Estimating the Cost of End-of-Life Care Among US Adults: Real-World Evidence Using a Case-Crossover Study Design

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Background

End-of-life care has been shown to account for a significant portion of overall healthcare spending [1]. Costs of end-of-life care have most often been estimated in Medicare populations, resulting in a gap in understanding of the costs of end-of-life care among commercially insured patient populations. Commercially insured populations are generally younger and more likely to be employed than Medicare populations, meaning results from Medicare studies may not be generalizable to patients who are commercially insured. The incomplete capture of death records in real-world data studies is a substantial limitation. Missing death information often makes traditional cohort and case-control study designs inappropriate options for measuring overall survival or differences in the costs of end-of-life care. Unlike cohort and case-control study designs, case-crossover studies include patients in an analysis such that each patient serves as their own control, leading to an adjustment of time-invariant confounders. The generalizability of findings is discussed.

Objective

To estimate the cost of end-of-life care in CHRONOS, a large US real-world database, using a case-crossover study design.

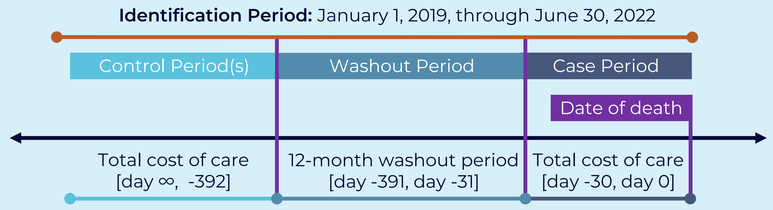

Figure 1. Study Diagram

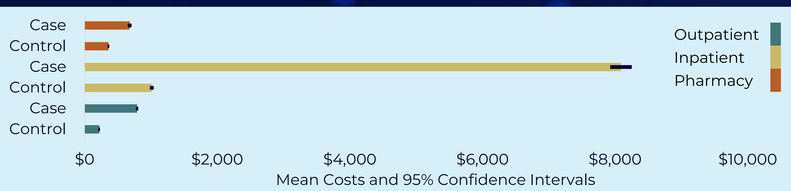

Figure 2. Mean Costs by Case and Control Period and Place of Service

Methods

Patients with a death recorded between January 1, 2019, and June 30, 2022, were identified in CHRONOS, a RWD claims database. Patients were required to be age 18+, enrolled in a health insurance plan for at least 30 days prior to the date of death, and be enrolled in a health insurance plan for at least one 30-day period more than 12 months before the month of death (Figure 1).

The date of death was defined as the date of service for a claim with an ICD-10-CM diagnosis, HCPCS, discharge, or type of bill code indicating a death occurred. End-of-life care was defined as any care recorded and paid on an institutional, professional, or pharmacy claim in the 30 days before death. The total cost of care paid by a healthcare insurer or patient in the 30 days before death was compared to costs of care paid during enrolled months in the patients' history. A 12-month washout period was used to separate the month of death and control months (Figure 1).

A mean difference and 95% confidence interval were calculated using a paired t-test and all costs were adjusted to 2022 USD.

Results

Patients with a death recorded in CHRONOS were 53% female and had a mean age of 51.7 (SD: 13.7) years. Higher costs in the month before death were most frequently due to oncology-related care recorded on institutional claims. After diagnoses for malignancies, CPD, diabetes, and mild liver disease were the most prevalent diagnoses (Figure 3).

The mean costs of care paid in the case period were $6,397.85 and were significantly higher than the costs in control periods The mean difference between case and controls periods was $5,195.80 ($5,077.30-$5,314.30; Figure 4).

Inpatient care was the most expensive with a mean cost of $8,088.20 ($7,925.80-$8,250.60) in the case period and $1,013.30 ($984.80-$1,041.90) in the control period (Figure 2).

Conclusions

These findings show the cost of end-of-life care is significantly higher than the costs associated with care received during other time periods in patients' healthcare journey. Understanding the magnitude of this increase can support appropriate planning, which improves patients' and families' quality of life. The generalizability of this analysis may be limited to US deaths occurring in healthcare settings and among commercially insured patients.

1. Duncan, I., Ahmed, T., Dove, H., & Maxwell, T. L. (2019). Medicare Cost at End of Life. The American Journal of Hospice & Palliative Care, 36(8), 705–710.

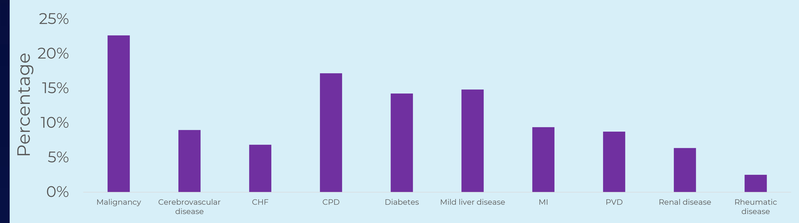

Figure 3. Top 10 Charlson Comorbidities
Note: CHF, congestive heart failure; CPD, chronic pulmonary disease; MI, myocardial infarction; PVD, pulmonary vascular disease

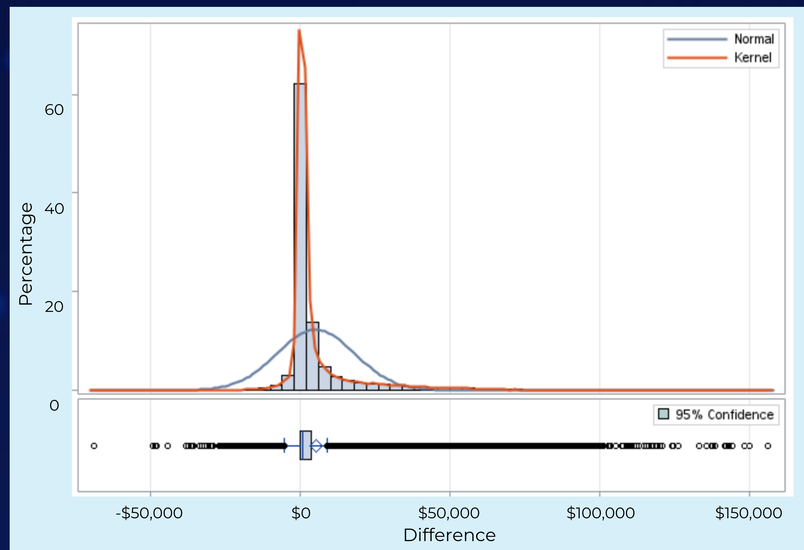

Figure 4. Distribution of Differences Between Case and Control Periods