TALKING POINT

Per capita expenditure of the English area health authorities

J H RICKARD

The Resource Allocation Working Party, comprising NHS administrators and DHSS officials, has now made its first interim report¹ on the distribution of health care resources for 1976-7 between regional health authorities. The report is still being widely discussed.² Public interest will now be turning to the even more complex questions of subregional allocations and, in particular, the degree of inequality in the distribution of resources between the 90 area health authorities.

Before the 1974 reorganisation the boundaries of regional hospital boards did not necessarily coincide with the catchment areas of their hospitals and, more particularly, hospital management committees or the boards of teaching hospitals were not responsible for specific geographical areas. Furthermore, community health services had different administrative areas. With such a complex mesh of services and areas it was not meaningful to relate the level of provision to populations. Discussion of inequalities had to be confined to considering broad differences between the 14 regions, though it was suspected that differences within regions might be greater than differences between regions. Since reorganisation it has been possible to consider differences between much smaller divisions. This paper relates to the 90 area health authorities.

Equality criterion

The provisional criterion of equality adopted is that each area should have the same volume of resources at its disposal in relation to the population it serves. While this ignores the contribution of capital, there is a close correlation between current expenditure and the numbers of hospital beds. No allowance has been made for epidemiological, social, or environmental factors which influence the "needs" of each population. Nevertheless, while the simple division of total expenditure by geographical population gives an incomplete picture³ we have made an adjustment for other critical factors. For example, in a detailed study of the Oxford region⁴ it was shown that the boundary crossover of patients and the above average costs of regional specialties and teaching hospitals explained the greater proportion of variation and had the effect of making the inequalities appear greater than was actually the case. Having adjusted for these factors it was presumed that the remaining differences indicated the true differences in the level of services.

Breakdown of expenditure

The techniques used in the Oxford study have been applied to all the areas in England and the resulting estimates are given in the table. Expenditure for 1972-3 has been attributed to each post-1974 area health authority, broken down by the following services: (a) non-psychiatric, general hospitals; (b) psychiatric hospitals; (c) community health services. Expenditure on family practitioner services was not included because, apart from administrative costs, this is not taken from the sum which can be distributed at the discretion of RHAs and AHAs.

Hospitals were grouped according to the AHA which administers them, taking into account all relevant agency and contractual arrangements. Expenditure data on inpatient, outpatient, and daypatient hospital services for 1972-3 were taken from the cost returns and aggregated for each AHA. Using this method, we omit the small element of non-costed expenditure on services such as peripheral clinics and blood transfusion but this should not affect the conclusion appreciably. Senior medical salaries are included. General and psychiatric hospitals (mental illness and mental handicap) were considered separately because of differences in catchment populations.

Expenditure on community health services for 1972-3 was esti-

mated from returns made to the DHSS. Where the cost of the ambulance service was not included with other expenditure, as for example in London, it was distributed between the AHAs in proportion to other expenditure.

Details of the adjustments to the expenditure on general hospitals are as follows:

(a) Net cross-boundary flows of patients were calculated by taking from Hospital Inpatient Enquiry (HIPE) for 1970 the numbers of deaths and discharges by location of residence and then compared with deaths and discharges by hospital from SH3. In totalling the SH3 figures, psychiatric hospitals, psychiatric wards in general hospitals, preconvalescent, and convalescent hospitals were excluded as their patients are not included in HIPE. The net flow for each AHA, positive and negative, was then multiplied by the coefficient

$$\frac{\text{population England}}{\text{total deaths and discharges in general hospitals}} = 10.1876$$

Adjustments were also made for agency agreements. The result was an estimate of the notional catchment population served by the hospitals of each AHA.

(b) Boards of governors hospitals—that is, the few postgraduate teaching hospitals—are not funded by AHAs but do provide a service for the people in an AHA's notional catchment population. For those areas in which a board of governors hospital is located, two figures are calculated: the first includes the expenditure of the hospital and the estimated notional catchment population served, and the second excludes these figures.

(c) Specialist hospitals providing regional or national specialties were treated separately. A list of these hospitals was drawn up with advice from the Regional Planning Division of the DHSS. The essential criteria for including a hospital in the list were that more than 25% of the case load was devoted to the "unusual" specialty and also that the average unit cost of the hospital was greater than the national average for that type, or similar type, of hospital.

Allowance was then made by subtracting the total expenditure and the notional catchment population served—that is, cases $\times$ 10.1876—from the area totals.

(d) An arbitrary 6% of total expenditure was subtracted from each metropolitan AHA to allow for London salary weighting.

(e) Teaching costs were estimated in an approximate way by comparing the unit costs of the former teaching hospitals, which are now administered by the AHA(T)s, with the national average unit costs for the non-teaching hospitals of the same type. London and provincial teaching hospitals were treated separately. The percentage differences were then applied to total expenditure and deducted from the expenditure of the AHA(T)s.

Discussion

The figures given in the table are estimates. The boundary crossovers were calculated from HIPE, which is a 10% sample, and the data may be unreliable. There is also the point that some boundary crossovers may arise because of the inequality of provision so that it could be argued that we have compensated for them unnecessarily. Furthermore, no allowance has been made for differences in capital stock, though, in general, it is the case that areas with above average per capita current expenditure also have above average hospital beds per capita. But the most important reason why these data cannot be taken as definitive is that the populations have not been weighted to reflect differences in morbidity or age/sex distribution: if they had been weighted for relative "need" it might make the inequalities appear less, or greater.

Forty-nine AHAs are within £3 per capita of the national average expenditure per capita of £19.03 on general hospitals. The adjustments used are probably not sufficiently precise to distinguish between these. Nineteen areas, however, have

expenditure of over £3 greater than the national average and 22 have over £3 less than the national average: these illustrate the scale of the adjustments which might need to be made. It is debatable how far the extremes—the highest, Liverpool, with £43.99 per head and the lowest, Leicestershire, £10.72, are artifacts of the methods used or genuine differences.

Our work has been concentrated on general hospitals which account for the greater part of the expenditure. Because patients in psychiatric hospitals are not included in HIPE, it was not possible to calculate crossboundary flows and notional catchment populations. Expenditure was divided by geographical populations amended for agency arrangements and the considerable variations—some areas record nil expenditure per head—reflect the uneven distribution of psychiatric hospitals

*Per capita expenditure 1972-3 based on notional populations**

	Community health	General hospitals	Psychiatric hospitals	All services
Cumbria	4.02	19.70	3.51	27.23
Durham	3.47	29.29	5.46	38.22
Northumberland	4.19	17.81	14.62	36.62
Cleveland	3.56	28.68	1.39	33.63
Newcastle upon Tyne	4.15	20.95	4.81	29.91
North Tyneside	3.17	15.83	—	19.00
Gateshead	3.43	17.56	4.49	25.48
South Tyneside	3.44	25.80	—	29.24
Sunderland	3.54	15.91	3.89	23.34
Northern Region	3.69	21.41	4.32	29.42
Humberside	3.31	20.91	3.63	27.85
N Yorkshire	3.53	17.12	5.23	25.87
Bradford	3.53	18.10	4.23	25.85
Leeds	3.14	22.84	3.94	29.92
Calderdale	3.60	19.33	3.86	26.79
Kirklees	3.47	18.97	5.27	27.71
Wakefield	3.47	17.48	7.98	28.93
Yorkshire Region	3.39	19.48	4.60	27.47
Derbyshire	3.21	13.50	4.88	21.59
Leicestershire	3.24	10.72	4.09	18.05
Lincolnshire	3.43	14.01	7.01	24.45
Nottinghamshire	3.37	15.21	3.61	22.19
Barnsley	3.50	17.58	—	21.08
Doncaster	3.44	16.65	3.18	23.27
Sheffield	3.70	22.77	5.59	32.06
Rotherham	3.74	13.69	—	17.43
Trent Region	3.39	15.13	4.17	22.69
Cambridge	3.08	15.77	3.16	22.01
Norfolk	3.26	15.14	5.57	23.97
Suffolk	2.80	18.00	4.86	25.66
E Anglia Region	3.06	16.09	4.68	23.83
Bedfordshire	3.75	13.89	4.70	22.34
Hertfordshire	3.52	18.10	8.19	29.81
Barnet	4.18	22.37	5.15	31.70
Brent and Harrow	3.63	25.60	5.36	34.59
Ealing, Hammersmith and Hounslow	4.49	21.74	3.37	29.60
Hillingdon	3.89	18.62	—	22.51
Kensington, Chelsea and Westminster	4.62	24.56	7.62	36.80
North-west Thames Region	3.96	21.24	5.46	30.66
Essex	3.44	19.02	5.51	27.97
Barking and Havering	3.68	21.15	5.28	30.11
Camden and Islington	6.57	26.21	6.16	38.94
Enfield and Haringey	3.66	28.11	0.11	40.84
Hackney, Newham, etc	4.47	30.66	0.73	34.88
Redbridge and Waltham Forest	4.01	29.68	—	35.65
North-east Thames Region	4.05	21.68	4.56	32.79
E Sussex	4.03	24.34	—	32.95
Kent	3.37	18.10	3.65	29.36
Bexley and Greenwich	4.88	17.52	6.76	28.23
Bromley	2.60	27.52	4.96	37.36
Lambeth, Lewisham and Southwark	5.69	22.23	6.07	30.90
South-east Thames Region	3.59	24.36	2.15	32.20
			4.43	30.19
				29.72

*Notional Catchment Population:

(1) General hospitals—geographical population adjusted for boundary crossover of patients, agency arrangements, and board of governors hospitals.

(2) Psychiatric hospitals—geographical populations adjusted for agency arrangements.

(3) Community health—geographical populations.

Expenditure of hospitals has been amended to take account of teaching costs, London weighting, and specialist hospitals.

(4) Area expenditure is shown with and without the appropriate board of governors hospital expenditure.

	Community health	General hospitals	Psychiatric hospitals	All services
Surrey	3.90	20.74	9.96	34.60
W Sussex	3.25	17.07	5.48	25.80
Croydon	3.68	20.66	9.95	34.29
Kingston and Richmond	4.42	23.40	8.50	36.32
Merton, Sutton and Wandsworth	4.38	25.65	8.69	38.72
South-west Thames Region	3.90	21.62	8.64	34.16
Dorset	3.09	17.90	3.66	24.65
Hampshire	3.38	16.17	5.15	24.70
Isle of Wight	3.50	16.63	5.88	26.01
Wiltshire	3.42	17.41	4.68	25.51
Wessex Region	3.33	16.90	4.74	24.97
Berkshire	3.85	17.89	3.83	25.57
Buckinghamshire	4.04	16.40	2.92	23.36
Northants	3.78	15.41	3.87	23.06
Oxfordshire	3.95	17.94	4.61	26.50
Oxford Region	3.91	17.12	3.83	24.86
Avon	3.82	22.22	7.70	33.74
Cornwall and Isles of Scilly	3.63	16.73	4.74	25.10
Devon	3.55	16.93	5.88	26.36
Gloucestershire	3.85	15.63	3.09	22.57
Somerset	3.65	16.08	8.75	28.48
S Western Region	3.70	17.91	6.11	27.72
Hereford and Worcester	3.69	16.63	5.96	26.28
Salop	3.38	16.20	—	19.58
Staffs	3.44	12.11	3.37	18.92
Warwickshire	3.29	14.23	7.11	24.63
Wolverhampton	3.50	14.85	—	18.35
Walsall	3.04	11.06	5.03	19.13
Dudley	3.60	19.01	—	22.61
Sandwell	3.46	13.68	—	17.14
Birmingham	3.48	19.40	4.38	27.26
Solihull	3.34	12.57	5.64	21.55
Coventry	3.25	18.14	—	21.39
West Midlands	3.43	15.90	3.36	22.69
Cheshire	3.44	20.12	7.55	31.11
Sefton	5.54	17.49	2.05	25.08
Liverpool	2.73	43.99	7.45	54.17
St Helen's and Knowsley	3.19	17.37	—	20.56
Wirral	3.25	19.47	—	22.72
Mersey Region	3.47	23.70	4.34	31.51
Lancashire	3.84	18.42	6.31	28.57
Wigan	3.36	15.26	—	18.62
Bolton	3.11	18.43	—	21.54
Bury	3.61	16.39	—	20.00
Rochdale	3.50	21.90	—	25.40
Salford	4.04	20.29	9.36	33.69
Manchester	4.19	28.11	—	32.30
Oldham	3.97	16.96	—	20.93
Trafford	3.74	15.52	—	19.26
Stockport	3.35	19.68	1.03	24.06
Tameside	3.33	14.12	—	17.45
N Western	3.73	20.05	2.78	26.56
England	3.74	19.03	4.54	27.31

and this is unlikely to describe true differences in the levels of service.

By contrast, there is no problem of boundary crossovers with community health and the figures are representative of the services. Variations in expenditure are less than for hospital services. There is no evidence that expenditure on community health is increased to compensate for below-average hospital expenditure or vice versa.

The total expenditure in the table is, of course, the sum of the others and includes any errors and inaccuracies in the components. The exercise has been exploratory, but, while reliance should not be placed on individual figures, they serve as a starting point for further discussion.

Any views expressed in this paper are entirely personal and should not be ascribed to the Department of Health and Social Security.

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¹ *First Interim Report of the Resource Allocation Working Party*. London, DHSS, 1975.

² *British Medical Journal*, 1975, 4, 66.

³ Buxton, M J, and Klein, R E, *British Medical Journal*, 1975, 1, 345.

⁴ Rickard, J H, *The Allocation of Revenue Expenditure between Areas in the Reorganised Health Service*. Oxford Regional Health Authority, 1974.

Economic Advisers Office, Department of Health and Social Security, London W1P 8AD

J H RICKARD, MA, MSC, economic adviser