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# Factors associated with not receiving homecare, end-of-life homecare, or early homecare referral among cancer decedents: A population-based cohort study



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#### ARTICLE INFO

## Article history: Received 21 January 2014 Received in revised form 27 October 2014 Accepted 25 November 2014

Keywords:
Homecare
Cancer
End-of-life
Health care access
Equality

#### ABSTRACT

Publicly funded homecare has been shown to reduce acute care use and improve quality of life for those nearing end-of-life (EOL). Yet despite the known benefits of homecare, many EOL cancer patients never receive these services. We used administrative data on all cancer decedents in Ontario, Canada in 2006 to determine predictive factors of *not* receiving homecare, *not* receiving EOL homecare, and late initiation of EOL homecare. 22,262 decedents met the eligibly criteria, 25% of whom never received homecare in the last six months of life. A logistic regression found that cancer disease site, having a comorbidity (OR: 1.15, 95% CI: 1.1–1.2), region of residence, shorter cancer survival (OR: 2.09, 95% CI: 1.8–2.4), being male (OR: 1.25, 95% CI: 1.2–1.3), lower income (OR: 1.06, 95% CI: 1.03–1.08), older age (OR: 1.03, 95% CI: 1.02–1.05), and less prior emergency department use were significant factors associated with not receiving homecare (p < 0.001). Individuals with hematological cancer (OR: 1.57, 95% CI: 1.3–1.8) were less likely to receive homecare in their final months. Some of these covariates also predicted not receiving EOL homecare and late referral to these services (p < 0.05). The systematic differences in homecare use that we identified can help to guide strategies for improving access to these important services.

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#### 1. Introduction

The desire to provide high-quality and cost-effective end-of-life (EOL) care are causing healthcare systems to shift from a hospital-centric to a community-centric view that provides EOL care to patients in their homes [1]. EOL is a defined as the period of imminent decline before death [2]; for our study we have used the timeframe of the last six months of life. The home is an important setting for EOL care because of escalating health care costs, mostly due to hospitalizations, to meet the demands of an aging population [3,4], and the preference of most patients to die in their home [5,6]. Indeed publicly funded homecare at EOL has been shown to improve patient well-being, reduce acute care use, and lower overall healthcare costs [7–11]. Accordingly, the expansion of homecare is an identified priority in many national EOL care policies [12-14], being viewed as a sustainable alternative to costly institutional care. EOL homecare in Canadian and United Kingdom contexts is similar to visiting hospice services in the United States, embodying an array of health, practical, and social support services provided to patients in their place of residence [15–17]. The objectives of EOL homecare are to help the patients maintain independence in their home, ensure their safety, manage symptoms, and preserve their quality of their life [18,19]. For home to be the setting for EOL care is in part a function of the accessibility to homecare service support, which has not been extensively studied [20,21].

The option of homecare is of particular relevance to cancer patients nearing the end of their life. A large number of studies have reported that patients with advanced cancer have many unmet needs [22-24] including unmanaged pain, psychological distress, and other symptom burdens [25,26]. The typical trajectory of decline of cancer patients is relatively short and predictable compared to those with non-malignant life-limiting illnesses [27], providing opportunity for care planners to get needed supports in place in the home and contain symptom exacerbation. Despite the known necessity and propriety of EOL care for advanced cancer patients residing in the home, many never receive these services in the last months of life [20,28]. While the impact of receiving homecare on patient outcomes such as satisfaction, healthcare usage, and place of death has been relatively well researched, little is known about the factors associated with not receiving homecare among those who could potentially benefit from these services. Identification of systematic disparities in homecare access is important to guiding directives toward meeting the EOL needs of the population in an inclusive and cost effective manner.

Our objectives in this research were threefold. First, among a population-based cohort of cancer decedents, to determine the factors associated with homecare not being received. Second, among those who received homecare, to determine the factors associated with EOL homecare not being received. Third, among those who received EOL homecare, to determine the factors associated with EOL homecare not being initiated early.

#### 2. Methods

#### 2.1. Study design and setting

This is a population based, retrospective cohort study. Administrative health care datasets were linked using a common unique identifier to provide the demographic and service use characteristics of all decedents in Ontario, Canada with a cancer confirmed cause of death in 2006. Residents of this province are covered through a universal, publicly funded health insurance program that includes physician services, hospital care, and homecare [29].

Each of Ontario's 14 health regions has a Community Care Access Centre (CCAC) that determines patient eligibility for homecare and coordinates these services in that area [30,31]. Referrals to homecare can be made by hospital physicians, community providers, or individuals, such as neighbors or family members [32]. Homecare, including health professional, practical, and equipment services, is provided through non-profit and private community agencies contracted by the CCAC. To be eligible for any publicly funded homecare, the patient must need at least one professional service in the home (i.e., nursing, physiotherapy, occupational therapy, or speech language pathology). Homecare recipients are classified into a service allotment category which corresponds to the goals of care and intensity of service required [12]. The "end-of-life" homecare category denotes the greatest service entitlement, often with specialized care providers. While non-EOL homecare services may include elements of palliation, such as attention to pain, EOL homecare typically deals with more complex symptom management and has a clear EOL care intent. To receive EOL homecare, the patient must, at a minimum, have a health condition that is not responsive to curative treatment and be expected to die within a year.

#### 2.2. Data sources

The study population was identified from the Ontario Cancer Registry (OCR), a validated data source for capturing all diagnosed cases of cancer, date of diagnosis, and cancer-confirmed cause of death [33]. The demographic characteristics of this cohort were determined from both the 2006 Canadian Census of the Population and the Registered Persons Database (RPDB), a registry of all individuals eligible for public health care in Ontario. Use of homecare was derived from the provincial Home Care Database (HCD), emergency room visits from the National Ambulatory Care Reporting System (NACRS), and inpatient hospitalizations (excluding rehabilitation services and complex continuing care) from the Discharge Abstract Database (DAD). The Ontario Drug Benefit (ODB) Program Database was used to determine patients who at any point in the last six months of life had medications dispensed at a long-term care (LTC) faculty, thus indicating that they were a LTC resident, as validated in prior research [34].

#### 2.3. Case determination

Cases were based on all decedents with a cancerconfirmed cause of death from the OCR. Decedents who

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