

# Consumption of hospital resources for hip fracture

## Discharge rates for fracture in Norway

The hospital discharge rate for the period 1977–1981 in a population of 1.08 million was 1.91 per 1000 inhabitants for hip fractures and 3.89 for other fractures (skull fractures excluded). Discharges for fractures constituted 4.3 per cent of the discharges from the somatic hospitals. Hip fracture consumed one fourth of all somatic hospital bed-days for the oldest patients.

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This study was performed to determine the consumption of in-hospital resources used for fracture treatment. In particular, we were interested in the consumption of resources for treatment of the major group of patients with hip fractures. In addition to time trends, we wanted to study the proportion of total somatic care needed for fracture treatment and care, in order to gain some idea about the need for further resources.

In this study we used hospital discharge rates as an index. To some extent discharge rates may also give an indication of the incidence of major fracture groups in a community. The public health care system in Norway enables all patients to use hospital facilities irrespective of income and social status. Information about consumption of hospital resources is available through data compiled by the Central Bureau of Statistics.

### Patients and methods

Data from the Economic and Medical Information System (ØMI-system) for the years 1977, 1978, 1980 and 1981 (no information is available for 1979), for 6 counties in Norway (Hedmark, Aust-Agder, Vest-Agder, Rogaland, Sør-Trøndelag and Nord-Trøndelag) have been published by the Central Bureau of Statistics. From these reports we took the number of discharges, the mean length of stay and the discharge rates by age group and sex. Category 88 in the ØMI-system (corresponding to ICD code no. 820) represents fractures in the proximal end of the femur (fracture of the femoral neck, pertrochanteric and subtrochanteric fractures; in this study called

hip fractures). Category 89 is other fractures (ICD code no. 805–918, 821–829, excluding fractures of the cranium ICD code no. 800–805). Data have also been collected for all somatic diseases. The population in these 6 counties was 1.08 million, representing 26.7 per cent of all inhabitants in Norway.

By combining the data from the ØMI-system and from the detailed population surveys, the consumption of hospital resources for the treatment of hip fractures was estimated and compared with the consumption of resources for the treatment of other fractures, and for total somatic care. Calculations were performed separately for each year, and the results are given as the mean for these 4 years.

### Results

The discharge rate for *hip fractures* was 1.91 per 1000 inhabitants, with a female-to-male ratio of 2.3:1 (Table 1, Figures 1 and 2). From 1977 to 1981, no overall increase in hip fractures was found (Table 2). However, during this period, females over 75 years had an increase in the number of hip fractures of 9–12 per cent (Figure 3).

Patients with *other fractures*, skull fractures excluded, had a discharge rate of 3.89 per 1000 inhabitants, with a female-to-male ratio of 0.7:1 (Table 1).

For *total somatic care*, there were 136 discharges per 1000 inhabitants, with a female-to-male ratio of 1.3:1 (Table 1).

Discharges for hip fractures accounted for 1.44 per cent of discharges from total somatic care, whereas other fractures constituted 2.88 per cent. The mean length of stay for patients

Table 1. Number of discharges per 1000 inhabitants and days of hospital stay. Means of the years 1977, 1978, 1980 and 1981 for discharges and 1977 and 1978 for hospital stay

|                            | Male | Female | Both sexes |
|----------------------------|------|--------|------------|
| <b>Hip fractures:</b>      |      |        |            |
| Discharges                 | 1.17 | 2.65   | 1.91       |
| Length of stay             | 22.0 | 25.1   | 24.0       |
| <b>Other fractures:</b>    |      |        |            |
| Discharges                 | 4.62 | 3.17   | 3.89       |
| Length of stay             | 12.7 | 15.3   | 14.0       |
| <b>Total somatic care:</b> |      |        |            |
| Discharges                 | 118  | 155    | 136        |
| Length of stay             | 10.2 | 9.6    | 9.6        |

with hip fractures was 24 days versus 9.6 days for total somatic care; hip fracture thus consumed 3.5 per cent of the somatic bed-days. Patients with other fractures stayed in hospital for an average of 14 days or 4.2 per cent of total somatic bed-days; hip fracture patients thus consumed 46 per cent of total fracture bed-days.

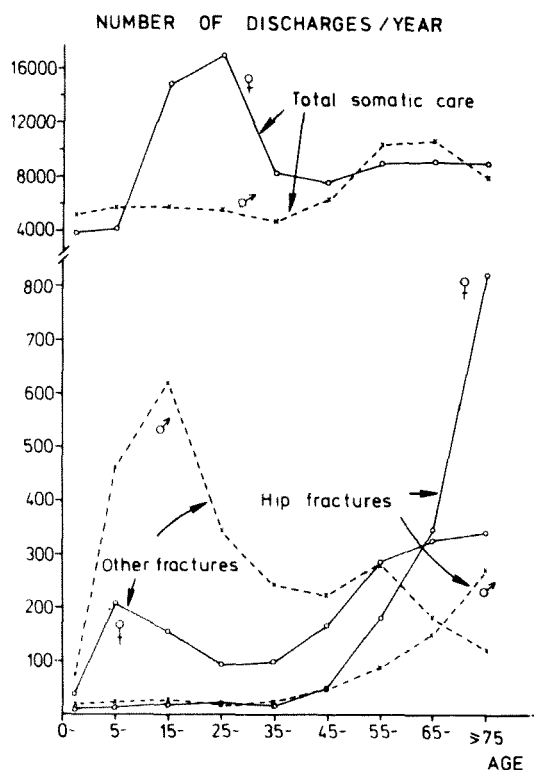


Figure 1. Number of discharges for hip fractures, for other fractures and for the total somatic care by age group and sex (mean for the years 1977, 1978, 1980 and 1981).

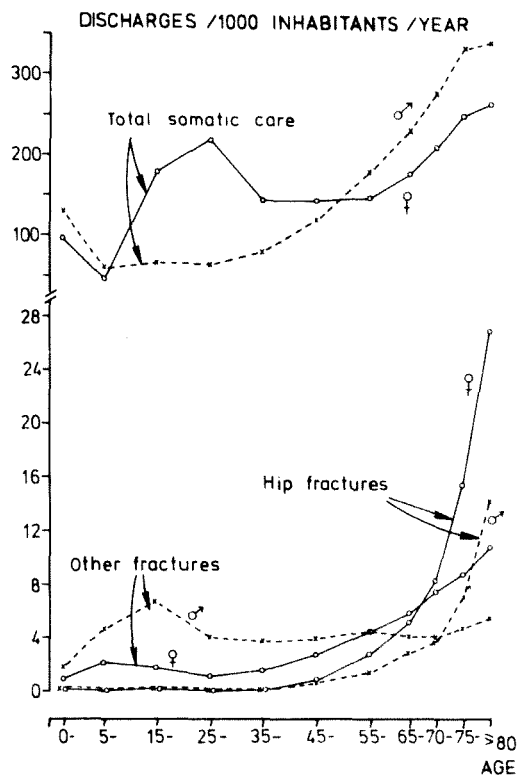


Figure 2. Number of discharges per 1000 inhabitants for hip fractures, for other fractures and for the total somatic care by age group and sex (mean for the years 1977, 1978, 1980 and 1981).

Hip fractures were responsible for less than 0.5 per cent of the total somatic discharges below the age of 45, but thereafter they constituted an increasing part; in females aged over 80 years they consumed 11 per cent of all discharges.

Table 2. Discharges and population at risk for 1977-81 (numbers in thousands)

|                            | 1977 | 1978 | 1980 | 1981 |
|----------------------------|------|------|------|------|
| <b>Hip fractures:</b>      |      |      |      |      |
| Male                       | 0.73 | 0.73 | 0.54 | 0.61 |
| Female                     | 1.44 | 1.54 | 1.41 | 1.52 |
| <b>Other fractures:</b>    |      |      |      |      |
| Male                       | 2.39 | 2.57 | 2.60 | 2.58 |
| Female                     | 1.63 | 1.72 | 1.73 | 1.77 |
| <b>Total somatic care:</b> |      |      |      |      |
| Male                       | 60.9 | 61.1 | 65.9 | 65.8 |
| Female                     | 81.4 | 82.5 | 87.1 | 86.6 |
| <b>Inhabitants:</b>        |      |      |      |      |
| Male                       | 533  | 537  | 544  | 547  |
| Female                     | 536  | 540  | 547  | 551  |

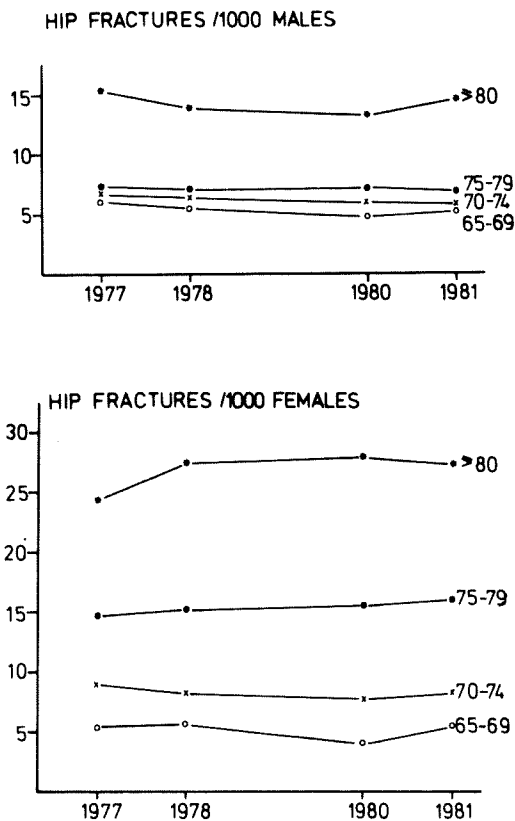


Figure 3. Number of discharges for hip fractures per 1000 males and per 1000 females for the four oldest age groups for 1977, 1978, 1980 and 1981.

Compared with total somatic care, other fractures caused most hospital admissions for males in the age group 15–24 (10.7 per cent), and for females in the age groups 5–14 (5.0 per cent) and after the age of 45 with 3.8 per cent for those 80 years or older.

The number of discharges for hip fractures was 2.0 per cent less in 1981 than in 1977, although the population had increased by 2.7 per cent (Table 2). During the same period, the number of discharges increased by 8 per cent for other fractures and by 7 per cent for total somatic care.

Data on the length of hospital stay for each sex is only available for 1977 and 1978 (Table 1); stays about 3 days longer were found for females than for males both for hip fractures (25 versus 22 days) and for other fractures (15 versus 13 days). The mean stay in hospital was, however, about ½ day shorter for females

than for males (9.6 versus 10.2 days). From 1977 to 1981, no change in the average length of stay for hip fracture was found, but the total somatic stay was reduced from 10.1 days to 9.4 days.

## Discussion

The ØMI-reports give the number of discharges from hospital for a specified diagnosis. Such a system depends on correct diagnoses, but the diagnosis of fractures should be simple and thus reliable. These reports do not, however, differentiate between first and rehospitalizations, and hospital discharge rates therefore tend to overestimate true incidence rates. For hip fractures, these estimates are found to be 20–30 per cent higher than the true incidence (Falch & Ilebekk 1978, Evans et al. 1979, Lewis 1981, Rees 1982). Discharge data for fractures (e.g. hip fractures) will, however, give important information concerning time-related changes and trends.

The general incidence of discharges for hip fractures of 1.91 per 1000 inhabitants found in this study is in accordance with the 1.7 per 1000 inhabitants reported by Fredin & Sernbo (1982) in Sweden. Wallace (1983) found 16 hip fractures/1000 females over the age of 75 years, compared to 21 discharges/1000 females in the present study.

In a previous report from Norway, Falch & Ilebekk (1978) reported an admission rate of 17/1000 females 70 years of age or above, which agrees with our discharge rate. In Denmark, Frandsen & Kruse (1983) found, however, for the period 1973–1978, an even higher incidence, namely 28 hip fractures/1000 females 75 years and older. For patients aged 80 or more, we found a discharge rate of 27 per 1000 for females and 14 per 1000 for males, which corresponds to 26 and 13 reported from Sweden by Zetterberg & Andersson (1982) for the years 1978–79. The female-to-male ratio of 2.3:1 corresponds with other reports (Jensen 1980, Lewis 1981, Frandsen & Kruse 1983), but is lower than the 4:1 ratio reported by Swanson & Murdoch (1983).

The proportion of total somatic care used for the treatment of hip fractures increased mark-

edly with age; females with hip fractures consumed 11 per cent of all discharges in the highest age-group. The demands on the total hospital care-system are, however, even higher, as the average length of stay for patients with hip fractures is 2.5 times longer than the average for the total somatic care (Table 1). This indicates that as many as one fourth of all somatic hospital bed-days for the oldest patients are consumed by hip fracture.

The average length of hospital stay for hip fracture in our study was 24 days, whereas Lewis (1981) found an average stay of 38 days and Swanson & Murdoch (1983) 35 days. These authors reported a longer hospital stay for women than for men: 7 days and 19 days more, respectively, compared with our finding of 3 more days (Table 1).

Several authors have reported an increasing incidence of hip fractures during the last decade (Zetterberg & Andersson 1982, Frandsen & Kruse 1983, Swanson & Murdoch 1983). Although the period we have examined was only 5 years, it is remarkable that no increase in the incidence of hip fracture could be detected.

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