Staffing in cardiology in the United Kingdom 1990

Sixth biennial survey: with data on facilities in cardiology in England and Wales 1989

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Abstract

The Sixth Biennial Survey of Staffing in Cardiology was conducted in July 1990. This report summarises the data that were collected, together with the results of a survey of facilities in cardiology made in 1989. The total number of cardiologists in the United Kingdom, defined as individuals trained in the specialty and spending at least 40% of their time working in it, is now 323. Six individuals work part time only, making 320 whole time posts. This number has increased over the two years from 1988 to 1990 by 32, of which 23 work only in the specialty and nine as general physicians with a major interest in cardiology. The rate of increase in numbers over the past decade has been reasonably consistent with an average of approximately 4.4% per year. Thirty one districts in England and Wales still have no cardiologist and 13 other districts have little provision with an average of three (visiting) sessions each per week. The population in these 44 districts is 8.3 million. Scotland also has an inadequate distribution of service in the specialty. If recommendations for cardiac surgery and angioplasty made in the Fourth Report of a Joint Cardiology Committee of the Royal College of Physicians of London and the Royal College of Surgeons of England are to be met, we calculate that we need 63 more cardiologists in our major centres. To provide one cardiologist in every district hospital and two for larger districts would require 94 more specialists, making a total shortfall of 157 individuals.

We have no excess of senior registrars to provide for a major expansion at consultant level. Time spent within the senior registrar (or academic equivalent) grade has tended steadily to decline and very few now reach the end of their contracts. The need for more individuals to pass through the senior registrar grade will be met in part by a planned reduction in the training period to three years. This will be inadequate, however, be-

cause projected retirements show that the number of consultant vacancies will increase sharply from 1997. We believe that additional senior registrar posts must be created if a serious shortfall in service provision by consultants is to be avoided. The provision of non-invasive facilities in cardiology is reasonable. The need for additional equipment for invasive cardiology has not been assessed. The number of physiological measurement technicians varies considerably between regions and is generally inadequate.

Biennial surveys of staffing in cardiology were first monitored in 1978 and four have been published since 1981.¹⁻⁴ We now report the results of the sixth survey of staffing that was conducted in 1990 and the third survey of facilities that were monitored in 1989.

The surveys are conducted under the aegis of the British Cardiac Society and the Cardiology Committee of the Royal College of Physicians. It has a dual purpose: the identification of deficiencies in the provision of cardiological services and the matching of the number of trainee cardiologists with expected consultant vacancies.

The original stimulus for the survey was the excessive number of time expired senior registrars in the specialty in the late 1970s. The information and the predictions for cardiology that have been collected for more than a decade led to an acceptance within the specialty of a reduction in the number of senior registrar posts. A reasonable balance was achieved several years ago between the number of senior registrars completing their training and the number of vacancies at consultant grade. The objectives of the Joint Planning Advisory Committee (JPAC) were therefore anticipated and met even before the committee was set up. So far, no corrective adjustments have been requested in adult cardiology by the JPAC, but the number of senior registrar posts in paediatric cardiology has been increased slightly. The balance may now have tipped in the other direction from that of the 1970s, in that we may have too few

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senior registrar posts. In the recent past only a minority of senior registrars finished their training before entering the consultant grade, and indeed many appointments could be regarded as somewhat premature. This tendency, however, will probably correct itself over the next two or three years because we have relatively few retirements due in the immediate future. Thereafter the position becomes more complex. Important changes are expected from 1997 when the number of consultant vacancies will increase sharply, but the planned three year senior appointments⁵ will increase the throughput. We need closer monitoring over these years when numbers will fluctuate. For the foreseeable future, and over the period of these important changes, we intend to undertake surveys of staffing each year instead of biennially, starting from 1991.

Methods of survey

The index date for consultant staffing was July 1990 and that for senior registrars was three months earlier. Most of the data on facilities were collected in 1989 but a few that were missing were obtained retrospectively in 1990. We approached a contact in every health district in England and Wales and requested cooperation in the completion of the forms used to collect data for the survey. The contacts are cardiologists or general physicians who have an interest in the specialty. Selection is made with the advice of colleagues in the regional cardiac centres to ensure that the contacts are still in post and in a position to offer the help that we require. When the data have been collected they are analysed on a regional basis and sent to at least one cardiologist within that region to check for any obvious errors. We also compare the information with that obtained in previous surveys and check any apparent inconsistencies. The process of data collection and verification is therefore stringent and offers considerable protection against errors important enough to influence predictions. The data on personal projected retirement dates are regarded as confidential and only group data are seen outside the survey offices.

The data from Scotland and Northern Ireland are collected within these countries and subsequently sent to the coordinating centre in Sussex. In Scotland the situation is complex, because many posts are designated

as serving general medicine although the incumbents are trained in and practice cardiology. This difficulty necessitated a correction to the 1988 survey for Scotland.⁶ The comparative data presented for Scotland in this paper have been collected after detailed enquiries and are believed to be accurate.

The questionnaire on staffing by consultant grades has two sections. One is for those who practise in the specialty virtually all of their professional time. The other, which tends to relate to district hospitals, is for physicians with a major interest in the specialty; to qualify for inclusion they should have had an appropriate training in cardiology and should retain a major interest with at least 40% of their professional time spent in the specialty. Accreditation is not yet used as a criterion because most practitioners were appointed before this was available.

The questions in the facilities survey relating to invasive and non-invasive facilities were reasonably straightforward. The term "major haemodynamic facilities" refers to left heart studies (pressure measurements and angiography) whereas "minor haemodynamic studies" refers to right heart measurements such as bedside pressure monitoring with Swan-Ganz catheters. A cardiac care unit is defined as an area of monitored beds with a central console and fluoroscopy immediately available within the same area. Stress testing could be either with a treadmill or a bicycle ergometer.

The format of the tables is similar to that used in previous publications. Most tables show comparable data from the 1988 survey,⁴ presented within brackets.

Comments

STAFFING: CONSULTANT GRADE

Table 1 shows the overall numbers of consultant cardiologists in England and Wales from 1980 to 1990. Figure 1 shows the increase over the decade. As in the relevant tables, the bar charts indicate separately those engaged only in cardiology and those who are general physicians with both special training and a major interest in cardiology. A division is made also into adult and paediatric posts, giving four subdivisions in all. (The number of physicians designated as having only a major interest in paediatric cardiology is small or absent, so that only three components are seen in most of the bars in fig 1). The overall increase in numbers over the decade has been 98 posts (44%) with

Table 1 Cardiovascular physicians in England and Wales, 1980-1990

Year	Cardiology only		Major interest		Totals
	Adult	Paediatric	Adult	Paediatric	
1980	103	19	98	3	223
1982	111 (8%)	18 (- 5%)	117 (19%)	4 (33%)	250 (12%)
1984	111 (8%)	29 (53%)	121 (23%)	6 (100%)	267 (20%)
1986	119 (16%)	31 (63%)	118 (20%)	2 (- 33%)	270 (21%)
1988	130 (26%)	33 (74%)	128 (31%)	0 (0%)	291 (30%)
1990	145 (42%)	39 (105%)	134 (37%)	2 (- 33%)	320 (43%)

The 1990 figures show the number of whole time equivalents (WTEs). There are six half posts, so the total of individuals is 323. The accompanying graph also shows WTEs for 1990. Percentage increases since 1980 are shown in brackets.

Figure 1 Increase over a decade in the number of consultant posts in cardiology in the United Kingdom

changes for cardiology only (adult), cardiology (paediatric), and major interest (adult), being respectively 44 posts (42.7%), 20 posts (95%), and 35 posts (35%). The average yearly increases are, of course, approximately one tenth of these figures.

Table 2 shows data for England and Wales listed by region with latest population figures, number of health districts, number of major cardiac centres undertaking surgery, and the numbers of cardiologists (both totals and the subdivisions as in table 1). The health districts in Wales are organised somewhat differently from those in England with a usual pattern of two district general hospitals in each (one

health district has none). The number has not changed but we have presented the Welsh data differently in the current survey, with data based on districts as for England rather than on district general hospitals as we did previously. There are two fewer health districts in England as a result of reorganisation. The number of cardiologists has increased by 32 over the two year period 1988 to 1990. Twenty three of these new posts are in full time adult cardiology. The smaller apparent increase of 29 shown in the table represents greater precision in the reporting of data: previously six part-time posts were each scored as a whole unit whereas they are now scored as half a unit.

Tables 3 and 4 show comparable data for Scotland and Northern Ireland. Some inconsistency in the reporting of posts with an interest in cardiology (reflecting different traditions for designation compared with that in England) have led to a further retrospective change in the 1988 data after our published correction.⁶ The increase of three in the number of posts reported now is, however, real and not an artefact of reclassification. Scotland has one cardiologist per 121 000 population compared with one per 63 000 population in Northern Ireland and one per 157 000 in England and Wales.

Tables 5–7 show expected retirements of cardiologists in the United Kingdom from 1990 to 2005, and the same information for England and Wales appears as a bar chart in fig 2. The purpose of the figure is to illustrate the tendency to a stepped increase in expected vacancies from 1997 onwards. This has important planning implications for the number of training posts, but the JPAC formula (intended to achieve a balance between training posts and consultant vacancies) makes no allowances for such predictions. Planning depends on a formula based on historical vacancies with an additional allowance for growth that is also based on historical data. We recognise that the Department of Health does not have access to reliable forward predictions, but we hope that

Table 2 Cardiovascular Physicians (WTEs) by region in England and Wales at 1 July 1990 (Office of Population Censuses and Surveys, figures in thousands) (1988 data in parentheses)

Region	Population mid-1988	No of HDs	No of MCs	Cardiology only		Major interest		Totals
				Adult	Paediatric	Adult	Paediatric	
East Anglia	2 034.4	8 (8)	1	4.0 (3)		5.5 (6)		9.5 (9)
Mersey	2 403.9	10 (10)	1	4.0 (4)		6.0 (5)		13.0 (12)
North East Thames	3 776.4	16 (16)	3	15.5 (12)	3.0 (3)	9.0 (10)		24.5 (22)
North West Thames*	3 470.4	13 (15)	3	11.0 (16)	1.0 (2)	7.0 (7)		19.0 (25)
North Western	3 989.6	19 (19)	3	9.0 (9)	3.0 (2)	12.0 (12)		24.0 (23)
Northern	3 071.0	16 (16)	1	8.5 (6)	3.0 (2)	9.0 (11)		20.5 (19)
Oxford	2 523.7	8 (8)	1	4.0 (4)	2.0 (2)	7.0 (7)		13.0 (13)
South East Thames	3 651.6	15 (15)	4	15.0 (15)	4.0 (4)	9.0 (8)		28.0 (27)
South West Thames	2 961.4	13 (13)	1	9.0 (7)		6.0 (8)	1.0	16.0 (15)
South Western	3 236.0	11 (11)	1	6.0 (5)	3.0 (2)	5.0 (6)		14.0 (13)
Trent	4 662.4	12 (12)	3	8.0 (6)	1.0 (1)	12.5 (11)	1.0	22.5 (18)
Wessex	2 928.4	10 (10)	1	3.0 (2)	3.0 (2)	11.0 (8)		17.0 (12)
West Midlands	5 205.3	22 (22)	3	14.0 (13)	3.0 (3)	15.0 (11)		32.0 (27)
Yorkshire	3 620.1	17 (17)	3	12.0 (10)	3.0 (3)	11.0 (9)		26.0 (22)
Wales†	2 857.0	9 (9)	1	4.0 (4)		9.0 (9)		13.0 (13)
Special hospitals		4 (4)	4	18.0 (14)	10.0 (7)			28.0 (21)
Totals	50 393.3	203 (205)	34	145.0 (130)	39.0 (33)	134.0 (128)	2.0 (0)	320.0 (291)

*Owing to reorganisation (Hammersmith and Brent) North West Thames has two HDs less than in 1988.

†Wales has 18 (18) district hospitals.

HD, health district; MC, major centre.

Notes: (a) South West Thames and Wales show minor updates to published 1988 data.

(b) Regions with half posts: Northern (1, will not be replaced), Trent (1), East Anglia (1), North East Thames (1), South East Thames (2).

(c) The 1988 data show the number of physicians not the number of WTEs.

(d) Blanks in the tables represent either zero values or data not appropriate. This is for ease of reading and does not imply missing values.

Table 3 Cardiovascular physicians by health board in Scotland at 1 July 1990 (Office of Population Censuses and Surveys, figures in thousands)

Health district	Population mid-1989	Cardiology only		Major interest		Totals
		Adult	Paediatric	Adult	Paediatric	
Argyll and Clyde	441.2			2 (1)		2 (1)
Ayrshire and Arran	374.5			2 (2)		2 (2)
Borders	102.7					
Dumfries and Galloway	147.6			1 (1)		1 (1)
Fife	344.8					
Forth Valley	271.4					
Grampian	503.5	3 (3)				3 (3)
Greater Glasgow	933.2	9 (9)	3 (3)	6 (5)		18 (17)
Highland	201.9			1 (1)		1 (1)
Lanarkshire	562.3			3 (3)		3 (3)
Lothian	742.9	7 (6)	2 (2)	1 (1)		10 (9)
Orkney	19.4					
Shetlands	22.2					
Tayside	392.5	2 (2)				2 (2)
Western Isles	30.6					
Totals	5 090.7	21 (20)	5 (5)	16 (14)		42 (39)

Notes: (a) Dumfries and Glasgow show minor updates to previously published data.

(b) One new whole time adult post in Edinburgh not established.
1988 data are shown in parentheses.

Table 4 Cardiovascular physicians by health board in Northern Ireland at 1 July 1990 (Office of Population Censuses and Surveys, figures in thousands)

Health district	Population mid-1989	Cardiology only		Major interest		Totals
		Adult	Paediatric	Adult	Paediatric	
Eastern HSSB	645.9	11 (10)	2 (2)	2 (3)		15 (15)
Northern HSSB	385.7			4 (3)		4 (3)
Southern HSSB	291.2			3 (3)		3 (3)
Western HSSB	260.2			3 (3)		3 (3)
Totals	1 583.0	11 (10)	2 (2)	12 (12)		25 (24)

1988 data are shown in parentheses.
HSSB, Health and Social Services Board.

an appropriate response will be made for the data that we have collected. The numbers in brackets in tables 5–7 show the predictions for retirements that were made in 1988 for the same years. The pattern is very similar, but inevitably there are minor differences year to year reflecting inconsistencies in the dates of intended early retirement. These small differences do not change our overall predictions, and the similarity of the pattern is reassuring.

The data in tables 8–10 continue to disappoint. Although the number of cardiologists has increased overall, we still have many districts with no representative of the specialty and others in which provision is clearly

inadequate. If the present tables are compared with those in our previous report, apparent inconsistencies will be noticed: this is a consequence of more refined data and does not represent inaccuracies. We have now included in tables 8–10 not only lack of provision but also inadequate provision (defined as less than seven sessions per week, usually provided by visiting specialists). Thus in England and Wales we now have 31 districts with no cardiologist (total population 5.46 million) compared with 45 in 1988 and 54 in 1986. But an additional 13 districts (total population 2.84 million) have inadequate provision with an average of only three sessions each. In Scotland six health

Table 5 Cardiovascular physicians expected to retire each year in England and Wales (as of 1 July 1990)

Year	Cardiology only			Major interest			Grand total
	Adult	Paediatric	Total	Adult	Paediatric	Total	
Not stated*	3		3	1		1	4
1990	1		1	1		1	2 (3)
1991	3		3	1		1	4 (5)
1992	1		1	1		1	2 (4)
1993	3	1	4	1		1	5 (9)
1994	3		3	1		1	4 (4)
1995	4		4	1	1	2	6 (5)
1996	3		3	2		2	5 (6)
1997	5		5	8		8	13 (10)
1998	3		3	2		2	5 (6)
1999	1	2	3	8		8	11 (13)
2000	5	2	7	7		7	14
2001	4	1	5	2		2	7
2002	3		3	9		9	12
2003	2	2	4	2		2	6
2004	6	2	8	4		4	12
2005	6	2	8	3		3	11
2006 or later	91	27	118	81	1	82	200
Totals	147	39	186	135	2	137	323

*Mainly locum posts.

The grand total expected to retire each year, as given in 1988, is shown in parentheses.

Table 6 Cardiovascular physicians expected to retire each year in Scotland (as of 1 July 1990)

Year	Cardiology only			Major interest			Grand total
	Adult	Paediatric	Total	Adult	Paediatric	Total	
1990		1	1				1 (1)
1991	1		1				1 (1)
1993				1		1	1 (1)
1995	1		1	2		2	3
1997	1		1				1
2000	1		1	1		1	2
2003	1		1	1		1	2
2004				2		2	2
2005	1	1	2	1		1	3
2006 or later	15	3	18	8		8	26
Totals	21	5	26	16		16	42

1988 data are shown in parentheses.

Table 7 Cardiovascular physicians expected to retire each year in Northern Ireland (as of 1 July 1990)

Year	Cardiology only			Major interest			Grand total
	Adult	Paediatric	Total	Adult	Paediatric	Total	
1992	1		1				1 (1)
1997	1		1				1 (1)
1998	1		1				1 (1)
2001				1		1	1
2004	2	1	3	1		1	4
2005	2		2				2
2006 or later	4	1	5	10		10	15
Totals	11	2	13	12		12	25

1998 data are shown in parentheses.

boards have no cardiologists. The situation in Northern Ireland is probably satisfactory because of the close cover provided for the small two district hospitals without their own specialists.

Our data for consultant numbers do not agree with those published by the Department of Health, based on Korner statistics.⁷ The department has a subdivision between “main specialty” and “second specialty”, presumably reflecting our own division between “whole

time” and “major interest” physicians. There is no separate designation for paediatric cardiology. The department’s figures (1989) for “main specialty” totalling 148 individuals contrast with ours (1990) of 184 for adult plus paediatric cardiology. For “second specialty” the discrepancy is greater: 79 against 136. Thus the total shortfall against our carefully collected figures is 93, with only 10 months difference between the index dates for data collection. The discrepancy may be due in part to differen-

Figure 2 Projected retirements of cardiologists from 1990 to 2005. There is a tendency for a substantial increase from 1997 onwards

Table 8 Health districts without cardiologists by region in England and Wales at 1 July 1990

Region	Population mid-1988	No of Hds	No of Hds without	Losses	Gains	HD population without
East Anglia	2 034.4	8 (8)	2 (3)		1	419.5
Mersey	2 403.9	10 (10)	5 (6)		1	974.1
North East Thames	3 776.4	16 (16)	2 (3)		1	517.6
North West Thames*	3 844.1	13 (15)	3 (4)		1	716.7
North Western	3 989.6	19 (19)	5 (5)			865.6
Northern	3 071.0	16 (16)	6 (6)			994.4
Oxford	2 523.7	8 (8)				
South East Thames	3 651.6	15 (15)	(1)		1	
South West Thames	2 961.4	13 (13)	3 (3)	1	1	727.2
South Western	3 236.0	11 (11)	3 (3)			569.8
Trent	4 662.4	12 (12)	2 (4)		2	525.0
Wessex	2 928.4	10 (10)	2 (3)		1	250.8
West Midlands	5 205.3	22 (22)	6 (8)		2	1 037.1
Yorkshire	3 620.1	17 (17)	3 (3)			479.8
Wales†	2 857.0	9 (9)	2 (1)	1		227.7
Special hospitals		4 (4)				
Totals	50 393.3	203 (205)	44 (53)	2	11	8 305.3

*Owing to reorganisation North West Thames has two HDs less than in 1988 (Hammersmith and Brent).
†Although there is an apparent loss in Wales, the number of DGHs without (eight of 18) has not changed.
This table shows the number of HDs that have fewer than seven cardiology sessions per week.
The 1988 data have been re-calculated to the same definition and are shown in parentheses.
The number of HDs completely without in 1990 was 31 (45 in 1988) and 13 more HDs had on average only three sessions each.
Ten HDs counted as having a cardiologist had fewer than 10 sessions each.

Table 9 Scottish health boards without cardiologists at 1 July 1990 (Office of Population Censuses and Surveys, figures mid-1989 in thousands)

Health Board	Population without
Borders	102 700
Fife	344 800
Forth Valley	271 400
Orkney	19 400
Shetlands	22 170
Western Isles	30 630
Total	791 100

No change from (updated) 1988 figure of six health boards without.

ces in designation among those practising cardiology between “second specialty” consultants and general physicians. This cannot account, however, for the major difference between the two surveys in the numbers for specialist cardiologists or paediatric cardiologists without a general medical commitment. The Department of Health is aware of our own statistics and for the purposes of the JPAC has accepted them in the past. Consultant numbers determine the number of training posts, so we hope they will continue to do so. A reconciliation of the department’s data with our own, district by district, would be ideal but is apparently impracticable.

STAFFING: SENIOR REGISTRARS

Tables 11 and 12 show the numbers within regions of cardiologists, senior registrars, and major cardiac centres. As far as we are aware all the major centres within teaching hospitals have senior registrars. The Brook Hospital in South East Thames was officially designated as

a regional cardiac centre though it is not administered by a teaching authority and has no senior registrar. There has been no change overall in the number of senior registrars compared with 1988, though there have been a few changes in distribution. Table 13 shows that only 13 senior registrar contracts are expected to expire in 1991 and 1992, but 35 had been in post less than two years at the time of the 1990 survey (with three posts vacant). Four senior registrars were time expired and employed on extended contracts. In general, far more senior registrars are being appointed before they complete their training period than continue beyond the first expiry date. The number of expected consultant vacancies for the ensuing four years is also appreciably less than the number of senior registrars due to finish training. This is a familiar pattern that has been mentioned in previous surveys, due principally to the growth in consultant numbers of four to five per cent per annum. The apparent mismatch has not prevented the average time in post as senior registrar tending to become progressively shorter. The figures in tables 14 and 15 for Scotland and Northern Ireland are too small to exert any major influence on the position overall for the United Kingdom.

STAFFING: PHYSIOLOGICAL MEASUREMENT TECHNICIANS

Technical assistance is crucial to the effective operation of cardiac centres and departments of cardiology in district hospitals—yet we have no official norm for staffing levels. Table 16 shows the wide disparity in the number of qualified and trainee technicians (recorded as whole time equivalents) in each region, both as totals and as numbers per hundred thousand patients. Such data must be interpreted with care, particularly where relative overprovision might be inferred. For example, Mersey has the largest number of technicians pro rata but very few cardiographers. We can deduce that the technicians take the electrocardiograms, a practice which increases flexibility and which, in some situations, may be cost effective.

Table 10 Northern Ireland health boards without cardiologists at 1 July 1990 (Office of Population Censuses and Surveys, figures mid-1989 in thousands)

Health Board	No of UoMs	No of UoMs without	Health board population	UoM Pop without
Eastern HSSB	6	2 (2)	645.9	115.2
Northern HSSB	4	(1)	385.7	
Southern HSSB	3		291.2	
Western HSSB	3		260.2	
Total	16	2 (3)	1 583.0	115.2 (305.0)

UoM, Unit of management; HSSB, Health and Social Services Board.

Table 11 Cardiovascular physicians and senior registrars by region of England and Wales at 1 July 1990 (1988 data in parentheses)

Region	No of HDs	Cardiology only	Major interest	Total cardiologists	Senior registrars	No of MCs
East Anglia	8	4	6	10	1 (1)	1
Mersey	10	7	6	13	3 (3)	1
North East Thames	16	16	9	25	4 (4)	3
North West Thames*	13	12	7	19	3 (4)	3
North Western	19	12	12	24	2 (4)	3
Northern	16	12	9	21	3 (3)	1
Oxford	8	6	7	13	2 (3)	1
South East Thames	15	20	9	29	3 (4)	4
South West Thames	13	9	7	16	1 (1)	1
South Western	11	9	5	14	2 (2)	1
Trent	12	9	14	23	3 (4)	3
Wessex	10	6	11	17	1 (2)	1
West Midlands	22	17	15	32	3 (4)	3
Yorkshire	17	15	11	26	4 (5)	3
Wales†	9	4	9	13	3 (3)	1
Special hospitals	4	28		28	8 (9)	4
Totals	203 (205)	186 (163)	137 (128)	323 (291)	46‡ (56)	34

*Owing to reorganisation North West Thames has two districts less than in 1988. † Wales has 18 district hospitals.

‡There were four vacant senior registrar posts in adult cardiology.

Numbers refer to cardiologists not whole time equivalents. MC, major centre.

Table 12 Cardiovascular physicians and senior registrars in Scotland and Northern Ireland at 1 July 1990

Region	No of HBs	Cardiology only	Major interest	Total cardiologists	Senior registrars	No of MCs
Scotland	15	26	16	42	7	2
Northern Ireland	4	13	12	25	2	1

Note: Northern Ireland had three vacant senior registrar posts in adult cardiology. Mc, major centre; HB, health board.

Moreover, most technicians have duties in other disciplines—for example in respiratory function or in a vascular laboratory. While our respondents have been asked to allow for this confounding variable, it is difficult to do so with any degree of accuracy. We know, however, that the bleak situation shown for Oxford and Wessex does reflect a very unsatisfactory situation which must detract from the efficiency of the two centres within these regions.

In 1987 the British Cardiac Society report on Cardiology in the District Hospital⁸ recommended that four technicians dedicated to cardiology were needed for each 250 000 population (in addition to cardiographers). Cardiac centres undertaking catheterisation, angiography, angioplasty, electrophysiology, and other technically demanding procedures need an appreciably higher ratio. Relatively little change has occurred from 1984 to 1989. The increase of 84 in technician numbers must be considered alongside the decrease in cardiographers of 31. The net increase of 53 (4%) can make little impression on the delays and constraints in the performance and reporting of the investigations that are crucial for the optimal management of most patients with heart disease.

STAFFING: MISCELLANEOUS

Sixty districts reported that a resuscitation training officer was employed, but usually this is part time only and often combined with other duties. We know from other sources of 23 full time resuscitation training officers. The Royal College of Physicians recommended in 1987 that every district should employ a resuscitation training officer. Most have not heeded this advice though no other technical post could make as much impact in reducing the number

of patients dying from potentially treatable causes. We have no previous data on rehabilitation facilities, but we were told of 113 programmes within the 214 districts of England and Wales. We have no details of these but a report on rehabilitation within the United Kingdom has been prepared and is in the press.⁹ Many may offer very limited facilities: we can be certain that nearly half the districts offer none.

FACILITIES

The 1989 survey (conducted one year earlier than the staffing survey reported above) did not include Scotland and Northern Ireland. Table 17 for England and Wales shows few surprises. Some of the minor changes in the number of cardiac care units may be due to differences in the interpretation of our definition. We are aware that a few hospitals with an appreciable acute workload are still without any cardiac care units but, in general, distribution throughout the country is reasonable. We made no enquiry about numbers of beds in relation to population. Cardiac surgery is performed in

Table 13 Contract expiry dates for senior registrars compared with retirement dates for consultants in England and Wales at 1 July 1990

Year	SR contracts expiring	Consultants retiring	Balance
1991	4	4	
1992	9	2	7
1993	16	5	11
1994	11	4	7
1995	3	6	-3
Totals	43	26	17

Notes: (a) Five SR contract expiry dates are not known.

(b) One post was discontinued after survey date, the senior registrar is now consultant, contract date not relevant.

Table 14 Contract expiry dates for senior registrars (SR) compared with retirement dates for consultants in Scotland at 1 July 1990

Year	SR contracts expiring	Consultants retiring	Balance
1991	2	1	1
1992	1		1
1993	2	1	1
1994	1		1
Totals	6	2	4

Note: One senior registrar contract expiry date is not known.

Table 15 Contract expiry dates for senior registrars (SR) compared with retirement dates for consultants in Northern Ireland at 1 July 1990

Year	SR contracts expiring	Consultants retiring	Balance
1990			
1991			
1992	1	1	
1993			
1994	1		1
Totals	2	1	1

Note: Three senior registrar contract expiry dates are not known.

two fewer centres (both in the North West Thames Region) owing to health district re-organisation but the number of hospitals carrying out cardiac surgery remains unchanged. A few centres without cardiac surgery undertake left heart studies and four of them also offer angioplasty. Only five districts cannot offer temporary pacing and in some of these a provision available nearby offers at least a partial solution. In general, however, we believe that every hospital taking acute emergencies should have immediate provision for temporary pacing and any deficiency in this respect is dangerous and unacceptable.

Table 18 shows that 190 of the 212 districts have echocardiographic facilities—an increase of 50 since the previous survey in 1984. Appreciably more centres can offer cross-sectional echocardiography, which explains the decrease in M mode facilities. Over 100 districts also have Doppler imaging and half of them have colour flow Doppler imaging. Fewer districts report that they are undertaking cardiac scintigraphy (unfortunately it is not possible to make an accurate comparison of the scintigraphy figures from 1984 because those data were incorrectly calculated).

Most districts, however, have facilities for ambulatory monitoring and stress testing. These facilities are now distributed satisfactorily and will not need regular surveys in future years. Greater attention can then be paid to other aspects of the quality of service that can be offered.

We note an important increase in the number of ambulances with defibrillators from 1986 to

1989. This may have less relevance after the decision by the Secretary of State that all frontline ambulances should carry defibrillators.¹⁰ We believe this to be an important initiative.

Consultant staffing: a statement of need
The need for cardiologists both at cardiac centres and district general hospitals has increased substantially over two or three decades for several major reasons. First, the development of coronary artery bypass grafts and percutaneous coronary angioplasty has created a huge workload in the assessment of potential candidates for these procedures. Secondly, the need for angioplasty, balloon dilatation of valves, and therapeutic catheter procedures for patients with congenital heart disease has also led to the development of the concept of the interventionist physician within the specialty. Thirdly, the control of arrhythmias by pacing, by drugs, and by surgery has become complex but highly successful: it calls for specialist skills that cannot readily be provided by a general physician. Fourthly, management of patients with serious heart disease in hospitals outside major cardiac centres is no longer straightforward: therapeutic agents such as modern antiarrhythmics and thrombolytics have potential for considerable harm as well as benefit, while investigations such as echocardiography, stress testing, and ambulatory monitoring demand training and

Table 16 Technical support in cardiology by region in England and Wales at 1 March 1989 (1984 data are given in parentheses)

Physiological measurement technicians						Since 1984			Cardiographers
Region	No of HDs	Qualified	Trainee	Total	Per 100 000	Increase	Decrease	Per 250 000 population	
East Anglia	8 (8)	20 (15)	2 (5)	22 (20)	1.1 (1.0)	0.09		2.04	24 (21)
Mersey	10 (10)	38 (65)	16 (18)	54 (83)	2.2 (3.4)		1.18	4.16	3
North East Thames	16 (16)	62 (53)	4 (14)	66 (67)	1.7 (1.8)		0.05	2.86	45 (30)
North West Thames*	13 (15)	51 (28)	10 (19)	61 (47)	1.7 (1.4)	0.40		2.75	34 (35)
North Western	19 (19)	104 (83)	18 (14)	122 (97)	3.1 (2.4)	0.62		5.08	17 (19)
Northern	16 (16)	26 (33)	11 (6)	37 (39)	1.2 (1.2)		0.03	1.86	35 (37)
Oxford	8 (8)	14 (11)	2 (2)	16 (13)	0.6 (0.5)	0.10		1.08	20 (20)
South East Thames	15 (15)	42 (41)	8 (10)	50 (51)	1.4 (1.4)		0.05	2.36	41 (51)
South West Thames	13 (13)	32 (21)	8 (6)	40 (27)	1.4 (0.9)	0.44		2.35	19 (18)
South Western	11 (11)	38 (32)	7 (2)	45 (34)	1.4 (1.1)	0.34		2.68	31 (29)
Trent	12 (12)	75 (82)	18 (22)	92 (104)	2.0 (2.3)		0.28	3.41	21 (44)
Wessex	10 (10)	21 (16)	4 (5)	25 (21)	0.8 (0.7)	0.11		1.65	25 (28)
West Midlands	22 (22)	89 (81)	8 (7)	97 (88)	1.9 (1.7)	0.17		3.24	36 (35)
Yorkshire	17 (17)	72 (65)	16 (8)	88 (73)	2.4 (2.0)	0.42		4.01	26 (31)
Wales†	9 (9)	84 (65)	16 (19)	100 (84)	3.5 (3.0)	0.52		6.64	18 (34)
Special Hospitals	4 (5)	59 (43)	8 (9)	67 (52)					7 (3)
Totals	203 (206)	827 (731)	155 (166)	981 (897)	1.9 (1.8)	0.15		3.36	402 (433)

*Hammersmith is now shown under special hospitals.
†Wales has 18 (18) district hospitals.
Staff numbers are in rounded WTEs. For population see table 17.

Table 17 Cardiac facilities (number of HDs with given facility) by region in England and Wales at 1 March 1989 (Office of Population Censuses and Surveys' figures in thousands)

Region	Population mid-1988	No of HDs	No of CCUs	Cardiac surgery	Haemodynamic		PTCA	Invasive EP	Pacing	
					Major	Minor			Permanent	No Temp†
East Anglia	2 034.4	8 (8)	9 (8)	1 (1)	2 (2)	7 (5)	1 (1)		2 (2)	
Mersey	2 403.9	10 (10)	10 (9)	1 (1)	1 (1)	6 (3)	1 (1)	1 (1)	1 (1)	(1)
North East Thames	3 776.4	16 (16)	19 (15)	3 (3)	4 (4)	10 (9)	4 (3)	3 (3)	4 (4)	
North West Thames*	3 470.4	13 (15)	15 (14)	2 (4)	4 (5)	9 (9)	3 (3)	4 (4)	4 (6)	
North Western	3 989.6	19 (19)	20 (19)	3 (3)	4 (3)	12 (11)	3 (2)	4 (3)	5 (5)	1 (2)
Northern	3 071.0	16 (16)	21 (21)	1 (1)	1 (1)	8 (6)	1 (1)	1 (1)	1 (1)	
Oxford	2 523.7	8 (8)	6 (5)	1 (1)	1 (1)	6 (5)	1 (1)	1 (1)	2 (1)	1 (1)
South East Thames	3 651.6	15 (15)	19 (17)	4 (4)	5 (4)	11 (9)	4 (4)	6 (5)	7 (6)	
South West Thames	2 961.4	13 (13)	12 (11)	1 (1)	2 (2)	12 (7)	1 (1)	2 (2)	3 (2)	
South Western	3 236.0	11 (11)	13 (12)	1 (1)	1 (1)	7 (6)	2 (1)	6 (3)	5 (5)	
Trent	4 662.4	12 (12)	16 (15)	2 (2)	3 (3)	8 (7)	2 (2)	2 (2)	4 (3)	(2)
Wessex	2 928.4	10 (10)	9 (10)	1 (1)	1 (1)	6 (4)	1 (1)		3 (2)	
West Midlands	5 205.3	22 (22)	24 (25)	3 (3)	6 (8)	15 (15)	4 (1)	4 (5)	11 (9)	1 (1)
Yorkshire	3 620.1	17 (17)	17 (13)	3 (3)	4 (3)	11 (8)	3 (2)	5 (2)	6 (5)	1 (3)
Wales†	2 857.0	9 (9)	15 (12)	1 (1)	1 (2)	6 (6)	1 (2)	1 (1)	2 (2)	1 (1)
Special hospitals		4 (5)	4 (2)	4 (4)	4 (4)	3 (5)	3 (4)	4 (4)	4 (4)	
Total	50 393.3	203 (206)	229 (208)	32 (34)	44 (45)	137 (115)	35 (30)	44 (37)	64 (58)	5 (11)

*Hammersmith now shown under special hospitals.

†Wales has 18 district hospitals.

‡HDs without temporary pacing facilities.

1984 data are shown in parentheses.

skill. Finally, an optimal service calls for commitment to the prevention of heart disease, to training in resuscitation, and to the provision of rehabilitation programmes. These needs are poorly met at present.

A report of the Royal College of Physicians of London and the Royal College of Surgeons of England recommended that every health district with four or more physicians should have one trained in cardiology.¹¹ But table 8 shows that 31 districts have no cardiologists and that 13 others have minimal visiting representation, so that overall there is a serious shortfall in 44 districts on this basis. Subsequent to the Royal Colleges' recommendation, the British Cardiac Society stated that each large district (over 250 000) required two cardiologists for the provision of an adequate service.⁸ Other major specialties such as gastroenterology and respiratory medicine have made similar recommendations. These estimates have not been contested in discussions relating to manpower either within the college or outside it, and indeed they are crucial to the concept of a consultant based service.

According to this criterion a total of 62 district general hospitals should have a second cardiologist, but only 12 of them do. This indicates an additional need for 50 posts.

The need for additional physicians within cardiac centres is more difficult to determine, but an approximation can be made by quantifying the need for investigations and treatment in relation to cardiac surgery, which forms the major part of the present workload. The recommendation for the annual need for cardiac surgery is 400–500 per million population.¹² The population of England and Wales is a little over 50 million, implying (taking the mid point) that 22 500 operations should be carried out each year. If every surgeon does 250 operations, and if twice as many cardiologists are needed as surgeons—figures that are widely accepted—then we require at least 180 adult cardiologists in the centres, compared with the present total of 117. This estimate of a requirement for 63 additional cardiologists within major centres is a conservative figure that does not allow for the new demands of angioplasty and added responsibilities in other

Table 18 Non-invasive cardiac facilities (number of HDs with given facility) by Region in England and Wales at 1 March 1989 (for populations see table 17) (1984 data are shown in parentheses)

Region	Echocardiography				Scintigraphy	Ambulatory monitoring		Stress tests	Coronary Ambulance
	M mode only	Cross sectional	Doppler	Colour flow		Recording	Analysis		
East Anglia	(3)	8 (5)	5		4	8 (8)	6 (4)	8 (8)	2 (1)
Mersey	3 (1)	6 (2)	5	2	1	10 (7)	8 (5)	10 (9)	5 (1)
North East Thames	(3)	16 (10)	11	5	9	16 (15)	14 (14)	16 (16)	2 (1)
North West Thames*	1	10 (8)	7	5	8	12 (15)	11 (12)	12 (13)	1
North Western	3 (2)	16 (10)	10	5	8	18 (17)	18 (15)	18 (17)	7 (3)
Northern	3 (4)	10 (7)	10	4	9	16 (16)	9 (6)	16 (15)	13 (1)
Oxford	(3)	8 (3)	6	2	2	8 (7)	8 (7)	7 (7)	7 (1)
South East Thames	2 (2)	13 (8)	10	3	9	15 (15)	15 (14)	15 (15)	3 (3)
South West Thames	1 (4)	12 (5)	8	4	4	13 (13)	10 (10)	13 (13)	9 (4)
South Western	1	9 (8)	8	7	9	11 (11)	8 (9)	10 (10)	7 (4)
Trent	(3)	9 (5)	6	1	10	12 (9)	10 (7)	12 (10)	6 (2)
Wessex	1 (3)	8 (3)	6	1	4	10 (10)	8 (5)	9 (9)	5 (3)
West Midlands	4 (5)	16 (9)	10	4	15	22 (21)	18 (14)	19 (18)	9 (2)
Yorkshire	5 (1)	12 (8)	10	5	8	15 (15)	12 (13)	15 (15)	7 (2)
Wales‡	1 (2)	8 (6)	7	2	6	8 (8)	8 (8)	8 (8)	7 (1)
Special hospitals		4 (4)	3	2	4	4 (4)	4 (4)	4 (4)	
Totals	25 (36)	165 (101)	122‡	52‡	110‡	198 (191)	167 (147)	192 (187)	90 (29)

*Hammersmith now shown under special hospitals.

†Wales has 18 district hospitals.

‡Data for 1984 were not available for comparison in these three categories.

spheres. We may also be paying inadequate attention to the radiation hazards faced by the new generation of interventionalist cardiologists, especially if fewer registrars are available for the less demanding routine catheter investigations.

Implications of the shortfall in consultant staffing

In England and Wales there are at present 323 consultant cardiologists according to the 1990 biennial survey. The total shortfall, set out in detail above, is:

Additional cardiologists for centres	63
Cardiologist for districts with none	44
Cardiologists (2) for bigger districts	50

Thus we have a pressing need for 157 posts, to make a total of 478—an increase of almost exactly 50% on the current figure.

The present staffing levels are clearly inadequate for the needs of the service and the present annual growth rate in consultant posts (approximately 4.5%) is now equivalent to 14 posts per year. If this trend continues over the next decade we will have met most of the shortfall outlined above—that is, 140 of the 159 posts that we believe are urgently needed now. The guidelines, however, may have shifted by then. The calculations we have used assume that the service workload will continue to be met mostly by trainees. An equitable distribution of resources at an acceptable level plus the objective of a consultant based service, however, can be achieved in cardiology by the beginning of the 21st century only if the annual growth rate in consultant posts is appreciably greater than the current 4.5%.

A rapid rate of growth cannot be achieved easily. The logical approach would be to create first the appropriate number of training posts and then increase consultant posts as more trainees become available. This would be unacceptable, however, without the guarantee of a subsequent and commensurate increase in consultant posts; and no such guarantee could be given. We should therefore increase the number of consultant posts and training posts concurrently, and accept the short term expedient of premature promotion—as indeed is occurring already owing to the present shortage of senior registrars.

We drew attention in our previous survey to the remarkable difference in the provision of cardiology between the United Kingdom and most of the rest of the developed world.⁴ Even now we have only 6.4 cardiologists per million population in England and Wales. Our 1989 paper quoted the ratio for Europe as a whole as 45 per million, with the recommended figure for the United States being 60 per million. We see

little prospect of provision in the United Kingdom on a scale similar to that which is regarded as satisfactory in many neighbouring European countries.

Our present requirement for posts at senior registrar level depends on predictions of consultant vacancies in three or four years time. We can offer predictions based on planned retirement dates, present expansion, and an allowance for unexpected events such as death. To this we should add numbers for a greater rate of expansion as argued above, but the data presented in figure 2 (based on retirement plans) show a step-wise increase in numbers that are needed from 1997, even without a greater rate of growth. The JPAC formula does not permit any account to be taken of such predictions, even when it is based on carefully collected data. The present tendency for premature appointments from senior registrar to the consultant grade therefore seems destined to recur—after a brief lull—to a greater extent than ever before. This undesirable situation has already affected paediatric cardiology and could be prevented by planning that is not constrained by the rigid application of inappropriate formulae. The reduction of the training period from four to three years in our new programme⁵ will mitigate but not prevent a future crisis.

We thank our colleagues who completed our questionnaires so diligently. We seek their continuing forbearance.

- 1 Chamberlain DA, Goodwin JF, Emanuel RW, Bailey LG. Career prospects in cardiology in England and Wales. Survey of 15 health regions. *Br Heart J* 1981;45:460-3.
- 2 Chamberlain D, Bailey L, Emanuel R, Oliver M. Staffing and facilities in cardiology in England and Wales July 1982. Second biennial survey. *Br Heart J* 1985;50:597-604.
- 3 Chamberlain D, Bailey L, Julian D. Staffing and facilities in cardiology in the United Kingdom 1984. Third biennial survey. *Br Heart J* 1986;55:311-20.
- 4 Chamberlain D, Bailey L, Sowton E, Ballantyne D, Boyle D, McC, Oliver M. Staffing in cardiology in the United Kingdom 1988. Fifth biennial survey. *Br Heart J* 1989;62:482-7.
- 5 Chamberlain D, Julian D, Sleight P, Sowton E. Proposals for a new training programme for cardiology. *Br Heart J* 1990;63:317-20.
- 6 Chamberlain D. Staffing in cardiology in the United Kingdom 1988: Fifth biennial survey [letter]. *Br Heart J* 1990;63:262.
- 7 Medical Manpower and Education Division, Department of Health. Medical and dental staffing prospects in the NHS in England and Wales 1989. *Health Trends* 1990;3:96-103.
- 8 Report of a working group of the British Cardiac Society. Cardiology in the district hospital. *Br Heart J* 1987;58:537-46.
- 9 British Cardiac Society. Working Party Report on Cardiac Rehabilitation. *Br Heart J* unpublished.
- 10 The Modern Ambulance Service Good Practice Guidance. Report by Working Group to Chief Executives NHS Management Executives. November 1990.
- 11 Provision of services for the diagnosis and treatment of heart disease in England and Wales. Third Report of a Joint Cardiology Committee. Royal College of Physicians of London and the Royal College of Surgeons of England. *Br Heart J* 1985;53:477-82.
- 12 Provision of services for the diagnosis and treatment of heart disease. Fourth report of a Joint Cardiology Committee of the Royal College of Physicians of London and the Royal College of Surgeons of England. *Br Heart J* (In press).

such patients. To retain the confidentiality of our database we undertook the mailing ourselves.

Do not forget the date for our first teach-in, announced in the December newsletter. This new programme is intended to update members of the society in growing points of modern medicine that are intimately related to our specialty. Sir David Weatherall will be arranging the first meeting (on molecular biology) on Tuesday 31 March from 10 am to 4 pm. A subsidy will be available for long-distance travel within the United Kingdom. We intend that these meetings should be small to encourage interaction with the speakers. There will not be another similar opportunity for a very long time. Contact the society at once if you wish to reserve a place—but you may already be able to secure a place on the reserve list only . . . Please note that the meetings are exclusively for members.

Copies are now available from the society offices of the Fourth Report of a Joint Cardiology Committee of the Royal Colleges of Physicians of London and the Royal College of Surgeons of England on the provision of services for the diagnosis and treatment of heart disease. The college reports are authoritative documents that can be of great value to those who have to persuade managers of the basic requirements of a cardiology service.

Another date for many diaries, and again we expect demand to exceed supply: Resuscitation '92 will be the first CPR congress of the European Resuscitation Council (the British Cardiac Society was prominent in the formation of the European Resuscitation Council which is now gaining wide acceptance in Europe). An excellent international

programme has been arranged in cooperation with the Resuscitation Council of the United Kingdom. The meeting will take place in the Brighton Centre. All the indications show this will be a popular meeting and many delegates are expected from mainland Europe. Application forms can be obtained from the society office.

Remember to note our new address given below. And again for reference our new telephone number is: 071 383 3887. Note that our fax number has a slightly different exchange code: 071 388 0903.

DOUGLAS CHAMBERLAIN
President, British Cardiac Society
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NOTICE

1992

The Annual Meeting of the **British Cardiac Society** will take place at the Harrogate International Centre on 26 to 29 May. The closing date for receipt of abstracts was 3 January.

CORRECTIONS

Staffing in cardiology in the United Kingdom. Sixth biennial survey: with data on facilities in cardiology in England and Wales 1989 (November issue, volume 66: pages 395–404). The President of the British Cardiac Society has asked us to point out that table 13 showed an incorrect total under the number of consultants retiring from 1991 to 1995, though the data for individual years were correct. This total was inadvertently left unchanged when one year was removed from the table shortly before the paper was submitted.

Table 16 showed the number of technicians in the Regions of England and Wales, and these figures were correct according to the returns received. But the calculations for numbers per 250 000 were incorrect—the true totals were slightly higher. This error represents a complex calculation based on the premise that the need for technician time is not related in a linear fashion to population. These figures were derived for another purpose but were inadvertently substituted for the original calculations that had been correctly made.

Physical activity in ischaemic heart disease in middle-aged British men. *AG Shaper, G Wannamethee* (November issue, volume 66: pages 384–94). The authors have asked us to point out that R Weatherall was inadvertently omitted from the authorship of this paper, which is *AG Shaper, G Wannamethee, R Weatherall*.