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Racial disparity in hospice use in the United States in 2002

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We used complete Centers for Disease Control death certificate records and the Centers for Medicare and Medicaid Services 100% Standard Analytic File for hospice claims for 2002 to examine differences in hospice utilization between African-American and white decedents living in the United States. White decedents were more likely to use hospice in the year before their death than African-American decedents (29% vs 22%). Cause-specific hospice utilization rates among women were consistently higher than among men within a given race. African-American decedents were consistently less likely to use hospice than white decedents for almost all conditions. Hospice utilization was lower among African-American than among white decedents in 31 of 40 states. The higher the overall hospice utilization in a state, the less the positive difference between white and African-American usage rates; that is, the more accepted hospice is, as measured by 'market share', the lower the racial disparity in its use. *Palliative Medicine* (2008); **22**: 205–213

Key words: database; end-of-life; hospice; Medicare; racial differences

Introduction

Despite the growth of hospice use in the United States following the enactment of the Medicare Hospice Benefit, relatively little is known about differential access to hospice care. Although several studies have found that minorities are more likely to die in the hospital than Caucasians^{1–3} and that minorities use hospice services at a lower rate than Caucasians,^{4–8} no large-scale study has simultaneously evaluated the differences in access to, and utilization of, hospice care among different racial groups by age, sex, geography and cause of death.

Two previous national studies found that minority decedents are less likely to have received hospice services than whites. Greiner, *et al.*⁵ performed an analysis of the 1993 National Mortality Followback Survey, which included data from 23,000 decedents. Findings of this study included that African-Americans were less likely to use hospice than whites (odds ratio = 0.59, $P < 0.001$) and those without a living will and without a cancer diagnosis were less likely to use hospice. A more recent analysis of the 1991–2000 Underlying and Multiple Cause-of-Death Files and the 1992–2000 National Home and Hospice Care Surveys found that hospices use rates are increasing rapidly for both white and African-American

patients. Hospice use by white patients increased from 10% of all deaths in 1992 to 23% in 2000 and hospice use by African-Americans from 5% in 1992 to 18% in 2000.⁹ Two other studies examined racial and ethnic differences in hospice use on regionally restricted samples. Enguidanos, *et al.*⁸ performed a retrospective study using data on 38,519 low-income decedents from 18 counties in California using linked Medi-Cal (California Medicaid) and Medicare claims from 1996 to 2000. They found that the estimated probability of white decedents using hospice was 8.2% compared with 6.2% for African-Americans. Lackan, *et al.*¹⁰ studied hospice use by Hispanic white and Non-Hispanic white cancer decedents in California and New Mexico using the linked SEER-Medicare database. They found that the small ethnic difference in hospice use among white cancer decedents were not statistically significant after adjusting for several social and demographic confounding factors (OR 1.05; 95% CI: 0.98–1.13).

Racial and socio-economic disparities in the use of palliative and health care services generally are not unique to the United States. A recent analysis of socio-economic and racial disparities in four countries (Canada, England, New Zealand and the United States) by Hussey, *et al.*¹¹ found that most of nine quality indicators measured showed disparity over time. Many authors have found similar general socio-demographic disparities in health care throughout the lifespan. However, the United Kingdom and other countries with universal health coverage tend to show less disparity.^{12–14}

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Our study provides the first detailed estimates of differences in hospice utilization between African-American and white decedents in the United States by sex, age, place of residence and cause of death. We used comprehensive, national level data from population registries and Medicare claims records to track racial differences in hospice utilization among the older Americans. The analysis focuses on deaths at ages 65 and older (representing 74% of annual deaths¹⁵) in 2002, the most recent year for which comprehensive data were currently available.

Methods

Hospice utilization ratio

We calculated hospice utilization ratios (HUR) for this study, where HUR_i was defined as the fraction of decedents in a specific group of decedents, i , who used Medicare-reimbursed hospice care at some point during the year before their death.

$$HUR_i = \frac{\# \text{ hospice users in group } i}{\# \text{ of decedents in group } i}$$

Data sources

This study draws on data from two sources. The numerator of the HURs was drawn from the Standard Analytic File Hospice (SAF-H) for the year 2002 and maintained by the Centers for Medicare and Medicaid Services (CMS). The SAF-H is a complete record of reimbursement claims for the Medicare Hospice Benefit and captures all individuals who used hospice services under the Medicare program. It contains demographic information for each beneficiary including age, race, gender, state and county of residence and detailed diagnostic information. Most beneficiaries enter the SAF-H through a single hospice stay ending at death, but for those who had multiple records in the SAF-H, only the most recent hospice stay and most recent claim was included. The Compressed Mortality File (CMF) for 2002, maintained by the National Center for Health Statistics, provided data for the denominator of the HUR. The CMS is a complete record of deaths among US residents and contains individual-level information for state and county of residence, age at death, race, gender and underlying cause of death.

Study population

We focused on Medicare-based hospice utilization, 12 months before death, among older Americans who died in 2002. The use of two separate beneficiary-encrypted public-use databases for generating HURs necessitated certain statistical assumptions. First, the

SAF-H is limited to Americans enrolled in the Medicare program but not all hospice deaths occur within the Medicare population. Over 18% of hospice patients are under 65 and not eligible for Medicare. Approximately 4% of eligible Americans are not enrolled in Medicare.¹⁶ Moreover, some Medicare-eligible patients use volunteer hospice services that are not covered by Medicare (although this is known to be uncommon). Because Americans are eligible for Medicare at age 65, we restricted the analysis to deaths at age 65 and above. The HURs computed in this study slightly understate the extent of overall hospice utilization among older Americans. However, they do fully capture Medicare-covered hospice utilization among older Americans. Second, up to 8% of individuals who receive hospice care do not die within 12 months of hospice enrollment,¹⁷ and not all individuals die in the same calendar year in which they enrol in hospice. Moreover, some individuals enrol in hospice but terminate hospice before their death, and hospice care itself may increase survival time.¹⁸ Individuals who died while receiving hospice care in 2002 were included, and individuals who received hospice services but were known to have remained hospice patients beyond their last claim in the 2002 SAF-H were excluded. All other individuals who received hospice services in 2002 and were discharged to home or hospital according to their last hospice claim on record in 2002 were included based on the assumption that most of these individuals likely died shortly after terminating hospice.

Because the SAF-H represents hospice services provided under the Medicare program, and because the CMF represents complete census data, the HUR should be interpreted as the *ratio of Medicare-based hospice utilization* among older Americans in 2002.

Race

Race coding in the CMF is not fully commensurate to race coding in the SAF-H. The CMF collapses the race and ethnicity codes from the Social Security Administration's source files into three mutually exclusive categories, white, African-American and other. In the CMF, decedents of Hispanic origin may thus be included among any of the three CMF race codes. The SAF-H follows Medicare conventions and assigns each beneficiary to one of seven mutually exclusive race codes (white, African-American, Asian, Native American, Hispanic, other and unknown). Therefore, these codes were collapsed into three categories of white, African-American and other.

Individuals of Hispanic origin in the SAF-H are placed in the race category 'other', whereas Hispanic individuals in the CMF might be included in any of the three race categories. As the number of Hispanics identified as such in the SAF-H was small relative to the number of whites

and African-Americans (6475 Hispanic vs 466,449 white and 36,107 African-American), this coding difference between the SAF-H-based numerator and CMF-based denominator should affect the HURs for whites and African-Americans relatively little. However, as a large share of non-white and non-African-American beneficiaries in the SAF-H are of Hispanic origin, the HURs for the collapsed race category 'other races' are likely severely upwardly biased. Therefore, we focused on the HURs for white and African-American decedents exclusively. This decision followed recommendations regarding race comparisons in Medicare data by Lauderdale and Goldberg¹⁹ and Elwert and Christakis.²⁰

Cause of death

Primary cause-of-death data is included in CMF data, but not in SAF-H data. Therefore, for the SAF-H, the principal diagnosis associated with individuals' last hospice claim was used as cause of death. Moreover, mortality data for CMF is classified by ICD-10, whereas the SAF-H data is classified by ICD-9. Therefore, ICD-9 codes were converted into ICD-10 codes using the method described by Anderson, *et al.*²¹ This conversion was considered unproblematic for most causes of death except for Alzheimer's disease, for which the conversion from ICD-9 to ICD-10 has been shown to create a clear discontinuity in trend in that a significant number of deaths that had been categorized as senile or pre-senile organic psychotic conditions and pneumonias under ICD-9 now are categorized as Alzheimer's disease.²¹ To achieve sufficiently large cell sizes and to guard against issues associated with converting from ICD-9 to ICD-10, data were collapsed into 11 cause-of-death categories: heart disease, cancer, CVA/stroke, COPD, accident/suicide, diabetes, influenza/pneumonia, Alzheimer's disease, nephritis/kidney disease, sepsis and 'all other'. These categories,

which represent a collapsed version of the 113-category classification used by the Centers for Disease Control, are shown in Table 1 with data sizes for the SAF-H numerator and the CMF denominator. When data were collapsed into these cause-of-death categories, a greater proportion of decedents in the SAF-H fell into the 'all other causes' category than in the CMF (25% vs 15%). Inspection of the primary claim diagnosis codes in the SAF-H showed that a non-trivial proportion of SAF-H diagnosis codes gave symptoms (e.g., 'psychosis') rather than underlying diseases, thereby artificially inflating the 'all other causes' category in the numerator of the HUR. To adjust for this inflation, excess observations from the 'all other causes' category were redistributed across the cause-of-death categories in the SAF-H numerator on a *pro rata* basis. Specifically, the proportion of individuals dying of 'all other causes' was assumed to be the same in numerator and denominator, and all diseases were assumed to be equally likely to be miscoded as 'all other' in the SAF-H. The excess of cases in the 'all other' category was redistributed across the 10 specific causes of death proportional to their representation in the SAF-H. This adjustment, which was only applied in tables where cause of death was a grouping variable, preserved the relative ranking of HURs across causes of death. Because the adjustment affects the percentage-point difference between race-specific HURs for specific causes of death, only adjusted HURs are presented.

Region-specific HURs

Neither the CMF nor the SAF-H contains information on place of death, although they both contain residence (state and county). Therefore, region-specific HURs are presented by place of residence. Geographic coverage was restricted to decedents residing in the 50 states or the District of Columbia.

Table 1 Database size by race and cause of death in the SAF-H and the CMF

Cause of death	Numerator: SAF-H			Denominator: SAF-H		
	White	African-American	All	White	African-American	All
Heart disease	60,068	3533	65,489	561,662	58,531	630,675
Malignancy	196,938	18,478	222,128	346,635	37,259	391,001
CVA/stroke	27,871	2440	31,474	126,470	13,616	143,293
COPD	27,231	854	28,576	101,421	5554	108,313
Accident/fracture/suicide	1	0	1	35,945	2377	39,189
Diabetes	458	67	560	44,985	8235	54,715
Influenza/pneumonia	1481	45	1557	53,168	4388	58,826
Alzheimer's disease	19,230	1374	21,175	54,532	3301	58,289
Nephritis/kidney disease	13,967	1891	16,655	28,537	5136	34,316
Sepsis	1271	104	1420	22,108	4147	26,670
All other	117,933	7321	129,043	240,392	21,654	266,433
Total	466,449	36,107	518,078	1,615,855	164,198	1,811,720

SAF-H, Standard Analytic File Hospice; CMF, Compressed Mortality File.

Small cells

Cell size limitations were encountered when classifying the population of decedents along multiple dimensions, despite the fact that this study used an almost complete census of the relevant population. For example, a complete cross-classification of the decedent population in the United States along all dimensions considered in this report would generate close to 400,000 categories (2 race \times 2 gender \times 3 age \times 3000 counties \times 11 causes of death = 396,000) for only 624,946 hospice users in 2002. Therefore, the number of dimensions considered simultaneously was limited and HURs computed from sparsely populated cells were flagged. Group-specific HURs that had numerators containing <20 hospice users and/or denominators containing <100 decedents were flagged and subsequently disregarded.

Statistical analysis

This study used data that completely enumerate the population of interest (deaths and hospice users in 2002). Because the HURs computed in this report are population level quantities rather than sample estimates, statistical tests are not reported.

Results

Hospice utilization by race, sex, age and cause of death

Table 2 presents cause-of-death-specific hospice utilization rates for African-American and white decedents by sex. Cause-specific HURs for women were consistently higher than the HURs for men within a given race. Differences in cause-specific hospice utilization between men and women were usually of moderate size but in some cases were substantial. For example, the HUR for malignancies for white men was 11% less than the corresponding HUR for white women (59% vs 70%). Similarly, the

HUR for African-American men was 10% lower than the corresponding HUR for African-American women (49% vs 59%). At the extreme, the HUR for kidney disease among African-American men was 18% lower than the corresponding HUR among African-American women (30% vs 40%). African-American decedents were consistently less likely to use hospice than were white decedents for almost all conditions. At the extreme, 51% of white men dying of kidney disease received hospice care compared with 30% of African-American men. Alzheimer's disease was the only cause of death for which African-American decedents were more likely to receive hospice care than white decedents and then only among women. Hospice utilization patterns between African-American and white decedents were slightly different with respect to the rank order of conditions for which hospice care was being received. White decedents were most likely to receive hospice for malignancies (65%), kidney disease (56%) and Alzheimer's disease (40%). African-American decedents were most likely to receive hospice for malignancies (54%), Alzheimer's disease (45%) and kidney disease (40%). Although COPD was the cause of death with the fourth highest HUR among white decedents, it was the sixth highest among African-Americans.

Table 3 presents HUR by age, cause of death, race and sex. Overall, white decedents were more likely than African-American decedents to use hospice in the year before their death (29% vs 22%), and this difference was consistent for both men (27% vs 21%) and women (30% vs 23%). In general, hospice utilization was lowest in the youngest age group for most cause-of-death categories for both white and African-American decedents with two notable exceptions. First, hospice utilization for deaths from Alzheimer's disease decreased considerably with age among men and women of either race. Second, hospice utilization for deaths from nephritis and kidney disease decreased considerably with age among white women (from 69% in the youngest group to 53% in the

Table 2 Hospice utilization rate by race, sex and cause of death

Cause of death	White			African-American		
	Male	Female	Total	Male	Female	Total
Heart disease	0.11	0.13	0.12	0.05	0.08	0.07
Malignancy	0.59	0.70	0.65	0.49	0.59	0.54
CVA/stroke	0.21	0.28	0.25	0.17	0.21	0.20
COPD	0.27	0.34	0.31	0.15	0.18	0.17
Accident/fracture/suicide	0.00 n	0.00 n	0.00 n	0.00 n	0.00 n	0.00 n
Diabetes	0.01	0.01	0.01	0.01 n	0.01	0.01
Influenza/pneumonia	0.03	0.03	0.03	0.01 n	0.01	0.01
Alzheimer's disease	0.40	0.41	0.40	0.40	0.49	0.45
Nephritis/kidney disease	0.51	0.60	0.56	0.30	0.48	0.40
Sepsis	0.06	0.07	0.07	0.01	0.04	0.03
All other	0.27	0.30	0.29	0.21	0.23	0.22
Total	0.27	0.30	0.29	0.21	0.23	0.22

n, sparse numerator (<20 deaths).

Table 3 Hospice utilization rate by age, cause of death, race and sex

Cause of death		White		African-American	
		Female	Total	Male	Female
Heart disease	65–74	0.06	0.08	0.04	0.05
	75–84	0.11	0.12	0.05	0.07
	85+	0.14	0.15	0.07	0.09
Malignancy	65–74	0.56	0.67	0.46	0.55
	75–84	0.60	0.72	0.50	0.62
	85+	0.62	0.73	0.52	0.64
CVA/stroke	65–74	0.17	0.22	0.14	0.16
	75–84	0.22	0.28	0.19	0.21
	85+	0.22	0.29	0.17	0.25
COPD	65–74	0.26	0.33	0.13	0.18
	75–84	0.28	0.35	0.16	0.18
	85+	0.27	0.33	0.16	0.20
Accident/fracture/suicide	65–74	0.00 n	0.00 n	0.00 n	0.00 n
	75–84	0.00 n	0.00 n	0.00 n	0.00 n
	85+	0.00 n	0.00 n	0.00 n	0.00 n
Diabetes	65–74	0.01	0.01	0.01 n	0.01 n
	75–84	0.01	0.01	0.01 n	0.01
	85+	0.01	0.02	0.01 n	0.01 n
Influenza/pneumonia	65–74	0.02	0.03	0.01 n	0.00 n
	75–84	0.03	0.03	0.01 n	0.01 n
	85+	0.03	0.03	0.01 n	0.02
Alzheimer's disease	65–74	0.49	0.58	0.48	0.63
	75–84	0.43	0.50	0.38	0.58
	85+	0.36	0.35	0.38	0.42
Nephritis/kidney disease	65–74	0.48	0.69	0.27	0.40
	75–84	0.52	0.64	0.32	0.48
	85+	0.51	0.53	0.34	0.54
Sepsis	65–74	0.03	0.05	0.01 n	0.03 n
	75–84	0.05	0.06	0.02 n	0.03
	85+	0.09	0.09	0.02 n	0.05
All other	65–74	0.18	0.17	0.14	0.12
	75–84	0.26	0.26	0.22	0.20
	85+	0.36	0.36	0.31	0.31

n, sparse numerator.

^aLess than 20 hospice users in numerator.

older group) but not among African-American women or African-American or white men. Indeed, for African-American women, the age gradient of the HUR for nephritis and kidney disease was the second steepest (40–54%), exceeded only by the age gradient for 'all other' diseases.

Hospice utilization by race and state of residence

Table 4 presents hospice utilization by race, state of residence and sex. Figures 1 and 2 present the data graphically. Hospice utilization was lower among African-American than white decedents in 31 of 40 states (results are not reported on 11 states where African-American hospice usage was too sparse). This difference ranged from only 2% in Pennsylvania, Mississippi and Kentucky to 16% in Washington, DC. The average state difference in hospice utilization rates between African-Americans and whites in states where whites have higher utilization rates than African-Americans was 6%. Conversely, there were nine states in which African-American decedents had the same or higher HURs than whites. This difference

in favour of African-American decedents in these states ranged from 0% (Arizona, Oklahoma, Washington state) to 9% (Iowa). The average difference in hospice utilization rates between African-Americans and whites in states where African-Americans have the same or higher utilization rates than whites was 3%.

Excluding HURs with sparse numerators and denominators, state-specific HURs for men in a given race group usually fell short of the HURs for women in the same race group, except for a few states in which the male HURs exceed female HURs by no more than 2%. The state-specific HURs for white men exceed the state-specific HURs for African-American men in all but four states: Arizona, Iowa, Kansas and Washington State. The state-specific HURs for white women also usually exceed the state-specific HURs for African-American women, except in seven states: Arizona, Iowa, Minnesota, Nebraska, Oklahoma, Oregon and Wisconsin, all of which are states with small African-American populations.

Figure 3 plots the racial difference in HURs (white minus African-American) against the state-specific HUR for all decedents. The graph suggests a decrease in the

Table 4 Hospice utilization rate by race, state, and sex

	White			African American		
	Male	Female	Total	Male	Female	Total
Alabama	0.32	0.34	0.33	0.25	0.29	0.27
Alaska	0.09	0.13	0.11	0.00 n d	0.08 n d	0.04 n d
Arizona	0.45	0.52	0.49	0.44	0.53	0.49
Arkansas	0.25	0.25	0.25	0.16	0.18	0.17
California	0.27	0.31	0.29	0.19	0.20	0.19
Colorado	0.41	0.46	0.44	0.35	0.46	0.41
Connecticut	0.24	0.25	0.24	0.16	0.21	0.19
D.C	0.25	0.33	0.29	0.12	0.15	0.14
Delaware	0.29	0.31	0.30	0.21	0.24	0.23
Florida	0.38	0.43	0.41	0.32	0.33	0.33
Georgia	0.32	0.35	0.34	0.25	0.25	0.25
Hawaii	0.23	0.27	0.25	0.21 n d	0.29 n d	0.24 n d
Idaho	0.21	0.25	0.23	0.33 n d	0.33 n d	0.33 n d
Illinois	0.28	0.32	0.30	0.23	0.25	0.24
Indiana	0.25	0.26	0.26	0.19	0.23	0.21
Iowa	0.30	0.31	0.31	0.33 d	0.45	0.40
Kansas	0.28	0.31	0.30	0.30	0.29	0.29
Kentucky	0.25	0.26	0.25	0.20	0.26	0.23
Louisiana	0.26	0.28	0.27	0.19	0.18	0.18
Maine	0.14	0.13	0.14	0.60 n d	0.00 n d	0.38 n d
Maryland	0.26	0.29	0.27	0.17	0.19	0.18
Massachusetts	0.22	0.23	0.23	0.19	0.20	0.20
Michigan	0.33	0.37	0.35	0.25	0.29	0.28
Minnesota	0.26	0.26	0.26	0.25	0.35	0.30
Mississippi	0.26	0.27	0.27	0.23	0.26	0.25
Missouri	0.27	0.31	0.29	0.22	0.27	0.25
Montana	0.22	0.22	0.22	0.00 n d	0.50 n d	0.25 n d
Nebraska	0.24	0.27	0.26	0.26 d	0.28	0.27
Nevada	0.34	0.40	0.37	0.30	0.37	0.34
New Hampshire	0.23	0.24	0.24	0.17 n d	0.00 n d	0.07 n d
New Jersey	0.23	0.27	0.25	0.15	0.18	0.16
New Mexico	0.29	0.34	0.32	0.36 d	0.36 d	0.36
New York	0.19	0.20	0.20	0.10	0.10	0.10
North Carolina	0.26	0.26	0.26	0.20	0.20	0.20
North Dakota	0.18	0.17	0.18	n d	2.00 n d o	2.00 n d o
Ohio	0.32	0.35	0.34	0.28	0.30	0.29
Oklahoma	0.31	0.37	0.34	0.29	0.39	0.35
Oregon	0.34	0.39	0.37	0.36 d	0.50	0.44
Pennsylvania	0.25	0.29	0.27	0.23	0.27	0.25
Rhode Island	0.24	0.24	0.24	0.16 n d	0.22 d	0.19
South Carolina	0.25	0.28	0.27	0.19	0.19	0.19
South Dakota	0.17	0.15	0.16	1.00 n d	1.00 n d	1.00 n d
Tennessee	0.21	0.20	0.21	0.17	0.18	0.18
Texas	0.31	0.37	0.34	0.26	0.29	0.27
Utah	0.31	0.36	0.34	0.29 n d	0.34 n d	0.33 n d
Vermont	0.19	0.19	0.19	0.50 n d	0.14 n d	0.22 n d
Virginia	0.24	0.25	0.24	0.16	0.16	0.16
Washington	0.28	0.33	0.31	0.32	0.30	0.31
West Virginia	0.21	0.22	0.22	0.13	0.16	0.15
Wisconsin	0.25	0.26	0.25	0.23	0.32	0.27
Wyoming	0.14	0.17	0.15	0.50 n d	0.00 n d	0.20 n d

n: less than 20 hospice users in numerator

d: less than 100 decedents in denominator

o: greater than 1, impossible value.

white advantage of hospice utilization over hospice utilization among African-American decedents with increasing levels of overall hospice utilization in the state. The higher the overall hospice utilization in a state, the less the positive difference between white and African-American HURs. That is, the more accepted hospice is, as measured by 'market share,' the lower the racial disparity in its use.

Discussion

In 2002, African-American decedents were substantially less likely than white decedents to receive hospice services. This difference holds for both men and women though women of both races tend to receive more hospice care than men. It holds for all age groups among older Americans and across all causes of death except Alzheimer's

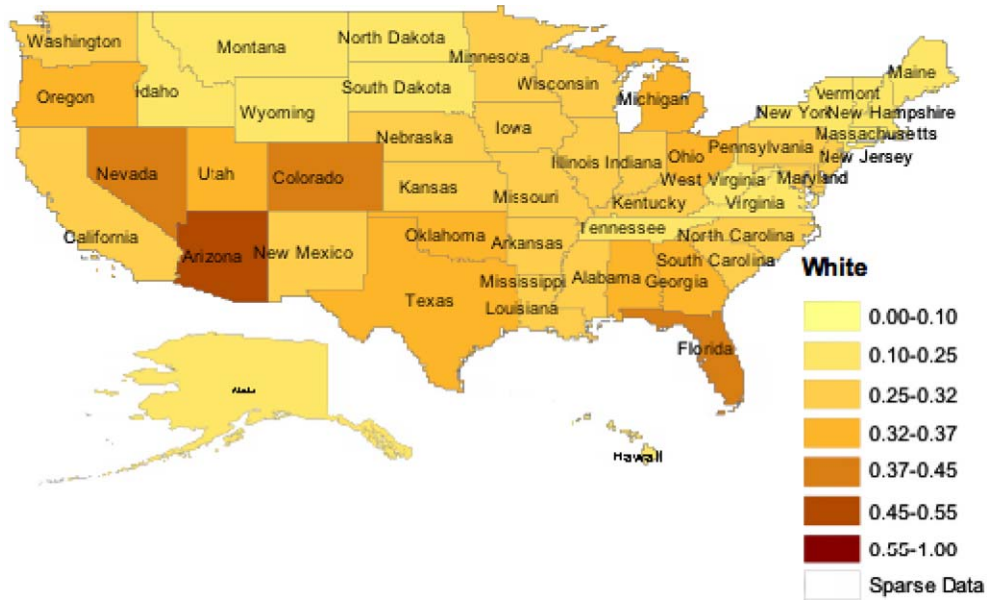


Figure 1 White hospice utilization by state.

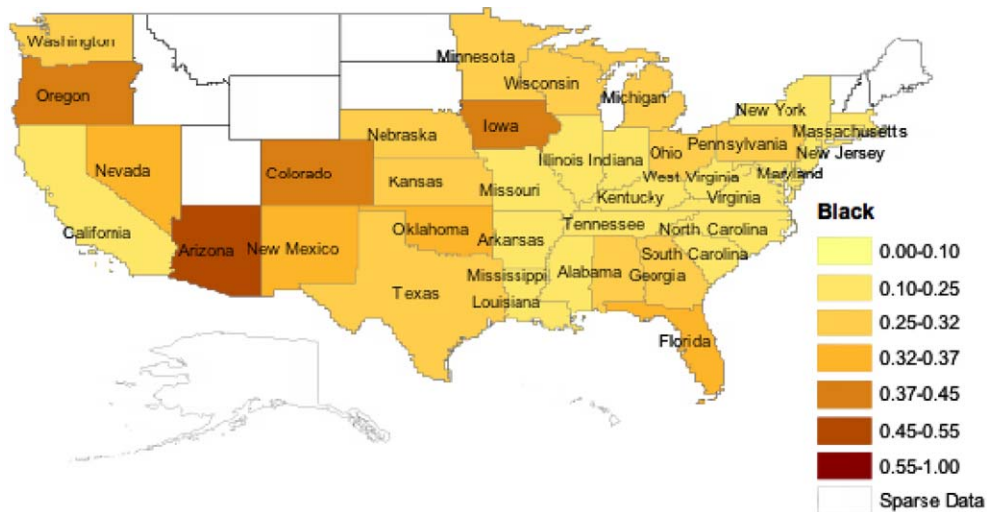


Figure 2 African-American hospice utilization by state.

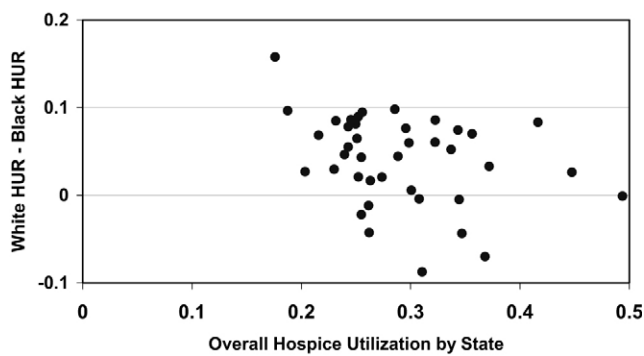


Figure 3 Racial difference by overall hospice utilization.

disease. It also holds across most states of the union (insofar as data availability permits the computation of state hospice utilization rates).

The state-level analysis indicates the possibility that racial disparities in hospice utilization decrease in areas where hospice utilization is more common. This is an important finding with policy implications for hospice practice and regulation. One promising strategy to help reduce white/African-American disparity in hospice use appears to be to increase access to hospice care for all eligible individuals.

We estimate that a total of an additional 11,292 of the 163,198 African-American decedents aged 65 and above in the United States who died in 2002 would have to have received hospice services in the 12 months before their deaths for African-American and white HURs to be equalized.

These results point to continuing race differences in end-of-life care in the United States. The present study does not permit inference about whether these race disparities in end-of-life care can be attributed to socio-economically or culturally rooted differences in demand for hospice care among African-American and white decedents, to differences in supply conditions or to discrimination.^{22,23} A recent report by Crawley and Singer²⁴ suggests that limitations on curative treatment in the Medicare Hospice Benefit may play an important role as minority populations demand aggressive treatments perceived to be denied. Other factors that may contribute to under-utilization of palliative care among minority ethnic groups include variation in referral by health and social service professionals, poor knowledge and lack of awareness, geographic disparities in health care service provision, stereotypes about the use of palliative care, mistrust and racism. Further research is needed to investigate competing explanations for why older African-American decedents in the United States are on average less likely to receive hospice services towards the end of their lives than white decedents.

The present study puts hospice utilization in 2002 at 29% for whites and 22% for African-Americans. In spite of this apparent disparity in hospice use, there is evidence from a number of studies that access to hospice by African-Americans is improving.^{8–10,24} Our cross-sectional results are consistent with the hypothesis that the growth of hospice in the United States may have had some impact on the overall access to hospice by all racial groups.

A number of limitations should be considered regarding this study that have to do with the restrictions of using two different databases. Specific hospice users could not be matched with decedents in the CMS mortality files; hence, there is some possibility of error and accurate data on use of hospice care for racial groups other than whites and African-Americans was not reliably available.

In spite of these limitations, we have, for the first time, been able to quantify at a population level, the actual differences in hospice usage for whites and African-Americans in the United States. Although it appears that racial disparity continues to exist in access to hospice care, this disparity is quite variable by age, cause of death and geography,²⁵ and it appears to be less pronounced especially in areas where hospice use is more widespread. Future research will hopefully find these trends continuing to the point where racial disparity in access to hospice care may be mitigated.

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