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Place of death by region and urbanization among gynecologic cancer patients: 2006–2016

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HIGHLIGHTS

- Place of death among gynecologic oncology patients varies by United States census region.
- Place of death among gynecologic oncology patients varies by urbanization.
- In rural and metro areas, black gynecologic cancer patients are more likely to die as inpatients, compared to whites.
- In rural and metro areas, black gynecologic cancer patients are equally as likely to die in a hospice facility as whites.

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ABSTRACT

Objective. To evaluate associations between US region of residence and urbanization and the place of death among women with gynecologic malignancies in the United States.

Methods. A retrospective cross-sectional study was performed using publicly available death certificate data from the National Center for Health Statistics. All gynecologic cancer deaths were included from 2006 to 2016. Comparisons among categories were performed with a two-tailed chi-square test, with p-values <0.05 considered significant.

Results. From 2006 to 2016, 328,026 women died from gynecologic malignancies in the US. Of these deaths, 40.1% ($n = 134,333$) occurred in the patient's home, 24.9%($n = 81,823$) in the hospital, and 11.3% (37,188) in an inpatient hospice facility. Place of death varied by geographic region. The Northeast had the largest percentage of gynecologic cancer patients (31.3%) die as a hospital inpatient. The West had the highest percentage of deaths (49.3%) at home. Deaths in a hospice facility were the highest (14.1%) in the South. Place of death varied by urbanization; patients residing in large central metro or rural counties were the most likely to die during hospital admission (28.7% and 27.1%, respectively). Patients living in medium-sized metro areas were the least likely to die in hospitals (21.8%) and most likely to die in a hospice facility (14.3%). All comparisons were significant by study definition.

Conclusion. The place of death for patients with gynecologic malignancies varies by US region and urbanization. These disparities are multifactorial in nature, likely influenced by both sociodemographic factors and regional resource availability. In this study, however, rural and central metro areas are identified as regions that may benefit from further hospice development and advocacy.

1. Background

In 2017, over 31,000 women died from gynecologic cancers in the United States [1]. For these patients, the location of their death may be an important indicator of their quality-of-life (QOL) at the end of life (EOL) [2]. Specifically, death at home is favored by the majority of patients with advanced cancer [3–5] and there are many benefits of dying outside the hospital. Death in the hospital has been associated with decreased QOL for patients and an increased risk of developing psychiatric illness in the bereaved caregivers [6]. Additionally, death outside of the hospital, when enrolled in hospice care, results in lower total health system costs in the last year of life [7] and less aggressive EOL care has been associated with longer survival in several cancer populations [8,9].

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Table 1
Place of death in gynecologic cancer patients.

Demographic-Gynecologic Cancers	Gyn Cancer Cohort (2006–2016) $n = 328,026$ (%)	2006 $n = 28,489$ (%)	2011 $n = 29,751$ (%)	2016 n = 32,390 (%)
Age at time of death				
0–14	41 (0.01)	8 (0.03)	5 (0.02)	3 (0.01)
15–24	444 (0.1)	34 (0.1)	37 (0.1)	30 (0.1)
25–34	3620 (1.1)	297 (1.0)	310 (1.0)	394 (1.2)
35–44	12,426 (3.8)	1228 (4.3)	1138 (3.8)	1097 (3.4)
45–54	35,992 (11.0)	3395 (11.9)	3319 (11.2)	3133 (9.7)
55–64	70,326 (21.4)	5743 (20.2)	6526 (21.9)	7021 (21.7)
65–74	83,686 (25.5)	6570 (23.1)	7332 (24.6)	9283 (28.7)
75–84	76,107 (23.2)	7287 (25.6)	6858 (23.1)	7147 (22.1)
85+	45,384 (13.8)	3927 (13.8)	4226 (14.2)	4281 (13.2)
Race				
White	274,207 (83.6)	24,296 (85.3)	24,843 (83.5)	26,636 (82.2)
Black or African American	42,769 (13.0)	3.394 (12.0)	3912 (13.1)	4417 (13.6)
Asian or Pacific Islander	9328 (2.8)	669 (2.3)	848 (2.9)	1151 (3.6)
American Indian or Alaska Native	1722 (0.5)	130 (0.5)	148 (0.5)	186 (0.6)
Ethnicity[a]				
Non-Hispanic	303,990 (92.7)	26,710 (93.8)	27,648 (92.9)	29,666 (91.6)
Hispanic	23,414 (7.1)	1746 (6.1)	2056 (6.9)	2639 (8.1)
Primary Cancer Diagnosis				
Ovarian Cancer[b]	168,633 (51.4)	15,656 (55.0)	15,325 (51.5)	15,483 (47.8)
Uterine Cancer	96,063 (29.3)	7384 (26.0)	8641 (29.0)	10,733 (33.1)
Cervical Cancer	44,714 (13.6)	3976 (14.0)	4092 (13.8)	4188 (13.0)
Vulvar Cancer	11,028 (3.4)	862 (3.0)	1022 (3.4)	1221 (3.8)
Other Gynecologic Cancers[c]	7588 (2.3)	611 (2.0)	671 (2.3)	765 (2.4)
Place of Death[d]				
Decedent's Home	134,333 (40.1)	11,272 (39.6)	12,037 (40.5)	14,141 (43.7)
Inpatient	81,823 (24.9)	8562 (30.0)	7398 (24.9)	7119 (22.0)
Nursing Home/Long Term Care	47,387 (14.4)	4760 (16.7)	4443 (14.9)	3809 (11.8)
Hospice Facility	37,188 (11.3)	1405 (4.9)	3316 (11.1)	5433 (16.8)
Other/Unknown	21,434 (6.5)	1982 (7.0)	2039 (6.9)	1299 (4.0)
Medical Facility: Other	5861 (1.8)	508 (1.8)	518 (1.7)	589 (1.8)
US Census Region[e]				
Northeast (NE)	66,684 (20.3)	6181 (21.7)	6158 (20.7)	6204 (19.1)
Midwest (MW)	75,277 (22.9)	6689 (23.5)	6788 (22.8)	7256 (22.4)
South (S)	117,741 (35.9)	10,015 (35.2)	10,692 (36.0)	11,880 (36.7)
West (W)	68,110 (20.8)	5593 (19.6)	6085 (20.5)	7035 (21.7)
County Urbanization[e,f]				
Large Central Metro (≥ 1000,000)	94,654 (28.9)	8186 (28.7)	8510 (28.6)	9531 (29.4)
Large Fringe Metro (≥ 1000,000)	78,565 (24.0)	6624 (23.3)	7089 (23.8)	7976 (24.6)
Medium Metro (250,000–999,999)	67,626 (20.7)	5834 (20.5)	6159 (20.7)	6700 (20.7)
Small Metro (50,000–249,999)	31,492 (9.6)	2822 (9.9)	2913 (9.8)	2998 (9.3)
Micropolitan (urban cluster ≥10,000)	31.298 (9.5)	2800 (9.8)	2829 (9.5)	2901 (9.0)
Rural/Noncore (urban cluster <10,000)	23,981 (7.3)	2175 (7.6)	2225 (7.5)	2259 (7.0)

[a] Ethnicity does not include $n = 622$ patients with ethnicity "Not Stated" (0.19% of the entire cohort).
[b] Ovarian Cancer includes the following diagnosis codes: "Malignant neoplasm of ovary", "Fallopian tube – malignant neoplasms", "Specified parts of peritoneum – malignant neoplasms", "Peritoneum, unspecified – Malignant neoplasms", Uterine adnexa, unspecified – Malignant neoplasm".
[c] Other Gynecologic Cancers includes the following diagnosis codes: "Malignant neoplasm of vagina", "Malignant neoplasm of other and unspecified female genital organs", "Broad ligament – malignant neoplasm", "Round ligament – malignant neoplasm", "Parametrium – malignant neoplasm", "Other specified female gential organs", "Overlapping lesion of female genital organs – malignant neoplasm", and "Malignant neoplasm of placenta".
[d] 'Medical Facility: Other' includes patient deaths originally coded as "Medical Facility - Outpatient or ER," "Medical Facility - Dead on Arrival" and "Medical Facility – unknown". "Other/Unknown" includes patient deaths originally coded as either "Other" and "Place of Death Unknown".
[e] US Census Division and Country Urbanization numbers do not include numbers which were suppressed. Sub-national data representing zero to nine (0–9) deaths per category were suppressed. US Census Division sections has 214 patients suppressed from 1999 to 2015. County Urbanization has 410 patients suppressed from 1999 to 2015.
[f] Urbanization is defined using the "2013 NCHS Urban-Rural Classification Scheme for Counties". For the purposes of user comprehension, the label "Noncore" was called "Rural/Noncore" to indicate the rural nature of the population.

The relationship between preferred place of death and actual place of death has been studied. In one such study, 90% of terminally ill cancer patients preferred to die at home but only one-third of patients achieved their preferred place of death [10]. Patients receiving hospice services were more likely to achieve their place of death goal. [10,11] A second study identified that despite clear preferences for death at home, more than half actually died in the hospital [12]. Importantly, this study found that the area of residence was the most powerful predictor of place of death, with the risk of in-hospital death decreasing with greater geographic availability of skilled nursing facilities and hospice [12].

In gynecologic oncology patients, there has been a move away from inpatient deaths. From 2003 to 2015, there was a 47% increase in deaths occurring in home or in hospice facilities among gynecologic oncology patients [13]. In light of this data regarding increasing hospice utilization, this study sought to comprehensively evaluate the data regarding place of death in gynecologic oncology patients with attention to associations between place of death and level of urbanization or geographic region in the United States.

2. Methods

A retrospective study of all women whose primary cause of death was a gynecologic malignancy, as specified on their death certificate, in the United States between 2006 and 2016 was performed. Data was collected through the Centers for Disease Control and Prevention (CDC) Wide-ranging Online Data for Epidemiologic Research (WONDER) database. The CDC WONDER is a de-identified, free-of-cost,

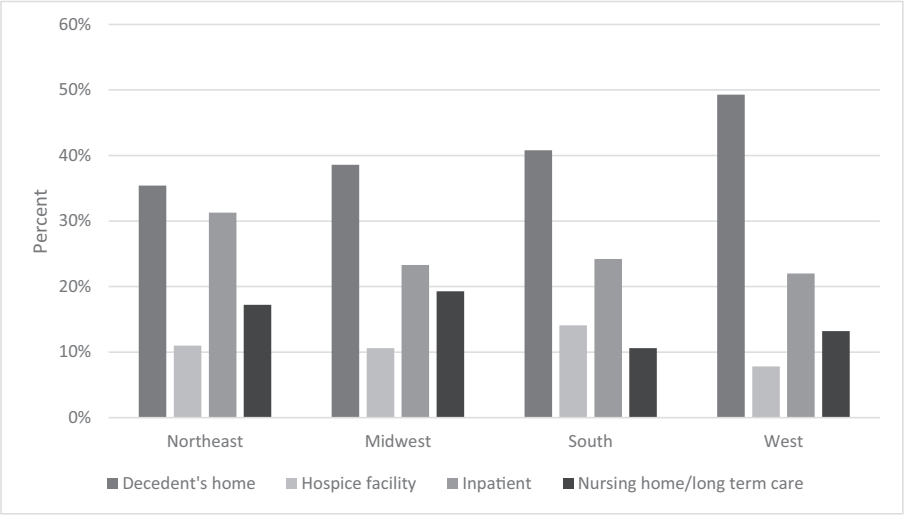

Fig. 1. Gynecologic cancer place of death by US region from 2006 to 2016.

publicly available online dataset that is maintained by the National Center for Health Statistics. This dataset contains mortality data from death certificates for all US counties ranging from 1999 to 2016. A death certificate includes demographic information, a single underlying cause of death, and the location of death.

All women with gynecologic malignancies as the primary cause of death were included in this study. The Duke University Medical Center Institutional Review Board provided a waiver (Pro00102187) for this study, as CDC WONDER is a de-identified and publicly available. Data collected from CDC WONDER also included age at death, year of death, race, ethnicity, place of death, US census division, urbanization via county, and cause of death (type of primary cancer). Age at death was described in 10-year increments with the exception of the lower and upper extremes, which were reported as 0–14 years and 85 or more years, respectively. Race was described as white, black or African American, Asian or Pacific Islander, and American Indian or Alaskan Native. Ethnicity was reported as Hispanic or Non-Hispanic. Delineation of cause of death was performed using available ICD-10 codes recorded on death certificates.

Within CDC WONDER, place of death is reported as Decedent's Home, Hospital Inpatient, Nursing Home/Long Term Care, Hospice Facility, Other/Unknown, Medical Facility: Outpatient or ER, Medical Facility: Dead on Arrival, or Medical Facility: unknown. For clarity in this study, Medical Facility: Outpatient or ER, Medical Facility: Dead on Arrival, and Medical Facility: unknown were combined into one category – "Medical Facility: Other". In 2003, "Hospice Facility" was added to the place of death categories. Although the data does not distinguish if the patient received hospice care at home prior to death, the greatest percentage of hospice services (45%) are provided in the home, so death at home likely includes the use of home hospice in many instances [14].

Patient residence was reported at both the state and county level and was categorized into US Census divisions. Urbanization was categorized using the 2006 NCHS Urban-Rural Classification Scheme for Counties which utilizes the population of the county of residence at the time of death. Urbanization classifications include large central metro (population ≥ 1000,000/county), large fringe metro (population ≥ 1000,000/county), medium metro (population 250,000–999,999/county), small metro (population 50,000–249,999/county), micropolitan (urban cluster with population ≥ 10,000/county), and rural/noncore (urban cluster with population < 10,000/county). This classification is commonly used in health care research as it separates large metropolitan areas (population of at least one million) further into two categories: "large central metro" and "large fringe metro", to better reflect inner city versus suburban populations, respectively [15].

Region of the country was determined by the four United States Census Regions: Northeast (NE), Midwest (MW), South (S), and West (W). The Northeast region is comprised of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. The Midwest region is comprised of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. The South is comprised of Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Finally, the West is comprised of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Table 2
Gynecologic cancer deaths by US census region.

Gynecologic Cancer Deaths by US Census Region from 2006 to 2016	Northeast $n = 66,684$ n (%)	Midwest $n = 75,277$ n (%)	South $n = 117,741$ n (%)	West $n = 68,110$ n (%)	p value
Location of Death[a]					
Decedent's home	23,584 (35.4)	29,092 (38.6)	48,087 (40.8)	33,570 (49.3)	< 0.001
Hospice facility	7316 (11.0)	8005 (10.6)	16,568 (14.1)	5299 (7.8)	< 0.001
Home or Hospice	30,900 (46.3)	37,097 (49.3)	64,655 (54.9)	38,869 (57.1)	< 0.001
Medical facility – inpatient	20,858 (31.3)	17,512 (23.3)	28,487 (24.2)	14,966 (22.0)	< 0.001
Nursing home/long term care	11,447 (17.2)	14,494 (19.3)	12,458 (10.6)	8988 (13.2)	< 0.001
Medical facility – outpatient/ER/DOA or unknown	1029 (1.5)	1227 (1.6)	2327 (2.0)	1147 (1.7)	< 0.001

[a] Location of death subdivisions do not include $n = 21,434$ patients whose place of death was "Other/Unknown".

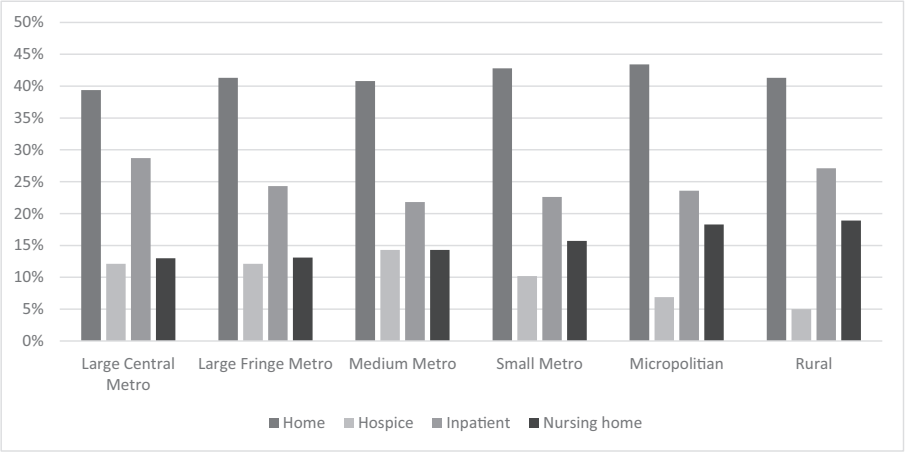

Fig. 2. Gynecologic cancer place of death by urbanization from 2006 to 2016.

2.1. Statistical analysis

Descriptive variables were summarized. We examined urbanization and US census region variables for association with place of death utilizing the chi-square test. Statistical analyses were performed using SPSS v21 (Armonk, NY). Multivariate analysis was not possible with the data used in this analysis, as the CDC only provides these characteristics in aggregate in order to protect subject privacy. All comparisons were two-tailed, with a statistical significance threshold of $p < 0.05$.

3. Results

From 2006 to 2016, 328,026 women died from gynecologic malignancies in the United States, including 168,633 (51.4%) from ovarian cancer, 96,063 (29.3%) from uterine cancer, 44,714 (13.5%) from cervical cancer, and 11,028 (3.4%) from vulvar cancer. Table 1 shows patient characteristics of the sample, including place of death, US census region, and urbanization. The majority of patients were white (83.6%), non-Hispanic (92.7%), and ≥ 55 years old (83.9%) (Table 1).

Trends in place of death are noted in Table 1. Among all gynecologic cancers, 51.4% of deaths occurred at home or in hospice from 2006 to 2016. During the study period, there was a 16% increase in deaths at home or in hospice facilities (44.5% in 2006 to 60.5% in 2016). Specifically, deaths in a hospice facility increased by 11.9% (4.9% to 16.8%) and deaths in the decedent's home increased by 4.2% in the decade from 2006 to 2016. Overall, the largest percentage of deaths occurred in the decedent's home (40.1%) with the inpatient setting being the next most common location (24.9%). The percentage of gynecologic cancer patients dying in the inpatient setting decreased over time, with 22% of deaths occurring in the inpatient setting in 2016, down from 30% in 2006.

Place of death varied by US census region (Fig. 1). When evaluating place of death by region, the Northeast had a larger percentage of gynecologic cancer patients die in the inpatient setting compared to any other region (31.3% vs 23.3% (MW), 24.2% (S), & 22.0% (W)) (Table 2). The West had the highest percentage of deaths at home (49.3% vs 35.4% (NE), 38.6% (MW), 40.8% (S)) (Table 2). Over the 11-year period, the South had the highest rate of death within hospice facilities (14.1% vs 11.0% (NE), 10.6% (MW), 7.8% (W)) (Table 2). The lowest percentage of deaths in a nursing home/long term care setting was also seen in the South. All trends in place of death by region were significant ($p < 0.001$).

Overall, 52.9% of deaths from gynecologic cancers occurred in patients residing in counties with at least one million residents (large central metro and large fringe metro areas). (Table 1 and Fig. 2) Throughout the study period, gynecologic cancer patients living in a medium sized metro area were the least likely to die as inpatient and the most likely to die in a hospice facility. (Table 3) Patients living in rural counties were the least likely to die in a hospice facility. Patients residing in large central metro counties and rural counties were the most likely to die in the inpatient setting (28.7% and 27.1%, respectively). (Table 3) The percentage of patients dying at home ranged from 39.4% - 43.4% for all urbanization levels.

Subsequent analysis evaluated gynecologic cancer death by urbanization and further stratified by race (Table 4). Within the large central metro areas, 37.2% of black patients died in the inpatient setting compared to 25.7% of white patients. This difference was also observed in rural counties with 34.8% of black patients and 26.0% of white patients dying in the hospital. However, in both of these urbanization areas there was no racial difference in

Table 3
Gynecologic cancer deaths by US county urbanization.

Gynecologic cancer deaths by US county urbanization from 2006–2016	Large central metro $n = 94,654$ n (%)	Large fringe metro $n = 78,565$ n (%)	Medium metro $n = 67,626$ n (%)	Small metro $n = 31,492$ n (%)	Micro-politian n = 31,298 n (%)	Noncore/rural $n = 23,981$ n (%)	p value
Location of death[a]							
Decedent's home	37,339 (39.4)	32,452 (41.3)	27,567 (40.8)	13,490 (42.8)	13,569 (43.4)	9916 (41.3)	< 0.001
Hospice facility	11,418 (12.1)	9527 (12.1)	9657 (14.3)	3227 (10.2)	2154 (6.9)	1205 (5.0)	< 0.001
Home or Hospice	48,757 (51.5)	41,979 (53.4)	37,224 (55.0)	16,717 (53.1)	15,723 (50.2)	11,121 (46.4)	< 0.001
Medical facility – inpatient	27,126 (28.7)	19,104 (24.3)	14,715 (21.8)	7102 (22.6)	7378 (23.6)	6488 (27.1)	< 0.001
Nursing home/long term care	12,217 (13.0)	10,273 (13.1)	9694 (14.3)	4959 (15.7)	5723 (18.3)	4521 (18.9)	< 0.001
Medical facility – outpatient/ER/DOA or unknown	1839 (1.9)	1337 (1.7)	1057 (1.6)	460 (1.5)	510 (1.6)	391 (1.6)	< 0.001

[a] Location of death subdivisions do not include n = 21,434 patients whose place of death was "Other/Unknown".

the percentage of deaths occurring in a hospice facility (large central metro – black 11.6% vs white 12.6%; rural – black 5.3% vs white 5.0%) (Table 4).

4. Discussion

In 1998, the American Society of Clinical Oncology published a special report emphasizing palliative care involvement and hospice utilization as critical components of high-quality end-of-life cancer care [16]. Subsequently, improving end-of-life (EOL) care has been a focus of cancer research for the past two decades. Death in a hospital has been associated with decreased quality-of-life (QOL), increased risk of psychiatric illness in the bereaved caregiver, and increased total health system costs, making death in one's home or in an inpatient hospice facility a crucial component of high-quality EOL cancer care. [6,7] Assessing patient goals and wishes for end-of-life care is effective at decreasing inpatient deaths [17] through the timely involvement of palliative care and hospice services. Between 2000 and 2015, the proportion of hospitals with >50 beds that had a palliative care program tripled from 25 to 75% [18]. The current study found that from 2006 to 2016, the place of death for patients with gynecologic cancers followed this same trend; the percentage of deaths occurring at home or in hospice facilities increased by 16%. A concomitant 8% decrease in inpatient deaths was also noted during this same time period.

This study demonstrates geographic variation in the proportion of deaths occurring in the decedent's home or hospice compared to the inpatient setting. Similarly, the Dartmouth Atlas Project found regional variation in hospice utilization [19]. Approximately 35 million individuals live in communities >30 min from a hospice agency and 6 million individuals live >60 min from a hospice agency [20]. Broadly speaking, there is greater access to hospice in urban compared to rural areas. However, communities with lower median incomes, lower educational attainment, and a lower percentage of the population who are black are more likely to be >30 min from a hospice agency, independent of population density [20]. This study further highlights that the urbanization disparity is not simply based on population density, as gynecologic cancer patients in medium metro populations, but not large metro areas, were the most likely to die in a hospice facility (14.3%). Social support likely plays a critical role in this finding. Social support has often been characterized as a three-tier system: tier one consisting of family and friends, tier two consisting of community, religious organizations, and local emergency services, and tier three consisting of formal fee-based services. Rural residents have typically preferred tiers one and two for means of support. [21] Additionally, in rural areas the greater distance from hospice may mean a patient is too far to reasonably receive daily services or too far for family to travel to visit someone in an inpatient hospice facility. Also, greater distance from hospice organizations means community members are less likely to be volunteers or employees. When community members are involved with hospice, trust, cultural sensitivity, and overall awareness and knowledge of hospice increases, all of which have been previously identified as barriers to hospice uptake. [22,23].

Gynecologic oncology patients in large central metro areas were the most likely to die in the inpatient setting. Similarly, the Northeast US Census region, with the highest population density, has the largest percentage of gynecologic cancer deaths in the inpatient setting. Through these regional and urbanization trends, this study demonstrates that access to hospice is not the sole factor in utilization for gynecologic oncology patients.

There are known racial disparities in place of death, with non-white cancer patients being significantly less likely to die at home [24]. Our study confirms this finding and adds new granularity to this racial disparity specifically at the urbanization level. In large central metro areas, where hospice access is considered adequate, 37.2% of black women with gynecologic cancers died in the hospital, compared to 25.7% of white patients. A similar pattern was observed in the rural areas where 34.8% of black gynecologic cancer patients died in the hospital versus 26.0% of white patients. Research demonstrates that black patients are more likely to experience distress when discussing death, want aggressive end-of-life care, have spiritual beliefs that conflict with the goals of palliative care, and have distrust in the healthcare system [25]. Not surprisingly, they have less favorable beliefs about hospice [25]. Three variables have demonstrated a 96% sensitivity in predicting place of death: 1) the caregiver's preferred place of death, 2) the patient's preferred place of death, and 3) the caregiver's perceived social support [26]. Thus, within the black population, potential barriers to home or hospice death may be more dependent on patient and family belief systems than hospice availability, regional, or urbanization factors.

Our study has several limitations inherent with the use of the dataset. First, our study relies on the accurate documentation of both the place of death and gynecologic malignancy as the primary cause of death. However, the rate of documentation error for cause and place of death would have to be large and demonstrate a change over time to impact our results. Additionally, we started the data range for our study at 2006 to eliminate ascertainment bias that was potentially associated with the introduction of “hospice” as an option for the death certificate place of death in 2002. Socioeconomic and regional factors such as income [27], insurance [28], educational attainment [20], and hospice service availability influence hospice utilization are not captured by the dataset. Finally, when place of death is coded as “nursing home/long term care”, we are unable to extricate whether hospice services were provided at the facility.

The overall proportion of deaths from gynecologic cancers occurring in patients' homes or hospice is increasing. However, despite widespread implementation of palliative care programs, many sociodemographic variables, such as US region, urbanization, and race, increase the likelihood that a cancer patient will die in the inpatient setting. This highlights the need to address EOL disparities that have widespread impact on patients, caregivers, and the US medical system as a whole. Specifically, educational efforts geared toward urban black communities on hospice/palliative care benefits and common misconceptions may be a high yield intervention. It will be important for these interventions to focus on the benefit of early hospice/palliative care enrollment and for future studies to track the length of hospice service utilization.

Author contributions

AMP: Contributed to development of study concept, hypothesis generation, study design, data collection, data organization, and primary manuscript authorship.

FC: Contributed to hypothesis generation, study design, and manuscript editing.

LJH: Contributed to hypothesis generation, study design, and manuscript editing.

BAD: Significant role in manuscript revision and editing.

JPC: Development of study concept and significant contributions to hypothesis generation, study design, and manuscript editing.

Declaration of Competing Interest

The authors of this paper have no conflicts of interest related to this submission.

Acknowledgments

None.

Table 4
Gynecologic cancer deaths by urbanization and race.

Gynecologic cancer deaths by US county urbanization and race from 2006 to 2016	Race	Place of death	Number of gynecologic cancer deaths (%)
Large Central Metro	Black or African American	Decedent's home	6494 (32.1)
		Hospice facility	2337 (11.6)
		Inpatient	7518 (37.2)
		Nursing home/long term care	2166 (10.7)
		Other/Unknown	970 (4.8)
		Medical Facility: Other	719 (3.6)
		Total	20,204
	White	Decedent's home	28,669 (41.3)
		Hospice facility	8709 (12.6)
		Inpatient	17,819 (25.7)
		Nursing home/long term care	9461 (13.6)
		Other/Unknown	3605 (5.2)
		Medical Facility: Other	1074 (1.5)
		Total	69,337
Large Fringe Metro	Black or African American	Decedent's home	2859 (33.8)
		Hospice facility	980 (11.6)
		Inpatient	2789 (32.9)
		Nursing home/long term care	813 (9.6)
		Other/Unknown	703 (8.3)
		Medical Facility: Other	322 (3.8)
		Total	8466
	White	Decedent's home	28,631 (42.1)
		Hospice facility	8353 (12.3)
		Inpatient	15,536 (22.9)
		Nursing home/long term care	9265 (13.6)
		Other/Unknown	5155 (7.6)
		Medical Facility: Other	1000 (1.5)
		Total	67,940
Medium Metro	Black or African American	Decedent's home	2441 (35.7)
		Hospice facility	935 (13.7)
		Inpatient	2018 (29.5)
		Nursing home/long term care	731 (10.7)
		Other/Unknown	491 (7.2)
		Medical Facility: Other	221 (3.2)
		Total	6837
	White	Decedent's home	24,219 (41.1)
		Hospice facility	8567 (14.5)
		Inpatient	12,177 (20.7)
		Nursing home/long term care	8806 (15.0)
		Other/Unknown	4289 (7.3)
		Medical Facility: Other	841 (1.4)
		Total	58,899
Small Metro	Black or African American	Decedent's home	978 (36.1)
		Hospice facility	245 (9.0)
		Inpatient	868 (32.0)
		Nursing home/long term care	289 (10.7)
		Other/Unknown	239 (8.8)
		Medical Facility: Other	87 (3.2)
		Total	2711[a]
	White	Decedent's home	12,289 (43.4)
		Hospice facility	2934 (10.4)
		Inpatient	6071 (21.4)
		Nursing home/long term care	4613 (16.3)
		Other/Unknown	2009 (7.1)
		Medical Facility: Other	385 (1.4)
		Total	28,301
Micropolitan	Black or African American	Decedent's home	934 (39.1)
		Hospice facility	164 (6.9)
		Inpatient	730 (30.6)
		Nursing home/long term care	285 (11.9)
		Other/Unknown	163 (6.8)
		Medical Facility: Other	106 (4.4)
		Total	2386[a]
	White	Decedent's home	12,342 (43.6)
		Hospice facility	1946 (6.9)
		Inpatient	6456 (22.8)
		Nursing home/long term care	5356 (18.9)
		Other/Unknown	1782 (6.3)
		Medical Facility: Other	411 (1.5)
		Total	28,293
Noncore/Rural	Black or African American	Decedent's home	795 (36.7)
		Hospice facility	114 (5.3)
		Inpatient	753 (34.8)
		Nursing home/long term care	251 (11.6)

Table 4 (*continued*)

Gynecologic cancer deaths by US county urbanization and race from 2006 to 2016	Race	Place of death	Number of gynecologic cancer deaths (%)
		Other/Unknown	167 (7.7)
		Medical Facility: Other	78 (3.6)
		Total	2165[a]
	White	Decedent's home	8962 (41.8)
		Hospice facility	1069 (5.0)
		Inpatient	5571 (26.0)
		Nursing home/long term care	4210 (19.6)
		Other/Unknown	1286 (6.0)
		Medical Facility: Other	339 (1.6)
		Total	21,437

[a] US County Urbanization numbers do not include numbers which were suppressed. Sub-national data representing zero to nine (0–9) deaths per category were suppressed. County Urbanization has 16 patients suppressed from 2006 to 2016.

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