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Twenty-Four–Year Demographic Trends of a Brazilian Long-Term Care Institution for the Aged

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A B S T R A C T

Objectives: The objectives of this study were to assess demographic trends of a long-term care institution (LTCI) for the aged throughout 24 years and to discuss the results considering regulations and demographic, socioeconomic, and epidemiological changes in Brazil during this period.
Methods: We assessed administrative data of 394 residents of a Brazilian LTCI between January 1, 1990, and December 31, 2013. We calculated age at admission, age at death, length of stay (LOS), and median age of the residents on December 31 for each year from 1990 to 2013. Annual mortality index and total number of admissions and discharges also were analyzed. We used the Jonckheere-Terpstra trend test and 1-way ANOVA for statistical analysis.
Results: We observed a significant statistical increased trend of the mean age at admission, of the median age of the residents, and of the median LOS throughout the period. There was no increased or decreased trend of the median age at death.
Conclusions: The increased trend of the mean age at admission and the median age of the residents may reflect improvements in health, socioeconomic status, life expectancy, and the development of protective regulations for older adults in Brazil. The increased trend of the median LOS may reflect the aforementioned improvements, but we expect a future inversion of this trend due to the admission of older, sicker, and more functionally dependent elderly individuals.

Population aging is a worldwide phenomenon. High-income countries (HICs) have the oldest population due to an aging process that occurred throughout the past century.[1] On the other hand, most elderly individuals already live in less developed nations and some middle-income countries (MICs) are experiencing a remarkably fast demographic transition. The same population aging that extended over a century in France will occur in just 2 decades in Brazil.[1] This fast demographic transition combined with socioeconomic inequities of less developed nations may lead to a great number of elderly individuals with unmet health and social assistance needs.

The development of comprehensive long-term care for the aged is a key public health and social assistance priority for aging populations. Preventing premature institutionalization is important for older adults' quality-of-life improvement and lowering economic burden to society. In HICs, older adults are already living longer in the community, being admitted later to nursing homes (NHs), although sicker and with greater functional dependency.[2–4] Admissions to long-term care institutions (LTCIs) later in life and for shorter periods also may be the result of an increased availability of home-based services and of the use of standardized criteria for admission.[5–7]

Nevertheless, HICs have a greater use of LTCIs compared with 2 major MICs. The proportion of the population older than 65 years living in LTCIs is 3.7% in Canada, 4.3% in the United States, 5.1% in the United Kingdom, and 5.3% in Australia.[8] In China, 1.5% of elderly individuals live in NHs or in apartments for seniors,[9] and in Brazil the estimated prevalence is from 0.46% to 1.0%.[10–13]

In Brazil, this relatively low use could be related to a small number of LTCIs and to the low social acceptance to living in these institutions.[10]

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Additionally, the low prevalence of oldest-old in the elderly population of MICs contrasts with the higher percentage in HICs.[12,14]

Currently, Brazilian LTCIs are defined as residential facilities[15] with a major social assistance role. In a national survey, 65.2% of these institutions were philanthropic and 34.9% of the residents were functionally independent.[11] Additionally, more than half of the residents were long stayers, living in the LTCI for more than 3 years in 2 regional studies.[12,13]

Nonetheless, the increase of the oldest-old population in Brazil may lead to a greater number of functionally dependent and frail older adults, imposing a higher need of beds, regulation, and investments for LTCIs. If Brazilian LTCIs reorganize themselves to a more health-oriented profile, we should expect a transition to shorter stays due to post-acute care from hospitals as observed in the United States through the 1980s.[16,17] So far, there is still a lack of studies evaluating these institutions in Brazil regarding demographic trends throughout the years.

In accordance with its global agenda, the Task Force on Nursing Homes of the International Association of Gerontology and Geriatrics has published a paper calling for more research on NH systems throughout the world.[18] Therefore, the aims of this study were to assess demographic trends of one philanthropic LTCI during a 24-year period and to discuss the results considering regulations, and demographic, socioeconomic, and epidemiological changes in Brazil during this period.

Methods

The "Casa do Ancião da Cidade Ozanam" is a philanthropic LTCI for the aged maintained by Sociedade São Vicente de Paulo (SSVP). The SSVP is a religious order that owns 45.9% of philanthropic LTCIs of the metropolitan area of Belo Horizonte, Brazil.[19] This unit was established in 1945 and had a maximum of 93 beds in 2013. Currently, residents are admitted after assessment of social vulnerability, dependency in activities of daily living, and lack of family support by the Belo Horizonte Municipality's social service. Minimum age of 60 years for admission was established after the promulgation of the Older Adult Statute.[20]

The ethical committee of the Federal University of Minas Gerais approved this study. We collected administrative data of residents that lived in the institution between January 1, 1990, and December 31, 2013. Administrative data were gender, date of birth, date of admission, and end date (date of death; date of discharge from the unit; and December 31, 2013, for those who were still living at the institution at the end of the study). From the total of 417 residents, 23 were excluded because of lack of one or more data. This led to 394 participants (94.48% of the residents on the period). We calculated for each resident, his or her age at admission, length of stay (LOS), and age on each end date. Sample distributions were assessed with the Shapiro-Wilk test for normality. We used the median as the parameter for skewed distributions and mean for normal distributions. We assessed the mean age at admission, median age at end date, and median LOS for the entire period and for the residents living in the unit on December 31, 2013. Statistical significance was set to a minimum of .05 and confidence interval to 95%. For analysis of the median age difference between genders we used the Mann-Whitney test.

At the second phase, we analyzed the data on a time series. We selected all residents who were living at the unit on December 31 for each year. With these data we could analyze median age and median LOS. We further calculated mean age at admission and median age at death for each year of the time series. We calculated a mortality index for each year, dividing the number of deaths of the year by the total number of residents through the year multiplied by 100.

For trend analysis, we divided the time series into 6 groups (1990–1993; 1994–1997; 1998–2001; 2002–2005; 2006–2009; 2010–2013). We selected the Jonckheere-Terpstra (J-T) trend test to assess trend on the time series groups for age at admission, age at death, LOS, and age of the residents on December 31. We additionally used a 1-way analysis of variance (ANOVA) to assess age at admission, as it was normally distributed.

Results

From the total analyzed data, there were 251 deaths (63.7%), 61 discharges (15.5%), and 82 residents (20.8%) remained living at the institution on December 31, 2013. Eight centenarians lived in the institution (2% of the total), all were women, 6 died and 2 were alive on December 31, 2013. Nine residents were younger than 60 years at their end date. Women represented 92.9% from the total. On the end date, women were aged a median 81.9 years and men 77.2 years.

For the entire period, 2.3% were younger than 60 years; 11.9% were between 60 and 69 years; 27.4% between 70 and 79 years; and 58.4% were 80 years and older. Mean age at admission was 76.14 years. The median age at death was 82.13 years. The median age at discharge was 77.32 years. Total LOS data revealed that 19.8% stayed less than 1 year; 39.6% stayed between 1 and 5 years; 20.3% stayed more than 5 years, and 20.3% stayed more than 10 years. Median LOS was 3.84 years (Table 1). Mean mortality index was 10.78 deaths per 100 residents per year. There was a mean of 13.67 admissions per year, 2.54 discharges per year, and 83.91 residents per year (Figure 1).

Comparing 1990–1993 with 2010–2013, we found mean ages at admission of 76.81 years (59.55–92.97) and 80.26 years (60.07–97.66), respectively. The median LOS were 5.03 years (0.01–34.16) and 5.53 years (0.03–46.54). The median ages of the residents on December 31 were 78.14 years (44.73–100.52) and 80.46 years (57.10–106.07). The median ages at death were 81.20 years (47.26–101.07) and 83.19 years (60.67–106.64).

We observed a statistically significant increased trend of age at admission (J-T Statistic $P = .010$; ANOVA $P = .002$), LOS (J-T Statistic $P = .002$), and age of the residents on December 31 (J-T Statistic $P < .001$) (Figures 2–4) There was no statistical increase or decrease in trend of age at death (J-T Statistic $P = .139$). We also observed a marked decrease of the percentage of the group younger than 60 years through the time series (Figure 5).

Discussion

The total median age of the residents was 81.27 years and women were older (81.9 years) than men (77.2 years). This is consistent with the life expectancy (LE) gender gap observed in the Brazilian population and to the greater prevalence of women in

Table 1
Demographic Characteristics of the Sample

Total Data Analysis	n	Mean	Median	SD	Skewness	SE Mean/Skewness	Min	Max	Per 25	Per 75
Age at end date	394	80.97	81.27	9.92	−0.36	0.12	47.26	106.77	75.10	87.75
Age at admission	328	76.14	77.05	10.61		0.586	40.23	97.84	69.30	84.23
Age at death	251	81.97	82.13	10.25	−0.57	0.154	47.26	106.77	76.75	89.21
LOS	394	6.29	3.84	7.66	2.43	0.12	0.003	47.06	1.34	7.67
Age of the residents on December 31, 2013	82	80.68	81.30	9.08		0.27	60.10	101.60	74.15	86.94