the specialty. It results from an increase in demand over supply. Nonetheless, efforts are required to address training, career issues, and working conditions in ophthalmology.

## Data sharing statement

It may be possible for the authors to make tabulated data, produced in the course of this work but not included in the paper, available to interested readers on request.

# Patient and Public Involvement

Patients were not involved in the design or any aspect of the study, by agreement with the funding body, since the study did not involve any medical or patient data. Results of the study are published in various papers in the peer-reviewed literature, and summary reports of our survey work are on our website at www.ndph.ox.ac.uk

#### Declarations

Competing Interests: None declared.

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**Ethics approval:** This study was approved by the National Research Ethics Service, following referral to the Brighton and Mid-Sussex Research Ethics Committee in its role as a multicentre research ethics committee (ref 04/Q1907/48 amendment Am02 March 2015).

Guarantors: TWL and MJG.

**Contributorship:** TWL and MJG designed and conducted the surveys. AB performed the analysis and wrote the first drafts of the paper. All authors contributed to further drafts and all approved the final version.

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ORCID iD: Trevor W Lambert D https://orcid.org/0000-0001-9688-3036

### References

- Lambert TW, Goldacre MJ and Bron AJ. Career choices for ophthalmology made by newly qualified doctors in the United Kingdom, 1974–2005. *BMC Ophthalmol* 2008; 8: 3.
- Alwadani F, Alrushood A, Altokhy H and Alasbali T. Forecast of ophthalmology practice trends in Saudi Arabia: a survey of junior residents. *Middle East Afr J Ophthalmol* 2010; 17: 343–348.
- Oluwole OC. Factors influencing choice of specialty amongst Nigerian ophthalmologists. *Pak J Ophthalmol* 2012; 28: 10–13.
- Noble J. Factors influencing career choice in ophthalmology. Can J Ophthalmol 2006; 41: 596–599.
- Gedde SJ, Budenz DL, Haft P, Tielsch JM, Lee Y and Quigley H. Factors influencing career choice among graduating ophthalmology residents. *Ophthalmology* 2005; 112: 1247–1254.
- Noble J, Schendel S, Shannon D and Baerlocher MO. Motivation and future trends: a survey of Canadian ophthalmology residents. *Can J Ophthalmol* 2007; 42: 821–825.
- Mackinnon SE, Mizgala CL, McNeill IY, Walters BC and Ferris LE. Women surgeons: career and lifestyle comparisons among surgical subspecialties. *Plast Reconstr Surg* 1995; 95: 321–329.
- Alsubaie N, Aldhofaian HS, Alhuwaimel L, Ruxshan N, Alghamdi F, Shamia A, et al. Specialty preferences and the factors influencing them among pre-clerkship medical students: the first study from Alfaisal University-College of Medicine, Saudi Arabia. *Cureus* 2016; 8: e894.
- 9. Statista. Number of ophthalmologists per 10,000 population in Europe in 2017. Hamburg: Statista, 2018.
- NHS Digital. NHS Workforce Statistics, September 2017, Provisional Statistics. Published 21 December 2017. https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/nhs-workforce-statistics-september-2017-provisional-statistics (accessed 7 February 2020).
- The Royal College of Ophthalmologists. Workforce census 2016. London: The Royal College of Ophthalmologists, https://www.rcophth.ac.uk/2017/ 03/workforce-census-2016-a-picture-of-the-size-andshape-of-the-uk-ophthalmic-medical-workforce/ (2016, accessed 7 February 2020).
- The Royal College of Ophthalmologists. Workforce census 2018. London: The Royal College of Ophthalmologists, https://www.rcophth.ac.uk/wp-content/uploads/2019/02/RCOphth-Workforce-Census-2018.pdf (2018, accessed 7 February 2020).
- 13. Health Education England. 2018 competition ratios. Leeds: Health Education England, 2018.
- Goldacre M and Lambert T. Participation in medicine by graduates of medical schools in the United Kingdom up to 25 years post graduation: national cohort surveys. *Acad Med* 2013; 88: 699–709.

- Braun V and Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006; 3: 77–101.
- Miles M and Huberman M. *Qualitative data analysis: a sourcebook of new methods*. Beverly Hills, CA: Sage, 1984.
- O'Cathain A and Thomas KJ. "Any other comments?" Open questions on questionnaires – a bane or a bonus to research? *BMC Med Res Methodol* 2004, https://doi. org/10.1186/1471-2288-4-25.
- Barat A, Goldacre M and Lambert T. Career choices and career progression of junior doctors in dermatology: surveys of UK medical graduates. *Dermatol Res Pract*, 2018; 2092039: 1–10. https://doi.org/10.1155/ 2018/2092039.
- Gottfredson LS. Circumscription and compromise: a developmental theory of occupational aspirations. *J Counsel Psychol* 1981; 28: 545–579.
- Morrow G, Burford B, Carter M and Illing J. *The* impact of the working time regulations on medical education and training: literature review. Durham: Centre for Medical Education Research, Durham University, 2012.
- Fitzgerald JEF and Caesar BC. The European working time directive: a practical review for surgical trainees. *Int J Surg* 2012; 10: 399–403.

- 22. Hampton T, Greenhalgh R, Ryan D and Das-Purkayastha P. Female surgical trainee attrition: why do women drop out? *RCS Bull* 2016; 98: 134–137.
- 23. Shah DN, Volpe NJ, Abbuhl SB, Pietrobon R and Shah A. Gender characteristics among academic ophthalmology leadership, faculty, and residents: results from a cross-sectional survey. *Ophthalmic Epidemiol* 2010; 17: 1–6.
- 24. Taylor KS, Lambert T and Goldacre M. Career progression and destinations, comparing men and women in the NHS: postal questionnaire surveys. *BMJ* 2009; 338: b1735.
- 25. The Medical Women's Federation. *Making part-time work*. London: The Medical Women's Federation, 2008.
- Blakemore LC, Hall JM and Biermann JS. Women in surgical residency training programs. *J Bone Joint Surg* 2003; 85: 2477–2480.
- Hoffman J, Spencer F, Ezra D and Day AC. Changes in UK ophthalmology surgical training: analysis of cumulative surgical experience 2009–2015. *BMJ Open* 2017; 7: e018526. doi: 10.1136/bmjopen-2017-018526.
- Rodrigues I, Symes R, Turner S, Sinha A, Bowler G and Chan WH. Ophthalmic surgical training following modernising medical careers: regional variation in experience across the UK. *BMJ Open* 2013; 3: e0002578.

	Ophthalmology as first choice			Ophthalmology as any choice			
Graduation year	Year I % (N)	Year 3 % (N)	Year 5 % (N)	Year I % (N)	Year 3 % (N)	Year 5 % (N)	
1974	0.9 (17/1940)	1.3 (20/1486)	1.2 (21/1755)	1.5 (29/1940)	1.9 (28/1486)	1.6 (28/1755)	
1977	1.3 (33/2637)	1.5 (35/2336)	1.4 (37/2602)	2.6 (68/2637)	1.7 (40/2336)	1.7 (43/2602)	
1980	2.1 (61/2853)	1.6 (45/2843)	1.3 (35/2716)	3.1 (89/2853)	2.1 (59/2843)	1.5 (42/2716)	
1983	1.7 (54/3166)	1.6 (50/3037)	0.0	2.7 (85/3166)	1.9 (58/3037)	0.0	
1993	2.8 (74/2621)	1.8 (51/2777)	1.8 (49/2729)	3.5 (92/621)	2.0 (56/2777)	1.9 (51/2729)	
1996	1.6 (47/2926)	1.6 (43/2721)	1.5 (39/2521)	2.7 (79/2926)	1.8 (48/2721)	1.6 (40/2521)	
1999	2.1 (58/2727)	1.8 (46/2549)	1.7 (46/2661)	2.9 (79/2727)	2.2 (56/2549)	1.8 (47/2661)	
2000	2.1 (63/2978)	2.3 (68/2968)	1.7 (47/2703)	3.0 (88/2978)	2.6 (76/2968)	1.8 (50/2703)	
2002	2.4 (66/2778)	1.6 (45/2748)	1.3 (32/2552)	3.4 (94/2778)	1.9 (52/2748)	1.3 (33/2552)	
2005	1.8 (56/3128)	1.4 (38/2710)	1.2 (28/2362)	2.6 (82/3128)	1.5 (41/2710)	1.6 (37/2362)	
2008	1.4 (46/3302)	0.8 (27/3228)	0.9 (22/2369)	2.0 (67/3302)	0.9 (29/3228)	1.1 (27/2369)	
2009	1.7 (51/2917)	-	-	2.3 (68/2917)	-	-	
2011	1.6 (16/1001)	-	-	2.3 (23/1001)	-	-	
2012	1.6 (39/2398)	1.6 (33/2063)	-	2.0 (49/2398)	1.7 (36/2063)	-	
2015	2.3 (71/3040)	-	-	2.6 (78/3040)	-	-	

Appendix Table I. Preferences for Ophthalmology in individual cohorts: percentages and numbers of respondents.