Discharge of patients to long-term care from a large acute hospital over a 12-year period

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Abstract

Background Several factors may be important in determining the discharge of patients to long-term care from the acute hospital.

Aims We aimed to look at factors associated with discharge to long-term care from St. James's Hospital, Dublin between 1997 and 2008.

Methods Data obtained from a long-term care database within the geriatric service were analysed. This service is responsible for assessing and listing all patients for long-term care within the hospital.

Results 3,107 patients were listed and 2,520 discharged to long-term care during the period. Mean age was 81.7 ± 7.3 years and 64.1 % were female. The number listed increased since 1997, but there was no change in age or gender. Median time to discharge was 52 days, but varied by year and was longer for public versus private facilities (mean difference = 18 days, $P = 0.006$). Mortality of those awaiting long-term care was 17.0 %, but varied significantly by year and ranged form 9.3–29.0 %. Mortality was higher in males, in those of older age and during the winter months.

Conclusions Variation in the time to discharge appears to be associated with changes in the provision of publicly funded private nursing home beds.

Keywords Long-term care · Acute hospital · Discharge · Listing · Mortality

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Introduction

An increasing older population and concomitant rise in age related disease and disability have led to an increase in the number of people requiring placement in long-term care facilities in Ireland.

In order to plan for the future funding and provision of nursing home beds in Ireland, it is important that there is an awareness of both the current need and trend in the number who may require long-term care. This will facilitate policy makers in formulating strategies to enable adequate provision of beds and hence allow for the appropriate and timely transfer of patients to nursing homes from hospital when required.

This study represents the largest of its kind in Ireland to date and aims to explore on both the trends and factors associated with discharge to long-term care from a large Dublin hospital over an 12-year period, prior to the introduction of the Fair Deal Scheme.

Methods

Data for all patients discharged to long-term care from St James's Hospital, Dublin between 1997 and 2008 were obtained from a long-term care database within the Medicine for the Elderly Department. This is a database

maintained by the geriatric service, which is responsible for assessing and listing all patients for long-term care within the hospital. This information included basic patient demographics (age and gender), the date of admission to hospital, as well as the date of listing and discharge to both public and private long-term care facilities. The records also included the date of death of any listed patients while awaiting long-term placement.

Data were analysed with the software program JMP 9.02. Mean and median values were used, respectively, for normal and abnormally distributed data. The number admitted, listed and subsequently discharged to each nursing home type was calculated for each month and year. The median time from admission to listing (time to list), as well the time from listing to death or nursing home discharge was also calculated both in the overall data set as well as for each year. The mortality rate (the percentage of patients who died while awaiting long-term care) was calculated per year of listing. The annual number of bed days used by listed patients who were discharged or died in any given year was calculated. Differences in data across all years were analysed with the one way ANOVA, Chi squared and unpaired t test as appropriate. Logistic regression analysis was used to investigate the possible relationship between the time to list, time to discharge and mortality using age, gender, year of discharge or listing as variables. Statistical significance was accepted when $P < 0.05$.

Results

Between 1997 and 2008, there were 3,107 patients listed and 2,520 patients discharged alive from St. James's Hospital to long-term care. Patients' age ranged from 30 to 107 years with a mean age of 81.7 ± 7.3 years. Females comprised 64.1 % of the total cohort and were marginally older than males (mean difference 2.9 years, $P < 0.001$). There was no significant difference in the age or gender profile of patients discharged across the years. However, there was a notable increase in the number listed for long-term care particularly, from the year 2000 onwards (Table 1).

The median time to list was 42 days (IQ range 24–75). There was a notable increase in the time to list from 2003 onwards (difference in the median time was 15 days comparing the period 2003–2008 versus 1997–2002, $P = 0.001$) (Fig. 1). In a logistic regression analysis, time to list was shorter in those of older age ($P < 0.001$) and in those discharged to private nursing home ($P < 0.001$), but was not associated with gender. The number of patients listed per month was greatest in the winter apart from in December when it was lowest.

The median time to discharge from listing was 52 days (IQ range 21–106) and varied by year and type of nursing home (Fig. 2). Patients discharged to public versus private facilities waited longer (difference in median = 18 days, $P = 0.006$). Time to discharge decreased during the period 1998–2001 and increased thereafter until 2004 when it peaked at 103 days. This was followed by a decrease in 2005–2007 and rise again in 2008. Overall, the median time to discharge was significantly lower in the period 1997–2001 versus 2002–2008 (difference in median = 31 days, $P < 0.001$). Over the years, there was an overall increase in the proportion discharged to private nursing home with it ranging from 27.5 % in 1998 to up just over 70 % in the years 2005–2008. A higher number of discharges to nursing home occurred in the winter months apart from the month of December. In a logistic regression model, time to discharge was also shorter for those of older age ($P = 0.009$), but was not associated with gender.

The annual number of bed days used by patients awaiting long-term care varied significantly across the years and ranged from 9,337 to 34,060. A substantial increase in the number of bed days occurred in 2003, with the number rising to a peak in 2004–2005, followed by a subsequent fall and then rise again in 2008. This largely reflected variation in the time to discharge to long-term care.

The overall mortality rate of patients awaiting long-term care was 17.0 % and varied significantly per year of listing (range 9.3–29.0 %). Mortality for males was higher compared to females (20.4 % vs. 15.7 %, $P = 0.001$). In a logistic regression model, older age ($P < 0.001$) and year of listing ($P < 0.001$) were also predictors of death, but there was no association with the time to list. The median time to death from listing was 37 days (IQ range 16–85). Mortality was higher in the winter months, peaking in the month of January.

Discussion

This is the largest study in Ireland to date that has explored on the discharge of patients to nursing home from a large acute hospital. There has been a substantial increase in the number of patients listed for long-term care since 1997. An increase in life expectancy and a 19.8 % rise in the population of adults aged 70 or older in the county Dublin area from 1996 to 2006 may account for this higher number [1].

Time to list increased from 2003 by about 2 weeks, but remained constant thereafter. It was shorter for those of older age and who were discharged privately. This may reflect differences in patient case mix and complexity, or other factors impacting on the time to referral to the geriatric service or the decision making process regarding

Table 1 Basic demographics, the number listed and discharged, median time to list and discharge, mortality and bed days per year and nursing home discharge type

|	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	P value
Age (mean)	81.2	80.7	81.1	81.3	81.7	81.6	81.8	81.9	81.6	81.5	82.5	82.8	0.20[a]
Female (%)	61.4	60.7	64.0	59.4	64.8	65.9	69.1	65.1	64.8	63.1	63.0	66.0	0.86[b]
Listed	171	158	231	271	307	273	259	224	253	301	322	337	
Discharged	152	138	177	234	255	195	155	182	204	302	247	279	
Mortality (%)	21.6	14.6	18.6	17.0	12.4	23.1	29.0	26.3	19.0	10.0	9.3	14.5	<0.0001[b]
Private (%)	35.5	27.5	37.3	64.1	67.5	59.5	47.6	47.3	70.6	71.5	73.3	73.8	<0.0001[b]
Public (%)	64.5	72.5	62.7	35.9	32.5	40.5	52.4	52.7	29.4	28.5	26.7	26.2	
Time to list	34	44	30	31	34	36	46	50	55	49	55	49	<0.0001[a]
Time to discharge	55	44	40	34	26	52	102	103	90	51	35	79	<0.0001[a]
Bed days	12,530	9,337	11,510	14,115	11,496	14,827	22,286	34,060	34,046	28,132	14,769	30,260	

Mortality (%) is per year of listing

Private/Public (%) percentage discharged to private or public nursing home, *Bed days* days used by listed patients who were discharged or died in a given year
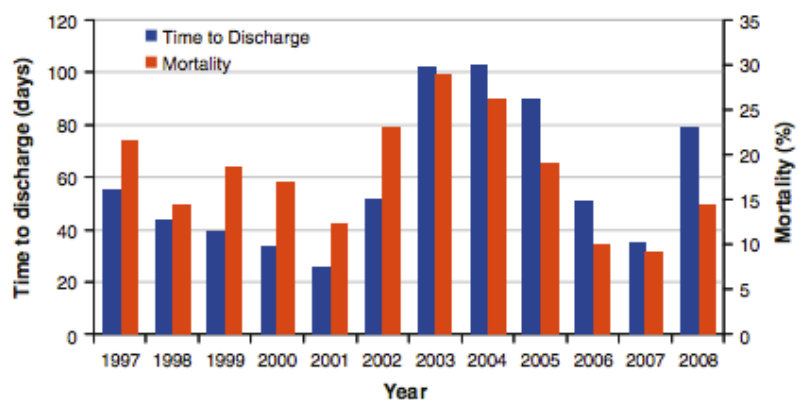
[a] Anova test

[b] Chi squared test

Fig. 1 Median time to list per year of listing. *Error bars* represent one standard error
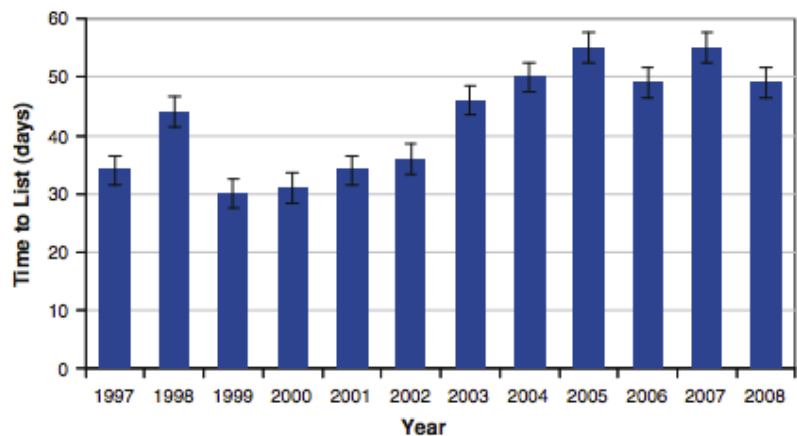
Fig. 2 Median time to discharge (from listing) and mortality per year of listing

suitability for placement in long-term care. Despite this, there was no change in the age or gender profile of those listed over the years, and increased time to list was not associated with a higher mortality rate. The mean age of those discharged to long-term care was 82 years and approximately two-thirds were female, findings that are similar to the overall demographic profile of long-term residents in Ireland [2]. The higher number of patients

listed in the winter months (apart from in December) may be accounted for by more admissions to hospital during this time. It is also possible that the impact of the holiday period led to a reduction in numbers listed in December.

Time to discharge to long-term care was dependent upon the year of discharge and was shorter for those discharged to private nursing homes and those of older age. It may have varied due to temporal changes in the both the funding structure, availability and access to private and public nursing home beds. It is likely that changes in the provision of publicly funded private beds over the years helps account for this. For example, the fall in waiting times from 2005 to 2007 most likely relates to the introduction of publicly funded "delayed discharge initiative (DDI)" beds by the HSE in the greater Dublin area between August 2005 and March 2007 [3]. This is also supported by the fact that during this period there was a substantial increase in the proportion of discharges to private nursing homes. It is possible that the shorter time to discharge for older patients may reflect differences in the discharge process in this group.

Over two-thirds of all nursing home discharges between 2005 and 2008 were to private facilities. The increased reliance on private institutions is also reflected in 2008 data showing that only about 30 % of all long stay patients resided in public facilities [2]. This move towards a model of more private-based care may be due to its lower cost [4], particularly in a time of healthcare cutbacks. However, the needs of some patients with high dependency and more complex medical morbidity may be better met in public facilities. In fact, for this reason it has been previously cited that private beds may be of limited value in such cases [5].

17.0 % of all patients on the waiting list died and most within 3 months, reflecting a group who are frail and have multiple medical co-morbidities. This compares to a death rate of 23.9 % per year found in a previous study of 760 patients awaiting long-term care in a large acute hospital in Dublin [6]. It also compares to a 30-day inpatient mortality rate of 20.7 % for those aged over 75 who had an acute medical admission to St James's Hospital [7]. Mortality varied significantly by year ranging from 9.3 to 29.0 %. As expected, death was more likely to occur in the winter months, in males and in those of older age, and was positively associated with time to discharge. A higher rate of medical disease in the winter, and increased morbidity in males and in those of older age likely accounts for this. It is unclear whether a longer length of stay in hospital is an independent risk factor for death as it could be related to acquired nosocomial illness. However, it may simply reflect a shorter life expectancy in a frail elderly group.

In a previous small study in Ireland, patients awaiting long-term care accounted for 55 % of all delayed discharges from an acute hospital [8]. It is therefore inevitable that long and inappropriate waiting times for nursing home placement have contributed significantly to increased hospital occupancy rates and overcrowding in A/E departments over the years.

There was a very significant difference in the number of bed days used by patients listed for long-term care ranging from 9,337 to 34,060 per year. This translates into a cost of approximately between 8 and 30 million euro per year (assuming €889 as the mean cost of an acute hospital bed) which is substantially more than the cost of otherwise funding long-term care [4, 9]. The inappropriate use of these bed days represents a lost opportunity in providing other services, particularly those that are elective within the hospital.

Despite the rise in the overall number requiring long-term care in hospital in the last decade, there has been a relatively stable and predictable number needing placement in recent years and with no change in their demographic profile. Provision of an appropriate mix of both public and private beds will be essential in ensuring the timely transfer of patients to long-term care in the future. The introduction of the Nursing Home Support Scheme (Fair Deal Scheme) in October 2009 is likely to have had an impact on waiting times to discharge to nursing home for hospital patients and will need to be investigated in the coming years [10].

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