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MARITAL STATUS, ILLNESS AND
THE USE OF HEALTH SERVICES

Interim Report

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INTRODUCTION

This is an interim report of the project investigating the use of
hospital in-patient care by married and non-married people.   The project
developed from the work of Dr. Morton Kramer during a sabbatical year at
the London School of Hygiene in 1968 in which he drew attention to the large
variations in hospital admission rates and lengths of stay between married
and non-married patients.   The proposal was subsequently made to the DHSS
in 1972-3 that further investigation of this phenomenon should form part of
the research programme of the Unit during that year.   For the past 18 months
the authors of this report have been reviewing the literature on the relation-
ship between marital status, illness and the use of health services, and they
have also carried out further extensive analyses of information collected in
the Hospital In-Patient Enquiry and Hospital Activity Analysis.   The results
of that work are presented in this report, which is intended to form a back-
ground to the proposals (submitted separately) for the fieldwork stage of
the project.   The report first reviews the evidence of differential
utilisation rates between married and non-married people, and then discusses
some causes and consequences of them.

MARITAL STATUS AND THE USE OF HEALTH AND SOCIAL SERVICES: A GENERAL REVIEW

Hospitals

It has been known for many years that non-married people generally
suffer more illness and display higher rates of hospital use than married
people.   The phenomenon has perhaps been documented most extensively in the
field of psychiatric illness.   In 1899 the Forty-third Report of the Lunacy
Commissioners[1] included a table showing that 'at marriageable ages, and in
proportion to the population, considerably more single than married or
widowed persons are admitted .... to the asylums of England and Wales'.
Commenting on this finding three years later, Tuke[2] concluded that 'celibacy
is more likely to favour mental disease than the married condition', although
he cautiously added that it was an open question whether it is 'the mental
condition of an individual which has prevented marriage, and not celibacy
which has caused .... his mental condition'.

More recent research confirms the continuing truth of these earlier
observations.   The analysis by Price and his colleagues[3] of the marital
status of first admissions to psychiatric beds in England and Wales in 1965-6,
based on data from the Mental Health Enquiry, showed that among patients over

the age of 16, admission rates were lowest for the married, highest for the
widowed and intermediate for the single. This finding held good for both
male and female admissions and also for patients in each age group. Among
patients aged 65 and over the admission rates increased in all marital status
categories, but there were no clear signs of the rate for non-married patients
in these higher ages increasing more steeply than among married patients.

Baldwin's studies of patients entering the psychiatric case register of
North-east Scotland between 1963 and 1967 show a number of similarities.
Among both males and females the entry rates for new patients were highest
for divorced and lowest for married persons.[4] Widowed men displayed higher
rates than single men, but among the women the rates were higher for the
single than for the widowed. A separate analysis of all patients admitted
to the register between 1963 and 1965 who were hospitalised within a year
of referral to the register again showed that married people were the least
likely to enter hospital and widowed and divorced patients were the most
likely.[5] In a third study based upon the North-east Scotland case register,
point prevalence rates were calculated at 31st December 1968.[6] A total of
3,229 people were on the register at that time, giving an overall rate of
6.82 per thousand population; but the rates for married persons were the
lowest of all marital states in all residential areas, rates for single
persons were rather higher, while those for the widowed and divorced were
very much higher.

Further corroborative evidence of the preponderance of non-married
patients in psychiatric care comes from McKechnie's[7] point prevalence study
of a long-term population in a Scottish psychiatric hospital and from
Susser's[8] analysis of first contacts (inceptions) and all contacts (episodes)
with psychiatric agencies recorded in the Salford register of mental illness
during the period 1959-1963.

A similar over-representation of non-married persons has been found
among inpatients in non-psychiatric hospitals. In 1956 Abel-Smith and
Titmuss[9] published the provisional results of their analysis of people in
NHS hospitals on census night 1951, showing that the non-married were over-
represented among both psychiatric and non-psychiatric patients relative to
the population as a whole. They found, for example, that 'for all types of
hospital and in relation to their numbers in the total adult population,
the single, widowed and divorced make about double the demand on hospital
accommodation compared with married people'. Some distinctive variations
were noted between male and female patients and between the old and the young.
At all ages the proportions of single, widowed and divorced men in both

psychiatric and non-psychiatric hospitals were higher than the corresponding rates for women; and for both men and women the proportions of people in hospital rose most sharply with advancing age among the single, less so for the widowed and divorced, and even less so for the married. By the age of 65 the difference in the relative representation of married and non-married people had assumed major proportions, and 68 per cent of patients over that age in psychiatric hospitals and 73 per cent in non-psychiatric hospitals were either single, widowed or divorced.

A similar analysis from the 1961 census[10] of persons in psychiatric and non-psychiatric hospitals in England and Wales broadly bears out the findings of Abel-Smith and Titmuss.* In both types of hospitals there was an over-representation of non-married patients on census night relative to the total population, and a corresponding under-representation of married patients. Within the non-married category, single patients had the highest rates of all. In total, 24 per cent of all patients in non-psychiatric hospitals were single and 51 per cent were widowed or divorced, and in psychiatric hospitals the corresponding proportions were 44 and 33 per cent. The tendency noted by Abel-Smith and Titmuss for the proportion of hospitalised patients to rise most sharply with increasing age among the single was replicated in the 1961 census among non-psychiatric patients but not among patients in psychiatric hospitals. In these hospitals there was little difference in the proportions of married and widowed/divorced persons with increasing age, while the proportion of single people actually declined with increasing age.

Information on variations by marital status in the use of other parts of the hospital service is scarce. However, the few studies of hospital outpatient departments that have incorporated the variable of marital status suggest that whereas single and widowed persons make greater use of inpatient facilities than married people, it is the latter who use outpatient services most extensively. Evidence of this is provided by Forsyth and Logan's[11] study of 50,000 new outpatients in 80 hospitals, which showed that married people were over-represented in relation to their proportion in the total population, while single and widowed persons were under-represented. Similar results were found from a sample of 1,556 new outpatients attending Guy's

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* The 1961 census is at present the most recent census to provide information on the population in residential institutions. The 1966 sample census did not provide this information and the 1971 data have yet to be published.

hospital in 1962.[12]   A significantly larger proportion of married than of
single, widowed or divorced persons were attending outpatient departments,
and even if married women attending ante-natal clinics were excluded there
still remained an over-representation of married patients.   The proportion
of patients in the sample who were divorced, separated or widowed (8 per cent)
corresponded closely with the figure for the London Administrative County
(9 per cent).

The results of these studies suggest that the preponderance of non-
married people in inpatient care may arise partly from the fact that, in cases
where hospital admission is not overwhelmingly justified on clinical grounds,
the non-married tend to be admitted for inpatient care and the married to be
treated on a day-patient basis.   If this is so, then a relative excess of
married persons may be expected not only in outpatient departments but also
in day hospitals.   In day centres, by contrast, which probably embody a
greater element of social care, one may again expect to find a preponderance
of non-married attenders.   The evidence, though sketchy, partially supports
such an interpretation.   Farndale[13] discusses some slender evidence on the
use of psychiatric day hospitals, taken from the 1955-7 Triennial Statistical
Report of the Bethlem Royal and Maudsley Hospitals, which shows a marked under-
representation of widowed and divorced persons and a probable over-represen-
tation of the married.   (Rates are not given and the marital structure of
the population at risk is not known.)   But a separate study quoted by
Farndale on the marital status of patients aged 60 and over attending five
geriatric day hospitals in 1960 revealed the more usual pattern of an over-
representation of the widowed and divorced and an under-representation (at
least among the women) of the married.   A more recent study by Wilkie[14] of
people attending day hospitals and day centres of all types in the county of
Essex also produced results conforming more closely to generally observed
pattern.   He found that at all ages the attendance rates per 100,000
population were lower for married than for non-married people and in the
higher age groups attendance rates were greatest among widowed persons.

To summarise thus far: information on hospital usage by marital status
indicates a consistent and marked over-representation of non-married patients
in hospital inpatient care, particularly among elderly patients in non-
psychiatric hospitals.   What little evidence there is on the use of other
forms of hospital care suggests that non-married people may make less use of
outpatient departments than married people but are probably more heavily
represented among patients attending day hospitals and day centres, with
the possible exception of psychiatric day hospitals.

The consistently higher rates of hospital inpatient use by non-married than by married patients is not confined to the National Health Service. Evidence is available of comparable trends in the United States, even though the organisation of hospitals in that country differs markedly from the British system.   In the field of psychiatric care, Kramer's[15] collations of data from a number of different studies is testimony of the resemblance between the American and British patterns of use in this regard.   In one study, for example, based upon 22,205 first admissions to psychiatric hospitals in 13 states in 1960, married persons were shown to have much lower first admission rates than the non-married, especially the separated and divorced. The married also had considerably higher probabilities of release than the other marital status groups, particularly the never-married (single). Moreover, the never-married and the separated and divorced who were released within the first three months following admission had slightly higher readmission rates within the six months following their release.   More recently, Taube's[16] analysis of admission rates to State and county mental hospitals in 1969 confirmed 'that marital status continues to be an importantt variable in describing the differential utilization of mental hospitals by sub-groups of the population'.   The highest admission rates, for both men and women, occurred among the separated/divorced and the lowest among the married.   Similar findings have been also been reported elsewhere in America (Malzberg,[17] Locke et al,[18] Pugh and MacMahon[19]), in Norway (Odegard[20,21]) and in Australia (Krupinski and Stoller[22]).

Less information appears to exist on the marital composition of persons in non-psychiatric hospitals in the United States, but there is evidence from the National Health Survey of variations by marital status in discharges and lengths of stay with respect to short-stay hospitals.[23,24]   Information on discharges from these hospitals in 1970 shows that the rate was slightly higher for non-married than for married people.   For example, among patients aged 15+ the discharge rate was approximately 143 per 1,000 population for the married and 152 per 1,000 population for the non-married, whilst among elderly patients (aged 65+) the discharge rates were 273 and 293 respectively. Information on the length of stay of persons in short-stay hospitals showed that the non-married also had a higher mean duration of stay than the married, the difference being 2.8 days for those aged 15+ and 2.3 days for those aged 65 and above.

Little information has come to hand from North America on possible variations by marital status in the use of other parts of the hospital service.

A report by Steinmetz[25] of a survey of 3,460 patients attending emergency rooms and outpatient departments in six accredited general hospitals on Montreal Island revealed 'a much higher proportion' of widowed persons among the OP attenders than would have been expected from their frequency in the population. Among patients treated in the emergency rooms the proportion of married persons was lower, of single persons the same, and of widowed persons almost double the city rates. This result does not accord with the English experience (page 3); nor, as far as one can tell does Taube's[26] analysis of admission rates to psychiatric outpatient clinics of American state and county hospitals in 1969. This analysis showed that the age-adjusted OP admission rate for the separated and divorced was over five times as high as the rate for the married.

It would be misleading to place too great an emphasis on localised studies, but there is clearly a hint in these results that, although the use of hospital inpatient facilities in the United States reflects the same predominant variations by marital status noted so consistently in English hospitals, the pattern of outpatient use may differ in the two countries. Whereas in England the variations in outpatient use appear to complement the marital differences in inpatient use, in America they merely parallel them.

Residential homes

As with inpatient care, homes for the elderly and the disabled also contain a disproportionate number of non-married people. The 1961 census[10] showed that the proportion of all elderly people enumerated in such homes was highest for the single (5 per cent) and lowest for the married (0.2 per cent), with the divorced and widowed occupying an intermediate position (2 per cent). The proportions of both single and widowed/divorced people in residential homes increased consistently with rising age. For example, in the age group 65-69 years, 2 per cent of single and 1 per cent of all widowed/divorced people were enumerated in residential homes, but these figures increased to 11 and 5 per cent respectively in the age group 80+. By contrast, no consistent increase in the proportion of married people was found with rising age, and in no age group did the proportion of married people exceed 1 per cent. As in non-psychiatric hospitals, the residential homes contained a higher proportion of men than of women in each marital status group, although the differences were quite small.

These results from the census are confirmed in studies of admissions to old people's and welfare homes. Townsend,[27] in his classic study of

residential institutions and homes falling within Part III of the 1948
National Assistance Act, collected information on 666 elderly persons
admitted to 173 institutions in 1958-9. Using this information, Townsend
estimated that among males aged 65 and over the admission rates to Part III
institutions in 1959 were 2 per thousand population among the married,
19 per thousand among the widowed and 25 per thousand among the single.
For elderly females the respective rates were estimated to be 1, 9 and 15.
The new residents also differed in other ways from the general population..
A disproportionately large number of those who were married or widowed
were childless, and nearly three-quarters of these had never had children.

In a more recent study of 200 admissions to a welfare home in Edinburgh,
Lowther and McLeod[28] found that only 9 per cent of the men and 4 per cent of
the women admitted were married. Half the male admissions and two-thirds
of the female admissions were widowed, and most of the remainder were single.
Lowther and McLeod do not give a population base to enable the calculation
of admission rates, but the rate for married people would clearly be very
low and the rate for widowed people may possibly be lower than that for
single persons. Likewise, Kay et al,[29] in a study of elderly people admitted
to local authority welfare homes in Newcastle between 1957 and 1960, found
that 'taking the sexes together, the proportion of single people was 3.5
times as large as the proportion in the population, and of married people
only 0.05 times as large'. It is worth noting that this preponderance of
elderly non-married people in residential homes occurs in addition to their
over-representation among admissions to geriatric hospital care. The
Newcastle study reported 'a marked excess of both single and widowed and a
deficiency of married people' among patients admitted to geriatric wards
in the General Hospital, and Isaacs et al[30] found that just over three-
quarters of a consecutive series of 612 patients admitted to the geriatric
department of the Glasgow Royal Infirmary in 1966-7 were single or widowed
and just under a quarter were married. These figures compared with
corresponding proportions of two-thirds and one-third among a control group
matched for age and sex.

From the United States the 1960 census[31] showed that, among those aged
65 and over in residential homes on census night, 23 per cent were single
and 66 per cent were widowed/divorced, compared with corresponding figures
of 8 per cent and 39 per cent among elderly people in the total population.
Married persons comprised 53 per cent of the total population but only
10 per cent of residents in homes.

Social services

Besides making greater use of hospital inpatient facilities and residential homes, single and widowed persons also appear to make more demands on the social services than married persons. Goldberg and Neill,[32] in a study of 1,000 patients referred over a four-year period to a social worker attached to the Caversham Health Centre, found that single, widowed and divorced patients were over-represented, comprising 62 per cent of the social work clients but only 49 per cent of the population of the area. In every age group a larger proportion of the social work clients were widowed, divorced or separated than in the Camden population. These results are obviously biased by the fact that the clients were referred to the social worker through a medical agency, but Goldberg and Neill comment that 'information emerging on the marital status of clients in a national sample of cases carried by social workers in local authority departments show similar trends'. Goldberg's earlier study[33] of elderly people referred to the welfare department of a London Borough also showed that in comparison with the elderly population of the Borough, widowed and divorced persons were over-represented: they comprised 68 per cent of the welfare clients but only 55 per cent of the population. The proportion of elderly single persons referred to the welfare department (13 per cent) was almost the same as the proportion in the population, while married persons were under-represented, accounting for a third of the elderly population but only a fifth of the welfare clients.

With regard to domiciliary services, Townsend[34] reported that in Bethnal Green in the winter of 1955-6, 464 people of pensionable age were currently being visited, or had recently been visited, by a home help. Single people were found to make a demand roughly proportional to their numbers in the population, but relatively more widowed and fewer married people claimed help. Thirty-five per cent of the men being helped and 67 per cent of the women were widowed or separated, compared with 26 per cent and 51 per cent respectively in the local population.

Summary

These assorted pieces of information about the relationship between marital status and service use are obviously not directly comparable. They employ different indices of use (admission rates, point prevalence rates, length of stay); they cover differing populations (some of the studies are

local, some national; some are confined to the elderly, others to all age groups); they relate to different service systems (general hospitals, psychiatric hospitals, residential homes, social services); and they use varying time periods, methods and definitions. However, these very diversities are all the more impressive in sustaining the general conclusion that, across a range of services, people who are not married display higher utilisation rates than those who are. Even within this global assertion there exists a considerable degree of consensus on matters of detail. For example, the over-representation of non-married persons seems to increase with rising age, particularly among single persons in non-psychiatric care. Within the non-married category, widowed and divorced persons appear fairly consistently to have higher utilisation rates than single persons for psychiatric agencies but lower rates for non-psychiatric care. In many cases male patients display higher rates of use than female patients in each marital status group.

DIFFERENTIAL HOSPITAL USE: AN ANALYSIS OF HIPE AND HAA

The deficiencies of existing knowledge

Of the many questions raised by the studies reviewed above, two appear to be of fundamental importance: how do these variations by marital status arise, and what do they signify in terms of the use of resources? Such questions are particularly pertinent in the matter of hospital use where escalating costs and dwindling resources intensify the need for maximum efficiency in the deployment of inpatient facilities. However, the studies summarised above, though useful in providing indicators, do not offer many guidelines towards an answer. There are three principal deficiencies. First, although the census data reveal variations by marital status in point prevalence rates of hospital use, they give no indication of the component factors. It is not possible from census data to calculate whether the rates for non-married patients are higher than for married patients because of increased admissions, longer average stays, or both. The American evidence on the use of short-stay hospitals (page 5) suggests that both admission rates and lengths of stay may be greater among the non-married, and the data on admission rates to psychiatric hospitals in England and Wales would bear this out; but it is not possible to say how much of the excess use if attributable to increased admissions and how much to longer stays.

Second, the utilisation data are essentially unrelated to resources.
The census data and studies of point prevalence and admission rates yield
no more than a crude estimate of the additional resources (i.e. bed-days)
used to sustain the higher utilisation rates of non-married patients, and
they give no indication of how these additional resources may be distributed
between admission rates and lengths of stay. Nor, obviously, do they show
what proportion of these additional resources may be considered to be
inappropriately used, or whether such use should or could be diminished.

Third, there is little indication, apart from a simple psychiatric/non-
psychiatric split, of how the observed variations by marital status vary
according to diagnosis. Is there a limited number of conditions which explain
a large proportion of the excess use by the non-married, or do these patients
tend to have a higher use virtually across the whole spectrum of hospitalised
complaints?

An attempt was made to overcome some of these problems by Dr. Morton
Kramer, Chief of the Biometry Branch of the US National Institute of Mental
Health, during a sabbatical year in 1968 at the London School of Hygiene and
Tropical Medicine. Kramer had already assembled some American data on
marital differences in psychiatric hospital use, and he turned to the Hospital
In-Patient Enquiry as a possible source of comparable data on the English
hospital service. Using a three-year average for 1964-5-6, Kramer analysed
the age and sex-specific variations by marital status in the average daily
rate of bed use, and then assessed the relative importance of admission rates
and lengths of stay in producing the observed variations. He also repeated
these analyses for each of the HIPE diagnostic groups. However, because
the results were not written up in a form that related to potential future
studies, and because the analyses were not updated with the appearance of
subsequent HIPE reports, the decision was made to carry out entirely new
analyses of the HIPE data to overcome these twin deficiencies. Subsequently
a limited amount of data collected in the Hospital Activity Analysis were
added to the study to counteract the particular deficiency of the Hospital
InlPatient Enquiry that it makes no distinction between single, widowed,
separated and divorced persons: all are lumped together in a 'not married'
category.

The methods of the analysis: a summary

The full method and results of the HIPE and HAA analyses are contained
in Appendices I and II of this report. Data from the Hospital In-Patient

Enquiry were analysed for selected years between 1964 and 1970 (these being
the years during which the tabulations including marital status were published)[*]
and HAA data for 1972 were analysed in two regions: the North-east and
South-east Metropolitan Regions. The basic method of analysis, which owes
much to Kramer's initial work, comprised the following steps. First, the
average daily rate of bed use per million population by married and non-
married patients was calculated for each age and sex group and the differences
between the rates of bed use of the two marital groups were expressed in
actual numbers of beds. Second, the relative contribution of admission
rates and mean durations of stay towards the observed variations in the
rates of bed use were identified. Next, calculations were made of the
number of beds which non-married patients in each sex and age group would have
used each day if they had had the same discharge rate, mean duration of stay
and rate of bed use as the corresponding group of married patients. Lastly,
most of these calculations were repeated within each of the HIPE diagnostic
categories.

The results of the analysis: a summary

The result of the analysis of the rates of bed use (the rate being
defined as the average number of beds used daily per million population)
showed a similar pattern to that revealed by the point prevalence data.
In each age and sex group, and in each year analysed, the rates were
higher for non-married than for married persons. The differences increased
considerably between 1964 and 1970, and by the latter year non-married women
over 25 had a rate of bed use more than three and a half times that of married
women, and non-married men over 25 had a rate almost three times that of
married men. The excess rate by non-married patients tended to increase
with rising age and was much greater for elderly persons aged 65 and over
than for those in the younger age groups. Except in the age group 25-34 years
the rate of bed use was also greater for non-married men than for non-married
women, but no consistent differences were observed between married men and
women.

An indication of differences in rates of bed use within the non-married

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[*] The 1971 report of the Enquiry announced that henceforth a number of tables
(including the table on marital status) would appear triennially. Although
it is intended that these triennial tables should be available as reference
material in the years between their publication, a request for the 1971
marital status table proved unsuccessful.

category was gained from the analysis of HAA data from the South-east Metropolitan RHB in 1972. This showed that in most age and sex groups the rates of bed use for divorced persons were lower, and for single and widowed persons were higher, than the corresponding rates for married persons. The two exceptions to this pattern occurred among men in the 45-64 age group, where the rate was higher for divorced than for married men, and among women in the age group 25-44 years where the same reversal occurred. No consistent differences emerged between the rates of bed use of single and widowed patients. For men, the rate was higher among the widowed than among the single in all but the youngest age group while for women, the rate was higher among the single than the widowed in all but the highest age group (75+).

Calculations were made from the HIPE data of the actual number of additional beds required each day by non-married patients to sustain their higher rate of bed use. These revealed a total in 1970 of 35,000 additional beds each day, representing 46 per cent of all beds used each day, on average, by non-married patients. The number of additional beds required in that year was greatest for persons in the older age groups, reflecting both the tendency for the excess rate of bed use to rise with increasing age and also the greater number of persons in the older age groups. Whereas only 8 per cent of the additional beds were accounted for by persons under 45 years of age, 75 per cent were used by elderly persons age 65 years and over. Although the rate of bed use was higher among non-married males than among non-married females, the actual number of additional beds required was much greater for non-married females at ages 65 years and over than for non-married males, due to the larger number of non-married females, particularly in the older age groups. Thus 67 per cent of the extra beds occupied by non-married persons aged 65 years and over were occupied by non-married females.

The relative contributions of differential discharge rates[*] and mean durations of stay towards these observed variations in bed use were assessed. The HIPE tables showed that in each year analysed, non-married patients almost invariably displayed higher discharge rates than married patients. The only exception in 1970 occurred among women aged 75 and over, where the discharge rate of the married exceeded that of the non-married.

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[*] Strictly speaking the Hospital In-Patient Enquiry and Hospital Activity Analysis record discharges (live or dead), not admissions. Each discharge must obviously have been preceded by an admission and the two are therefore equivalent, though not within any specified time period.

Among both male and female patients the ratio of the discharge rate of
non-married to married patients generally decreased with increasing age.
The older the patients, in other words, the narrower became the difference
in the discharge rates between the two marital groups.   A comparison of
the mean durations of stay of married and non-married patients showed that
for each year and in each age and sex group the length of stay was also
higher   among the non-married.   However, whereas the excess discharge
rate of non-married patients tended to diminish with increasing age, the
difference in the mean duration of stay increased with rising age.   The
HIPE data thus showed that the higher rate of bed use by non-married
persons was due both to their higher admission rates and their longer
average stays in hospital.   The relative importance of these two factors
varied with increasing age, with length of stay becoming more important
with rising age and admission rates becoming less important.

Further information on variations in discharge rates within the non-
married category was obtained from the HAA data for the South-east Metropolitan
Region.   In each age and sex group the discharge rate was highest among the
widowed and lowest among the divorced, the only exception being divorced women
in the age group 25-44.   Among males the rates were higher for single than
for married men at all ages, but the reverse pattern occurred among females.
The HAA results therefore suggest that the higher discharge rates for non-
married men revealed in the HIPE tabulations may reflect an excess rate
among both single and widowed males, whereas the higher discharge rates for
non-married women may be caused almost entirely by the widows.

The differential effects of the higher discharge rates and longer
average lengths of stay of non-married patients on the extra number of beds
used each day by these patients were calculated from the HIPE data.   Among
male patients in 1970, about 7,000 extra beds were used daily to accommodate
the excess discharge rate of non-married men and about 9,000 extra beds
were used to sustain their greater mean length of stay.   Among female patients,
about 22,000 extra beds were used to accommodate the longer average stays
of the non-married women, but there would actually have been a slight
reduction in the beds used if the non-married women had exhibited the same
discharge rate as the equivalent married groups.   This is because the number
of beds 'saved' as a result of the lower discharge rate of non-married
women over 75 more than offset the extra beds used by those in younger age
groups.

Finally, an analysis of the HIPE results by diagnostic categories showed that at all ages the extra beds used by non-married patients tended to be concentrated disproportionately in a few diagnoses. The principal diagnoses accounting for the majority of the extra beds occupied by non-married patients related to disorders of the circulatory or nervous systems, a psychiatric·disorder, or (in the case of men)respiratory disease. Among the younger age groups the extra beds used by the non-married, though much fewer in number, tended to be concentrated even more disproportionately in just a handful of diagnoses. Above the age of about 65 there is a greater tendency for non-married patients with any illnesses to occupy more beds than married patients, and this is perhaps the one over-riding impression left by the analysis. The 'problem' of the differential use of inpatient care by married and non-married patients is essentially a problem of the elderly.

The quality of the data

These results from the Hospital Inpatient Enquiry and Hospital Activity Analysis reveal variations in resource use of a sufficiently large order to justify further investigation into their aetiology and significance. Before proceeding to this, however, the possibility must be acknowledged that part of the observed variations may result from defects in the data themselves. The small amount of existing work on this problem indicates three major possible sources of error. First, HIPE and HAA deal with episodes of hospital treatment, not with people. One person admitted on, say, five separate occasions during a year would be recorded as five discharges, and the possibility therefore exists that part of the higher discharge rate of non-married persons may reflect their greater propensity towards multiple admissions rather than the fact of more non-married people being admitted. However, an analysis by Acheson and Barr[35] of multiple spells of inpatient treatment recorded in the Oxford Record Linkage Study found no evidence to support this possibility. In this study, Acheson and Barr classified patients aged 15+ according to their marital condition at the time of their first admission to hospital in 1962 and then compared the readmission rates during the year of non-married and married persons in each of four age groups. Of the eight comparisons thus ensuing, five yielded a higher readmission rate among married persons, two yielded a higher rate for non-married persons, and in one comparison the rates were identical. However, the rate of transfer of patients to a second hospital (other than the local convalescent hospital, which was excluded from the analysis) was higher for non-married patients in almost every comparison, the difference being most marked among males and females over the age of 65.

A second possible source of error lies in the incorrect recording of marital status at some point between the admission of the patient to hospital and the entry of his particulars onto the computer record. There is always the possibility that an incorrect marital status will have been given by the patient in the first place, and there are several opportunities for clerical errors to be made in transferring the information from one record to another. Moreover, hospital record departments no doubt vary in their handling of cases where marital status is unknown. There is consequently a feeling of scepticism towards the validity of much hospital data (Forsyth and Sheikh).[36] Wherever possible the data are 'cleaned' to detect logically impossible cross-tabulations, but it is unlikely that inaccuracies in marital status would show up to any great extent. No definitive study has come to hand of the validity of marital status records, although a study of the validity of HAA information is currently underway in Nottingham. The most extensive study to date of the accuracy of hospital data was made on the Scottish Hospital In-Patient Statistics by Lockwood.[37] Comparing information on the SHIPS form with that on the patient's medical record, Lockwood found that only two out of nine items of demographic data (including marital status) had less than 95 per cent agreement; these were area of residence (94.8 per cent) and occupation (83.6 per cent). It would seem from this that the error in transcribing is quite small, but the nature of Lockwood's study precluded any examination of alternative possible sources of error.

A third possible source of error which may enter into the calculation of rates (such as discharge rates or rates of bed use) resides in the denominator on which the rates are based. Interest in this source of error has arisen principally in the context of the calculation of marital-specific death rates, where inconsistencies between the recording of marital status on census schedules and death certificates could produce inaccuracies in the mortality rates. A similar difficulty might arise in the calculation of hospital utilisation rates where these are based upon census data. A 'true' validation of census data, especially marital status, would be exceedingly difficult, and empirical studies of error have tended instead to concentrate on the degree of correspondence between information on census records and death certificates. As part of an evaluation of the 1961 census of England and Wales, all death certificates for people aged between 15 and 74 years who died during May and June 1961 were matched with the corresponding census records to assess the comparability of common items of information.[38] A correct agreement between the marital status recorded on the death certificate and on the census record was found for at least

95 per cent of the single, married and widowed, but for only 80 per cent
of the divorced.   The net difference rate was no more than 4 per cent
for the single, married or widowed, but was as much as 18 per cent among
the divorced.

A similar study by the US National Center for Health Statistics in 1960[39]
likewise found a generally high level of correspondence for the single,
married and widowed but relatively low correspondence for the divorced.
No substantial differences in levels of agreement were found between men
and women, and it is estimated that no more than 20 per cent of the
discrepancies could have resulted from real changes in marital status
between the time of the census and death.   The conclusion is drawn that
the 'true' mortality rates for single and married persons were higher than
those observed, while the 'true' rates for widowed and divorced persons were
lower than the observed rates.   It seems very improbable, however, that such
errors in base data could account for more than a small part of the apparent
excess use of hospitals by non-married patients.   A given degree of net
error in the census data would produce the same degree of relative error in
the rates in a given age and sex group;   and there is no evidence that the
probable net census errors are of the same order as the variations noted
between, say, the rates of bed use of married and widowed patients in HAA.

To summarise: our examination of possible sources of error indicates
that, while deficiencies in the data may contribute to the observed variations,
it seems unlikely that they can wholly explain them.   There appears to
remain a 'real' excess.

THE SIGNIFICANCE OF DIFFERENTIAL HOSPITAL USE: A FRAMEWORK OF APPROACH

Need, use and utilisation reviews

Having set out the evidence of higher rates of hospital use by non-
married than by married patients, we must now consider the meaning which
these results have for the way in which resources are used.   Obvious
questions arise as to whether the variations between married and non-married
persons are 'justified' in relation to the needs of each group or whether
they are indicative of a possible 'misuse' of hospital resources.   More
specifically in the context of the data reviewed above, how much of the
excess rate of bed use among non-married patients is appropriate to their
needs and how much is merely a reflection of the non-availability of
alternative, lower levels of care?

These questions are at the heart of an increasingly important form of
medical audit - the utilisation review.   Such a review seeks to establish
the appropriateness, or otherwise, of specific components of health service
use, with implications for control, planning and quality of care. Probably
the most extensive review programme is that of the Professional Standards
Review Organisation, established by the United States Congress with effect
from January 1974.   PSROs, which are controlled through a National
Professional Review Council, are required in effect to answer three basic
questions about all medical services delivered under Titles 18 and 19 of
the 1965 Social Security Amendments (Medicare and Medicaid): is the
service medically necessary, does it meet professionally recognised
standards of quality, and is it of the proper level (hospital or nursing home)
and duration of care?   With respect to hospital care, admissions are
reviewed as to: whether the admission was necessary; whether the hospital
stay was proper in length; whether there was appropriate use of radiology,
clinical chemistry, pharmaceuticals, etc; and whether plans have been made
for long-term or after-care.   The primary purpose of the PSRO legislation,
according to Sanazaro,[40] is 'to help control the rapid increase in total
expenditure by curbing unnecessary use of services in hospitals and nursing
homes' (our underlining).   Likewise Zimmer,[41] after describing what he calls
the 'health care crisis' of the United States, sees the value of utilisation
reviews in highlighting areas within which levels of care could be reduced,
thereby reducing costs and overcrowding of hospitals and other care institu-
tions.   Nelson's[42] description of the outcome is blunter: 'negative
findings result in no payment for service, either to the hospital or the
doctor'.

A fundamental (though often unarticulated) assumption underlying a
utilisation review of the kind embodied in the PSRO legislation is that
scarce medical care resources should be used to meet what are judged to be
clinical needs; they should not be used to cope with social needs, nor
should they be used to satisfy all expressed demand, however trivial.
Indeed, the very phrase 'appropriate use' implies that a negative, inappro-
priate use might sometimes occur, presumably when resources are expended on
those whose clinical needs are judged to come low in the hierarchy of claims
upon a limited budget.   The relationship between need and use can be
summarised in the following paradigm (Anderson):[43]

		Need for service	
		Present	Absent
Service	Used	Appropriate use	Inappropriate use
	Not used	Inappropriate non-use	Appropriate non-use

In two cases the outcome is appropriate; that is, the correct match is
achieved between the need for and use of a service. In the other two cases,
however, the outcome is inappropriate: patients either use services in the
absence of a need for them (inappropriate use) or they fail to use services
of which they have a need (inappropriate non-use). The identification of
patterns of inappropriate use (or non-use) has clear implications for policy,
for it forms an essential preliminary to policy decisions aimed at its control
or elimination. The existence of inappropriate use, if demonstrated, would
not in itself be a sufficient justification for the pursuit of alternative
policies (such as the provision of alternative care outside the hospital),
but it would prepare the way for an evaluation of the costs and benefits
(financial and otherwise) of such policies.

The application of this paradigm to actual populations immediately
encounters the problem of defining and identifying need. Two initial points
must be made. Firstly, any definition of need rests ultimately upon values
and it therefore behoves the definer to state as clearly as possible the
value base on which he is proceeding. In the present case, the paradigm
assumes that a person's need for a service can be assessed independently of
his use of it, and that in itself is a value judgment about the nature of need.
Secondly, the paradigm is concerned with need not as an isolated quality of
the patient or his illness but always in relation to a particular service.
The question to be asked is not 'what needs does this person have?' but more
specifically, 'does this person need this particular service at this moment
in time?'.

Whether or not a particular patient is judged to be in need of a service
will depend upon who makes the judgment and on what basis. In considering
the possible meanings that may be given to the concept of need, Bradshaw[44]

has predicated a four-fold taxonomy of normative, felt, expressed and
comparative need which may empirically co-exist in various combinations.
Normative need is 'that which the expert or professional ... defines as
need in any given situation'. Felt need is equated with want: it is
assumed to exist when people say they need a particular service. Expressed
need is equated with demand and is only present, according to Bradshaw's
classification, when there is an underlying felt need. Comparative need
is said to exist when one group of people not in receipt of a service
display the same relevant characteristics as a group which is receiving
the service.

It is a logical outcome of the argument developed so far that, if
the terms 'appropriate' and 'inappropriate' use of services are to have
any meaning (if, in other words, one is not prepared to define need purely
on the basis of use), then the concept of need in Bradshaw's typology that
corresponds most closely to the definition implicit in a utilisation review
is that of normative or professionally judged need. The value judgment
that scarce medical care resources should be used to meet what are considered
to be the most urgent <u>clinical</u> needs means that the assessment of need can
only be made by an appropriately qualified medical practitioner, basing his
judgment solely upon the patient's clinical condition and ignoring (for the
purposes only of making the judgment) any social or non-clinical features
of the patient. Thus in a recent review of 3,369 patients reported by
Zimmer,[45] the judgments were made by hospital physicians in response to the
question: 'does the patient require hospital care <u>today?</u>'. Implicit in
the question (though not perhaps too clearly in this particular example) is
the invitation to the physician to make his judgment as though in an ideal
world, assuming an adequate availability of alternative levels of care outside
the general hospital. It would then be a separate question whether, <u>in the
absence of such alternative levels of care</u>, a patient who is judged not to
need general hospital care should reasonably continue to be hospitalised,
but such strictly non-clinical considerations would not enter into the initial
assessment. It is necessary, in other words, to make a clear distinction
between the initial assessment of the appropriateness of use (which is done
in terms only of clinical need) and the management and policy implications
flowing from the discovery of inappropriate use. To permit the introduction
of social criteria into the original assessment is to confound the underlying
assumption about the way in which medical care resources should be used.

The notion of need being assessed by an appropriately qualified medical practitioner, basing his judgment exclusively upon his perception of the patient's clinical condition, is the definition adopted in this report as most directly relevant to the questions posed earlier about the meaning of the differential utilisation rates of married and non-married persons. It must be re-emphasised, however, that this definition, like any other, is base upon particular value-judgments about the proper use of resources, and it may be subject to ambiguities in its actual application. Bradshaw himself mentions some of these difficulties in using expert judgments: they may not correspond with other socially desirable definitions of need, they may be tainted with paternalism, different experts may well reach different (and possibly conflicting) judgments, and normative standards may change over time as a result both of technical developments and of changing values in society. It is in the nature of the concept of need that such difficulties cannot entirely be overcome, but certain methodological checks can be built into a research situation to minimise the chances of totally wild judgments being accepted. These may include, for example, a contrast between explicit and implicit criteria of assessment and between individual and team judgments.

An application of the paradigm

The paradigm relating need and use can be applied in a research context to approach the question of what the observed variations in hospital utilisation between married and non-married people mean in terms of the ways in which resources are being used. Although substantial differences between the utilisation patterns of different categories of patients do not of them-selves pre-suppose the existence of inappropriate use, such differences may nevertheless be visible manifestations of inappropriate use (or non-use) by either category. The observation of major variations in the use of health services can therefore be seen as a starting point in the investigation of possible inappropriate use, not as evidence per se of such use. In the case of the variations between married and non-married patients, the following logical possibilities may be stated:

1. There is an inappropriate non-use by married patients
   (i.e. a use below their level of professionally judged need).

2. There is an inappropriate use by non-married patients (i.e. a use
   in excess of their level of professionally judged need).

3. 1 and 2 are occurring simultaneously.

4. There is an appropriate use by both married and non-married patients.
   (If this proves to be the case, the further question arises of why
   people without marriage partners experience more illness requiring
   hospital care than do married people.)

The application of this framework in an investigation of the differential
utilisation rates of married and non-married patients could incorporate
a review of both admission rates and lengths of stay, and might in an
appropriate research context also answer further questions which at present
remain obscure.   What is the difference between the gross and net volume of
inappropriate use in the married and non-married groups?   How much of the
excess use of hospital beds by non-married patients is due to a relatively
small number of non-married patients making very large demands upon the
hospitals, and how much to a larger number of such patients each making
a small additional demand?   How much of the total excess use of hospital
beds by non-married patients is attributable to the heightened morbidity
and mortality risks of widowed people following the loss of the spouse?
If evidence of inappropriate use is found from such a study, it would be
considered desirable to investigate the circumstances under which it occurred
and to decribe alternative services that may be required for its control.
It would then be a matter of policy whether active steps should be taken,
for the existence of inappropriate use is not considered in itself to be
a _prima facie_ justification for its control.   In short, a utilisation
review merely assesses use in relation to a particular concept of need:
it does not carry any _necessary_ implications for health care policy, for
such policy must be forged in a broader context than the judgments of
individual professional workers.

An investigation of the kind described above into the implications of
the differential rates of hospital use by married and non-married patients
has yet to be carried out;   separate proposals are being submitted to the
Department for just such a study.   But as a background to the proposals
a search has been made of the literature for possible evidence of the
extent to which the variations reported above reflect a situation of
inappropriate use, and in the remainder of this report we present a summary
of that evidence.   The material is arranged under three main headings.
First, and briefly, the possibility is examined of part of the excess use
by non-married patients being explained by an inappropriate _non-use_ by
married patients.   It is a theoretical possibility in terms of the paradigm
that whilst non-married patients receive treatment appropriate to their needs,

those who are married somehow fail to receive an appropriate level of care. Second, and at greater length, the evidence is reviewed which supports the hypothesis that the excess use of hospital inpatient care by non-married patients (especially elderly patients) is a reflection of their inappropriate use. Such evidence is concerned with the extent to which non-married people (in contrast to married people) are admitted to and remain in hospital in the absence of any clear clinical need. Third, evidence is examined which tends to support the hypothesis that non-married patients display higher rates of hospital use than married patients simply because they have a greater clinical need of inpatient care. In the terms of the paradigm, in other words, there may be an appropriate use by both married and non-married patients, with the observed variations in utilisation rates reflecting what is judged to be a greater clinical need among the latter.

It must be emphasised that much of the evidence is incomplete and circumstantial. In particular, very few studies involving professional assessments of need ('normative need') have incorporated the variable of marital status, and judgments of probable variations in need between married and non-married groups are therefore largely speculative. Nevertheless it is believed that cumulatively the evidence sustains a number of broad conclusions which are drawn in a closing section of this report.

INAPPROPRIATE NON-USE BY MARRIED PERSONS

People may fail to receive the hospital care appropriate to their needs either through a failure to be admitted under circumstances which would be judged to justify such care, or through their leaving hospital before being considered clinically fit to do so. There appears to be very little evidence indeed of any variations by marital status in the extent of inappropriate non-use. To the extent that it does occur, it probably takes the form of an inappropriate non-admission to hospital, for the number of patients who gain discharge from inpatient care before being considered clinically fit to leave is likely to be quite small.

Inappropriate non-admission of married persons to hospital may occur as a result of decisions taken at any of a number of stages through which an individual must pass prior to entering hospital. The principal behavioural elements in the utilisation process have been drawn together in schematic form (Diagram 1). This schema, which is adapted from Anderson,[43] is similar to

Diagram 1.   Behavioural elements in health service use
(adapted from Anderson)[43]

that commonly used in behavioural studies of health service use (see, for example, McKinlay,[46] Adams,[47] Kalimo,[48] Bice and White,[49] Kaitaranta and Purola,[50] Anderson[51]). In essence, the schema postulates a set of factors that heighten the individual's perception of his need for medical care. These factors include clinical morbidity (which impinges upon the individual's consciousness through the appearance of symptoms); a feeling of social or psychological dysfunctioning; and a group of predisposing factors which might comprise, inter alia, the individual's attitudes and beliefs about the value of seeking care, his previous experiences in submitting to treatment, and his knowledge about the susceptibility of his perceived illness to treatment. All these will combine to shape the individual's illness behaviour (Mechanic and Volkhart),[52] defined by Kasl and Cobb[53] as 'any activity undertaken by a person who feels ill, to define the state of his health and to discover a suitable remedy'. Such activity may or may not include recourse to the formal medical care system. Freidson, for example, postulates a series of steps through which the sick person may pass in seeking care (the lay referral system), culminating in a consultation with a doctor only if other low-order remedies fail to produce the desired effects. Such a system obviously does not characterise every illness episode, but the concept is useful in indicating further filters that may intervene between the individual's perception of a need for care and his entry into the formal medical care system. His attitudes and expectations about the outcome of seeking care and his under-standing of the availability and ease of access to appropriate care will form two important constraints. Finally, having taken the step of consulting a primary care doctor, there will be further decisions (in which the patient is probably only a minor participant) about referral to outpatient and/or admission to inpatient care.

Although this schema offers a way of explaining the mechanisms by which an inappropriate non-admission might occur, the data are lacking to enable the schema to be applied to the problem in hand. Variations are known to exist in illness behaviour and in the perception of need for care among population sub-groups (King,[54] Zola,[55] Jaco,[56] Wadsworth et al[57]), but no information has come to hand about any such differences between marital status groups. Similarly, although there is known to be a considerable amount of unreported illness in the community (Last,[58] Logan,[59] Israel and Teeling-Smith[60]), the distribution of such unmet need (assuming that that is what it would be judged to be) by marital status is not known. Thus while it is possible to identify the factors which may lead to the inappropriate non-use

of hospital inpatient care by persons, the available evidence does not permit
one to determine the existence or extent of such non-use.

INAPPROPRIATE USE BY NON-MARRIED PERSONS

The excess use of hospital inpatient facilities by non-married patients
may be regarded as inappropriate if such use is not considered to be justified
by their greater clinical need for hospital care. A number of pieces of
evidence exist of the extent to which this may be happening. A study carried
out in the Liverpool RHB area in 1967-8 of the relative importance of social
and clinical factors in determining length of stay offered relevant data
capable of reanalysis by marital status.[61] The full results are contained in
Appendix III.

The 1,106 patients in the cross-sectional study were all those over the
age of 20 who had had an unbroken stay of at least 30 days in an officially
classified 'acute' bed in the Liverpool RHB area. A comparison of the
marital distribution of the patients in the study with that of the regional
population showed a relatively smaller proportion of married than of single
or widowed persons among the hospital patients in each of four broad age
groups and for both sexes. This group of long-stay patients was also found
to contain a higher proportion of non-married persons than did the total
hospital patient population, indicating marital status to be a significant
factor in determining length of stay in hospital. Information on the clinical
condition of patients and on the presence of social factors which may have
delayed discharge, showed that in each age group fewer single than married or
widowed patients were regarded as having a clinical need for continuing
hospital care, and more were thought likely to experience problems in being
discharged. There appeared to be little difference between married and
widowed patients under 60 years of age in their clinical or social needs, but
above that age a larger proportion of widowed than of married patients were
expected to have problems on being discharged.

These results confirm that at all ages a much larger proportion of non-
married than of married patients were likely to be remaining in hospital as
a result of social factors (unsuitable home accommodation, lack of friends
and relatives to provide assistance, etc.). Other investigations, though
not concerned specifically with marital status, have also shown that a not
inconsiderable number of people are admitted to or remain in hospital in the

absence of obvious clinical need.   An earlier study in the Liverpool Hospital
Region,[62] in 1950, of the possible use of recovery homes in the health service,
included a one-day census of all adult patients in the region except those
in sanatoria, infectious diseases and other special hospitals, and convalescent
and mental hospitals.   Also excluded were patients who were recommended for
stays of five days or less in the recovery home, and those in certain special-
ties which are not generally suitable for transfer: ophthalmology, otorhino-
laryngology, obstetrics, and mental, venereological and infectious diseases.
The results showed that 21 per cent of all patients were considered by the
medical staff as suitable for transfer to recovery homes, giving the hospitals
in a full year the equivalent of 2,605 extra full beds, or 2,995 extra beds
at 85 per cent occupancy.

These dramatic figures were repeated in later studies.   In Birmingham,
Crombie and Cross[63] reported that at least 13 per cent and possibly 43 per
cent of patients occupying medical beds in a large general hospital in
Birmingham required only hotel care; and Mackintosh et al[64] classified 13 per
cent of the patients in the same wards as not requiring hospital care on
strictly medical grounds.   In 1960, Forsyth and Logan[65] published the results
of their work in Barrow, showing that 25 per cent of male patients and 42 per
cent of female patients in general medical wards did not need inpatient care
on clinical grounds alone.   More recent surveys have tended to report much
less spectacular conclusions, though there is little consistency in the basis
on which judgments are made.   McPhail and Bradshaw[66] found that 6 per cent
of patients in acute and geriatric beds in the Leeds and Otley area had been
'stuck' in bed for at least seven days unnecessarily.   Of these, just over a
quarter were suitable for hostel-type accommodation with trained nursing staff,
half required residential accommodation without trained nursing staff, and the
remainder were fit to go home with appropriate support.   A study in Scotland.
by Meredith et al,[67] using criteria of medical and nursing dependency, found
that patients occupying acute beds who might more properly be accommodated in
geriatric hospitals or in local authority residential accommodation constituted
only 5 per cent of the total in both teaching and district hospitals, but that
nevertheless 31 per cent of patients in teaching hospitals and 37 per cent of
patients in district hospitals could have been accommodated more suitably
in alternative accommodation to that in which they were located.   In Oxford,
Loudon[68] found that a quarter of patients in medical and surgical beds in the
Radcliffe Infirmary could have been discharged earlier to general practitioner
units, with an estimated saving of 18 per cent of bed-days.

These various studies are not all strictly germane to the central theme of this report, for they do not directly contrast the levels of need of married and non-married patients. Nevertheless they illustrate the probable extent of inappropriate use, and, combined with the marital variations noted in the Liverpool study and with other data discussed in the report, they sustain the hypothesis that a significant proportion of the excess rate of acute bed-use among non-married patients would <u>possibly</u> be classified as inappropriate. The concept of inappropriate use based strictly upon clinical criteria is more problematic in its application to geriatric, chronic sick and convalescent hospitals, for a substantial element of 'social care' may well be considered appropriate and even desirable in such hospitals.

The chief social factors identified as being responsible for the higher admission rates and longer lengths of stay of non-married patients (especially elderly patients) are the lack of assistance from kin or friends, the unsuitability of housing, and the sparse provision of sub-acute care or domiciliary services in the community. Of these, the most important is probably the lack of friends or relatives to provide the necessary degree of support and care in the home (Meredith <u>et al</u>).[67] The availability of care by other family members depends upon the structure and composition of the family and the geographical proximity of family members and their ability to provide care. Non-married persons, particularly elderly single and childless widowed people, are most likely to experience a lack of family care. Whereas only a small number of elderly married persons live alone, the 1966 sample census showed that 42 per cent of single elderly people (defined as men aged 65 and over and women aged 60 and over) and 48 per cent of the elderly widowed/divorced were living in one-person households,[*] while a national survey of 2,500 persons aged 65 and over undertaken in 1962 found that 43 per cent of both the single and the widowed and divorced were living alone (Shanas <u>et al</u>).[69] A larger proportion of non-married women than of men in the survey were living alone, the difference being greatest among the single. The chances of elderly widows and widowers living alone are related to the presence or absence of children, for those having no children were much more likely to be living alone than those with one or more children. Childless widows and widowers were the most 'lonely', these people being more likely even than single elderly persons to be in one-person households. In contrast with the non-married, nearly all elderly married people live in multi-person

[*] The 'household' here refers to the private household and consists of those who sleep under the same roof, and eat around the same table.

households.   The national survey found that two-thirds of elderly married people were still keeping house together with nobody else present and the majority of the remainder had unmarried children living at home.

Although a substantial proportion of elderly single and widowed people live alone, many appear to have a relative nearby and to maintain frequent contact.   Elderly people with children were more likely than those without children to have frequent contact with kin (Shanas et al),[69] but the lack of children was partly compensated by more frequent contact with siblings and other relatives.   For example, the national survey showed that only 15 per cent of the sample reported no contact with kin in the previous week. However, although the majority of elderly single and childless widowed people appear to maintain frequent contact with their families, it is probable that this group includes the largest proportion of those who are relatively isolated from the kin network and who are least likely to live with (or at least be in close contact with) a relative who is able to provide care and assistance.   This may well be an important factor in precipitating hospital admission, for as Townsend[34] states with regard to the effect of family structure and proximity on the availability of family care: 'people who need help with their shopping and cleaning or who need nursing because they are infirm or ill are most likely to get it at home if the daughter lives with them or nearby: if the daughter lives some distance away there is less chance of getting it.   As the variations in family circumstances are followed through - to those with sons and daughters-in-law but not daughters, to the childless, and finally to the unmarried, especially those having no siblings - the availability of family help diminishes and claims on the social services increase.

Evidence of the extent of family care for infirm and severely incapacitated relatives is provided by Isaac's study[30] of elderly patients in Glasgow, while Townsend and Wedderburn[70] found that among a sample of 3,480 elderly persons who were ill or in bed during the previous year, 77 per cent relied on a spouse, child or other relative for help with the housework, 80 per cent with shopping, and 82 per cent for help with meals.   By contrast, only 5 per cent received help with housework from the social services, 2 per cent help with shopping, and 2 per cent help with meals.   Such figures not only support the authors' claim that 'in illness and infirmity the role of the family in providing personal and household care dwarfs that of the social services', but also suggest that it is precisely the lack of such family care that may

enhance the risk of admission to a residential institution.   Evidence of
this in relation to homes for the elderly is provided by Townsend's[27] study
of a sample of new residents admitted in 1958-9.   Those who had been living
alone were significantly less infirm than those living in multi-person house-
holds, implying that elderly people who receive assistance from others may
reach a more advanced stage of infirmity before being admitted to a residential
home than those who have no such assistance.   Moreover the residents admitted
to the homes were less likely to have relatives living in the same household
or in close proximity than were elderly people in the general population.   Of
the married and widowed residents, a disproportionate number were found to
have no children visiting them.

     A similar situation appears to exist with regard to the use of hospital
inpatient facilities.   Isaacs[30] found that one-quarter of elderly patients
admitted from home to the geriatric department of the Glasgow Royal Infirmary
were admitted because of 'insufficient home care'.   This group was the least
ill of those admitted but they had become gravely deprived of care when they
were no longer able to look after themselves.   As compared with those admitted
because of 'therapeutic optimism', those admitted as a result of 'insufficient
home care' included fewer married subjects, more who lived alone and more who
had no children .   The mortality rate for this group was comparatively low
and so too was their discharge from hospital, due to their inadequate social
resources, including the lack of support from kin.   As a result, a large
proportion of those admitted because of insufficient basic care tended to
remain in hospital as long-stay patients.   Further evidence of the greater
length of hospital stay by those with little support from kin is provided
by Cartwright's[71] study of 785 persons in their last year of life.   This
showed that when people living alone were admitted to hospital, they were less
likely to be discharged to die at home within the year.   Many of those who
were discharged had symptoms described as 'very disturbing' (84 per cent
compared with 69 per cent of those dying in hospital and 56 per cent of those
who had not been in hospital during the last year of their lives).   However,
more of those discharged were married, fewer lived alone and more of them
lived with relatives of a younger generation and had family members to look
after them.

     There appears to be little information which relates specifically to
admission to acute inpatient care.   However Isaacs[30] reports that patients
who present an image of social deprivation and prolonged dependency and who
are regarded as having poor prospects of hospital discharge will tend to be

labelled 'geriatric' and referred to the geriatric unit.   Social factors
may therefore play a more important role in determining the admission of
elderly people to a geriatric than to an acute bed, and those who are heavily
dependent and who lack kin support are more likely to be admitted to a
geriatric unit.   The discharge of patients from acute inpatient care is
often delayed as a result of social factors, with one of the main factors
being the absence of support from kin (Butler and Pearson).[61]   This results
in hospital stay being prolonged either until alternative accommodation is
arranged or until the patient is fit enough to return to his own home.

To summarise this section: the evidence on the availability of family
care in times of illness suggests that non-married people (especially the
elderly non-married) may experience graver deprivations in this regard than
married people, resulting in lower clinical thresholds of hospital admission
and hence possibly in higher rates of inappropriate use.

APPROPRIATE USE BY NON-MARRIED PERSONS

The evidence presented in the previous section supported the hypothesis
that part, at least, of the higher rate of hospital use by non-married
patients is a result of their inappropriate use of inpatient care, reflecting
their relatively poorer ability to cope with illness on a domiciliary basis.
It is not inconsistent with this hypothesis, however, that non-married people
may also experience a greater amount of illness 'needing' hospital treatment,
and to that extent their excess rate of use would be judged to be appropriate,
reflecting a higher level of clinical need.   In this section we consider
the evidence of variations by marital status in mortality and morbidity
experience, using these data as indirect indicators of levels of need.   It
must be emphasised, however, that in terms of the paradigm of appropriate and
inappropriate use, these are merely indirect indicators, for they do not
directly embody any normative judgments of need for care.

Marital status and mortality

Taking deaths first, it has long been known that married persons generally
display lower mortality rates than the non-married.   In 1859 William Farr,[72]
the chief statistical medical officer at the General Registry Office, reported
that 'a remarkable series of observations extending over the whole of France
enables us to determine for the first time the effect of conjugal condition on
the life of the population', and he concluded on the basis of these observations

that 'unmarried people suffer from disease in undue proportion and the have-been-married suffer still more'.   In 1912 March[73] published some extensive data on age-specific death rates by marital status for France, Russia and Sweden during the period 1886-1895, showing that for both sexes and in almost all age groups, mortality rates were lowest for the married, slightly higher for the single and highest for the widowed and divorced.   More recent national data from England and Wales and the United States confirm the continuation of these trends.

In England and Wales the most recent data on mortality rates by marital status are those relating to the years 1965-7, published by the Registrar General in 1971.[74]   These show that for both sexes and in almost all decennial age groups between 15 and 84, mortality rates were highest for widowed persons, next highest for single persons, next highest for divorced persons and lowest for married persons.   The only groups in which non-married persons experienced lower mortality rates than married persons were single and divorced men aged 75+ and divorced women aged 65-74.   The ratios of the mortality rates of non-married to married persons generally declined with increasing age, being highest among young widowed persons and lowest among the elderly single and divorced.   There is no clear evidence of changes over time in mortality rates by marital status.   An earlier set of data for 1958, published by the Registrar General in 1960,[75] is not strictly comparable with the 1965-7 data because of the use of quinary age groups and the amalgamation of widowed and divorced persons.   A cursory comparison of the two sets of data, however, suggests a slight improvement during the period in the mortality experience of single men in relation to married men, though the same is not true for women.   An interesting confirmation of the apparent failure to reduce the mortality gap between married and single women is found in Brooke's[76] analysis of 1948 deaths among single and married women.   In each quinary age group the ratio of single to married mortality rates in 1948 was _lower_ than that reported for either 1958 or 1965-7.

The age standardised death rates among the white population of the United States show a similar pattern to England and Wales, with the rates being lowest for married persons, next highest for single persons and highest for the widowed and divorced.[77]   The major difference between the trends of the two countries centres on divorced persons, who appear consistently to display the highest death rates in America but who in this country generally display rates a little lower than those for both single and widowed persons.

There is also a suggestion that the recent reduction in England and Wales of the ratio of death rates of non-married to married men has not been replicated in America, for as Lerner and Anderson[78] have pointed out, the recent improvements in adult mortality have favoured married persons disproportionately, resulting in an _increase_ in the gap between the death rates of the married and the non-married. In 1940, for example, the mortality of all non-married American males aged 20+ exceeded that of married men by 59 per cent, but by 1957 the excess had increased to 74 per cent. Among women, the corresponding figures were 33 per cent (in 1940) and 51 per cent (in 1957). By 1957 the advantage of married men was greatest in the age group 35-44 (where the excess mortality of the _unmarried_ was 168 per cent) and the advantage of married women was greatest in the age group 25-34 (where the excess mortality of the _unmarried_ was 130 per cent).

Marital status and cause of death

Differences in mortality rates by marital status are to some extent associated with differential mortality from certain specific conditions. The Registrar General's data for 1965-7 included information on the cause of death, giving standard mortality ratios by marital status for each cause.[74] Conditions for which the SMRs of non-married persons were substantially higher than those of married persons included tuberculosis of the respiratory system, cancer of the buccal cavity and oesophagus, senile psychosis, myocardial degeneration, hypertensive disease, influenza and pneumonia, cirrhosis of the liver, rheumatoid arthritis and allied conditions, accidents, self-poisoning and suicide. (To some extent, of course, the magnitude of these SMRs vary according to age, sex and specific marital status, but these causes are prominent among those which generally discriminated most markedly between married and non-married people.) The most recent American national mortality statistics showed that causes of death with a high variability by marital status include tuberculosis, influenza and pneumonia, cirrhosis of the liver, heart disease, syphilis, accidents and suicide.

Some of these associations between marital status and cause of death are well-known and extensively documented, even though the causative mechanisms remain as yet unclear. Female cancers are a case in point. Cancer of the breast has long been recognised as commoner in single than in married women, while cancer of the uterus shows the reverse association. The most comprehensive assessment of mortality from female cancers is Logan's[79] appraisal of death rates from breast and uterine cancer in England and Wales in 1948-9.

He confirmed that death rates from cancer of the breast in women who had
passed childbearing age were higher in single and in infertile married
women than in fertile married women. However, at childbearing ages married
women, whether they had had children or not, experienced higher death rates
from cancer of the breast than did single women. Death rates from cancer
of the uterine cervix were higher in married than in single women at each
age, irrespective of childbearing. Mortality from cancer of the body of the
uterus tended to be higher in single and in infertile married women than in
married women who had borne children.

Notwithstanding the pronounced variations by marital status in deaths from
particular causes, an equally striking aspect of the national mortality data
is the higher death rates among non-married than married persons for almost
every major cause of death. As Shurtleff[80] puts it, 'there is no disease
that kills impartially, that kills the married and the unmarried alike'.
In fact, the 1965-7 mortality data for England and Wales showed no cause of
death, among either men or women, for which the SMR of married persons was
greater than that of all the non-married categories. How, then, can such
variations be explained?

Artefacts in the data

Several authors have pointed to possible artefacts in the collection and
processing of data that may in part account for the observed variations.
Possible misclassification of marital status on the death certificate or in
the census enumeration has already been discussed (page 15) and the conclusion
reached that in most cases such misclassification could account for only a
small part of the variation. There may possibly exist some systematic
variations in the recording of cause of death, but no evidence of this has
come to hand. It is known, however, that a high proportion of deaths from
certain causes, especially road traffic accidents, occur to persons of unknown
marital status, and these are conventionally excluded from the numerator in
calculating marital-specific death rates. The effect may be artificially
to enlarge or diminish the apparent mortality of different marital status
groups if these cases are not systematically distributed between each group.
A further factor that has been suggested as a possible cause of the high
mortality among widows is the administrative requirement in both America and
Britain that, in the event of a married couple dying simultaneously (e.g. in
a traffic accident), one should be recorded as married at the time of death
and the other as widowed. This would have the effect of artificially

depressing the death rate for married persons and increasing the rate for widowed persons. Lastly the point has been made that by comparing death rates in conventional quinary age groups, no allowance is made for the possibility that differences in average age may exist between persons of different marital status <u>within</u> any age group. For example, the widows in a quinary age group may be older, on average, than the married women, and this may account in part for their observed excess mortality. The Registrar General[74] concluded that this artefact accounted for some of the excess mortality among the widowed in the 1965-7 data in each age and sex group except for males aged 15-24. In a separate cohort study of 4,486 widowers by Parkes <u>et al</u>[81] it was estimated that about a quarter of the excess mortality noted in the cohort could be explained by the average age of the widowers being one year greater than the average age of married men within the same age group.

Marital status and morbidity

It seems generally accepted that although such defects in the data may account for some of the excess mortality of non-married persons, they do not explain more than a small part of the differences between marital status groups. We turn later in this report to more substantial explanations of the association, but it is helpful first to consider the extent to which mortality rates parallel morbidity levels. Mortality rates have traditionally been regarded as a useful indicator of the extent of morbidity in the population, for death is usually a clear unambiguous and easily measured event. By contrast, no such sharp distinction exists between a healthy and a diseased state in an individual, and the evaluation of health (or illness) depends in part upon the subjective experience of the person involved. However, whereas morbidity and mortality were clearly linked in earlier times, the extent to which differences in mortality rates may be regarded as a valid indicator of disease in today's advanced industrial societies is unclear. With the changed pattern of disease much morbidity is now chronic, having little direct effect upon longevity and mortality but causing considerable disability from middle age onwards. Simultaneously, the increased expectation of life has resulted in an increase in the degenerative diseases of old age. Townsend,[34] for example, found that in a sample of elderly persons living in private households in Bethnal Green, 30 per cent of the women and 22 per cent of the men could be regarded as infirm and suffering from a 'severe limitation of movement, difficulty with stairs and in kneeling, trouble with their feet and a tendency to giddiness and falling'. Similar results were produced by a survey carried

out in Great Britain in 1968, which showed that 38 per cent of persons aged
75 or more, 22 per cent of those aged 65-74 and 9 per cent of those aged
50-64 had some kind of physical, mental or sensory impairment.[82]   In the
United States, the US Health Interview Survey has found that 40 per cent
of people aged 65 or more had some kind of chronic disorder.[83]

The extent to which differences in mortality rates among marital status
groups also reflects differences in morbidity, will depend on the severity
and types of diseases experienced by married and non-married persons and on
their illness behaviour.   It is possible that the higher mortality rates
for non-married persons are also associated with higher morbidity rates, or
with a similar or lower amount of morbidity due either to the lower incidence
of chronic conditions, or to differences in illness behaviour which lead to
higher mortality rates for similar diseases and conditions.

More direct evidence on the extent of morbidity in the population than
can be gained from mortality data is that obtained by personal interviews
or reports and by clinical examinations.   There is however a wide discrepancy
between self-reported illness and the volume of disease determined on the
basis of clinical examinations (Sagen et al,[84] Fisher,[85] US National Health
Survey[86]), and few such studies appear to provide data by marital status.
The General Household Survey[87] does provide information on self-reported
illness of persons in private households by marital status (see Appendix IV).
The results of the first year of the survey showed that in all age and sex
groups a higher proportion of widowed, divorced or separated than of married
or single persons reported a long-standing illness, disability or infirmity.
The relationship between the proportions of single and of married respondents
reporting a chronic illness or disability varied according to age.   In the
age group 15-44 the proportions were identical;   in the age group 45-64 a
slightly higher proportion of single than of married men and women reported
a chronic illness;   and in the age group 65+ the proportion was slightly
higher for the single.   A further question was asked about activity
restriction through illness in the two weeks preceding the interview;   the
answers showed that rather fewer married persons reported such restrictions,
but there were otherwise no consistent variations by marital status.   Taking
all self-reported illnesses together (i.e. both chronic and acute) the general
picture emerged of a greater volume of ill-health among non-married than
married people, and it is estimated from the calculations made in Appendix IV
that the relatively higher rates of reported illness among the widowed/divorced/
separated respondents could be sufficient to account for much of the higher
hospital discharge rates observed among widowed patients in the HAA analyses
(Appendix II).

Data from the Californian Health Survey in 1954-5 show a similar pattern (La Horgue).[88]   Various measures of morbidity were used in the survey, including incidence and prevalence rates of self-reported illnesses, days of disability and confinement to bed, the presence of chronic conditions and spells of hospitalisation.   The results showed that married persons had lower scores on each morbidity measure than divorced persons, even with age, income and race taken into account.   Some, but not all, of the measures revealed a greater morbidity among widowed than among married persons;   and whilst no consistent variations in morbidity were noted between single and married men, among the women it was the married who displayed a greater morbidity than the single on almost all measures.   This latter finding, interestingly, finds confirmation in Brooke's[76] analysis of illness reporting among single and married women in the Survey of Sickness in 1948.   Between the ages of 16 and 44 proportionately more single than married women reported freedom from illness and injury month by month;   conversely, married women reported higher monthly prevalence rates and inception rates for illnesses causing up to two days' incapacity.   Between 45 and 64 the differences were less marked and over the age of 65 there was little difference between the sickness experience of the two groups.

The finding that relatively more non-married than married persons suffer from chronic illness is confirmed in a number of studies.   Data from the 1967 American National Survey of Economic Opportunity showed a consistently higher prevalence of work-limiting chronic conditions among non-married persons in almost all the disease categories employed (Wan).[89]   In an entirely different context, Marris[90] noted that many of the widows whom he interviewed had suffered post-bereavement physical symptoms which, in their own opinion or that of their doctor, were caused or aggravated by the shock of their husbands' deaths.   These included loss of weight, rheumatism and fibrositis, asthma, bronchitis, duodenal ulcers, indigestion, skin irritation, gum abscesses, headaches, insomnia and nerves.   The suggestion in the last two symptoms that widowhood may be a causal agent in psychiatric morbidity is supported indirectly by the evidence reported above of high suicide rates among the widowed and more directly by data presented by Stein and Susser.[91]   In attempting to surmount the difficulty that high prevalence rates among a population of widowed persons give no indication of whether it is the process of becoming widowed or the state of widowhood that may be causing the morbidity, Stein and Susser examined data from the Salford case register relating to the time interval between bereavement and first admission into psychiatric care. They were able not only to confirm the established association between

widowhood and entry to psychiatric hospital, but also to identify the
transition into widowhood as a cause of entry to psychiatric care and therefore
by inference as a cause of severe mental disorder.   The equation of admission
to psychiatric care and psychiatric morbidity is not without hazard, particu-
larly in the field of mental illness where a variety of social and legal
factors may determine which people are admitted to care (Hollingshead and
Redlich);[92] but in one of the few population-based surveys of psychiatric
morbidity, Bellin and Hardt[93] also found higher rates of mental disorder
among elderly widowed than among elderly married persons in New York.

Marital status, mortality and morbidity: explanatory hypotheses

In addition to possible artefacts in the data, discussed above, which
might account for part of the association between marital status, death and
illness, substantive hypotheses put forward to explain these observations
have been of two major types: the selection hypothesis and the 'unfavourable
environment' hypothesis.   The selection hypothesis postulates that those who
are the least fit and who therefore carry the greatest mortality and morbidity
risks are more likely to be 'selected out' of marriage and to remain single
than those who enjoy good health.   The fact that age-specific mortality
rates invariably show the greatest excesses of single over married deaths in
the younger (marriageable) age groups is important confirmation of a selection
effect, but selection may also operate at older ages to ensure that those who
become widowed and divorced remain in a non-married state.   The approach
of comparing 'ever married' (i.e. married, widowed, divorced and separated
persons as one group) with 'never married' (single) persons is useful in
overcoming the selective factors that operate after marriage, but it does not
eliminate those associated with the original marriage (McMahon and Pugh).[94]
Using this technique, Zalokar[95] concluded from her study of female American
deaths in 1949-51 that selection was the most important factor explaining the
mortality variations by marital status up to the age of 45.   Likewise, Medsger
and Robinson's[96] study of rheumatoid arthritis patients suggested that the
large number of divorcees among a group of female rheumatoid patients was
best explained by their lower rate of remarriage.

Selection of a different kind may also operate to bring together in
marriage people with similar high health risks.   This is called by Kraus
and Lilienfeld[97] the 'mutual choice of poor-risk mates' hypothesis.   It has
been explored most fully by Ciocco[98] in the course of his analysis of the
death records of 2,571 white married couples of which both partners died in

Washington County, Maryland, during the period 1898-1938. Ciocco found
first, that a high positive correlation existed in the length of life of
husbands and wives, and second, that there was a marked tendency for
husbands and wives to die from the same cause when one spouse died from
influenza, pneumonia, heart disease, cancer or (most markedly) tuberculosis.
The correlation in length of life is postulated to result from marriage
between people with similar 'vitality' or 'resistance', and this in turn is
due in part to marital selection, reinforced by the shared marital environment.
Ciocco further considers selection to have played a part in the association
between cause of death of husbands and wives, particularly for tuberculosis
and heart disease, but his argument is not strong and he eschews the issue of
how far the mutual selection of poor risk mates could be conscious.

The alternative hypothesis (the 'unfavourable environment' hypothesis)
takes a number of forms but postulates in essence that there is 'something'
about the married state that enhances health and well-being, or conversely,
that there is 'something' about the non-married state that threatens health
and precipitates illness and death. The specific components of the environ-
ment that are held to create different mortality and morbidity risks for
the married and non-married probably vary from one cause of death and illness
to another. Shurtleff[80] suggests that marriage and the routine of family life
may be conducive to regularity in patterns of eating, sleeping, working and
playing, and this in turn reduces the threats to health resulting from heart
disease, accidents and syphilis. Married people also appear to have better
housing conditions and more adequate financial resources than others, and
they may have a stronger motivation to guard their health for the sake of
their partners and dependents and to seek care promptly in times of illness.
Non-married persons, by contrast, may deliberately expose themselves to a more
dangerous environment and life-style, though the direction of this causal
relationship (if such it is) is unknown. Certain features of the marital
relationship itself, most notably the sexual relationship and the production
of children, may be further factors conferring either risk or immunity. It
is now widely accepted, as Logan's[79] analysis implied (page 31), that sexual
intercourse is a risk factor in cervical cancer. Two indicators of sexual
activity that are particularly associated with cancer risk are the age at
which regular intercourse starts and the number of different sexual partners
(Raven and Roe);[99] these may possibly account in large measure for the much
higher mortality rates from cervical cancer among widowed and divorced women
than among single women. Conversely, childbearing appears to offer some

immunity to breast cancer, thereby favouring married women. Estimates of the incidence of breast cancer in relation to parity indicate that women with four or more children experience incidence rates less than half those of nulliparous women (MacMahon et al),[100] although there is more recent evidence that it is the first birth (rather than subsequent births) that is most instrumental in conferring immunity (MacMahon[101]).

A further important example of the specific effects of a marital state is seen in the breakup of marriage through the death of one of the partners, when immediately the widowed partner is at extra risk himself. The study by Parkes et al,[81] in which 4,486 widowers aged 55+ were surveyed for a period of nine years following the deaths of their wives in 1957, found that death rates among the widowers in the first six months of bereavement were 40 per cent greater than the expected rate for married men of the same age. Thereafter mortality fell gradually to the level of married men, with no subsequent rise during the nine years. The greatest increase in mortality during the initial months of widowhood was found among those dying from coronary thrombosis and other arteriosclerotic and degenerative heart disease. In addition, almost a quarter of the deaths were from the same diagnostic group as the wife's death, a higher proportion than could be expected by chance. Similar results have been reported by Cox and Ford,[102] who found a rise in mortality during the second but not the first six months of bereavement, and by Rees and Lutkins.[103] The latter's study of mortality among bereaved relatives over a six-year period found a mortality rate during the first year of bereavement that was seven times greater than in a control group. The increase was greatest among bereaved spouses and lowest among bereaved children, but all the close relatives who were studied displayed a higher mortality rate than the controls.

The processes that might explain this association between widowhood and premature death include all those listed above. There may be curiosities in the collection and processing of the statistics; there may be an element of homogamy, in which unfit persons have married each other and the death of one partner has 'triggered' the latent weakness in the other (Young et al[104]); there may be a shared unfavourable environment, be it one conducive to the spread of infectious disease or one of immediate physical danger as in road traffic accidents. In addition the emotional impact and subsequent stress resulting from bereavement may be causative or predisposing factors in the high death rates of widowed persons from suicide, accidents, coronary throm- bosis and gastro-intestinal diseases, notably peptic ulcer and cirrhosis of the liver. But whatever the causes, mortality and morbidity rates among the widowed remain high, universal, and (in the case of deaths) most marked in the younger age groups.

The divorced are in many respects in a similar position to the widowed but tend to have a less well-defined social position and few social supports. There have been relatively few studies of the effects of divorce on morbidity and mortality, but Chester's[105] study of the self-reported health experiences of female petitioners for divorce suggests that the effect of divorce on health is fairly similar to that of widowhood. The majority of the respondents reported a deterioration in their health, of whom nearly all reported symptoms associated with stress. The maximum disturbance was found to occur in the later stages of marriage and separation rather than with the divorce action itself, indicating, as Chester notes, 'that transition in status is closely related to personal disorder, and ... that when marriages are dissolved it is not the divorce but the earlier separation which has most impact'. The stress of divorce has been suggested as a factor in the high mortality rates from suicide and cirrhosis of the liver among divorced persons, but it seems at least an open question in the case of cirrhosis whether the presence of alcoholism might have precipitated the divorce.

Indeed, there are clearly many features of the association between marital status, illness and death that remain obscure. The point has been made, for example, that even among conditions displaying a well-established differential prevalence rate for married and non-married persons, there is often a disconcerting lack of any association between marital status and the risk factors associated with those conditions. Weiss,[106] for example, sought to explain the higher death rates from coronary heart disease among the non-married by demonstrating their greater susceptibility to known risk factors in CHD. Using data from the US Health Examination Survey, he compared persons in each marital status for systolic and diastolic blood pressure, serum cholesterol and ponderal index; but he found no consistent differences in any of the risk factor levels between married and non-married men and women. Likewise, Berkson[107] points out that although the death rates from lung cancer show the characteristic American gradient of increase from married through single to widowed and divorced persons, nevertheless cigarette smoking rates are higher among married than non-married persons. On the other hand, death rates from almost all cancers are higher in the divorced category than any other, which suggests that a more general explanation may be needed. A viral aetiology to cancer might provide such an explanation, but it would then be necessary to account for the greater risk of exposure to the virus among the divorced. At this point, as Berkson comments, 'powers of explanation seem to fail'.

CONCLUSIONS

The light which this volume of evidence casts upon the extent and causes of inappropriate use and non-use of hospital inpatient resources by non-married and married people is difficult to summarise, but some broad conclusions seem permissible.

First, it seems unlikely that the higher rates of inpatient use by non-married persons is explained by a widespread under-use by married persons. It is true that this conclusion is based upon the absence of evidence to support the corollary proposition rather than the existence of evidence which positively supports the conclusion itself. Yet it is difficult to believe that married patients are commonly discharged from hospital (or discharge themselves) before they are considered clinically fit to leave, and it seems improbable on general grounds that married people are significantly more likely than non-married people to experience a failure of admission (for whatever reason) under circumstances which would be considered to justify such admission on clinical grounds. In sum, an inappropriate non-use by married patients, whether reflected in their lower admission rates or their shorter average lengths of stay, is probably an inadequate explanation of the observed variations.

Second, there exists a reasonably large corpus of evidence, both direct and circumstantial, of a greater element of clinically inappropriate use among non-married than married patients, especially with respect to delayed discharges from hospital. It seems likely therefore that part of the higher rate of hospital use by non-married patients may reflect a clinically inappropriate use, associated with the presence of social factors such as the poor availability of family care, low standards of housing and the lack of sub-acute care or domiciliary services in the community. It is not, of course, assumed that the married patients never display an inappropriate use, merely that such use is more frequently associated with the non-married state.

Third, the general weight of the evidence on marital variations in morbidity and mortality points towards lower levels of health and higher death rates among non-married than married people, with the widowed and divorced experiencing the worst rates of all. Although such evidence cannot be taken directly as an indicator of a greater volume of clinical need among the non-married, cumulatively it supports the contention that part of the excess rate of hospital bed use by non-married patients may simply be a function of enhanced need. To that extent, the greater use of hospital inpatient care by the non-married may be regarded as appropriate.

Yet there remain many gaps to be filled. Although the evidence reviewed above strongly suggests that the observed variations in hospital use between married and non-married patients results from both a greater amount of inappropriate use and a larger volume of need among the non-married, it is impossible on the basis of existing evidence to allocate the proportions of extra beds used by non-married patients to each of these two major causes. The significance of one cause relative to the other is simply not ascertainable.   Nor can we estimate with much reliability how the element of inappropriate use may be distributed between admission rates and lengths of stay. A further important question is whether the excess use by non-married patients is due to a small number of these patients making very large demands upon the hospitals or to a much larger number each making a small additional demand.

Elderly patients have been found to account for a major part of the total excess use by non-married, but again there is little detailed information on the pattern and causes of such use.   Of special interest here is the position of widowed persons in the post-bereavement period.   It is known that mortality risks increase appreciably following the death of a spouse, and it was shown in the HAA analyses that the discharge rates for widowed patients are consistently higher than for any other marital group.   If a substantial proportion of the excess use by all non-married persons is accounted for by widows and widowers in the post-bereavement period, the policy implications may well be different from a situation in which the excess use results from isolated people remaining in hospital for lack of social care at home.

In short, much remains to be learned about the nature and causes of the very large variations in hospital use between persons of differing marital statuses.   It is suggested that the utilisation review offers an appropriate vehicle for further study and would provide a useful data base for any policy decisions that may be aimed at controlling or even eliminating the most extreme variations in use.

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Appendix I

Analysis of data from the Hospital In-Patient Enquiry

Note: pages and tables are numbered separately within
        this appendix

INTRODUCTION

One stimulus to the development of the project has been the work of Dr. Morton Kramer and his colleagues in the Biometry Branch of the National Institute of Mental Health, Washington. Starting from the earlier observations by Abel-Smith and Titmuss* of the relative over-representation of single and widowed people among the hospital patient population, and drawing upon the results of their own analyses of the social and demographic characteristics of in-patients and out-patients at American mental hospitals,** Kramer and his colleagues performed a series of analyses of data published in the Hospital In-Patient Enquiry reports for 1964, 65 and 66. The results of these analyses, as yet uncollated, bear out the main observations of Abel-Smith and Titmuss, but they have not been written up in a form that relates to the purposes of this project, nor have they been updated as H.I.P.E. reports have appeared for subsequent years. To overcome these twin deficiencies an entirely new analysis has been made of H.I.P.E. data relating marital status to various indices of hospital utilisation. The analysis, which is the subject of this paper, seeks to establish the magnitude and nature of differences between married and unmarried people in their use of hospital in-patient beds. Some of the approaches and methods employed in the paper derive from Kramer's earlier work, and his contribution in this way is gratefully acknowledged.

SOURCE

The data presented in this paper are drawn from published reports of the Hospital In-Patient Enquiry, which is based upon a systematic sample of approximately one in ten in-patient records from N.H.S. hospitals in England and Wales. Private and staff patients and those in convalescent hospitals and hospitals confined to the treatment of psychiatric diseases are normally excluded from the Enquiry, but psychiatric patients in general wards of general hospitals are included. Complications and conditions of pregnancy, childbirth and puerperium fall within the scope of the Enquiry but have been omitted from all the analyses in this paper because the H.I.P.E. reports have failed consistently to distinguish between married and unmarried women admitted with these disorders.

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* B. Abel-Smith and R.M. Titmuss. The cost of the National Health Service in England and Wales. National Institute of Economic and Social Research, 1956, page 70-72 and Appendix H.

**Department of Health, Education and Welfare, Public Health Service. Health Services and Mental Health Administration, National Institute of Mental Health, Office of Program Planning and Evaluation, Biometry Branch, Survey and Reports Section. Statistical Notes 32 and 35, September 1971.

Annual reports from the Hospital In-Patient Enquiry covering all eligible hospitals have been prepared since 1958, but marital status has been included only since 1964. That is therefore the earliest year covered by this paper, and 1966 and 1968 have been included to show intermediate trends. The last two years for which full reports were available at the time of this paper was compiled (1969 and 1970)complete the coverage. All the data presented here relate to hospital discharges and deaths during the years in question, not to individual patients. Thus patients discharged more than once during a calendar year are at risk of inclusion in the sample at each discharge. The sampling methods employed in the Enquiry are designed to avoid bias in selection, but since the sampling fraction is never exactly 1/10 either for the whole country or for any region it is probable that some bias is invariably present in the returns made by each hospital. This is likely to be minimised in the case of hospitals also participating in the Hospital Activity Analysis, where the sampling may be done by a central computer from the full H.A.A. returns.

There is very little evidence concerning the validity of the recording of marital status on H.I.P.E. record forms, and the classification of marital status in the reports must therefore be accepted at face value. Other studies within the project are concerned with that problem. In evaluating the results presented in this paper some allowance should be made for the possibility of error in the matter of recording marital status (though any such error is as likely to be random as systematic),and also for the unfortunate classification of patients simply as 'married' or 'other'. The latter include not only single, widowed and divorced patients but also an unknown proportion of patients whose marital status is for some reason not recorded. It would be wrong to minimise the limitation which this classification imposes upon the conclusions to be drawn from the following analyses, for as the H.A.A. tables in a later Appendix show, there are marked differences between single, widowed and divorced patients in their use of hospitals. It must therefore be assumed that any overall differences between the married and non-married groups may cloak a number of variations which could only be revealed by treating the single, widowed and divorced as separate groups.

The clinical condition selected for inclusion in the Enquiry, where a choice is available, is the principal condition for which the patient was admitted to hospital, taking into account in making the diagnosis all the information available at the time of discharge. The classification of diagnostic groups in the 1966, 1968, 1969 and 1970 Enquiries was based

upon List A of the 1965 International Statistical Classification of
Diseases, and in the 1964 Enquiry upon specially derived sub-divisions
of the 1955 I.C.D.

THE DATA IN THE HOSPITAL IN-PATIENT ENQUIRY

The following data used in this paper are either contained in or
calculable from the H.I.P.E. reports.

1. The total population of England and Wales from which the in-patients
are drawn (P). Population figures by marital status are not given in the
H.I.P.E. reports but they can be calculated from the discharge rates
and they correspond to the mid-year estimates contained in the Registrar
General's Annual Statistical Reviews of England and Wales.

2. The number of in-patients appearing in the enquiry (N). This
number is a sample of all patients who were discharged or died or were
transferred to other hospitals and institutions during the calendar year
in question. Discharges can obviously be taken as the equivalent of
admissions, though not within any specified time period. Some patients
discharged in, say, 1970 (and therefore appearing in the 1970 enquiry)
may have been admitted in 1969 or even earlier, and some patients admitted
in 1970 may not be discharged until 1971 or even later.

3. The estimated discharge rate of all patients per 10,000 population
(DR). The rate is calculated by multiplying the number of patients in the
sample (N) by the grossing factor,* dividing by the number in the popula-
tion (P), and multiplying by 10,000.

4. The mean duration of stay in days (MDS). This is calculated for
each separate in-patient spell by aggregating the number of days recorded
by the patients in the sample and dividing by the number of such patients
(N). Duration of stay is taken to be the calendar difference in days
between the dates of admission and of final discharge (excluding convalescent
spells). This measure, being an arithmetic mean, may be greatly influenced
by a few cases with abnormally long durations of stay, making it difficult
to use as a comparative statistic.

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*The grossing factor converts sample numbers into estimates of the total
hospital population. The H.I.P.E. reports generally give the factors
for the sample as a whole and for each region and department, but not for
each sex, age or marital status group. Hence the grossing factor applied
to each sex, age and marital status group in this paper is perforce the
national factor for the year in question; these are as follows.
1964: 10.748   1966: 11.136   1968: 11.001   1969: 10.793   1970: 11.065

The population estimates, numbers in sample, discharge rates and mean durations of stay for the years covered by this paper are shown, by age, sex and marital status, in Table 1. The discharge rates and mean durations of stay are also depicted graphically, for married and non-married male and female patients over 25, in diagrams 1 and 2. (The reasons for excluding patients under 25 are given below.)

5. The average number of beds used daily (ABD). This measure is obtained by aggregating the number of bed-days of cases in the sample who were discharged in the year in question, multiplying by the appropriate grossing factor, and dividing by the number of days in the year. The average number of beds used daily may also be expressed as a rate per million population (ABDR). The measure of daily bed use has two principal uses for planning purposes: it indicates the number of beds actually used (at 100 per cent occupancy) in the treatment of specific groups of patients, and it usually provides a better basis for morbidity comparisons than discharge rates because it represents the total hospital load for each group rather than the number of separate spells of in-patient care. It is, however, a derived statistic in the sense of mediating the relationship between discharge rates and lengths of stay and should therefore be interpreted with reference to those component variables. For example, it would be important to know whether a higher rate of bed use among non-married than married patients in a given age and sex group resulted from higher discharge rates, longer average stays, or both. The relationship between discharge rates, lengths of stay and daily bed use is given in the formula:

$$ABDR = \frac{ABD \times 1m.}{P} = \frac{DR \times MDS \times 100}{\text{Number of days in year}}$$

(The two methods of calculating ABDR yield slightly different results due to the process of rounding off).

The number of beds used daily (ABD) and the rates per million population (ABDR) for the years covered by this paper are shown, by age, sex and marital status, in Table 2. The rates for married and non-married male and female patients over 25 are also depicted graphically in diagram 3.

6. The number of deaths among patients in the sample. It should be noted that the number of deaths shown in any diagnostic category is the number of patients with that particular diagnosis on admission who subsequently died during that spell in hospital. It is not a list of the causes of death.

All the above data are contained in or calculable from the H.I.P.E. reports for married and non-married men and women in each age and diagnostic group (and for all ages and all diagnoses). All the analyses in this paper, however, exclude patients below the age of 25 because, due to the very small number of patients below this age, most of the differences between married and unmarried patients are statistically inadmissible. Above this age the standard H.I.P.E. age groupings are used, as in Tables 1 and 2. (Patients over 75 were identified separately for the first time in 1968.) The two statistics which relate to population size (the discharge rate and the rate of daily bed use) are each calculated on the population within that age/sex/marital-status group. For example, the discharge rate among married men over 75 with a diagnosis of cerebrovascular disease is defined as the number of such discharges (and deaths) expressed as a rate per 10,000 married men over 75 in the population. Likewise the rate of bed use among patients in any given age/sex/marital-status group is calculated as the total number of beds used daily, on average, by those patients expressed as a rate per million population in that age/sex/marital-status group.

THE ANALYSIS OF THE DATA

Using the data described in the previous section, the following analyses were performed.

1. First, the average number of beds used daily per million population by married and unmarried patients (designated as ABDR(M) and ABDR(NM) respectively) was calculated for each age and sex group. These rates were presented in the H.I.P.E. reports until 1966; for subsequent years they have been calculated in the manner described in note 5 of the previous section. The results, set out in Table 2 and diagram 3, are discussed in more detail later in the paper, but they show, briefly, that in each age group and for both sexes the non-married patients had higher rates of bed use than their married counterparts in each of the years covered by this paper.

2. Secondly, the major components of the higher rates of bed use by non-married patients were identified. Since the rate of bed use is a function of both the discharge rate and the average length of stay, the higher rates among non-married patients could result from higher discharge rates, longer average stays, or both. Four possibilities can be identified:

Case 1	DR (M) $>$ DR (NM)	and	MDS (M) $>$ MDS (NM)
Case 2	DR (M) $<$ DR (NM)	and	MDS (M) $<$ MDS (NM)
Case 3	DR (M) $>$ DR (NM)	and	MDS (M) $<$ MDS (NM)
Case 4	DR (M) $<$ DR (NM)	and	MDS (M) $>$ MDS (NM)

Cases 1 and 2 must always result in higher rates of bed use for married and non-married patients respectively, but cases 3 and 4 might result in a higher rate for either group, depending upon the relative values of DR and MDS. The appropriate case can be determined simply by calculating the ratio of non-married to married patients (i.e. married patients = 1.00) with respect to discharge rates and lengths of stay. These calculations, which are set out in Table 3 and diagram 4, show, first of all, that each age and sex group in each of the five years was either case 2 or case 3; that is, the unmarried patients invariably stayed in hospital for longer periods of time than their married counterparts, although in some instances (notably among middle-aged and elderly women) they had lower discharge rates. Secondly, the results show that in general the ratios for discharge rates diminished with rising age whilst the ratios for lengths of stay tended to enlarge with increasing age (albeit in a somewhat irregular fashion). These results are discussed in greater detail later.

3. Next, the differences between the rates of bed use of the two marital-status groups were expressed in actual numbers of beds by calculating the number of beds which non-married male and female patients in each age group would have occupied each day under each of three assumptions, namely:

first, that they had displayed the same discharge rate as the corresponding group of married patients. This was done by substituting the value of DR(M) for DR(NM) in the calculation of ABDR(NM), and then converting to numbers of beds.

The formula for this conversion is:

$$\text{ABD(NM) under this assumption} = \frac{\text{ABDR(NM)} \times \text{P(NM)}}{1 \text{ million}}$$

$$\text{where ABDR(NM)} = \frac{\text{DR(M)} \times \text{MDS(NM)} \times 100}{\text{Number of days in year}}$$

secondly, that they had displayed the same mean duration of stay as the corresponding group of married patients. This was done by substituting the value of MDS(M) for MDS(NM) in the calculation of ABDR(NM), and then converting to numbers of beds. The formula for this conversion is:

$$\text{ABD(NM) under this assumption} = \frac{\text{ABDR(NM)} \times \text{P(NM)}}{1 \text{ million}}$$

$$\text{where ABDR(NM)} = \frac{\text{DR(NM)} \times \text{MDS(M)} \times 100}{\text{Number of days in year}}$$

thirdly, that they had displayed the same discharge rate and average length of stay as the corresponding group of married patients (i.e. the same rate of bed use). The formula for calculating this figure is:

$$\text{ABD(NM) under this assumption} = \frac{\text{ABDR(M)} \times \text{P(NM)}}{1 \text{ million}}$$

Although it might appear that the number of beds which non-married patients would have occupied under this third assumption would equal the sum of the numbers obtained under the first two assumptions, the relationship is more complex. Allowing for some slight error due to the rounding off of decimal numbers, the number of beds obtained under this third assumption is equal to the product of the numbers obtained under the first two assumptions, divided by the number of beds actually occupied each day by the unmarried.

By subtracting the beds which non-married patients would have occupied under each assumption from the number which they actually used, a measure is then derived of the 'extra' beds used each day by these patients resulting, variously, from longer stays, higher discharge rates, or both. The 'extra' beds will usually be a positive number, but may be negative when non-married patients are either admitted to hospital less frequently than the married or stay for shorter periods of time. It is important to note that this way of defining the 'extra' number of beds occupied by unmarried patients is not the same as simply computing the difference between the number of beds used by married and non-married patients, for it takes account of the fact that, in any age and sex group, there is an unequal number of married and unmarried people in the population. The difference between the number of beds used by married and non-married patients would be a valid indicator of the extra beds used by either group only if there were the same number of married and unmarried people in the population, which clearly is not the case.

The results of this part of the analysis are set out in Table 4 and, partially, in diagram 5. Briefly, they show not only that the 'extra' beds occupied each day by non-married patients constitute a large proportion of all beds used by them (especially among older patients), but also that the number of such beds increased very rapidly for females (though not for males) between 1964 and 1969, with a slight decrease in 1970.

4.   Finally, the major statistics described above were analysed by diagnosis within each age and sex group. The diagnoses were ranked according to the magnitude of the difference between the rates of bed use of unmarried and married patients $|i.e. ABDR(NM) - ABDR(M)|$ and the major statistics were calculated for the top few diagnoses in each age and sex group. These are shown in Tables 5-8 for males and Tables 9-12 for females. For the purposes of this part of the analysis no diagnoses were included in which the sample cases for either married or unmarried patients were less than 20. The justification for this is that a small number of cases in a relatively rare condition involving long stays might seriously distort the validity of the comparisons, both statistically and in terms of the impact upon the hospital service.

Because of the large volume of data generated by the diagnostic analyses, and also because of changes in the diagnostic coding between 1964 and 1970, only the most recently available figures (1970) are used in this part of the analysis. Full diagnostic break-downs have, however, been derived for each year covered by this paper, and comparisons are made where appropriate.

RESULTS

The discussion of results in this section follows closely the stages in
the analysis outlined above.   Tables 1 and 2, and the associated diagrams
1-3, set out the base data from which the later tables are constructed.
They show a number of characteristic features in the pattern of hospital
utilisation.   First, the discharge rates for unmarried men and women over 25
are higher than those for married patients, and the gap has been widening
since 1964 (diagram 1).   In that year, unmarried men over 25 were discharged
at a rate 48 per cent higher than married men, and unmarried women at a
10 per cent higher rate than their married equivalents.   By 1970 the
differences had increased to 66 and 38 per cent respectively.   The reason
for the widening gap is that although discharge rates have risen since 1964
for both married and unmarried patients, by far the steepest rises have
occurred among the non-married group.   The discharge rate of unmarried men
in 1970 was 21 per cent higher than in 1964, and of unmarried women 32 per
cent higher, yet the corresponding increases among married men and women were
only 8 per cent and 5 per cent respectively.   A simple extrapolation of the
trends since 1964 suggests that the gap between the discharge rates of unmarried
and married patients is unlikely to narrow in the immediate future.

Secondly, the average length of stay of unmarried men and women over 25
is greater than that of married patients.   The average stay of unmarried
men over 25 has remained fairly consistently at a level about 75 per cent
higher than that of married men, even though the actual average for both
groups of men has fallen (by about a fifth) between 1964 and 1970.   Among the
female patients over 25 the average length of stay has also fallen during this
period for both married and unmarried women, but the decline has been relatively
greater among the married than the unmarried (21 per cent against 9 per cent).
Consequently, the gap between the two groups has been widening.   In 1964 the
average length of stay of unmarried female patients was 2.4 times that of the
married, but by 1970 the difference had increased to 2.7.

The combined effects of discharge rates and lengths of stay upon rates
of bed use are shown in Table 2 and diagram 3.   The table shows both the
number (ABD) of beds occupied each day, on average, by patients in each

age/sex/marital-status group and also the rate (ABDR) of bed use per million population. In most age groups, and in total, married men occupied a greater number of beds than unmarried men in each of the five years, whereas married women invariably used fewer beds in total (due mainly to the much smaller numbers occupied by married women over the age of 75). However, in each age and sex group, without exception, the rate of bed use was higher in every year for the unmarried than for the married. The differences are of a large order and have widened since 1964 (see diagram 3). In 1964, unmarried patients (both male and female) exhibited a rate two-and-a-half times that of their married equivalents. Subsequently the rate of bed use has fallen gently for all married patients (and also for non-married men), but among unmarried female patients it rose quite considerably to 1968, since when it has declined a little. We have, therefore, the first major conclusion of the analysis and the most important single finding of the paper: in 1970 unmarried female patients over 25 had a rate of bed use more than three and a half times that of married women, and unmarried male patients over 25 had a rate almost three times that of married men. All the other results presented in this paper are of secondary importance in comparison with this central fact, which represents the essential justification for the entire project.

The relative significance of discharge rates and lengths of stay in producing the large and growing difference between the rates of bed use of married and unmarried patients is displayed in Table 3 and diagram 4. The table shows the ratio of non-married to married patients in each age and sex group with respect to discharge rates and mean durations of stay (married patients = 1.00). Male patients display a reasonable consistency: in each age group, and in total, they were classified as case 2 in each of the five years. This means that the higher rates of bed use by unmarried men were the outcome of both higher discharge rates and longer average stays. The ratios for both variables were a little higher in 1970 than they had been in 1964 (the increase is more pronounced for discharge rates than lengths of stay), and the ratios in 1968 were slightly at odds with a regular increase during that period. It will be seen from Table 3, however, that the relative contribution of each factor varied according to the age of the male patients. Although the data contain some irregularities, they show in general that whereas the ratios were larger for discharge rates than for lengths of stay

among younger patients, the reverse situation obtained among older patients. This is most noticeable at the three latest years, and indicates that the higher rates of bed use by younger unmarried males owe more to their increased likelihood of getting into hospital (compared with the married man) than to their longer stays once admitted. Above the age of 65, however, it is clearly the longer stays which are the dominant factor underlying the higher rates of bed use by the unmarried.

The female patients presented a similar picture in certain respects. As with the men, the ratios of non-married to married patients with respect to discharge rates and lengths of stay were higher in 1970 than in 1964, and, also paralleling the male data, the ratios for lengths of stay generally increased with age whilst those for discharge rates tended to diminish with age. Unlike the male patients, however, there came a point in the age scale where the discharge rate of the non-married women was actually below that of the corresponding group of married women (case 3). In 1964 and 1966 that happened at about the age of 35, in 1968 at about 45, in 1969 at 65, and in 1970 at about 75. The trend among female patients is therefore in this respect becoming increasingly similar to that of the males, although even in 1970 the substantially higher rate of bed use by non-married women over 75 was due entirely to their longer average stays: had the mean stay of these women been the same as that of the equivalent group of married women then their rate of bed use would have been lower.

The effects of all of this upon the actual number of beds used each day are shown in Table 4 and, partially, in diagram 5. Column 1 of the table, which is repeated from Table 2, shows the number of beds used on average each day by the non-married patients in each age and sex group. The next three columns show the number of beds which these patients would have used if they had exhibited the same discharge rates, mean durations of stay and rates of bed use as the equivalent group of married patients. Columns 5, 6 and 7, which are derived simply by subtracting columns 2, 3 and 4 from column 1, show the extra number of beds used because of the excess utilisation rates of the unmarried under each of the three assumptions. They may be regarded either as the additional beds required to sustain the excess rates, or as the potential savings to the hospital sector which might accrue from somehow

reducing the discharge rates, mean durations of stay and rates of bed use of non-married patients to the levels of their married counterparts.

The results in Table 4 show very clearly that the higher utilisation rates exhibited by unmarried patients involve the commitment of a large number of additional beds. Among the male patients, the aggregate number of extra beds used each day by virtue of the higher rates of bed use by the unmarried (column 7) amounted to between 13 and 14 thousand in each of the years under study. This can be expressed alternatively by saying that if the unmarried men in each age and sex group had had the same rate of bed use as the equivalent married men, then 13-14,000 fewer beds would have been needed each day. This represented 57 per cent of the 23,911 beds used daily by non-married men over 25 in 1970, or 22 per cent of the 61,712 beds used by all male patients over that age. The number of extra beds resulting from the higher discharge rates of the unmarried men (column 5) ranged between about 6,500 and 7,500, and the number resulting from the longer average stays (column 6) varied between about 8,000 and 10,000. There are, of course, variations within these global figures between the different age groups. The majority of the extra beds used, under each of the three assumptions, is accounted for by patients over the age of 65. Moreover, the older the patients, the greater is the relative importance of the longer average stays among the unmarried. In 1970, for example, the longer stays of unmarried men over 75 involved the commitment of 4,022 extra beds, compared with only 2,541 extra beds resulting from their higher discharge rate. At the younger ages (up to 45) the reverse situation obtained (though the actual number of beds involved was obviously much smaller), and in the age group 45-64 the number was about the same in both cases. A broadly similar pattern can be seen in the earlier years also. Taking all ages over 25 together, the reduction in the average length of stay of non-married to that of married men would, in 1970, have yielded an almost 20 per cent greater saving in beds than the corresponding reduction of discharge rates.

Again, the female patients exhibited a somewhat different pattern. First, it is seen that whereas the extra number of beds used daily by unmarried men over 25 by virtue of their higher rate of bed use remained fairly constant at between 13 and 14 thousand in each year, among women the number rose sharply between 1964 and 1969, declining slightly in 1970 (diagram 5). In 1964 the

aggregate for all ages over 25 amounted to 10,588 extra beds (lower than the male figure for that year), but by 1966 it had risen to 16,543 and by 1969 to 22,687, before dropping slightly to 21,755 in 1970. The figure for 1970 represented 41 per cent of the 53,581 beds used each day by non-married women over the age of 25, or 25 per cent of the 87,325 beds used daily by all female patients over that age. The second main point of difference between the male and female patients lies in the way the extra beds are composed. Whereas both longer average stays and higher discharge rates contributed to the extra beds used by unmarried men in each age group, among the women the extra beds resulted almost exclusively from the longer average stays of the unmarried patients, and owed very little to the differences in discharge rates. This conclusion is clearly foreshadowed in Table 3, which showed that among older women those without marriage partners were actually discharged at a lower rate than those who were married. In 1970, for example, the number of extra beds needed to accommodate the longer mean duration of stay of unmarried women was, in aggregate, 22,435 (Table 4, column 6). Against this, however, the lower discharge rate among unmarried patients over 75 meant, in aggregate, that 1,288 fewer beds were actually used than would have been the case if all the unmarried women had exhibited the same discharge rate as the equivalent married groups. In reality, of course, this saving in beds was more than offset by the effects of the longer average stays, but the point is that only among the younger patients (those under 65) could any savings at all have resulted from reducing the discharge rates of the unmarried to the levels of the married. To the extent that any substantial savings are sought, the solution must lie in reducing the persistently longer periods of time which unmarried women spend in hospital. It should, of course, be noted that the trends underlying this conclusion are themselves changing, with the result that the conclusion itself would have been stronger in 1964 than in 1970. In 1964, for example, the discharge rate of the married patients exceeded that of the unmarried in all but the youngest age group, whilst by 1970 an excess rate by married women occurred only in the highest age group. It seems probable that in future unmarried women in all age groups will be discharged at a higher rate than the corresponding married women, with the result that proportionately greater savings may accrue from reducing that rate than has been the case in the past.

It remains at this stage an open question whether it should be an objective of policy to reduce as far as possible the rates of bed use of unmarried patients to those of the married, but to the extent that this is a reasonable

objective of policy (perhaps with a view to reallocating the consequent
savings in hospital costs to more economical and possibly more appropriate
forms of care), then different methods of achieving it are indicated for male
and female patients, and for those of different ages.   Among younger women
(those under about 45) the enquiry should focus equally upon the reasons why
those without marriage partners are admitted to hospital more frequently
than those who are married, and, having been admitted, stay longer on average.
Above the age of about 45, however, the main fact to be explained is the
tendency for unmarried women to remain in hospital for appreciably longer
periods of time than those who are married, although we may also wish to
enquire why the latter are admitted more frequently.   When considering the
male patients, by contrast, questions must be asked about the higher discharge
rates and longer stays of non-married men at all ages, for although the extra
number of beds is affected more by length of stay than by discharge rate as
age increases, nevertheless a significant number of extra beds is required
across the whole age range to accommodate both the longer stays and the more
frequent admissions of the unmarried.

It seems clear that before much of value can be said about the possible
ways of achieving these objectives (or, indeed, about the value of the
objectives themselves), further information is required about the variations
within the data between different disease categories.   The diagnostic analyses
are set out in Tables 5-12, and are limited to the 1970 Enquiry.   They also
exclude all diagnoses in which the number of cases of either married or
unmarried patients was less than 20.   The diagnostic groups included in each
table are those which displayed the greatest differences between the rates of
bed use of married and non-married patients.   The first two columns show
these rates for both categories of patients;   the third column gives the case;
and columns 4 and 5 show the ratio of unmarried to married patients with
respect to discharge rates and average lengths of stay.   Column 6 displays
the number of beds actually used each day, on average, by unmarried patients
in each diagnostic group, and column 7 shows the number of beds which they
would have used if they had exhibited the same rates of bed use as the
corresponding group of married patients.   (This latter statistic is calculated
in the same manner as column 4 in Table 4).   By subtracting the figure in
column 7 from that in column 6 an estimate is derived of the number of
additional beds required to accommodate the excess rates among the unmarried

in each diagnostic group (column 8). Finally, the last two columns show
the percentage of deaths among married (M) and non-married (NM) patients in
each diagnostic group.

Of the data relating to the male patients (Tables 5-8), two points
claim immediate attention. First, within each age group (especially the
higher age groups) a mere handful of the hundred or so diagnoses listed in
the H.I.P.E. tables accounted for a substantial proportion of the extra beds
used by unmarried men in 1970. Secondly, all but one of the listed diagnoses
were case 2; that is, both discharge rates and mean durations of stay for
these diagnoses were higher among the non-married than the married. It seems,
therefore, not only that many of the extra beds used by unmarried male patients
in 1970 were accounted for by the elderly, but also resulted from a relatively
small number of conditions which gave rise to both higher admission rates and
longer average stays.

What were those conditions? Among men over 75 (Table 5) six diagnoses
resulted in the allocation of at least 300 extra beds each day to the non-
married: cerebrovascular disease (A85), diseases of arteries, arterioles and
capillaries (A86), bronchitis and emphysema (A93a), senility without mention
of psychosis (A136), other forms of heart disease (A84), and other ischaemic
heart disease (A83b). Four of these diagnostic groups thus related to disorders
of the circulatory system, and the six together accounted for 59 per cent of all
the extra beds used by unmarried men of this age. In two of the groups
(A85, A93a) the ratios of unmarried to married patients were higher for discharge
rates than for lengths of stay; in the other four groups the reverse situation
obtained. Particularly long relative stays were recorded by unmarried men
suffering from other ischaemic heart disease, diseases of arteries, etc. and
senility. The latter diagnosis also displayed a high ratio for the discharge
rate.

Among men between the ages of 65-74 and 45-64 (Tables 6 and 7) the results
are similar, although the absolute numbers of extra beds (column 8) are
generally of a lower order in most diagnostic groups. In both age categories
the top four or five diagnoses accounted for about two-fifths of the extra beds
used; prominent among these were cerebrovascular disease, bronchitis and

emphysema, other forms of heart disease and other diseases of the nervous system (A79a).   All the diagnoses were case 2;   among patients aged between 65 and 74 the ratios of unmarried to married patients were higher for discharge rates than for lengths of stay in all but one diagnostic group;   in the younger group the ratios followed no consistent pattern.   Diagnoses in which the unmarried men had noticeably higher discharge rates than their married counterparts included bronchitis and emphysema (in both age groups) and tuberculosis (in the younger group).   Appreciably longer average stays by unmarried men between 45 and 64 were recorded for cerebrovascular disease and other diseases of the nervous system.   No other diagnosis in either age group had a length-of-stay ratio in excess of 2.00.

The results of the analyses in the two lowest age groups (25-34 and 35-44; Table 8) are numerically of little significance, for the extra beds used by unmarried men of these ages are few in comparison with those recorded at the higher ages.   Nevertheless, they are interesting in that mental disorders and respiratory TB were the top ranking diagnoses in both age groups, with epilepsy and fractures/injuries (not shown separately in the table) also appearing among the leading half-dozen diagnoses.   Tuberculosis among men aged between 25 and 34 was also the only listed diagnosis in any age group in which the unmarried patients had shorter average stays than the married (case 4).

Deaths among male patients were very few in the two lowest age groups and were virtually the same for married and non-married patients in the 45-64 group. Above this age, however, deaths not only constituted at least a moderate proportion of cases in all the listed diagnoses but were also more common in most cases among the unmarried.   The differences were usually of only a few percentage points, but the consistency is striking.

The female figures for 1970 (Tables 9-12) show that, as with the male patients, a small number of diagnoses accounted for a large proportion of the extra beds occupied by non-married women.   Likewise, most of these diagnoses related either to the circulatory or nervous systems or to a psychiatric disturbance.   Other diagnoses made isolated appearances: fracture of the femur (AN 140a) and senility (A136) among the over 75s, musculo-skeletal disorders (A122, 124, 125c) among those under 35, and rheumatoid and osteo-arthritis (A121a and A121b) among women at all ages over 45.   The main

difference between the principal diagnoses of the male and female patients lies in the respiratory diseases (especially bronchitis and emphysema) which figured prominently among the men but were entirely lacking among women.

In view of the earlier finding that female patients over 75 were, in aggregate, case 3 (that is, taking all diagnoses together), it is somewhat surprising to see that all but one of the eight leading diagnoses contributing to the extra beds occupied by unmarried women of this age were case 2. In most of these diagnoses, however, the discharge rates among the unmarried were no more than about 50 per cent higher than those of the married, whereas the average lenghts of stay were up to five or six times as great. A similar situation obtained in the 65-74 and 45-64 age groups, where the ratios of non-married to married patients for mean durations of stay were invariably higher than those for discharge rates. Below the age of 45, however, the anticipated reversal of the pattern is in fact observed: in the two youngest age groups the ratios in the listed diagnoses were higher for discharge rates than for lengths of stay.

The pattern of deaths among the women was very similar to that of the men. Very few deaths occurred among patients under the age of 45, and in the age group 45-64 the proportion of deaths was almost identical for married and unmarried women. Above the age of 64, however, a higher proportion of unmarried than of married patients died in each one of the diagnostic groups listed in Tables 9 and 10. In some diagnoses the differences were as large as 10 or 11 percentage points. The persistence of the difference between married and unmarried patients (both male and female) in this respect is striking. The explanation may lie in the fact that unmarried patients, staying longer in hospital on average than their married counterparts, are at greater risk of dying in hospital; alternatively, the difference may merely reflect the established variations in the mortality experience of the married and the single. The H.I.P.E. data offer few clues: the phenomenon must be examined in the light of other evidence.

The contribution of the different diagnoses to the total figures for each age and sex group was virtually identical in the 1968, 1969 and 1970 Enquiries, suggesting that the results described above may be quite reliable and not the result of annual fluctuations or peculiarities. Comparisons with the 1964 Enquiry are more problematic because of the different diagnostic

classifications used in that year, but the results nevertheless appear to be broadly comparable. In that year, for example, six diagnoses accounted for almost two-thirds of the extra number of beds used by non-married men over 65: vascular lesions of C.N.S., senility without psychosis, bronchitis, general arteriosclerosis, arteriosclerotic/coronary heart disease and other diseases of the heart. Among women over 65 in the 1964 Enquiry the five leading diagnoses which accounted for almost three-quarters of the extra beds were: vascular lesions of C.N.S., general arteriosclerosis, senility without psychosis, other diseases of the heart and rheumatoid arthritis. Comparison between these results and Tables 5 and 9 confirms the basic similarity between the two years. Among patients under 65 the major difference between 1964 and 1970 is the relatively greater prominence of tuberculosis of the respiratory system in the former year as a contributory diagnosis in the extra beds used by unmarried men and women.

SUMMARY

A principal objective of this paper is to assess the claim that unmarried people use more hospital resources than those with marriage partners. That claim is clearly supported by the evidence of the Hospital In-Patient Enquiry, although it requires some modification as a global statement in the light of the detailed analyses performed here.

The results presented in this paper show that if unmarried patients in each age and sex group had had the same rates of bed use as their married counterparts, then 35,296 fewer beds would have been needed each day in N.H.S. hospitals in England and Wales in 1970. It is worth repeating that this figure excludes beds in psychiatric hospitals, although it does include the growing number of psychiatric patients in general hospitals. Moreover, comparisons with earlier years show that until 1969 the number of extra beds occupied each day by unmarried patients over 25 had been rising quite rapidly: in 1964 the total (taking male and female patients together) was 24,387, in 1966 30,596, and in 1969 36,035. Virtually all of this increase since 1964 is attributable to female patients, who by 1970 accounted for more than 60 per cent of the extra beds occupied by all unmarried patients. The results

also show that a high proportion of these extra beds are occupied by elderly
patients.   Taking male and female patients together, those over 75 accounted
for 53 per cent of all the extra beds used in 1970, and those over 65 for
75 per cent.   Nevertheless, some differences persist right down to the
youngest age groups in this analysis, and these must eventually be explained.

As a rule, the unmarried patients use more beds both because they are
admitted to hospital more frequently and, having been admitted, stay longer on
average than their married counterparts.   This was true for male patients
in each age group in 1970 and for female patients up to the age of about 65.
But whereas the excess discharge rates of the non-married patients tend to
diminish with increasing age (even reaching a point, among women over 75, where
the discharge rate of the unmarried in 1970 was actually lower than that of the
married), the differences in length of stay tend to increase with age.   This
means that the older the patients the greater would be the probable savings
in daily bed use resulting from a reduction in the average length of stay
(rather than the discharge rate) of the unmarried to the levels displayed by
their married counterparts.   This is especially true for female patients; on
the basis of the 1970 data, savings in bed use among women over 65 could
have resulted only from a reduction in the mean duration of stay of the
unmarried.

There is a tendency at all ages for the extra beds used by non-married
patients to be disproportionately concentrated in a few diagnoses.   Among male
patients over 75 in the 1970 Enquiry, for example, the six "leading" diagnoses
(see Table 5) accounted for 59 per cent of the extra beds used in that age and
sex group but only 44 per cent of all beds used by men over 75.   Among the
younger age groups the extra beds used by the unmarried, though much fewer in
number, tended to be concentrated even more disproportionately in just a
handful of diagnoses.   The higher rates of bed use by unmarried patients under
35 were attributable in 1970 to a few conditions (especially mental disorders,
tuberculosis, epilepsy and injuries) which exerted an influence out of all
proportion to their significance among the total list of conditions causing
hospital admission at this age.   Higher up the age range there is a wider
spread of conditions which display a differential rate of bed use; there is,
in other words, a greater tendency for unmarried people with any illness to
occupy more beds than married people.

Notes

1. The following tables include all diagnoses <u>except</u> deliveries and disorders of pregnancy, childbirth and puerperium.

2. The following abbreviations are used:

P	=	population of England and Wales in thousands (mid-year estimates)
N	=	number of cases (discharges) in sample
DR	=	discharge rate per 10,000 population
MDS	=	mean duration of stay in days
ABD	=	average number of beds used daily
ABDR	=	average number of beds used daily per million population
M	=	married patients
NM	=	non-married patients (single, widowed, divorced, marital status not known)

Table 1.   Population (England and Wales), number in sample,
discharge rate per 10,000 population and mean duration of stay,
by age, sex and marital status, of patients in the Hospital
In-Patient Enquiry, 1964, 1966, 1968-70

Year, sex and age		Marital Status							
		Married				Non-married			
		P(000s)	N	DR	MDS	P(000s)	N	DR	MDS
1964									
Males	25-34	2,352	8,895	406.5	11.7	709	3,899	590.5	15.0
	35-44	2,815	12,299	469.7	14.9	447	2,775	667.2	27.1
	45-64	4,925	37,217	812.3	18.2	734	7,530	1,102.3	28.0
	65-74	1,152)				314)			
		)	20,825	1,459.3	25.6	)	11,227	1,934.3	44.8
	75+	382)				310)			
Total	25+	11,626	79,236	732.5	18.9	2,514	25,431	1,087.2	33.3
Females	25-34	2,496	13,535	582.7	9.4	400	2,418	649.9	15.4
	35-44	2,818	17,774	677.8	12.2	395	2,451	667.5	18.1
	45-64	4,534	33,400	791.6	16.6	1,561	9,371	645.7	26.3
	65-74	966)				1,215)			
		)	15,538	1,371.6	30.1	)	23,104	1,061.0	50.8
	75+	251)				1,125)			
Total	25+	11,065	80,247	779.5	17.0	4,696	37,344	854.7	40.2
1966									
Males	25-34	2,373	8,715	408.9	11.3	681	3,637	594.5	16.6
	35-44	2,716	11,356	465.6	13.4	434	2,605	668.3	15.3
	45-64	5,022	36,551	810.5	17.4	752	7,525	1,114.9	26.9
	65-74	1,219)				327			
		)	21,649	1,497.0	24.6		11,990	2,105.3	43.0
	75+	392)				307			
Total	25+	11,722	78,271	743.6	18.1	2,501	25,757	1,146.9	31.8

Table 1 - continued

Year, sex and age		Marital Status							
		Married				Non-married			
		P(000s)	N	DR	MDS	P(000s)	N	DR	MDS
Females	25-34	2,499	13,824	616.0	8.8	390	2,257	644.8	16.1
	35-44	2,716	17,707	725.9	11.3	355	2,232	700.9	16.5
	45-64	4,663	33,883	809.1	16.3	1,530	9,222	671.0	28.2
	65-74	1,003)				1,242)			
		)	15,489	1,365.1	29.3	)	24,664	1,138.1	52.8
	75+	260)				1,172)			
Total	25+	11,141	80,903	808.7	16.4	4,689	38,375	911.4	42.6
1968									
Males	25-34	2,393	8,973	412.5	9.9	672	3,944	645.5	11.5
	35-44	2,636	11,585	483.5	11.7	423	2,997	779.1	18.0
	45-64	5,031	38,574	843.5	15.7	760	8,860	1,282.9	23.0
	65-74	1,283	16,275	1,395.4	20.0	339	6,333	2,055.0	31.1
	75+	402	7,304	1,999.1	25.9	305	7,656	2,762.2	40.7
Total	25+	11,745	82,711	774.7	16.3	2,499	29,790	1,311.4	27.2
Females	25-34	2,532	15,371	667.9	8.1	396	2,683	746.4	10.0
	35-44	2,634	17,798	743.4	10.0	332	2,616	868.3	24.4
	45-64	4,717	34,686	809.0	14.4	1,486	10,590	783.8	21.7
	65-74	1,052	10,194	1,066.5	22.1	1,262	11,556	1,007.0	37.3
	75+	273	4,614	1,861.1	33.1	1,220	18,174	1,638.4	57.9
Total	25+	11,208	82,663	811.4	14.3	4,696	45,619	1,068.7	39.5
1969									
Males	25-34	2,429	9,772	434.1	9.6	674	4,224	676.3	10.8
	35-44	2,605	12,140	503.0	11.1	420	2,857	734.9	18.3
	45-64	5,026	39,800	854.6	15.1	766	9,084	1,280.1	22.3
	65-74	1,319	17,605	1,440.5	19.2	346	6,629	2,066.0	28.8
	75+	407	7,440	1,972.0	26.1	305	7,584	2,685.5	44.0
Total	25+	11,786	86,757	794.5	15.7	2,511	30,378	1,305.7	27.2

Table 1 - continued

| Year, sex | | Marital Status | | | | | | | |
| and age | | Married | | | | Non-married | | | |
		P(000s)	N	DR	MDS	P(000s)	N	DR	MDS
Females	25-34	2,577	16,495	690.9	7.4	400	3,029	818.1	16.0
	35-44	2,592	18,401	751.3	10.3	325	2,712	900.9	12.3
	45-64	4,723	35,646	814.6	14.2	1,463	11,047	814.9	21.7
	65-74	1,078	10,762	1077.6	21.3	1,274	12,218	1,035.5	35.3
	75+	279	4,659	1803.6	28.6	1,245	18,723	1,622.7	57.6
Total	25+	11,249	85,963	824.8	13.7	4,707	47,729	1,094.4	38.4
1970									
Males	25-34	2,453	9,492	428.1	8.8	687	4,049	652.2	12.5
	35-44	2,582	11,289	483.8	10.6	418	2,726	721.3	14.6
	45-64	5,014	38,486	849.4	14.4	771	8,941	1,283.0	21.7
	65-74	1,348	17,501	1,436.1	18.0	355	6,759	2,105.5	28.4
	75+	410	7,428	2,007.1	23.8	305	7,566	2,746.6	41.4
Total	25+	11,807	84,196	789.1	14.8	2,536	30,041	1,310.7	26.3
Females	25-34	2,611	16,408	695.3	7.0	414	3,038	812.2	9.0
	35-44	2,559	17,437	753.9	9.8	319	2,631	910.0	20.6
	45-64	4,721	33,979	796.4	13.9	1,440	10,786	828.4	21.9
	65-74	1,098	10,701	1,078.4	20.6	1,285	12,497	1,076.4	31.9
	75+	284	4,540	1,769.5	30.0	1,268	19,100	1,667.0	55.0
Total	25+	11,273	83,065	815.3	13.4	4,726	48,052	1,125.0	36.8

Table 2.   Number of beds used daily and rates of bed use per
million population, by age, sex and marital status, of patients
in the Hospital In-Patient Enquiry, 1964, 1966, 1968-70

Year, sex and age		Marital Status			
		Married		Non-married	
		ABD	ABDR	ABD	ABDR
1964					
Males	25-34	3,049	1,296.7	1,720	2,423.0
	35-44	5,364	1,905.9	2,210	4,943.7
	45-64	19,847	4,030.2	6,200	8,444.2
	65+	15,665	10,212.8	14,771	23,678.6
Total	25+	43,925	3,778.2	24,901	9,904.9
Females	25-34	3,720	1,490.2	1,095	2,738.7
	35-44	6,350	2,253.0	1,305	3,307.8
	45-64	16,330	3,601.0	7,244	4,644.1
	65+	13,756	11,298.6	34,495	14,738.5
Total	25+	40,156	3,692.1	44,139	9,399.3
1966					
Males	25-34	3,002	1,265.1	1,839	2,700.4
	35-44	4,640	1,708.4	1,220	2,811.1
	45-64	19,448	3,872.6	6,172	8,207.4
	65+	16,244	10,083.2	15,730	24,810.7
Total	25+	43,334	3,696.8	24,961	9,980.4
Females	25-34	3,714	1,486.2	1,106	2,835.9
	35-44	6,102	2,246.7	1,124	3,166.2
	45-64	16,819	3,606.9	7,947	5,194.1
	65+	13,833	10,952.5	39,702	16,446.6
Total	25+	40,468	3,632.3	49,879	10,637.4

Table 2 - continued

Year, sex and age		Marital Status			
		Married		Non-married	
		ABD	ABDR	ABD	ABDR
1968					
<u>Males</u>	25-34	2,681	1,120.4	1,361	2,025.3
	35-44	4,064	1,541.7	1,623	3,836.9
	45-64	18,182	3,614.0	6,125	8,059.2
	65-74	9,796	7,635.2	5,914	17,445.4
	75+	5,692	14,159.2	9,361	30,691.8
Total	25+	40,415	3,441.0	24,384	9,757.5
<u>Females</u>	25-34	3,730	1,473.1	807	2,037.9
	35-44	5,359	2,034.6	1,917	5,774.1
	45-64	14,961	3,171.7	6,900	4,643.3
	65-74	6,780	6,444.9	12,948	10,260.0
	75+	4,591	16,816.9	31,627	25,923.8
Total	25+	35,421	3,160.3	54,199	11,541.5
1969					
Males	25-34	2,766	1,138.7	1,344	1,994.1
	35-44	3,972	1,524.8	1,545	3,678.6
	45-64	17,793	3,540.2	5,997	7,829.0
	65-74	10,016	7,593.6	5,652	16,335.3
	75+	5,744	14,113.0	9,860	32,327.9
Total	25+	40,291	3,418.5	24,398	9,716.4
<u>Females</u>	25-34	3,614	1,402.4	1,430	3,575.0
	35-44	5,482	2,115.0	987	3,036.9
	45-64	14,918	3,158.6	7,084	4,842.1
	65-74	6,776	6,285.7	12,746	10,004.7
	75+	3,939	14,118.3	31,894	25,617.7
Total	25+	34,729	3,087.3	54,141	11,502.2

Table 2 - continued

Year, sex and age		Marital Status			
		Married		Non-married	
		ABD	ABDR	ABD	ABDR
1970					
Males	25-34	2,524	1,028.9	1,529	2,225.6
	35-44	3,615	1,400.1	1,203	2,878.0
	45-64	16,769	3,344.4	5,875	7,620.0
	65-74	9,530	7,069.7	5,820	16,394.4
	75+	5,363	13,080.5	9,484	31.095.1
Total	25+	37,801	3,201.6	23,911	9,428.6
Females	25-34	3,494	1,338.2	831	2,007.2
	35-44	5,168	2,019.5	1,640	5,141.1
	45-64	14,267	3,022.0	7,166	4,976.4
	65-74	6,681	6,084.7	12,099	9,415.6
	75+	4,134	14,556.3	31,845	25,114.4
Total	25+	33,744	2,993.3	53,581	11,337.5

Table 3.   Ratio of non-married to married patients with
respect to discharge rates and mean durations of stay,
by age and sex in the Hospital In-Patient Enquiry,
1964, 1966, 1968-70

Year, sex and age		Ratio of non-married to married patients:		Case (see text)
		Discharge rate	Mean duration of stay	
1964				
Males	25-34	1.45	1.28	2
	35-44	1.42	1.82	2
	45-64	1.36	1.54	2
	65+	1.33	1.75	2
Total	25+	1.48	1.76	2
Females	25-34	1.12	1.64	2
	35-44	0.98	1.48	3
	45-64	0.82	1.58	3
	65+	0.77	1.69	3
Total	25+	1.10	2.36	2
1966				
Males	25-34	1.45	1.47	2
	35-44	1.44	1.14	2
	45-64	1.38	1.55	2
	65+	1.41	1.75	2
Total	25+	1.54	1.76	2
Females	25-34	1.05	1.83	2
	35-44	0.97	1.46	3
	45-64	0.83	1.73	3
	65+	0.83	1.80	3
Total	25+	1.13	2.60	2

Table 3 - continued

Year, sex and age		Ratio of non-married to married patients: Discharge rate	Mean duration of stay	Case (see text)
1968				
Males	25-34	1.56	1.16	2
	35-44	1.61	1.54	2
	45-64	1.52	1.46	2
	65-74	1.47	1.56	2
	75+	1.38	1.57	2
Total	25+	1.69	1.67	2
Females	25-34	1.12	1.23	2
	35-44	1.17	2.44	2
	45-64	0.97	1.51	3
	65-74	0.94	1.69	3
	75+	0.88	1.75	3
Total	25+	1.32	2.76	2
1969				
Males	25-34	1.56	1.13	2
	35-44	1.46	1.65	2
	45-64	1.50	1.48	2
	65-74	1.43	1.50	2
	75+	1.36	1.69	2
Total	25+	1.64	1.73	2
Females	25-34	1.18	2.16	2
	35-44	1.20	1.19	2
	45-64	1.00	1.53	2
	65-74	0.96	1.66	3
	75+	0.90	2.01	3
Total	25+	1.33	2.80	2

Table 3 - continued

Year, sex and age	Ratio of non-married to married patients: Discharge rate	Mean duration of stay	Case (see text)
1970			
<u>Males</u> 25-34	1.52	1.42	2
35-44	1.49	1.38	2
45-64	1.51	1.51	2
65-74	1.47	1.58	2
75+	1.37	1.74	2
Total 25+	1.66	1.78	2
<u>Females</u> 25-34	1.17	1.29	2
35-44	1.21	2.10	2
45-64	1.04	1.58	2
65-74	1.00	1.55	2
75+	0.94	1.83	3
Total 25+	1.38	2.75	2

Year, sex and age	(1) Beds actually used(NM)	(2) Beds assuming DR(M)	(3) Beds assuming MDS(M)	(4) Beds assuming ABDR(M)	(5) (1-2)	(6) (1-3)	(7) (1-4)
1964							
Males							
25-34	1,720	1,184	1,342	919	536	378	801
35-44	2,210	1,559	1,217	852	651	993	1,358
45-64	6,200	4,574	4,034	2,958	1,626	2,166	3,242
65+	14,771	11,177	8,463	6,373	3,594	6,308	8,398
Total 25+	24,901	18,494	15,056	11,102	6,407	9,845	13,799
Females							
25-34	1,095	983	669	596	112	426	499
35-44	1,305	1,328	881	890	- 23	424	415
45-64	7,244	8,904	4,584	5,621	-1,660	2,660	1,623
65+	34,495	44,670	20,474	26,444	-10,175	14,021	8,051
Total 25+	44,139	55,885	26,612	33,551	-11,746	17,531	10,588
1966							
Males							
25-34	1,839	1,263	1,250	862	576	589	977
35-44	1,220	845	1,062	741	375	158	479
45-64	6,172	4,480	3,986	2,912	1,692	2,186	3,260
65+	15,730	11,151	8,971	6,393	4,579	6,759	9,337
Total 25+	24,961	17,739	15,269	10,908	7,222	9,692	14,053
Females							
25-34	1,106	1,057	605	580	49	501	526
35-44	1,124	1,162	768	798	-38	356	326
45-64	7,947	9,538	4,572	5,519	-1,591	3,375	2,428
65+	39,702	47,539	21,994	26,439	-7,837	17,708	13,263
Total 25+	49,879	59,296	27,939	33,336	-9,417	21,940	16,543

Table 4 - continued

Year, age and sex	(1) Beds actually used(NM)	(2) Beds assuming DR(M)	(3) Beds assuming MDS(M)	(4) Beds assuming ABDR(M)	(5) (1-2)	(6) (1-3)	(7) (1-4)
1968							
Males							
25-34	1,361	873	1,177	753	488	184	608
35-44	1,623	1,009	1,056	652	614	567	971
45-64	6,125	4,040	4,194	2,747	2,085	1,931	3,378
65-74	5,914	4,031	3,817	2,588	1,883	2,097	3.326
75+	9,361	6,799	5,978	4,319	2,562	3,383	5,042
Total 25+	24,384	16,752	16,222	11,059	7,632	8,162	13,325
Females							
25-34	807	725	656	583	82	151	224
35-44	1,917	1,650	790	675	267	1,127	1,242
45-64	6,900	7,147	4,595	4,713	-247	2,305	2,187
65-74	12,948	13,754	7,695	8,133	-806	5,253	4,815
75+	31,627	36,018	18,127	20,517	-4,391	13,500	11,110
Total 25+	54,199	59,294	31,863	34,621	-5,095	22,336	19,578
1969							
Males							
25-34	1,344	866	1,199	767	478	145	577
35-44	1,545	1,059	939	640	486	606	905
45-64	5,997	3,999	4,057	2,712	1,998	1,940	3,285
65-74	5,652	3,933	3,760	2,627	1,719	1,892	3,025
75+	9,860	7,250	5,857	4,304	2,610	4,003	5,556
Total 25+	24,398	17,107	15,812	11,050	7,291	8,586	13,348
Females							
25-34	1,430	1,211	663	561	219	767	869
35-44	987	823	826	687	164	161	300
45-64	7,084	7,084	4,638	4,621	0	2,446	2,463
65-74	12,746	13,277	7,699	8,008	-531	5,047	4,738
75+	31,894	35,356	15,830	17,577	-3,462	16,064	14,317
Total 25+	54,141	57,751	29,656	31,454	-3,610	24,485	22,687

Table 4 - continued

Year, age and sex	(1) Beds actually used (NM)	(2) Beds assuming DR(M)	(3) Beds assuming MDS(M)	(4) Beds assuming ABDR(M)	(5) (1-2)	(6) (1-3)	(7) (1-4)
1970							
Males							
25-34	1,529	1,007	1,080	706	522	449	823
35-44	1,203	809	876	585	394	327	618
45-64	5,875	3,893	3,903	2,579	1,982	1,972	3,296
65-74	5,820	3,967	3,686	2,510	1,853	2,134	3,310
75+	9,484	6,943	5,462	3,990	2,541	4,022	5,494
Total 25+	23,911	16,619	15,007	10,370	7,292	8,904	13,541
Females							
25-34	831	710	645	554	121	186	277
35-44	1,640	1,357	779	644	283	861	996
45-64	7,166	6,881	4,543	4,352	285	2,623	2,814
65-74	12,099	12,111	7,806	7,819	-12	4,293	4,280
75+	31,845	33,810	17,373	18,457	-1,965	14,472	13,388
Total 25+	53,581	54,869	31,146	31,826	-1,288	22,435	21,755

Table 5

Measures of bed use by married and non-married males over 75, by diagnosis, in Hospital In-Patient Enquiry 1970

Diagnostic group	(1) ABDR(NM)	(2) ABDR(M)	(3) Case	(4) Ratio of non-married to married DR	(5) MDS	(6) ABD(NM)	(7) ABD(NM) assuming ABDR(M)	(8) (6 - 7)	(9) Percentage deaths NM	(10) M
A85 Cerebrovascular disease	4,865	2,090	2	1.59	1.47	1,482	637	845	53	54
A86 Diseases of arteries arterioles and capillaries	2,786		2	1.38	2.86	850	215	635	48	33
A93a Bronchitis and emphysema	2,471	676	2	1.95	1.87	753	206	547	22	19
A136 Senility (without psychosis)	1,620	90	2	3.63	4.93	494	27	467	36	25
A84 Other forms of heart disease	2,220	861	2	1.60	1.61	677	263	414	44	42
A83b Other ischaemic heart disease	1,281	195	2	1.77	3.71	390	59	331	47	29
All other diagnoses	15,852	8,463				4,838	2,583	2,255		
All diagnoses	31,095	13,081	2	1.37	1.74	9,484	3,990	5,494	29	25

Table 6

Measures of bed use by married and non-married males

65-74, by diagnosis, in Hospital In-Patient Enquiry 1970

Diagnostic group	(1) ABDR(NM)	(2) ABDR(M)	(3) Case	(4) Ratio of non-married to married DR	(5) MDS	(6) ABD(NM)	(7) ABD(NM) assuming ABDR(M)	(8) (6 - 7)	(9) Percentage deaths NM	(10) M
A85 Cerebrovascular disease	1,933	633	2	1.77	1.72	687	225	462	41	37
A93a Bronchitis and emphysema	1,509	421	2	2.17	1.65	536	150	386	14	13
A84 Other forms of heart disease	754	305	2	1.81	1.36	268	108	160	34	30
A79a Other diseases of nervous system	801	355	2	1.41	1.60	284	126	158	15	16
A91,92 Pneumonia	487	215	2	2.03	1.12	173	76	97	51	47
All other diagnoses	10,910	5,141				3,872	1,825	2,047		
All diagnoses	16,394	7,070	2	1.47	1.58	5,820	2,510	3,310	18	15

Table 7

Measures of bed use by married and non-married males 45-64,

by diagnosis, in Hospital In-Patient Enquiry 1970

Diagnostic group	(1) ABDR(NM)	(2) ABDR(M)	(3) Case	(4) (5) Ratio of non-married to married DR		(6) ABD(NM)	(7) ABD(NM) assuming ABDR(M)	(8) (6 - 7)	(9) (10) Percentage deaths NM	
				DR	MDS				NM	M
A85 Cerebrovascular disease	848	161	2	1.92	2.75	653	124	529	32	28
A6 Tuberculosis of respiratory system	498	106	2	3.05	1.55	384	82	302	7	6
A79a Other diseases of nervous system	464	123	2	1.84	2.05	358	95	263	7	5
A93a Bronchitis and emphysema	342	120	2	2.24	1.28	264	93	171	8	8
All other diagnoses	5,468	2,834				4,216	2,185	2,031		
All diagnoses	7,620	3,344	2	1.51	1.51	5,875	2,579	3,296	9	7

Table 8

Measures of bed use by married and non-married males 35-44 and 25-34, by diagnosis, in Hospital In-Patient Enquiry 1970

Diagnostic group	(1) ABDR(NM)	(2) ABDR(M)	(3) Case	(4) (5) Ratio of non-married to married		(6) ABD(NM)	(7) ABD(NM) assuming ABDR(M)	(8) (6 - 7)	(9) (10) Percentage deaths	
				DR	MDS				NM	M
Age 35-44										
A69-71 Mental disorders	220	13	2	5.17	3.27	92	5	87	-	-
A6 Tuberculosis of respiratory system	236	71	2	2.32	1.43	99	30	69	6	1
All other diagnoses	2,422	1,316				1,012	550	462		
All diagnoses	2,878	1,400	2	1.49	1.38	1,203	585	618	3	2
Age 25-34										
A69-71 Mental disorders	420	15	2	4.29	6.41	288	10	278	1	-
A6 Tuberculosis of respiratory system	109	39	4	3.24	0.85	74	27	47	-	-
All other diagnoses	1,697	975				1,167	669	498		
All diagnoses	2,226	1,029	2	1.52	1.42	1,529	706	823	-	-

Table 9

Measures of bed use by married and non-married females over 75, by diagnosis, in Hospital In-Patient Enquiry 1970

Diagnostic group	(1) ABDR (NM)	(2) ABDR (M)	(3) Case	(4) Ratio of non-married to married DR	(5) MDS	(6) ABD(NM)	(7) ABD(NM) assuming ABDR(M)	(8) (6 - 7)	(9) Percentage deaths NM	(10) M
A85 Cerebrovascular disease	5,033	2,449	2	1.07	1.91	6,383	3,105	3,278	56	51
A136 Senility without psychosis	1,518	307	2	1.63	3.03	1,924	389	1,535	32	23
A84 Other forms of heart disease	1,840	724	2	1.05	2.42	2,334	918	1,416	39	33
A86 Diseases of arteries, arterioles and capillaries	1,674	580	2	1.46	1.98	2,124	735	1,389	47	36
A69-71 Mental disorders	1,024	344	2	1.58	1.88	1,296	436	860	26	16
A121b Osteo-arthritis and allied conditions	883	287	2	1.33	2.31	1,118	364	754	6	3
AN 140a Fracture of neck of femur	1,266	693	2	1.53	1.19	1,604	879	725	23	23
A121a Rheumatoid arthritis and allied conditions	680	124	3	0.98	5.64	861	157	704	14	12
All other diagnoses	11,196	9,048				14,201	11,474	2,727		
All diagnoses	25,114	14,556	3	0.94	1.83	31,845	18,457	13,388	26	21

Table 10

Measures of bed use by married and non-married females 65-74,

by diagnosis, in Hospital In-Patient Enquiry 1970

Diagnostic group	(1) ABDR(NM)	(2) ABDR(M)	(3) Case	(4) Ratio of non-married to married DR	(5) MDS	(6) ABD(NM)	(7) ABD(NM) assuming ABDR(M)	(8) (6 - 7)	(9) Percentage deaths NM	(10) M
A85 Cerebrovascular disease	1,316	687	2	1.24	1.55	1,689	883	806	48	41
A121a Rheumatoid arthritis and allied conditions	819	204	2	1.15	3.48	1,052	262	790	7	4
A79a Other diseases of nervous system	815	273	2	1.18	2.53	1,048	351	697	16	9
A84 Other forms of heart disease	484	179	2	1.29	2.09	620	230	390	29	27
A86 Diseases of arteries, arterioles and capillaries	275	78	2	1.17	3.01	354	100	254	21	20
All other diagnoses	5,707	4,664				7,336	5,993	1,343		
All diagnoses	9,416	6,085	2	1.00	1.55	12,099	7,819	4,280	14	11

Table 11

Measures of bed use by married and non-married females 45-64, by diagnosis, in Hospital In-Patient Enquiry 1970

Diagnostic group	(1) ABDR(NM)	(2) ABDR(M)	(3) Case	(4) Ratio of non-married to married DR	(5) MDS	(6) ABD(NM)	(7) ABD(NM) assuming ABDR(M)	(8) (6 - 7)	(9) Percentage deaths NM	(10) N
A79a Other diseases of nervous system	514	104	2	1.44	3.45	740	150	590	7	5
A85 Cerebrovascular disease	426	110	2	1.26	3.06	615	158	457	34	35
A74 Epilepsy	155	9	2	1.44	11.90	225	13	212	2	-
A121a Rheumatoid arthritis and allied conditions	182	73	2	1.60	1.56	263	105	158	1	1
All other diagnoses	3,699	2,726				5,323	3,926	1,397		
All diagnoses	4,976	3,022	2	1.04	1.58	7,166	4,352	2,814	6	4

Table 12

Measures of bed use by married and non-married females 25-34 and 35-44, by diagnosis, in Hospital In-Patient Enquiry 1970

Diagnostic group	(1) ABDR(NM)	(2) ABDR(M)	(3) Case	(4) DR	(5) MDS	(6) ABD(NM)	(7) ABD(NM) assuming ABDR(M)	(8) (6 - 7)	(9) NM	(10) M
				Ratio of non-married to married					Percentage deaths	
Age 35-44										
A74 Epilepsy	391	110	2	3.19	1.12	125	35	90	–	1
A69-71 Mental disorders	300	47	2	2.69	2.36	96	15	81	–	–
All other diagnoses	4,450	1,863				1,419	594	825		
All diagnoses	5,141	2,020	2	1.21	2.10	1,640	644	996	1	1
Age 25-34										
A69-71 Mental disorders	115	31	2	2.68	1.39	48	13	35	–	–
A122-124, 125c Other musculo-skeletal and connective tissue disorders	86	34	2	1.85	1.39	36	14	22	–	–
All other diagnoses	1,806	1,273				747	527	220		
All diagnoses	2,007	1,338	2	1.17	1.29	831	554	277	1	–

Discharge
rate/10,000
population

1300

1200

1100

1000

900

800

700

600

500

400

300

200

100

Non-married males

Non-married females

Married females

Married males

Diagram 1.   Discharge rates per 10,000 population, by sex and
marital status, of patients over 25 in Hospital In-Patient
Enquiry, 1964, 1966, 1968 – 1970.

1964   1966   1968   1969   1970   Year

Diagram 2. — Mean duration of stay in days, by sex and
marital status, of patients over 35 in Hospital In-
Patient Enquiry, 1964, 1966, 1968 - 1970

Mean duration
of stay in
days

45

40

35

30

25

20

15

10

5

Non-married females

Non-married males

Married males

Married females

1964   1966   1968   1969   1970   Year

Beds used /
Tm. population

Diagram 3. Number of beds used daily per million population, by sex and
marital status, of patients over 25 in Hospital In-Patient Enquiry, 1964
1966, 1968 – 1970

Non-married females

Non-married males

Married males

Married females

12000

11000

10000

9000

8000

7000

6000

5000

4000

3000

2000

1000

1964   1966   1968   1969   1970

Diagram 4. — Ratios of non-married to married patients with respect to discharge rates and mean durations of stay, by sex, in Hospital In-Patient Enquiry, 1964, 1966, 1968 — 1970.

Ratio

Mean duration of stay, females

Mean duration of stay, males

Discharge rate, males

Discharge rate, females

Appendix II

Analysis of data from the Hospital Activity Analysis

Note: pages and tables are numbered separately within
        this appendix

THE LIMITATIONS OF THE HOSPITAL IN-PATIENT ENQUIRY

Although the Hospital In-Patient Enquiry (H.I.P.E.) at present contains
the fullest systematic data about the marital status of in-patients, it has
certain deficiencies for the purposes of this investigation. The most impor-
tant of these is the classification of the marital status of patients simply
as 'married' or 'other'. The category 'other' not only groups together the
single, widowed, divorced and separated (who, on the evidence of other studies,
cannot validly be treated as an homogeneous group with respect to morbidity,
mortality and illness behaviour), but also conceals an unknown proportion of
patients whose marital status has for some reason remained unrecorded.
Secondly, the processing and publication of H.I.P.E. data is not wholly
satisfactory. The complexities of collecting and analysing the data result
in a delay of several years before publication, and although this time-lapse
has recently been reduced, the lag at the end of 1973 was still at least two
years. Moreover the 1971 report of the Enquiry announced that henceforth
a number of tables (including the table on marital status) would only appear
triennially. Although it is intended that these triennial tables should
be available as reference material in the years between their publication, a
request for the 1971 marital-status table proved unsuccessful. A third
drawback in the H.I.P.E. data is that the enquiry from which they derive
covers only a ten per cent sample of in-patient deaths and discharges; this
in turn means that the sampling procedures may give rise to errors and
inaccuracies, and that reliable information is not forthcoming for individual
hospitals and groups. For the purposes of this study it is difficult even
to obtain inter-regional comparisons of the relationship between marital status
and hospital use.

These various difficulties, not all of which are peculiar to the special
interests of this study, detract from the general utility of the Hospital
In-Patient Enquiry as a source of valid information about hospital utilisation
patterns.

HOSPITAL ACTIVITY ANALYSIS

These three deficiencies in the Hospital In-Patient Enquiry are
theoretically overcome in the Hospital Activity Analysis (H.A.A.), introduced
in 1965 to provide consultants with a more appropriate tool than H.I.P.E.
for short-term management.* The basic information recorded in H.A.A. is

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* B. Benjamin. 'Hospital Activity Analysis: an information feedback for the
consultant'. The Hospital, 1965, Vol.61, p.221. D.M. Robson. 'Hospital
Activity Analysis: its use in hospital management'. The Hospital, 1967,
Vol.63, p.388.

similar to that of H.I.P.E., and where the two systems are operated together
the 10 per cent H.I.P.E. sample is usually drawn from the full H.A.A.
returns.   The important innovations embodied in Hospital Activity Analysis,
however, are those of coverage, speed and detail.   All deaths and discharges
from the participating hospitals are included in the Analysis (thereby elimina-
ting the possibility of sampling errors), and it is a requirement of the
system that there should be a rapid analysis and feedback of the data to
individual hospitals and consultants.*   In addition, the detailed recording
of marital status enables the easy production of tables which distinguish
single, married, widowed, divorced and separated patients.

The capacity of Hospital Activity Analysis to overcome (at least in
theory) each of the three deficiencies in H.I.P.E. outlined above seemed to
justify an exploration of the practical feasibility of using H.A.A. data for
the kind of research purposes typified by this project.   Is it really
possible to produce up-to-date tables, either for the country as a whole
or for any selected sub-areas of it, based upon analyses of all deaths and
discharges within the chosen areas, and with each marital status separately
identified?   If so, the researcher can reasonably look to H.A.A. rather
than H.I.P.E. as his best source of information about hospital activities.
In fact, however, it was clear from an early stage that, at the time of the
investigation (1973), certain aspects of the collection and processing
of H.A.A. data would frustrate the full realisation of this aim.

One important drawback is that, although H.A.A. covers all in-patient
deaths and discharges from participating hospitals, not all hospitals through-
out the country are yet involved in H.A.A. recording.   By September 1971
only 68 per cent of all hospitals were participating, covering 69 per cent
of deaths and discharges,** and in one of the two regions selected for this
investigation the proportion of beds in non-psychiatric hospitals which had
been included in H.A.A. recording for the whole of 1972 was as low as two-
fifths.   In the other region the proportion was about two-thirds.   Since
patients included in H.A.A. in those regions where the coverage is less than
complete may not be representative of all patients in the region, there must
for the time being remain serious imperfections in the ability of H.A.A. to
give an accurate representation of what is happening at national level and
in some regions.   At the same time, however, this is clearly a transitory

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* A. Dodman and C. Eastham.   'Hospital Activity Analysis: an enquiry into
the automated collection of data'.   The Hospital, 1965, Vol.65, p.622.

**J.S.A. Ashley.   'Present state of statistics from hospital in-patient data
and their uses'.   British Journal of Preventive and Social Medicine 1972,
Vol.26, no.3, p.135.

problem which will diminish as the coverage of the Analysis extends. By July 1973 the proportion of hospitals participating in the scheme had risen to 90 per cent, and all non-psychiatric hospitals should be included by the end of 1974.*

A more intractable difficulty is that, since H.A.A. is intended primarily as a management tool at local level, the task of analysis and the production of tables is undertaken by each Regional Hospital Board, either independently or by grouping with others to use common computer facilities. Thus although the use of a common identification sheet (HMR1-IP) throughout the country ensures that identical core data are collected nationally, there is no central machinery for analysing the data on a national basis. If tabulations for the whole country are required they must be aggregated from those commissioned from each Board or group of Boards. Such an exercise is not only time-consuming but may also encounter serious difficulties in obtaining completely standardised tabulations from several different computer centres. Unlike the problem of coverage discussed above, this second difficulty is not likely to improve with time. As far as is known there are no plans for the central analysis of H.A.A. even when coverage is complete; what seems more probable is that the Hospital In-Patient Enquiry will continue to supply the nation-wide statistics, with the sampling fraction increased from 10 per cent to perhaps 30 per cent of deaths and discharges.

Two lesser difficulties also deserve comment. One is the question of the quality of H.A.A. data. Although it is impossible to know exactly how accurate the returns are from each hospital, anecdotal evidence suggests that the quality is probably rather uneven throughout the country. Reports are heard of substantial discrepancies between H.A.A. and S.H.3. returns, even in such matters as the simple number of deaths and discharges in each specialty, and the 10 per cent samples submitted for H.I.P.E. purposes have on occasions been grossly inaccurate. It seems likely that the Office of Population Censuses and Surveys can exercise a much better control over the quality of the H.I.P.E. data than the Boards can over the H.A.A. data, although once again it is possible that quality control will improve with increasing experience in working the system. Lastly there is the difficulty that, for certain regional tabulations (for example those dealing with marital status), it may not always be easy to derive population data for the R.H.B.

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* Written answer by the Secretary of State for Social Services, reported in Health and Social Service Journal, 1973, Vol.83, no.4346, p.1734.

areas, for example for the purpose of calculating rates. The Registrar
General, in his Annual Statistical Reviews of England and Wales (Part I),
provides estimates of the age and sex distribution of the home populations of
R.H.B. areas, but the distribution by marital status is available each year
only at national, not regional level. It is possible to build up regional
aggregates from census material for local authority areas with reasonable
precision (see post page 6), although even this solution is not perfect.

A STUDY OF H.A.A. DATA IN TWO HOSPITAL REGIONS

These various difficulties in the structure and management of H.A.A.
not only made it quite impossible to produce tabulations on a nation-wide
basis, but also prevented the collection of complete H.A.A. data even on a
pilot basis in two local hospital regions. It was hoped originally that
tabulations could be produced, based upon all deaths and discharges in the
two regions, which could be contrasted with the H.I.P.E. statistics, but which,
by virtue of the fuller coverage of the analysis and the detailed classifi-
cation of marital status, would give an added refinement to the conclusions
reached in Appendix I. That this aim could not be achieved in full was
due principally to the incomplete coverage of H.A.A. in the two regions,
although it is obvious that the timing of the study and the selection of the
regions (though influenced very heavily by the requirements of the project)
was less than ideal. There were regions in 1972 in which the coverage of
H.A.A. was virtually complete, and it will probably be complete in the two
study regions by 1974. It seems likely, therefore, that in the near future
H.A.A. will, for certain purposes, be a much better data source than H.I.P.E.
at regional level, although the lack of machinery for the central analysis
of H.A.A. may render it less satisfactory than H.I.P.E. as a source of
national data.

In spite of the limitations of the H.A.A. material collected in this
study, there is one important respect in which, having actually assembled
the data, their superiority over the H.I.P.E. tabulations justifies a
cautious examination of them. This is that the marital status of patients
is recorded in full. Accordingly, the remainder of this paper presents
some limited results of an analysis of the H.A.A. data from the two regions
to get some indication of the variations in patterns of use between single,
widowed, divorced and separated patients. The exercise cannot be regarded
as anything more than a pilot study of what might be achieved with full
H.A.A. data in the near future.

THE SCOPE AND METHOD OF THE STUDY

The study was restricted to two R.H.B. areas: the North East and South East Metropolitan regions, excluding the teaching hospital groups. These regions were selected partly because of their common use of the Hospitals' Computer Centre for London (hence the relative ease with which the desired tabulations could be obtained) and partly because of their geographical relationship to the University of Kent and the possibility that they might be the location for future field studies. The calendar year 1972 was chosen as the study year (the fact that this was possible being an illustration of the speed with which H.A.A. tabulations are made available), and all hospitals were included which had participated in H.A.A. for the whole year. About two-thirds of all beds in non-psychiatric hospitals in S.E. Met. and about two-fifths of such beds in N.E. Met. were thus included. The most serious deficiency in the data clearly stems from the impossibility of knowing how representative the patients discharged from these beds were of all patients discharged in the two regions.

As in the Hospital In-Patient Enquiry, psychiatric hospitals are excluded from Hospital Activity Analysis, but the H.I.P.E. convention of excluding 'deliveries and disorders of pregnancy, childbirth and puerperium' (I.C.D. nos. A112-118, Y60-61) could not be applied strictly to the H.A.A. data because some hospitals included obstetric cases in their recording whilst others excluded them. That would not itself present any difficulty provided all such cases could first be identified in the H.A.A. returns and then excluded, but the H.A.A. tabulations were available only by specialty, not by diagnosis. The procedure was therefore adopted of excluding all cases recorded as obstetric and G.P. maternity, and including all those recorded as gynaecology (some of whom may possibly have fallen within the I.C.D. numbers listed above).

The steps in the analyses are straightforward. First, the question must be considered of whether the populations of the two regions are typical of the country as a whole, at least in terms of their age, sex and marital structures. The significance of any comparisons between H.I.P.E. and H.A.A. results, however oblique, can only be assessed in the light of a knowledge of the respective populations from which the patients are drawn. Secondly, some judgement must be made about the extent to which the hospitals partici- pating in H.A.A. during 1972 were typical of all hospitals in the regions.

The third stage is to plot the distribution by marital status of patients appearing in the H.A.A. figures and to compare it with the H.I.P.E. distributions. Lastly, the ratios of observed to expected frequencies, the discharge rates and the rates of bed use of patients of different marital status are calculated and compared with the corresponding statistics from the Hospital In- Patient Enquiry. Throughout these analyses the principal aim is always to see what light the H.A.A. results can throw upon the dark, undifferentiated mass of 'unmarried' patients in the H.I.P.E. reports.

THE POPULATIONS OF THE TWO REGIONS

The first step in the analysis, as indicated in the preceding section, is to assess the extent to which the populations of the selected regions are typical of the country as a whole, especially in relation to the distribution of marital status. A partial difficulty in doing this is that marital distribution within R.H.B. areas is not published. A number of solutions are available to the problem, the best of which is probably to work from census data, building up the data for local authority areas into regional aggregates. Even this solution poses problems in London boroughs which fall within two metropolitan hospital regions, but it was nevertheless the method adopted here. The results of the 1971 census were used, and no elaborate steps were taken to ascertain the precise distribution for those London boroughs which are part-in and part-out of the two regions. In the case of the N.E. Met. region the whole of the following London boroughs have been included: Barking, Hackney, Havering, Newham, Redbridge, Tower Hamlets, Waltham Forest, Haringey, Enfield and the City of London. In the South East region the whole of Bexley, Bromley, Greenwich, Lewisham and Southwark are included. There is a slight loss of precision resulting from this approach, but probably not sufficient to distort the general conclusions.

Table 1 shows the population of England and Wales, aged 25 and above, by age, sex and marital status, in 1971. Tables 2 and 3 give the same information for the S.E. and N.E. Met. regions respectively.* The structures of the three populations are reasonably similar, at least with respect to the variables of age, sex and marital status. In England and Wales 46.1 per cent of the population in question were men compared with 45.6 per cent in the S.E. Met. and 46.9 per cent in the N.E. Met. region. The differences are

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* The analysis is restricted to patients over 24 in order to standardise with the H.I.P.E. tabulations (see Appendix 1, page 5). Below this age most of the differences between married and unmarried patients are statistically inadmissable due to small numbers.

negligible. With regard to age, no more than four percentage points separated the three populations in the proportions of men or women in any age group, although by taking only four age groups the chances are obviously reduced of finding any large discrepancies. Nevertheless the variations in age between the three populations remained quite small even within each marital-status category. (These percentages are not shown in the tables but they can be derived simply by recalculating them down the columns.)

Equally important for the purposes of this paper, the tables show that the proportions of people who were single, married and widowed/divorced, whilst not differing very much between the three populations in total, did vary to a considerable extent at certain ages. In general the two regions contained fewer single and more married men and women than the country as a whole, especially at the older ages. Among men over 75, for instance, 10 per cent of those in England and Wales were single, compared with 6 per cent and 5 per cent respectively in the S.E. and N.E. Met. regions; and 50 per cent were married, compared with about 60 per cent in the two regions. Of the women over 75, 23 per cent in England and Wales were single compared with 18 per cent in the S.E. and 14 per cent in the N.E. Met. region; and 15 per cent were married compared with 19 and 20 per cent respectively in the two regions. The differences between the three populations in the proportions of widowed and divorced people were much smaller, in total and in each age and sex group.

These variations in the marital profiles of the populations may be important in contrasting the three groups of hospital patients. All else being equal, the fact that there are relatively more single and fewer married men and women in the national population than in the populations of the two regions is likely to be reflected in the distribution of marital status among the hospital deaths and discharges.

THE HOSPITALS PARTICIPATING IN H.A.A.

The point has already been emphasised that the most serious deficiency in the H.A.A. material lies less in the fact that it represents an incomplete coverage of the two regions during the year in question (for it would always be possible to apply a grossing factor to the data, as in H.I.P.E.) than in its unknown degree of representativeness. How sure can we be that the patients actually included in H.A.A. recording were a representative sample

of all patients leaving all eligible hospitals in the two regions during
1972?   The strict answer is that we simply don't know, and this must
inevitably add to our caution in approaching the data.   Three considerations,
however, encourage the hope that the H.A.A. data may not be wildly atypical.
First, there appears to be no prima facie reason why hospital groups which
participated during 1972 should be different in any systematic way from
those which did not participate.   Secondly, since it is generally hospital
groups rather than individual hospitals which either did or did not partici-
pate, there is bound to be at least some representation of each major type
of hospital (acute, chronic, geriatric, etc.) in the analysis.   Thirdly,
the participating groups, as the following chart shows, were not all
grouped together in any particular sub-areas of the regions.   Whilst it
would be erroneous to suggest that the groups were geographically represen-
tative of the regions, they were by no means confined to limited segments of
them.

H.M.Cs. participating in H.A.A. for the whole of 1972	
S.E. Metropolitan RHB	N.E. Metropolitan RHB
Greenwich	Harlow
Lewisham	Hackney
Woolwich	Ilford (Barking Hospital only)
Medway	South Essex
Thanet	Chelmsford
Cray Valley & Sevenoaks	Colchester
Bromley	
Hastings	
Brighton & Lewes	
Mid-Sussex	

THE DISTRIBUTION OF MARITAL STATUS IN H.I.P.E. AND H.A.A.

Tables 4 and 5 show the age, sex and marital distribution of patients appearing in the Analysis in the two regions in 1972. Table 6, which is adapted from the H.I.P.E. Report for 1970 (the latest available year) shows the numbers (and percentage) of men and women, by age and marital status, appearing in the Enquiry for that year.

It is interesting to note, first, that the distribution of marital status is very similar in both the S.E. and N.E. Met. regions. The major difference is the higher proportion of married patients (male and female) at most ages in the N .E. Met. region which is offset by slightly lower proportions in each of the other marital categories. There were also fewer patients of unknown marital status in the N.E. Met. region. This basic similarity in the marital structure of the two groups is important, for it further suggests that the patients included in these tables may be acceptably representative of all patients discharged from the two regions in 1972. In view of the comparable marital structure of the population in each region it would have been a cause for some suspicion if substantial disparities had been found in the structure of the two groups of patients. The absence of any marked disparities must therefore increase our confidence that we are probably dealing with a good cross-section of all patients.

Next, a comparison of the H.A.A. data (Tables 4 and 5) and the H.I.P.E. results (Table 6) shows that the percentage of patients recorded as married is of a similar order in all three cases. Taking all ages together, 74 per cent of men in the Hospital In-Patient Enquiry were married compared with 73 per cent and 79 respectively in the S.E. and N.E. Met. regions; and 63 per cent of women in H.I.P.E. were married compared with 58 per cent and 67 per cent respectively in the two regions. Moreover, even within each of the four age groups the variations between the three sets of data were seldom more than three or four percentage points. The main purpose, however, in setting out the marital distribution of the H.A.A. patients is to delineate the composition of the group of unmarried patients. Tables 4 and 5 show that, among male patients of all ages, about 10 per cent were single, 10 per cent widowed, 2 per cent divorced or separated, and between 2 and 4 per cent were of unknown marital status. Naturally these proportions vary substantially with age. In the youngest age group, about 15 per cent of the men were single and fewer than 1 per cent were widowed, whilst in the oldest

age group the percentages are, respectively, about 6 per cent and 37 per cent. Among the female patients, about 10 per cent in both regions were single, (the proportions in both regions <u>rising</u> with increasing age), and between about a fifth and a quarter were widowed (with the proportion ranging from 1 in 100 among those under 44 to almost two-thirds of those over 75). Between 2 and 4 per cent of the women were divorced or separated, and a similar proportion were of unknown status.

In view of the essential similarity between the three sets of data (Tables 4, 5 and 6) in the proportions of married and unmarried men and women in each age group, it seems probable that the group of 'other' (i.e. non-married) patients in the H.I.P.E. tabulations would break down into its constituent statuses in much the same proportions as in the H.A.A. data. The particular importance of this lies in the fairly small numbers of patients of unknown marital status - no more than 5 per cent in the South East and 3 per cent in the North East Met. region in any age group. If it is assumed that the recording of marital status for H.I.P.E. purposes before the introduction of H.A.A. was no less accurate than it is now in those hospitals participating in H.A.A., then the validity of the results presented in Appendix I is not substantially impaired on these grounds.

Having cautiously established that the distribution of marital status is reasonably similar in the three sets of patients (notwithstanding some fairly large differences at certain ages between the three populations from which the patients were drawn), the question arises of what the results signify. It was shown in Appendix I that unmarried patients were over-represented among those appearing in the Hospital In-Patient Enquiry: in many age and sex groups, for example, they had higher discharge rates and higher rates of bed use than their married counterparts. Does this finding appear from the H.A.A. results to hold equally good for single, widowed, divorced and separated patients, or are some of these groups very much more over-represented than others? The most direct way of tackling this question would be to calculate the discharge rates for patients of each marital status, but since the exact grossing factors in the two regions are unknown, this is possible only on a somewhat tenuous basis. An alternative method, which does not depend upon knowing the grossing factor (but which does nevertheless assume that the patients appearing in the analysis are representative of all patients) is first to calculate the number of patients that would be expected in each age, sex and marital status group on the assumption that there was no difference in these respects between the patients and the total

population, and then to compare these expected frequencies with the actually observed frequencies. In the next two sections we first perform this latter exercise (that is, comparing observed and expected frequencies), and then calculate the estimated discharge rates of H.A.A. patients in the S.E.Met. region, bearing in mind the considerable assumptions upon which the calculations are based.

OBSERVED AND EXPECTED DISTRIBUTIONS OF MARITAL STATUS

Tables 7 and 8 show, for the S.E. and N.E. Met. regions respectively, the ratios of observed to expected frequencies for male and female patients in each age and marital status group. The observed frequencies from which these ratios derive are simply those contained in Tables 4 and 5. The expected frequencies are calculated from the population data in Tables 2 and 3 by dividing the population number in each cell by the total male or female population (as the case may be), and then multiplying the result by the total number of male or female patients in H.A.A. whose marital status was known.* The ratios actially shown in Tables 7 and 8 are then derived simply by dividing the observed by the expected frequencies. These ratios can be interpreted in two ways. The magnitude of any ratio indicates the extent to which patients in that particular age/marital-status group are over- or under-represented among all male or female patients. Thus a ratio in excess of 1.00 would indicate an over-representation of patients of that age and marital status in the survey relative to the corresponding regional population; conversely a ratio of less than 1.00 would indicate an under-representation. Secondly, the relative magnitude of ratios within any age group (i.e. across any row) indicates the extent to which patients of any marital status are over- or under-represented in relation to patients of a different marital status within that age group. The first two of Table 7, for example, shows not only that married and separated men between 25-44 were represented with half their expected frequency whereas widowed men of the same age were represented with a 21 per cent higher frequency than expected, but also that, relative to the married men, the widowed men were almost two-and-a-half times as numerous (i.e. 1.21 divided by 0.50).

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* A slight imperfection in the expected frequencies results from using population data for 1971 and H.A.A. patient data for 1972. In practice, however, the marital structure of the population does not change dramatically from one year to the next, and the results are probably good enough for the purposes of this particular analysis.

Since the pattern of the ratios is quite complex it is best to
consider the male and female results separately. Among the male patients
in both regions, three trends stand out clearly. First, as we would expect,
the ratios not only vary between marital statuses within each age group, but
also increase regularly with rising age. The older the patients, in other
words, the greater their degree of over-representation. Secondly, divorced
men displayed consistently lower ratios than any other marital category.
This is true in total (all ages) and within each age group. Thirdly,
widowed men had consistently higher ratios than any others, both in total
and within all but one of the age groups (the exception being the age group
75+ in N.E. Met.). Apart from these clear-cut trends it will be noticed
that, as a rule, single men exhibited ratios of a similar order to the married,
especially in the S.E. Met. region. In that region the single male ratios
were, in each age group, a little higher than those of the married, but in
N.E. Met. they were higher in two of the age groups and lower in the other
two. It is not possible from these figures, therefore, to make any consis-
tent generalisations about single and married men beyond the fact that, in
virtually every case, their ratios were lower than those of the widowed and
higher than those of the divorced.

Among the female patients, as with the men, certain trends are
reasonably clear-cut. First there is the expected increase in the ratios
with rising age. The pattern here is not quite as regular as among the male
patients, for in both regions the ratios in the age group 45-64 are lower than
in the preceding group, and, in N.E. Met., they drop still further in the
following age group among divorced women. But in general it is true that
the older the patients the more over-represented they are. Secondly,
divorced women generally exhibited lower ratios than any other marital category.
This is true in total (all ages) and in most age groups (the exceptions being
25-44 and 45-64 in S.E. Met.). This, too, parallels the male results.
Thirdly, also following the trend among the men, the ratios for widowed
women are higher than for any other marital status when women of all ages
are taken together, but unlike the men there are a number of age groups
(especially in N.E. Met.) in which the widowed ratios rank only second.
There is one interesting respect in which the female data exhibit a greater
consistency than the male: in each age group in both regions the ratios
for single women were lower than for married women (though not for all ages
together in S.E. Met.).

In sum, this particular treatment of the H.A.A. material seems to show quite clearly that considerable variations exist between single, widowed and divorced patients in their degree of over- or under-representation among hospital patients. Relative to their frequency in the population it appears to be the widowed (especially widowed men) who are most heavily over-represented and the divorced who are most markedly under-represented. Moreover in terms of actual numbers of patients, the widowed yielded much higher excesses of observed over expected frequencies than either the single or the divorced. In the S.E. Met. region, for example, there were, in all, about 4,500 more widowed men and about 6,800 more widowed women than would be expected from their frequency in the population; and in the N.E. Met. region the excesses were about 1,900 and 1,800 respectively.* Only married patients in the two highest age groups had higher absolute excesses of observed over expected numbers and this results, of course, from the very much larger numbers of married than of widowed patients.

DISCHARGE RATES

An alternative way of looking at the results presented in the previous section is to calculate the discharge rate per 10,000 population for each age, sex and marital status group. The discharge rates from the national H.I.P.E. data, discussed in Appendix I, showed that in 1970 married patients almost invariably had lower discharge rates than the unmarried. The only exception occurred among women over the age of 75, where the discharge rate for married women was slightly higher than for the unmarried. What the H.I.P.E. results cannot show is how the rates differ between single, widowed and divorced patients.

In principle, Hospital Activity Analysis permits the calculation of discharge rates for any group of patients; the rate is, after all, merely the total number of patients divided by the total population, multiplied by 10,000. In fact in the present study the serious difficulty occurs that the total number of patients is not known (hence the grossing factor is unknown); and, furthermore, there is no certainty that the patients included in H.A.A. in the two regions are truly representative of all patients. In spite of these difficulties estimates can be made of the discharge rate for each

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* These figures are of patients actually recorded in H.A.A. They are not adjusted to represent estimates for all patient deaths and discharges in the two regions. Such estimates would, of course, be higher.

marital status, and, as an indication of the type of results obtainable from such an analysis, they have been calculated for the S.E. Met. region only.   The results are given in Table 9.

The method of calculating the discharge rates is as follows.   First, it is assumed that the total number of patients eligible for inclusion in H.A.A. (i.e. the total number if H.A.A. had covered the entire region) is the same as the regional estimate of all deaths and discharges given in H.I.P.E. (excluding, in the case of women, deliveries and disorders of pregnancy, childbirth and puerperium).   These figures are available for the 1971 Enquiry, broken down by age and sex (though not, of course, by marital status).   Next, the number of H.A.A. patients in each age and sex group is calculated as a percentage of the estimated total number of patients in that group.   From this a grossing factor is derived which is then applied to that age and sex group.   Finally the number of patients thus obtained is expressed as a rate per 10,000 population of the same age and sex (these latter figures having already been given in Tables 2 and 3).   The resulting rates (shown in Table 9) are of the same relative magnitude to each other as the ratios of observed to expected frequencies shown in Table 7.   What they show in addition to that table is first, what the actual rates look like for each marital status, and secondly, how the discharge rates for married patients in H.A.A. compare with the H.I.P.E. rates from the 1970 Enquiry. For this purpose the H.I.P.E. rates have been added in the table.

Since the relative magnitude of these rates to each other is the same as for the ratios already described in Table 7, the commentary on this table can be restricted to the last point mentioned at the end of the previous paragraph.   It will be seen that the discharge rates for married patients in H.A.A. are of a very similar order to those contained in H.I.P.E. Indeed, in view of the assumptions built into the calculation of the H.A.A. rates, the comparison is almost astonishing.   But since there are unlikely to be any major differences between the whole country and the S.E. Met. in the age- and sex-specific discharge rates of married patients these results foster further confidence that, in this region at least, the patients included in H.A.A. were probably a reasonable cross-section of all patients dying in or discharged from hospitals in the region.

THE USE OF BEDS

The final use to which the H.A.A. data can be put is a comparison of rates of bed use between single, widowed and divorced patients. The H.I.P.E. analyses in Appendix I showed that, in each age and sex group, the rate of bed use (defined as the average number of beds used daily per million population) was higher in every year for the unmarried than for the married. The differences were of a large order in 1970 and have widened since 1964. As with the discharge rates, however, the H.I.P.E. data offer no indication of variations within the group of unmarried patients between the single, the widowed and the divorced.

The calculation of rates of bed use from the H.A.A. data is hampered (as was the calculation of discharge rates) by ignorance of the precise grossing factor. It is, however, possible to make tolerably good estimates by first arriving at an estimate of the total average daily bed use throughout the region, and then expressing this as a rate per million population. The totals for each age, sex and marital-status group are derived in exactly the same way as the total number of patients, described in the previous section. The rates of bed use are set out in Table 10 for the S.E. Met. region.

Among the male patients there is a fairly consistent ranking of the rates of each marital status. In all but the youngest age group the widowed men had the highest rates by quite a large margin, with single men displaying the second highest rates. Divorced males had the lowest rates of bed use in all but the age group 45-64, with married men generally in third place. The rates, as would be expected, increase consistently with rising age, but a comparison with Table 2 in Appendix I shows that the rates themselves, in an absolute sense, are very much higher in several age groups than the national H.I.P.E. rates (which are, for convenience, shown also in the table). Differences of this magnitude must remain for the time being problematic. To some extent they doubtless reflect the relatively generous availability of beds in the South East compared with the country as a whole, but there are no available statistics showing rates of bed use by age and region to be used for comparative purposes.

Among the female patients, as with the males, the single and the widowed displayed higher rates of bed use in each age group than either the married or the divorced, but in each age group except the highest (75+) the top rank was held by the single.   Divorced women had much lower rates than any of the others at all ages except 25-44;   married women generally ranked third.   A comparison between the H.A.A. rates for this one region and H.I.P.E. rates for the whole country again shows a substantial discrepancy between the two sets of data, though perhaps a little less marked than among the males.

SUMMARY

Data from the Hospital Activity Analysis (H.A.A.) were assembled from two metropolitan hospital regions to see whether they could be used to overcome certain deficiencies in the Hospital In-Patient Enquiry (H.I.P.E.).   It was concluded that, at the time of the study, H.A.A. was not a better data source than H.I.P.E. partly because it had not been fully implemented throughout the two selected regions and partly because the lack of any central analysis of H.A.A. returns would make it extremely difficult to use the material for national trends.   The problem of incomplete coverage is a temporary one which should disappear within the near future, but the lack of any known plans for the central analysis of H.A.A. data will make it difficult to use as a source of national (rather than regional) statistics.

In spite of these difficulties it was possible to use the H.A.A. material for limited purposes in delineating some of the variations within the group of non-married patients between the single, the widowed and the divorced.   First, the distribution of marital status among patients in the two regions was compared with the national distribution shown in the Hospital In-Patient Enquiry.   The proportions of married patients were similar in all three cases, even within age groups.   Of the non-married patients in H.A.A., about 10 per cent were single, a further 10 per cent of the men (but about a quarter of the women) were widowed, and no more than 4 per cent were divorced or separated.   The proportion of patients whose marital status was unknown never exceeded 5 per cent in any age or sex group.

Next, these observed frequencies are expressed as a ratio of the frequencies that would have been expected if the male and female patients had been distributed among the age and sex groups in the same way as in the population. Certain trends are fairly clear-cut. In general, the older the patients the greater was their degree of over-representation, but within each age group the ratios were high for widows and widowers, and low for divorced patients. Single and married patients generally had ratios between those of the widowed on the one hand and the divorced on the other. In terms of actual numbers of patients the widowed yielded much higher excesses of observed over expected frequencies than either the single or divorced.

The discharge rates per 10,000 population were calculated in one region for each age, sex and marital-status group by using a grossing factor based upon the SH3 returns for 1970. The rates thus calculated were of a very similar order, in the case of married patients, to those derived from the 1970 H.I.P.E. data. Of the non-married patients, discharge rates were generally high among the widowed and low among the divorced. Single men had higher rates than married men at all ages, whereas the rates for single women were always lower than for married women.

Lastly, the rates of bed use per million population were calculated for one of the regions using the same grossing factor as in the calculation of discharge rates. Single and widowed patients displayed the highest rates, irrespective of age and sex, with married patients generally occupying the third rank and divorced patients the fourth. The rates of bed use among elderly widows (75+) were especially high.

Table 1.   Population of England and Wales, aged 25 and above, by sex, age and marital status, 1971

(Source: 1971 census, summary tables, Great Britain)

Sex and age	Marital	Status		Total
	Single	Married/Separated	Widowed/Divorced	
Males				
25 - 44	924.6 (15.3)	5,041.0 (83.3)	82.3 (1.4)	6,047.9 (100)
45 - 64	634.0 (11.1)	4,793.8 (84.0)	280.1 (4.9)	5,707.9 (100)
65 - 74	188.2 (11.1)	1,237.2 (72.7)	275.8 (16.2)	1,701.2 (100)
75+	68.3 (10.2)	333.4 (49.9)	266.0 (39.9)	667.7 (100)
Total	1,815.1 (12.8)	11,405.4 (80.8)	904.2 (6.4)	14,124.7 (100)
Females				
25 - 44	653.2 (10.5)	5,381.9 (86.3)	197.9 (3.2)	6,233.0 (100)
45 - 64	852.1 (13.3)	4,524.8 (70.6)	1,029.2 (16.1)	6,406.1 (100)
65 - 74	490.4 (198.)	937.9 (37.9)	1,046.2 (42.3)	2,474.5 (100)
75+	318.2 (22.6)	208.1 (14.8)	879.2 (62.6)	1,405.5 (100)
Total	2,313.9 (14.0)	11,052.7 (66.9)	3,152.5 (19.1)	16,519.1 (100)

Notes: 1.   Population figures are in thousands

2.   Percentages are calculated across rows and included in brackets

Table 2. Population of South East Metropolitan R.H.B., aged 25 and above, by sex, age and marital status, 1971

(Source: 1971 census county reports, Part I)

Sex and age	Marital status				Total
	Single	Married/separated	Widowed	Divorced	
Males 25 - 44	55.7 (14.3)	327.0 (84.0)	0.9 (0.3)	5.6 (1.4)	389.2 (100)
45 - 64	32.1 (8.1)	349.8 (87.8)	10.7 (2.7)	5.9 (1.4)	398.5 (100)
65 - 74	9.3 (6.9)	109.6 (80.9)	15.4 (11.4)	1.1 (0.8)	135.4 (100)
75+	3.8 (6.2)	37.7 (61.1)	20.0 (32.4)	0.2 (0.3)	61.7 (100)
Total	100.9 (10.2)	824.1 (83.7)	47.0 (4.8)	12.8 (1.3)	984.8 (100)
Females 25 - 44	38.1 (9.6)	345.2 (86.9)	4.0 (1.0)	9.8 (2.5)	397.1 (100)
45 - 64	46.3 (10.4)	335.1 (75.3)	52.2 (11.7)	11.4 (2.6)	445.0 (100)
65 - 74	30.3 (15.5)	89.5 (45.8)	72.8 (37.2)	2.9 (1.5)	195.5 (100)
75+	25.1 (18.3)	26.0 (19.0)	85.1 (62.1)	0.8 (0.6)	137.0 (100)
Total	139.8 (11.9)	795.8 (67.8)	214.1 (18.2)	24.9 (2.1)	1,174.6 (100)

Notes: 1. Population figures are in thousands

2. Percentages are calculated across rows and included in brackets

Table 3. Population of North East Metropolitan R.H.B., aged 25 and above, by sex, age and
marital status, 1971

(Source: 1971 census county reports, Part I)

Sex and age		Marital status				Total
		Single	Married/separated	Widowed	Divorced	
Males	25 - 44	65.6 (15.4)	352.8 (83.0)	1.0 (0.3)	5.6 (1.3)	425.0 (100)
	45 - 64	34.4 (8.1)	372.1 (87.8)	11.6 (2.7)	5.6 (1.4)	423.7 (100)
	65 - 74	8.5 (7.1)	95.8 (79.8)	14.7 (12.3)	1.0 (0.8)	120.0 (100)
	75+	2.7 (5.4)	30.2 (60.2)	17.2 (34.3)	0.1 (0.1)	50.2 (100)
	Total	111.2 (10.9)	850.9 (83.5)	44.5 (4.4)	12.3 (1.2)	1,018.9 (100)
Females	25 - 44	38.9 (9.0)	379.4 (87.8)	4.2 (1.0)	9.7 (2.2)	432.2 (100)
	45 - 64	37.9 (8.6)	345.7 (78.0)	49.9 (11.3)	9.5 (2.1)	443.0 (100)
	65 - 74	21.4 (12.9)	78.2 (47.0)	64.8 (39.0)	1.8 (1.1)	166.2 (100)
	75+	15.1 (13.5)	21.9 (19.6)	74.3 (66.5)	0.4 (0.4)	111.7 (100)
	Total	113.3 (9.8)	825.2 (71.6)	193.2 (16.8)	21.4 (1.8)	1,153.1 (100)

Notes: 1. Population figures are in thousands

2. Percentages are calculated across rows and included in brackets

Table 4. H.A.A. discharges and deaths, by sex, age and marital status,

South East Metropolitan R.H.B., 1972

Sex and age	Marital status						Total
	Single	Married	Widowed	Divorced	Separated	Not known	
Males							
25 - 44	2,278 (17.0)	10,128 (75.4)	68 (0.5)	163 (1.2)	232 (1.7)	568 (4.2)	13,437 (100)
45 - 64	2,079 (8.4)	19,965 (81.0)	1,033 (4.2)	282 (1.2)	330 (1.3)	965 (3.9)	24,654 (100)
65 - 74	1,094 (6.8)	11,609 (72.4)	2,352 (14.7)	107 (0.7)	184 (1.1)	688 (4.3)	16,034 (100)
75+	617 (5.5)	5,900 (52.6)	4,040 (36.0)	28 (0.2)	75 (0.7)	565 (5.0)	11,225 (100)
Total	6,068 (9.3)	47,602 (72.8)	7,493 (11.5)	580 (0.8)	821 (1.3)	2,786 (4.3)	65,350 (100)
Females							
25 - 44	2,027 (8.6)	19,507 (83.0)	248 (1.1)	634 (2.7)	568 (2.4)	530 (2.2)	23,514 (100)
45 - 64	2,013 (8.2)	17,936 (72.7)	3,071 (12.4)	504 (2.1)	406 (1.6)	747 (3.0)	24,677 (100)
65 - 74	2,107 (13.1)	6,769 (42.1)	6,209 (39.7)	126 (0.8)	148 (0.9)	696 (4.3)	16,055 (100)
75+	2,778 (14.6)	3,243 (17.0)	11,906 (62.4)	38 (0.2)	73 (0.4)	1,039 (5.4)	19,077 (100)
Total	8,925 (10.7)	47,455 (57.0)	21,434 (25.7)	1,302 (1.6)	1,195 (1.4)	3,012 (3.6)	83,323 (100)

Notes: 1. The female data exclude all obstetric and G.P. maternity cases

2. Percentages are calculated across rows and included in brackets

Table 5. H.A.A. discharges and deaths, by sex, age and marital status, North East Metropolitan R.H.B., 1972

Sex and age	Marital status						Total
	Single	Married	Widowed	Divorced	Separated	Not known	
Males							
25 – 44	1,348 (13.5)	8,383 (83.9)	34 (0.3)	77 (0.8)	53 (0.5)	100 (1.0)	9,995 (100)
45 – 64	1,149 (8.3)	11,762 (85.5)	479 (3.5)	97 (3.5)	100 (0.7)	177 (1.3)	13,764 (100)
65 – 74	528 (6.8)	6,010 (77.1)	1,053 (13.5)	28 (0.4)	34 (0.4)	146 (1.8)	7,799 (100)
75+	332 (6.7)	2,545 (51.7)	1,912 (38.8)	5 (0.1)	9 (0.2)	121 (2.5)	4,924 (100)
Total	3,357 (9.2)	28,700 (78.7)	3,478 (9.5)	207 (0.6)	196 (0.5)	544 (1.5)	36,482 (100)
Females							
25 – 44	1,164 (7.4)	13,993 (88.4)	160 (1.0)	237 (1.5)	201 (1.3)	72 (0.4)	15,827 (100)
45 – 64	940 (7.3)	10,284 (79.6)	1,327 (10.2)	138 (1.1)	98 (0.8)	126 (1.0)	12,913 (100)
65 – 74	777 (11.2)	3,481 (49.9)	2,517 (36.2)	16 (0.2)	30 (0.4)	148 (2.1)	6,969 (100)
75+	1,021 (13.1)	1,583 (20.3)	4,963 (63.6)	15 (0.2)	5 (-)	217 (2.8)	7,804 (100)
Total	3,902 (9.0)	29,341 (67.4)	8,967 (20.6)	406 (0.9)	334 (0.8)	563 (1.3)	43,513 (100)

Notes: 1. The female data exclude all obstetric and G.P. maternity cases

2. Percentages are calculated across rows and included in brackets

Table 6. H.I.P.E. discharges and deaths, by sex, age and marital status, 1970

| Sex and age | Marital status | | Total |
	Married	Other	
Males			
25 – 44	20,781 (75.4)	6,775 (24.6)	27,556 (100)
45 – 64	38,486 (81.2)	8,941 (18.8)	47,427 (100)
65 – 74	17,501 (72.1)	6,759 (27.9)	24,260 (100)
75+	7,428 (49.5)	7,566 (50.5)	14,994 (100)
Total	84,196 (73.7)	30,041 (26.3)	114,237 (100)
Females			
25 – 44	33,845 (85.7)	5,669 (14.3)	39,514 (100)
45 – 64	33,979 (75.9)	10,786 (24.1)	44,765 (100)
65 – 74	10,701 (46.1)	12,497 (53.9)	23,198 (100)
75+	4,540 (19.2)	19,100 (80.8)	23,640 (100)
Total	83,065 (63.4)	48,052 (36.6)	131,117 (100)

Notes: 1. The female data exclude deliveries and disorders of pregnancy, childbirth and puerperium

2. Percentages are calculated across rows and included in brackets

Table 7. Ratio of observed to expected frequencies of discharges and deaths, by age, sex and marital status, of patients in H.A.A. in South East Metropolitan R.H.B. 1972

Sex and age	Marital status			
	Single	Married/separated	Widowed	Divorced
Males				
25 - 44	0.64	0.50	1.21	0.47
45 - 64	1.02	0.91	1.53	0.76
65 - 74	1.86	1.70	2.41	1.55
75 +	2.59	2.50	3.18	2.15
Total	0.95	0.93	2.52	0.72
Females				
25 - 44	0.78	0.85	0.91	0.95
45 - 64	0.64	0.81	0.86	0.65
65 - 74	1.02	1.13	1.25	0.65
75+	1.62	1.87	2.05	0.80
Total	0.94	0.89	1.47	0.77

Note: See text for method of calculating expected frequencies

Table 8. Ratio of observed to expected frequencies of discharges and deaths, by age, sex and marital status, of patients in H.A.A. in North East Metropolitan R.H.B. 1972

| Sex and age | Marital status | | | |
	Single	Married /separated	Widowed	Divorced
Males				
25 - 44	0.58	0.68	1.06	0.40
45 - 64	0.95	0.90	1.18	0.50
65 - 74	1.77	1.79	2.03	0.88
75+	3.57	2.40	3.17	1.25
Total	0.86	0.96	2.23	0.49
Females				
25 - 44	0.80	1.00	1.03	0.66
45 - 64	0.67	0.81	0.72	0.39
65 - 74	0.98	1.21	1.04	0.25
75+	1.83	1.96	1.79	1.15
Total	0.93	0.97	1.25	0.51

Note: See text for method of calculating expected frequencies

Table 9. Discharge rate per 10,000 population, by age, sex and marital status, of patients in H.A.A. in South East Metropolitan R.H.B., 1972, and in Hospital In-Patient Enquiry 1970

Sex and age	Hospital Activity Analysis				Hospital In-Patient Enquiry, 1970	
	Single	Married/separated	Widowed	Divorced	Married	Other
Males						
25 - 44	618	478	1,144	439	457	678
45 - 64	959	859	1,428	707	849	1,283
65 - 74	1,705	1,560	2,214	1,409	1,436	2,106
75+	2,053	2,029	2,586	1,800	2,007	2,747
Total	880	855	2,173	667	789	1,311
Females						
25 - 44	697	762	813	848	724	855
45 - 64	652	821	823	663	796	828
65 - 74	848	943	1,041	531	1,078	1,076
75+	1,339	1,543	1,693	575	1,770	1,667
Total	830	833	1,257	718	815	1,125

Notes: 1. See text for method of calculating total number of discharges

2. The female data exclude all obstetric and G.P. maternity cases

Table 10. Average number of beds used daily per million population, by age, sex
and marital status, of patients in H.A.A. in South East Metropolitan R.H.B., 1972
and in Hospital In-Patient Enquiry 1970

Sex and age	Hospital Activity Analysis				Hospital In-Patient Enquiry, 1970	
	Single	Married/separated	Widowed	Divorced	Married	Other
Males						
25 - 44	2,982	1,307	1,678	1,079	1,219	2,472
45 - 64	5,809	2,416	12,864	3,512	3,344	7,620
65 - 74	23,543	10,478	54,140	9,227	7,070	16,394
75+	46,821	23,970	57,600	6,400	13,081	31,095
Total	5,213	2,854	33,382	2,031	3,202	9,429
Females						
25 - 44	2,338	1,279	2,293	1,604	1,675	3,371
45 - 64	13,186	3,975	6,724	2,237	3,022	4,976
65 - 74	14,857	10,523	12,937	2,103	6,085	9,416
75+	28,876	24,758	36,186	4,538	14,556	25,114
Total	10,321	3,177	16,618	1,485	2,993	11,338

Notes: 1. See text for method of calculating total average daily bed use.

2. The female data exclude all obstetrics and G.P. maternity cases

Appendix III

Analysis of data from a study of long-stay patients in acute
hospital in-patient care in the Liverpool Hospital Region

Note: pages and tables are numbered separately within
        this appendix

INTRODUCTION

In 1967-68 a survey was made of all patients over 20 years of age
(N = 1,106) in the Liverpool Regional Hospital Board area (including the
United Liverpool Hospitals) who had had an unbroken stay of at least 30 days
in officially classified "acute" beds. The primary objective of the survey
was to quantify and explain the extent to which acute hospital resources were
being "blocked" by patients whose clinical conditions no longer required acute
in-patient care, and the results (together with the detailed methodology of
the study) were subsequently published.* During the course of the survey,
information was gathered from the case records about the marital status of each
patient (classified as single, married, widowed, divorced/separated). The
survey data has now been re-analysed to determine the prevalence of single,
married and widowed persons among this group of 'long-stay' patients and to
examine the clinical and social need for hospital care among patients in each
of these marital status groups.

AGE, SEX AND MARITAL STATUS OF LONG STAY PATIENTS IN ACUTE HOSPITAL CARE

Table 1 shows the distribution of the 1,106 patients in the survey by age,
sex and marital status. The percentages are based upon the totals in each age
group. Table 2 gives corresponding data for the total adult population
(20 years and above) of the Liverpool R.H.B. area in 1966, which is the popula-
tion from which more than 90 per cent of all in-patients in the region are drawn.
Table 3 facilitates comparison between the first two tables by showing, for each
age, sex and marital-status group, the observed frequencies (i.e. the numbers of
patients actually in the survey), the expected frequencies (i.e. the numbers
that would appear if the survey patients had the same distribution by age, sex
and marital status as the total adult population), and the ratios of observed
to expected frequencies. The expected frequencies in any cell are calculated
by dividing the population number in that cell by the total regional adult
population (1,478,090), and then multiplying the result by the total number of
patients in the sample whose marital status was known (1,088). A ratio of
1.00 indicates that patients in that cell were represented in the survey with
exactly their frequency in the population. Ratios in excess of 1.00 indicate
an over-representation of patients in the survey, relative to the adult
population; conversely for ratios below 1.00.

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*
   J.R. Butler and M. Pearson. Who Goes Home? Occasional Papers in Social
   Administration, No.34.   G. Bell & Sons, 1970.   See also: R.F.L. Logan,
   J.S.A. Ashley, R.E. Klein and D.M. Robson.   Dynamics of Medical Care.
   Memoir No.14, London School of Hygiene and Tropical Medicine, 1972,
   (especially chapter 12).

As Table 3 shows, the ratio of observed to expected frequencies increased consistently with rising age among men and women in each marital status group. There were, however, notable differences within each age group in the extent to which single, married and widowed persons were represented in the survey, with the ratio of observed to expected frequencies being smaller for married than for single or widowed persons in each sex and age group.* Married patients (male and female combined) were under-represented in the survey in the age groups 20-39 and 40-59 years and appeared with almost three times their expected frequency at age 70+, while single and widowed persons were over-represented in all but the youngest age group and by age 70+ were present with more than five times the frequency expected from their distribution in the total adult population. There was no consistent difference between the ratios of single and widowed persons; in the age groups 60-69 and 70+ years single persons had slightly higher rates of observed to expected frequencies than widowed persons, while in the age group 40-59 years the widowed were more heavily represented.

The greater representation of non-married than of married persons in each age group held good for both male and female patients in all age groups. However, as Table 3 shows, the ratios of observed to expected frequencies were greater for males than for females within each age and marital status group. Thus it appears that the tendency to remain in acute hospital care for long periods of time is due to factors associated with the age, sex and marital status of the patient, with married females in the younger age groups being least likely to be represented among long-stay patients and non-married (especially single) males in the older age groups being most heavily represented.

A further analysis, of which figures are not shown in the tables, indicates that even among these long-stay patients (especially elderly patients) those who were married may have had the shortest stays in hospital and the single may have had the longest average stays. The analysis is not perfect because, being a cross-sectional design, the survey could not show the <u>total</u> length of time which patients spent in hospital. Up to the time of the interviews, however, the mean durations of stay among patients under the age of 60 were 79 days for the single and 66 days for the married and widowed; in the age group 60-69 years the means were 89, 69 and 71 days respectively for the single, the married and the widowed; and above the age of 70 the respective means were 85, 71 and 83 days.

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* Divorced/separated persons are exluded from the analysis as they comprised only 19 patients

The question arises as to whether the relatively greater representation of non-married than of married persons among this group of long-stay patients merely reflects the marital distribution of all hospital patients. It is true that a higher proportion of hospital patients than of the general population are without marriage partners but the proportion of spouse-less people was still higher among this group of long-stay patients. In 1968, for example, 27 per cent of the male and 36 per cent of the female patients over 25 years of age discharged from N.H.S. hospitals were without marriage partners, compared with 51 per cent of the men and 71 per cent of the women in the survey.* This greater representation of non-married persons in the survey population was found among each age group and indicates that marital status is a significant factor in determining length of stay in hospital as well as the chances of being admitted in the first place.

CLINICAL AND SOCIAL FACTORS ASSOCIATED WITH LENGTH OF HOSPITAL STAY

One reason why certain groups of patients may remain in hospital for longer periods of time than others is that their conditions are different and possibly more serious and that their discharge is therefore delayed on purely clinical grounds. However, the decision whether or not to discharge a patient is often based on additional considerations of a social nature. Thus, for example, the fact that a patient may live alone, without the help of relatives or neighbours living nearby, may militate against their being discharged from hospital, even though they may be medically fit to leave. It would require a fairly complex research design to assess the relative weight of medical and social factors in explaining differences in length of hospital stay among marital status groups, for it would involve contrasting the medical state and social circumstances of single, married and widowed patients who were and were not discharged within specified periods of time. The present study, involving a simple cross-sectional survey of patients in hospital at a particular point in time, cannot supply such information. However, some indirect evidence can be found by comparing the clinical condition and social needs of single, married and widowed patients at the time of the survey. Evidence on the clinical condition of patients is provided by information concerning their

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* Report of the Hospital In-Patient Enquiry for the year 1968, Pt.I, Table 9, H.M.S.O., 1972

need for care and use of hospital services, while evidence of social factors which may affect length of stay is gained from information about possible discharge problems.

The doctors' opinions of the need for care

The hospital doctor responsible for each patient was asked whether, in his opinion, the patient needed to remain in hospital care. If the answer to this question was positive, he was then asked whether the patient needed to remain in an acute ward or could appropriately be transferred elsewhere. Combining the answers to these two questions, the following classification was derived:

1. Patient does not require hospital care at all (low care)
2. Patient requires hospital care but not acute (intermediate)
3. Patient requires continuing acute care (high care)

The form of the question was designed to capture the clinical dimensions of each case: it was intended, in other words, that the doctors should, in answering these questions, concern themselves solely with the patients' clinical condition. In practice, of course, it is rarely possible to do this, and the answers doubtless reflect a mixture of criteria. Nevertheless, it is felt that they can be taken as a reasonable indicator of the broad clinical requirements of the patients in the survey.

As Table 4 shows, the proportion of persons in each marital status group who were regarded as needing continuous acute care (high care) decreased with age, while the proportion thought to require low or intermediate care increased with rising age. Within each of three broad age groups (under 60, 60-69 and 70+) a smaller proportion of single than of widowed or married persons were placed in the high care category and a correspondingly larger proportion of single persons were in the categories of low and intermediate care. There was little difference among the two youngest age groups in the distribution of married and widowed persons between the three levels of care, but in the age group 70+ the proportion of married persons who were thought to require continuing acute care was higher than the proportion of widowed persons and the proportion requiring low and intermediate care was correspondingly smaller. Thus on the basis of the doctors' assessments of the need for care it appears that single persons were more likely to have remained in hospital for non-clinical

reasons than were married and widowed persons, and that relatively more married persons aged 70+ had clinical needs for hospital care than widowed persons in this age group.

Use of services

A second indicator of the patients' clinical conditions was derived from a question put to the doctors about the patients' current needs for a selection of services that may characterise acute in-patient care. Most of the services were sub-divided by type in a simple attempt to distinguish different levels of need. For example, among patients needing X-ray facilities a distinction was made between those needing contrast and straight X-ray; physiotherapy was classified as bed or ambulant; and so on. This type of classification is by no means an accurate indicator of differing levels of need, but forms a convenient method of deriving broad qualitative groupings among the patients. The services about which the doctors were questioned are listed below; those taken as indicative of the highest level of need are marked with an asterisk. An additional code category in each case was, of course, 'none'.

> X-rays: contrast,* straight
> Physiotherapy: bed,* ambulant
> Laboratory tests: regularly,* occasionally
> Dressings: some*
> Special diet: with supervision,* without supervision
> Drug treatment: intravenous,* injection, oral, other
> Nursing care: intensive,* skilled frequent, skilled intermittent,
>   unskilled
> Further surgery: some*
> Other services: any*

Table 5 sets out the total number of services (of any type) reported by the doctors as being needed by patients in each marital status and age and sex group. The mean number of services is set out in the right-hand column. Insofar as the continued use of these services is accepted as a valid indicator of severity, the figures in the table clearly confirm the replies to the previous question. Thus the mean number of services required by each marital status group is seen to decline with increasing age, while the mean number of

services required by single persons in each age group was lower than that
required by married and widowed persons. There was again no consistent
difference between married and widowed patients, with the mean number of
services required being larger for the married than the widowed in the age
group 70+ but slightly smaller in the two younger age groups. A further
analysis of patients requiring the most 'intense' form of each of the listed
services (that is, services marked with an asterisk above), showed a similar
distribution between age and marital status groups as for all services (Table 6).
Thus the mean number of services needed at the most 'intense' level declined
with increasing age among each marital status group, while within every age
group the mean number of services required was lower for single patients than
for widowed or (except in the age group 60-69 years) married patients.

Discharge problems

Some indication of the presence of factors (other than those directly
associated with the patients' illness) which may have caused variations in
the length of stay among marital status groups, was gained from information
about possible discharge problems. The doctors were asked during the course
of their interviews whether they felt there would be any problems about
discharging the patients. The context of the replies made it clear that,
as intended, the doctors were thinking principally about problems of a
non-clinical nature. Table 7, which sets out the replies to this question,
shows a marked difference between the proportion of single and of widowed
or married persons who were expected to have problems on being discharged,
with the proportions being highest among single persons in each of the three
age groups. There was little difference between married and widowed patients
under 60 years of age, but in the age groups 60-69 and 70+ the proportion of
widowed patients expected to have problems on discharge was much higher
than the proportion of married patients.

Table 8 relates anticipated discharge problems to the doctors' assess-
ments of the patients' needs for care. This shows that those regarded as
requiring continuing acute care (high care) were much less likely to be
expected to experience problems in being discharged than were those requiring
only low or intermediate care. This was true for each marital status group
and lends support to the view that patients classified as high care had
tended to remain in hospital on account of their medical condition, while

those classified as low or intermediate care were more likely to have
remained in hospital as a result of social factors.   Analysis of the types
of services, which, if available, would have allowed low-care patients to
have been discharged immediately, showed that the most important were
thought to be the provision of a place in an institution or home, the
assistance of a home help and meals on wheels.

SUMMARY

The distribution of single, married and widowed persons among a group
of patients who had been in continuous acute in-patient care for at least
30 days was compared with their distribution in the total adult population.
This showed there to be a relatively smaller proportion of married than of
single and widowed persons among the hospital population in each of four
broad age groups, and for both sexes.   There was however, no consistent
difference within the non-married group between the proportions of single
and widowed persons in the survey, for in the age groups 60-69 and 70+ the
proportion of single persons exceeded the proportion of widowed persons,
while in the age group 40-59 years widowed persons were more heavily represented.
A comparison of the marital status of patients in the survey population with
that of all hospital in-patients showed there to be a larger proportion of
non-married male and female patients among the group of long-stay patients.
This indicates that marital status was a significant factor in determining
length of stay in hospital.

Information on the clinical condition of single, married and widowed
patients was gained from questions on the doctors' opinions of their need for
care and their need for a selection of hospital services, while an indication
of the presence of social factors which may have delayed discharge was gained
a question which asked doctors whether they felt there would be any problems
(of a non-clinical nature) in discharging patients.   Analysis of the
responses to these questions showed that in each age group fewer single
persons were regarded as having a clinical need for continuing hospital care
than married or widowed persons, but more were thought likely to experience
problems on discharge.   There appeared to be little difference in the
clinical or social needs of married and widowed persons aged under 60 years.
However, a larger proportion of widowed than of married persons in the age
groups 60-69 and 70+ were expected to have problems on discharge, and in the

age group 70+ married persons were thought to have a greater clinical need
for hospital care.

Information regarding the clinical condition and social needs of
single, married and widowed patients thus suggests that in each age group
a much larger proportion of single than of widowed or married persons are
likely to have remained in hospital as a result of social factors (unsuitable
home accommodation, lack of friends and relatives to provide assistance, etc.),
and that in the older age groups a larger proportion of widowed than of
married persons remained in hospital for predominately social reasons.   This
survey thus indicates the existence of varying clinical and social needs for
hospital care among marital status groups and suggests that, in general,
social factors play a more important role in prolonging hospital stay among
non-married (and particularly among single) than among married patients.   It
does not however account for the smaller proportion of married than of
widowed persons in the survey at ages under 60 years, or for the relatively
greater representation of widowed than of single persons in this age group.
Such questions can only be resolved by means of a more detailed study.

Table 1. Sex, age and marital status of patients in the survey

Sex and marital status	20-39	40-59	60-69	70+	Total
Males					
Single	32(56.1)	27(23.3)	23(18.1)	32(14.1)	114(21.6)
Married	24(42.1)	73(62.9)	81(63.8)	85(37.4)	263(49.9)
Widowed	-	10(8.6)	20(15.7)	107(47.2)	137(26.0)
Divorced/separated	1(1.8)	6(5.2)	3(2.4)	3(1.3)	13(2.5)
All males	57(100)	116(100)	127(100)	227(100)	527(100)
Females					
Single	8(40.0)	19(19.2)	26(18.9)	60(19.7)	113(20.1)
Married	11(55.0)	59(59.6)	53(38.4)	38(12.5)	161(28.7)
Widowed	-	17(17.2)	58(42.0)	206(67.8)	281(50.1)
Divorced/separated	1(5.0)	4(4.0)	1(0.7)	-	6(1.1)
All females	20(100)	99(100)	138(100)	304(100)	561(100)
Total					
Single	40(51.9)	46(21.4)	49(18.5)	92(17.3)	227(20.9)
Married	35(45.5)	132(61.4)	134(50.6)	123(23.2)	424(39.0)
Widowed	-	27(12.5)	78(29.4)	313(58.9)	418(38.4)
Divorced/separated	2(2.6)	10(4.7)	4(1.5)	3(0.6)	19(1.7)
All patients	77(100)	215(100)	265(100)	531(100)	1088(100)

Notes: 1. Patients whose marital status is unknown are omitted from the table. This includes 8 males and 10 females.

2. Percentages are calculated down columns and included in brackets

Table 2.   Adult population (over 20) of Liverpool Regional
Hospital Board area, 1966, by sex, age and marital status

Sex and marital status	Age				Total
	20-39	40-59	60-69	70+	
Males					
Single	83,450(31.2)	25,580(9.6)	7,340(7.6)	4,020(7.0)	120,390(17.5)
Married	182,780(68.5)	234,250(88.0)	79,910(82.9)	34,780(60.5)	531,720(77.4)
Widowed	470(0.2)	5,740(2.2)	8,950(9.3)	18,610(32.4)	33,770(4.9)
Divorced	350(0.1)	660(0.2)	160(0.2)	40(0.1)	1,210(0.2)
All males	267,050(100)	266,230(100)	96,360(100)	57,450(100)	687,090(100)
Females					
Single	52,880(19.8)	32,370(11.1)	19,040(15.4)	17,410(16.0)	121,700(15.4)
Married	210,340(78.6)	231,520(79.5)	66,950(54.4)	25,360(23.3)	534,170(67.5)
Widowed	1,500(0.6)	22,160(7.6)	35,800(29.1)	65,710(60.3)	125,170(15.8)
Divorced	2,800(1.0)	5,330(1.8)	1,370(1.1)	460(0.4)	9,960(1.3)
All females	267,520(100)	291,380(100)	123,160(100)	108,940(100)	791,000(100)
Total					
Single	136,330(25.5)	57,950(10.4)	26,380(12.0)	21,430(12.9)	242,090(16.3)
Married	393,120(73.5)	465,770(83.5)	146,860(66.9)	60,140(36.1)	1,065,890(72.1)
Widowed	1,970(0.4)	27,900(5.0)	44,750(20.4)	84,320(50.7)	158,940(10.8)
Divorced	3,150(0.6)	5,990(1.1)	1,530(0.7)	500(0.3)	11,170 (0.8)
Total	534,570(100)	557,610(100)	219,520(100)	166,390(100)	1,478,090(100)

Notes: 1. Source Age and sex of single and married people is aggregated from
County Reports for Cheshire and Lancashire, 1966 Sample census.
Proportion of population in the two A.Cs. resident in Liverpool RHB
area is assumed to be the same in each age/sex group as in the total
population in 1966 (25.1% of Lancashire, 30.1% of Cheshire).   For
widowed and divorced people, aggregates are derived in the same way;
totals for each sex are then distributed to the listed age groups
in the same proportions as for the total population of England and
Wales (using Census 1966 U.K. General Tables, Table 2).

2. Percentages are calculated down columns and included in brackets.

Table 3. Observed frequencies, expected frequencies, and ratio of observed to expected frequencies, by age, sex and marital status

Sex and marital status	Age 20-39	40-59	60-69	70+	Total
Males					
Single	32/61.5 (0.52)	27/18.8 (1.44)	23/5.4 (4.26)	32/3.0 (10.67)	114/88.6 (1.29)
Married	24/134.5 (0.18)	73/172.4 (0.42)	81/58.8 (1.38)	85/25.6 (3.32)	263/391.4 (0.67)
Widowed	-	10/4.2 (2.38)	20/6.6 (3.03)	107/13.7 (7.81)	137/24.9 (5.50)
Divorced	1/0.3 (3.33)	6/0.5 (12.00)	3/0.1 (30.00)	3/0.03 (100.00)	13/0.9 (14.44)
Females					
Single	8/38.9 (0.21)	19/23.8 (0.80)	26/14.0 (1.86)	60/12.8 (4.69)	113/89.6 (1.26)
Married	11/154.8 (0.07)	59/170.4 (0.35)	53/49.3 (1.08)	38/18.7 (2.03)	161/393.2 (0.41)
Widowed	-	17/16.3 (1.04)	58/26.4 (2.20)	206/48.4 (4.26)	281/92.1 (3.05)
Divorced	1/2.1 (0.48)	4/3.9 (1.03)	1/1.1 (0.91)	-	6/7.3 (0.82)
Total					
Single	40/100.4 (0.40)	46/42.7 (1.08)	49/19.4 (2.53)	92/15.8 (5.82)	227/178.2 (1.27)
Married	35/289.4 (0.12)	132/342.8 (0.41)	134/108.1 (1.24)	123/44.3 (2.78)	424/784.6 (0.54)
Widowed	-	27/20.5 (1.32)	78/32.9 (2.37)	313/62.1 (5.04)	418/117.0 (3.57)
Divorced	2/2.3 (0.87)	10/4.4 (2.27)	4/1.1 (3.64)	3/0.4 (7.50)	19/8.2 (2.32)

Notes: 1. Observed frequencies (to left of hyphen in each cell) are numbers of patients in the survey. Expected frequencies (to right of hyphen in each cell) are numbers that would appear if the survey patients had the same distribution by age, sex and marital status as the total adult population. The ratios of observed to expected frequencies are shown in brackets underneath.

2. Observed frequencies of divorced patients include separated patients, but expected frequencies of divorced patients exclude those who are separated. For census purposes these latter are counted as married.

Table 4. Doctors' opinions of need for care, by marital status and age and sex

Marital status and age and sex	Doctors' opinions of need for care			All patients
	Low	Intermediate	High	
Single <60	**19(22.3)**	22(25.9)	44(51.8)	85(100)
60-69	12(24.5)	20(40.8)	17(34.7)	49(100)
70+	24(26.1)	52(56.5)	16(17.4)	92(100)
Male	31(27.4)	45(39.8)	37(32.8)	113(100)
Female	24(21.2)	49(43.4)	40(35.4)	113(100)
Total	55(24.3)	94(41.6)	77(34.1)	226(100)
Married <60	18(10.8)	39(23.5)	109(65.7)	166(100)
60-69	25(18.7)	44(32.8)	65(48.5)	134(100)
70+	27(22.1)	52(42.6)	43(35.3)	122(100)
Male	43(16.5)	82(31.4)	136(52.1)	261(100)
Female	27(16.8)	53(32.9)	81(50.3)	161(100)
Total	70(16.6)	135(32.0)	217(51.4)	422(100)
Widowed <60	4(14.8)	6(22.2)	17(63.0)	27(100)
60-69	14(17.9)	24(30.8)	40(51.3)	78(100)
70+	90(28.8)	151(48.2)	72(23.0)	313(100)
Male	37(27.0)	63(46.0)	37(27.0)	137(100)
Female	71(25.3)	118(42.0)	92(32.7)	281(100)
Total	108(25.8)	181(43.3)	129(30.9)	418(100)
Divorced/ separated <60	1(8.3)	2(16.7)	9(75.0)	12(100)
60-69	-	2(50.0)	2(50.0)	4(100)
70+	1(33.3)	1(33.3)	1(33.3)	3(100)
Male	1(7.7)	4(30.8)	8(61.5)	13(100)
Female	1(16.7)	1(16.7)	4(66.6)	6(100)
Total	2(10.5)	5(26.3)	12(63.2)	19(100)

Notes: 1. Patients whose marital status and/or need for care is unknown are omitted from the table. This includes 11 males and 10 females.

2. Percentages are calculated across rows and included in brackets.

Table 5. Total number of services needed, by marital status and age and sex

Marital status and age and sex		Total number of services needed										Mean number
		0	1	2	3	4	5	6	7	8	9	
Single	<60	5	9	6	22	17	14	9	2	2	-	3.59
	60-69	3	4	8	7	15	6	3	4	-	-	3.54
	70+	2	14	23	27	11	1	2	1	-	-	2.58
	Male	3	19	12	35	22	11	7	3	2	-	3.25
	Female	7	8	25	21	21	20	7	4	-	-	3.32
	Total	10	27	37	56	43	31	14	7	2	-	3.28
Married	<60	3	11	21	30	38	36	15	10	3	-	3.95
	60-69	5	7	24	25	34	23	11	2	2	-	3.59
	70+	4	10	15	27	26	28	11	2	-	-	3.62
	Male	5	21	39	49	60	54	21	12	2	-	3.73
	Female	7	7	21	33	38	33	16	2	3	-	3.74
	Total	12	28	60	82	98	87	37	14	5	-	3.74
Widowed	<60	-	2	2	7	7	4	1	3	-	1	4.11
	60-69	1	3	6	22	20	12	7	6	1	-	4.01
	70+	17	41	76	67	52	35	16	8	1	-	2.99
	Male	4	23	26	32	21	14	9	7	-	1	3.19
	Female	14	23	58	64	58	37	15	10	2	-	3.29
	Total	18	46	84	96	79	51	24	17	2	1	3.26
Divorced/ separated	<60	-	1	-	2	3	4	-	2	-	-	4.41
	60-69	-	-	-	-	3	1	-	-	-	-	4.25
	70+	-	-	1	-	1	1	-	-	-	-	3.67
	Male	-	1	1	-	6	4	-	1	-	-	4.15
	Female	-	-	-	2	1	2	-	1	-	-	4.50
	Total	-	1	1	2	7	6	-	2	-	-	4.26

Note: Patients whose marital status and/or need for services is unknown are omitted from the table. This includes 8 males and 11 females.

Table 6. Total number of services needed at the most 'intense' level, by marital status and age and sex

Marital status and age and sex	Total no. of services needed at most 'intense' level										Mean number
	0	1	2	3	4	5	6	7	8	9	
Single <60	32	24	17	7	3	1	2	-	-	-	1.26
60-69	20	17	7	4	1	-	-	-	-	-	0.96
70+	58	21	11	-	2	-	-	-	-	-	0.55
Male	55	31	17	6	2	1	2	-	-	-	0.95
Female	55	31	18	5	4	-	-	-	-	-	0.87
Total	110	62	35	11	6	1	2	-	-	-	0.91
Married <60	56	47	36	16	7	4	1	-	-	-	1.32
60-69	57	44	20	10	2	-	-	-	-	-	0.91
70+	59	40	21	3	-	-	-	-	-	-	0.74
Male	102	82	53	16	8	1	1	-	-	-	1.06
Female	70	49	24	13	1	3	-	-	-	-	0.96
Total	172	131	77	29	9	4	1	-	-	-	1.02
Widowed <60	8	10	4	3	2	-	-	-	-	-	1.30
60-69	33	23	13	5	1	2	1	-	-	-	1.08
70+	188	70	37	9	9	-	-	-	-	-	0.66
Male	76	37	14	5	4	1	-	-	-	-	0.74
Female	153	66	40	12	8	1	1	-	-	-	0.80
Total	229	103	54	17	12	2	1	-	-	-	0.78
Divorced/separated											
<60	1	5	5	-	1	-	-	-	-	-	1.58
60-69	2	-	2	-	-	-	-	-	-	-	1.00
70+	2	-	1	-	-	-	-	-	-	-	0.67
Male	5	2	6	-	-	-	-	-	-	-	1.08
Female	-	3	2	-	1	-	-	-	-	-	1.83
Total	5	5	8	-	1	-	-	-	-	-	1.32

Note: Patients whose marital status and/or need for services is unknown are omitted from the table. This includes 8 males and 11 females.

Table 7. Anticipated problems relating to discharge, by marital status and age and sex

Marital status and age and sex	Anticipated problems relating to discharge			Not likely to be discharged	Not known	All patients
	No	Yes	Total			
Single						
Under 60	44 (60.3)	29 (39.7)	73 (100)	9	4	86
60-69	17 (41.5)	24 (58.5)	41 (100)	3	5	49
70+	18 (25.7)	52 (74.3)	70 (100)	16	6	92
Male	46 (46.9)	52 (53.1)	98 (100)	10	6	114
Female	33 (38.4)	53 (61.6)	86 (100)	18	9	113
Total	79 (42.9)	105 (57.1)	184 (100)	28	15	227
Married						
Under 60	114 (79.7)	29 (20.3)	143 (100)	21	3	167
60-69	91 (77.8)	26 (22.2)	117 (100)	12	5	134
70+	66 (60.6)	43 (39.4)	109 (100)	9	5	123
Male	168 (73.0)	62 (27.0)	230 (100)	24	9	263
Female	103 (74.1)	36 (25.9)	136 (100)	18	4	161
Total	271 (73.4)	98 (26.6)	369 (100)	42	13	424
Widowed						
Under 60	18 (78.3)	5 (21.7)	23 (100)	2	2	27
60-69	36 (55.4)	29 (44.6)	65 (100)	11	2	78
70+	96 (37.5)	160 (62.5)	256 (100)	32	25	313
Male	47 (40.2)	70 (59.8)	117 (100)	9	11	137
Female	103 (45.4)	124 (54.6)	227 (100)	36	18	281
Total	150 (43.6)	194 (56.4)	344 (100)	45	29	418
Divorced/ Separated						
Under 60	8 (72.7)	3 (27.3)	11 (100)	-	1	12
60-69	3 (100.0)	-	3 (100)	1	-	4
70+	-	3 (100.0)	3 (100)	-	-	3
Male	7 (63.6)	4 (36.4)	11 (100)	1	1	13
Female	4 (66.7)	2 (33.3)	6 (100)	-	-	6
Total	11 (64.7)	6 (35.3)	17 (100)	1	1	19

Notes: 1. Patients whose marital status and/or need for care is unknown are omitted from the table. This includes 8 males and 10 females.

2. Percentages are calculated across rows and included in brackets.

Table 8. Anticipated problems relating to discharge, by marital status and doctors' opinions of need for care

Marital status and doctors' opinions of need for care	Anticipated problems relating to discharge			Not likely to be discharged	Not known	All patients
	No	Yes	Total			
Single						
Low care	18 (36.7)	31 (63.3)	49 (100)	3	3	55
Intermediate care	16 (22.5)	55 (74.5)	71 (100)	17	6	94
High care	44 (69.8)	19 (30.2)	63 (100)	8	6	77
Married						
Low care	40 (59.7)	27 (40.3)	67 (100)	1	2	70
Intermediate care	58 (58.6)	41 (41.4)	99 (100)	28	8	135
High care	171 (85.1)	30 (14.9)	201 (100)	13	3	217
Widowed						
Low care	35 (33.7)	69 (66.3)	104 (100)	2	2	108
Intermediate care	33 (25.8)	95 (74.2)	128 (100)	32	21	181
High care	82 (73.2)	30 (26.8)	112 (100)	11	6	129
Divorced/separated						
Low care	-	2 (100.0)	2 (100)	-	-	2
Intermediate care	1 (25,0)	3 (75.0)	4 (100)	1	-	5
High care	10 (90.0)	1 (10.0)	11 (100)	-	1	12

Notes : 1. Patients whose marital status is unknown are omitted from the table. This includes 11 males and 10 females.

2. Percentages are calculated across rows and included in brackets.

Appendix IV

Analysis of data from the General Household Survey

Note: pages and tables are numbered separately within
       this appendix

THE GENERAL HOUSEHOLD SURVEY

The results produced by the Hospital In-Patient Enquiry and Hospital Activity Analysis are of substantial value in providing a continuous surveillance of hospital utilisation patterns. They are regular, systematic, and hopefully of increasing reliability. But they have a significant drawback for the purposes of this study (quite apart from any technical deficiencies which may surround the collection, analysis or presentation of data), namely that by concentrating exclusively upon hospitalised patients they offer little explanation of why some people use hospitals more frequently than others. High utilisation rates among certain groups of patients (e.g. those without marriage partners) may result from differences in the prevalence or severity of illness, in thresholds of care-seeking behaviour, in home circumstances, in referral through the medical care system, or any combinations of these. These alternative possibilities contain very different explanations of what might be happening, but little can be learnt about the reasons for variations in hospitalisation rates between different groups of people simply by looking at those who are admitted.

A broader perspective might be obtained by surveying samples of the total population and then comparing high and low users of health care services. But there is a difficulty, for until very recently there existed no population-based equivalent of H.I.P.E. or H.A.A. - that is, a regular on-going survey of population samples to assess health status and use of services. Such a survey was carried out in the early post-war years (the Survey of Sickness), but it was discontinued in 1952. A large number of 'once-off' surveys have been mounted for specific purposes but the results are difficult to synthesise because of variations in methods, definitions, sampling techniques, and so forth. Recently, however, the central statistical office has launched a new survey, known as the General Household Survey (GHS), to deal with a wide range of social topics within a single enquiry.* The aim is to provide a regular picture of changing social conditions in Great Britain and to link information about population structure, employment, health, education, housing, and so forth, on a frequent and timely basis. The questionnaire is in part concerned with households and in part with individuals. The survey is continuous and the results are analysed on a quarterly and annual basis. Additional questions of an ad hoc nature can be included to meet particular information needs.

* C.A. Moser. 'Some general developments in social statistics' in
  Social Trends, No. 1, Central Statistical Office, H.M.S.O., 1970.
  Office of Population Censuses and Surveys. The General Household Survey:
  Introductory Report. H.M.S.O., 1973.

The survey was piloted in February 1970 and the response was described as 'very encouraging'. The first full survey of 15,000 households began in October 1970 with interviews distributed over the following twelve months. It is hoped that the sample size will gradually be increased. The questionnaire includes a series of standard demographic questions and has sections on mobility, housing, occupation, travel, education, health and income. There is a separate set of questions for children. The health section includes questions of perceptions of acute and chronic illnesses; activity limitation through ill-health; the use of doctors, hospitals and other health services; and the use of certain welfare services. The General Household Survey thus supplements the information from the Hospital In-Patient Enquiry and Hospital Activity Analysis for the requirements of this study, and through the kind permission of the Director of the Social Survey Division of the Office of Population Censuses and Surveys the results of the first full calendar year of the survey have been made available to us. It is with those results that this appendix is concerned.

The calendar year in question is 1971 and the results presented here cover England and Wales only. The survey actually extends to Great Britain, but in order to standardise with the scope of the Hospital In-Patient Enquiry all the tabulations in this section exclude the results from Scotland. This exclusion means that the data in this paper do not match exactly with those contained in the 1973 Introductory Report of the Survey, for the latter extend to the whole of Great Britain. A total of 10,789 households was interviewed (a response rate of just over 80 per cent) and these contained, in all, 31,150 responding individuals. For the purposes of this paper, however, children under the age of 15 are excluded; this left 23,140 responding adults (thus defined), and their distribution by age, sex and marital status is shown in Table 1.* The table also shows, for comparative purposes, the marital distribution of men and women over 15 in the Registrar General's mid-year estimate for England and Wales in 1971.** The two sets of figures are very similar, especially among the age groups over 45. The GHS respondents contained slightly fewer single people and slightly more of the widowed, divorced and separated than the population of England and Wales but the differences are generally quite small and do not invalidate the conclusion that, at least with respect to age, sex and marital status, the survey respondents were reasonably representative of the population from which they were sampled.

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* Because of the small number of widowed, divorced and separated respondents at certain ages, they have been grouped together in one category.
** The Registrar General's Statistical Review of England and Wales, 1971, Part II, Table A3(a). H.M.S.O.

THE REPORTING OF LONG STANDING ILLNESS AND RESTRICTED ACTIVITY

Respondents were asked whether they suffered from any long-standing illness, disability or infirmity which limited their activities relative to most people of their age. Irrespective of their reply to this question all respondents were further asked whether, in the previous two weeks, they had had to cut down on any of the things they usually did because of illness, disability or injury. Those reporting a long-standing illness which caused them to limit their activities were regarded as having a chronic illness, while those who had had to restrict their normal activities during the preceding two weeks were regarded as having an acute illness. It was recognised that such questions would not establish the total prevalence rates of chronic and acute illness but were designed to identify those who felt that their activities were limited by illness, for it is partly the extent to which people feel ill that motivates them to seek advice and treatment.

The replies to these two questions are set out in Table 2. Relatively more of the widowed/divorced/separated than of the single respondents reported a long-standing illness; this result held good in each age group and for both sexes. Moreover, at all ages up to 75 the proportions reporting such an illness were higher for the widowed/divorced/separated than for the married. On the other hand, the replies to the question about activity restriction in the preceding two weeks did not appear to be related to marital status in any consistent way. Among male respondents over the age of 45 the proportions reporting any recent activity restriction increased from the single to the married to the widowed/divorced/separated, but the reverse trend occurred among men aged 15-44, and there was no discernable pattern at all among the women. In almost each age and marital-status category there were relatively more women than men reporting some activity restriction, but the differences were quite small. Among those reporting any recent restriction, the mean number of restricted days in the two-week period bore no apparent relationship to either sex or marital status, although respondents over the age of 65 almost always reported a higher average number of restricted days than those below this age.

By aggregating people who reported a long-standing illness and those reporting restricted activity in the previous two weeks, a very broad estimate is derived of the proportion of people in the community who regard themselves as affected in some way by long-term or short-term illness.

In fact there was a considerable overlap between the two groups: the majority of those experiencing a long-standing illness also suffered some degree of activity restriction in the previous two weeks. As a result, the marital distribution of the aggregate group of 'ill' people was similar to that of the group with a long-standing illness only: the proportions of widowed/divorced/separated persons reporting an illness were higher than for either single or married people in all but two of the age and sex groups. The exceptions occurred among men aged 15-44, where identical proportions were recorded for the single and for the widowed; and among women aged 45-64, of whom a slightly higher proportion of the single than of the widowed reported an illness. In most cases, however, the excess proportions of widowed/divorced/separated respondents were quite small: were they, then, sufficiently great to be consistent with the higher rates of hospital admission which these patients displayed in the H.A.A. data?

It is possible to approach the question in a crude fashion by asking what the hospital discharge rates would be if the proportions of respondents reporting an illness in the survey were repeated identically throughout the entire population, and if the proportions of these 'ill' people (thus defined) who were admitted to hospital were identical within any age and sex group - irrespective, that is, of marital status. If, in other words, it is assumed that there are no variations by marital status in the proportion of 'ill' people who are hospitalised, can the differential discharge rates noted in HIPE and HAA be sufficiently explained in terms of the different percentages of people in each marital status group who reported themselves to be ill? The exercise can only give some broad approximations, but the results are consistent with a positive answer. Hypothetical discharge rates per 10,000 population have been calculated in the manner described above, basing the number of discharges on those given in the 1970 HIPE report. They are shown in the following table, together with the actual discharge rates obtained from 1973 HAA data for the South East Metropolitan RHB.*

For men aged between 45 and 64 the hypothetical discharge rates correspond very closely with those obtained from HAA data in the South-East

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* In the General Household Survey widowed persons are combined with the separated and divorced, whereas in Hospital Activity Analysis they are normally treated separately. For the purposes of this comparison HAA discharge rates have been calculated for the widowed and divorced combined, but excluding the separated, who are grouped in HAA data with the married and cannot be isolated. The two sets of discharge rates are not therefore wholly comparable, but the very small number of separated persons is unlikely to have any substantially distorting effect.

		Hypothetical discharge rates per 10,000 population	HAA discharge rates, S.E.Met. RHB, 1973
Males			
45-64	Single	939	959
	Married	857	859
	W/D/S	1,018	1,172
65-74	Single	1,275	1,705
	Married	1,403	1,560
	W/D/S	1,613	2,161
75+	Single	1,735	2,053
	Married	2,008	2,029
	W/D/S	2,209	2,578
Females			
45-64	Single	986	652
	Married	800	821
	W/D/S	1,075	843
65-74	Single	976	848
	Married	1,044	943
	W/D/S	1,201	1,021
75+	Single	1,800	1,339
	Married	1,770	1,543
	W/D/S	1,876	1,682

Met.RHB in 1973. In the two higher age groups the hypothetical rates
are lower than the HAA rates in each marital status group, but the relative
magnitudes of the rates are similar, especially the ratio of widowed to
single rates. For women in all age groups the hypothetical discharge rates
are lower than the corresponding HAA rates, and the relative magnitudes of
rates between the two sets of data are less consistent than for the men.
Nevertheless, the assumptions upon which the hypothetical rates are based
ensured that in each age group the widowed/divorced/separated women had
higher rates than either the single or the married, and to that extent the
results are consistent with known patterns of hospital utilisation, at
least in this one region.

Clearly, the assumptions used in this analysis are great, and the
results are in no sense definitive. Yet they are instructive in their
suggestion that the slightly higher proportions of widowed/divorced/separated
people reporting an illness in the GHS survey could be consistent with the
higher hospital discharge rates observed among this group, without having
to assume any differences in the way these patients are referred for
hospital care by general practitioners. The GHS data, in short, are not
at odds with the hypothesis that more widowed people enter hospital than
others simply because more of them are ill, and not because those who are ill
behave or are treated differently.

THE RESPONSE TO ILLNESS

What steps, then, did people take to treat their perceived illnesses?
Respondents were asked whether they had consulted a doctor during the previous
two weeks or had been to hospital as an in-patient or out-patient during the
previous three months for curative or diagnostic reasons (but excluding
preventive care). By combining the replies to this question with the
reporting of illness the following simple typology is derived:

1. Patients reporting no long-standing illness, no recent activity
   limitation, and no contact with a curative service (not ill and not
   treated).

2. Patients reporting a long-standing illness and/or recent activity
   limitation, and also contact with a curative service (ill and treated).

3. Patients reporting a long-standing illness and/or recent activity
   limitation, but no contact with a curative service (ill and not treated).

There is, of course, no certainty that the conditions which were treated
were also those causing activity limitation in the previous two weeks
or reported as a long-standing illness; there is merely a presumption
that they were. In addition there is a residual group of 'other'
respondents which may include some who were treated for illnesses other
than those reported in the interview, and some who for one reason or
another failed to answer the questions. These usually amounted to between
10 and 15 per cent of any age/sex/marital-status category, but in some cases
(for example among widowed/divorced/separated women aged 15-44) the proportion
of 'other' responses was as high as two-fifths. The practice has therefore
been followed of omitting these 'other' respondents from the calculation of
the percentages shown in Tables 3 and 4.

The first column in these tables restates the tendency for widowed/
divorced/separated respondents to report more illness than those in the other
marital categories. Among men and women, the proportion falling within the
category 'not ill, not treated' was lower for the widowed/divorced/separated
than for either the single or the married, and conversely the proportion
classified as 'ill' was higher. This held good in each age group, though
the differences were small among older women and younger men. The results
for single and married patients were very similar.

The percentage of those patients reporting an illness who received
treatment is shown in the last column of each table. Between two-fifths
and three-fifths of 'ill' respondents had received some form of treatment,
but the proportions varied systematically with neither marital status nor
age. The most consistent differences occurred between male and female
respondents: in all but one of the age and marital categories a higher
proportion of women than of men reporting an illness had been treated.

These results, like those in the previous section, are consistent with
the hypothesis that proportionately more widowed people may enter hospital
than others simply because more of them are ill. The fact on the one
hand that the prevalence of self-reported illness and disability was a
little greater among those who had been married than those who either were
married or had never been married, and on the other hand that the response
to the perception of ill-health, in terms of seeking professional care,
showed no such variation, suggests that the threshold of care-seeking
behaviour may have been similar for people in each marital status group.

This finding reinforces the hypothesis that the more extensive (and also perhaps intensive) use of services by widowed than by single or married people may be explained in terms of differences in morbidity levels rather than in variable thresholds of illness behaviour or referral patterns by general practitioners.

THE USE OF PREVENTIVE AND CURATIVE SERVICES

Questions were asked in the survey about the use which respondents had made of various health and social services, but for most of them (including hospital in-patient care) the frequencies in each age and sex group were too small to permit comparisons between people of differing marital status. The problem can be overcome fairly well by grouping together services with predominantly preventive or curative emphases, although this procedure introduces further distortions by amalgamating services which may be used in very different ways and for different purposes. This reservation must be heeded in understanding the results.

Table 5 shows the proportion of respondents using at least one of the preventives services included in the questionnaire and at least one of the curative services. The data are arranged by age, sex, and marital status. Preventive services (which must have been used in the previous month) comprise: family planning clinic, child welfare centre, vaccination or immunisation service, mass X-ray unit, and cervical smear test. (The use of some of these services is obviously closely associated with marital status). In addition, respondents were classified as using a preventive service if they had seen a G.P. in connection with any of the above services during the previous two weeks, or if they had had a general medical examination or check-up. Curative services are defined for the purpose of the survey as all services covered by the General Household Survey, including those provided by in-patient and out-patient departments, but excluding preventive services as defined above.

The number of respondents in the Table using one or more curative service is higher than the number in the 'ill and treated' columns of Tables 3 and 4, for whereas the latter was confined to people who reported a long-standing illness and/or activity restriction in the previous two weeks, the former includes all respondents in the survey in contact with

a curative service. The two sets of data are, however, consistent between themselves and consistent with the hypothesis outlined above, for Table 5 confirms that, in each age and sex group, a higher proportion of widowed/ divorced/separated than of married or single persons had had contact with a curative service. This result would be expected in the light of the earlier finding that whereas relatively more widowed etc. people reported themselves to be ill, there were no apparent differences by marital status in the proportions of ill people seeking diagnosis or cure.

The data on preventive services must be treated with a good deal of caution because of their heterogeneous nature and because some of them (family planning clinic, child welfare centre, possibly cervical smear test) have very strong associations with marital status and age. In general, however, the pattern seems to emerge of a consistently higher rate of use among the widowed/divorced/separated up to the age of 65 in the men and 75 in the women, with no clear-cut variations beyond that.

SUMMARY

Information from the first year of operation of the General Household Survey has been analysed to assess variations by marital status in the reporting of chronic and acute illness, and in the use of health care services. The Survey was not designed specifically as a health survey, and the data are not wholly suitable for the purposes of this study. Deficiencies arise partly from limitations in the number and form of questions asked, and partly from the fact that, by confining the survey to private households, elderly people in institutions (who may comprise a disproportionate number of single and widowed persons) are excluded.

The replies to two questions about the effects of chronic and acute illness showed that respondents who felt they had either or both forms of illness comprised a higher proportion of widowed/divorced/separated than of married or single people. This held good for men and women at most ages, and although the percentage differences were quite small it is estimated that they may be sufficiently large to account for much of the higher hospital discharge rates observed among widowed patients. The data are not at odds with the hypothesis that more widowed people enter hospital than others simply because more of them are ill, and not because those who are ill behave or are treated differently.

Further support for this hypothesis comes from the finding that, among those reporting a chronic and/or acute illness, there were no consistent variations by marital status in the proportions who had had contact with a 'curative service' (G.P. or hospital inpatient or outpatient department) within a specified period of time. However, when the number of <u>all</u> those in contact with a curative service is expressed as a percentage of the total number of respondents in each age and sex group, the results are consistently higher among the widowed/divorced/separated than among either the married or the single.

Table 1. Persons aged 15+ responding in the General Household survey
persons aged 15+ in England and Wales, 1971, by sex, age and marital status

(percentages)

Age and marital status		Males General house-hold survey	England and Wales	Females General house-hold survey	England and Wales
15-44	Single	36.4	40.2	25.7	30.0
	Married	62.0	58.8	70.3	67.8
	W/D/S	1.6	1.0	4.0	2.2
N (= 100%)		5,893	9,656,000	5,875	9,368,000
45-64	Single	6.8	8.7	8.3	9.2
	Married	87.7	87.0	76.0	77.1
	W/D/S	5.5	4.3	15.7	13.7
N (= 100%)		3,663	5,708,000	3,922	6,090,000
65-74	Single	6.2	7.4	11.5	13.4
	Married	79.6	79.5	46.0	46.9
	W/D/S	14.2	13.1	42.5	39.7
N (= 100%)		1,013	1,734,000	1,473	2,418,000
75+	Single	4.4	8.0	12.2	15.4
	Married	58.1	57.4	19.4	18.5
	W/D/S	37.5	34.6	68.4	66.1
N (= 100%)		456	713,000	845	1,534,000
All ages					
	Single	22.5	25.6	17.4	20.3
	Married	72.0	69.8	65.6	64.2
	W/D/S	5.5	4.6	17.0	15.5
N (= 100%)		11,025	17,811,000	12,115	19,410,000

Note: W/D/S = Widowed/divorced/separated. In the data for England and Wales
separated persons are included with the married.

Table 2. Persons aged 15+, by sex, age and marital status, reporting a long-standing illness, restricted activity in previous two weeks, and number of days of restricted activity

Age and marital status	Males Long-standing illness	Restricted activity	Mean days restricted	% based on	Females Long-standing illness	Restricted activity	Mean days restricted	% based on
15 - 44 Single	204 (9.5)	155 (7.2)	6.2	2,147	117 (7.8)	118 (7.8)	6.1	1,509
Married	351 (9.6)	257 (7.0)	7.3	3,654	338 (8.2)	297 (7.2)	6.9	4,132
W/D/S	11 (12.0)	6 (6.5)	6.2	92	31 (13.3)	.17 (7.3)	9.6	234
45 - 64 Single	68 (27.3)	17 (6.8)	9.7	249	102 (31.3)	35 (10.7)	10.4	326
Married	787 (24.5)	264 (8.2)	9.6	3,214	682 (22.9)	290 (9.7)	8.3	2,979
W/D/S	57 (28.5)	19 (9.5)	9.7	200	198 (32.1)	69 (11.2)	8.9	617
65 - 74 Single	25 (39.7)	6 (9.5)	11.3	63	61 (36.1)	17 (10.1)	9.6	169
Married	330 (40.9)	82 (10.2)	10.7	806	265 (39.1)	75 (11.1)	11.2	678
W/D/S	63 (43.8)	16 (11.1)	12.5	144	279 (44.6)	81 (12.9)	9.8	626
75+ Single	7 (35.0)	1 (5.0)	14.0	20	48 (46.6)	19 (18.5)	12.2	103
Married	119 (44.9)	27 (10.2)	9.8	265	86 (52.4)	17 (10.4)	11.6	164
W/D/S	75 (43.9)	26 (15.2)	12.0	171	294 (50.9)	71 (12.3)	10.5	578

Notes: 1. Percentages based on totals in each age, sex and marital status group are included in brackets

2. W/D/S = Widowed/divorced/separated

Table 3. Males aged 15+, by age and marital status, reporting a long-standing illness and/or restricted activity, and whether or not in contact with a curative service

Age and marital status		Health status			Total	Others	% of ill who were treated
		Not ill, not treated	Ill and treated	Ill and not treated			
15-44	Single	1,492 (82.1)	146 (8.0)	180 (9.9)	1818 (100)	329	44.8
	Married	2,650 (83.1)	260 (8.2)	280 (8.8)	3190 (100)	464	48.1
	W/D/S	62 (81.6)	6 (7.9)	8 (10.5)	76 (100)	16	42.9
45-64	Single	141 (65.6)	29 (13.5)	45 (20.9)	215 (100)	34	39.2
	Married	1,987 (68.6)	380 (13.1)	531 (18.3)	2898 (100)	316	41.7
	W/D/S	111 (62.7)	25 (14.1)	41 (23.2)	177 (100)	23	37.9
65-74	Single	33 (56.9)	15 (25.9)	10 (17.2)	58 (100)	5	60.0
	Married	387 (52.5)	158 (21.4)	192 (26.1)	737 (100)	69	45.1
	W/D/S	56 (45.5)	32 (26.0)	35 (28.5)	123 (100)	21	47.8
75+	Single	8 (53.3)	3 (20.0)	4 (26.7)	15 (100)	5	42.9
	Married	104 (45.8)	63 (27.8)	60 (26.4)	227 (100)	38	51.2
	W/D/S	56 (40.6)	47 (34.1)	35 (25.4)	138 (100)	33	57.3

Notes: 1. Percentages are calculated across rows, based on totals which exclude 'others'

2. W/D/S = Widowed/divorced/separated

Table 4   Females aged 15+, by age and marital status, reporting a long-standing illness

and/or restricted activity, and whether or not in contact with a curative service

Age and marital status		Health status Not ill, not treated	Ill and treated	Ill and not treated	Total	Others	% of ill who were treated
15-44	Single	1,059 (83.2)	113 (8.9)	100 (7.9)	1,272 (100)	237	53.1
	Married	2,762 (83.0)	305 (9.2)	262 (7.8)	3,329 (100)	303	53.8
	W/D/S	92 (69.2)	18 (13.5)	23 (17.3)	133 (100)	101	43.9
45-64	Single	178 (60.3)	50 (16.9)	67 (22.7)	295 (100)	31	42.7
	Married	1,840 (69.7)	379 (14.4)	421 (15.9)	2,640 (100)	339	47.4
	W/D/S	287 (56.7)	111 (21.9)	108 (21.3)	506 (100)	111	50.7
65-74	Single	80 (55.2)	36 (24.8)	29 (20.0)	145 (100)	24	55.4
	Married	311 (52.2)	145 (24.3)	140 (23.5)	596 (100)	82	50.9
	W/D/S	246 (44.9)	153 (27.9)	149 (27.2)	548 (100)	78	50.7
75+	Single	33 (37.9)	30 (34.5)	24 (27.6)	87 (100)	16	55.6
	Married	56 (39.2)	48 (33.6)	39 (27.3)	143 (100)	21	55.2
	W/D/S	173 (35.3)	191 (39.0)	126 (25.7)	490 (100)	88	60.3

Notes: 1. Percentages are calculated across rows, based on totals which exclude 'others'.

2. W/D/S = Widowed/divorced/separated

Table 5. Persons aged 15+, by sex, age and marital status, using at least one preventive service and at least one curative service within specified periods. (See text for details)

Age and marital status	Males using:			Females using:		
	1 or more curative service	1 or more preventive service	% based on	1 or more curative service	1 or more preventive service	% based on
15-44 Single	373 (17.4)	162 (7.5)	2,147	296 (19.6)	188 (12.5)	1,509
Married	646 (17.7)	343 (9.4)	3,654	1,080 (26.1)	873 (21.1)	4,132
W/D/S	20 (21.7)	11 (12.0)	92	65 (27.8)	53 (22.6)	234
45-64 Single	47 (18.9)	24 (9.6)	249	72 (22.1)	37 (11.4)	326
Married	613 (19.1)	378 (11.8)	3,214	674 (22.6)	398 (13.4)	2,979
W/D/S	46 (23.0)	26 (13.0)	200	181 (29.3)	156 (25.3)	617
65-74 Single	18 (28.6)	12 (19.0)	63	58 (34.3)	20 (11.8)	169
Married	216 (26.8)	128 (15.9)	806	219 (32.3)	118 (17.4)	678
W/D/S	50 (34.7)	26 (18.1)	144	227 (36.3)	138 (22.0)	626
75+ Single	7 (35.0)	1 (5.0)	20	45 (43.7)	25 (24.2)	103
Married	97 (36.6)	58 (21.9)	265	69 (42.1)	39 (23.8)	164
W/D/S	77 (45.0)	31 (18.1)	171	270 (46.7)	133 (23.0)	578

Notes: 1. Percentages based on totals in each age, sex and marital status group are included in brackets
2. W/D/S = Widowed/divorced/separated