

# Bed usage and disease specific mortality within ICD chapters

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**SUMMARY** Using Hospital In-Patient Enquiry (HIPE) data (Department of Health and Social Security and Office of Population Censuses and Surveys, 1974), the relationship between mortality and bed usage was examined for a number of disease categories within 10 chapters of the *International Classification of Diseases (ICD)* (World Health Organisation, 1967). There was found to be significant correlation within six chapters for males and within six chapters for females. The use of standardised mortality ratios (SMRs) in the formula of the Resource Allocation Working Party (RAWP) (Department of Health and Social Security, 1976) for certain chapters where no correlation could be demonstrated is questioned. It is suggested that separate SMRs for urinary disease and genital disease should be used and that the SMRs for Chapter XVII (accidents, poisoning, and violence) should either be omitted from the formula or determined separately for subdivisions of the chapter.

Since the publication of the report of the Resource Allocation Working Party (RAWP) (Department of Health and Social Security, 1976), the concept of using standardised mortality ratios (SMRs) as a weighting factor in the formula for determining the allocation of resources for non-psychiatric hospital services has been the subject of a continuing debate. Most of this has centred on the acceptability of using mortality as a proxy measure of morbidity (Barr and Logan, 1977; Forster, 1977). One aspect of the RAWP's proposals which deserves closer scrutiny is the recommendation that for the purposes of applying the formula, SMRs should be calculated for broad groups of conditions in accordance with the chapter headings of the *International Classification of Diseases (ICD)* (World Health Organisation, 1967). Each chapter encompasses a wide range of diseases, not all of which make heavy demands upon hospital resources, and not all of which are important causes of mortality. This study sets out to examine how closely the mortality in individual disease categories in each chapter heading correlates to the demand made by those categories upon hospital beds.

## Method

Reference was made to table 9 of the Hospital In-Patient Enquiry (HIPE) for 1972 (Department of Health and Social Security and Office of

Population Censuses and Surveys, 1974), and table 17 of the review (Part 1) for the same year (Office of Population Censuses and Surveys, 1976a). Each of the broad groups to which the application of SMRs had been proposed by the RAWP was subdivided according to the modification of the ICD 'A' list used in table 9 of the report on HIPE. The estimated average number of beds used daily for each disease category was then compared with the number of deaths attributable to that category. Separate scatter diagrams were constructed for males and females within each broad group, except Chapter IV for which no suitable subdivisions were found to exist. The Figure illustrates one diagram for Chapter X.

## Results

Pearson's correlation coefficient ( $r$ ) was calculated for each set of data and tests of significance were applied using Student's  $t$ . The findings are summarised in Table 1.

## Discussion

The significant level of correlation between bed usage and mortality found to exist for the disease categories within Chapters II, VI, VII, VIII, and XIII of the *ICD*, tends to support the use of SMRs for these five groups as a weighting factor for resource

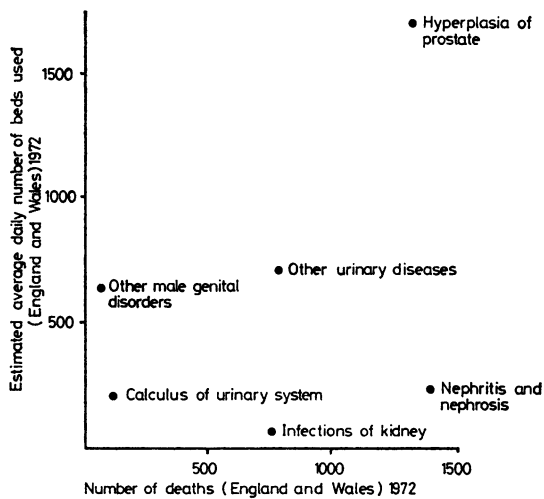


Figure Diseases of the genitourinary system in men.

allocation. The subgroups examined within Chapter III were too few to produce any statistically significant results. The relatively poor correlation for the categories within Chapter X (diseases of the

genitourinary system) and Chapter XVII (accidents, poisoning, and violence) poses the question whether SMRs for these groups are an appropriate weighting factor: the findings suggest that diseases which make most demands upon hospital beds may not be those which contribute most to mortality. This does not necessarily invalidate the adoption of these ICD chapter headings in the RAWP's formula, since it is possible that the SMRs for each category within a chapter may follow similar patterns of regional variation. Reference to mortality statistics (Office of Population Censuses and Surveys, 1976a, b) suggests, however, that this is not always so.

The figures for genitourinary disease (Table 2) demonstrate an obvious anomaly in respect of females. Genital conditions accounted for more than 75% of bed utilisation and contributed less than 5% of the mortality within this group. There would seem to be a good case for regarding urinary and genital disease in women as distinct entities and weighting regional populations by separate national bed usage rates and separate regional SMRs within the overall RAWP's formula. The same approach might also be adopted for men, in whom genital conditions accounted for two-thirds of the bed usage but less than one-third of the deaths.

Table 1 Correlation between bed usage and mortality for disease categories within 10 ICD Chapters (England and Wales 1972)

ICD chapter headings	No. of disease categories	Correlation coefficient (r)	
		Males	Females
I Infective and parasitic diseases	4	0.98*	0.74
II Neoplasms	10 male 13 female	0.80**	0.86**
III Endocrine, nutritional, and metabolic diseases	3	0.991	0.995
VI Diseases of nervous system and sense organs	6	0.90*	0.92**
VII Diseases of the circulatory system	11	0.68*	0.77**
VIII Diseases of respiratory system	6	0.83*	0.83*
IX Diseases of the digestive system	7	0.65	0.79*
X Diseases of the genitourinary system	7 male 8 female	0.42	Negative value
XIII Diseases of the musculoskeletal system and connective tissue	7	0.93**	0.85**
XVII Accidents, poisoning, and violence	12	0.20	0.41

\*Significant at level P < 0.05  
\*\*Significant at level P < 0.01

Table 2 Bed usage and mortality for disease categories within ICD Chapter X (England and Wales 1972)

Disease category	Males		Females	
	Estimated average no. of beds used daily	No. of deaths	Estimated average no. of beds used daily	No. of deaths
Nephritis and nephrosis	224	1419	187	1244
Infections of kidney	57	778	237	1432
Calculus of urinary system	210	92	145	103
Other urinary diseases	656	773	727	783
Hyperplasia of prostate	1699	1246	—	—
Other male genital disorders	612	48	—	—
Diseases of the breast	23	—	216	4
Salpingo-oophoritis and cervicitis	—	—	232	20
Uterovaginal prolapse	—	—	1204	27
Other female genital disorders	—	—	2848	80
All causes in chapter X	3481	4356	5796	3693

Table 3 *Bed usage and mortality for disease categories within ICD Chapter XVII (England and Wales 1972)*

Disease category (nature of injury)	Males		Females	
	Estimated average no. of beds used daily	No. of deaths	Estimated average no. of beds used daily	No. of deaths
Fracture				
Of skull and face	332	2 627	173	1164
Of spine and trunk	485	773	531	596
Of neck of femur	707	395	2850	1519
Of other unspecified parts of femur	958	334	1504	1053
Of other parts of body	1338	252	1231	381
Dislocation (without fracture) and sprains of joints and muscles	389	45	152	39
Intracranial injury (excluding skull fracture)	799	876	505	508
Burn	385	237	265	305
Adverse effects of medicinal agents	306	1 093	502	1689
Toxic effects of substances chiefly non-medicinal	45	819	41	422
Complications of surgical procedures and medical care	245	17	299	11
Other injuries and reactions	1040	4 641	647	2001
All causes in Chapter XVII	7029	12 109	8700	9688

The figures for accidents, poisoning, and violence (Table 3) suggest that if SMRs for this group are to be used in the RAWP's formula, they too should be calculated for separate subdivisions of the chapter. A simpler alternative would be to omit completely the SMR for Chapter XVII from the formula.

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