Effect of Advance Directives on End-of-Life Care and Spending Varies Regionally

Nicholas LH, Langa KM, Iwashyna TJ, Weir DR. Regional variation in the association between advance directives and end-of-life Medicare expenditures. JAMA 2011;306:1447–53.

Study Overview

Objective. To examine the associations between advance directives and end-of-life expenditures and care, and to evaluate whether regional patterns modified these associations.

Design. Retrospective cohort approach relying on longitudinally collected survey data and linked Medicare claims data.

Setting and participants. The cohort was made up of respondents to the Health and Retirement Survey (HRS), a nationally representative interview-based survey conducted every 2 years on older US residents. The survey includes 1 interview with a next-of-kin after a respondent's death, and data is linked with Medicare files at the individual level. HRS respondents were included in this study if they died between 1998 and 2007 at age 65 or older or while on Medicare for other disability.

The primary "exposure" of interest was whether a decedent had created a treatment-limiting advance directive. This information was not present in the HRS interviews with the Medicare beneficiaries themselves so was obtained by reviewing interviews conducted with next-of-kin after beneficiaries' deaths. Decedents were classified into 1 of 3 groups; those with a directive specifying that they wanted some limitation on end-of-life treatment (eg, "do not intubate" or "do not resuscitate"), those with a directive specifying that they wanted all care possible, and those with no advance directive. Because only 1.5% of decedents had advance directives requesting that they receive all possible care, the researchers classified these individuals as having "no treatment-limiting advance directives."

Main outcome measures. The primary outcome measure was a decedent's Medicare spending in the last 6 months of life. Other outcomes included hospitalizations, hospice care, and in-hospital death. Important covariates included comorbidities in the last 6 months of life, race, wealth, education, and age. Additionally, the decedent's region of residence (according to Dartmouth Atlas areas) was assigned to 1 of 4 spending quartiles based on 1999–2005 Medicare spend-

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ing on beneficiaries in the 6 months before death. The median spending for the first quartile ("low-spending") regions was $8787, that for quartiles 2 & 3 ("medium-spending") was $10,848 and for the 4th quartile ("high-spending"), $15,744.

Main results. The final group of decedents included in the analysis was made up of 3302 people, of whom just over half were women and who passed away at an average age of 82.8 years. 70% were hospitalized at some point in their final 6 months of life and 41% died in a hospital. 61% had a living will or durable power of attorney and 39% had a written treatment-limiting advance directive. Patients with a limiting directive were more likely to be white, well-educated, and affluent. Importantly, median Medicare spending in the last 6 months of life was similar despite the type/presence of advance directive ($21,614 for those without limiting directives vs. $21,008 for those with a limiting directive, $P = 0.53$).

The investigators found that decedents from low-spending regions were slightly more likely to have treatment-limiting advance directives than those from high-spending regions, a relationship that persisted after adjustment for demographic and socioeconomic characteristics. The adjusted odds ratio (OR) for having a treatment limiting advance directive if one was from a high spending region was 0.69 (95% confidence interval [CI], 0.54–0.88). Despite differences in regional spending, the breakdown of cause of death and overall comorbid illness was very similar across the 4 quartiles of spending.

Multivariable log-transformed linear regression models were built to relate advance directive type to end-of-life expenditures. Initial results showed no difference in individual Medicare spending by advance directive category. However, when models were stratified by regional spending level (low, medium, high), there were important differences. Specifically, residents of high-spending regions with advance directives limiting treatment had significantly lower ($5585 less) end-of-life spending than patients in those same regions without advance directives. This is in contrast to medium- and low-spending regions, where the presence or absence of a treatment-limiting advance directive did not correlate with changes in spending.

Multivariable logistic regression was used to examine the relationship between advance directives and several outcomes: the use of life-sustaining treatments, in-hospital death, and hospice use during the last 6 months of life. In medium- and high-spending regions, the probability of receiving hospice care was higher for patients with treatment-limiting advance directives (38% vs. 27% in medium-spending regions, and 41% vs. 24% in high-spending regions). Conversely, the probability of in-hospital death was lower for patients with treatment-limiting advance directives in those same regions (37% vs. 42% in medium-spending regions, and 38% vs. 47% in high-spending regions).

Conclusion. Using Medicare-linked survey data from a nationally representative sample of decedents, the authors found that advance directives specifying treatment limitations were more common in areas of lower end-of-life spending. However, the presence of such a directive correlated with significantly lower spending, lower probability of in-hospital death, and higher probability of hospice use only if the decedent resided in a traditionally medium- or high-spending region.

Commentary

End-of-life care is costly and accounts for up to a quarter of the spending in large programs like Medicare [1]. Despite the huge financial costs associated with this care, there is evidence that aggressive interventions at the end of life are not always desired by patients, and may have more to do with provider patterns of care than individual preferences [2]. It is possible that the widespread use of advance directives could better align the care that is provided with patient preferences, and even result in cost savings. Although the use of advance directives is increasing, there are still many aging or severely ill adults who do not have them [3]. Efforts to increase the use of advance directives in the United States are ongoing.

Previous research on whether treatment-limiting advance directives decrease spending at the end of life has been inconclusive [4,5]. The authors of this study argue that this inconsistency could be due to the modifying effect of regional patterns of care. Previous, geographically-limited studies might not have been able to detect the complex nature of this relationship. Data from the Dartmouth Atlas has shown that certain U.S. regions routinely spend more on health care than others, even when adjusting for differences in cost of

living and patient populations. Additionally, this research has shown that despite higher spending levels, better outcomes are often not achieved and occasionally outcomes are worse [6].

This study addresses whether patients who document a desire for treatment limitation at the end of life have their wishes respected, and whether the overarching medical culture of the region in which patients reside affects the impact of their advance directives. The findings of the study indicate that regional norms have a major impact on individual care patterns at the end of life, and that treatment-limiting advance directives are effective, particularly in regions where the norm is for more aggressive care.

In addition to addressing an important and controversial topic, this study was large and relied upon nationally representative data. This feature allowed the authors to evaluate regional variation, something that previous studies of this issue have not accomplished. Additionally, the outcomes chosen by the authors focused not only on cost but also services used at the end of life, including hospice care. This is important because it shifts the focus and impact of the work back towards providing care that is more respectful of patient wishes rather than just decreasing cost in our medical system. The study design was observational, so while we can conclude that there is correlation between treatment-limiting advance directive use and lower spending at the end of life, a causal relationship cannot be assumed. The conclusions are also somewhat weakened by the fact that the authors had to rely on next of kin interviews conducted after death to obtain information on the nature and presence of an advance directive. This could limit the accuracy of the assigned exposure category—it is possible that proxies would remember their loved one having an advance directive but not be sure of the details of such a document. Prospective data on the presence and type of advance directive collected from the patients themselves would have been better. Also, as the authors acknowledge, limiting the sample to older Medicare patients makes it hard to predict whether these patterns are generalizable to other populations (eg, younger adults with cancer).

Another potential limitation not acknowledged by the authors was that a decedent's regional spending level was determined by their zip code of residence. This assumes that their primary residence was where they died, or more importantly, where they got most of their care in the last part of their life. In reality, many U.S. adults age 65 and older do not stay in their primary region of residence year-round (the so-called "snowbirds") [7]. It would be important to know whether the medical care decedents received was in the same region in which they resided, as this again creates the potential for misclassification into the wrong spending category and incorrect conclusions about the effect of regional practice patterns on individual factors.

Applications for Clinical Practice

In summary, Nicholas and colleagues have taken a novel approach to the question of whether treatment-limiting advance directives are used, respected, and impacted by regional practices. Their findings remind us that regional norms often dictate care, even in the highly personal experience of dying. As clinicians, we should strive to provide care that aligns more with patient wishes and best evidence than with the status quo of our practice environment.

—Review by Kristina Lewis, MD

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