Manpower in pathology 1969-1975¹

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SYNOPSIS An attempt has been made to assess for the period 1969-1975 the demand for consultant pathologists and the adequacy of the trainee cadre to fulfil this demand. In addition new data have been acquired on the way in which pathologists apportion their time between specialties and the availability of specialist opinion and other derived information. The demand for consultants in all specialties, with the exception of morbid anatomy, is likely to exceed the supply. The shortfall is greatest in medical microbiology and chemical pathology, but may be felt equally in haematology in the short term.

In 1968 Council appointed a subcommittee to enquire whether there were likely to be sufficient pathologists completing their training to fulfil the expected demand for consultants in regional hospitals in England and Wales for the period up to 1975. As well as putting values to the two essential unknowns, supply and demand of pathologists, it was hoped to acquire en passant some other useful information.

The enquiry was conducted by means of a questionnaire (the obverse is on page 554), sent to the senior pathologist in each group or independent laboratory. A modified questionnaire enquiring primarily about trainees was sent to the relevant departmental heads in each teaching group in England, Wales, and Scotland.

Date

Most of the questionnaires were distributed during March, 1969, and were returned during the subsequent few weeks.

Completeness of the Survey

REGIONAL HOSPITALS

Comparison with the Medical Directory shows that 90% of regional pathologists were accounted for on returned questionnaires.

PUBLIC HEALTH LABORATORY SERVICE

Virtually 100% replied.

TEACHING GROUPS

There were no returns from two undergraduate

centres and incomplete returns from two undergraduate and one major postgraduate centre.

Degree of Specialization of Regional Consultants

This survey has provided much more information than has hitherto been available about how pathologists apportion their time between specialties (Table I).

Until recent years many pathologists were appointed as general pathologists, even though they were for the most part to specialize in one of the main subdisciplines. With expansion of the service, others who once had to practise in several departments of the laboratory can now devote more time to a single specialty. Pathologists are much more specialized than appears in current statistics and more perhaps than is generally realized:

42% of all regional board pathologists devote 100% of their time to a single specialty;

52% of all regional board pathologists devote 90% or more of their time to a single specialty;

61% of all regional board pathologists devote 80% or more of their time to a single specialty.

There are wide variations between regions: for instance the proportion of consultants who are highly specialized (devoting 90+ % of their time to a single specialty) ranges from 26% to 84%. These differences seem more to reflect traditional regional policy than the number of small laboratories involved but this must nevertheless constitute another factor.

Consultant Time Devoted to Each Specialty in Regional Board Hospitals

Table II shows the number of consultant 'whole-time equivalents' spent in each specialty recorded

¹An abbreviated version of the report submitted to the Council of the Association of Clinical Pathologists

Regional Board	% Consultants Specialized ²	Morbidity Anatomy						Haematology						Dept. of H. & S.
		Dept. of H. & S.S. ¹	No. of Consultants Devoting % of their Time to the Specialty ²					Dept. of H. & S.S.	No. of Consultants Devoting % of their Time to the Specialty					
			100	90	80	70	60		100	90	80	70	60	
Newcastle	32	3	6	4	4	2	7	—	1	—	—	1	1	—
Leeds	42	2	6	4	5	2	3	1	2	1	—	3	1	—
Sheffield	69	8	13	3	3	—	1	4	5	2	2	1	—	3
E. Anglia	60	3	3	3	1	1	1	—	—	—	—	—	2	—
N.W. Met.	69	21	20	2	—	1	—	11	9	—	1	1	3	4
N.E. Met.	49	5	10	1	2	2	3	3	5	—	1	3	—	1
S.E. Met.	38	—	7	—	2	2	7	—	5	—	1	1	—	—
S.W. Met.	84	18	16	1	—	—	1	12	8	1	—	1	—	10
Oxford	52	—	3	1	1	—	1	2	2	—	—	1	—	—
S. Western	80	7	12	1	1	1	—	1	5	3	—	—	2	9
Welsh	26	—	2	1	2	1	—	—	1	—	—	—	1	—
Birmingham	45	2	8	8	3	4	3	2	1	3	—	2	1	—
Manchester	40	4	12	5	2	6	5	1	6	—	1	2	—	—
Liverpool	38	2	2	5	1	2	1	—	2	1	1	1	1	—
Wessex	49	6	7	—	2	2	5	9	4	—	—	—	1	5
Total		81	127	39	29	26	38	46	56	11	7	17	13	32

Table I Consultants in regional board hospitals classified by region, specialty, and degree of specialization

¹Statistics compiled by the Department of Health and Social Security Statistics and Research Division in February 1970.²Devoting not less than 95% of their time to one specialty. For the purpose of this Table time spent in administration has been reallocated pro rata to the specialties practised by the consultant.

Region	Morbidity Anatomy	Haematology	Chemical Pathology	Microbiology
Metropolitan	76 (38%)	57 (28.5%)	32 (16%)	35 (17.5%)
Southern	47 (44%)	28 (26%)	15 (14%)	18 (17%)
Mid & North	131 (52%)	63 (25%)	22 (9%)	37 (15%)
All	254 (45%)	148 (26%)	69 (12%)	90 (16%)

Table II Consultant whole-time equivalents devoted to each specialty in regional hospitals¹¹Takes no account of PHLS bacteriologists

on questionnaires from regional laboratories. The Table requires some care in interpretation, because time spent by Public Health Laboratory Service (PHLS) bacteriologists on National Health Service (NHS) bacteriology is unknown and has therefore, although substantial, been omitted; moreover the Table takes no account of clinical biochemists, of whom some will be of consultant standing. This will exaggerate the relative proportion of consultant time devoted to morbid anatomy and haematology. Nevertheless the interesting relationship between consultant time spent in morbid anatomy and haematology remains valid. The ratio varies geographically from 1.33:1 in metropolitan regions to 2.12:1 in midland and northern regions. The variation between individual laboratories is much wider—from 0.7:1 to 5:1.

The reason for the variation is not immediately apparent. It might be expected that junior medical staffing would be a factor, since it is much more generous in metropolitan regions than elsewhere

but this seems to have little effect on the difference. Indeed in midland and northern regions a higher proportion (45%) of the available non-consultant time is given to morbid anatomy than in metropolitan regions (35%). There is probably some major factor, possibly the demand for coroner's work, which is responsible for the geographical variation in the morbid anatomy/haematology ratio.

Region	Junior : Consultant Ratio
Northern and midland	0.39
Metropolitan	0.63
Other	0.33

It has long been assumed that morbid anatomy requires more consultant time than haematology, since every specimen requires a consultant examination. But in view of the different ratios shown in Table II and considering the increasing complexity of laboratory control and diagnosis of haematological conditions, it might now be opportune to reflect on which, if any, of these ratios provides the optimal distribution of consultant effort in a regional hospital. There are many laboratories in which haematology and morbid anatomy share equally the consultant time available.

Availability of Specialist Opinion in Each Discipline

Table II suggests that at least in disciplines other than morbid anatomy there may be a shortage of

Chemical Pathology					Microbiology					General		Total	
No. of Consultants Devoting % of their Time to the Specialty					Dept. of H. & S.S. No. of Consultants Devoting % of their Time to the Specialty					Dept. of H. & S.S. No. of Consultants Not Devoting More than 59% of their Time to Any One Specialty		Survey	Dept. of H & S.S.
100	90+	80+	70+	60+	100	90+	80+	70+	60+				
1	—	—	—	—	7	—	—	—	—	35	10	37	45
—	—	—	—	—	1	2	1	—	1	39	7	38	43
5	—	—	1	—	7	4	1	1	—	30	4	46	52
1	—	—	—	—	5	1	1	—	—	14	1	15	27
4	—	—	—	—	8	6	—	1	1	25	10	60	69
1	1	—	—	1	4	2	—	1	—	44	6	41	57
4	—	2	1	—	—	1	—	—	1	46	10	45	46
7	1	1	—	—	10	5	2	—	—	5	5	49	55
1	—	—	—	—	—	3	—	1	—	19	4	19	21
4	—	—	—	—	3	2	—	—	—	17	4	35	37
—	—	—	—	—	7	1	—	—	—	33	10	19	30
—	2	—	1	—	3	2	1	—	—	65	16	56	72
—	—	1	2	—	4	1	—	—	—	55	15	58	64
—	—	—	—	1	1	—	—	—	—	35	10	26	38
—	2	1	—	2	6	1	—	—	—	11	4	31	37
28	6	5	5	4	66	31	5	4	4	473	116	575	693

Table I Consultants in regional board hospitals classified by region, specialty, and degree of specialization—continued

Percentages of 'Patient Requests' arriving at Departments Headed by a Consultant spending 90 + %, 50-89%, or <50% of his Time in the Specialty														
	Morbidity Anatomy			Haematology			Biochemistry				Medical Microbiology			
											90%+			
	90 +	50-89	<50	90 +	50-89	<50	90 +	B/C	50-89	<50	NHS	PHLS	50-89	<50
Newcastle	49	47	4	13	36	51	13	51	5	31		41	3	56
Leeds	57	39	4	20	61	19	18	42		40	41		16	43
Sheffield	69	29	2	77	16	7	37	14	24	25	27	53	8	12
E. Anglia	63	37			69	31	49			51	49			51
N.W. Met.	90	6	4	57	33	10	27	31	6	36	34	26	14	26
N.E. Met.	71	29		32	47	21	29	45	11	15	15	26	17	42
S.E. Met.	29	58	13	34	21	45	33		22	45	28	24	12	56
S.W. Met.	97		3	74	15	11	59	26	4	11	66	15	4	15
Oxford	84	16		61	18	21	15	51	18	16	61		39	
S.West	80	17	3	72	21	7	54	19		27	25	51		24
Wales	31	59	10	17	26	57		40	17	43	8	17	7	68
Birmingham	64	36		30	51	19	18	45	21	16	16	38	22	24
Manchester	39	61		27	25	48		48	18	34	7	17	11	65
Liverpool	33	67		27	34	39	3	32	9	56	3	15	5	77
Wessex	81	19		70	8	22	23	20	57		100			
All Regions	62	35	3	43	31	26	25	32	14	29	24	28	11	37

Table III Availability of specialist opinion in each discipline

specialist opinion. Table III is an attempt to quantify the availability of specialist opinion in each discipline. It shows the likelihood that a patient request will, in the laboratory in which it arrives, go to a department which is under the supervision of a more (90+ %) or less (50-85 %) specialized pathologist, or of an unspecialized pathologist devoting less than half his time to the specialty concerned. In Table II each region and each specialty are separately considered. Table III relies for its meaningfulness on there being in general, although of course not in particular, a positive correlation between the exper-

tise of a consultant in a specialty and the proportion of his time which he devotes to its practice.

There are big differences between regions, but considering first England and Wales as a whole (ie, the last line of the table), about half the country's patient requests arrive at departments in which there is a 90+ % specialized pathologist, or, in the case of chemical pathology, either a chemical pathologist or a top grade biochemist. The actual proportions vary from 62% of patient requests in morbid anatomy to 52% in medical microbiology.

But conversely, considering the likelihood that a

ASSOCIATION OF CLINICAL PATHOLOGISTS MANPOWER ENQUIRY

Hospitals served by $\text{lab}(s)$ included in this form:

NAME OF LABORATORY _____ REGIONAL BOARD _____

Total Deaths and Discharges for 1968

Total O.P. attendances for 1968

Total Patient Requests for 1968

Sub-Group lab(s) included in this form:

in hospitals served by lab(s) included in this form

" " " " " " " "

dealt with

[illegible]

patient request will arrive at a department not supervised by a specialist, 26% of requests in England and Wales go to laboratories where no pathologist devotes as much as half his time to haematology; for microbiology the figure is 37% of requests, for biochemistry 29% of requests and for morbid anatomy 3%. In some regions and for some disciplines there is more than a 50% chance that a request will arrive at a department without a medically qualified specialist (defined in this case as a consultant giving not less than half his time to the specialty). This is so for haematology in two regions, for microbiology in six regions, and for chemical pathology in 10 regions.

It should be borne in mind when considering these figures that when a laboratory has no specialist in a particular discipline that specialty will frequently be served by a consultant who cannot afford to devote more than very little indeed of his time to it. This applies especially to medical microbiology and chemical pathology, in which it was not infrequently

stated that those specialities received 10% or less of a consultant's time.

In more than half the instances in which a '90 + %' microbiologist is available, he is either employed by the PHLS or jointly by the PHLS and NHS.

Staffing of Biochemistry Departments

In Table IV laboratories are classified according to number of patient requests received per annum, and subclassified according to the medical or graduate supervision of the biochemistry department.

Even among the largest groups, those dealing with 150,000+ and 200,000+ patient requests a year, only half have departments of biochemistry in the charge of a chemical pathologist. There are a surprising number of medium-sized laboratories and even some larger which have no biochemist of principal grade, and there are some with no biochemist at all.

Patient Requests	<50,000					<100,000					<150,000					<200,000					>200,000				
Staffing of biochemistry department ¹	0	B/C	PG	TG	C	0	B/C	PG	TG	C	0	B/C	PG	TG	C	0	B/C	PG	TG	C	0	B/C	PG	TG	C
No. of hospitals	16	3			5	29	15	14	2	16	8	11	16	3	15	4	2	9	3	17			4	9	13
% of hospitals within each class	67	12			21	38	20	18	3	21	15	21	30	6	28	11	6	26	9	48			15	35	50

Table IV Staffing of biochemical departments in regional board hospital laboratories

¹If in the laboratory there is a consultant devoting 50% or more of his time to biochemistry the laboratory has been listed under C. C = Consultant, TG = Top Grade biochemist, PG = Principal Grade biochemist, B/C = Basic Grade biochemist, 0 = No biochemist or pathologist devoting as much as half his time to biochemistry.

Fig. 1 Work load in regional pathology laboratories. Patient requests distributed according to the consultant/request ratio in the receiving laboratory or group. Each vertical shape represents 100% of the patient requests undertaken within a region, thus all shapes have the same total area. The width of a shape at any particular level represents the proportion of the patient requests in the region which are received in laboratories having a consultant/request ratio according to the scale marked on the ordinate.

Consultants											
Retirements by 1975					Vacancies of Six Months' Standing					Deficiencies at Present	
Morbid Anatomy	Haematology	Biochemistry	Microbiology	Unclassified	Morbid Anatomy	Haematology	Biochemistry	Microbiology	Unclassified	Morbid Anatomy	Haematology
Newcastle				3				1	1		1
Leeds	2			2				1			
Sheffield	2	1		1		1		1	1	1	
East Anglia	1			1		1				1	3
N.W. Met.	1			4			1			1	1
N.E. Met.	3		2	1		1					1
S.E. Met.	1			1							
S.W. Met.	3	3		2						1	
Oxford				2		1				2	1
S. Western	2	2		1						1	
Wales				2				1			2
Birmingham	3			2							2
Manchester				4		4		1		1	1
Liverpool	1	1		1				1			
Wessex	1			4							
Total	20	7	2	11	30	8	1	6	2	8	12

Table V Future demand for regional consultants

Work Load per Consultant

In most regions most of the work goes to laboratories or laboratory groups in which consultant work load is 39-59,000 patient requests per consultant per annum (Fig. 1). There is a wide scatter in the consultant/request ratios, but the figures are of course subject to the defects and anomalies of the 'patient request' as a unit of work. There are sufficient examples of a level of 49,000 requests/consultant being exceeded to raise the question of whether there is overwork or faulty recording.

Age Distribution among Consultant Pathologists

Figure 2 (page 560) shows the distribution by age and specialty of regional consultant pathologists. Not unexpectedly, the haematologists are a slightly younger than average group, with the chemical pathologists younger still.

Applications Refused for Consultants and Principal Grade Biochemists

It was thought at the time of compiling the questionnaires that the extent of the real demand for consultant pathologists might be masked by the rejection at board or department level of requests for increases in consultant establishment. Accordingly there was included the following question, 'Have any posts (specify) been applied for but turned down at regional board or Ministry level?' Applications refused were as follows:

Consultant chemical pathologists	..	..
Consultant morbid anatomist	..	..
Consultant neuropathologist	..	..
Consultant (specialty unknown)	..	..
Principal grade biochemist	..	..

Vacancies Remaining Unfilled for Six Months

In spring 1969 the number of consultant vacancies of six months' standing in regional hospital board hospitals was 14, of which 10 were in northern regions (Table V). The total number of vacancies will presumably have been 15 or 16 allowing for unreturned questionnaires.

During the period 1 January 1969 to 30 June 1969 Professor K. R. Hill was investigating the outcome of advertisements for consultant pathologists. Information was available concerning 34 (out of a total of 43) advertisements: no appointment was made in 18 cases (8 haematology, 5 bacteriology, 4 pathology). Many of these vacancies were presumably filled before they had remained vacant for six months.

Present Deficiencies in Establishment

In order to avoid overstatement, responders were asked, when answering the question, 'What are your deficiencies in present consultant establishment', to limit themselves to posts for the creation of which application had already been made or would very soon be made. The replies are summarized in Table V. The fact that the number of deficiencies (52) amounts to about one sixth of the total six-year

Establishment		Additional Consultants ¹ Required by 1975							1975 Requirements in Grades Other than Consultants		
Bio-chemistry	Micro-biology	Unclassified	Morbid Anatomy	Haematology	Bio-chemistry	Micro-biology	Unclassified	Total Consultants	Senior Registrars	Registrars	Medical Assistants
		2	3.5	5	1	2.5	7	19			
			4.5	3.5	2	4	5.5	19.5	1	3	
	1		4	2	2	4	3	15			
			1.5	2	1.5	2.5	1	8.5	3	5	
3	2	1	4.5	5	7	6	8	30.5	2	1	1
1	1		6	3.5	4	3.5	2	19			
3		1	3	3	5	4	4	19	2	4	2
2			4	4.5	3.5	3	2	17	4	8	1
			2.5	2.5		1	1	7	1	4	
1			6	2	2	2	4	16	8	1	1
1		3	1.5	3.5	3	2	3	13	1		
	1		8	2.5	3	4.5	4	21	4	5	1
	1	6	5	11	5	9	5	35	6	8	2
1		1	1	2.5	3.5	3	5	15	7	4	
			4	2.5	1.5	2	3	13	2	3	2
12	6	14	58.5	55	44	53	57.5	267.5	41	48	11

Table V Future demand for regional consultants—continued

¹Also includes filling of existing vacancies and replacement of those retiring.

requirement lends some support to the latter figure 330 (see below).

Administration

Although many pathologists have to devote a good deal of their time to administration, it was not the subject of a specific question. However, in 40 cases the proportion of time given to administration was stated: the average was 20%, but the range extended from 5% to 65%, with a mode of 10%.

In the tables time spent in administration has been reallocated pro rata to the specialties practised by the individual.

Cytology

Some responders dealt separately with cytology and others included it in morbid anatomy. It has thus been necessary to count cytology in with morbid anatomy.

Demand for New Consultants in Regional Board Hospitals up to 1975

In comparing probable supply with the likely demand for regional consultant pathologists, the period 1969-1975 seemed short enough for estimates to be realistic and long enough to be useful. It might, in retrospect, have been wiser to have chosen a longer period.

Demand arises from two main sources: retirements and new appointments. The former were calculated from the ages of pathologists and the latter from answer to the questionnaires. Pathol-

ogists were asked for a conservative estimate of their 1975 establishment needs. Table V summarizes the replies. Fractions occur in column 4, because it seemed preferable, where the likely specialty of a new consultant might lie between two alternatives, to regard the demand as half a consultant for each of the specialties concerned. This gives a truer estimate of distribution than consigning the entry to the unclassified heading. Where the specialty of a new consultant could not be determined, or where he would have to cover more than one specialty, he was placed in the unclassified group.

Table V shows a demand on the returned questionnaires for 267.5 consultants during the period up to 1975. This figure takes no account of unreturned and incomplete questionnaires, premature death, and retirement of existing pathologists. Moreover it is improbable that the demand for juniors (Table V) will be met, which is likely to increase the need for consultants. Considering these factors the actual demand over the period is more likely to be in the region of 330.

The distribution between specialties of the pathologists required differs widely from that of those in post (Table VI).

	Distribution (%) by Specialty			
	Morbid Anatomy	Haematology	Chemical Pathology	Medical Microbiology
Pathologists in post	56	24	10	10
Pathologists required during the period 1969/75	28	26	21	25

Table VI Distribution of pathologists required and in post

	Senior Registrars					Registrars				
	Morbid Anatomy	Haematology	Chemical Pathology	Microbiology	Unclassified	Morbid Anatomy	Haematology	Chemical Pathology	Microbiology	Unclassified
England & Wales teaching groups										
University employed	31	15	10	16	3	9	11	6	7	9
NHS employed	11	17	6	7	1	21	18	7	10	12
Scotland all groups										
University employed	9	1	2	6		19	1	1	5	5
NHS employed	4	4	1	4	3	10	4		4	27
England & Wales regional board hospitals	20	9	5	3		26	32	4	5	37
PHLS				18					8	
Total	75	46	24	54	7	85	66	18	39	90

Table VII *Trainees classified by specialty and grade*

Two factors are largely responsible for this situation: (a) the present deficiency of chemical pathologists, haematologists, and bacteriologists, and (b) the assumption often made in the course of compiling Table V that one of the existing pathologists, already spending the larger part of his time doing morbid anatomy, will continue to be a specialist morbid anatomist when the consultant establishment is increased.

Trainees

The pool of future consultants consists mainly of the following: (1) NHS-employed trainees in the grades of senior registrar, registrar, senior house

officer; (2) some of those holding junior academic posts in medical schools and their associated hospitals. For the purpose of this survey grades up to and including lecturer are regarded as trainees. This is further discussed below.

Trainees in teaching groups (medical schools and their associated hospitals) and in Scotland have been divided into three categories: (1) NHS-employed, (2) university employed, but holding an honorary registrarship or senior registrarship classified by NHS grade, (3) university employed with no NHS grade classified according to academic post.

Table VII shows trainees classified by grade and intended specialty. Senior house officers have not

	Birth Status	Senior Registrars		Registrars		Lecturers		Assistant Lecturers		SHO		Total	
		M	F	M	F	M	F	M	F	M	F	M	F
England and Wales Teaching hospitals													
University employed	A ^a	51	15	25	8	39	1	16	5			131	29
	B	5	1	4	1	3		3				15	2
	C	3		4		3		2				12	
NHS employed	A	33	5	31	15					15	3	79	23
	B		1	2	3					2	1	4	5
	C	2	1	11	6					5	4	18	11
		94	23	77	33	45	1	21	5	22	8	259	70
Scotland													
University employed	A	16	2	25	6	22	3	5	2			68	13
	B												
	C												
NHS employed	A	15		25	15					12	3	52	18
	B	1		1								2	
	C			4							2	4	2
		32	2	55	21	22	3	5	2	12	5	126	33
England and Wales regional board hospitals													
	A	27	4	22	5					12	8	61	17
	B	2		10	9					3	1	15	10
	C	4		44	14					24	13	72	27
		33	4	76	28					39	22	148	54

Table VIII *Trainees by grade, sex, and birth for 533 males and 157 females^a*

^aWhere information on the questionnaires has been lacking sex is assumed to be male, and those whose surnames were not clearly either English, Welsh, Scottish, or Irish have been classified as belonging to group C.

^aA = UK born, B = foreign born intend UK career, C = foreign born intend career outside UK.

Lecturers and Research Workers					Assistant Lecturers					SHO	Totals
Morbid Anatomy	Haematology	Chemical Pathology	Microbiology	Unclassified	Morbid Anatomy	Haematology	Chemical Pathology	Microbiology	Unclassified		
29	6	2	8	1	14			5	7	30	189
											140
10	2		8	5	1				6	17	81
										61	78
											202
39	8	2	16	6	15			5	13	108	26
											716

Table VII Trainees classified by specialty and grade—continued

been classified by specialty, since the information was often lacking; moreover at so early a stage in their careers most trainees will not have made a firm decision. Table VIII shows trainees classified by grade, sex, place of birth, and intention to remain in the UK.

It is not easy from these figures to assess the real size of the trainee body. One of the main difficulties lies in the estimation of the proportion of 'trainees' in academic posts who are potential NHS consultants. This is an important consideration because pathology continues to recruit many of its consultants from this source. Whereas most NHS-employed trainees probably intend to become consultants, this is not the case among junior academic staff.

Table IX shows that the three categories of 'trainees' differ in their distribution between specialties and between grades.

Trainee Category	Senior:Junior Ratio ¹	Morbid Anatomy: Haematology Ratio for Senior Registrars and Lecturers
NHS-employed	0.6	1.1
University-employed with NHS grading	1.3	2.5
University-employed without NHS grading	2.19	4.93

Table IX Categories of trainees distributed between specialties and between grades

¹These figures refer only to those intending to practise in UK.

These differences reinforce the suggestion that the groups require separate estimates of their likely yield of consultants, but provide no basis for the estimations themselves. As a result of numerous discussions with colleagues, it has been assumed that half of those with, and one third of those without, honorary NHS grading are trainees, in the

sense that they are in the pipeline leading to NHS consultancy. The remainder will supply needs for academic posts and consultancies within the teaching groups.

The senior:junior ratio is higher among academic staff; this would be expected in the lower ranks of a more stable hierarchy, through which there is orderly progression, ie, the number is greater in the grade having the longer tenure. The very low senior registrar/registrar ratio among NHS-employed trainees is referred to later.

As might be expected, the group of junior academic staff with honorary NHS grading fills an intermediate position between the other two. It presumably contains a higher proportion of potential consultants than the purely academic group, yet many in this category are certainly not trainees. Consideration of age alone makes it obvious that some are permanent members of the staff of their departments.

There is a very high proportion of foreign-born trainees in regional hospitals: 124 out of 202, or more than 61%. The proportion is highest (85%) in the registrar grade and lowest (14%) among senior registrars. In teaching groups the proportions are much lower: 27% of NHS-employed trainees and 14% of those holding junior academic posts.

In order to obtain a realistic estimate of the number of trainees, the following corrections have been applied to the total of the figures: (a) subtraction of those not intending to practise in UK; (b) allowance for deficiencies of 10% and 20% respectively in regional board and teaching hospital returns; (c) multiplication by $\frac{1}{2}$ and $\frac{1}{3}$ respectively of the numbers of those in academic posts with and

NHS-employed trainees	342
University-employed trainees with hon NHS grading	99
University-employed lecturers and assistant lecturers without NHS grading	41
Total	482

Table X Potential consultants

Fig. 2 Age distribution of regional board consultant pathologists by specialty. In each figure the heavy line curve is the overall age distribution of consultant pathologists; the thin line curve relates to the specialty concerned.

without NHS gradings. On this basis the estimated number of trainees who might be potential consultants (Table X).

Consultant Supply and Demand

If the average training period is six years, it would appear that, even allowing for a wastage of 20%, the annual output of consultants from a body of trainees 482 strong would be over 60 per annum. This would be sufficient to satisfy the demand. The actual position is, however, neither so simple nor so favourable as this.

New consultants are seldom appointed other than from the ranks of senior registrars or lecturers. It is therefore from the number in these grades that the annual output should be derived. Applying to the gross figures the same corrections as previously, the numbers of potential consultants in senior training grades are (Table XI):

	England and Wales	Scotland	Total
NHS-employed senior registrars	85	20	105
Honorary senior registrars	45	11	56
Lecturers	18	10	28
Total	148	41	189

Table XI *Potential consultants in senior training grades*

Even if it be assumed that Scotland trains twice as many pathologists as are required for her own consumption, the number of potential consultants for England and Wales now in training is only 169. This is equivalent, if the average time spent in the senior training grades is three and a half years, to an annual output of 48. Thus on the present basis, but making no allowance for wastage from the senior grades, it can be expected that 288 new consultants would become available to fill regional posts in England and Wales during the six years. This must be compared with the demand for 330 consultants over the same period.

Not only is there an apparent absolute shortage of senior trainees, but they are maldistributed

between specialties in relation to the demand. Table XII shows the distribution of a theoretical six-year output of 288 consultants, based upon the specialties of present senior trainees; compared with this is the distribution of the 330 consultants required in the same six years (the 'unclassified' group has been distributed pro rata between the specialties).

Table XII also shows the passes of the MRC Path examination on a notional six-year basis. The distribution is fairly close to that of present senior trainees. The actual number of MRC Path passes is of course considerably higher than the expected output of regional consultants.

The first two lines of Table XII forecast a marked deficiency in trained pathologists in chemical pathology and medical microbiology. There is a smaller deficiency of haematologists, but in the short term it is this which may be more obvious and more serious.

Undesirable though it may be medical microbiology departments have often had to manage with little consultant attention, especially with a PHLS laboratory within call, and clinical biochemists have often to do duty for chemical pathologists; the demand for consultants in these specialties may therefore remain latent. Meanwhile, when pathologists and their regional boards turn to increasing consultant establishments, haematology will probably and perhaps properly be the first specialty to receive attention.

Table XII shows an expected deficiency of haematologists of 12 over six years, but a 10% wastage among senior trainees would increase the deficiency to 20. There is moreover a suggestion in the table that intending haematologists are less inclined to tackle the MRC Path and are less successful when they do so than are their brethren in other specialties.

There is an apparent excess of trainees in morbid anatomy. But even this could be illusory if junior university staff, who are responsible for the excess, are more prone than those in other specialties to adopt academic careers.

It must again be noted in considering the supply and demand position that no allowance has been made in the figures either for wastage from the

	Specialty Distribution According to:	Morbid Anatomy	Haematology	Chemical Pathology	Medical Microbiology	Total
Six-year demand for consultants: 330	Table I	92 (28%)	86 (26%)	69 (21%)	83 (25%)	330
Six-year notional supply: about 48 p.a.	Table VII	125 (43%)	74 (26%)	34 (12%)	55 (19%)	288
Notional six-year MRC Path pass rate (= actual passes May 68-May 70 $\times$ 12/5)	R.C. Path. statistics	202 (46%)	76 (17%)	67 (15%)	98 (22%)	443

Table XII *Distribution of theoretical six-year output of consultants compared with six-year demand*

senior training grades or for death or retirement of consultants before the age of 65. The shortfall in candidates for consultant posts will thus be greater even than is shown.

Public Health Laboratory Service

Although forms from the PHLS were all returned, no figures were supplied for expansion. There are 11 trainees of senior registrar grade, and 11 retirements expected in the period up to 1975. Upon the basis of calculation used here, this rate of training should be sufficient for replacements and with a possible slight excess for expansion.

Blood Transfusion Service

Insufficient replies were received to make analysis profitable. The numbers of medical staff are relatively few and therefore will not substantially alter the findings.

Senior Registrar : Registrar Ratio

If there were no wastage at either registrar or senior registrar level the numbers in each grade would be directly proportional to the time spent therein. If the average tenure of senior registrarship is 3.5 years and that of a registrarship 2 years, the ratio of

senior registrars to registrars (SR/R) would be $3.5 \div 2 = 1.75$.

The actual SR/R ratio is much lower than this: 0.44, or, if foreign-born registrars are excluded from the calculation, 0.84. The ratio has remained unchanged during the period 1967-70; therefore the main contribution to the low ratio must be loss from the registrar grade. Even if only UK-born registrars are considered, it would appear that upwards of half of them do not proceed to senior registrarships.

This loss seems very big, but is not by any means out of the way. Those specialties in which a registrarship is useful for general practice or as a preliminary to entry into other specialties would be expected to have low ratios, but many of the narrower specialties have ratios lower than that of pathology. In fact only two specialties, urology and cardiology, have SR/R ratios significantly higher than that of pathology (Table XIII).

Although pathology does not appear unduly wasteful of its junior trainees, it seems important for those who regulate numbers in these posts to know what happens to registrars who do not proceed to senior registrarship. This is information which the Association might wish to acquire, and it might be worth attempting a retrospective study of, say, the 1965-68 vintages of registrars.

Beyond 1975

The age distribution curve of NHS consultant pathologists is fairly symmetrical (Fig. 2) and has a marked peak in the age group 48-51. There will therefore be a continuously rising retirement rate until the years 1985/88 at which epoch there will be retirements occurring at the rate of 38 per annum, which is equivalent to more than three-quarters of the total annual NHS consultant demand for the next six years. This means that for many years to come it will be necessary to train pathologists in greater numbers than is at present being done.

Envoi

This survey has produced some new information which may be useful now and as a baseline for the future. Its forecasts indicate the need for more trainees in pathology, but can in the nature of things have little effect on the supply of new consultants by 1975. It may encourage trainees to go into the specialties with shortages and may also help boards and others to make the best use of what manpower is available, and possibly to question the present use to which it is put.

	SR/R Ratio	R/SR Ratio
Diseases of the chest	0.090	11.1
General surgery	0.196	5.1
Geriatrics	0.216	4.6
Paediatrics	0.222	4.5
General medicine	0.228	4.4
Gynaecology and obstetrics	0.228	4.4
Traumatic and orthopaedic surgery	0.286	3.5
Anaesthetics	0.333	3.0
Mental illness	0.344	2.9
Neurosurgery	0.384	2.6
Ear, nose, and throat	0.400	2.5
Neurology	0.434	2.3
Thoracic surgery	0.454	2.2
Venereology	0.478	2.1
Physical medicine	0.554	1.8
Pathology, all specialties ²	0.554	1.8
Plastic surgery	0.588	1.7
Ophthalmology	0.625	1.6
Dermatology	0.625	1.6
Radiology	0.667	1.5
Cardiology	0.770	1.3
Urology	1.11	0.9

Table XIII Senior registrar/registrar ratios in 22 specialties¹

¹ From the Department of Health & Social Security R1 Tables for 1969
² The SR/R ratio for pathology is higher than that quoted in the survey. This is probably due to the inclusion in the Department figures of some senior registrars recorded in the survey as primarily university employees. The R/SR ratios are included since they are easier to interpret at a glance.

I am most grateful to all my colleagues who, either by filling in questionnaires or persuading their colleagues to do so, have furnished the data upon which this report is based.

It is a pleasure to acknowledge the assistance of Mr Don Neal of the Nuffield Operational Research Unit, Reading University, whose advice was sought in constructing the questionnaire and subsequently in considering some of the data.

This survey began as a remit to a Council sub-committee, but in the event the information obtained

was more than could be conveniently dealt with by a committee, it thus happens that the report comes from a single pen. I thank my fellow committee members for help and encouragement, and exonerate them from blame for any shortcomings.

Whenever reference is made to statistical information other than that in the report, it has been derived, unless otherwise stated from the R1 tables of the Department of Health and Social Security, Hospital Medical and Dental Staff, England and Wales.

The July 1971 Issue

THE JULY ISSUE CONTAINS THE FOLLOWING PAPERS

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