Regional Distribution of General Practitioners and Consultants in the National Health Service

J. M. LAST,* M.B., D.P.H.

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This study, one of a series on aspects of medical manpower, deployment, and recruitment, was designed to discover the extent to which individual medical schools in Britain supply the administrative regions of England and Wales with doctors. My objective was to test two hypotheses: firstly, that doctors settle near the place where they lived in their youth rather than near the medical school they attended, if home and medical school were in different regions; and secondly, that consultants are less likely than general practitioners to settle in the region where they lived in their youth, opportunity to pursue a specialist career being for them a higher priority than choice of a place to live.

Methods

I sent a postal questionnaire (see Appendix) to a 10% probability sample of general practitioners and consultants in England and Wales (a separate investigation is required in Scotland, where the supply-demand relation is quite different). The universe for the sample consisted of lists of doctors maintained by the Ministry of Health, current at 30 September 1965. The sample was drawn by officers in the Statistical Branch of the Ministry of Health, London, for whose technical assistance I am grateful. Information on the situation of permanent or family home during attendance at medical school, supplied in response to the questionnaire, was categorized into the Registrar General's standard regions for analysis. These divisions are coarse but suffice to show the principal regional variations in patterns of settlement. When respondents indicated that their permanent home changed from one region to another during their medical education, the region closest to their present address was coded for analysis. Since only 3% of respondents moved in this way, only a negligible bias was introduced.

After a pilot study in March 1966, questionnaires were posted in July 1966, and reminder letters (with a copy of the questionnaire) in September 1966. Data were coded and punched on 80-column cards for analysis.

Results

The initial mailing produced an approximately 80% response from both general practitioners and consultants. Reminder

TABLE I.—Sample Size and Response

	Posted	Returned		Died, Declined, Returned from D.L.O.	No Response
		No.	%		
G.P.s ..	1,982	1,730	87.3	17	235
Consultants ..	816	701	85.9	26	89
Total ..	2,798	2,431	86.9	43	324

letters raised the response rate to 87% of general practitioners and 86% of consultants (Table I). The analyses which follow have been carried out on questionnaires returned by 1,730 general practitioners and 701 consultants.

* Department of Social Medicine, University of Edinburgh.

Like all retrospective studies, this one suffers from bias due to selective factors which had operated previously: by definition, only the doctors remaining in England and Wales could be included. This has to be remembered when the output of medical schools is considered.

Catchment Areas of Medical Schools

In England and Wales 36% of general practitioners and 49% of consultants attended medical schools in London. The greater contribution of London schools to consultant than to general practice manpower is significant at the 1% level. A further 28% of general practitioners and 24% of consultants attended medical schools elsewhere in England. The remainder received their medical training outside England and Wales; 17% of general practitioners and 16% of consultants attended Scottish medical schools and 8% of general practitioners attended medical schools in Ireland (including Queen's University, Belfast). Edinburgh University makes the largest single contribution to the supply of general practitioners in England (7%) and is also the second largest source of supply of consultants (7%), exceeded only by St. Bartholomew's Hospital Medical School (9%). St. Bartholomew's and the London Hospital Medical College share with Edinburgh the distinction of contributing more than 6% of general practitioners in England and Wales (Table II). The figures in Table II can be multiplied by 12 to produce approximate estimates of the number of general practitioners and consultants supplied by

TABLE II.—Medical School Attended

	General Practitioners	Consultants
Charing Cross	17	9
Guy's	86	39
King's	40	27
London	104	37
Middlesex	58	31
Royal Free	23	16
St. Bartholomew's	102	65
St. George's	27	8
St. Mary's	40	29
St. Thomas's	54	42
University College	52	30
Westminster	16	11
Total London	619 (36%)	344 (49%)
Birmingham	63	25
Bristol	31	9
Cardiff, Welsh National	35	17
Durham, Newcastle	66	17
Leeds	87	28
Liverpool	88	46
Manchester	78	23
Sheffield	43	5
Total "Provincial"	491 (28%)	170 (24%)
Oxford*	23	12
Cambridge*	31	2
Aberdeen	51	16
Edinburgh	122	52
Glasgow	94	31
St. Andrews	20	11
Total Scottish	287 (17%)	110 (16%)
Belfast	53	10
Eire	114	22
Commonwealth	33	16
European	38	12
Other and unstated	92	17
Total	1,730	701

* Oxford and Cambridge graduates have been classified in the clinical school they attended, when this information was given.

each medical school to England and Wales in 1966. For example, this calculation indicates that about 1,200 general practitioners and a little under 800 consultants in England and Wales attended St. Bartholomew's.

Table III shows the number and percentage of general practitioners supplied by medical schools to each of the standard regions in England and Wales. Here, as in Table V, which shows the regional distribution of consultants, those who attended Oxford and Cambridge are included with graduates

TABLE III.—Number and Percentage of General Practitioners Supplied by Medical Schools to the Standard Regions of England and Wales

Region	Medical Schools Supplying Region				Total 100%
	London Schools (+ Oxbridge)	Scottish Schools	Irish Schools (+ Belfast)	Main Provincial Schools	
N. England	16 (12%)	43 (32%)	9 (7%)	{Durham 43 (32%) Leeds .. 10 (7%)}	136
E. and W. Yorks.	9 (8%)	25 (21%)	13 (11%)	{Leeds .. 41 (34%) Sheffield .. 10 (8%)}	119
N.W. England	32 (11%)	56 (20%)	38 (14%)	{Liverpool 51 (18%) Manchester 47 (17%)}	281
N. Midland	41 (29%)	33 (23%)	25 (18%)	{Leeds .. 9 (6%) Birmingham 9 (6%)}	141
Midland	47 (30%)	22 (14%)	16 (10%)	{Birmingham 34 (22%) Liverpool 8 (5%)}	155
E. England	87 (61%)	17 (12%)	13 (9%)	All Prov. 15 (11%)	142
S.E. England	145 (74%)	23 (12%)	9 (5%)	All Prov. 9 (5%)	195
S. England	67 (66%)	14 (14%)	6 (6%)	All Prov. 13 (13%)	102
S.W. England	80 (53%)	12 (12%)	5 (5%)	Bristol .. 25 (17%)	151
London	121 (55%)	28 (13%)	5 (11%)	All Prov. 16 (7%)	222
Wales ..	28 (33%)	9 (9%)	6 (6%)	{Welsh Nat. 27 (31%) Liverpool 9 (10%)}	86
Total	673 (38.9%)	287 (16.6%)	167 (9.7%)	491 (28.4%)	1,730

of London medical schools and Belfast graduates are included with others from Ireland. London schools make a major contribution to general practice manpower in Southern and South-Eastern England as well as in London, and only in Yorkshire does their contribution fall below 10% of the total. Scottish medical schools supply more than a fifth of the total in the four northern regions of England and more than 10% in every region except Wales. The contribution of Irish medical schools is greatest in the North Midlands and North-Western England—the regions closest to Ireland. The provincial medical schools make an important contribution to general practice manpower in their own regions, but graduates of provincial schools are outnumbered by Londoners in regions close to London, and almost outnumbered by Scots in regions on the border. The evidence of Table III suggests that medical schools tend to supply general practitioners to adjacent rather than to remote regions.

However, there is a closer association between present residence of general practitioners and the region in which they resided while attending medical school (Table IV). Thus 51% of general practitioners who as students were resident in England and Wales have settled in the region of their permanent home at that period. Table IV also shows that those who came from outside England and Wales have settled mainly in the regions most accessible to their homeland: the Scots in the North, the Irish in the West, the Commonwealth and foreign graduates in London and South-East England. There is no evidence of a "drift to the South-East"; if anything, the reverse has occurred. The northward and westward movement into general practice and consultant appointments is, no doubt, a result of the laws of supply and demand, and reflects regional differences in the ratio of applicants to vacancies. When the analysis is repeated on cohorts graduating up to 1939, 1940–9, and since 1950, a secular trend emerges: movement out of the South-East was greatest among graduates in the period 1940–9. Movement into England and Wales from Scotland and Ireland has decreased progressively from the earliest to the more recent of these periods.

Tables V and VI show the corresponding figures for consultants. Table V gives the proportion of consultants supplied to each standard region of England and Wales by London, Scottish, Provincial, and Irish medical schools, and Table VI shows the relation between region of permanent home during student life and present residence of consultants.

TABLE V.—Number and Percentage of Consultants Supplied by Medical Schools to the Standard Regions of England and Wales

Region	Medical Schools Supplying Region				Total 100%
	London Schools (+ Oxbridge)	Scottish Schools	Irish Schools (+ Belfast)	Main Provincial Schools	
N. England	12 (22%)	20 (37%)	—	Durham .. 11 (20%)	54
E. and W. Yorks.	11 (26%)	8 (19%)	1 (2%)	Leeds .. 9 (21%)	42
N.W. England	21 (22%)	16 (17%)	6 (6%)	{Liverpool 24 (26%) Manchester 14 (15%)}	94
N. Midland	14 (31%)	15 (33%)	8 (18%)	All Prov. 6 (13%)	45
Midland	12 (23%)	8 (15%)	3 (6%)	Birmingham 13 (25%)	52
E. England	35 (76%)	3 (7%)	2 (4%)	All Prov. 3 (7%)	46
S.E. England	62 (77%)	12 (15%)	—	All Prov. 5 (6%)	81
S. England	34 (71%)	8 (17%)	2 (4%)	All Prov. 3 (6%)	48
S.W. England	30 (67%)	1 (2%)	2 (4%)	Bristol .. 5 (11%)	45
London	117 (75%)	14 (9%)	6 (4%)	All Prov. 11 (7%)	157
Wales	10 (27%)	5 (14%)	2 (5%)	Welsh Nat. 13 (35%)	37
Total	358 (51%)	110 (15.7%)	32 (4.6%)	170 (24.3%)	701

TABLE IV.—Settlement of General Practitioners

Student Residence	Present Residence											Total
	N. Eng.	E./W. Yorks.	N.W. Eng.	N. Mid.	Mid.	E. Eng.	S.E. Eng.	S. Eng.	S.W. Eng.	Lond.	Wales	
N. England	65 (61%)	8	12	4	2	3	5	2	4	1	1	107
E./W. Yorks.	7	59 (47%)	22	15	3	6	3	2	4	2	1	126
N.W. England	4	6	116 (62%)	35 (46%)	14	4	6	7	9	8	4	186
N. Midland	1	5	3	7	6	8	3	4	5	3	—	76
Midland	—	2	—	—	48 (54%)	5	5	3	7	2	—	89
E. England	2	—	4	5	7	26 (36%)	13	6	3	8	2	72
S.E. England	—	1	1	1	1	19	67 (53%)	8	14	7	2	127
S. England	—	2	2	4	5	3	11	20 (31%)	15	2	—	64
S.W. England	3	1	11	8	9	22	32	15	41 (54%)	7	1	76
London	3	—	6	—	7	5	5	6	19	96 (44%)	—	217
Wales	—	—	—	—	—	—	—	—	5	9	61 (57%)	107
Total	96	86	185	89	106	105	157	80	126	145	72	1,247
Scotland	26	15	40	28	19	9	14	14	12	17	7	201
N. Ireland	7	7	14	6	11	7	2	—	4	5	2	65
Ire	4	5	27	16	7	7	9	5	3	23	5	112
Commonwealth	1	—	5	1	5	7	6	2	3	14	—	44
Other	2	5	9	1	7	5	7	—	2	17	—	55
Unknown	—	1	1	—	—	2	—	1	—	1	—	6
Gross total	136	119	281	141	155	142	195	102	151	222	86	1,730

50.8% of those originally from England and Wales have settled in the region where they lived as medical students.

TABLE VI.—*Settlement of Consultants*

Student Residence	Present Residence											
	N. Eng.	E. & W. Yorks	N.W. Eng.	N. Mid.	Midland	E. Eng.	S.E. Eng.	S. Eng.	S.W. Eng.	London	Wales	Total
N. England	13 (46%)	4	1	3	—	—	3	—	1	3	—	28
E. & W. Yorks	5	12 (28%)	6	2	3	—	2	2	3	7	1	43
N.E. England	6	4	40 (57%)	2	1	—	2	3	4	7	1	70
N. Midland	2	1	2	4 (13%)	2	4	5	4	—	5	—	29
Midland	2	1	3	—	20 (54%)	4	2	—	1	4	—	37
E. England	1	2	1	3	4	6 (18%)	4	1	5	5	—	32
S.E. England	—	4	1	3	3	5	19 (31%)	6	6	14	1	62
S. England	—	—	—	2	—	1	3	10 (40%)	2	6	—	25
S.W. England	1	—	4	—	1	2	2	7 (29%)	3	3	2	24
London	6	1	6	4	2	16	20	12	9	65 (45%)	3	144
Wales	1	1	3	1	—	1	7	3	3	5	21 (46%)	46
Total	38	30	67	24	36	39	69	42	41	124	30	540
Scotland	13	8	14	10	6	3	6	3	2	12	5	82
N. Ireland	—	1	4	2	2	1	—	—	—	1	—	13
Eire	—	—	4	6	2	—	1	—	1	—	—	22
Commonwealth	1	—	2	3	3	2	—	1	—	6	—	22
Other	2	2	2	2	3	1	3	—	1	3	—	19
Unstated	—	—	1	—	—	—	—	—	—	2	—	3
Grand total	54	42	94	45	52	46	81	48	45	157	37	701

40.2% of those originally from England and Wales have settled in the region where they lived as students.

Table VI also shows that consultants have tended to scatter rather more widely than general practitioners, and that a significantly smaller proportion ($P < 0.01$) of consultants have settled in the region where they lived as students.

The absence of a "south-easterly drift" of general practitioners is confirmed on examining the movements of those who came from the North of England or the Midlands to medical schools in London (Table VII). Only 2 of 108 remained in London and 10 more in South-Eastern England; 64 of 108 (59%) returned to the North and Midlands. Movement in the other direction has more than made up for the small losses; 23 (12%) of 191 Londoners and 7 (6%) of 112 former residents of South-Eastern England have moved into the North and Midlands, which altogether have gained 60 general practitioner graduates and lost 42 to other parts of England. London-trained consultants who belong to the North and Midlands are less likely to return than to stay in the South-East or in the London area (Table VIII); only 14 out of 49 (29%) returned,

and the rest have nearly all stayed in London or in South-Eastern England. However, the North and the Midlands have gained 52 London-trained consultants from other regions, amply compensating for the loss of 35 who failed to return home.

The greater mobility of consultants no doubt reflects the fiercer competition for vacancies, especially in the first decade after the 1939–45 war; and it also suggests that consultants regard pursuit of their chosen career as more important than settlement in a particular part of the country. Analysis of answers to a further question provide confirmation of this.

Respondents were asked if they had settled in the region of their first choice and if they were practising in the specialty of their first choice. Their replies indicate that consultants more often put their career first and general practitioners more often put choice of dwelling-place first, if these priorities conflict. Thus 22% of general practitioners but only 13% of consultants who had settled in the area of their first choice said that they would have preferred a different specialty. However, 36% of consultants and 26% of general practitioners who were following the specialty of their first choice said they would have preferred to live in a different part of the country. The differences are small and the method of inquiry insensitive; interviews would be required to establish the validity of the finding.

Provincial Medical Schools and Regional Supply of Doctors

It has been suggested that the needs of a region which is short of doctors can be met by building a medical school there in the expectation that its graduates will settle locally and make good the deficit. However, the evidence from this inquiry suggests that an alternative policy would be equally successful, at any rate so far as general practice is concerned. As already pointed out, more London-trained general practitioners belonging to the North, the Midlands, or the West of England have returned home to practise than have remained in London (Table VII); but provincial regions in England have lost more general practitioners by the departure of graduates who resided locally as students than they have gained by local settlement of graduates belonging to other parts of the country. For example, Manchester draws 96% of its general practitioner graduates from North-Western England, the North Midlands, and the Midlands. However, 20% of these have moved to regions further south and only two from other regions (one from the North) have settled locally. The regional gains and losses of the provinces as a result of these movements are shown in Table IX.

Losses of consultants compared with those of general practitioners are proportionately greater, but their significance is

TABLE VII.—*General Practitioners, London Schools*

Student Residence	Present Residence											Total
	N. England	E. & W. Yorks	N.W. Eng.	N. Midland	Midland	E. England	S.E. England	S. England	S.W. England	London	Wales	
N. England	2	—	2	1	—	—	—	—	—	—	—	6
E. & W. Yorks	2	5	6	—	—	2	2	2	—	—	—	19
N.W. England	—	12	2	2	2	2	3	3	4	—	2	28
N. Midland	2	1	14	2	4	3	3	3	2	1	—	32
Midland	—	4	1	2	2	2	2	2	3	1	—	23
E. England	—	—	7	7	21	12	5	2	6	2	—	58
S.E. England	2	—	3	3	18	62	7	10	6	2	—	112
S. England	1	—	1	4	3	6	18	9	1	—	—	44
S.W. England	—	—	1	—	3	5	4	19	5	—	—	40
London	3	1	6	7	22	27	14	18	86	1	—	191
Wales	2	1	1	6	3	5	2	4	7	20	—	47
All other places ..	—	—	—	—	3	3	6	2	—	5	—	19
Total	14	7	29	36	38	82	133	62	73	118	27	619

TABLE VIII.—*Consultants, London Schools*

Student Residence	Present Residence											Total
	N. England	E. & W. Yorks	N.W. Eng.	N. Midland	Midland	E. England	S.E. England	S. England	S.W. England	London	Wales	
N. England	—	2	—	1	—	—	—	—	—	2	—	5
E. & W. Yorks	1	—	1	—	—	—	—	—	—	2	—	8
N.W. England	1	1	4	1	—	—	1	1	2	2	—	12
N. Midland	—	—	—	—	—	2	2	2	2	—	—	18
Midland	—	—	—	—	—	2	2	2	2	—	—	6
E. England	—	2	1	3	4	6	4	1	5	4	—	30
S.E. England	1	—	1	2	3	5	18	4	6	14	1	58
S. England	—	—	1	1	1	2	3	6	2	6	—	19
S.W. England	—	—	4	1	1	2	1	1	1	1	—	14
London	6	1	6	4	2	15	19	11	9	64	3	140
Wales	1	—	—	—	—	6	1	—	—	5	—	19
All other places ..	1	1	2	—	1	2	—	—	1	6	—	15
Total	12	10	21	12	11	34	61	31	29	114	9	344

debatable in view of the greater mobility of consultants. Only the South-Western region has gained more than it has lost as a result of these interchanges. Perhaps climate as well as the laws of supply and demand has played a part.

TABLE IX.—English Provincial Medical Schools, G.P.s, Consultants, and All Doctors. Regional Gains and Losses

School	Regions Served	No. from these Regions	No. Living there Now	Losses	Gains from Other Regions
Birmingham	N. Midland, Midland	G.P. 50	43	13	6
		Cons. 23	13	10	—
		Total 73	56	23	6
Bristol ..	S. Eng., S.W. Eng.	G.P. 23	26	2	5
		Cons. 7	7	—	—
		Total 30	33	2	5
Durham ..	N. Eng., E. & W. Yorks	G.P. 58	47	12	1
		Cons. 17	13	4	1
		Total 75	60	16	1
Leeds ..	N. Eng., E. & W. Yorks, N.W. Eng.	G.P. 79	65	15	1
		Cons. 26	14	12	—
		Total 105	79	27	1
Liverpool ..	N.W. Eng., Midland, Wales	G.P. 75	68	15	8
		Cons. 38	29	10	1
		Total 113	97	25	9
Manchester	N.W. Eng., N. Midland, Midland	G.P. 75	61	16	2
		Cons. 21	15	7	1
		Total 96	76	23	3
Sheffield ..	E. & W. Yorks, N. Midland, N. & W. Eng.	G.P. 33	30	9	6
		Cons. 5	5	—	—
		Total 38	35	9	6

The evidence suggests that a region short of doctors would be helped more by recruiting larger numbers of students from families resident in its area than by establishing a local medical school. This solution would also be cheaper and would perhaps produce quicker results.

Social and Demographic Findings

In these samples 92% of general practitioners and 93% of consultants were male. Approximately a fifth of both general practitioners and consultants came from medically qualified families, but there is a secular trend in family recruitment to medicine. Over 25.5% of consultants and 20.1% of general practitioners who qualified before the war came from medical families, but the proportion of both general practitioners and consultants from medical families has declined among more recent graduates, falling to 15% of consultants and 19% of general practitioners who qualified in 1950 or later (but numbers of consultants in this group are small). General practitioners are more likely to follow in their father's footsteps than consultants; 79.9% of general practitioners and only 19% of consultants with medically qualified parents have entered the same field of work as their parent. However, the chances of these events are obviously unequal and these differences have no meaning in themselves.

Sixty-six per cent. of general practitioners and 60% of consultants are practising in the part of the country of their first choice. Those who are not are most likely to have qualified in the decade beginning at the end of the second world war. Their movements have been most influenced by the excess of applicants over vacancies for consultant posts and principals in general practice. Of 487 general practitioners for whom general practice was not the first career choice, 144 (29.6%) would have preferred a career in surgery had an opening been available, 68 (14%) would have preferred a career in obstetrics and gynaecology, 59 (12%) in internal medicine, and 41 (8%) in paediatrics. Among 117 consultants not practising in the specialty of their first choice, most would have preferred a

"main-stream" specialty (medicine or surgery) to a career in a "minor" specialty, and 26 (22%) would have preferred to be in general practice.

Summary

A postal inquiry among general practitioners and consultants in the National Health Service in England and Wales has shown that general practitioners more often than consultants settle in the part of the country where they spent their youth rather than close to the medical school they attended if these were in different regions. It can therefore be concluded that regions short of doctors would be more effectively, expeditiously, and economically helped to overcome the shortage by a larger recruitment of students from these regions, rather than by establishing medical schools there. Consultants more often than general practitioners train at London teaching hospitals and tend to diffuse more widely throughout the country rather than to settle close to the place where they lived while they were medical students.

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Appendix

Patterns of Settlement of Doctors in the National Health Service

1. NAME OF DOCTOR
2. ADDRESS
3. MEDICAL SCHOOL(S) ATTENDED
4. YEAR OF GRADUATION
5. PERMANENT RESIDENCE BEFORE MEDICALLY QUALIFIED:

Could you please indicate with a tick in which of the undermentioned regions your family home was situated before you qualified in medicine. If you lived in more than one, please tick each, and indicate the order by writing alongside "1," "2," etc.

Northern England (Northumberland, Cumberland, Westmorland, Durham, N. Riding of Yorkshire)	South-Eastern England (Surrey, Sussex, Kent)
East and West Ridings of Yorkshire	Southern England (Oxon, Bucks, Berks, Hants, I.O.W., Dorset)
North-Western England (Lancs, Cheshire)	South-Western England (Glos, Somerset, Devon, Wilts, Cornwall)
North Midland (Derbyshire, Leics, Notts, Northants, Rutland, Lincs)	Greater London
Midlands (Staffs, Shropshire, Herefordshire, Worcs, Warwickshire)	Wales
Eastern England (Norfolk, Huntingdon, Suffolk, Cambs, Ely, Beds, Herts, Essex)	Scotland
	Northern Ireland, Isle of Man
	Eire
	British Commonwealth Country
	Other

6. Could you please indicate in which of the following types of community your family home was situated while you were a medical student:

Large conurbation (city or suburban area)	Urban area (over 50,000 pop.)
Small urban area (10,000–50,000 pop.)	Village or rural area
7. Were either of your parents medically qualified? Yes..... No.....
If "Yes," have you entered the same field of work? Yes..... No.....
8. PRESENT SITUATION
Please state the year you entered your present field of work
9. Are you settled in the part of Britain of your first choice? Yes..... No.....
10. (IF MARRIED).
Are you settled in the part of Britain of your spouse's first choice? Yes..... No.....
11. Is your present field of work your first choice? Yes..... No.....
12. If "No," what was your first choice?
Please specify.....

If you would care to make any general comments on matters related to the subject of this inquiry could you please use the reverse side of this form.