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Title Page

Title

Dementia in older people admitted to hospital: an analysis of length of stay and associated costs

Authors

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Running Head

Length of stay and cost of care for older people with dementia

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Abstract

Objectives: Patients with dementia in the acute setting are generally considered to impose higher costs on the health system compared to those without the disease largely due to longer length of stay (LOS). Many studies exploring the economic impact of the disease extrapolate estimates based on the costs of patients diagnosed using routinely collected hospital discharge data only. However, much dementia is undiagnosed and therefore in limiting the analysis to this cohort, we believe that LOS and the associated costs of dementia may be overestimated. We examined LOS and associated costs in a cohort of patients specifically screened for dementia in the hospital setting.

Methods: Using primary data collected from a prospective observational study of patients aged >/= 70yrs, we conducted a comparative analysis of LOS and associated hospital costs for patients with and without a diagnosis of dementia.

Results: There was no significant difference in overall length of stay and total costs between those with (μ = 9.9 days, μ = €8,246) and without (μ = 8.25 days, μ = €6,855) dementia. Categorical data analysis of LOS and costs between the two groups provided mixed results.

Conclusions: The results challenge the basis for estimating the costs of dementia in the acute setting using LOS data from only those patients with a formal dementia diagnosis identified by routinely collected hospital discharge data. Accurate disease prevalence data, encompassing all stages of disease severity, is required to enable an estimation of the true costs of dementia in the acute setting based on LOS.

Keywords

dementia, screening, acute setting, length of stay, costs, older people

Key Points

- Studies that explore the economic impact of dementia by extrapolating estimates based on the length of stay and costs of patients diagnosed using routinely collected hospital discharge data only may be overestimated.
- When patients were screened for dementia on admission to the acute setting, we found no significant difference in overall length of stay and total costs between those with and without the disease.

- Accurate disease prevalence data, encompassing all stages of disease severity, is required to enable an estimation of the true costs of dementia in the acute setting based on length of stay.

Main Text

Introduction

Dementia is a serious chronic condition, typically affecting older people, and imposes a substantial economic burden on the health system and society.[1] The most recent figures estimate the global cost of dementia at US$818 billion, representing over 1% of the world's GDP.[2] Population ageing, the dominant demographic trend of this century, is cited as the main driver of this global epidemic,[3] anticipated to become a trillion dollar disease by 2018.[2] It is of note that dementia differs from other conditions by the way in which its costs are distributed across a variety of public and private resources.[4] The cost of dementia in Western Europe is reported at €263 billion, of which 19% is attributable to direct medical costs, with the remaining costs falling on the social care (43%) and informal care (38%) sectors.[3]

The most recent estimates for Ireland reveal that in 2016 dementia affected 55,000 people (1.16% of the overall population), of which just under 47,600 were adults aged 70yrs+, and it is projected that the number of people affected by the disease will triple by 2041.[5] It is widely accepted that much dementia remains undiagnosed, with between 50-80% of people affected having no formal diagnosis of their condition.[6-11] Furthermore, it has been identified that dementia is underestimated in hospital registries, [12-21] due to limitations with coding systems, insufficient diagnoses and the failure to document and record dementia as a diagnosis even when the diagnosis has been established.[12,13,20] Reports of the prevalence rate of dementia in the acute-care setting range from 3.9% to 22%, depending on the hospital and age cohort under consideration.[7,12,22] A recent Irish multi-hospital observational study identified a dementia prevalence of 25% amongst older hospitalised patients of whom just over 35% had a previously known diagnosis (listed in GP letter, medical notes or report of a family member). Of those with a known diagnosis of dementia, only 20% of cases had been captured by the hospital in-patient enquiry (HIPE) registry.[13,15]

Patients with dementia in the acute setting are generally considered to impose higher costs on the health system. This is reflected in longer length of stay (LOS) compared to those the same age without the disease,[7,12,16,17,20,22-33] increased risk of in-hospital complications,[21,34] safety and behavioural issues requiring 1:1 care, and a higher risk of readmission.[21] However, many of these studies that explore the economic impact of the disease extrapolate estimates based on the costs of formally diagnosed patients only.[23,33,35-37] An Irish study examining the additional hospital days due to dementia estimated an associated annual cost of >€199 million to the Irish health system.[35] These marginal costs were determined by assessing the additional LOS for those with a known diagnosis of dementia captured by the HIPE system and multiplying this excess LOS by the estimated dementia hospital admissions

based on European age specific prevalence rates.[35] However, in limiting the analysis of a dementia cohort to those with a formal diagnosis only, and by extension the most severely impaired patients, we believe that LOS in hospital and the associated costs of dementia may be overestimated.

In light of the hypothesis that dementia imposes higher direct medical costs on the health system largely due to longer LOS in hospital, but with supporting evidence that much dementia is undiagnosed, our study examines LOS and associated costs in a cohort that was specifically screened for dementia in the hospital setting.

Using primary data collected by Timmons et al[15] on the true prevalence of dementia in the hospital setting we can accurately compare LOS and associated costs for those with and without dementia. With an ageing demographic profile and the consequent economic pressures on the health system, robust data on the prevalence and the economic impact of dementia on the acute setting is required. This information is fundamental to inform policy makers on appropriate resource allocation in planning for a sustainable health-system and highlighting priorities for future research.

Methods

We used primary data from a non-consecutive, prospective cohort study of patients aged >/= 70yrs, including elective (non-day case) and unplanned admissions to any speciality across six acute hospitals in Cork County between May 2012 and February 2013 (14 collection days per hospital: pre-planned and staggered over 6 weeks; all days of week evenly represented; all patients admitted in the 24-hour period included).[15] In this study, patients consenting to inclusion and not critically ill had been assessed within 48 hours of admission (90% of all admissions included, n=606). Researcher-defined dementia status (possible in 598/606) was ascertained by initial MMSE[38] screening (score ≥27/30 coded as non-dementia; expected 2% under-diagnosis rate)[22] and then expert review of detailed researcher-collected patient data: standardised collateral history (IQCODE informant tool),[39] delirium status (DRS-R98),[40] depression screen (GDS-5),[41] hearing and vision screens, education history, presenting illness details, past history of cognitive or mental health disorder. In this highly-characterised cohort, we conducted a comparative analysis of LOS and the associated hospital costs for patients with and without a diagnosis of dementia in the 594 patients with available LOS data. Of note, this analysis does not include the costs of delirium, whether in isolation, or superimposed on dementia.

Hospital resource utilisation

The dates of admission to and discharge from hospital were captured at the individual patient level. This enabled the calculation of LOS, recorded as the number of days spent in hospital. To ensure accuracy with this data, LOS was also crosschecked with the longitudinal data captured for each patient. In certain cases, one-to-one monitoring was required to ensure patient safety and well-being in the hospital setting. The allocation of a special carer (SC) to perform this monitoring and the number of days that each patient spent receiving one-to-one care from a SC were recorded.

Calculation of healthcare costs

Costs of healthcare resource utilisation were collected from the Irish health payer's perspective, the Health Service Executive (HSE), and are presented in 2013 Euro. Costs included the hospital cost of an inpatient bed and the cost of a SC. Irish hospitals don't have a standard methodology for recording costs at the ward or hospital level. To overcome this irregularity, the study used the aggregate in-patient bed per diem cost for 2012 and 2013 as appropriate, obtained from correspondence with the Healthcare Pricing Office of the HSE. 2012 in-patient bed per diem costs were adjusted to 2013 Euro using the annual consumer price index rates as published by the Central Statistics Office in Ireland.[42] Due to the study's perspective, the public in-patient per diem costs were also applied to the private hospital included in the analysis.

To estimate the cost of a SC we assumed that for the case of male patients, SCs were male porters and for female patients, SCs were female healthcare assistants. This decision was made in agreement with the consulting geriatrician (ST). Salaries were determined from the New Entrant (mid-point) Health Sector Salary Scales effective from 1 July 2013.[43] As per guidelines issued by the Irish Health Information and Quality Authority,[44] salaries were adjusted for employer's social insurance, imputed pension costs and overheads, from which a daily cost for a SC was estimated.

Statistical Analysis

Data were entered into FileMaker Pro 11 database and transferred to SPSS version 22 [IBM Co., Chicago, IL, USA] for analysis. Descriptive statistics of patient characteristics are presented as frequencies and percentages, and continuous variables are presented as mean +/- SD. Due to positively skewed LOS and hospital cost data, we applied non-parametric techniques to analyse the data. A series of Mann Whitney-*U* tests were performed to compare differences in LOS and costs

between the two patient groups, that is, those with and without hospital diagnosed dementia. A Chi-square test for independence was conducted to indicate the association between dementia status and the presence of a SC. The daily cost of a SC was subject to sensitivity analysis where the cost was varied by + and – 50%. Statistical significance was determined using $P < 0.05$.

Results

Overview of all patients enrolled in the study

Of the 594 patients enrolled in the study, 304 (51.2%) were female and 290 (48.8%) were male, ranging in age from 70 to 99 years ($\mu = 79.7$ years, SD = 6.6). The majority of patients were based in a public hospital (81.1%) and admitted via the emergency department (70.9%). Medical admissions (66.2%) were most prevalent followed by surgical (21.4%), and geriatric and orthopaedic combined (12.3%). The most common presenting diagnosis was surgery/procedure (19.7%), followed by cardiac conditions (16.8%), pneumonia (10.9%), gastrointestinal issues (9.3%) and respiratory illnesses (7.2%). In terms of the patients living arrangements prior to admittance, 62.3% patients were living at home with their partner or other family members, almost 30% were living on their own, and the remaining patients were resident in a nursing home (5.9%) or came from sheltered accommodation (3%).

Dementia

Dementia was present in almost a quarter of patients (24.9%). Of these patients, 64% had no previous diagnosis of dementia prior to presenting to hospital. The prevailing principal diagnosis within the cohort with dementia was pneumonia (18.2%), followed by cardiac conditions (15.5%); gastrointestinal issues (7.4%) and urinary tract infections (5.4%). Timmons et al[15] provides a full breakdown of the demographic and clinical statistics of patients with and without dementia.

Length of stay

Mean LOS in hospital for the study cohort was 8.66 days (min. = 1, max. = 219, SD = 12.88). The average LOS in the dementia group was 9.9 days (SD = 11.20), ('previously diagnosed dementia' = 10.19 days and 'research-categorised as dementia; not previously diagnosed = 9.74 days). This compared with 8.25 days (SD = 13.38) for those without dementia (Table 1). The difference between the two cohorts was non-significant ($p = 0.108$).

The difference in LOS between the two groups was interrogated using the following categories; gender; age group; admission type; hospital type and location; speciality of the admitting team; patient living arrangements prior to admittance to hospital; patient discharge arrangements and primary diagnosis at admission (Table 1). Results varied, but mean LOS was shorter for those with a dementia diagnosis in the following instances on admission: to a rural hospital, geriatric & orthopaedic admitting team, coming from a sheltered home and coming from a nursing home. At admission, patients were diagnosed with one of ten conditions. In the case of four of these conditions; respiratory, infection, stroke and surgery/procedure, mean LOS was shorter for those with a dementia diagnosis. Based on destination at discharge alone, mean LOS was shorter for the dementia cohort compared to the cohort without dementia when discharged to nursing homes for long term care and to short term care facilities (noting that 60% of those with dementia discharged to a nursing home already resided there pre-admission, compared to 50% of those without dementia). When patients died in hospital, the number of days to death was shorter in the cohort with dementia. Discharge to home was the only instance where mean LOS was longer in the group with dementia.

Significant differences in LOS were observed between the two groups in two categories; (i) the patient's living arrangements prior to admission to hospital and (ii) the primary diagnosis at admission. A longer LOS was observed for the dementia cohort (μ =11.61 days) compared to the non-dementia group (μ = 7.55 days) in the case where they were living with a partner or other family member prior to admission. Conversely, a shorter LOS was identified in the dementia group (μ = 2.4 days) compared to the non-dementia group (μ = 5.87 days) where the admitting diagnosis was for a surgical procedure.

INSERT TABLE 1 HERE

Special Carers (SC)

36 patients in total (6.1% of the study cohort) required one to one care during their hospital stay, 10.8% (n=16) of those with a dementia diagnosis and 4.5% (n=20) of those without a dementia diagnosis. A Chi-square test for independence indicated a significant association between the presence of dementia and the requirement for a SC; χ^2 (1, n=594] = 6.7, p = 0.009).

For those patients allocated a SC, the number of days with the carer ranged from 1 to 24 with a mean of 4.47 days. The mean number of days with the carer was lower in the group diagnosed with dementia (μ = 3.38 days) compared to the group without dementia (μ = 5.35 days). Additionally, for those allocated a SC, the mean LOS in hospital was non-significantly lower in patients with dementia than without (μ = 16.31 days $_{\text{dementia}}$ v 19.70 days $_{\text{no dementia}}$).

Costs

Inpatient bed

The cost of an overnight inpatient bed, as advised by the Healthcare Pricing Office of the HSE, is €829 for 2012 (adjusted to 2013 prices) and €815 for 2013. Using length of stay data, the mean total cost of an inpatient bed for the study cohort was €7,158 (SD = €10,574). The mean cost for patients with dementia was €8,186 (SD = €9,262), higher than those without dementia (μ = €6,816, SD = €10,963). However, the difference of €1,370 was not statistically significant.

SC

The daily cost of a SC was calculated as €161 for a male SC and €169 for a female SC. The average total cost of a special carer was €730 (min. = €161, max. = €3,864, SD = €869), but lower for patients with dementia (μ = €555, SD= €522), compared to those without dementia (μ = €871, SD = €1,063). Again, the difference in mean cost was not statistically significant.

Total cost

Combining the cost of an inpatient bed and the cost of a special carer, the mean total cost per patient in the study cohort was €7,202 (SD = €10,654). A comparison of total costs between the two patient cohorts revealed higher costs for those with dementia (μ = €8,246 $_{\text{dementia}}$ v €6,855 $_{\text{no dementia}}$) (Table 2), (μ = €8,512 $_{\text{previously diagnosed dementia}}$ v μ = €8,098 $_{\text{research-categorised as dementia; not previously diagnosed}}$). However, this difference was non-significant. The group with dementia reported a median total cost of = €4,560 (n=148) compared with €4,145 (n= 446) in the group without dementia, MWU = 30103.5, z = -1.61, *p* = 0.108. Varying the daily cost of special carers by + and - 50% in the sensitivity analysis did not alter the results.

INSERT TABLE 2 HERE

Discussion

Current estimates of the cost of dementia in the hospital setting typically use the difference in LOS between a dementia and non-dementia patient cohort as a proxy for the marginal cost of the disease along with reported prevalence rates to determine the total cost of the disease.[21,31,33] This limits analyses to patients with a formal diagnosis of the disease. Though these studies do highlight the fact that their analysis is limited to formally diagnosed patients, they mainly postulate that disease costs are underestimated due to the under-diagnosis of the disease.[17,21] However, this study highlights the

potential nuances present in this approach. In terms of identifying the marginal cost of the disease, we propose that using LOS data for the dementia patient group from hospital registries, specifically patients with a formal diagnosis, limits the analysis to a more severely impaired population and therefore may not lead to an accurate measurement of costs. To our knowledge, this is the first study that compares direct hospital resource utilisation and costs between patients with and without dementia where the disease is specifically diagnosed in the hospital setting. Our study finds no significant difference in terms of LOS and associated costs between those with and without dementia. The findings are aligned with a study performed within the German Study on Ageing, Cognition and Dementia in Primary Care Patients, which considered the net costs of dementia by disease stage. Similarly no significant differences in mean annual costs for in-patient treatment was found between dementia and non-dementia patients.[45] While subjects for this German study were recruited through GPs, dementia was also specifically diagnosed as part of the study by an experienced geriatrician or geriatric psychiatrist.[46] Our study findings highlight the fact that continued use of hospital discharge/registry based data for sourcing dementia prevalence rates and associated LOS in order to calculate dementia care costs in the hospital setting, may provide misleading estimates and should be treated with caution.

Limitations

Given that previous studies largely determine the direct medical costs of dementia primarily based on hospital LOS data, we confined our analysis of hospital costs to the cost of an inpatient bed based on LOS and the cost of a special carer based on length of time with the carer. We acknowledge that this doesn't allow us to capture the full cost of inpatient hospital care. However, we believe that with accurate prevalence data, an analysis of costs based on LOS provides a valid starting point for comparing the true costs of inpatient care for those with and without dementia.

While the cost of SCs has been estimated based on the salaries of full time permanent staff, we are aware that porters and health care assistants in Ireland are frequently hired through agencies and so in reality would be more expensive. Whilst it is not feasible to cost for SCs hired through agencies for this study, we have calculated the daily cost based solely on the number of working days in the year, that is, excluding weekend days, public holidays and an annual leave allowance of 25 days. Furthermore, the cost of special carers has been subject to sensitivity analysis where the cost was stressed by + and - 50%, with no impact on the results.

Conclusion

Dementia has been described as the greatest global challenge for health and social care this century,[47] with a risk that healthcare systems could be overwhelmed by the costs of providing care for those with the disease into the future.[48] At a time when many healthcare agencies are competing for limited resources, accurate and reliable estimates of costs are increasingly required to ensure that decisions on the implementation of public health policy and the allocation of healthcare funding will have the desired effect. The results of this work challenge the basis for estimating the costs of dementia in the acute care setting based solely on the LOS of those with a formal diagnosis of the disease and who have been captured within routine hospital discharge data. The study highlights the importance of establishing accurate disease prevalence data in the first instance, encompassing all stages of disease severity, to then enable an estimation of the true costs of dementia in the acute care setting based on patients' LOS in hospital.

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Table 1 Length of stay statistics of patients with and without dementia

Factor	Dementia Mean (SD)†	No Dementia Mean (SD)†	Dementia Median (IQR)‡	No Dementia Median (IQR)‡	Test	*P*-value
Overall	9.90 (11.199)	8.25 (13.379)	5.50 (9)	5.00 (6)	MWU = 30110.0	0.108
Gender						
Male	9.31 (11.819)	7.55 (8.656)	5.00 (6)	5.00 (6)	MWU = 6974.0	0.872
Female	10.33 (10.780)	8.98 (16.960)	5.00 (6)	5.00 (6)	MWU = 8117.5	0.608
Age Group						
70-79yrs	8.39 (10.409)	7.97 (15.304)	5.00 (6)	5.00 (5)	MWU = 5464.0	0.894
80-89yrs	10.40 (11.502)	8.66 (9.678)	6.00 (8)	6.00 (5)	MWU = 5349.0	0.459
90-99yrs	10.65 (11.615)	8.90 (10.452)	6.50 (10)	4.50 (10)	MWU = 291.5	0.383
Admission Type						
Acute	10.58 (11.715)	9.20 (14.876)	6.00 (8)	6.00 (6)	MWU = 17115.0	0.358
Elective	6.85 (7.989)	6.29 (9.34)	6.50 (10)	4.00 (5)	MWU = 1957.0	0.953
Hospital						
Rural public	6.83 (5.348)	9.36 (11.050)	5.00 (3)	5.00 (9)	MWU =1085.5	0.925
Urban public	11.04 (12.752)	8.91 (15.728)	6.00 (9)	5.00 (6)	MWU = 13532.0	0.264
Urban private	8.88 (5.384)	5.81 (4.662)	7.50 (7)	5.00(6)	MWU = 246.5	0.054
Speciality of admitting team						
Surgical	8.79 (13.435)	7.44 (10.496)	4.00 (6)	5.00 (5)	MWU = 665.5	0.331
Medical	9.04 (10.087)	7.32 (7.260)	5.00 (8)	5.00 (6)	MWU = 14093.5	0.393
Geriatric & orthopaedic	13.26 (13.251)	16.81 (34.458)	7.00 (12)	7.00 (10)	MWU = 572.5	0.379
Home type						
Home alone	11.13 (12.336)	9.76 (11.775)	6.00 (11)	6.00 (7)	MWU = 2000.0	0.494
Home & others	11.61 (12.317)	7.55 (14.349)	7.00 (11)	5.00 (5)	MWU = 9300.0	*0.002*
Sheltered	5.29 (2.563)	7.91 (9.115)	6.00 (3)	4.00 (8)	MWU = 35.0	0.749
Nursing home	4.41 (2.291)	7.25 (5.230)	4.00 (2)	7.50 (10)	MWU = 81.0	0.284
Destination at discharge						
Home	7.53 (7.903)	6.49 (6.386)	5.00 (6)	5.00 (5)	MWU = 13913.0	0.414
Nursing Home (LTC)§	14.00 (17.371)	31.56 (52.807)	5.00 (17)	13.50 (34)	MWU = 221.0	0.230
Non-home (STC)¶	12.24 (8.227)	13.23 (14.793)	11.00 (14)	9.00 (9)	MWU = 420.5	0.559
Deceased	9.46 (8.171)	14.75 (15.276)	7.00 (11)	10.00 (11)	MWU = 36.0	0.244
First Diagnosis						
Cardiac	10.35 (8.616)	6.94 (7.620)	6.00 (16)	4.00 (5)	MWU = 675.0	0.083
Respiratory	6.67 (4.676)	11.11 (10.921)	6.00 (7)	8.00 (9)	MWU = 83.5	0.344
Pneumonia	12.22 (14.001)	8.16 (6.140)	6.00 (12)	7.00 (4)	MWU = 512.5	0.995
Urinary tract infection	18.75 (19.374)	7.67 (11.169)	11.50 (35)	3.00 (5)	MWU = 16.5	0.059
Gastrointestinal	9.64 (7.201)	7.73 (6.980)	7.00 (13)	6.00 (7)	MWU = 20.35	0.416
Infections	7.33 (3.724)	10.00 (10.392)	7.50 (7)	6.50 (13)	MWU = 23.0	0.950
Stroke	6.00 (4.000)	16.39 (45.383)	5.00 (7)	5.00 (6)	MWU = 65.0	0.828
Cancer	12.00 (9.764)	9.57 (6.366)	9.50 (18)	9.00 (10)	MWU = 37.5	0.576
Other	10.40 (12.226)	8.80 (10.242)	5.00 (7)	5.00 (7)	MWU = 1598.5	0.448
Surgery/procedure	2.40 (1.765)	5.87 (9.011)	2.00 (3)	4.00 (4)	MWU = 359.5	*0.001*

†SD – standard deviation; ‡IQR – interquartile range; §LTC – long-term care; ¶STC – short-term care;

Table 2 Total cost statistics of patients with and without dementia

Factor	Dementia Mean (SD)†	No Dementia Mean (SD)†	Dementia Median (IQR)‡	No Dementia Median (IQR)‡	Test	*P*-value
Overall	€8,246 (€9,336)	€6,855 (€11,045)	€4,560 (€7,128)	€4,145 (€4,974)	MWU = 30103.5	0.108
Gender						
Male	€7,780 (€9,911)	€6,304 (€7,365)	€4,145 (€5,181)	€4,145 (€4,974)	MWU = 6951.5	0.842
Female	€8,582 (€8,943)	€7,432 (€13,884)	€5,473 (€8,497)	€4,145 (€5,181)	MWU = 8135.5	0.072
Age Group						
70-79yrs	€7,021 (€8,731)	€6,632 (€12,633)	€4,145 (€4,996)	€4,145 (€4,145)	MWU = 5511.0	0.964
80-89yrs	€8,631 (€9,514)	€7,176 (€7,991)	€5,135 (€6,660)	€4,974 (€4,145)	MWU = 5340.5	0.448
90-99yrs	€8,897 (€9,785)	€7,370 (€8,664)	€5,811 (€7,876)	€3,731 (€7,876)	MWU = 296.0	0.429
Admission Type						
Acute	€8,819 (€9,770)	€7,637 (€12,203)	€4,974 (€6,688)	€4,974 (€5,030)	MWU = 17069.5	0.338
Elective	€5,679 (€6,624)	€5,248 (€7,967)	€4,145 (€4,974)	€3,316 (€4,145)	MWU = 1963.0	0.973
Hospital						
Rural public	€5,688 (€4,432)	€7,785 (€9,177)	€4,145 (€2,487)	€4,145 (€7,461)	MWU = 1081.0	0.898
Urban public	€9,200 (€10,635)	€7,400 (€12,972)	€5,013 (€7,715)	€4,145 (€4,974)	MWU = 13547.5	0.271
Urban private	€7,357 (€4,463)	€4,836 (€3,883)	€6,218 (€5,596)	€4,145 (€4,767)	MWU = 248.0	0.056
Speciality of admitting team						
Surgical	€7,432 (€11,391)	€6,209 (€8,954)	€3,316 (€4,767)	€4,145 (€4,145)	MWU = 662.5	0.320
Medical	€7,502 (€8,352)	€6,095 (€6,071)	€4,145 (€6,632)	€4,145 (€4,974)	MWU = 14077.5	0.385
Geriatric & orthopaedic	€11,088 (€11,097)	€13,832 (€28,108)	€5,803 (€10,724)	€5,754 (€8,533)	MWU = 566.0	0.342
Home type						
Home alone	€9,232 (€10,257)	€8,142 (€9,978)	€4,974 (€9,119)	€4,974 (€6,057)	MWU = 2007.0	0.513
Home & others	€9,687 (€10,278)	€6,261 (€11,738)	€5,803 (€9,119)	€4,145 (€4,145)	MWU = 9273.0	*0.002*
Sheltered	€4,382 (€2,125)	€6,570 (€7,566)	€4,974 (€2,487)	€3,316 (€6,632)	MWU = 35.0	0.791
Nursing home	€3,686 (€1,962)	€6,053 (€4,345)	€3,316 (€1,658)	€6,387 (€8,083)	MWU = 79.0	0.269
Destination at discharge						
Home	€6,248 (€6,518)	€5,397 (€5,350)	€4,145 (€4,974)	€4,145 (€4,145)	MWU = 13941.5	0.430
Nursing Home (LTC)§	€11,664 (€14,497)	€25,908 (€43,010)	€4,145 (€14,093)	€11,192 (€27,979)	MWU = 217.50	0.204
Non-home (STC)¶	€10,195 (€6,813)	€11,068 (€12,691)	€9,119 (€11,440)	€7,461 (€7,142)	MWU = 418.5	0.541
Deceased	€8,039 (€7,196)	€12,228 (€12,664)	€5,803 (€9,176)	€8,290 (€8,912)	MWU = 37.0	0.301
First Diagnosis						
Cardiac	€8,682 (€7,350)	€5,811 (€6,422)	€5,457 (€13,264)	€3,316 (€4,089)	MWU = 672.5	0.080
Respiratory	€5,522 (€3,882)	€9,204 (€9,056)	€4,974 (€5,810)	€6,632 (€7,047)	MWU = 83.5	0.344
Pneumonia	€10,150 (€11,615)	€6,735 (€5,088)	€5,135 (€9,724)	€5,803 (€2,919)	MWU = 505.0	0.915
Urinary tract infection	€15,521 (€15,983)	€6,334 (€9,261)	€9,534 (€28,336)	€2,487 (€3,633)	MWU = 15.5	*0.046*
Gastrointestinal	€8,059 (€6,053)	€6,416 (€5,800)	€5,803 (€11,553)	€4,974 (€5,389)	MWU = 203.0	0.410
Infections	€6,070 (€3,097)	€8,289 (€8,617)	€6,218 (€6,053)	€5,389 (€10,363)	MWU = 23.5	0.950
Stroke	€5,030 (€3,419)	€13,420 (€36,975)	€4,145 (€5,888)	€4,145 (€4,862)	MWU = 62.5	0.733
Cancer	€9,948 (€8,094)	€7,966 (€5,331)	€7,876 (€14,922)	€7,461 (€8,290)	MWU = 38.0	0.622
Other	€8,679 (€10,225)	€7,319 (€8,535)	€4,145 (€6,024)	€4,145 (€5,803)	MWU = 1615.0	0.502
Surgery/procedure	€1,988 (€1,465)	€4,905 (€7,792)	€1,658 (€2,487)	€3,316 (€3,316)	MWU = 355.0	*0.001*

†SD – standard deviation; ‡IQR – interquartile range; §LTC – long-term care; ¶STC – short-term care;