

Papers

Country of training and ethnic origin of UK doctors: database and survey studies

Michael J Goldacre, Jean M Davidson, Trevor W Lambert

Abstract

Objectives To report on the country of training and ethnicity of consultants in different specialties in the NHS, on trends in intake to UK medical schools by ethnicity, and on the specialty choices made by UK medical graduates in different ethnic groups.

Design Analysis of official databases of consultants and of students accepted to study medicine; survey data about career choices made by newly qualified doctors.

Setting and subjects England and Wales (consultants), United Kingdom (students and newly qualified doctors).

Results Of consultants appointed before 1992, 15% had trained abroad; of those appointed in 1992-2001, 24% had trained abroad. The percentage of consultants who had trained abroad and were non-white was significantly high, compared with their overall percentage among consultants, in geriatric medicine, genitourinary medicine, paediatrics, old age psychiatry, and learning disability. UK trained non-white doctors had specialty destinations similar to those of UK trained white doctors. The percentage of UK medical graduates who are non-white has increased substantially from about 2% in 1974 and will approach 30% by 2005. White men now comprise little more than a quarter of all UK medical students. White and non-white UK graduates make similar choices of specialty.

Conclusions Specialist medical practice in the NHS has been heavily dependent on doctors who have trained abroad, particularly in specialties where posts have been hard to fill. By contrast, UK trained doctors from ethnic minorities are not over-represented in the less popular specialties. Ethnic minorities are well represented in UK medical school intakes; and white men, but not white women, are now substantially under-represented.

Introduction

Immigration to the United Kingdom in recent decades has changed the ethnic composition of the medical workforce in two major respects. Firstly, the NHS has relied heavily, and increasingly, on the immigration of doctors to make up the shortfall in numbers of "home trained" doctors. Secondly, the ethnic composition of doctors trained in UK medical schools has changed as second and third generation UK educated pupils from ethnic minorities have entered medicine in increasing numbers. We report on these trends.

Methods

Consultants in England: analysis of national database

The Department of Health maintains an annually updated database of all NHS consultants in England and Wales for the Advisory Committee on Clinical Excellence Awards. We used the 2002 database—which included, for each consultant in post at the end of 2001, sex; ethnic group; year of first consultant appointment and of current post; for the current post, specialty, hospital, UK region, and type of contract; and, for the first time, country of undergraduate medical training (UK or abroad).¹ No historical copies of the database exist, so we could not include consultants appointed in the years 1964-2001 who had left the NHS before 2002.

All personal identifiers were removed from the files before analysis. Ethnic groups within this database, and in the other two databases described below, were defined according to the categories used by the Office for National Statistics—white, Indian, Pakistani, Bangladeshi, Chinese, black Caribbean, black African, black other, and other ethnic group. We analysed the data both by individual ethnic group and in four broader groups—UK trained white doctors, UK trained non-white doctors, white doctors who had trained abroad, and non-white doctors who had trained abroad. We calculated the percentage contribution by the four groups of consultants to each specialty. We displayed the results either according to standard specialty groupings²⁻³ or for individual specialties if, on examination, they showed important differences for the four demographic groups.

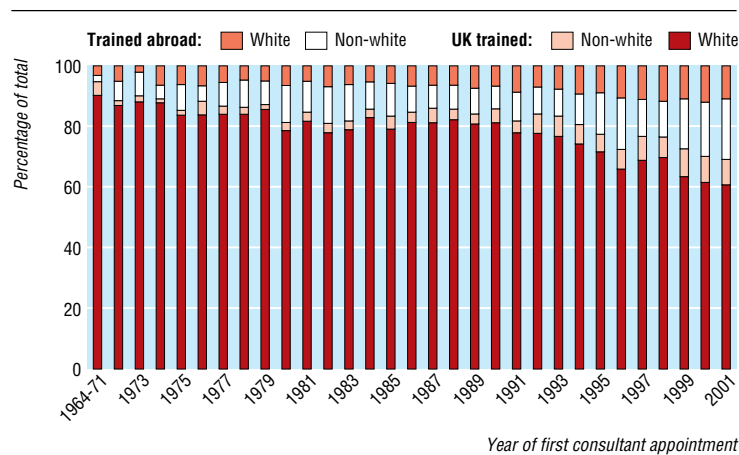
We used components of χ^2 to test the significance of differences in the representation of the four demographic groups in each specialty, compared with their percentage of the total number of consultants. We took $P < 0.001$ as a significant difference because of the large number of multiple comparisons involved. For example, in table 1 the analysis of consultants appointed during 1964-91 involved 51 comparisons. A full Bonferroni correction to the level of significance suggests that $P < 0.001$ on each comparison is roughly equivalent to $P < 0.05$ on a single comparison (that is, $0.05/51 \approx 0.001$).

Universities and Colleges Admissions Service (UCAS) statistics

Aggregated statistics from the Universities and Colleges Admissions Service include the ethnic group of accepted "home" applicants (that is, UK based) to UK medical schools by year of acceptance from 1996 to 2002. There are no collated national statistics on the actual uptake of accepted places or of numbers



An extra table appears on *bmj.com* giving details of career choices of newly qualified doctors from ethnic minority groups



Percentage of NHS consultants by ethnic group and place of training grouped by the year of their first consultant appointment

of graduates by ethnicity. We assumed that the students' year of clinical qualification would be, typically, five years after acceptance to medical school, and we projected forward to 2001-7 the percentages of newly qualified doctors in successive years of qualification by ethnic group.

Survey data from the UK Medical Careers Research Group

We have undertaken cohort studies of all UK medical graduates in particular years, using postal questionnaires, to seek information about doctors' early choice of eventual career and their actual career destinations.^{2,3} We analysed the distribution by ethnic group (as described above) of respondents to surveys undertaken between 1974 and 2000, and we have tabulated the career choices of the graduates of 1993, 1996, 1999, and 2000.

Results

Consultants in post in 2001: distribution by ethnic group and speciality

The figure shows the percentages of NHS consultants by ethnic group and place of training grouped by the year of their first consultant appointment. The distribution of consultants by each demographic group has changed over time: the percentage who trained abroad increased most substantially in the last 10 years covered by the 2002 database. Accordingly, we have summarised the results for consultants who were first appointed before 1992, and for those appointed between 1992 and 2001.

Table 1 shows the percentage of consultants in each speciality from each demographic group. Of all consultants first appointed during 1964-91, 81.5% were UK trained and white, 3.3% were UK trained and non-white, 6.2% were trained abroad and white, and 9.1% were trained abroad and non-white. Of those first appointed during 1992-2001, 68.6% were UK trained white, 7.2% were UK trained non-white, 10.0% were trained abroad white, and 14.1% were trained abroad non-white. Thus, the percentage of newly appointed consultants who were trained abroad increased from 15.3% in 1964-91 to 24.1% in 1992-2001, and the percentage from ethnic minorities increased from 12.4% in 1964-1991 to 21.3% in 1992-2001.

The consultants first appointed during 1964-91 showed significant and substantial differences in the distribution of the four demographic groups between specialties ($\chi^2_{48} = 694.9$, $P < 0.001$) (table 1). Compared with their overall percentages in the consultant workforce, significantly and substantially lower percentages of UK trained white doctors, and higher

percentages of non-white doctors trained abroad, were in geriatric medicine, genitourinary medicine, general psychiatry, old age psychiatry, and learning disability (significance assessed by χ^2 tests with adjusted standardised residuals); and significantly higher percentages of UK trained white doctors, and significantly lower percentages of non-white doctors trained abroad, were in general medicine and general surgery. In addition, in radiology there was a significantly higher percentage of UK trained white doctors than of other demographic groups, in psychiatry a significantly higher percentage of white doctors trained abroad, and in genitourinary medicine a significantly higher percentage of UK trained non-white doctors. We also found significant differences between the demographic groups in the specialties of employment of the consultants who were first appointed in 1992-2001 ($\chi^2_{48} = 324.3$, $P < 0.001$) (table 1).

Among all consultants in post in 2001 who had been appointed from 1964 to 2001, the differences between specialties in the representation of the four demographic groups were significant ($\chi^2_{48} = 620.5$, $P < 0.001$). Non-white consultants who had trained abroad made up 11.9% of the consultant workforce. They were significantly over-represented in geriatric medicine (22.0%), genitourinary medicine (21.4%), paediatrics (17.2%), learning disability (36.2%), and old age psychiatry (18.4%) and were significantly under-represented in general medicine and public health medicine. Consultants who were white and had trained abroad made up 8.4% of the workforce. They were significantly over-represented in general psychiatry (12.9%) and significantly under-represented in general medicine (6.8%) and general surgery (5.4%). UK trained non-white doctors comprised 5.5% of all consultants and were significantly under-represented in psychiatry (3.4%). There were no other significant differences.

A higher percentage of white than of non-white consultants were women (24.0% of white consultants (4729/19710) *v* 18.4% of non-white doctors (763/4150), $\chi^2_1 = 60.8$, $P < 0.001$). This difference was more pronounced among consultants trained abroad (27.4% of white doctors were women (547/1994) *v* 17.4% of the non-white doctors (495/2840), $\chi^2_1 = 68.7$, $P < 0.001$).

Ethnic group of graduates from UK medical schools

Table 2 shows the distribution of white and ethnic minority doctors among responders to surveys undertaken by our Medical Careers Research Group. Of the respondents who graduated in 1974, 96.7% gave their ethnic group as white and 3.3% as non-white. We reanalysed the data excluding those from homes

Table 1 Percentages of NHS consultants in post in England and Wales in 2001 by year of first consultant appointment, place of training (UK or abroad), ethnicity, and speciality

Speciality	Consultants by place of training and ethnicity			
	UK trained		Abroad trained	
	White	Non-white	White	Non-white
Year of first consultant appointment 1964-91				
General medicine (n=1787)	89.6*	2.9	4.5	3.0†
Geriatric medicine (n=369)	67.8†	5.4	3.8	23.0*
Genitourinary medicine (n=113)	61.9†	10.6*	4.4	23.0*
Paediatrics (n=619)	83.4	3.2	6.8	6.6
Accident and emergency (n=139)	71.9	7.2	5.0	15.8
General surgery (n=569)	91.4*	3.0	3.2	2.5†
Cardiothoracic surgery (n=77)	74.0	7.8	11.7	6.5
Other surgical speciality (n=1334)	84.0	2.7	6.1	7.2
Obstetrics and gynaecology (n=510)	83.9	2.9	5.7	7.5
Anaesthetics (n=1395)	84.0	2.6	5.3	8.1
Radiology (n=856)	77.0†	4.6	7.6	10.9
Clinical oncology (n=188)	89.9	2.1	4.8	3.2
Pathology (n=1022)	79.7	3.3	7.0	9.9
Psychiatry (n=996)	71.0†	2.6	10.4*	16.0*
Learning disability (n=90)	37.8†	3.3	7.8	51.1*
Old age psychiatry (n=143)	65.0†	2.8	7.7	24.5*
Public health medicine (n=272)	82.4	3.3	8.1	6.3
Total (n=10 479)	81.5	3.3‡	6.2	9.1§
Year of first appointment 1992-2001				
General medicine (n=2265)	72.3*	8.7	8.6	10.4†
Geriatric medicine (n=332)	60.8	9.0	9.3	20.8*
Genitourinary medicine (n=121)	62.8	9.9	7.4	19.8
Paediatrics (n=970)	60.7†	6.0	9.3	24.0*
Accident and emergency (n=299)	65.6	7.7	10.4	16.4
General surgery (n=730)	69.5	7.8	7.1	15.6
Cardiothoracic surgery (n=98)	56.1	12.2	14.3	17.3
Other surgical speciality (n=1921)	64.9†	7.1	11.6	16.4
Obstetrics and gynaecology (n=684)	65.5	8.2	8.6	17.7
Anaesthetics (n=2030)	71.6	6.7	9.5	12.2
Radiology (n=772)	71.8	9.6	8.3	10.4
Clinical oncology (n=255)	78.4*	6.3	7.8	7.5
Pathology (n=935)	67.2	6.8	10.7	15.3
Psychiatry (n=1275)	69.5	4.0†	14.8*	11.7
Learning disability (n=106)	52.8†	7.5	16.0	23.6
Old age psychiatry (n=221)	67.4	5.4	12.7	14.5
Public health medicine (n=367)	80.9*	6.0	8.4	4.6†
Total (n=13 381)	68.6	7.2¶	10.0	14.1**

*Percentage significantly high for speciality compared with overall total ($P<0.001$).

†Percentage significantly low for speciality compared with overall total ($P<0.001$).

‡Ethnic composition: black 0.6%, Indian subcontinent 1.2%, Chinese 0.3%, other 1.2%.

§Ethnic composition: black 0.8%, Indian subcontinent 4.8%, Chinese 0.2%, other 3.3%.

¶Ethnic composition: black 0.9%, Indian subcontinent 3.3%, Chinese 1.0%, other 2.1%.

**Ethnic composition: black 2.1%, Indian subcontinent 7.6%, Chinese 0.2%, other 4.2%.

abroad or who were overseas students (as defined by the level of tuition fees paid to their UK medical schools); the percentages in 1974 were then 98.4% white and 1.6% non-white. In contrast, respondents from the cohort who qualified in 2000 comprised 74.4% white doctors and 25.6% from ethnic minority groups (78.5% and 21.5%, respectively, after excluding overseas students).

We used data from the Universities and Colleges Admissions Service (UCAS) on admissions to medical school to estimate details of ethnicity and sex of future medical graduates (table 3). The percentage of doctors from ethnic minority groups who were admitted to UK medical schools in 1996, and therefore due to graduate in or soon after 2001, was 26.9% (20.7% Asian, 2.1% Chinese, 1.5% black, 2.5% other non-white) (UCAS Data and Analytical Services, private communication, November 2003). The corresponding percentage of ethnic minority doctors graduating from UK medical schools by 2004-7 is projected to be 28-29%. By comparison, in 2001, 9% of the population of England and Wales were from ethnic minority groups, and, among people aged 20-24 years (the typical age range for medical students), 12.8% were from ethnic minority groups. People of Asian ethnic origin (including Chinese) comprised 8.0% of the population in this age range and 20.8% of the accepted medical students in 2002. People of black ethnic origin comprised 2.5% of the population and 2.6% of the medical students. White people comprised 87.2% of the relevant resident population and 72.0% of the medical students.⁴ White men comprised 43.5% of the UK population aged 20-24 years but only 26.0% of the UK medical students in 2002.

Career choices of newly qualified doctors by ethnic origin

Table 4 shows the career choices of doctors in their preregistration year who qualified from UK medical schools in 1993, 1996, 1999, and 2000 (based on responses to our surveys) grouped by ethnic origin. We have shown previously that men and women make different choices of speciality.² In the present analysis, career choices varied significantly with ethnic origin for both men and women (for men, $\chi^2_{11}=87.4$; for women, $\chi^2_{11}=67.2$; $P<0.001$ in both cases). Analysis of adjusted standardised residuals showed that non-white men were more likely than white men to choose specialist surgery and less likely to choose anaesthetics. Non-white women were less likely than white women to choose general practice and more likely to choose general medicine.

There were no significant differences between different ethnic subgroups in men's choices of mainstream speciality, but there was a significant difference for women ($\chi^2_{18}=48.2$,

Table 2 White and non-white doctors who qualified in each year from UK medical schools. Values are numbers (percentages) of those who replied to questionnaires from Medical Careers Research Group unless stated otherwise

Year of qualification	All qualifiers		χ^2 test for trend (df=1)	All qualifiers excluding those from abroad*		χ^2 test for trend (df=1)	Percentage of total cohort whose ethnic group is known‡
	White	Non-white†		White	Non-white		
1974	1662 (96.7)	56 (3.3)		1583 (98.4)	25 (1.6)		74.2
1983	2657 (93.7)	180 (6.3)		2528 (95.0)	132 (5.0)		74.7
1988	2281 (89.7)	262 (10.3)		2228 (92.0)	194 (8.0)		68.9
1993	2245 (82.7)	472 (17.3)	799.5, $P<0.001$	2131 (83.8)	412 (16.2)	675.4, $P<0.001$	74.0
1996	2589 (78.7)	702 (21.3)		2528 (82.3)	543 (17.7)		85.2
1999	2155 (76.3)	670 (23.7)		2069 (80.3)	508 (19.7)		67.2
2000	2104 (74.4)	723 (25.6)		2015 (78.5)	552 (21.5)		64.1

*Excludes (a) respondents whose family home was outside the United Kingdom or who did not supply the location of their family home, and (b) for the 1988, 1996, 1999, and 2000 cohorts, respondents who were classified as overseas based applicants to medical school (according to level of fees paid) or who did not supply this information.

†For all cohorts combined, ethnic subgroups comprised 0.9% black, 10.2% Asian, 3.1% Chinese, and 2.2% other ethnic origin.

‡Percentage based on those who responded to one or more of the questionnaires and who completed the section on ethnic origin, which was included from 1997 onwards. Variability in percentages for known ethnic origin is partially because some cohorts have been surveyed more often than others since then. Among all respondents to questionnaires including the section on ethnic origin, 4.8% did not answer that section.

Table 3 Ethnicity and sex of students accepted at UK medical schools between 1996 and 2002 compared with UK population of comparable age. Values are percentages

	Year of admission (projected year of graduation)						UK population in 2001 aged 20-24 years (n=3 122 212)
	1996 (2001) (n=4394)	1997 (2002) (n=4472)	1998 (2003) (n=4590)	1999 (2004) (n=4767)	2000 (2005) (n=5129)	2001 (2006) (n=5574)	
Ethnicity							
White:	73.1	74.0	74.9	71.2	71.6	70.4	72.0
Men	31.3	31.8	30.5	28.8	27.5	27.2	26.0
Women	41.8	42.3	44.4	42.5	44.1	43.2	46.0
Non-white:	26.9	26.0	25.1	28.8	28.4	29.6	28.0
Men	14.4	13.9	13.7	14.5	14.2	13.5	12.8
Women	12.5	12.0	11.4	14.3	14.3	16.1	15.2
Ethnic minority groups							
Black:	1.5	1.5	1.3	2.2	2.0	2.6	2.6
Men	0.7	0.8	0.5	1.0	1.0	0.9	1.1
Women	0.8	0.7	0.8	1.3	1.0	1.8	1.5
Asian:	20.7	20.3	20.0	21.1	21.2	20.6	18.6
Men	11.4	11.2	11.6	11.2	10.8	10.0	8.8
Women	9.4	9.1	8.4	9.9	10.4	10.6	9.9
Chinese:	2.1	1.9	1.7	2.2	2.2	2.0	2.2
Men	1.0	1.0	0.8	1.0	1.1	0.9	1.0
Women	1.1	0.9	0.9	1.2	1.1	1.1	1.2
Other*:	2.5	2.3	2.1	3.2	3.0	4.4	4.5
Men	1.3	1.0	0.7	1.3	1.3	1.8	1.9
Women	1.2	1.3	1.4	1.9	1.7	2.6	2.7

Data for students from Universities and Colleges Advisory Service (for UK domiciled applicants accepted to preclinical medicine courses, after excluding those of unknown ethnic origin). Data for UK population from 2001 census.

*Includes the "mixed race" categories that were added from 2001 for undergraduate entry.

$P < 0.001$). Chinese women were significantly more likely than women from other ethnic minority groups to choose general medicine, and significantly less likely to choose general practice; women from the Indian subcontinent were significantly more likely than other women from ethnic minorities, though a little less likely than white women, to choose general practice. (See extra table on bmj.com for details of specialty choice by ethnic subgroup.)

Table 4 Career choices of newly qualified doctors of 1993, 1996, 1999, and 2000 by sex and ethnicity. Values are percentages

Career choice*	Men		Women	
	White (n=3402)	Non-white (n=1160)	White (n=4546)	Non-white (n=1040)
General practice:	17.6	13.7	32.2	23.5‡
Excluding doctors from abroad†	17.6	16.4	32.3	27.2
General medicine:	22.5	26.9	21.4	28.7§
Excluding doctors from abroad†	22.6	25.1	21.3	25.8
Geriatric medicine	0.3	0.5	1.0	0.7
Paediatrics	4.4	4.7	8.4	8.6
Accident and emergency	3.4	1.5	2.9	1.9
General surgery:	11.7	13.6	5.7	5.0
Excluding doctors from abroad†	11.6	13.5	5.7	4.7
Other specialist surgery:	16.7	23.4§	5.0	6.4
Excluding doctors from abroad†	16.6	22.1	4.9	5.7
Obstetrics and gynaecology	1.6	1.6	4.5	5.4
Anaesthetics	9.6	4.3‡	7.5	5.1
Psychiatry	4.7	3.0	3.6	3.9
Other medical specialty	6.1	5.1	7.0	10.0
Non-medical choice	1.6	1.5	0.9	0.9

*Specialty of first choice for long term career at the end of the preregistration year.

†Excludes (a) respondents whose family home was outside the United Kingdom or who did not supply the location of their family home, and (b) for the 1996, 1999, and 2000 cohorts, respondents who were classified as overseas applicants to medical school (according to the level of fees paid) or who did not supply this information. (Numbers excluded: for men, 82 white, 238 non-white; for women, 162 white, 217 non-white.)

‡Percentage significantly low for specialty compared with overall total ($P < 0.001$).

§Percentage significantly high for specialty compared with overall total ($P < 0.001$).

Discussion

We found that hospital practice in the NHS has become increasingly dependent on doctors who trained overseas: they represent 15% of consultants appointed during 1964-91 and 24% of those appointed since 1991. These doctors comprise a particularly high percentage of consultants in geriatric medicine, psychiatry, learning disability, and genitourinary medicine. By contrast, doctors from ethnic minority groups who trained in the United Kingdom have similar career destinations to those of UK trained white doctors. White men, but not white women, are substantially under-represented in the current intakes to UK medical schools

Immigrant doctors who trained abroad

Medical immigration into the United Kingdom has increased, and the United Kingdom is a substantial net importer of doctors.⁵⁻⁶ For example, 58% of all doctors who obtained full registration with the General Medical Council in 2002 qualified outside the United Kingdom.⁷ There are various reasons why doctors migrate to this country—to take up prestigious posts for which there is international competition; to occupy vacancies unfilled by UK trained doctors; for family reasons; to move from areas of lower professional opportunity; to increase their income; and to escape from areas of civil unrest.

Given the varied reasons for immigration, it is not surprising that the job destinations of doctors who trained abroad do not necessarily match those of home trained doctors. As has long been recognised,⁵ doctors trained abroad are over-represented at the consultant level in specialties that can be hard to fill. It is also well recognised that there are large numbers of non-white doctors who trained abroad in career grade hospital posts below the level of consultant and in inner city general practice.⁸

Among UK trained doctors, the postgraduate experience and career posts of white and non-white consultants should be similar. Indeed, we found that their career destinations are sufficiently similar, especially for those appointed in 1992-2001, to conclude that the ethnic origin of UK trained doctors has little

influence on opportunity of entry to particular specialties. The main differences in career destinations between white and non-white consultants are associated with having trained abroad rather than ethnic origin.

UK doctors from ethnic minorities

The percentage of UK medical students from ethnic minorities is now substantial.⁹ We show how the percentage has risen over time. From less than 2% of newly qualified doctors in the early 1970s, it will soon approach 30%, well in excess of the representation of people from ethnic minorities in the general population. This raises important questions for policy makers: should the ethnic mix of intake to medical schools broadly reflect the ethnic mix of the community from which students are drawn? If so, what should be the mechanisms to achieve such representation?

Monitoring ethnic group and sex is generally undertaken in the expectation that, if there are concerns, they will be about under-representation of ethnic minorities and women. The high representation of ethnic minorities, and specifically those of Asian origin, indicates high academic achievement by them. It probably indicates that many of the most able school pupils from these ethnic groups, and perhaps particularly women, choose medicine as a career. The reasons for the substantial under-representation of white men merit further study. With increasing immigration from continental Europe, the broad group of white ethnicity may need further subdivision in future.

General practice has declined in popularity among newly qualified, UK trained doctors in the past couple of decades.^{2,3} Our data on career choice suggest that, particularly among women, a smaller percentage of non-white than white doctors choose a career in general practice. Perhaps a higher proportion of ethnic minority than white doctors regard some of the hospital specialties as particularly prestigious. Generally, however, the similarities in career choices between white and non-white UK trained doctors are more striking than are the differences.

Conclusions

Doctors from ethnic minorities have made a major contribution to the staffing of UK medicine. This will increase with the rise in ethnic minority students entering UK medical schools. Older generations of immigrant ethnic minority doctors have helped to staff some of the less popular areas and specialties in medical practice. Younger generations of ethnic minority students, who have received their school and university education in the United Kingdom, make similar choices of future career to those of their white contemporaries.

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Contributors: MJG, JMD, and TWL planned the study. JMD and TWL analysed the data. MJG and JMD wrote the first draft. All authors contributed to subsequent drafts and approved the final version. All are guarantors for the study.

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What is already known on this topic

For many years the NHS has relied on doctors who trained overseas to maintain adequate medical staffing, and these doctors, many of whom are from non-white ethnic groups, have tended to be concentrated in the less popular specialties

The percentage of newly trained UK medical graduates who are from non-white ethnic groups has increased substantially in recent years

What this study adds

NHS hospitals have become increasingly dependent on doctors who trained overseas: they represent 15% of consultants appointed during 1964-91 and 24% of those appointed since 1991

These doctors comprise a particularly high percentage of consultants in geriatric medicine, psychiatry, learning disability, and genitourinary medicine

By contrast, UK trained doctors from ethnic minority groups have similar career destinations to those of UK trained white doctors

White men, but not white women, are substantially under-represented in the current intakes to UK medical schools

Ethical approval: UK Medical Careers Research Group surveys in the past have been overseen by an independent advisory group convened by the funding body. Ethical approval for the current programme of surveys has been obtained through the Central Office for Research Ethics Committees. Data from the Advisory Committee on Distinction Awards and from UCAS were provided by these bodies in their roles as the custodians of the respective databases.

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UK Medical Careers Research Group, Department of Public Health, University of Oxford, Oxford OX3 7LF
 Michael J Goldacre *professor of public health*
 Jean M Davidson *research officer*
 Trevor W Lambert *statistician*

Correspondence to: M J Goldacre michael.goldacre@dphpc.ox.ac.uk