

The feasibility of postgraduate training programmes

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The report of the Royal Commission on Medical Education (1968) was the first serious attempt to design for Britain a comprehensive system which might reconcile postgraduate training requirements with service needs and ultimate career prospects. The suggested scheme deserves the closest study with regard to feasibility, and because suitable methods of analysis are equally applicable to alternative systems.

Through a study of the practical implications of 'general professional training' we have developed a versatile computer program. This simulates the passage of cohorts of doctors through a given training scheme. The size of the cohorts may represent the output of a medical school or of a whole country. The training scheme can be modelled on the sequences of posts recommended by Lord Todd (Royal Commission Report, Appendix 5) or on any alternative. The procedure then used to 'allocate' posts during the simulation is similar to that developed for pre-registration posts (Clayden and Parkhouse, 1971). Full details will be given in a subsequent paper.

The feasibility of a training scheme depends on the relationship between the numbers of training posts available and the numbers required, the latter depending on the purpose of the scheme. One approach is to examine the career preferences of medical graduates (as in Appendix 19 of the Todd Report) and see whether enough posts are available to satisfy these ambitions. The specialist ambitions of students by no means match the health needs of the community. Table 1 shows, for example, that although over 70% of the final year medical students surveyed by Todd envisaged a career within one of the main hospital specialties, current figures indicate that the proportion of trained doctors in the community who work in these

specialties, including their subdivisions, is only about 25%. The distribution between the specialties also shows (Table 1) how ambitions fail to match career prospects.

An alternative approach, therefore, is to examine the numbers of career vacancies likely to arise in the specialties of the National Health Service, including general practice, and to see whether enough training posts are available to supply these needs. As a third alternative post-graduate training can itself be regarded as a grid which, by virtue of the numbers of posts available, modifies the career ambitions of graduates towards a distribution more appropriate to the opportunities available.

Table 1. *Main hospital specialties: preferences and prospects*

	<i>Approximate % of final year students choosing</i>	<i>Approximate % of doctors practising</i>
Medicine	29	6
Surgery	19	6
Obstetrics and gynaecology	13	1.5
Pathology	2	3
Radiology/radiotherapy	1	2
Anaesthetics	2	3
Psychiatry	6	3
Total	72	25

The first column is derived from the Royal Commission inquiry to final year medical students of 1966; the second column is derived from Department of Health and Social Security figures. Specialties listed include subspecialties.

Some examples

Column 1 of Table 2 shows the existing numbers of senior house officer and registrar posts in the National Health Service in England and Wales in September 1970. Column 2 is based on the career preferences of 4,500 medical students in

1966 reported by the Royal Commission (Appendix 19), and shows numbers of posts required to implement 'general professional training' as suggested by Todd for an annual output of 2,000 graduates. Direct comparison between the columns may be made by assuming that all existing senior house officer and registrar posts would be suitable for general professional training; alternatively the numbers in column 1 can be scaled down on the assumption that any given percentage would be suitable.

Even allowing for the disproportionate number of students who favour a career in general medicine or general surgery there is a surplus of training posts in these specialties. In the specialties less known to students and less likely to be favoured at this stage, for example anaesthetics and radiology, there is apparently a great excess of posts. A number of surgical specialties show a surplus of posts, the outstanding example being orthopaedic surgery and casualty, in which service needs are strikingly dominant. Some medical specialties have a relative dearth of posts so that implementation of the Royal Commission's recommendations concerning the inclusion of specialized experience in the general professional training of physicians, which might

be both desirable and popular, would leave an additional residue of general medical posts. There is no existing single group of doctors corresponding to the proposed Todd specialty of community medicine; the estimated number of 'community medicine' appointments that would be required to implement the Royal Commission recommendations on the basis of student career preferences is 170.

Column 3 of Table 2 is an estimate of the numbers of training posts required to implement general professional training in relation to career prospects. This estimate is obtained by grouping National Health Service specialties according to the nine 'mainstreams' of Todd and deriving a frequency distribution from the existing numbers of consultants and general practice principals as a basis for distributing trainees between mainstreams. Assuming that the distribution of career outlets remained the same as at present, there would be a shortage of posts in dermatology and paediatrics for the training of 2,000 graduates a year. There would be an excess of posts in general medicine and respiratory disease, and in some surgical specialties (not listed). In general surgery, anaesthetics, orthopaedic surgery, radiology, and radiotherapy there would

Table 2. Numbers of posts required, by specialty, on the basis of various postgraduate training requirements

Specialty	Total no. of SHO and registrar posts (England and Wales) September 1970	Nos. of posts at SHO and registrar level (GPT posts) required for annual national output of 2,000 graduates to implement the Todd Report	
		On the basis of student career preferences	On the basis of probable distribution of NHS career outlets
Research	?	208	70
General surgery	1,173	512	200
Neurosurgery	84	52	28
Ophthalmology	259	106	190
Orthopaedic surgery and casualty	1,236	44	28
ENT	286	150	208
Urology	52	54	32
Obstetrics and gynaecology	1,068	822	836
Radiology/radiotherapy	291	14	34
Pathology	385	452	282
Anaesthetics	1,068	118	218
General medicine	1,254	884	392
Cardiology	62	130	24
Dermatology	73	175	196
Infectious diseases	50	12	42
Neurology	86	114	48
Paediatrics	530	372	762
Respiratory diseases	223	112	26
Geriatrics	335	154	222
General practice	?	680	1,422
Psychiatry	718	518	450

be a great excess of posts. There is again a clear discrepancy between training and service needs, since the actual numbers of senior house officer and registrar posts in some specialties showing a 'surplus' – for example general medicine and orthopaedic surgery – have increased considerably between 1968 and 1970. These estimates of numbers of training posts assume a two-year period of training in hospital, in appropriate specialties, for all general practitioners.

To illustrate the uses of the computer model outside the terms of reference of the Todd Report, we made an estimate of the numbers of senior house officer and registrar posts required to comply with the existing requirements for Diploma, Fellowship, and Membership examinations of the Royal Colleges and the Faculties. We do not give a column of figures for this, since the precise numbers of posts required depend very critically on the assumptions made in regard to the types of experience which trainees are likely to seek where a wide range of choice is permitted; for example, the new requirements for the MRCOG state that one year of training should be spent in posts 'other than obstetrics and gynaecology'. It is also necessary, in order to avoid a totally misleading picture, to assume that two years of training in hospital posts is required by all potential general practitioners. With these provisos in mind, and basing the distribution of trainees on the probable distribution of career outlets, it would appear that the present arrangements require considerably larger numbers of senior house officer and registrar posts than the Todd recommendations in certain specialties, for example anaesthetics, radiology and radiotherapy, orthopaedic surgery, and general medicine. This is largely because trainees in these specialties tend to spend the whole of their 'general professional training' period within their specialty, whereas under the Todd scheme there would be greater diversification. Conversely, the present arrangements appear to need fewer posts than Todd in obstetrics and gynaecology, paediatrics and pathology; this is largely because experience in these specialties would be required, according to the Todd proposals, by trainees in other disciplines. An important advantage of simulation techniques of this kind is the ability to estimate how critical various types of change would be in regard to the numbers of posts required.

Comment

The figures given in this paper are relatively crude approximations. For example, it is assumed that within each specialty all trainees follow one of the recommended paths suggested in Appendix 5 of the Todd Report. This is undoubtedly a somewhat unreal assumption; more refined analyses are feasible and smaller specialties or subspecialties not included in Table 2 can be studied.

The output of the medical schools in England and Wales was approximately 1,800 in 1970, and on present estimates will rise to about 3,000 in 1980. The Royal Commission recommended a total output for Britain of 4,000 by the early 1980s. The figures in columns 2 and 3 of Table 2 can be scaled up in order to estimate the numbers of posts that would be required for larger outputs of graduates. It is apparent, for example, that in specialties such as general surgery, anaesthetics, and radiology there would be a considerable excess of posts even to provide for 4,000 graduates a year.

The figures produced represent *average* number of posts required, for 10 successive simulated periods of six months. Larger numbers of posts would be needed to ensure that every doctor was satisfactorily placed on, for example, nine occasions out of 10. This becomes increasingly important if movement over a long distance is to be avoided; in applying our analysis to the Sheffield Region alone it appeared that in order to ensure a '99% chance' of a doctor obtaining a suitable post within the region in obstetrics and/or gynaecology it would be necessary to reserve 68 posts, although in any one six-month period it might happen that only about 30 of these posts were filled by doctors currently in the general professional training scheme. Fluctuations of this size would obviously create difficulties in hospital staffing and working efficiency. Furthermore the probability of obtaining a post of the desired type within the region is by no means the same as the probability of obtaining one specific job. Again, constraints of this type can be incorporated in the simulation for more detailed study.

Conclusion

This is a preliminary report giving examples of the way in which a computer program may be used to simulate the effect of implementing post-

graduate training schemes such as those suggested by the Royal Commission Report on Medical Education (1968). The examples given are over-simplified in many ways, but they illustrate the potentialities of a method of study which should be of interest to those concerned with graduate education and health manpower requirements in a wide variety of situations.

Once a training scheme has been defined, the computer system described in this paper may be used to help day-to-day running. This is an extension of the preregistration procedures currently in use in a number of medical schools,

and would require very small amounts of computer time.

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