TALKING POINT

Trends in episode based and person based rates of admission to hospital in the Oxford record linkage study area

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Most routine health service information systems are based on episodes rather than on people: data are collected and analysed as isolated events, such as individual hospital episodes, and events relating to the same individuals are not routinely brought together. Thus, for example, the Hospital Activity Analysis and the annual Hospital In-patient Enquiry can be used to count episodes of admission to hospital but not numbers of people admitted to hospital. While variation in rates over time or between different populations may reflect differences in the numbers of people treated or variation in multiple admissions per individual, or both, routine statistics cannot generally be used to make these distinctions.

Rates of admission, measured as discharges from and deaths in hospital, have risen steadily in England for many years at an average increase of about 2% a year. There has been speculation about whether this rise has represented a true increase in the number of people treated by the National Health Service or whether it may simply reflect an increase in repeat admissions.^{1,2} In England the Oxford record linkage study may be used to link together successive episodes of admission to hospital for the same individuals and to distinguish between episodes of admission to hospital and numbers of individual people admitted to hospital in a large, defined population.³ In this paper we present some general findings comparing trends in episode based and person based rates of admission.

Methods

The Oxford record linkage study is a collection of brief abstracts of hospital inpatient records, similar to the Hospital Activity Analysis, which it preceded, together with data from birth registrations and death certificates. The data are collected in such a way that records relating to the same individuals may be linked together and analysed to produce unduplicated counts of numbers of people.

Data have been collected for the Oxford record linkage study since 1963 in the original study area that comprised part of Oxfordshire (covered population 350 000). From 1966 the area covered by data collection expanded to include the whole of Oxfordshire and West Berkshire (population 900 000). During the early 1970s the area covered by data collection gradually increased and by 1975 it covered six of the eight present districts in the Oxford region (population 1.9 million). During 1984 data collection expanded further to cover the whole Oxford region (population 2.3 million).

We followed the usual convention of counting "discharges from and deaths in hospital," but for simplicity these are referred to as admissions in the text. In this way we calculated for each year the all ages admission rate, the age specific admission rates in quinquennial age bands, and age standardised admission rates. The data were analysed in this way, firstly, using the unlinked hospital episodes as the units of analysis and, secondly, using individual people admitted during each year as the units of analysis. For the latter, the analyses were based on the linkage of records relating to the same individuals within calendar years. Thus, for example, an individual admitted five times in a calendar year is counted as one individual admitted in that year; an individual admitted five times in one year and five times in the next is counted as an individual admitted once in the first year and once in the second year. We also calculated the average number of episodes of admission to hospital per person admitted to hospital in each age group in each calendar year. For ease of presentation and because of variation in geographical coverage and the size of the population covered over the years the results in this paper are confined to the data for Oxford in 1963, Oxfordshire and West Berkshire from 1968 to 1984, and the six health districts covered from 1975 to 1984. In all the analyses records were included if the patient was both resident in and treated in the relevant area. Psychiatric and obstetric discharges are excluded from this paper.

Results

The table shows the number of episodes of admission to hospital per 100 people admitted by age group, within selected calendar years. It shows how in general repeat rates of admission rise with increasing age. The table also shows that there has been an increase in repeat rates of admission over time, notably in the elderly age groups.

Figure 1 shows episode based and person based admission rates from 1968 to 1984 in the original two record linkage study districts; and from 1975 to 1984 in the six districts covered during these 10 years. The all ages (unstandardised) rates are shown, rather than age standardised rates, so that the impact of demographic change and, in particular, the increasing proportion of elderly people in the

Average number of episodes of inpatient care per 100 people admitted to hospital

Age group (years)	Oxfordshire (part) 1963-5	Six health districts 1975-7	Six health districts 1982-4
0-4	116.4	117.9	125.3
5-14	112.0	114.2	115.4
15-24	115.3	117.0	116.9
25-34	119.2	118.5	118.9
35-44	124.4	122.5	122.0
45-54	131.0	129.0	130.8
55-64	135.3	137.0	142.2
65-74	138.7	144.7	149.2
75-84	140.0	148.0	157.0
85+	139.5	152.9	163.4

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FIG 1—Episode based and person based admission rates from 1968 to 1984 in the original two record linkage study districts, and the rates in the six health districts covered in 1975-84.

population is not standardised out of the figures. The profile shown by the age standardised rate is similar to that in figure 2 except that the upward trends are, as expected, slightly flatter. In summary, over the past 10 years about 80% of the annual increase represented an increase in the number of individuals admitted to hospital each year; and about 20% represented a rise in multiple admissions per person per year.

Figure 2 shows the ratio of admission rates in the three years 1982-4 to those in the three years 1975-7 for men and women in each age group. (Ratios were calculated on three year values because of the variability in discharge rates across single years.) It can be seen that both episode based and person based rates of admission have risen in all age groups but with differences in the magnitude of the rise between age groups.

FIG 2—Ratio of age specific admission rates in 1982-4 to those in 1975-7 for men and women.

Discussion

The availability of linked records means that rates of hospital admissions can be analysed in relation both to episodes of hospital care and to individuals receiving such care. The introduction of the recommendations of the National Steering Group on Health Services Information will facilitate linkage of hospital records in a district (although not across districts).⁴ Hitherto, the Oxford region has been the only large area in England where linkable hospital data have been routinely collected.

The rise in episode based rates of hospital admission in England has been the subject of professional, political, and public interest. On the one hand, it has been suggested that the rise indicates that each year more people than ever have received hospital care; on the other hand, there has been speculation that the rise may simply represent an increase in multiple admissions per individual.

In the Oxford region both factors have contributed to the rise in rates of admission. The rise in rates of readmissions per individual no doubt reflects, at least in part, policy moves towards planned discharge and readmission particularly in the care of the elderly. Our data also show a rise in repeat admissions classified as emergencies. Analysis of patterns of planned and emergency readmissions since 1963 in the Oxford record linkage study area will be the subject of further work. We cannot judge whether readmission patterns in the Oxford region have been similar to those elsewhere. Lengths of hospital inpatient stay in this region are among the lowest in the country. If lengths of stay prove to be related to readmission rates Oxford might have higher readmission rates than elsewhere for this reason.

Increases in both episode based and person based admission rates were seen in all age groups, each district, and most clinical specialties over the 21 year period covered by the data. Explanations for the rise are beyond the scope of this study but possibilities include advances in clinical practice, rising expectations for and standards of clinical care, increases in staffing and funding levels over the 21 years resulting in an increase in the NHS's capacity to meet patients' needs, perhaps lowered thresholds for admission or readmission or both, and perhaps an increase in the prevalence of some of the conditions requiring admission to the hospital in the population. As elsewhere in England the decline in lengths of stay in Oxford has been greater than the increase in admission rates with the net result of a decline in the numbers of beds used during the period.¹

Our data no doubt underestimate the total rise in hospital inpatient care because during the period covered by the data there has also been an increase in hospital admissions in the private sector.⁵ Will rates of admission to hospital continue to rise further? There is, presumably, a limit to the volume of medical care which a

Review body prices new staff grade

The BMA has described the salary scale announced for the new career grade of staff doctor as "attractive for doctors who want to remain working in the hospital service but do not aim for consultant posts." In *Supplement to Seventeenth Report 1987* the doctors' and dentists' review body has responded to joint evidence from the professions and the government by proposing a seven point scale ranging from £13 720 to £20 470, a scale that will be reviewed along with the pay of other NHS doctors in April 1988.¹ In accepting the review body's proposals the Minister for Health described the introduction of this new career grade as a "key element" in the package of manpower reforms for hospital doctors agreed between the profession and the government last year.²

The review body's report, published on 9 February, is reproduced below along with a table comparing the scale for the new grade with those of other non-consultant grades. Entry requirements for the staff grade will be a minimum of three years as a senior house officer, including training in the relevant specialty (7 November 1987, p 1220).

Staff grade salaries compared with other hospital grades

Senior house officer (£)	Registrar (£)	Staff grade (£)	Associate specialist (£)
10 980	12 460	13 720	15 240
11 720	13 090	14 845	16 890
12 460	13 720	15 970	18 540
	14 350	17 095	20 190
	15 110	18 220	21 840
		19 345	23 490
		20 470	25 700

Agreement has yet to be reached, however, on the superannuation arrangements for sessions above the 10 four hour sessions a week on which the salary scale is based. The BMA has warned potential recruits to the grade about this hiatus, and Dr Dallas Brodie, chairman of the Hospital Junior Staff Committee, commenting that the staff grade is acceptable, has called for urgent resolution of the superannuation arrangements for those doctors working more than 10 sessions.

Mr A J P Ross, chairman of the Central

Committee for Hospital Medical Services, cautions that the success of the new grade will depend on the continuation of the expansion in the number of consultants. He describes the new grade as value for money for the health authorities and as providing opportunities for doctors now being offered clinical assistant posts with no security of tenure.

References

- 1 Review Body on Doctors' and Dentists' Remuneration. *Supplement to seventeenth report 1987*. London: HMSO, 1988. (Cmd 309.)
- 2 UK Health Departments, Joint Consultants Committee, chairmen of regional health authorities. *Hospital medical staffing: achieving a balance: plan for action*. London: DHSS, 1987.

Review body report

"We have recently received joint written evidence from the Health Departments and the professions on a new grade—to be called the 'staff' grade—and have taken oral evidence from both parties separately. The proposal to introduce a new hospital intermediate grade was included in the consultative document, *Hospital Medical Staffing—Achieving a Balance*, which was issued by the DHSS in July 1986 on behalf of the Health Departments, Joint Consultants Committee and chairmen of Regional Health Authorities. We are now in a position to recommend an appropriate salary structure for the staff grade, at rates effective from 1 April 1987.

"The parties have described the main purpose of the grade as contributing to the support available to consultants at an intermediate level of experience so as to offset, in part, expected reductions in registrar posts and to reduce reliance on unplanned clinical assistant appointments. The grade is intended to provide a satisfactory hospital career for those practitioners unable or unwilling to complete higher specialist training. The posts will be offered in any specialty, but particularly in specialties with recruitment difficulties, or where reductions in the training grades are expected, or where reliance on multi-session clinical assistants is high. It is intended that practitioners in the grade will spend substantially the whole of their contracted time working, on-call duties being minimal.

"The parties have agreed that staff grade contracts should be for four hour sessions and that basic salary should relate to a minimum average commitment of 10 such sessions, with a liability to deputise for certain absences and undertake additional duties in exceptional circumstances. Contracts may specify three regular additional sessions and, exceptionally, one temporary additional session. Time off in lieu, or where this is

Mr A J P Ross, chairman of the Central Committee for Hospital Medical Services, who describes the new grade as "value for money."

impracticable, the equivalent of one session at locum rates, will be granted for cover outside normal contracted hours. The maximum possible remuneration would therefore relate to an exceptional commitment of 60 hours, equivalent to 15 sessions.

"The parties state that the minimum entry requirement to the staff grade will be three years' service in the senior house officer grade with training in the relevant specialty. Practitioners on appointment will be expected to be capable of tasks carried out by experienced senior house officers or first year registrars. More experienced entrants will be paid higher up the incremental scale. It is intended that continuing education will be available to enable practitioners in the grade to update and improve their skills with a reasonable prospect, for those suitably qualified, of being regraded to associate specialist. Exceptionally, where a practitioner wishes to compete to re-enter a training grade, he or she will be entitled to salary protection if successful.

"We have been asked to recommend a basic annual salary relating to a 10 session commitment, together with locum rates per session and per week related to the mid-point of the basic scale. The parties suggest that a scale comprising a minimum and six incremental points should reward the varying levels of experience encompassed by the grade. They suggest that the minimum point of the scale might be the second incremental point of the registrar scale and the maximum point approximately the mid-point of the associate specialist scale.

"The parties' suggestions are made on the

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population needs and, of course, also a limit to what it can afford to provide. The fact that rates of admission to hospital tend to be considerably lower in England than in many other developed countries,⁶⁷ that the prevalence of self reported chronic illness in England seems to have risen,⁸ that the number of elderly people in the population continues to rise, and that the trend in admission to hospital over the years has been steadily upwards all suggest that the pressure for hospital care may continue to rise.

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- 1 Department of Health and Social Security. *The health service in England. Annual report 1985-86*. London: DHSS, 1986:31-4.
- 2 Maynard A, Bosanquet N. *Public expenditure on the NHS: recent trends and future problems*. London: Institute of Health Services Management, 1986:17-9.
- 3 Acheson ED. *Medical record linkage*. Oxford: Oxford University Press, 1967.
- 4 Department of Health and Social Security. *Steering group on health services information: first report to the Secretary of State*. London: HMSO, 1982. (DA(82)13.)
- 5 McPherson K, Coulter A, Stratton I. Increasing use of private practice by patients in Oxford requiring common elective surgical operations. *Br Med J* 1985;291:797-9.
- 6 Kohn R, White KL. *Health care: an international study*. Oxford: Oxford University Press, 1976.
- 7 Maxwell RJ. *Health and wealth. An international study of health-care spending*. Lexington: DC Heath and Company, 1981.
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