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The use of preventable hospitalization for monitoring the performance of local health authorities in long-term care

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ABSTRACT

Objective: The objective of the study was to examine whether there are differences in the performance of long-term care programs between local health authorities, using preventable hospitalization as an indicator.
Methods: A retrospective cohort study compared the rate of preventable hospitalization for local health authorities in Tuscany (Italy) between January 2012 and September 2016. Several administrative datasets for the patients in long-term care programs were linked at the individual (patient) level. Elderly disabled patients 65 years of age and older in long-term care programs in Tuscany from both types of programs: nursing homes (n = 4 196) and home care (n = 15 659) were included in the study.
Results: The rate of preventable hospitalization differed considerably between local health authorities. Three out twelve local health authorities had a significantly lower and one had a significantly higher preventable hospitalization rate than the regional average.
Conclusion: There was a large variation in the rate of preventable hospitalization among the local health authorities. Applying preventable hospitalization as an indicator for quality, with implications for periodical audit can be used for monitoring the performance of a long-term care program.

1. Background

According to the OECD, with the share of the population aged 80 years old or over increasing, by 2050 Italy will be one of the oldest populations in an OECD country [1]. By 2030 it is estimated that around 9% of the Italian population will be over 80 years old [4]. Moreover, public expenditure on long-term care (LTC) in 2007 was estimated at 1.7% of the Italian GDP [7], and it can be expected to grow. As society ages, well-organized health support and personal care will be increasingly needed. In the light of this challenge, to ensure the suitable delivery of care policy makers should control its provision at the local health authoritylevel. Taking into consideration the growing number of elderly people, which brings about an increase in the percentage of disabled individuals among the population, monitoring the performance of local health authoritiesis of great interest to policy-makers. In the literature, previous studies have noted improvement through the use of tools developed to monitor provision at the local level, thereby showing that the results could be used to provide feedback on strengths and weaknesses, with the aim of encouraging future actions and goals [37].

Institutional fragmentation is a key characteristic of the Italian LTC system [7,38]. The Italian health care system provides universal coverage free of charge, with regional level organization in which the regions are responsible for the organization and delivery of health care. The primary health system's principles and goals, the core benefit package of services, and the distribution of national funds to the regions are all set up at a national level. Community health services, combining primary care and secondary care directly or through hospitals (public or private accredited providers) are organized at the local level by geographically based local health authorities (LHAs). Financing schemes for LHAs vary from region to region, as regional governments finance them and the LHAs directly depend on them [6]. Depending on the region there are different modalities regarding the source of funding, governance and management of responsibilities. The regional authorities and local municipalities are responsible for the organization and provision of long-term care programs. As the center of the system, the regions define their own policies and instruments.

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In Italy LTC is organized in terms of residential services, home care and monetary benefits. Although monitoring the provision of services is under the jurisdiction of the central government, there is still a lack of actual action in this field. Correspondingly, the regions are responsible for monitoring the quality of care given by private and public healthcare providers [5,7,9].

Although LHAs are located in the same region, with the same general principles and organization, such as the same criteria for financing public and private health-care providers, there may be differences when it comes to the performance of their long-term care program. Some of the possible causes for differences in the performance of LHAs may be health-care resources and the efficiency of care. Regulations in the Tuscany regional make it possible for each district that is under the organization of an LHA to improve its LTC program. Tuscany's health system is divided into district zones "Zone-distretto", each one representing an optimal territorial area for assessing the health and social need of communities. With the available resources provided by municipalities and LHAs, each district zone organizes its own LTC services. A single regional territory can contain different geographical areas (such as mountainous areas and areas with high or low housing density), and the continuity of social and health integration for elderly disabled people is managed locally. Taking this into account, it is important to stimulate debate on the causes of differences in the long-term care provided by different LHAs.

The risk of hospitalization is generally high among elderly disabled people with complex medical, functional and support service needs [8,17,19]. In addition, the patients in an LTC program are frail and chronically ill adults, and some hospitalization may be necessary. However, with good organization of outpatient care, certain hospitalization might be preventable. Improvements in the quality of the monitoring, evaluation and early management of specific patient profiles may help to reduce preventable hospitalization. Empirical evidence on the hospitalization of patients in LTC has revealed potential preventable hospitalizations [2]. For example, a study conducted on the Medicare and Medicaid users of nursing homes and home and community-based services in several place in the US [3] demonstrated an association between LTC settings and potentially preventable hospitalization.

In this study, we aimed to investigate whether it is possible to measure the quality of LTC provision by comparing the preventable hospitalization rate of LHAs. Information on the performance of LHAs could be used as a tool for discussion between policy makers. In contrast with previous studies that focus on using preventable hospitalization to compare two LTC organizational settings [3], our study showed that preventable hospitalization as an indicator could be used for reporting the performance of complex organizational systems for subjects in both types of LTC, i.e., nursing homes or home care. Observing types of LTC separately through public reporting could help to give a better understanding of individual problems from each LTC organizational unit and improve the coordination and integration of services. Moreover, changing the focus from the national to the local level of evaluation by monitoring performance using preventable hospitalization as an indicator can lead to the LTC system being easier to manage, as public reporting will encourage the local management to understand and respond better to local needs [39,40].

2. Methods

2.1. Study design, setting, and sample

A retrospective cohort study was conducted on elderly disabled patients in LTC programs in Tuscany, Italy. The sample consisted of patients 65 years of age or older who started an LTC program in the period from January 2012 to December 2014, with the exclusion of terminal cancer patients and other terminal patients. Terminal cancer and other terminal patient were defined as patients who are not likely to benefit from curable treatment and with a prognosis of death in the next 6 months [31,32]. The follow-up for preventable hospitalization was in the period from January 2012 to September 2016. Patients from both types of LTC programs, residential care and home care, were included in the study.

2.2. Data sources

We obtained data from several combined sources from the Tuscany region in Italy. A merged database was created using information from the registers for residential and home care, hospital discharge records, drug-dispensing records and the register of chronic diseases in Tuscany. The datasets with anonymized unique ID numbers were provided by ARS Toscana (Tuscany Regional Health Agency), which is allowed by regional law to use these data for research purposes. The Declaration of Helsinki and Italian Law number 196/2003 on personal data protection were respected.

Information about the number of elderly individuals in each LHA was collected from the National Institute for Statistics (Istat) from 2012, and information about the patients' clinical characteristics, Charlson index score, number of prescribed drugs and disability level was collected from different administrative flows from ARS Toscana.

2.3. Measures

The key outcome measure used to monitor performance and compare different local health authorities was preventable hospitalization for specific diagnoses.

Based on previous studies the following list of diagnoses was used: cellulitis, congestive heart failure, chronic obstructive pulmonary disease (COPD), dehydration/electrolyte imbalance, pneumonia/respiratory infection, sepsis and urinary tract infection [2,3,8,34]. The diagnoses in this list, used to measure preventable hospitalization, only included conditions that were common to all of the previous studies. These diagnoses were identified as the primary cause of hospitalization from hospital discharge records.

We included variables for age, gender, urban or rural residence, clinical characteristics, Charlson index, disability level and number of prescribed drugs. Age was divided into two categories (65–79 and $\geq$80), with the first group described as young-old (aged 65–79 years) and the second as the oldest-old (80 years old or above) [33]. The urban or rural categorization was based on OECD Regional Typology, 2010. The number of prescribed drugs variable was measured as the sum of all the drugs a patient uses, and each drug was classified according to the ATC5 classification system. Additionally, we included a disability level variable, calculated using an algorithm that combines three scales: the level of dependence in BADL (Basic Activities of Daily Living), the level of cognitive impairment measured through the "Short mental status questionnaire" [29] and the level of mood and behavioural disorders measured using the respective scales included in the Minimum Data Set – Home Care (MDS-HC) [30], which presented a reflection of the individual's health status and medical care needs. The disability level variable was developed in a project on LTC development in Tuscany [18]. The presence or absence of diseases such as heart failure, ischemic heart disease, COPD and dementia was included. Risk-adjusted patient profiles were used in order to consider the variation between patients that can affect preventable hospitalization. The selection of risk factors was based on demographic characteristics and clinical factors [41]. All analyses were carried out for the total sample and stratified by type of LTC program, residential or home care.