



# Hospital admissions 2000–2014: A retrospective analysis of 288 096 events in patients with dementia



Catarina Bernardes<sup>a</sup>, João Massano<sup>a,b,\*</sup>, Alberto Freitas<sup>c,d</sup>

<sup>a</sup> Department of Clinical Neurosciences and Mental Health, Faculty of Medicine University of Porto, Portugal

<sup>b</sup> Department of Neurology, Centro Hospitalar de São João, Porto, Portugal

<sup>c</sup> Department of Community Medicine, Information and Health Decision Sciences (MEDCIDS), Faculty of Medicine University of Porto, Portugal

<sup>d</sup> CINTESIS – Center for Health Technology and Services Research, University of Porto, Portugal

## ARTICLE INFO

### Keywords:

Dementia  
Hospital administrative data  
Hospitalization  
Burden  
Alzheimer disease  
Mortality

## ABSTRACT

**Introduction:** Dementia is a leading cause of disability worldwide. It is associated with an increased risk of hospitalization, imposing a significant burden on healthcare systems. The evidence on the long-term evolution of this issue and broadly on healthcare systems is currently limited. This study aims to describe the hospitalizations of people who received a diagnosis of dementia admitted to public general hospitals in a western European country with universal health coverage, over more than a decade.

**Methods:** This retrospective observational study analyzed all inpatient episodes from 2000 to 2014 with a primary or secondary diagnosis of dementia using a national hospitalization database from mainland Portuguese public hospitals.

**Results:** A total of 288 096 hospital admissions were registered. Hospitalization rates increased 4.7 times throughout the study period. Pneumonia and urinary tract infections were the most frequent main diagnoses, while dementia itself was the cause of admission in a minority (6.8%) of cases. Cerebrovascular disease, diabetes without chronic complications, and congestive heart failure were the most prevalent comorbidities; 5.9% of patients with dementia admitted to hospital underwent a surgical procedure, orthopedic surgeries being the most frequent. The median length of hospital stay was 8.0 days, and in-hospital mortality rate was 16.1%.

**Conclusions:** Dementia patients represent a significant amount of hospital admissions. Most leading causes of hospital admissions are preventable if timely diagnosed and could be effectively managed in the outpatient setting. These findings may be useful for healthcare resource planning and allocation. Further research should drive evidence-based reorganization of health care systems.

## 1. Introduction

Dementia is a major cause of disability worldwide, especially among older people. (Feigin et al., 2017) Population aging is expected to increase dramatically in the near and foreseeable future (Feng, Coots, Kaganova, & Wiener, 2014; Nourhashemi et al., 2001; Nowrangi, Rao, & Lyketsos, 2011; Qiu, De Ronchi, & Fratiglioni, 2007), intensifying the social and economic impact of this disorder (Bruggenjurgen, Andersohn, Ezzat, Lacey, & Willich, 2015). This might overwhelm hospitals with these patients (Sherzai et al., 2016), since dementia is associated not only with an increased risk of hospitalization and re-hospitalization, but also with longer lengths of stay. (Daiello, Gardner, Epstein-Lubow, Butterfield, & Gravenstein, 2014; Guijarro et al., 2010; Lyketsos, Sheppard, & Rabins, 2000; Phelan, Borson, Grothaus, Balch, &

Larson, 2012; Tolppanen et al., 2015) Research suggests that these patients are admitted to general hospitals for different reasons as compared to patients without dementia. (Daiello et al., 2014; Draper, Karmel, Gibson, Peut, & Anderson, 2011; Guijarro et al., 2010; Lyketsos et al., 2000; Phelan et al., 2012; Tolppanen et al., 2015; Tuppin, Kusnik-Joinville, Weill, Ricordeau, & Allemand, 2009; Zuliani et al., 2012) Admissions could potentially be avoided through better ambulatory care, as the major reasons for hospital admission are usually other disorders rather than the disease itself. (Griffith et al., 2016; Guijarro et al., 2010; Lin, Fillit, Cohen, & Neumann, 2013; Lyketsos et al., 2000; Phelan et al., 2012) Understanding why these patients are hospitalized is an opportunity to identify areas in need in terms of quality improvement, where healthcare systems can act by providing optimal and preventive treatment. Reducing the need for acute and unnecessary

\* Corresponding author at: Department of Clinical Neurosciences and Mental Health, Faculty of Medicine University of Porto, Alameda Prof. Hernâni Monteiro, 4200-319 Porto, Portugal.

E-mail address: [massano.joao@gmail.com](mailto:massano.joao@gmail.com) (J. Massano).

<https://doi.org/10.1016/j.archger.2018.05.006>

Received 23 January 2018; Received in revised form 12 April 2018; Accepted 7 May 2018

Available online 08 May 2018

0167-4943/ © 2018 Elsevier B.V. All rights reserved.

hospitalizations would decrease the costs of care, which seem to be higher in this population. (Griffith et al., 2016; Lin et al., 2013; Lyketos et al., 2000; Phelan et al., 2012; Tolppanen et al., 2015) Also, understanding the impact of the disease on the healthcare system is crucial for adequate planning of public health approaches and rational allocation of resources (Nunes et al., 2010; Santana, Farinha, Freitas, Rodrigues, & Carvalho, 2015; Sosa-Ortiz, Acosta-Castillo, & Prince, 2012), in order to ensure their efficient use.

Most previous studies on this subject were restricted to certain regional areas of a given country, or even to beneficiaries of a specific insurance scheme, possibly limiting the usefulness of results. Bearing in mind these data gaps, the present study aims to analyze the hospitalizations of people admitted to all public general hospitals with a diagnosis of dementia between 2000 and 2014 in Portugal, a European Union country providing universal health coverage to all citizens through a tax supported public health service.

## 2. Methods

A retrospective observational study was carried out using a national hospitalization database (Santos, Oliveira, Costa-Pereira, Amarante, & Freitas, 2016) from mainland Portuguese public hospitals, provided officially by the Health Services Authority of the Portuguese Ministry of Health. The study took into account all inpatient episodes from 2000 to 2014 with a primary or secondary diagnosis of dementia, coded as 090.40, 290.0, 290.2x, 290.3, 290.1x, 290.4x, 291.2, 294.2x, 294.1x, 046.1, 046.11, 094.1, 331.0, 331.1x, 331.82, (332.0 AND 294.1x) and (333.4 AND 294.1x), according to the 9th Revision of the “International Classification of Diseases, Clinical Modification” (ICD-9-CM), as given in Table 1. Each hospitalization was analyzed as an independent episode.

Given the nature of the studied disorder, the following seven age intervals were defined: 0–59 (named youngsters), 60–64, 65–69, 70–74, 75–79, 80–84, and > 85 years old (named elders). The variables analyzed were age, gender, settlement type, dementia subtype, main diagnosis, length of stay, surgical procedures performed, comorbidity profile, type of admission and final destination at discharge. In order to assess the dementia subtype, the codes were clustered into fifteen groups, as described in Table 1. Principal diagnosis and procedures were also assembled according to the Clinical Classifications Software (CCS) (“Clinical Classifications Software for ICD-9-CM,” 2016) and the Centers for Disease Control and Prevention (CDC) (“Procedure Code Mapping to NHSN Operative Procedures,” 2012), respectively. Settlement type categorization in “rural and urban” considered the ProDeR (“Programa de Desenvolvimento Regional”, a Portuguese strategic and financial program for rural development endorsed by the European

**Table 1**  
Subtypes of dementia included and the associated ICD-9-CM codes.

Subtype of dementia	ICD-9-CM codes
Dementia paralytica juvenille	90.40
Senile dementia	290.0 290.2x 290.3
Presenile dementia	290.1x
Vascular dementia	290.4x
Alcohol-induced persisting dementia	291.2
Unspecified dementia	294.2x
Dementia in conditions classified elsewhere	294.1x
Creutzfeldt-Jakob disease	46.1
Variant Creutzfeldt-Jakob disease	46.11
General paresis	94.1
Alzheimer's disease	331.0
Frontotemporal dementia	331.1x
Dementia with Lewy bodies	331.82
Parkinson's disease	332.0 AND 294.1x
Huntington's disease	333.4 AND 294.1x

Commission, available at [www.proder.pt](http://www.proder.pt)) classification (“Classificação das Freguesias do Continente em Rurais e Não Rurais, link available in reference list”). Finally, the comorbidity profile was evaluated using the Charlson Comorbidity Index (CCI) (Quan et al., 2005).

The hospital admission rates calculations were based on the Statistics Portugal data (Instituto Nacional de Estatística, available at [www.ine.pt](http://www.ine.pt)), referring to the population living in mainland Portugal in each year of the study period, which ranged from 9 845 237 to 10 059 864 inhabitants (“Resident population by place of residence, sex and age group, link available in reference list,”). To overcome the effect of variation in age distribution between districts, we calculated age-adjusted hospitalization rates, using the method of direct standardization. The standard population chosen was the population living in mainland Portugal between 2000 and 2014. The detailed explanation of this calculation can be found in Anderson et al. (Anderson & Rosenberg, 1998) Hospitalization rates according to the settlement type were performed for 2011 only, since there was no data about the estimated number of people living in each parish during the remaining years of the study. Increment ratios were calculated dividing the frequency of hospitalizations with a specific condition in 2014 by the frequency of hospitalizations in 2000 with the same condition.

## 3. Results

A total of 288 096 hospital admission episodes of people diagnosed with dementia were registered between 2000 and 2014. This number reflects 2.1% of all hospitalizations (e.g. due to any cause) and 4.8% of those among people  $\geq 60$  yo, denoting a total hospitalization rate of 192.4/100 000 inhabitants/year and a hospitalization rate of 787.2/100 000 inhabitants/year for people  $\geq 60$  yo. Most hospital admissions (95.2%) were the result of an emergency episode. Fig. 1 shows significant variation in age-adjusted hospitalization rates between different districts, about 3 times higher in Vila Real than in Évora or Beja. Fig. 1 also elucidates the increment in hospitalization rates observed throughout the study period. In fact, in 2014, this value was 4.7 times higher than in 2000 (391.0 vs 83.5 hospitalizations/100 000 inhabitants/year). The admission rate was higher in women (217.5 vs 165.2 hospitalizations/100 000 inhabitants/year), elders (3557.8 in > 85 yo vs 1950.2 in 80–84, 964.3 in 75–79, 413.3 in 70–74, 164.0 in 65–69, 71.3 in 60–64 and 5.8 hospitalizations/100 000 inhabitants/year in < 60 yo) and people from rural areas (265.9 vs 215.0 hospitalizations/100 000 inhabitants/year). A male:female ratio of 1:1.3 was seen. However, in all age ranges the number of hospitalizations per inhabitant per year was higher in men (7.5 vs 4.1 in < 60 yo; 89.9 vs 55.1 in 60–64; 194.4 vs 138.7 in 65–69; 474.0 vs 366.0 in 70–74; 1065.4 vs 893.1 in 75–79; 2066.2 vs 1879.3 in 80–84 and 3678.2 vs 3501.9 in > 85 yo). In general, people between 80 and 84 years old were the most affected (26.3%). In fact, 95.2% of all episodes were from 60 to 94 yo patients, and 49.3% were from 80 to 89 yo patients.

### 3.1. Dementia subtypes

Table 2 presents the different subtypes of dementia considered in this study, as well as the associated frequencies, lengths of stay and in-hospital mortality rates. Dementia itself was the cause of admission in 6.8% of all episodes. Vascular dementia (VaD), Alzheimer's disease (AD) and senile dementia were seen in 87.7% of the hospitalizations. However, in contrast to other types of dementia, they were rarely considered the main diagnosis. During the study period there was an increase in the frequency of unspecified dementia. While male admissions were mostly codified with VaD (31.1%), female admissions were mainly codified with AD (30.2%). Additionally, youngsters' admissions were mainly classified with VaD (23.4%), alcohol-induced persisting dementia (22.0%), and AD (15.0%), whereas elders' admissions were mainly classified with senile dementia (34.6%), VaD (30.6%), and AD (23.1%).

Download English Version:

<https://daneshyari.com/en/article/8257415>

Download Persian Version:

<https://daneshyari.com/article/8257415>

[Daneshyari.com](https://daneshyari.com)