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Correspondents are urged to write briefly so that readers may be offered as wide a selection of letters as possible. So many are being received that the omission of some is inevitable. Letters must be signed personally by all their authors.

Regional variations in the incidence of urinary stones

SIR,—In their interesting article (14 January, p 67) Drs D J P Barker and S P B Donnan, using hospital discharge data from the Hospital Inpatient Enquiry, suggest that the incidence of upper urinary tract stones varies from region to region in England and Wales, with a generally higher incidence in the southern regions. They speculate that these variations may be related to regional differences in diet or occupation or may depend in part on associations with atmospheric temperature, exposure to ultraviolet radiation, and hardness of drinking-water.

They show their awareness of the need for care in interpreting hospital discharge summary data (difficulties which for the most part apply also to Hospital Activity Analysis) by correcting for the sampling factors, combining cases of renal and ureteric stones and those of renal and ureteric colic, and concentrating on emergency admissions to lessen (though not eliminate) possible biases resulting from repeated admissions.

When all these precautions have been taken, however, the discharge rates with which we are left remain primarily measures of hospital usage for the conditions concerned, and the size of these rates depends partly on the true incidence of the condition in the population and partly on the factors which govern hospital admission. One of the most important of these factors is the availability of hospital beds, and it is well known that the regional rates of hospital bed provision differ markedly. It is possible, therefore, that despite the precautions taken the differences

in "incidence" rates described are merely reflections of the difference in rates of bed availability.

In order to test for an association between the two the discharge rates considered in the article to be the most sensitive indicators of incidence—namely, the combined average annual emergency admission rates per 100 000 population for renal and ureteric stones and renal and ureteric colic—were correlated with the regional rates of the average numbers of beds available daily in general surgery and urology (the specialties most likely to receive these cases) in 1971 (near the midpoint of the survey period) derived from the DHSS

National Summary of Hospital Statistics (SH3). The regions were ranked in descending order of rate of bed availability and a measure of the correlation of these rankings with those in descending order for discharge rates was obtained (see table below).

The two series of rates were positively correlated with a probability of less than 5% that this was a chance finding. Positive correlations were also obtained, though this time at the 10% level of significance, between the levels of bed availability and the combined average annual total admission rates for renal and ureteric stones and renal and ureteric colic (table III in the article) and between bed availability and operation rates for removal of stone in cases with renal stone as the main diagnosis (table VI in the article). In order to see whether admission rates for other acute surgical conditions might also be related to regional bed supply the rank order correlation was calculated for the rate of average

Relationship between rates of average number of hospital beds available, general surgery and urology, per 100 000 population, 1971, and combined average annual emergency admission rates per 100 000, 1968, 1970, 1972, and 1973, for renal and ureteric stones and renal ureteric colic

Region	Beds per 100 000	Rank order	Emergency admission rates per 100 000	Rank order
NE Metropolitan	95.8	1	36.7	4
Liverpool	94.3	2	29.0	10
NW Metropolitan	84.0	3	40.6	2
SE Metropolitan	82.2	4	31.2	8
SW Metropolitan	81.3	5	38.2	3
Newcastle	80.3	6	28.4	13
Wales	79.7	7	45.2	1
Manchester	73.9	8	28.9	11
Leeds	68.5	9	34.4	6
South-western	62.3	10	34.3	5
Wessex	61.4	11	26.8	14
Birmingham	61.0	12	28.5	12
East Anglia	59.5	13	30.0	9
Sheffield	54.4	14	22.5	15
Oxford	51.1	15	31.3	7

Spearman's rank order correlation coefficient = 0.443 ($P < 0.05$) (one-sided test).