What is already known on this topic

Some parents have strong concerns over an unsupported link between MMR vaccine and autism

Interventions to address parental concerns are largely didactic, and few studies have examined their effectiveness

What this study adds

An online interactive decision aid improved parents' attitudes to MMR vaccination

Decision aids have the potential for wider application in providing advice about immunisation

The findings indicate that many users had attitudes inconsistent with the best available evidence, even after completing the decision aid. This supports previous findings that parents can be more strongly influenced by perceived responsibility and anticipatory regret than by a numerical assessment of the risks and benefits of immunisation.[7 8] It also supports findings that parents withhold vaccinations because a risk from a known disease may be more acceptable than a smaller risk of ambiguous or unknown consequences.[9]

Limitations of study

Users were not compelled to provide their demographic details so there is potential for selection bias from the low response rate. This may also have arisen from the length of the aid. In addition, only 52 of the respondents reported having children of vaccination age, limiting the generalisability of our results. Online data collection still has promise if loss to follow-up can be minimised.

Future work

The aid could be adapted to be more interactive, with more in depth evidence layered according to parents' information needs. A randomised controlled trial might then allow methodological limitations to be addressed, and see whether the aid reduced decisional conflict and improved the timeliness and completion of MMR vaccination.

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Promotion to hospital consultant: regression analysis using NHS administrative data

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Abstract

Objectives To examine factors influencing promotion to hospital consultant.
Design Multivariate logistic regression analysis of NHS administrative data between 1991 and 2000.
Setting Hospitals in NHS Scotland.
Population All registrars, senior registrars, and specialist registrars in Scotland.
Main outcome measure The proportion of doctors promoted to NHS consultant.
Results Compared with doctors who graduated in Scotland, graduates from the rest of the United Kingdom and from overseas were less likely to be promoted to consultant (odds ratio 0.65, 95% confidence interval 0.52 to 0.82; and 0.37, 0.28 to 0.50, respectively). Promotion and holding an honorary contract before promotion were positively associated (1.37, 1.03 to 1.83); and the number of years since graduation (5.98 per year, 4.94 to 7.23). Women were less likely to be promoted (0.73, 0.60 to 0.90), as were doctors who worked part time (0.27, 0.17 to 0.42). Probabilities of promotion did not have a clear time trend between 1993 and 2000, and NHS boards in non-metropolitan areas of Scotland were more likely to offer promotions than NHS boards in metropolitan areas, presumably reflecting a higher gap between demand and supply in these boards.
Conclusion As the proportion of women in hospital medicine increases, government targets for the recruitment of consultants are unlikely to be met unless the promotion process is examined. It is unclear whether more recent reforms of the medical career structure will deal with these issues.

ELPS *This is the abridged version of an article that was posted on bmj.com on 31 October 2005: http://bmj.com/cgi/doi10.1136/bmj.38628.738935.3A*

Introduction

The process of promotion to hospital consultant is not well understood. The career track to becoming a consultant is competitive, and little empirical evidence exists about which doctors are promoted. We examine the role of several factors associated with promotion to NHS consultant in Scotland. We focus on the role of sex, country of qualification, hours of work, and the nature of training. We use a multivariate framework that controls for many factors that may be associated with promotion.

Method

We obtained data from the medical and dental census from 1991 to 2000 from the information services division of NHS Scotland. These data are collected by hospitals each time a doctor or dentist has joined or left, and include all doctors and dentists working in hospital and community health services,. The data represent the total population of doctors and dentists working in Scotland at 30 September each year. The data contain information, at an individual level, on age, sex, ethnicity, country of qualification, years since graduation, full time or part time contract, honorary contract, whole time equivalents, specialty, grade, hospital, and NHS board.

Promotions to consultant could not be observed where the job in the year before promotion was outside Scotland. The sample was restricted to doctors who were in the following grades in any given year over the period: registrar, senior registrar, and specialist registrar. This represents the pool of those doctors who could have potentially been promoted to consultant between 1991 and 2000.

Statistical methods

We used conditional fixed effects logistic regression.[1 2] The dependent variable took the value one for doctors who were consultants in the current year and not consultants in the previous year (promotion), and zero for others (no promotion). This estimation method controls for unobserved differences in promotion probabilities attributable to specialties, such as differences in demand and training for consultants across specialties alongside other unobserved factors leading to a different likelihood of promotion across specialties (unobserved heterogeneity). Independent variables included sex and country of qualification. A set of NHS health board variables were included to account for differences in demand at NHS health board level and supply of consultants and factors such as teaching status (for full details of the statistical analysis see bmj.com).

Results

Table 1 shows the characteristics of the sample, which included 2716 individual doctors, comprising a total of 7043 person year observations, in the promotion pool between 1993 and 2000 (see also bmj.com). Over the 1993-2000 period, 870 (32% of 2716 individuals) doctors were promoted to consultant from within NHS Scotland. The average yearly incidence of promotion to consultant during the 1990s was 12.4% (9.5% for women and 14.2% for men). Apart from 1993, men were more likely to be promoted than women in each year, although no clear trends over time emerged (table 1). Altogether 37.9% of doctors in the sample were female, 66.9% had qualified in Scotland, 20.5% in the rest of the UK, and 12.6% in other countries. The average experience since graduation was 9.4 years. An honorary contract was held by 8.2% of doctors, and 5.5% of the sample held a part time contract. Women were less likely to have held an honorary contract and more likely to have worked part time and to have changed from working part time to full time.

Table 2 shows the regression results for the full sample and separately for women and men.

Scottish medical graduates (the reference category) had the highest chance of getting promoted, followed by graduates from the rest of the UK. Doctors who had qualified outside the UK were least likely to get promoted. Doctors who had held an honorary contract during at least one of the two years before promotion were more likely to get promoted than those who had not. Doctors on a part time contract in at least one of the two years before promotion have lower promotion

Table 1 Doctors promoted to consultant in Scotland, by year and sex

No of doctors in each year	1993	1994	1995	1996	1997	1998	1999	2000	Total person years and average annual incidence of promotion
Women									
Not promoted	184	212	248	321	375	389	390	407	2526
Promoted	22	20	35	26	41	35	47	39	265
% promoted	10.7	8.6	12.4	7.5	9.9	8.3	10.8	8.7	9.5
Total	206	232	283	347	416	424	437	446	2791
Men									
Not promoted	360	368	421	469	509	540	499	481	3647
Promoted	38	48	88	91	94	70	100	76	605
% promoted	9.5	11.5	17.3	16.3	15.6	11.5	16.7	13.6	14.2
Total	398	416	509	560	603	610	599	557	4252
All doctors									
Not promoted	544	580	669	790	884	929	889	888	6173
Promoted	60	68	123	117	135	105	147	115	870
% promoted	9.9	10.5	15.5	12.9	13.2	10.2	14.2	11.5	12.4
Total	604	648	792	907	1019	1034	1036	1003	7043

The sample includes all doctors in NHS Scotland on September 30 each year between 1993 and 2000 in the grade of registrar, senior registrar, and specialist registrar. Observations from 1991 and 1992 were not included in the model because two of the independent variables were lagged by two years.

Table 2 Logistic regression results (dependent variable=1 if promoted, 0 if not promoted)*

	Complete sample		Women only		Men only	
Variable	**Odds ratio (95% CI)**	**P value**	**Odds ratio (95% CI)**	**P value**	**Odds ratio (95% CI)**	**P value**
Qualified England, Wales,† or Northern Ireland (=1)	0.65 (0.52 to 0.82)	0	0.70 (0.45 to 1.08)	0.111	0.61 (0.46 to 0.80)	0
Qualified non-UK† (=1)	0.37 (0.28 to 0.50)	0	0.34 (0.17 to 0.69)	0.003	0.34 (0.24 to 0.49)	0
Honorary contract‡ (=1)	1.37 (1.03 to 1.83)	0.029	1.04 (0.57 to 1.89)	0.889	1.40 (1.00 to 1.97)	0.049
Women (=1)	0.73 (0.60 to 0.90)	0.004	—		—	
No of years since graduation	5.98 (4.94 to 7.23)	0	5.77 (4.25 to 7.85)	0	5.94 (4.63 to 7.63)	0
No of years since graduation squared	0.47 (0.23 to 0.94)	0	0.55 (0.19 to 1.65)	0	0.52 (0.20 to 1.32)	0
Part time contract‡ (=1)	0.27 (0.17 to 0.42)	0	0.24 (0.14 to 0.41)	0	0.37 (0.07 to 2.01)	0.247
Change from working part time to full time ‡(=1)	1.81 (0.81 to 4.01)	0.147	1.69 (0.69 to 4.12)	0.253	3.64 (0.30 to 44.75)	0.313
No of doctor years	7043		2634		4237	
Likelihood ratio test§ χ^2 (df)	1605 (25)—P<0.0001		529 (24)—P<0.0001		1058 (24)—P<0.0001	

*Dummy variables for each NHS board and for each year were also included in the regression, but not included in the table. Results are available from the authors.
†Reference category: qualified in Scotland.
‡In the two years preceding promotion.
§The likelihood ratio test is a measure of the joint statistical significance of all included independent variables. Its value follows the χ^2 distribution.

probabilities than doctors working full time. These results assume that the promotion process is identical for men and women. We then dropped this assumption and investigated sex differences in promotion (table 2[2]).

Even after part time working, years since graduation, and all other covariates are controlled for, women are less likely to be promoted than men. Having an honorary contract is associated with promotion only for men. Years since graduation have a positive effect for both sexes, slightly higher for men, possibly because this variable may have absorbed some bias owing to higher past unobserved rates of part time work (or other unobserved factors that are correlated with part time work) by women, over and above those represented by the variable part time work that refers to the last two years before promotion. Part time contracts are negatively associated with promotion for both sexes, although this association reaches significance only for women. The fact that fewer than 1% of men work part time may account for the absence of precise estimates for men.

Discussion

Having an honorary contract in the years before promotion is associated with a higher probability of promotion to consultant. This may reflect the importance of exposure to teaching and research during medical training, although this seems to matter only for men. Hospital doctors who work part time, especially women, are less likely to be promoted. This may reflect less accumulated experience, but it may also reflect inflexibilities in the career structure.

Differences by sex

Women are less likely to get promoted than men, even after experience, part time working, and other factors are controlled for. Whether this is because of discrimination in the promotion process requires further research into variations in the criteria for promotion. This is consistent with sex imbalances after promotion in the award of discretionary points and distinction awards.[3] As the proportion of women in medicine increases, their stronger preference for part time work is likely to reduce the pool of doctors available for promotion.

Differences by place of graduation

The place of graduation is associated with promotion prospects, possibly due to differences in the quality of information about the doctor's skills and ability. However, given that on the job training reveals up to date skill and ability, the finding that promotions are more likely to be granted by those NHS boards outside of the main metropolitan areas of Scotland is likely to reflect the higher turnover of hospital consultants in NHS boards without teaching hospitals or tertiary services.

Limitations of the study

Our results come with several caveats. The data include only promotions that took place within NHS Scotland and rely on the accuracy and completeness of information sent to the information services division by hospitals. The measure of experience used (years since graduation) is not perfect, as it does not account fully for accumulated experience that may be different for men and women. The finding that women are less

What is already known on this topic

Little rigorous research has been conducted into the promotion of hospital doctors to consultant level

The study of the promotion process in the NHS is crucial for the design of evidence based policies on human resource management

What this study adds

The adjusted probability of promotion of female hospital doctors to consultant level is considerably lower than that of male doctors

Graduates from overseas and doctors working part time are less likely to be promoted

Doctors who held an honorary contract and those working in non-metropolitan NHS boards are more likely to be promoted

Explicit promotion criteria are needed so that the government's goal of a consultant led NHS can be met

likely to be promoted may in part reflect this. Investigating this point would require complete data on employment history since graduation. The data will also include doctors in the training grades who may not want to become a consultant, and the results may be partly reflecting the preferences of this group, who are more likely to be female and work part time. However, this group is likely to be small.

Conclusions

The achievement of current government targets for the numbers of consultants are influenced by the promotion process and the quality control exercised by the royal colleges. As the proportion of female doctors increases, it will be difficult to meet government targets unless the promotion process is re-examined. This should focus on the weight given to individuals' skills and ability and the flexibility of contracts and working conditions. Safeguards will need to be in place to ensure that factors less likely to be related to ability or performance (such as sex, place of graduation, or part time working) will not influence promotion chances. Since 2000, when the data used in this paper finish, several changes have been introduced that have altered the career structures of hospital doctors. These include the Calman reforms, Modernising Medical Careers, further proposals for reform of the staff or associate specialist grades, and new contracts for junior doctors and consultants. It is unclear what impact these changes will have on the issues discussed in this paper.

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Corrections and clarifications

Achieving the millennium development goals for health: Cost effectiveness analysis of strategies to combat malaria in developing countries

A mix-up during submission led to the wrong version of table 3 being included in the full version of this paper (see bmj.com) by Chantal M Morel and colleagues (*BMJ* 2005;331:1299-302, 3 Dec). The R_0 value for case management with chloroquine should be 0.35 (rather than 0.3). The adherence for artemisinin based combination treatment should be 35% (not 40%), and neither that nor the adherence for non-artemisinin based treatment needs a footnote. Values for probability of success when patients were not fully compliant should be 35% for non-artemisinin based treatment and 0% for intermittent presumptive treatment during pregnancy (rather than 35% and 10% respectively, as given). These revised values also apply to table B on bmj.com.

ABC of health informatics: Improving services with informatics tools

The authors of this ABC article, Frank Sullivan and Jeremy C Wyatt (*BMJ* 2005;331:1190-2, 19 Nov), inadvertently omitted an acknowledgment from the two tables at the top of p 1191 containing information on the analysis of approaches to changing clinical practice: internal and external processes. They were first published by Grol R. *BMJ* 1997;315:418-21.

Legislation for smoke-free workplaces and health of bar workers in Ireland: before and after study

Two errors occurred in this paper by Shane Allwright and colleagues (*BMJ* 2005;331:1117-20, 12 Nov). The model coefficients for cotinine concentrations in table 5 in the full version of this paper (see bmj.com) were wrong because they had not been corrected to take account of the conversion to SI units in table 6. The corrected table is at bmj.com (http://bmj.bmjjournals.com/cgi/content/full/331/7525/1117/DC1). The authors state that the revisions do not alter the conclusions of the paper. Also, in the abstract,the figures in parentheses after the median cotinine values are interquartile ranges not confidence intervals.

Primary care in the United States: problems and possibilities

Electronic difficulties while handling the proofs led to an error and an omission in this article by Robert L Phillips (*BMJ* 2005;331:1400-2,10 Dec). The author's job title was wrong; he is in fact director of the Robert Graham Center. In addition, the article should have contained the following disclaimer: "The information and opinions contained in research from the Graham Center do not necessarily reflect the views or policy of the American Academy of Family Physicians."

Extra scrutiny for industry funded trials

The title of this editorial by Kenneth J Rothman and Stephen Evans (*BMJ* 2005;331:1350-1, 10 Dec) should have referred to "studies," not "trials." The authors discussed all reports containing original data, so "studies" would have been more accurate. The use of the word "trials" was the result of a late editorial intervention.

Treatment of bites by adders and exotic venomous snakes

In this Clinical Review by David A Warrell, the author's email address was wrong (*BMJ* 2005;331:1244-7, 26 Nov). The correct address is david.warrell@ndm.ox.ac.uk

Randomised placebo controlled multicentre trial to assess short term clarithromycin for patients with stable coronary heart disease: CLARICOR trial

The main text and the summary box in this paper by Christian M Jespersen and colleagues (*BMJ* 2006;332:22-4, 7 Jan) refer to the patients in the trial being followed for up to three years. The authors have clarified that the mean follow-up was 960 (range 900-1070) days.