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Racial Disparities in Utilization of Palliative Care Among Patients Admitted With Advanced Solid Organ Malignancies

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Abstract

Background: There is increasing recognition of the importance of early incorporation of palliative care services in the care of patients with advanced cancers. Hospice-based palliative care remains underutilized for black patients with cancer, and there is limited literature on racial disparities in use of non-hospice-based palliative care services for patients with cancer.

Objective: The primary objective of this study is to describe racial differences in the use of inpatient palliative care consultations (IPCC) for patients with advanced cancer who are admitted to a hospital in the United States.

Design: This retrospective cohort study analyzed 204 175 hospital admissions of patients with advanced cancers between 2012 and 2014. The cohort was identified through the National Inpatient Dataset. *International Classification of Disease, Ninth Revision* codes were used to identify receipt of a palliative care consultation.

Results: Of this, 57.7% of those who died received IPCC compared to 10.5% who were discharged alive. In multivariable logistic regression models, black patients discharged from the hospital, were significantly less likely to receive a palliative care consult compared to white patients (odds ratio [OR] black: 0.69, 95% CI: 0.62–0.76).

Conclusions: Death during hospitalization was a significant modifier of the relationship between race and receipt of palliative care consultation. There are significant racial disparities in the utilization of IPCC for patients with advanced cancer.

Keywords

palliative care; disparities; inpatient; National Inpatient Sample; black

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Declaration of Conflicting Interests

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Supplemental Material

Supplemental material for this article is available online.

Introduction

In 2018, over 600 000 people died from cancer in the United States with higher mortality rates for black patients.[1,2] Indeed, there are disparities in health care and outcomes for black patients throughout the continuum of oncologic care.[3] Black women with breast cancer and black men with lung or prostate cancer have higher death rates than other racial groups.[2,4] Furthermore, black patients are more likely to have untreated pain, more likely to have care discordant with their preferences, and less likely to have advance directives or enroll in hospice at end of life (EOL).[5–9] Black patients and caregivers are also less satisfied with physician communication and overall quality of health at EOL.[10,11]

Palliative care improves quality of life, decreases depressive symptoms, and increases survival when incorporated early for patients with advanced malignancies.[12–14] Based on the extensive body of literature describing the benefits of palliative care, several professional societies advocate for the early incorporation of palliative care for patients with cancer.[15,16] Despite the strong association of palliative care with improved outcomes at EOL, there is limited literature about racial differences in the utilization of non-hospice-based palliative care consultations for patients with cancer.[9] Existing studies focus on the use of hospice-based palliative care services, which has been shown to be underutilized among black adults.[17–20] Furthermore, studies evaluating the use of non-hospice-based palliative care are often limited to a single center, a single type of malignancy, or do not specifically aim to investigate racial disparities in health care.[21–26]

Black patients have higher rates of emergency department visits, hospitalizations, and intensive care unit care at EOL compared to white patients.[6,27,28] Inpatient palliative care consultations (IPCC) offer a unique opportunity to introduce black patients and their families to non-hospice-based palliative care services as blacks are more likely to be treated at the EOL in an inpatient setting.[29] Given the gaps in the literature regarding disparities in use of non-hospice-based palliative care and the potential benefits of using IPCC for black patients, we seek to examine racial disparities in IPCC for patients with advanced cancer using a national population–based hospital database.

Methods

Data Sources and Patient Population

This study was performed using data from the Nationwide Inpatient Sample (NIS) from 2012 to 2014. The NIS is an all payer database that collects data from approximately 20% of all inpatient discharges from community hospitals across the United States. It is collected and maintained by the Agency for Healthcare Research and Quality (AHRQ). For each patient record, the NIS collects demographic data, hospital-level characteristics, and up to 25 diagnostic and procedure codes, coded using *International Classification of Disease, Ninth Revision, Clinical Modification* codes (*ICD-9-CM*).[30]

Patient records with a primary or secondary diagnosis of advanced solid organ malignancies as defined by relevant *ICD-9-CM* codes (Supplemental Table 1) were included in the study.

Patients younger than 18 years and with a length of stay (LOS) less than one day were excluded from our final study population. Patient comorbidity was categorized according to their Charlson Comorbidity Index score (CCI), into 1 of 3 groups; CCI = 2, CCI = 3–6 and CCI >6.[31] Receipt of major surgery during the inpatient admission was determined using criteria outlined by the AHRQ.[32]

Study Outcomes

The primary outcome of the study was the receipt of a palliative care consultation during the inpatient admission determined using the *ICD-9-CM* diagnosis code "v66.7."[33] This code has been used in previous studies to identify inpatient palliative care consultation in NIS data.[34,35] Other secondary outcomes of the study included inpatient LOS and inpatient mortality.

Study Exposure

The primary exposure of this study was race. Patient race was classified as white, black, Hispanic, Asian, or Pacific Islander, and all other races were grouped as "Other." Even though our primary objective is to examine black–white differences in palliative care, we have included data on races other than white and black to allow for hypothesis-generating ideas pertaining to other racial and ethnic minority groups.

Study Confounders

Directed acyclic graphs were used to visualize relationship between race and IPCC. Factors that impact race or IPCC but do not lie on pathway wherein race affects IPCC were included in final model as confounders. These include demographic characteristics including patient age and sex, and markers of socioeconomic status such as insurance status and median household income for the patient's zip code. Charlson Comorbidity Index score, receipt of a major operation during the inpatient admission, receipt of chemotherapy or radiation while inpatient, code status, gastrostomy tube placement, receipt of parenteral nutrition, inpatient hemodialysis, the development of postoperative complications and hospital LOS all represent illness severity. Finally, hospital-level characteristics including hospital region, hospital bed size, and hospital teaching status can all affect availability of palliative care consults.

Given our primary exposure and covariates of interest, we excluded hospital events where patient age, sex, race, insurance status, or patient outcome at discharge (dead or alive) were missing.

Statistical Analysis

Categorical data were compared between patient groups using Pearson χ^2 test, while continuous data were compared using the Kruskal-Wallis test. Multivariable logistic regression analyses were performed to assess the association between patient race and the receipt of palliative care services during the inpatient admission. Additional stratified analyses were also performed to identify factors associated with use of palliative care services within each patient group (by race and inpatient mortality). All multivariable models in the study adjusted for the following confounders of the relationship between race

and IPCC described above: Collinearity of variables was examined using variance inflation factor analysis, and model fit was evaluated using the Akaike Information Criterion. Results of the multivariable analysis were presented as odds ratios (ORs) with corresponding 95% CIs. All analyses were performed using Stata version 14.0, and a *P* value of <.05 was used to define statistical significance.[36] The study was approved by the institutional review board of Johns Hopkins University.

Results

Baseline Patient and Hospital Characteristics

A total of 204 175 hospital admission records met inclusion criteria. Of these the majority were white 146 306 (71.7%), 28 286 (13.8%) were black, 16 240 (7.9%) were Hispanic, and 6444 (3.2%) were Asian or Pacific Islanders. Median age was 65 years (interquartile range: 55–74 years) and 53% were females (Table 1). Eighty-six percent of all hospital admission records had an associated code status of full code, while 80% had aggressive inpatient care such as inpatient chemotherapy or radiation therapy, hemodialysis, mechanical ventilation, gastrostomy tube placement, or administration of parenteral nutrition. Approximately 14% (28 367) of included hospital admissions for patients with advanced solid organ malignancies had an associated palliative care consultation. The proportion of IPCC increased with time (Figure 1).

Factors Associated With Use of Palliative Care

In univariable analyses, black and Asian or Pacific Islander race (OR black: 1.11; 95% CI: 1.07–1.15; OR Asian/Pacific Islander: 1.15; 95% CI: 1.07–1.23, Table 2), increasing age (OR: 1.27; 95% CI: 1.24–1.31), insurance status other than private insurance, and comorbidity score (OR: 1.14; 95% CI: 1.13–1.15) were associated with significant increased odds of IPCC. Do-Not-Resuscitate status was associated with 12 times increased odds of receiving IPCC (OR: 12.1; 95% CI: 117–12.4), and receipt of aggressive care was also associated with increased odds of receiving IPCC (OR: 1.24; 95% CI: 1.21–1.18). In terms of hospital characteristics, only hospital bed size was associated with IPCC, with medium and large hospitals having increased odds of IPCC compared to small hospitals (OR medium: 1.16; 95% CI: 1.11–1.21; OR large: 1.10; 95% CI: 1.10–1.156).

In multivariable analyses, all of the significant factors from univariable analyses remained statistically significant with the exception of race. Once adjusted for age, gender, insurance status, comorbidity score, code status, hospital bed size, and receipt of aggressive care, there were no longer any statistically significant associations between race and receipt of IPCC (Table 2).

Palliative Care Utilization by Patient Race/Ethnicity

The highest utilization of IPCC by race or ethnicity was for Asian or Pacific Islanders (15.3%), followed by black (14.9%), Hispanic (14.1%), other (14.0%), and white (13.6%) patients. Rates of in-hospital mortality varied from 6.3% for Hispanic patients to 7.7% for Asian or Pacific Islander patients (Figure 2). When stratified by death during hospitalization event, 57.7% of those who died received IPCC compared to 10.5% who were discharged

alive. This difference persisted when further broken down by race. 56.8% of whites and 47.0% of blacks who died received IPCC versus 10.5% of whites and 12.3% of blacks those who were discharged alive (Figure 3).

Due to the strong effect of death on our outcome of interest, the multivariable analysis was repeated stratifying by death status. Adjusting for the same covariates as our original multivariable analysis, we see statistically significant increase in odds of IPCC for black and Hispanic patients compared to white (OR black: 1.14, 95% CI: 1.09–1.19; OR Hispanic: 1.11, 95% CI: 1.05–1.18). However, for those discharged alive, we see significant reductions in odds of IPCC for blacks and Hispanics compared to whites (OR black: 0.69, 95% CI: 0.62–0.76; OR Hispanic: 0.75, 95% CI: 0.65–0.87, Table 3.

Discussion

Although much of the existing literature focuses on disparities in the use of hospice, there are limited studies examining racial differences in the utilization of non-hospice-based palliative care services.[9] This study analyzed racial disparities in the use of palliative care for a nationally representative sample of patients with advanced cancer admitted to an inpatient unit. Black patients with cancer have been shown to have higher burden of symptoms at EOL and would therefore greatly benefit from palliative care interventions prior to initiation of hospice care.[5–7,9,11,37] However, racial differences were found in the use of IPCC for black patients with advanced cancers discharged alive versus white patients of the same condition.

Among patients with advanced cancers hospitalized in the United States, blacks were more likely than whites to receive IPCC if they died in the hospital. However, among patients who were discharged from hospital alive, this association reversed and blacks were less likely to have received IPCC than whites. This association remained true after adjusting for age, insurance status, and comorbidities. Among our entire cohort, a significantly higher proportion of IPCC were done for patients who died compared to those who were discharged alive. These findings suggest that death or perceived time to death is a significant mediator of receipt of IPCC for black patients.

Perceived time to death or death acting as a mediator on the relationship between race and receipt of IPCC may contribute to the mixed findings of the association between race and IPCC in the literature.[21–26] Although several studies have found higher odds of IPCC for hospitalized black patients with cancer, a few have found no difference or higher odds of IPCC for black patients compared to white patients.[21–26] However, only one of these studies investigated death as a mediator of receipt of IPCC.25 The absence of measurement of the potential mediator of death could explain the differences among these studies as highlighted by our findings of a transposed relationship between black race and IPCC when stratified by death. Furthermore, these studies included a single tumor type or were done at a single institution; factors that may lead to differences in racial distribution of people who died. Dissimilarities in study populations based on inclusion and exclusion criteria and temporal trends in IPCC may also explain the heterogeneity of study results.

Physicians who work in the inpatient setting are more likely to have EOL discussions when they believe prognosis to be grim and death imminent.[38,39] It has also been demonstrated that physicians who care for patients in a hospital setting are often unfamiliar with advance directives, lack knowledge of criteria for hospice or services available through hospice, and have discomfort in discussing futility of treatment with patients and their caregivers.[40] All of these factors may increase likelihood of using a palliative care consultation to overcome some of these barriers when death is believed to be close. This is supported by our findings of higher rates of IPCC among those who died compared to those discharged from hospital alive. Furthermore, critically ill nonwhite patients have been shown to have higher rates of discord with clinical providers and family members.[8] In this setting, IPCC may be used to facilitate EOL discussions which are perceived to be necessary but difficult. These factors may contribute to our finding of 14% higher odds of IPCC for black patients who died during admission compared to white patients.

The lower odds of IPCC utilization among black patients who were discharged alive reveal a critical disparity in the utilization of an effective medical tool which can improve health outcomes for black patients. In fact, these patients who are discharged alive are arguably the ones that would benefit the most from non-hospice-based palliative care; as they are going home to live with the sequelae of their cancer. Black patients potentially have more to gain from palliative care given their higher symptom burden at EOL.[9,11,37] Yet, this evidence-based practice is not being delivered to this vulnerable population at a rate equivalent to their white counterparts. Given our adjustments for medical and socioeconomic factors, which confound the relationship between race and IPCC, these results demonstrate that race and ethnicity play a role in the decision to provide IPCC. Further study is needed to understand the role of patient and family attitudes and choices in the rates of IPCC seen in this study.

Limitations

This study includes a large sample size and covers a variety of hospital settings across the United States, increasing the generalizability of our findings. However, there are some limitations. This is an administrative database which may have coding errors and lacks clinical details such as reason for palliative care consults and when consults were refused by patients. The ICD-9 code “v66.7” used to identify palliative care consults may also be used to code other medical care such as initiation of EOL care without a formal palliative care consultations. This would result in an overestimation of actual inpatient palliative care consults. However, validation studies have found high specificity of this code for capturing IPCC, especially among patients with advanced cancer.[33] We are also unable to ascertain whether palliative care consults were arranged for the outpatient setting postdischarge or whether patients had established care with palliative care team prior to admission. Using the NIS database, we are unable to distinguish between new admissions and readmissions. This may have led to an over- or underestimation of the prevalence of palliative care consultations in our study population depending on the racial distribution of readmissions in this sample.

Conclusions

To the best of our knowledge, this is the first study to use a nationally representative sample to address the question of whether or not disparities in utilization of palliative care consults persist for racial minorities in the inpatient setting. Although IPCC is more likely to be used for black patients who die, the disparity is reversed for black patients with advanced cancer who leave the hospital alive. As palliative care consult must be placed prior to death, this finding suggests that in the clinical setting, perceived risk of death mediates the relationship between race and use of palliative care consultation. Secondly, there remain significant disparities in utilization of palliative care for black patients most likely to benefit—those who were discharged from hospital alive. IPCC could be used to help address disparities in quality of care at EOL such as uncontrolled pain and foster a bridge for ongoing palliative care as an outpatient. Inpatient providers who care for patients with cancer should be aware of the benefits of IPCC, especially for racial minority patients. Further research is warranted to understand the underlying factors contributing the racial disparities in IPCC utilization and to develop interventions to improve utilization of IPCC among patients with advanced cancers.[9]

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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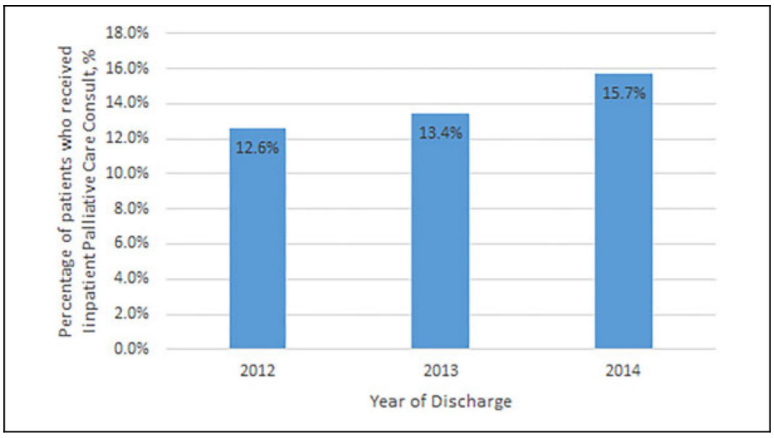

Figure 1.

Proportion of patients who received inpatient palliative care consult by year of inpatient admission.

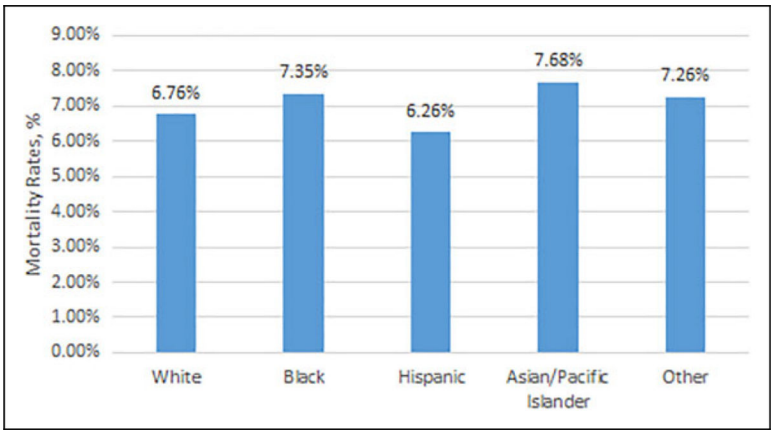

Figure 2.
Mortality rates among all patients by race/ethnicity.

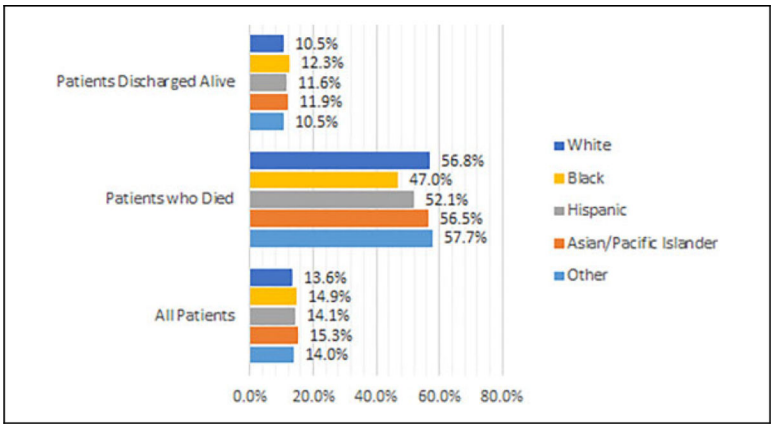

Figure 3.
Vital status at discharge by race/ethnicity.

Table 1.

Baseline Characteristics by Race and Ethnicity.

Characteristic	White n(%)	Black n (%)	Hispanic n (%)	Asian/Pacific Islander n (%)	Other n(%)	*P* value	Total N (%)
Age, years, median (IQR)	66 (57–75)	62 (54–71)	61 (50–71)	63 (53–72)	62 (53–72)	<.001	65 (55–74)
Sex						<.001	
Male	69 907 (47.8%)	12 400 (43.8%))	7557 (46.5%)	2952 (45.8%)	3235 (46.9%)		96 051 (47.0%)
Female	76 399 (52.2%)	15 886 (56.2%)	8683 (53.5%)	3492 (54.2%)	3664 (53.1%)		108 124 (53.0%)
Insurance						<.001	
Private	48 530 (33.2%)	7409 (26.2%)	3984 (24.5%)	2320 (36.0%)	2217 (32.1%)		64 460 (31.6%)
Medicare	77 839 (53.2%)	12 742 (45.0%)	6253 (38.5%)	2518 (39.1%)	2784 (40.4%)		102 136 (50.0%)
Medicaid	11 890 (8.1%)	5902 (20.9%)	4073 (25.1%)	1174 (18.2%)	1143 (16.6%)		24 182 (11.8%)
Other	8047 (5.5%)	2233 (7.9%)	1930 (11.9%)	432 (6.7%)	755 (10.9%)		13 397 (6.6%)
Income quartile						<.001	
Q1	31 817 (22.2%)	13 497 (49.1%)	5845 (37.1%)	792 (12.6%)	1739 (26.49%)		53 690 (26.9%)
Q2	37 482 (26.1%)	5907 (21.5%)	3802 (24.1%)	1079 (17.1%)	1411 (21.49%)		49 681 (24.9%)
Q3	36 441 (25.4%)	4722 (17.2%)	3723 (23.6%)	1692 (26.8%)	1525 (23.23%)		48 103 (24.1%)
Q4	37 746 (26.3%)	3339 (12.2%)	2385 (15.1%)	2748 (43.5%)	1890 (28.79%)		48 108 (24.1%)
Charlson Comorbidity	7(6–7)	7 (6–8)	6 (6–7)	6 (6–7)	6 (6–7)	<.001	7 (6–7)
							Index score, median (IQR)
Inpatient surgical procedure						<.001	
No	72 623 (49.6%)	16 989 (60.1%)	8900 (54.8%)	3353 (52.0%)	3441 (49.88%)		105 306 (51.6%)
Yes	73 683 (50.4%)	11 297 (39.9%)	7340 (45.2%)	3091 (48.0%)	3458 (50.12%)		98 869 (48.4%)
DNR status						<.001	
Full code	125 279 (85.6%)	24 516 (86.7%)	14 100 (86.8%)	5444 (84.5%)	5922 (85.84%)		175 261 (85.8%)
DNR	21 027 (14.4%)	3770 (13.3%)	2140 (13.2%)	1000 (15.5%)	977 (14.16%)		28 914 (14.2%)
Hospital location						<.001	
South	54 088 (37.0%)	13 944 (49.3%)	6429 (39.6%)	993 (15.1%)	2382 (34.53%)		77 836 (38.1%)
Midwest	31 935 (21.8%)	5896 (20.8%)	1162 (7.2%)	505 (7.8%)	914 (13.25%)		40 412 (19.8%)
West	24 614 (16.8%)	2316 (8.2%)	5922 (36.5%)	3659 (56.8%)	1226 (17.77%)		37 737 (18.5%)
Northeast	35 669 (24.4%)	6130 (21.7%)	2727 (16.2%)	1287 (20.0%)	2377 (34.45%)		48 190 (23.6%)

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Characteristic	White n(%)	Black n (%)	Hispanic n (%)	Asian/Pacific Islander n (%)	Other n(%)	*P* value	Total N (%)
Hospital bed size						<.001	
Small	17 149 (11.7%)	3259 (11.5%)	1726 (10.6%)	742 (11.5%)	680 (9.9%)		23 556 (11.5%)
Medium	33 172 (22.7%)	6913 (24.4%)	3873 (23.9%)	1295 (20.1%)	1357 (19.7%)		46 610 (22.8%)
Large	95 985 (65.6%)	18 114 (64.0%)	10 641 (65.5%)	4407 (68.4%)	4862 (70.5%)		134 009 (65.6%
Hospital teaching status						<.001	
Rural	9983 (6.8%	786 (2.8%	271 (1.7%	137 (2.1%	248 (3.6%		11 425 (5.6%
Urban nonteaching	40 207 (27.5%	5835 (20.6%	4781 (29.4%	1796 (27.9%	1536 (22.3%		54 155 (26.5%
Urban teaching	96 116 (65.7%	21 665 (76.6%	11 188 (68.9%	4511 (70.00%	5115 (74.1%		138 595 (67.9%)
Aggressive care (any)						<.001	
No	118 021 (80.7%)	21 814 (77.1%)	12 909 (79.5%)	5125 (79.5%)	5319 (77.1%)		163 188 (79.9%)
Yes	28 285 (19.3%)	6472 (22.9%)	3331 (20.5%)	1319 (20.5%)	1580 (22.9%)		40 987 (20.1%)
Inpatient radiation therapy						<.001	
No	139 333 (95.2%)	26 512 (93.7%)	15 521 (95.6%)	6166 (95.7%)	6562 (95.1%)		194 094 (95.1%)
Yes	6973 (4.8%)	1774 (6.3%)	719 (4.4%)	278 (4.3%)	337 (4.9%)		10 081 (4.9%)
Inpatient chemotherapy						<.001	
No	136 304 (93.2%)	26 161 (92.5%)	14 898 (91.7%)	5935 (92.1%)	6240 (90.5%)		189 538 (92.8%)
Yes	10 002 (6.8%)	2125 (7.5%)	1342 (8.3%)	509 (7.9%)	659 (9.5%)		14 637 (7.2%)
Mechanical ventilation						<.001	
No	141 554 (96.8%)	27 097 (95.8%)	15 686 (96.6%)	6211 (96.4%)	6634 (96.2%)		197 182 (96.6%)
Yes	4752 (3.2%)	1189 (4.2%)	554 (3.4%)	233 (3.6%)	265 (3.8%)		6993 (3.4%)
Gastrostomy tube						<.001	
No	142 765 (97.6%)	27 547 (97.4%)	15 862 (97.7%)	6292 (97.6%)	6698 (97.1%)		199 164 (97.5%)
Yes	3541 (2.4%)	739 (2.6%)	378 (2.3%)	152 (2.4%)	201 (2.9%)		5011 (2.5%)
Parenteral nutrition						<.001	
No	139 096 (95.1%)	26 834 (94.9%)	15 480 (95.3%)	6058 (94.0%)	6464 (93.7%)		193932 (95.0%)
Yes	7210 (4.9%)	1452 (5.1%)	760 (4.7%)	386 (6.0%)	435 (6.3%)		10 243 (5.0%)
Hemodialysis						<.001	
No	145 271 (99.3%)	27 733 (98.0%)	16 056 (98.9%)	6391 (99.2%)	6842 (99.7%)		202 293 (99.1%)
Yes	1035 (0.7%)	533 (2.0%)	184 (1.1%)	53 (0.8%)	57 (0.8%)		1882 (0.9%)
Palliative care consultation						<.001	

Characteristic	White n(%)	Black n (%)	Hispanic n (%)	Asian/Pacific Islander n (%)	Other n(%)	*P* value	Total N (%)
No	126 392 (86.4%)	24 080 (85.1%)	13 944 (85.9%)	5456 (84.7%)	5936 (86.0%)		175 808 (86.1%)
Yes	19 914 (13.6%)	4206 (14.9%)	2296 (14.1%)	988 (15.3%)	963 (14.0%)		28 367 (13.9%)

Abbreviations: IQR, interquartile range; DNR, Do Not Resuscitate.

Table 2.

Univariable and Multivariable Logistic Regression Analyses of Factors Associated With Receipt of Inpatient Palliative Care.

	Univariable logistic regression				Multivariable logistic regression			
Characteristic	**Odds ratio**	**95% CI**		***P* value**	**Odds ratio**	**95% CI**		***P* value**
Patient race								
White	Reference	–	–	–	Reference	–	–	–
Black	1.11	1.069	1.149	<.001	1.04	0.998	1.083	.065
Hispanic	1.05	0.997	1.095	.064	1.02	0.967	1.076	.466
Asian/Pacific Islander	1.15	1.072	1.232	<.001	1.08	0.998	1.170	.056
Other	1.03	0.960	1.104	.411	1.00	0.924	1.083	.994
Age, years	1.27	1.241	1.305	<.001	1.01	1.006	1.009	<.001
Sex								
Male	Reference	–	–	–	Reference	–	–	–
Female	1.04	0.979	1.030	.741	1.03	1.002	1.061	.038
Insurance								
Private	Reference	–	–	–	Reference	–	–	–
Medicare	1.25	1.215	1.289	<.001	0.85	0.814	0.882	<.001
Medicaid	1.33	1.278	1.391	<.001	1.17	1.110	1.223	<.001
Other	1.51	1.432	1.569	<.001	1.32	1.243	1.396	<.001
Income quartile								
Q1	Reference	–	–	–	–	–	–	–
Q2	0.98	0.943	1.013	.209	–	–	–	–
Q3	1.02	0.981	1.053	.374	–	–	–	–
Q4	1.02	0.983	1.056	.300	–	–	–	–
Charlson Comorbidity Index score	1.14	1.129	1.149	<.001	1.04	1.033	1.056	<.001
Inpatient surgical procedure								
No	Reference	–	–	–	Reference	–	–	–
Yes	0.17	0.169	0.181	<.001	0.28	0.269	0.288	<.001
DNR status								
Full code	Reference	–	–	–	Reference	–	–	–
DNR	12.08	11.738	12.437	<.001	8.60	8.345	8.866	<.001

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	Univariable logistic regression				Multivariable logistic regression			
Characteristic	**Odds ratio**	**95% CI**		***P* value**	**Odds ratio**	**95% CI**		***P* value**
Hospital location								
South	Reference	–	–	–	–	–	–	–
Midwest	0.98	0.944	1.012	.201	–	–	–	–
West	1.10	1.057	1.134	<.001	–	–	–	–
Northeast	1.03	1.001	1.069	.046	–	–	–	–
Hospital bed size								
Small	Reference	–	–	–	Reference	–	–	–
Medium	1.16	1.106	1.213	<.001	1.15	1.094	1.214	<.001
Large	1.10	1.060	1.151	<.001	1.18	1.128	1.237	<.001
Hospital teaching status								
Rural	Reference	–	–	–	–	–	–	–
Urban nonteaching	0.91	0.859	0.964	.001	–	–	–	–
Urban teaching	0.93	0.884	0.985	.012	–	–	–	–
Aggressive care (any)								
No	Reference	–	–	–	Reference	–	–	–
Yes	1.24	1.205	1.279	<.001	1.22	1.180	1.263	<.001
Inpatient radiation therapy								
No	Reference	–	–	–	–	–	–	–
Yes	1.39	1.324	1.467	<.001	–	–	–	–
Inpatient chemotherapy								
No	Reference	–	–	–	–	–	–	–
Yes	0.84	0.802	0.889	<.001	–	–	–	–
Mechanical ventilation								
No	Reference	–	–	–	–	–	–	–
Yes	1.73	1.630	1.832	<.001	–	–	–	–
Gastrostomy tube								
No	Reference	–	–	–	–	–	–	–
Yes	1.37	1.270	1.470	<.001	–	–	–	–
Parenteral nutrition								
No	Reference	–	–	–	–	–	–	–

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Characteristic	Univariable logistic regression Odds ratio	95% CI		*P* value	Multivariable logistic regression Odds ratio	95% CI		*P* value
Yes	1.27	1.199	1.334	<.001	–	–	–	–
Hemodialysis								
No	Reference	–	–	–	–	–	–	–
Yes	1.53	1.368	1.719	<.001	–	–	–	–

Abbreviation: DNR, Do Not Resuscitate.

Table 3.

Association of Race/Ethnicity and Receipt of Inpatient Palliative Care Stratified by Vital Status Results of a Multivariable Logistic Regression.[a]

	All patients			Patients who died			Patients discharged alive		
	Odds ratio	**95% CI**	***P* value**	**Odds ratio**	**95% CI**	***P* value**	**Odds ratio**	**95% CI**	***P* value**
White	Reference	–	–	Reference	–	–	Reference	–	–
Black	1.04	0.998–1.083	.065	1.14	1.087–1.190	<.001	0.69	0.622–0.764	<.001
Hispanic	1.02	0.967–1.076	.466	1.11	1.049–1.179	<.001	0.75	0.655–0.867	<.001
Asian/Pacific Islander	1.08	0.998–1.170	.056	1.11	1.014–1.214	.023	0.92	0.755–1.114	.384
Other	1.00	0.924–1.083	.994	1.01	0.923–1.106	.824	0.96	0.789–1.162	.660

[a]This model adjusted for age, gender, race/ethnicity, insurance status, comorbidities, code status, hospital bed size, and receipt of aggressive care.