Death Service Ratio: A Measure of Hospice Utilization and Cost Impact

Citation: Abernethy AP, Kassner CT, Whitten E, Bull J, Taylor DH. Death Service Ratio: A Measure of Hospice Utilization and Cost Impact. J Pain Symptom Manage 2011; 41(#6 June):e5-6.

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To the Editor:

In October 2007, Taylor et al.[1] published compelling data showing that use of hospice care reduces United States Medicare expenditures at the end of life. In a case-control study of a sample of Medicare decedents (1993-2003), the authors compared 1819 hospice decedents with 3638 matched controls. Hospice use reduced Medicare program expenditures after the initiation of hospice by an average of $2309 per hospice user ($7318 for hospice users vs. $9627 for controls; $P < 0.001$). For cancer, maximum savings of $7000 occurred with a length of stay (LOS) in hospice between 60 and 100 days; for other primary conditions, maximum savings of $3500 occurred with a LOS of 50-110 days.[1] Thus, cost savings were maximized with much longer periods of hospice use than is common among Medicare beneficiaries (median LOS of 16 days in not-for-profit, and 20 days in for-profit hospices).[2]

Examining Medicare expenditures in North Carolina for patients receiving hospice care vs. not served by hospice, we have obtained results that are consistent in showing that hospice use appears to lessen overall health care spending near the end of life. We acknowledge that these are preliminary analyses; we did not match hospice decedents with those nonhospice decedents who are most similar, as our goal here was to simply describe unadjusted Medicare cost differences in North Carolina. Likewise, a limitation of this initial exploration is that our analyses included only patients who died; we did not examine costs incurred by hospice patients who did not die.

Using 2008 data from the Centers for Medicare and Medicaid Services (CMS) Standard Analytic Files, Limited Data Sets for Hospice, Hospitals, Home Health Agencies, and Skilled Nursing Facilities (SNFs), we compared total Medicare expenditures for all Medicare beneficiaries who died under the care of one of these provider types. In North Carolina, average costs to Medicare for patients who died with a history of the following types of service use were hospice, $19,249; home health agency, $19,810; SNF, $25,842; hospital, $30,603; and multiple settings, $30,732 vs. not receiving care from any service, $6853. Notably, a North Carolina patient receiving end-of-life care through hospice received $11,354 less in care paid for by Medicare than did a patient receiving hospital-based care.

Clearly, hospice utilization exerts a strong force on health care system costs. How can we examine and monitor hospice utilization and impact? We propose "death service ratio" (DSR) as a simple measure of hospice use for this purpose. Calculated as a percentage – the numerator being deaths in a defined area or population served by hospice and the denominator being all deaths in that area/population – DSR serves as an indicator of hospice utilization in a region and, therefore, as an indirect indicator for impact of hospice on health care costs. We explicitly acknowledge that DSR is a crude indicator, as it does not accommodate for hospice LOS, patient complexity, or other important factors; but, in its simplicity, DSR allows regional monitoring of hospice utilization that can be linked to health system costs.

Using DSR as a primary measure, we recently completed a study of the impact of philanthropic funding for hospice services on hospice utilization and costs. In North Carolina counties receiving grants for hospice development through a large foundation (The Duke Endowment, Charlotte, NC), the DSR was 40% as compared with that of 30% in counties not funded by the foundation. Here, DSR was calculated as the number of Medicare beneficiaries in North Carolina who died under hospice care (numerator) over the total number of Medicare beneficiary deaths in North Carolina (denominator). Calculation of the DSR allowed for informative comparisons across service areas. Per patient hospital costs were similar between grant-funded and unfunded counties ($30,822 vs. $30,375; difference of $447). Per patient hospice rates were also similar ($19,258 vs. $19,234; difference of $24). However, looking more closely at the highest DSR counties, we found that, in the 10% of counties with highest DSR compared with all counties, per patient hospice costs were higher (mean $8063 vs. $7031; difference of $1032) but hospital costs were lower (mean $24,567 vs. $27,632; difference of -$3065). On balance, in counties with higher use of hospice, the use of hospital care was reduced; this observation is consistent with a hypothesis that increased hospice use reduces overall Medicare costs at the end of life. Further, we found evidence that external grant funding to support the development of hospice and palliative care was related to increase in hospice use, which correlated with the cost savings observed in these counties.

These analyses demonstrate that DSR can serve as a useful marker of hospice utilization and financial impact at the local level, leading to valuable insights about the relationship between use and costs within a regional population. We are currently examining DSR by county in North Carolina to understand trends in care, distribution of available services (including hospice and

palliative care), and impact of bridging community-based palliative care programs; results will likely be useful for workforce planning.

As a measure, DSR could be further developed as an indicator of access and impact, but certain steps must first be taken. These include exploration of the relationship between change in DSR and change in quality of care; determination of whether or not results generated in North Carolina are generalizable to other areas of the United States or the country as a whole; development of quality-of-care benchmarks followed by studies exploring methods for improving performance against those benchmarks; and standardization of what is encompassed by "hospice" care, as well as by its overarching discipline, "palliative care," to enable cleaner analyses.

From a policy standpoint, it is most important to consider hospice expenditures in the context of the "systemic cost" of end-of-life care, that is, the total cost of care from all care settings for the patient who dies on a specific service (especially important given the crossover of patients from one setting to another, making clear distinctions of hospice and nonhospice problematic). Hospice comprises only a fraction of total Medicare costs; as a proportion of total Medicare expenditures in 2008, hospice accounted for 8% ($11.1 billion), hospitals for 71% ($113 billion), and SNFs for 13% ($23 billion). Aggregate cost analyses support continued and substantial Medicare spending on hospice care, both to enhance end-of-life experiences for patients and their loved ones and make end-of-life care more affordable. DSR offers a simple and pragmatic measure for monitoring hospice utilization, tying change in utilization to cost reduction/increase, and, with further development, monitoring quality of care, access, disparities, and performance against national benchmarks. With this motivation, we plan to further study and strengthen DSR as a measure.

Acknowledgment

This project was supported in part by funding from The Duke Endowment.

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doi:10.1016/j.jpainsymman.2011.03.004

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