



CAN WE CURB HIGH HEALTH CARE SPENDING BY FOCUSING ON END-OF-LIFE CARE?

Why This Study Is Important

One quarter of annual Medicare spending is for beneficiaries in their last year of life, a fact that often leads observers to conclude that much of this spending is wasteful and that we could better control high health care spending by being more judicious with end-of-life care. But of course, to reduce wasteful spending in patients at the end of life, we would need accurate predictions of which patients will die and when. This study takes a closer look at the potential for eliminating wasteful spending at the end of life by examining spending for those who were expected to die soon and those who actually died.

What This Study Found

- Death is highly unpredictable. People who seem very likely to die are not the same as those who end up dying. Overall, less than 10 percent of beneficiaries who died within the year had more than a 50 percent predicted probability of dying in the year. Even among beneficiaries admitted to the hospital, 20 percent of whom will die within the year, less than 4 percent of decedents had a predicted mortality risk above 80 percent when they entered the hospital.
- Less than 5 percent of total Medicare spending is accounted for by individuals with a predicted one-year mortality risk above 50 percent. This share is much lower than the one quarter of Medicare spending on end-of-life care for beneficiaries who actually died.
- Beneficiaries who end up dying are sicker, and spending is higher for sicker individuals - both those who survive as well as those who die. Depending on the spending measure used, 30 to 50 percent of the concentration of spending at the end of life can be explained by the concentration of spending on the sick.

For more information about this study, contact Dr. Ziad Obermeyer at zobermeyer@berkeley.edu

For more information about the NIHCM Foundation Investigator-Initiated Research Grant Program, contact Dr. Julie Schoenman at 202-296-4426.

What These Findings Mean

To improve the value of our health care spending, it is necessary to assess how specific interventions affect quality of life and overall survival, all the while allowing for patient preferences regarding treatment decisions. The difficulty of predicting who will die, and when, means that for most patients the end-of-life period is known only in retrospect. While spending for people who die is very high, many sick patients also have high spending but survive. Furthermore, only a small share of overall spending is for people who have a very high probability of dying soon.

More About This Study

This study applied machine-learning techniques to Medicare claims data from 2007 for a random sample of Medicare beneficiaries to predict each beneficiary's probability of dying in 2008, then analyzed spending by *ex ante* (predicted) mortality and by *ex post* (actual) mortality. Two spending measures are considered. The first looks backward from the date of death in 2008 and aggregates all spending incurred during a specific time period prior to death. Comparable spending for survivors is computed for a period of the same duration beginning with January 1, 2008. The second spending measure is forward looking for both decedents and survivors and aggregates all spending from January 1 until the date of death or the end of the analysis period. Sensitivity analyses that used a different mortality prediction algorithm and predicted mortality starting from a hospital admission date rather than the first of the year did not change the study's findings materially.

Einav L, Finkelstein A, Mullainathan S, and Obermeyer Z. "Predictive Modeling of U.S. Health Care Spending in Late Life." *Science*, 360:1462-5, June 29, 2018.