# Hospital admission rates and the primary health team

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**SUMMARY.** The use of hospital beds was studied for a period of one year in a practice under the care of a closely co-ordinated team composed of the family physician, the family nurse, and a medical social worker. Admission rates and mean duration of stay in hospital are analysed and discussed in relation to selected socio-demographic variables.

The results showed that the study population used only half as many hospital beds when compared with national rates in Israel. We consider that this was achieved by the provision of planned co-ordinated comprehensive medical nursing and social services for patients suffering from long-term illness. Such a team is able to provide a high quality medical care and can significantly reduce the use of in-patient hospital services.

## Introduction

The relationship between in-patient hospital care and primary medical care has been the subject of numerous studies. Much of this interest has focused on the place of the hospital in the medical care of the community and stems from the fact that hospital care is the most expensive form of medical care. The use of hospital services is of particular importance in a system of prepaid medical care where no financial barriers exist between the patient and the hospital. In the Kupat Holim Health Insurance Institution in Israel the expenditure on in-patient hospital services represented about one third of the total annual health budget and amounted to 25 million pounds sterling (Kupat Holim Centre, 1975).

The need to make the most effective use of limited medical resources therefore dictates that admissions to hospitals be reserved for those patients whose need for specialised or sophisticated medical procedures cannot be met within the framework of primary medical care. It is not only cheaper but also more humane to care for the sick within a framework of medical care outside the hospital, whenever possible. Unnecessary admissions to hospitals for non-objective reasons or for medical procedures which could be adequately performed outside the hospital can therefore be regarded as an admission of failure of the primary medical care services in the community (*Journal of the Royal College of General Practitioners*, Editorial, 1972).

Conversely one measure of the quality of primary medical care is represented by an ability to reduce unnecessary hospital admissions and to treat patients in their home environment within the limits of acceptable medical practice. The attachment of a nurse to the general practitioner has been shown to reduce the number of admissions to hospital (Kuenssberg, 1970).

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## Aim

This survey was planned in order to study the use of hospital beds by a group of patients under the care of a family physician, a family nurse, and a medical social worker, practising as a closely co-ordinated team. This report comprises some of the preliminary findings.

### *Primary health care team*

During the past few years, a team consisting of the family doctor and the family nurse, has been increasingly accepted as a basis for providing primary health care in an ever increasing number of clinics within the Kupat Holim Health Insurance Institution which is responsible for medical services to 70 per cent of the population of Israel. In most teams, the work of the nurse is limited to assisting the doctor and performing routine office and nursing procedures. In several practices, however, the role of the nurse has been expanded to include screening and minor medical procedures. Although many practices have co-ordinated their work with the social services of the local authority, the presence of a social worker as a full-time member of the team is most unusual.

In our practice, the state-registered nurse not only carries out routine treatment, but is also expected to identify the nursing needs and plan the nursing programme of the families under her care. She participates actively in the supervision of patients with long-term illness by seeing them at regular intervals at the clinic or in their homes, organising their laboratory tests and advising them when to re-visit the doctor. She also advises them on health education and other preventive measures.

The medical social worker is attached to our practice and is in attendance daily. Her duties include detailed casework, managing family crises, mobilising community resources, and acting as resource person to the team. Much of her work includes visits to the patients' homes, schools, hospitals and other community institutions. The team attempts to provide comprehensive primary health care with close co-ordination, and with emphasis on the supervision of long-term illness, and an awareness of the psychosocial aspects of medical care and of individual health education.

## Method

### *Population of the practice*

The practice population consisted of all 1,600 patients registered with the urban clinic, but did not include children under the age of nine years, all of whom were under the care of a primary paediatrician. A demographic description of the practice has previously been published (Polliack *et al.*, 1973) and remains basically unchanged. With the exception of obstetrical deliveries, all admissions to the local regional hospital were recorded during the calendar year 1974. The survey included all admissions, irrespective of whether they were referred by the family doctor himself, by doctors on duty outside normal consulting hours, or by any other referral source. Data were recorded on pre-coded forms and reliability was cross-checked by examining both the clinic and the hospital records for each case. Rates were calculated using episodes of admissions as the denominator so as to enable comparison with statistical reports of the Israel Health Ministry.

## Results

### *Age and sex*

During the year of survey a total of 96 episodes of admission to hospital were recorded for 82 patients. The total admission rate was 60 per 1,000 patients at risk (56 per 1,000 for men and 64 per 1,000 for women). Admission rates climbed steeply with increasing age to a peak of 131 per 1,000 at age 50–59 years. This finding occurred for each sex,

but within each age group the rates among women were consistently higher than among men. This was especially noticeable under the age of 40 years where the rates for women were four to five times those of the men.

The mean duration of stay in hospital was 11·8 days (12·6 days for men, and 11·1 days for women). These figures also rose progressively with age to a peak of 15·2 days at age 40–49 years. Among men, the longest duration of stay was also found among this age group, but in women this was noted in those aged 60 years and over.

TABLE 1

ADMISSION RATES AND MEAN DURATION OF STAY, BY AGE AND SEX

| *Age groups (years)* | *Admission rates*[1] | | | *Mean duration of stay (days)*[2] | | |
|---|---|---|---|---|---|---|
| | *Male* | *Female* | Total | *Male* | *Female* | Total |
| Under 29 | 5 | 21 | 14 | 13·0 | 5·5 | 6·6 |
| 30–39 | 10 | 48 | 33 | 9·9 | 10·0 | 9·9 |
| 40–49 | 63 | 74 | 68 | 19·8 | 12·5 | 16·2 |
| 50–59 | 125 | 138 | 131 | 12·7 | 9·9 | 11·2 |
| 60 + | 101 | 106 | 103 | 8·0 | 14·1 | 11·2 |
| Total | 56 | 64 | 60 | 12·6 | 11·1 | 11·8 |

[1] Rates (adjusted to nearest whole number) per 1,000 patients at risk per year.

[2] Mean duration of each admission episode, i.e. total number of days of admission divided by number of admissions.

*Urgency of admission*

Of all the admissions 52 per cent were referred and admitted as emergencies (54 per cent of men and 46 per cent of women). These patients used 59 per cent of the total admission days and their mean duration of stay (13·4 days) was significantly longer than that of the 'booked' or non-emergency cases (10·0 days). A quarter (25 per cent) of all emergency admissions were re-admitted one or more times during the year as compared with only ten per cent of booked cases (table 2).

TABLE 2

DISTRIBUTION OF PATIENTS, ADMISSION EPISODES, ADMISSION DAYS AND MEAN DURATION OF STAY IN EMERGENCY AND NON-EMERGENCY ADMISSIONS

| | *Emergency admissions* | *Non-emergency admissions* | Total |
|---|---|---|---|
| Number of patients admitted | 40 | 42 | 82 |
| Number of admission episodes | 50 | 46 | 96 |
| Per cent of admission episodes | *52* | *48* | *100* |
| Number of admission days | 670 | 460 | 1,130 |
| Per cent of admission days | *59* | *41* | *100* |
| Duration of stay (days) | 13·4 | 10·0 | 11·8 |

*Social class*

No significant differences were found in the social class distribution of patients admitted to hospital, when compared with the practice population. Under the age of 60 years,

TABLE 3
MEAN DURATION OF STAY (DAYS) BY AGE AND SOCIAL CLASS[1]

| *Age group (years)* | *Upper class*[2] | *Middle class*[3] | *Lower class*[4] |
|---|---|---|---|
| Under 29 | 13·0 | 6·7 | 3·0 |
| 30–39 | — | 8·5 | 21·0 |
| 40–49 | 29·5 | 16·3 | (1·5) |
| 50–59 | 26·1 | 10·4 | 12·0 |
| 60 + | 6·5 | 12·5 | 10·5 |
| Total | 18·5 | 11·9 | 9·9 |

[1] In accordance with the classification of the Registrar General in Great Britain (Registrar General, 1970).

[2] Upper classes = Class 1 and 2—comprised seven per cent of all admissions.

[3] Middle class = Class 3 — comprised 60 per cent of all admissions.

[4] Lower classes = Class 4 and 5—comprised 27 per cent of all admissions.

the mean duration of stay among the upper social class was significantly higher than among those of middle and lower classes. This finding was however reversed among patients over that age (table 3).

*Marital status*

Among those aged 60 years and over, the mean duration of stay of patients living alone (16·5 days) was significantly longer than those who were living with their marital partners (9·3 days). No other differences were found in relation to marital status (table 4).

TABLE 4
MEAN DURATION OF STAY (DAYS) BY AGE AND MARITAL STATUS

| *Age group (years)* | *Living alone*[1] | *Marital partner*[2] | *Total* |
|---|---|---|---|
| Under 39 | 6·2 | 9·4 | 8·4 |
| 40–49 | — | 16·2 | 16·2 |
| 50–59 | (5·5) | 11·7 | 11·2 |
| 60 + | 16·5 | 9·3 | 11·2 |
| Total | 12·0 | 11·9 | 11·8 |

[1] Widows, widowers, and divorcees.

[2] Living with marital partner at home.

TABLE 5
PERCENTAGE DISTRIBUTION OF STUDY POPULATION, ADMISSIONS, AND NUMBER OF ADMISSION DAYS, BY YEAR OF IMMIGRATION

| *Year of immigration* | *Per cent of study population* | *Per cent of all admissions* | *Number of admission days* |
|---|---|---|---|
| Before 1948 | *30* | *34* | 440 |
| After 1948 | *28* | *49* | 520 |
| Born in Israel | *42* | *17* | 170 |
| Total | *100* | *100* | 1,130 |

*Year of immigration*

Immigrants who had arrived in Israel after the second world war (post 1948) comprised only 28 per cent of the study population, but were responsible for 49 per cent of all admissions. By comparison, the Israeli-born comprised 42 per cent of the population, but represented only 17 per cent of admissions. No differences were found among the immigrant groups in relation to days of admission or duration of stay in hospital (table 5).

## Discussion

Several important studies have been performed to analyse the use of hospitals by general practitioners: Second National Morbidity Survey, 1970–71; Morrell *et al.*, 1971; Fry, 1972; Illingworth, 1972; Loudon, 1972; Torrance *et al.*, 1972; Trevelyan *et al.*, 1974.

The use of different criteria makes exact comparisons difficult, but it appears that about ten per cent of the British population are admitted to hospital each year, and that the mean duration of stay is about 15 days (Royal College of General Practitioners, 1973). In the United States of America, admission rates vary from 128–150 per 1,000 with a mean duration of stay of 7·7 days (Lewis, 1975). In Israel, the annual admission rates, excluding obstetrical deliveries and standardised for comparison with our practice populations for age and sex, were 116 per 1,000: 103 and 128 per 1,000 for men and women respectively (Israel Health Ministry, 1975).

By comparison, the total admission rate found in our survey (60 per 1,000), as well as that for men and women separately (56 and 64 per 1,000 respectively) were almost half the admission rates for Israel. The mean duration of stay (11·8 days) did not differ significantly from the national figures. It could therefore be concluded that patients of our practice used only 50 per cent of the hospital beds when compared with national rates.

Our findings approximate closely to those of two other surveys performed in practices based on doctor-nurse teamwork and co-ordinated with the local social work services. Admission rates for the Nehora Rural Health Centre were 56 per 1,000 and were lower by one third than general rates for that region (Arnon, 1969). Similarly a rate of 58 per 1,000 was reported in an urban team practice (Meshullam, 1970). The results of our survey, therefore, add further support to local and overseas studies that the provision of a more comprehensive service based on teamwork tends to reduce the number of admissions to hospital.

During the past few years our primary care team has implemented a planned programme for the identification of patients with long-term illness and mental disorders among our practice population (Polliack *et al.*, 1973). With the active participation of the nurse and social worker, programmes have been introduced for the early detection, regular supervision and follow-up of patients suffering from hypertension, diabetes, malignant disease, and mental disorders. In the light of these programmes, it is of particular interest that the mean duration of stay for non-emergency admissions was significantly shorter than for emergency admissions. This evidence supports our impression that the provision of co-ordinated medical, nursing and social care has reduced the need for prolonged in-patient care for a large proportion of those patients suffering from long-term illness. A critical diagnostic comparison of emergency and non-emergency admissions would help to clarify these impressions and is now being performed.

The steep rise of admission rates with age has been well attested by other studies (Arnon, 1967; McGregor, 1969; Second National Morbidity Survey, 1970–71; Trevelyan *et al.*, 1974; Lewis, 1975). This serves to emphasise the high use of hospital beds by the older age groups. Although admission rates for patients aged 40–49 years were 50 per cent lower than those in their fifties, their mean duration of stay was 50 per cent longer. The explanation should be sought in the different pathology (especially in emergency admissions) prevalent among these two age groups, especially among the men.

Members of the Kupat Holim Health Insurance Institution are not liable for any expenses incurred by admission to hospital or any other forms of medical service. It is therefore difficult to explain the long duration of stay by patients of the upper social class below the age of 60 years. It could be suggested that because of the superior care available in their homes and because of their ability to use private consultant services outside the hospital, only the more serious and acute cases were admitted to hospital. It is also probable that those over the age of 60 years suffered from a relatively higher prevalence of chronic diseases which could perhaps be more amenable to home care (with better housing facilities among the upper class) and thereby permit earlier discharge and shorter duration of stay in this group. A diagnostic study would help to clarify this hypothesis.

The duration of stay among the elderly living alone was significantly higher than among those who were married. It is tempting to attribute these differences to the lack of caring facilities available in the homes of those living alone, which could in turn generate pressure on the hospital to prolong their stay. The higher prevalence of long-term illness among post-war immigrants especially refugees from post-war Europe has already been demonstrated (Polliack *et al.*, 1973) and probably explains their higher use of in-patient services. An age factor may however also be associated with this finding and would require further investigation.

*Implications*

An understanding of the factors which determine the use of hospital beds by the family physician is important for any evaluation of the medical care which he provides. Surveys in the United Kingdom have shown that " about one quarter of all hospital admissions might have been avoided by strengthening the domiciliary and social services " (Scottish Home and Health Department, 1971; Loudon, 1972; Torrance *et al.*, 1972). The preliminary findings of this survey strongly support these views and confirm that a primary health care team based on the family physician, the nurse, and a medical social worker can provide a framework for planned comprehensive co-ordinated care which can significantly reduce the use of in-patient hospital services. The implications of this should be obvious to those responsible for the planning and financing of medical services.

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## PERINATAL CARE OF LOW-RISK MOTHERS AND INFANTS—EARLY DISCHARGE WITH HOME CARE

A family-centred perinatal-care programme featuring collaboration by nurse practitioners, obstetricians, paediatricians and paramedical personnel was developed to enhance family participation and achieve a shorter but safe hospital stay. Discharge from the hospital was permitted as early as 12 hours after delivery. A perinatal nurse practitioner made daily home visits. The programme's safety, feasibility and acceptability to patients was studied by comparison of 44 patients so treated (study group) with 44 receiving traditional care (controls).

Twenty-one study families, but no controls, went home within 24 hours. The study and control groups had no significant differences or trends in numbers or types of morbidity during hospitalisation or the six-week post-partum period. The expense of the programme is approximately equalled by hospital costs saved through early discharge. The results indicate that early discharge with home-care follow-up observation as described is safe, economically feasible, and well accepted by patients.

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