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Factors influencing the decisions of senior UK doctors to retire or remain in medicine: national surveys of the UK-trained medical graduates of 1974 and 1977

Short title: Factors influencing retirement decisions of senior UK doctors

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MeSH terms: Attitude of health personnel; physicians; workforce; medical; retirement.

ABSTRACT

Objective: To report attitudes to retirement of late-career doctors.

Design: Questionnaires sent in 2014 to all United Kingdom (UK) medical graduates of 1974 and 1977.

Setting: UK.

Participants: 3695 medical graduates.

Main outcome measures: Factors which influenced doctors' decisions to retire and factors which encouraged doctors to remain in work.

Results: The response rate was 85% (3695/4369). Seventy per cent had retired. Of these, 67% retired when they had originally planned to, and 28% had changed their retirement plans. Fifty per cent of retired doctors cited 'increased time for leisure/other interests' as a reason; 43% cited 'pressure of work'. Women (21%) were more likely than men (11%) to retire for family reasons. Women (27%) were more likely than men (9%) to retire because of the retirement of their spouse. General Practitioners (GPs) were more likely than doctors in other specialties to cite 'pressure of work'. Anaesthetists and GPs were more likely than doctors in other specialties to cite the 'possibility of deteriorating skill/competence'. Radiologists, surgeons, obstetricians and gynaecologists, and anaesthetists were most likely to cite 'not wanting to do out-of-hours work'.

Doctors who were still working were asked what would encourage them to stay in medicine for longer. Factors cited most frequently were 'reduced impact of work-related bureaucracy' (cited by 45%) and 'workload reduction/shorter hours' (42%). Men (30%) were more motivated than women (20%) by 'financial incentivisation'. Surgeons were most motivated by 'reduction of on-call or emergency commitments'.

Conclusions: Retention policy should address ways of optimising the clinical contribution of senior doctors whilst offering reduced workloads in the areas of bureaucracy and working hours, particularly in respect of emergency commitments.
[270 words]

Strengths and limitations of this study

- This is a large nationwide study with a very high response rate.
- For retired doctors, the data are based upon actual retirements and not intentions.
- Doctors who have not yet retired were surveyed at a key stage for retirement planning.
- Although a large number of retired doctors responded, some may not have don, and there is a possibility of some responder bias.
- The small minority of non-contactable doctors largely comprised those who were unregistered, either through retirement or through having left medicine or the UK. It is possible that, if surveyed, their views on the topics of the paper would differ from those of the respondents.

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Data sharing: 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.

INTRODUCTION

When doctors retire, health services lose their experience, knowledge and support.(1) In the United Kingdom (UK) one in ten Specialty and Associate Specialist (SAS) doctors and General Practitioners (GPs) are aged over 60.(2) In 2015, over 80% of senior hospital doctors in the United Kingdom were considering early retirement, with stress identified as the main cause.(3) A survey of 1400 GPs by the Wessex Local Medical Committee showed that one fifth planned to retire early.(4) The early retirement of such experienced doctors creates challenges for the medical workforce, places more stress upon remaining staff and may adversely affect patient safety.(2, 3)

A recent survey of consultant physicians in the UK found that the most common reasons for retiring cited by these doctors included pressure of work, length of working hours and dissatisfaction with the National Health Service (NHS).(5) Interviews with GPs have identified further influences, including the following: ageing and health, family life, uncertainty about the future of primary care, concerns around revalidation, increased administrative burden, and lack of time with patients.(6, 7) A cohort of UK-trained doctors, across all specialties, in their early fifties revealed that these doctors considered early retirement for family/leisure reasons, and because of concerns about health, workload, and changes in the NHS.(8)

Much of the research focus on how to retain doctors nearing retirement has been on GPs. In interviews, GPs have suggested a need for reduced workload, a focus upon their own health, and improvements in morale.(6) Other research on retention of the GP workforce calls for a slower pace of administrative change and less work outside face-to-face patient care.(7) In one study, half of hospital consultants working in Scotland said they would postpone retirement if their workload reduced.(9)

We have studied the careers of the UK-trained medical qualifiers of 1974 and 1977 periodically from the first year after they qualified. In our latest survey we asked about retirement status, intentions to retire for those who had not already done so, and attitudes to retirement. The aim of this paper is to report on factors which had influenced the decision to retire and on factors that might encourage doctors to stay in medicine longer. We compared the replies of men and women, and of those working (or who had worked) in different specialties.

METHODS

In 2014 the UK Medical Careers Research Group surveyed the UK medical graduates of 1974 and 1977 using identical postal and web-based questionnaires. Up to four reminders were sent to non-respondents. Further details of the methodology are available elsewhere (10).

The surveys sent to both cohorts were identical and comprised structured, 'closed' questions and statements. Doctors were asked to indicate which one of seven phrases best described their current employment status: *working full-time in medicine*; *working part-time in medicine*; *working full-time outside medicine*; *working part-time outside medicine*; *retired, not now working in medicine*; *retired and 'returned' for some medical work*; *other*.

Retirees and doctors who had 'retired and returned', were asked to indicate which, if any, of the following factors had influenced their decision to retire when they did: *pressure of work*; *not wanting to do out-of-hours work*; *family reasons*; *to increase time for leisure/other interests*; *reduced job satisfaction*; *retirement of spouse/partner*; *financial security/insufficient financial incentive to stay*; *possibility of deteriorating skills/competence*; *the prospect of revalidation*; *poor health*; *to maintain good health*; '*none of the above – I just wanted to retire'*; *other*.

Doctors still working in medicine (full or part-time) were asked *'Would any of the following factors encourage you to stay working in medicine longer?'* Doctors could choose from one or more of the following factors: *workload reduction/shorter hours*; *reduction of on-call or emergency commitments*; *reduced impact of work-related bureaucracy*; *financial incentivisation*; *improved working conditions, other than (or as well as) hours*; *career change and development opportunities*; *more involvement in direct patient care*; *less involvement in direct patient care*; *none of these*; *other*.

In each case the list of response options offered was developed in part by studying text responses from doctors to previous surveys and in part by reviewing the literature on retirement and factors affecting retirement decisions.

We allocated a *career specialty* to each respondent using their recorded job history as reported to us in successive surveys and additional information about their specialist registration with the GMC as reported to us by the doctors in these surveys. For a small number of respondents we were unable to allocate a single career specialty, either because we did not have sufficient data about the doctor's career, or because the doctor had worked

in different specialties during their career. The career specialty allocation allowed us to analyse the responses and employment status of doctors in different specialties. Respondents were then grouped for analysis into these groups: *hospital medical specialties*, *surgical specialties, paediatrics, emergency medicine, obstetrics and gynaecology, anaesthesia, radiology, clinical oncology, pathology, psychiatry,* and *general practice / family medicine (GP)*.

The replies were analysed using χ^2 tests and Mann-Whitney U tests to explore differences in views towards retirement between men and women, between cohorts and between doctors working in different specialties. Statistical analysis was undertaken using SPSS version 22. Numbers of doctors were small in a few combinations of (for example) specialty and gender, but we report them for the record.

RESULTS

Response rates

There were 5482 graduating doctors in the two year-of-graduation cohorts we studied: 1974 (2347 graduates) and 1977 (3135 graduates). Across both cohorts 677 doctors were not contactable, 210 were deceased, 70 had told us that they did not wish to participate, and 156 doctors who had never replied to any of our previous surveys were not contacted.

The aggregated response rate of the remaining contactable doctors, over both surveys, was 84.6% (3695/4369). Taking the two cohorts together, the responders represent 70% of all surviving graduates and 85% of the contactable doctors. An abbreviated questionnaire which omitted some of the content reported here was completed by 98 graduates: we exclude these from further analysis.

The median age of the doctors from the cohorts at the time of the surveys was 64 for the 1974 cohort and 61 for the 1977 cohort. The median age for men was 62; 61 for women.

Current employment status

Over both cohorts, 44% (1572/3597) of respondents had retired from medicine and were no longer working in medicine (38% of men, 56% of women); 26% (935/3597) had retired and returned for some medical work (29% of men, 20% of women); and 29% (1043/3597) were still working in medicine (32% of men, 23% of women). Therefore, 55% of respondents overall were still working in medicine (whether they hadn't retired or had retired-and-returned; 61% of men, 43% of women). Over both cohorts, 0.8% were working outside medicine and 0.5% did not give their employment status.

Retired, and retired and 'returned' doctors: circumstances of retirement

When asked 'What were the circumstances of your retirement?', most of the retired doctors (66.8%) had retired when they had planned to retire, while 27.7% had retired not when originally planned (14.0% due to changes in the work environment and 13.7% due to changes in personal circumstances; Table 1). Retired doctors from the 1974 cohort were a little more likely to have retired when they had planned to retire compared with the 1977 cohort. In comparing the responses of doctors in different specialties, we did not consider doctors in emergency medicine or clinical oncology for comparison, owing to small counts. Radiologists were most likely to have retired when they had planned to retire (79.4%) and hospital medical specialists were least likely (62.4%; Table 1). Psychiatrists were most likely to report that their retirement was unplanned and due to a change in the work environment

(21.3%). GPs were most likely to report that their retirement was unplanned and due to changes in personal circumstances (15.2%).

Retired doctors: reasons for retiring

When asked which factors had influenced their decision to retire, the retired doctors most frequently cited 'increased time for leisure/other interests' as contributing to their decision to retire when they did (50.4%; Table 2). 'Pressure of work' was cited by 42.8%. Women were more likely than men to retire due to the retirement of a spouse or partner (Table 2). Further inspection within each specialty revealed that this gender difference was present in all specialties except Surgery, Obstetrics and gynaecology, Radiology, Pathology, and Psychiatry: while more women than men in these specialties cited 'Retirement of a spouse/partner', these differences were not significant. In General practice 28.4% of women cited this reason compared with 10.4% of men.

Overall, women were more likely than men to retire for family reasons (Table 2): this difference was most pronounced among GPs (cited by 20.7% of women and 12.2% of men; $p<0.001$) and Hospital medical specialists (cited by 30.6% of women and 13.3% of men, $p<0.01$). Men were more likely than women to retire for financial reasons. This difference was significant within both cohorts. Further inspection within each specialty grouping revealed that this gender difference was only present among GPs (men GPs: 33.3%, women GPs: 23.7%).

Men were also more likely than women to retire because they did not want to do out-of-hours work: this difference was most marked amongst hospital medical specialists (men 16.4%, women 5.6%) and paediatricians (men 26.7%, women 10.1%), and was significant within both cohorts.

Retired doctors from the younger 1977 cohort were significantly more likely than doctors from the 1974 cohort to have retired due to pressure of work (36.4% 1974, 48.3% 1977), reduced job satisfaction (35.8% 1974, 45.9% 1977), or for financial reasons (25.3% 1974, 32.4% 1977). This suggests that these factors are more relevant to decisions about early retirement.

Retired GPs were more likely to cite 'pressure of work' as a reason for retiring than doctors in other specialties (Table 3). Anaesthetists and GPs were more likely to cite the 'possibility of deteriorating skill/competence' than doctors in other specialties. Radiologists, surgeons, obstetricians and gynaecologists, and anaesthetists were more likely to cite 'not wanting to

do out-of-hours work' compared with doctors in other specialties. This pattern of reasons for retirement was observed in both cohorts ($p<0.001$).

Doctors still working: retirement plans

The doctors still working were asked which factors would encourage them to stay in medicine for longer. These doctors most frequently cited 'reduced impact of work-related bureaucracy' as a factor that would encourage them to stay working in medicine for longer (45.4%; Table 4), and 'workload reduction/shorter hours' (42.2%). Men were more likely than women to be encouraged by 'financial incentivisation'. This difference was significant within both cohorts ($p<0.05$).

Doctors from the 1977 cohort were significantly more likely than doctors from the 1974 cohort to be encouraged to remain by 'workload reduction/shorter hours' (32.5% 1974, 46.6% 1977) and 'improved working conditions' (14.0% 1974, 22.8% 1977).

There was little variation by specialty grouping in the scoring of factors which would encourage doctors to stay in medicine longer (Table 5). There was significant variation on only one factor: reduction of on call or emergency commitments, assigned more importance by surgeons.

DISCUSSION

Main findings

Over half of the respondents were still working in medicine (whether having retired and returned, or having never retired). Of those doctors who had retired, two thirds had retired when they had planned to retire and one quarter had an unplanned retirement due to either a change in the work environment or a change in personal circumstances. Doctors retired mainly to spend more time on leisure and other interests, or due to work pressures. More women than men retired due to the retirement of a spouse or partner: this difference was pronounced in General Practice, and less pronounced in specialties such as Surgery. More women than men retired due to family reasons (especially among GPs and Hospital medical specialists). More men GPs than women GPs retired for financial reasons, citing '*financial security/insufficient financial incentive to stay*'. More men than women in the hospital medical specialties and paediatrics cited retiring because they did not want to do out-of-hours work.

Certain retirement factors were cited more by the younger 1977 cohort than the 1974 cohort (pressure of work, reduced job satisfaction, financial reasons), suggesting that doctors considering early retirement are more influenced by these factors.

There were differences between specialties. More GPs cited 'pressure of work', more anaesthetists and GPs cited the 'possibility of deteriorating skill/competence', and more radiologists, surgeons, obstetrician and anaesthetists cited 'not wanting to do out-of-hours work' compared with doctors in other specialties.

The doctors still working cited two main factors that would encourage them to stay working in medicine for longer: 'reduced impact of work-related bureaucracy' and 'workload reduction/shorter hours'. More men than women could be encouraged to remain in medicine by financial incentivisation. More surgeons cited a reduction of on call or emergency commitments as influential to a future decision to stay.

Strengths and limitations

This is a large study with a very high response rate among contactable doctors (85%). In the case of the retired doctors in our study the data are based upon actual retirements and not intentions. In the case of the doctors who have not yet retired, we ask about factors that might encourage them to stay at a key stage when these doctors are typically considering retirement, therefore their answers are gathered at an optimal time. As has been mentioned elsewhere, retired doctors may be less likely to respond.(1) The non-contactable doctors largely comprised those who had ceased GMC registration, either through retirement or

through having left medicine or the UK. It is possible that, if surveyed, their views on the topics of the paper would differ from those of the respondents.

Comparison with existing literature

We found that a desire to spend more time on leisure/other interests and pressure of work were key factors in retirement decisions for the retired doctors we surveyed. A recent UK study found that 81% of senior hospital doctors were considering retiring earlier due to work pressures;(3) similarly, the most common reason for intended early retirement cited by UK consultants is pressure of work.(5) Family reasons and leisure time were the main reasons cited by senior UK doctors when considering early retirement.(8) A systematic review of retirement planning among doctors found that workload and burnout were the most common reasons provided for early retirement.(11)

Our finding that more GPs cited 'pressure of work' than doctors in other specialties, is consistent with other research which has found that GPs are concerned about high workloads.(6)

We found that doctors could be encouraged to stay in practice by reducing work-related bureaucracy and reducing workload/hours. Other research has found that doctors can be encouraged to stay working in medicine by reducing workplace frustration and workload pressure.(11)

Implications / conclusions

Doctors described a variety of professional and personal motivators for choosing the timing of their retirement. Some of the reasons given may be amenable to policy initiatives, which could result in securing a longer contribution to the health service by some doctors than would otherwise be the case. Retention policy should address ways of optimising the clinical contribution of senior doctors. For example, staged retirement with reduced workloads in the areas of bureaucracy and working hours, particularly in respect of emergency commitments, may enable seniors to continue using their skills for longer.

[2526 words]

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Table 1: Responses to the question *'What were the circumstances of your retirement?'*: retired and 'retired and returned' doctors from the 1974 and 1977 cohorts

Respondents	I retired when I had planned to retire %	n	It was unplanned and due to a change in the work environment %	n	It was unplanned and due to changes in personal circumstances %	n	Other %	n	Total (100%) N
All	66.8	1608	14.0	336	13.7	329	5.5	133	2406
Retirement status									
Retired	65.4	1009	13.6	209	16.3	251	4.7	73	1542
Retired and returned	69.3	599	14.7	127	9.0	78	6.9	60	864
Cohort									
1974 graduates	69.3	762	13.0	143	11.9	131	5.7	63	1099
1977 graduates	64.7	846	14.8	193	15.1	198	5.4	70	1307
Gender									
Men	68.4	1091	13.1	209	12.7	203	5.7	91	1594
Women	63.7	517	15.6	127	15.5	126	5.2	42	812
Specialty group									
Hospital medical specialties	62.4	141	13.3	30	14.6	33	9.7	22	226
Surgery	71.3	139	13.8	27	12.3	24	2.6	5	195
General practice	67.1	809	13.4	162	15.2	183	4.3	52	1206
Paediatrics	66.1	72	12.8	14	13.8	15	7.3	8	109
Emergency medicine	77.8	14	0.0	0	22.2	4	0.0	0	18
Obstetrics and gynaecology	75.0	30	12.5	5	10.0	4	2.5	1	40
Anaesthetics	71.7	109	12.5	19	9.2	14	6.6	10	152
Radiology	79.4	54	8.8	6	4.4	3	7.4	5	68
Clinical oncology	62.5	15	4.2	1	20.8	5	12.5	3	24
Pathology	67.5	77	16.7	19	8.8	10	7.0	8	114
Psychiatry	61.7	87	21.3	30	7.8	11	9.2	13	141

Chi-square tests for: Retirement status (χ^2_3=28.0, p<0.001), Cohort (χ^2_3=7.9, p=0.048), Gender (χ^2_3=7.6, p=0.54), Specialty group (χ^2_{30}=56.4, p=0.002). 1974 graduates by specialty group (χ^2_{30}=34.4, p=0.264), 1977 graduates by specialty group (χ^2_{30}=44.7, p=0.041). 1974 graduates by gender (χ^2_3=3.3, p=0.348), 1977 graduates by gender (χ^2_3=3.5, p=0.318). Within each specialty group, by gender, only anaesthetics was significant (χ^2_3=11.3, p=0.010).

Table 2: Doctors who have retired: self-reported factors contributing to their wish to retire

Factor	Men (N=1663) %	Men (N=1663) n	Women (N=844) %	Women (N=844) n	Total (N=2507) %	Total (N=2507) n
To increase time for leisure/other interests	51.2	852	48.8	412	50.4	1264
Pressure of work	42.3	704	43.8	370	42.8	1074
Reduced job satisfaction	41.4	689	41.0	346	41.3	1035
To maintain good health	32.5	540	30.6	258	31.8	798
Financial security/insufficient financial incentive to stay*	32.1	533	23.5	198	29.2	731
The prospect of revalidation	22.9	380	23.7	200	23.1	580
Possibility of deteriorating skill/competence	18.0	299	16.9	143	17.6	442
Other	17.1	285	17.2	145	17.2	430
Not wanting to do out-of-hours work*	18.2	302	10.7	90	15.6	392
Retirement of spouse/ partner*	9.4	156	26.5	224	15.2	380
Family reasons*	11.4	189	20.9	176	14.6	365
Poor health	11.5	191	9.6	81	10.8	272
None of the above – I just wanted to retire	6.9	115	8.1	68	7.3	183

*Gender comparisons on each row of the table (χ^2_1 tests): $p<0.001$.
Respondents could select all that applied to them.

Table 3: Factors contributing to retirement decisions by specialty

Factor	Specialty group: Hospital medical specialties (N=237)	Surgery (N=206)	General practice (N=1249)	Paediatrics (N=114)	Anaesthetics (N=157)	Pathology (N=119)	Psychiatry (N=147)	Total (N=2229)
To increase time for leisure/other interests	55.3	45.1	52.5	47.4	52.9	52.9	45.6	51.5
Pressure of work*	**32.5**	**28.6**	**51.6**	41.2	**32.5**	42.0	37.4	44.1
Reduced job satisfaction	34.6	44.2	44.6	40.4	38.9	35.3	45.6	42.4
To maintain good health	29.5	29.6	34.7	24.6	36.9	22.7	31.3	32.5
Financial security/insufficient financial incentive to stay	27.0	31.1	30.0	21.9	34.4	24.4	35.4	29.7
The prospect of revalidation	21.9	18.9	26.7	22.8	24.2	20.2	15.6	24.0
Possibility of deteriorating skill/competence*	**9.7**	16.0	**20.3**	15.8	**31.2**	9.2	10.2	18.0
Other*	21.5	19.9	**13.1**	21.1	17.2	20.2	23.8	16.4
Not wanting to do out-of-hours work*	13.1	**29.6**	**9.8**	16.7	**29.3**	16.0	14.3	14.3
Retirement of spouse/ partner	18.6	8.3	16.6	19.3	14.0	16.8	12.9	15.7
Family reasons	18.6	14.1	15.1	19.3	8.9	9.2	11.6	14.6
Poor health	8.9	8.7	11.5	9.6	7.6	14.3	9.5	10.6
None of the above – I just wanted to retire	5.5	5.8	7.5	9.6	4.5	6.7	5.4	6.9

Table shows specialties with over 100 respondents.
For numbers corresponding to percentages, and numbers for small number specialties, see Appendix 1.
*Specialty comparisons on each row of the table (χ^2_6 tests): p<0.001.
Significantly high or low percentages are indicated in **bold**.

Table 4: Factors that would encourage doctors to stay working in medicine for longer, for men and women

Factor encouraging doctors to stay	Men (N=790)		Women (N=253)		Total (N=1043)	
	n	%	n	%	n	%
Reduced impact of work-related bureaucracy	44.9	355	47.0	119	45.4	474
Workload reduction/shorter hours	42.8	338	40.3	102	42.2	440
Financial incentivisation*	29.6	234	20.2	51	27.3	285
None of these	24.1	190	22.5	57	23.7	247
Reduction of on-call or emergency commitments	25.2	199	18.6	47	23.6	246
Improved working conditions, other than (or as well as) hours	19.0	150	23.3	59	20.0	209
Career change and development opportunities	11.4	90	11.5	29	11.4	119
Other	9.0	71	11.5	29	9.6	100
More involvement in direct patient care	7.6	60	7.5	19	7.6	79
Less involvement in direct patient care	5.2	41	5.5	14	5.3	55

*Gender comparisons on each row of the table (χ^2_1 tests): $p<0.01$.

Table 5: Factors that would encourage doctors to stay working in medicine for longer, by specialty

Factor encouraging doctors to stay	Hospital medical specialties (N=174) %	Surgery (N=143) %	General practice (N=384) %	Total (N=701) %
Reduced impact of work-related bureaucracy	44.3	46.2	51.8	47.3
Workload reduction/shorter hours	44.3	42.7	41.9	43.5
Financial incentivisation	27.6	32.9	24.5	28.2
Reduction of on-call or emergency commitments*	25.3	**32.9**	15.1	24.7
None of these	19.5	18.9	25.5	23.2
Improved working conditions, other than (or as well as) hours	19.5	18.2	18.2	20.2
Career change and development opportunities	10.3	12.6	9.6	11.2
Other	10.3	11.2	9.4	9.2
More involvement in direct patient care	3.4	3.5	12.5	7.7
Less involvement in direct patient care	8.6	5.6	2.9	5.6

Table shows specialties with over 100 respondents.
For numbers corresponding to percentages, and numbers for small number specialties, see Appendix 2.
*Specialty comparisons on each row of the table (χ^2_3 tests): p<0.001.
Significantly high or low percentages are indicated in **bold**.

Appendix 1: Factors contributing to retirement decisions by specialty: numbers who selected each factor

Factor contributing to retirement decisions	Hospital medical specialties (N=237) n	Surgery (N=206) n	General practice (N=1249) n	Paediatrics (N=114) n	Emergency medicine (N=19) n	Obstetrics and gynaecology (N=45) n	Anaesthetics (N=157) n	Radiology (N=72) n	Clinical oncology (N=25) n	Pathology (N=119) n	Psychiatry (N=147) n	Total (N=2390) n
To increase time for leisure/other interests	131	93	656	54	5	19	83	42	9	63	67	1222
Pressure of work	77	59	645	47	10	15	51	34	10	50	55	1053
Reduced job satisfaction	82	91	557	46	7	16	61	22	7	42	67	998
To maintain good health	70	61	434	28	5	17	58	21	9	27	46	776
Financial security/insufficient financial incentive to stay	64	64	375	25	4	13	54	22	8	29	52	710
The prospect of revalidation	52	39	333	26	4	6	38	14	2	24	23	561
Possibility of deteriorating skill/competence	23	33	253	18	6	12	49	12	3	11	15	435
Other	51	41	164	24	3	7	27	12	11	24	35	399
Not wanting to do out-of-hours work	31	61	122	19	4	19	46	37	3	19	21	382
Retirement of spouse/ partner	44	17	207	22	0	2	22	11	2	20	19	366
Family reasons	44	29	188	22	1	3	14	8	8	11	17	345
Poor health	21	18	144	11	5	3	12	10	2	17	14	257
None of the above – I just wanted to retire	13	12	94	11	3	2	7	7	2	8	8	167

Appendix 2: Factors that would encourage doctors to stay working in medicine for longer, by specialty: numbers who selected each factor

Factor encouraging doctors to stay	Hospital medical specialties (N=174) n	Surgery (N=143) n	General practice (N=384) n	Paediatrics (N=40) n	Emergency medicine (N=9) n	Obstetrics and gynaecology (N=31) n	Anaesthetics (N=53) n	Radiology (N=36) n	Clinical oncology (N=19) n	Pathology (N=37) n	Psychiatry (N=40) n	Total (N=966) n
Reduced impact of work-related bureaucracy	77	66	199	21	4	13	22	21	6	13	15	457
Workload reduction/shorter hours	77	61	161	25	5	13	23	19	9	15	12	420
Financial incentivisation	48	47	94	12	2	8	17	19	7	9	9	272
Reduction of on-call or emergency commitments	44	47	58	18	5	12	22	13	5	6	9	239
None of these	34	27	98	5	2	8	14	5	4	12	15	224
Improved working conditions, other than (or as well as) hours	34	26	70	9	2	10	9	13	5	10	7	195
Career change and development opportunities	18	18	37	7	2	5	4	5	5	6	1	108
Other	18	16	36	3	0	1	4	1	4	3	3	89
More involvement in direct patient care	6	5	48	3	2	2	2	2	1	1	2	74
Less involvement in direct patient care	15	8	11	4	2	3	2	0	4	3	2	54

Factors influencing the decisions of senior UK doctors to retire or remain in medicine: national surveys of the UK-trained medical graduates of 1974 and 1977

Fay Smith, Shelly Lachish, Michael J Goldacre, Trevor W Lambert

STROBE Statement

	Item No	Recommendation	
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	DONE
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	DONE
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	DONE
Objectives	3	State specific objectives, including any prespecified hypotheses	DONE
Methods			
Study design	4	Present key elements of study design early in the paper	DONE
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	DONE
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	DONE
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	DONE
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	DONE
Bias	9	Describe any efforts to address potential sources of bias	DONE
Study size	10	Explain how the study size was arrived at	DONE
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	DONE
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	DONE
		(*b*) Describe any methods used to examine subgroups and interactions	DONE
		(*c*) Explain how missing data were addressed	DONE
		(*d*) If applicable, explain how loss to follow-up was addressed	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	DONE
		(b) Give reasons for non-participation at each stage	DONE
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	DONE
		(b) Indicate number of participants with missing data for each variable of interest	DONE

		(c) Summarise follow-up time (eg, average and total amount)	DONE
Outcome data	15*	Report numbers of outcome events or summary measures over time	DONE
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	DONE
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	DONE
Discussion			
Key results	18	Summarise key results with reference to study objectives	DONE
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	DONE
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	DONE
Generalisability	21	Discuss the generalisability (external validity) of the study results	DONE
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	DONE

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.

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Factors influencing the decisions of senior UK doctors to retire or remain in medicine: national surveys of the UK-trained medical graduates of 1974 and 1977

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Factors influencing the decisions of senior UK doctors to retire or remain in medicine: national surveys of the UK-trained medical graduates of 1974 and 1977

Short title: Factors influencing retirement decisions of senior UK doctors

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Ethical approval: National Research Ethics Service, following referral to the Brighton and Mid-Sussex Research Ethics Committee in its role as a multi-centre research ethics committee (ref 04/Q1907/48 amendment Am02 March 2015).

Guarantor: All authors are guarantors.

Contributorship: TL and MJG designed and conducted the surveys. SL and FS performed the analysis and wrote the first drafts of the paper. All authors had full access to all of the data (including statistical reports and tables) in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. .All authors contributed to further drafts and all approved the final version.

Transparency: The lead author affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

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MeSH terms: Attitude of health personnel; physicians; workforce; medical; retirement.

ABSTRACT

Objective: To report attitudes to retirement of late-career doctors.

Design: Questionnaires sent in 2014 to all United Kingdom (UK) medical graduates of 1974 and 1977.

Setting: UK.

Participants: 3695 medical graduates.

Main outcome measures: Factors which influenced doctors' decisions to retire and factors which encouraged doctors to remain in work.

Results: The response rate was 85% (3695/4369). 55% of respondents overall were still working in medicine (whether they hadn't retired or had retired-and-returned; 61% of men, 43% of women). Of the retirees, 67% retired when they had originally planned to, and 28% had changed their retirement plans. Fifty per cent of retired doctors cited 'increased time for leisure/other interests' as a reason; 43% cited 'pressure of work'. Women (21%) were more likely than men (11%) to retire for family reasons. Women (27%) were more likely than men (9%) to retire because of the retirement of their spouse. General Practitioners (GPs) were more likely than doctors in other specialties to cite 'pressure of work'. Anaesthetists and GPs were more likely than doctors in other specialties to cite the 'possibility of deteriorating skill/competence'. Radiologists, surgeons, obstetricians and gynaecologists, and anaesthetists were most likely to cite 'not wanting to do out-of-hours work'.

Doctors who were still working were asked what would encourage them to stay in medicine for longer. Factors cited most frequently were 'reduced impact of work-related bureaucracy' (cited by 45%) and 'workload reduction/shorter hours' (42%). Men (30%) were more motivated than women (20%) by 'financial incentivisation'. Surgeons were most motivated by 'reduction of on-call or emergency commitments'.

Conclusions: Retention policy should address ways of optimising the clinical contribution of senior doctors whilst offering reduced workloads in the areas of bureaucracy and working hours, particularly in respect of emergency commitments.
[270 words]

Strengths and limitations of this study

- This is a large nationwide study with a very high response rate.
- For retired doctors, the data are based upon actual retirements and not intentions.
- Doctors who have not yet retired were surveyed at a key stage for retirement planning.
- Although a large number of retired doctors responded, some may not have done, and there is a possibility of some responder bias.
- The small minority of non-contactable doctors largely comprised those who were unregistered, either through retirement or through having left medicine or the UK. It is possible that, if surveyed, their views on the topics of the paper would differ from those of the respondents.

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Data sharing: 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.

INTRODUCTION

When doctors retire, health services lose their experience, knowledge and support.[1] In the United Kingdom (UK) one in ten Specialty and Associate Specialist (SAS) doctors and General Practitioners (GPs) are aged over 60.[2] In 2015, over 80% of senior hospital doctors in the United Kingdom were considering early retirement, with stress identified as the main cause.[3] A survey of 1400 GPs by the Wessex Local Medical Committee showed that one fifth planned to retire early.[4] The early retirement of such experienced doctors creates challenges for the medical workforce, places more stress upon remaining staff and may adversely affect patient safety.[2, 3]

A recent survey of consultant physicians in the UK found that the most common reasons for retiring cited by these doctors included pressure of work, length of working hours and dissatisfaction with the National Health Service (NHS).[5] Interviews with GPs have identified further influences, including the following: ageing and health, family life, uncertainty about the future of primary care, concerns around revalidation, increased administrative burden, and lack of time with patients.[6, 7] A cohort of UK-trained doctors, across all specialties, in their early fifties revealed that these doctors considered early retirement for family/leisure reasons, and because of concerns about health, workload, and changes in the NHS.[8]

Much of the research focus on how to retain doctors nearing retirement has been on GPs. In interviews, GPs have suggested a need for reduced workload, a focus upon their own health, and improvements in morale.[6] Other research on retention of the GP workforce calls for a slower pace of administrative change and less work outside face-to-face patient care.[7] In one study, half of hospital consultants working in Scotland said they would postpone retirement if their workload reduced.[9]

We have studied the careers of the UK-trained medical qualifiers of 1974 and 1977 periodically from the first year after they qualified. In our latest survey we asked about retirement status, intentions to retire for those who had not already done so, and attitudes to retirement. The aim of this paper is to report on factors which had influenced the decision to retire and on factors that might encourage doctors to stay in medicine longer. We compared the replies of men and women, and of those working (or who had worked) in different specialties.

METHODS

In 2014 the UK Medical Careers Research Group surveyed the UK medical graduates of 1974 and 1977 using identical postal and web-based questionnaires. Up to four reminders were sent to non-respondents. Further details of the methodology are available elsewhere [10].

The surveys sent to both cohorts were identical and comprised structured, 'closed' questions and statements, with scope and encouragement for additional free-text comment. Doctors were asked to indicate which one of seven phrases best described their current employment status: *working full-time in medicine*; *working part-time in medicine*; *working full-time outside medicine*; *working part-time outside medicine*; *retired, not now working in medicine*; *retired and 'returned' for some medical work*; *other*.

Retirees and doctors who had 'retired and returned', were asked to indicate which, if any, of the following factors had influenced their decision to retire when they did: *pressure of work*; *not wanting to do out-of-hours work*; *family reasons*; *to increase time for leisure/other interests*; *reduced job satisfaction*; *retirement of spouse/partner*; *financial security/insufficient financial incentive to stay*; *possibility of deteriorating skills/competence*; *the prospect of revalidation*; *poor health*; *to maintain good health*; '*none of the above – I just wanted to retire'*; *other*.

Doctors still working in medicine (full or part-time) were asked *'Would any of the following factors encourage you to stay working in medicine longer?'* Doctors could choose from one or more of the following factors: *workload reduction/shorter hours*; *reduction of on-call or emergency commitments*; *reduced impact of work-related bureaucracy*; *financial incentivisation*; *improved working conditions, other than (or as well as) hours*; *career change and development opportunities*; *more involvement in direct patient care*; *less involvement in direct patient care*; *none of these*; *other*.

In each case the list of response options offered was developed in part by studying text responses from doctors to previous surveys and in part by reviewing the literature on retirement and factors affecting retirement decisions.

We allocated a *career specialty* to each respondent using their recorded job history as reported to us in successive surveys and additional information about their specialist registration with the GMC as reported to us by the doctors in these surveys. For a small number of respondents we were unable to allocate a single career specialty, either because

we did not have sufficient data about the doctor's career, or because the doctor had worked in different specialties during their career. The career specialty allocation allowed us to analyse the responses and employment status of doctors in different specialties. Respondents were then grouped for analysis into these groups: *hospital medical specialties*, *surgical specialties, paediatrics, emergency medicine, obstetrics and gynaecology, anaesthesia, radiology, clinical oncology, pathology, psychiatry,* and *general practice / family medicine (GP)*.

The replies were analysed using χ^2 tests and Mann-Whitney U tests to explore differences in views towards retirement between men and women, between cohorts and between doctors working in different specialties. Statistical analysis was undertaken using SPSS version 22. Numbers of doctors were small in a few combinations of (for example) specialty and gender, but we report them for the record.

RESULTS

Demographics and response rates

There were 5482 graduating doctors in the two year-of-graduation cohorts we studied: 1974 (2347 graduates) and 1977 (3135 graduates). These two cohorts graduated many years before the recent increase in the UK in the proportion of women among successive cohorts of UK medical graduates. In 1974 the graduation cohort was 73.2% male (1717/2347), and the cohort of 1977 was 67.5% male (2116/3135).

Across both cohorts 677 doctors were not contactable, 210 were deceased, 70 had told us that they did not wish to participate, and 156 doctors who had never replied to any of our previous surveys were not contacted. The aggregated response rate of the remaining contactable doctors, over both surveys, was 84.6% (3695/4369). The response rate among men was 84.4% (2554/3026) and that among women was 85.0% (1141/1343). Taking the two cohorts together, the responders represent 70% of all surviving graduates and 85% of the contactable doctors. An abbreviated questionnaire which omitted some of the content reported here was completed by 98 graduates: we exclude these from further analysis.

The median age of the doctors from the cohorts at the time of the surveys was 64 (men 64, women 63) for the 1974 cohort and 61 (men 61, women 60) for the 1977 cohort.

Current employment status

Over both cohorts, 44% (1572/3597) of respondents had retired from medicine and were no longer working in medicine (38% of men, 56% of women); 26% (935/3597) had retired and returned for some medical work (29% of men, 20% of women); and 29% (1043/3597) were still working in medicine (32% of men, 23% of women). Therefore, 55% of respondents overall were still working in medicine (whether they hadn't retired or had retired-and-returned; 61% of men, 43% of women). Over both cohorts, 0.8% were working outside medicine and 0.5% did not give their employment status.

Retired, and retired and 'returned' doctors: circumstances of retirement

When asked 'What were the circumstances of your retirement?', most of the retired doctors (66.8%) had retired when they had planned to retire, while 27.7% had retired not when originally planned (14.0% due to changes in the work environment and 13.7% due to changes in personal circumstances; Table 1). Retired doctors from the 1974 cohort were a little more likely to have retired when they had planned to retire compared with the 1977 cohort. In comparing the responses of doctors in different specialties, we did not consider doctors in emergency medicine or clinical oncology for comparison, owing to small counts.

Radiologists were most likely to have retired when they had planned to retire (79.4%) and hospital medical specialists were least likely (62.4%; Table 1). Psychiatrists were most likely to report that their retirement was unplanned and due to a change in the work environment (21.3%). GPs were most likely to report that their retirement was unplanned and due to changes in personal circumstances (15.2%).

Retired doctors: reasons for retiring

When asked which factors had influenced their decision to retire, the retired doctors most frequently cited wanting 'increased time for leisure/other interests' as contributing to their decision to retire when they did (50.4%; Table 2). 'Pressure of work' was cited by 42.8%. Women were more likely than men to retire because of the retirement of a spouse or partner (Table 2). Further inspection within each specialty revealed that this gender difference was present in all specialties except Surgery, Obstetrics and gynaecology, Radiology, Pathology, and Psychiatry: while more women than men in these specialties cited 'Retirement of a spouse/partner', these differences within each of these specialties were not significant. In General practice 28.4% of women cited this reason compared with 10.4% of men.

Overall, women were more likely than men to retire for family reasons (Table 2): this difference was most pronounced among GPs (cited by 20.7% of women and 12.2% of men; $p<0.001$) and Hospital medical specialists (cited by 30.6% of women and 13.3% of men, $p<0.01$). Men were more likely than women to retire for financial reasons. This difference was significant within both cohorts. Further inspection within each specialty grouping revealed that this gender difference was only present among GPs (men GPs: 33.3%, women GPs: 23.7%).

Men were also more likely than women to retire because they did not want to do out-of-hours work: this difference was most marked amongst hospital medical specialists (men 16.4%, women 5.6%) and paediatricians (men 26.7%, women 10.1%), and was significant within both cohorts.

Retired doctors from the younger 1977 cohort were significantly more likely than doctors from the 1974 cohort to have retired due to pressure of work (36.4% 1974, 48.3% 1977), reduced job satisfaction (35.8% 1974, 45.9% 1977), or for financial reasons (25.3% 1974, 32.4% 1977). This suggests that these factors are more relevant to decisions about early retirement.

Retired GPs were more likely to cite 'pressure of work' as a reason for retiring than doctors in other specialties (Table 3). Anaesthetists and GPs were more likely to cite the 'possibility of deteriorating skill/competence' than doctors in other specialties. Radiologists, surgeons, obstetricians and gynaecologists, and anaesthetists were more likely to cite 'not wanting to do out-of-hours work' compared with doctors in other specialties. This pattern of reasons for retirement was observed in both cohorts ($p<0.001$). For numbers corresponding to the percentages in Table 3, and numbers for small number specialties, see Appendix 1.

Doctors still working: retirement plans

The doctors still working were asked which factors would encourage them to stay in medicine for longer. These doctors most frequently cited 'reduced impact of work-related bureaucracy' as a factor that would encourage them to stay working in medicine for longer (45.4%; Table 4), and 'workload reduction/shorter hours' (42.2%). Men were more likely than women to be encouraged by 'financial incentivisation'. This difference was significant within both cohorts ($p<0.05$). Doctors from the 1977 cohort were significantly more likely than doctors from the 1974 cohort to be encouraged to remain by 'workload reduction/shorter hours' (32.5% 1974, 46.6% 1977) and 'improved working conditions' (14.0% 1974, 22.8% 1977).

There was little variation by specialty grouping in the scoring of factors which would encourage doctors to stay in medicine longer (Table 5). There was significant variation on only one factor: reduction of on call or emergency commitments was assigned more importance by surgeons than by others. For numbers corresponding to the percentages in Table 5, and numbers for small number specialties, see Appendix 2.

DISCUSSION

Main findings

Over half of the respondents were still working in medicine (whether having retired and returned, or having never retired). Of those doctors who had retired, two thirds had retired when they had planned to retire and one quarter had an unplanned retirement due to either a change in the work environment or a change in personal circumstances. Doctors retired mainly to spend more time on leisure and other interests, or due to work pressures. More women than men retired because of the retirement of a spouse or partner: this difference was pronounced in General Practice, and less pronounced in specialties such as Surgery. More women than men retired due to family reasons (especially among GPs and Hospital medical specialists). Thus, not only are female doctors influenced much more than men by family factors in their career decisions when they are young,[11] but the male-female differences, in respect of family and career decisions, persist with age into their sixties. More men GPs than women GPs retired for financial reasons, citing '*financial security/insufficient financial incentive to stay*'. More men than women in the hospital medical specialties and paediatrics cited retiring because they did not want to do out-of-hours work. Certain retirement factors were cited more by the younger 1977 cohort than the 1974 cohort (pressure of work, reduced job satisfaction, financial reasons), suggesting that doctors considering early retirement are more influenced by these factors.

There were differences between specialties. More GPs cited 'pressure of work', more anaesthetists and GPs cited the 'possibility of deteriorating skill/competence', and more radiologists, surgeons, obstetricians and anaesthetists cited 'not wanting to do out-of-hours work' compared with doctors in other specialties.

The doctors still working cited two main factors that would encourage them to stay working in medicine for longer: 'reduced impact of work-related bureaucracy' and 'workload reduction/shorter hours'. More men than women could be encouraged to remain in medicine by financial incentivisation. More surgeons cited a reduction of on call or emergency commitments as influential to a future decision to stay.

Strengths and limitations

This is a large study with a very high response rate among contactable doctors (85%). In the case of the retired doctors in our study the data are based upon actual retirements and not intentions. In the case of the doctors who have not yet retired, we ask about factors that might encourage them to stay at a key stage when these doctors are typically considering retirement, therefore their answers are gathered at an optimal time. As has been mentioned

elsewhere, retired, though contactable, doctors may be less likely to respond.[1] This may be for a variety of reasons including deteriorating health. The non-contactable doctors largely comprised those who had ceased GMC registration, either through retirement or through having left medicine or the UK. It is possible that, if surveyed, their views on the topics of the paper would differ from those of the respondents.

Comparison with existing literature

We found that a desire to spend more time on leisure/other interests and pressure of work were key factors in retirement decisions for the retired doctors we surveyed. A recent UK study found that 81% of senior hospital doctors were considering retiring earlier due to work pressures;[3] similarly, the most common reason for intended early retirement cited by UK consultants is pressure of work.[5] Family reasons and leisure time were the main reasons cited by senior UK doctors when considering early retirement.[8] A systematic review of retirement planning among doctors found that workload and burnout were the most common reasons provided for early retirement.[12] A 2015 literature review of occupational health issues amongst UK doctors [13] revealed interesting findings which concurred with our observed specialty differences among senior doctors. Stress and burnout were widely reported across specialties, though the reported levels of problems varied. For example, one referenced study showed that radiologists reported particularly high levels of job-related exhaustion compared to surgeons, oncologists and gastroenterologists.[14]

Our finding that more GPs cited ‘pressure of work’ than doctors in other specialties, is consistent with other research which has found that GPs are concerned about high workloads.[6]

We found that doctors could be encouraged to stay in practice by reducing work-related bureaucracy and reducing workload/hours. Other research has found that doctors can be encouraged to stay working in medicine by reducing workplace frustration and workload pressure.[12]

Further work The results reported here cover only some of the themes explored by us in these surveys. We asked specific questions about any adverse effects on health and wellbeing of work as a doctor, published elsewhere.[15] We also asked the doctors about their roles in addition to clinical work, specifying ‘teaching and training, research, management’ and ‘other (please describe)’. In addition to our closed questions, we asked for some ‘free text’ responses to questions about changes in policy and practice that

respondents would like implemented in medicine in the UK. We are in the process of analysing responses and, in further work, we will publish on these.

Implications / conclusions Doctors described a variety of professional and personal motivators for choosing the timing of their retirement. Some of the reasons given may be amenable to policy initiatives, which could result in securing a longer contribution to the health service by some doctors than would otherwise be the case. Retention policy should address ways of optimising the clinical contribution of senior doctors. For example, staged retirement with reduced workloads in the areas of bureaucracy and working hours, particularly in respect of emergency commitments, may enable seniors to continue using their skills for longer.

A higher percentage of women than men had retired. As noted in Results, these were cohorts in which the majority of doctors were men: they pre-dated the substantial increase in the intake of women into medicine. If the male-female differences in the likelihood of early retirement become evident in younger generations of doctors, these may become an important source of future attrition from the medical workforce overall.

[2526 words]

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Table 1: Responses to the question *'What were the circumstances of your retirement?'*: retired and 'retired and returned' doctors from the 1974 and 1977 cohorts

Respondents	I retired when I had planned to retire %	n	It was unplanned and due to a change in the work environment %	n	It was unplanned and due to changes in personal circumstances %	n	Other %	n	Total (100%) N
All	66.8	1608	14.0	336	13.7	329	5.5	133	2406
Retirement status									
Retired	65.4	1009	13.6	209	16.3	251	4.7	73	1542
Retired and returned	69.3	599	14.7	127	9.0	78	6.9	60	864
Cohort									
1974 graduates	69.3	762	13.0	143	11.9	131	5.7	63	1099
1977 graduates	64.7	846	14.8	193	15.1	198	5.4	70	1307
Gender									
Men	68.4	1091	13.1	209	12.7	203	5.7	91	1594
Women	63.7	517	15.6	127	15.5	126	5.2	42	812
Specialty group									
Hospital medical specialties	62.4	141	13.3	30	14.6	33	9.7	22	226
Surgery	71.3	139	13.8	27	12.3	24	2.6	5	195
General practice	67.1	809	13.4	162	15.2	183	4.3	52	1206
Paediatrics	66.1	72	12.8	14	13.8	15	7.3	8	109
Emergency medicine	77.8	14	0.0	0	22.2	4	0.0	0	18
Obstetrics and gynaecology	75.0	30	12.5	5	10.0	4	2.5	1	40
Anaesthetics	71.7	109	12.5	19	9.2	14	6.6	10	152
Radiology	79.4	54	8.8	6	4.4	3	7.4	5	68
Clinical oncology	62.5	15	4.2	1	20.8	5	12.5	3	24
Pathology	67.5	77	16.7	19	8.8	10	7.0	8	114
Psychiatry	61.7	87	21.3	30	7.8	11	9.2	13	141

Chi-square tests for: Retirement status (χ^2_3=28.0, p<0.001), Cohort (χ^2_3=7.9, p=0.048), Gender (χ^2_3=7.6, p=0.54), Specialty group (χ^2_{30}=56.4, p=0.002). 1974 graduates by specialty group (χ^2_{30}=34.4, p=0.264), 1977 graduates by specialty group (χ^2_{30}=44.7, p=0.041). 1974 graduates by gender (χ^2_3=3.3, p=0.348), 1977 graduates by gender (χ^2_3=3.5, p=0.318). Within each specialty group, by gender, only anaesthetics was significant (χ^2_3=11.3, p=0.010).

Table 2: Doctors who have retired: self-reported factors contributing to their wish to retire

Factor	Men (N=1663) %	Men (N=1663) n	Women (N=844) %	Women (N=844) n	Total (N=2507) %	Total (N=2507) n
To increase time for leisure/other interests	51.2	852	48.8	412	50.4	1264
Pressure of work	42.3	704	43.8	370	42.8	1074
Reduced job satisfaction	41.4	689	41.0	346	41.3	1035
To maintain good health	32.5	540	30.6	258	31.8	798
Financial security/insufficient financial incentive to stay*	32.1	533	23.5	198	29.2	731
The prospect of revalidation	22.9	380	23.7	200	23.1	580
Possibility of deteriorating skill/competence	18.0	299	16.9	143	17.6	442
Other	17.1	285	17.2	145	17.2	430
Not wanting to do out-of-hours work*	18.2	302	10.7	90	15.6	392
Retirement of spouse/ partner*	9.4	156	26.5	224	15.2	380
Family reasons*	11.4	189	20.9	176	14.6	365
Poor health	11.5	191	9.6	81	10.8	272
None of the above – I just wanted to retire	6.9	115	8.1	68	7.3	183

*Gender comparisons on each row of the table (χ^2_1 tests): $p<0.001$.
Respondents could select all that applied to them.

Table 3: Factors contributing to retirement decisions by specialty

Factor	Specialty group: Hospital medical specialties (N=237)	Surgery (N=206)	General practice (N=1249)	Paediatrics (N=114)	Anaesthetics (N=157)	Pathology (N=119)	Psychiatry (N=147)	Total (N=2229)
To increase time for leisure/other interests	55.3	45.1	52.5	47.4	52.9	52.9	45.6	51.5
Pressure of work*	**32.5**	**28.6**	**51.6**	41.2	**32.5**	42.0	37.4	44.1
Reduced job satisfaction	34.6	44.2	44.6	40.4	38.9	35.3	45.6	42.4
To maintain good health	29.5	29.6	34.7	24.6	36.9	22.7	31.3	32.5
Financial security/insufficient financial incentive to stay	27.0	31.1	30.0	21.9	34.4	24.4	35.4	29.7
The prospect of revalidation	21.9	18.9	26.7	22.8	24.2	20.2	15.6	24.0
Possibility of deteriorating skill/competence*	**9.7**	16.0	**20.3**	15.8	**31.2**	9.2	10.2	18.0
Other*	21.5	19.9	**13.1**	21.1	17.2	20.2	23.8	16.4
Not wanting to do out-of-hours work*	13.1	**29.6**	**9.8**	16.7	**29.3**	16.0	14.3	14.3
Retirement of spouse/ partner	18.6	8.3	16.6	19.3	14.0	16.8	12.9	15.7
Family reasons	18.6	14.1	15.1	19.3	8.9	9.2	11.6	14.6
Poor health	8.9	8.7	11.5	9.6	7.6	14.3	9.5	10.6
None of the above – I just wanted to retire	5.5	5.8	7.5	9.6	4.5	6.7	5.4	6.9

Table shows specialties with over 100 respondents.
For numbers corresponding to percentages, and numbers for small number specialties, see Appendix 1.
*Specialty comparisons on each row of the table (χ^2_6 tests): p<0.001.
Significantly high or low percentages are indicated in **bold**.

Table 4: Factors that would encourage doctors to stay working in medicine for longer, for men and women

Factor encouraging doctors to stay	Men (N=790)		Women (N=253)		Total (N=1043)	
	n	%	n	%	n	%
Reduced impact of work-related bureaucracy	44.9	355	47.0	119	45.4	474
Workload reduction/shorter hours	42.8	338	40.3	102	42.2	440
Financial incentivisation*	29.6	234	20.2	51	27.3	285
None of these	24.1	190	22.5	57	23.7	247
Reduction of on-call or emergency commitments	25.2	199	18.6	47	23.6	246
Improved working conditions, other than (or as well as) hours	19.0	150	23.3	59	20.0	209
Career change and development opportunities	11.4	90	11.5	29	11.4	119
Other	9.0	71	11.5	29	9.6	100
More involvement in direct patient care	7.6	60	7.5	19	7.6	79
Less involvement in direct patient care	5.2	41	5.5	14	5.3	55

*Gender comparisons on each row of the table (χ^2_1 tests): $p<0.01$.

Table 5: Factors that would encourage doctors to stay working in medicine for longer, by specialty

Factor encouraging doctors to stay	Hospital medical specialties (N=174) %	Surgery (N=143) %	General practice (N=384) %	Total (N=701) %
Reduced impact of work-related bureaucracy	44.3	46.2	51.8	47.3
Workload reduction/shorter hours	44.3	42.7	41.9	43.5
Financial incentivisation	27.6	32.9	24.5	28.2
Reduction of on-call or emergency commitments*	25.3	**32.9**	15.1	24.7
None of these	19.5	18.9	25.5	23.2
Improved working conditions, other than (or as well as) hours	19.5	18.2	18.2	20.2
Career change and development opportunities	10.3	12.6	9.6	11.2
Other	10.3	11.2	9.4	9.2
More involvement in direct patient care	3.4	3.5	12.5	7.7
Less involvement in direct patient care	8.6	5.6	2.9	5.6

Table shows specialties with over 100 respondents.
For numbers corresponding to percentages, and numbers for small number specialties, see Appendix 2.
*Specialty comparisons on each row of the table (χ^2_3 tests): p<0.001.
Significantly high or low percentages are indicated in **bold**.

Appendix 1: Factors contributing to retirement decisions by specialty: numbers who selected each factor

Factor contributing to retirement decisions	Hospital medical specialties (N=237) n	Surgery (N=206) n	General practice (N=1249) n	Paediatrics (N=114) n	Emergency medicine (N=19) n	Obstetrics and gynaecology (N=45) n	Anaesthetics (N=157) n	Radiology (N=72) n	Clinical oncology (N=25) n	Pathology (N=119) n	Psychiatry (N=147) n	Total (N=2390) n
To increase time for leisure/other interests	131	93	656	54	5	19	83	42	9	63	67	1222
Pressure of work	77	59	645	47	10	15	51	34	10	50	55	1053
Reduced job satisfaction	82	91	557	46	7	16	61	22	7	42	67	998
To maintain good health	70	61	434	28	5	17	58	21	9	27	46	776
Financial security/insufficient financial incentive to stay	64	64	375	25	4	13	54	22	8	29	52	710
The prospect of revalidation	52	39	333	26	4	6	38	14	2	24	23	561
Possibility of deteriorating skill/competence	23	33	253	18	6	12	49	12	3	11	15	435
Other	51	41	164	24	3	7	27	12	11	24	35	399
Not wanting to do out-of-hours work	31	61	122	19	4	19	46	37	3	19	21	382
Retirement of spouse/ partner	44	17	207	22	0	2	22	11	2	20	19	366
Family reasons	44	29	188	22	1	3	14	8	8	11	17	345
Poor health	21	18	144	11	5	3	12	10	2	17	14	257
None of the above – I just wanted to retire	13	12	94	11	3	2	7	7	2	8	8	167

Appendix 2: Factors that would encourage doctors to stay working in medicine for longer, by specialty: numbers who selected each factor

Factor encouraging doctors to stay	Hospital medical specialties (N=174) n	Surgery (N=143) n	General practice (N=384) n	Paediatrics (N=40) n	Emergency medicine (N=9) n	Obstetrics and gynaecology (N=31) n	Anaesthetics (N=53) n	Radiology (N=36) n	Clinical oncology (N=19) n	Pathology (N=37) n	Psychiatry (N=40) n	Total (N=966) n
Reduced impact of work-related bureaucracy	77	66	199	21	4	13	22	21	6	13	15	457
Workload reduction/shorter hours	77	61	161	25	5	13	23	19	9	15	12	420
Financial incentivisation	48	47	94	12	2	8	17	19	7	9	9	272
Reduction of on-call or emergency commitments	44	47	58	18	5	12	22	13	5	6	9	239
None of these	34	27	98	5	2	8	14	5	4	12	15	224
Improved working conditions, other than (or as well as) hours	34	26	70	9	2	10	9	13	5	10	7	195
Career change and development opportunities	18	18	37	7	2	5	4	5	5	6	1	108
Other	18	16	36	3	0	1	4	1	4	3	3	89
More involvement in direct patient care	6	5	48	3	2	2	2	2	1	1	2	74
Less involvement in direct patient care	15	8	11	4	2	3	2	0	4	3	2	54

Factors influencing the decisions of senior UK doctors to retire or remain in medicine: national surveys of the UK-trained medical graduates of 1974 and 1977

Fay Smith, Shelly Lachish, Michael J Goldacre, Trevor W Lambert

STROBE Statement

	Item No	Recommendation	
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Page 1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	Page 3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Page 5
Objectives	3	State specific objectives, including any prespecified hypotheses	Page 5
Methods			
Study design	4	Present key elements of study design early in the paper	Page 6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Page 6
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	Page 6
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Page 6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Page 6,7
Bias	9	Describe any efforts to address potential sources of bias	Page 6,7
Study size	10	Explain how the study size was arrived at	Page 6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Page 6,7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	Page 6,7
		(*b*) Describe any methods used to examine subgroups and interactions	Page 6,7
		(*c*) Explain how missing data were addressed	Page 6,7
		(*d*) If applicable, explain how loss to follow-up was addressed	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Page 8
		(b) Give reasons for non-participation at each stage	Page 8
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Page 8
		(b) Indicate number of participants with missing data for each variable of interest	Page 8

		(c) Summarise follow-up time (eg, average and total amount)	Page 8
Outcome data	15*	Report numbers of outcome events or summary measures over time	Page 8,9
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Page 9-10
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Page 9-10
Discussion			
Key results	18	Summarise key results with reference to study objectives	Page 11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Page 11-12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Page 13
Generalisability	21	Discuss the generalisability (external validity) of the study results	Page 13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Page 4

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.