HHS Public Access

Author manuscript

Cancer Epidemiol Biomarkers Prev. Author manuscript; available in PMC 2022 June 01.

Published in final edited form as:

Cancer Epidemiol Biomarkers Prev. 2021 June ; 30(6): 1079–1088. doi:10.1158/1055-9965.EPI-20-1631.

Long-term patterns of excess mortality among endometrial cancer survivors

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Abstract

Background: We investigated excess mortality after endometrial cancer using conditional relative survival estimates and standardized mortality ratios (SMRs).

Methods: Women diagnosed with endometrial cancer during 2000–2017 (N=183,153) were identified in the Surveillance, Epidemiology, and End Results (SEER) database. SMRs were calculated as observed deaths among endometrial cancer survivors over expected deaths among demographically similar women in the general U.S. population. Five-year relative survival was estimated at diagnosis and each additional year survived up to 12 years post-diagnosis, conditional on survival up to that year.

Results: For the full cohort, 5-year relative survival was 87.7%, 96.2%, and 97.1% at 1, 5, and 10 years post-diagnosis. respectively. Conditional 5-year relative survival first exceeded 95%, reflecting minimal excess mortality compared to the general population, at 4 years post-diagnosis overall. However, in subgroup analyses conditional relative survival remained lower for Black women (vs White) and those with regional/distant stage disease (vs localized) throughout the study period. The overall SMR for all-cause mortality decreased from 5.90 (95% CI: 5.81–5.99) in the first year after diagnosis to 1.16 (95% CI: 1.13–1.19) at 10+ years; SMRs were consistently higher for non-White women and those with higher stage or grade disease.

Conclusion: Overall, endometrial cancer survivors had only a small survival deficit beyond 4 years post-diagnosis. However, excess mortality was greater in magnitude and persisted longer into survivorship for Black women and those with more advanced disease.

Impact: Strategies to mitigate disparities in mortality after endometrial cancer will be needed as the number of survivors continues to increase.

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Conflicts of interest: The authors declare no potential conflicts of interest.

Keywords

endometrial cancer; mortality; survival; cancer survivors; SEER

Introduction

Endometrial cancer is the fourth most commonly diagnosed cancer among women in the United States (U.S.), with more than 65,000 new cases estimated in the year 2020.(1) Fortunately, five-year survival is high for endometrial cancer patients overall, at over 80% for all stages combined,(1) and recent data project that the number of endometrial cancer survivors in the U.S. will grow from approximately 800,000 in 2019 to just over 1 million by 2030.(2) With continued growth in the survivor population, there is a corresponding need for additional survivorship research to guide the long-term care of women with an endometrial cancer history.

Using standard survival curves, estimates of five-year survival reflect a patient's probability of surviving for five years beyond the date of a cancer diagnosis. While useful for recently diagnosed patients, these estimates are clearly less relevant for patients who have already lived for several years after diagnosis, since prognosis is generally expected to improve with each additional year survived. Thus for mid- to long-term survivors, estimates of conditional survival, which account for the length of time already survived, are more useful measures, and provide indicators of prognosis relevant to specific stages of survivorship.(3,4) Examining conditional survival among cancer survivors relative to expected survival among similar groups in the general population (i.e. conditional relative survival) can reveal excess mortality remaining among survivors within specific time windows after diagnosis. Likewise, standardized mortality ratios (SMRs), or ratios of observed mortality in a cancer cohort to expected mortality in the general population, are another measure that can be used to quantify excess mortality, from all causes as well as from specific causes, among cancer survivors. A comprehensive examination of excess mortality according to time since an endometrial cancer diagnosis, using SMRs and conditional relative survival estimates, could inform planning for surveillance and follow-up care in the years after initial treatment, but to our knowledge, has not been reported for U.S. endometrial cancer survivors.

The objective of this study was to estimate 5-year relative survival among U.S. women with endometrial cancer at the time of diagnosis and at each additional year survived (conditional relative survival) up to 12 years after diagnosis. We also estimated SMRs for all-cause and cause-specific mortality according to time since diagnosis to characterize how long-term patterns of mortality among endometrial cancer survivors compare to those among demographically similar women in general U.S. population. Analyses were performed overall and according to demographic and tumor characteristics.

Materials and methods

Data source and study population

Women with an endometrial cancer diagnosis were identified using data from the Surveillance, Epidemiology, and End Results (SEER) Program,(5,6) a system of population-based cancer registries which collects and reports data on cancer incidence and survival and covers approximately 35% of the U.S. population.(7) Information available in the SEER research database includes patient demographics, primary tumor site and morphology, stage, and vital status. For deceased patients, SEER recodes International Classification of Diseases (ICD) codes from the death certificate and reports cause of death in major groupings.(8) Mortality data for the general U.S. population are accessible through the SEER database and come from the National Center for Health Statistics. This study was considered exempt by the University of North Carolina Institutional Review Board.

From the SEER 18 registries, we identified women with a first malignant primary endometrial cancer (sites C54.0-C54.9, C55.9)(9) between 2000 and 2017. We excluded death certificate or autopsy only cases, those who were younger than 15 years at diagnosis, and those with missing information on race. In analyses of conditional 5-year relative survival, we also excluded those diagnosed after 2012, to allow a minimum of five years survival data through the end of follow-up for vital status on December 31, 2017. We used the following ICD-O-3 codes to define histologic subtypes as endometrioid: 8140, 8210, 8260, 8262, 8380–8384, 8440, 8480–8482, 8560, 8570; serous: 8441, 8450, 8460–8461; carcinosarcoma: 8950–8951, 8980–8981; clear cell: 8310, 8313; mixed: 8255, 8323.(10) All other codes were categorized together as other histologies.

Statistical analysis

We estimated 5-year relative survival among women with endometrial cancer at diagnosis and at each additional year survived up to 12 years after diagnosis, conditional on being alive at the beginning of that year. Relative survival was calculated as the ratio of observed survival among women with endometrial cancer to expected survival among women in the general U.S. population with a similar distribution of age, race, and calendar year. Survival was calculated using the actuarial method. Expected survival tables for the general population were generated using the Ederer II method. We considered the years at which conditional relative survival exceeded 90% and 95% to reflect little and minimal excess mortality, respectively, among endometrial cancer survivors compared to the general population.(3,4)

Standardized mortality ratios (SMRs) were estimated as the number of observed deaths among women with endometrial cancer divided by the number of expected deaths in the general population. The number of expected deaths was calculated as the product of the person-time at risk in the endometrial cancer cohort and the mortality rate for women in the general population with the same distribution of age, race (White, Black, Other), and calendar year. Confidence intervals (CIs) for all SMRs were produced using exact methods. SMRs were estimated for all-cause mortality and for cause-specific mortality from endometrial cancer, other cancers, cardiovascular diseases (CVD: diseases of the heart;

hypertension without heart disease; cerebrovascular diseases; atherosclerosis; aortic aneurysm and dissection; other diseases of arteries, arterioles, capillaries), and other causes. (8) We also report absolute excess risks (AERs), calculated as the difference between observed and expected deaths divided by the total person-years of observation, and expressed per 10,000 person-years. SMRs and AERs were estimated for the total study period and within the following time intervals: diagnosis-<1 year, 1 year-<5 years, 5 years-<10 years, and 10+ years post-diagnosis. Subgroup analyses were performed according to race, age at diagnosis, disease stage, histology, and grade. All analyses were performed using SEER*Stat, version 8.3.6.1.

Results

A total of 121,273 women, diagnosed with endometrial cancer during 2000–2012, contributed to analyses of conditional relative survival. Overall, 5-year conditional relative survival was 81.6% (95% CI: 81.4, 81.9) at diagnosis and increased consistently to 87.7% (95% CI: 87.7, 88.0), 96.2% (95% CI: 95.9, 96.5), and 97.1% (95% CI: 96.5, 97.6), respectively, at 1, 5, and 10 years post-diagnosis (Table 1; Figure 1). Conditional relative survival first exceeded 95%, reflecting minimal excess mortality compared to the general population, at 4 years after diagnosis.

The year at which minimal excess mortality was reached varied considerably according to patient demographic and cancer-related characteristics. Among White women, relative survival was >95% by 4 years after diagnosis, compared to 8 years among Black women and 6 years among women of other races. Survival estimates were consistently somewhat higher for women who were younger at diagnosis, exceeding 95% at 4 years among those age 15–64 years, and 5 years among those age 65 years and older. While women with localized stage disease had minimal excess mortality at diagnosis and consistently thereafter, those with more advanced stage disease did not surpass 95% relative survival by 12 years post-diagnosis; at 10 years, estimates were 91.3% (95% CI: 89.7, 92.8) and 87.3% (95% CI: 81.6, 91.3) among those with regional and distant stage disease, respectively. Likewise, throughout follow-up, relative survival remained consistently higher, and >95% was achieved earlier, for those with lower grade disease.

Patterns of conditional relative survival also varied according to histology; minimal excess mortality was observed as early as year 3 for those with endometrioid histology, but was observed much later or not within the study period for those with serous, carcinosarcoma, clear cell, mixed, or other histologies (Table 1). In analyses according to race stratified by stage, histology, and grade, Black women tended to reach little or minimal excess mortality later than White or other race women with similar disease characteristics (Supplementary Table 1). For example, among women with localized stage disease, 95% relative survival was first exceeded at diagnosis and 2 years for White women and women of other races, respectively, but not until 6 years for Black women.

SMR and AER analyses included a total of 183,153 women diagnosed with endometrial cancer between 2000 and 2017. Overall, the SMR for all-cause mortality decreased over time, from 5.90 (95% CI: 5.81, 5.99) in the first year after diagnosis to 2.76 (95% CI: 2.72,

2.79) and 1.30 (95% CI: 1.28, 1.33) at 1-<5 years and 5-<10 years, respectively, but remained significantly elevated at 10+ years post-diagnosis (SMR=1.16; 95% CI: 1.13, 1.19) (Table 2). In general, SMRs declined over time within all subgroups but tended to be higher for those who were Black or other race, younger at diagnosis, had higher stage disease, and had non-endometrioid histologies. However, even at 10+ years, those with localized stage disease, grade 1 disease, and endometrioid histology had a small but significant increase in all-cause mortality compared to the general population. AERs followed similar patterns for cancer-related characteristics, but for demographic characteristics, were higher for older women, rather than younger, and were much higher for Black women than either White women or those of other races. Patterns according to race observed in overall analyses, with higher SMRs for all-cause mortality among Black and other race women and the highest AERs among Black women, were also generally apparent within subgroups defined by stage, histology, and grade (Table 3).

Findings for cause-specific mortality, overall and according to race, are shown in Table 4. Overall, the SMR for endometrial cancer-specific mortality declined over time but was still significantly elevated at 10+ years post-diagnosis (SMR=10.37; 95% CI: 9.24, 11.59) (Table 4). SMRs for mortality from other cancers also declined consistently over time, from 3.93 (95% CI: 3.78, 4.08) between diagnosis and <1 year, to 1.06 (95% CI: 1.00, 1.13) at 10+ years. In contrast, mortality from CVD and other causes (non-cancer, non-CVD) was most elevated during the year after diagnosis, slightly elevated at 10+ years, and either significantly lower than or similar to the general population between 1 year and <10 years. Though the number of deaths from CVD and other causes exceeded the number of deaths from endometrial cancer at 5-<10 years and 10+ years, the AER for the full cohort was highest for endometrial cancer deaths within all time periods. In analyses according to race, SMRs for endometrial cancer were highest for women of other races during all time periods, but AERs were generally highest for Black women. For other cancers, CVD, and other causes, SMRs were consistently higher for Black women and women of other races than White women, and AERs were nearly always highest for Black women. SMRs and AERs for cause-specific mortality according to age at diagnosis, stage, histology, and grade are shown in Supplementary Tables 2–5. Though patterns varied somewhat according to cause of death and time since diagnosis, SMRs and AERs tended to be higher for women with more advanced stage or higher grade disease and those with non-endometrioid histologies.

Discussion

In this registry-based study, we estimated conditional 5-year relative survival up to 12 years after an endometrial cancer diagnosis and examined long-term patterns of excess mortality among endometrial cancer survivors according to demographic and cancer-related characteristics. As expected, relative survival increased with each additional year survived, and overall, exceeded 95% by 4 years after diagnosis. However, among the full cohort and within all subgroups, relative survival was still significantly below 100%, indicating some remaining elevation in mortality compared to the general population, at 10 years post-diagnosis. SMR and AER analyses further demonstrated that excess mortality, from all causes and from specific causes, compared to demographically similar women in the general

U.S. population, tended to be greater among non-White women and those with less favorable disease characteristics, even at 10+ years after endometrial cancer diagnosis.

Conditional survival estimates provide valuable information for cancer survivors who are well beyond their initial diagnosis and treatment period but remained concerned about the impact of their cancer history on their future mortality risk. Our analyses suggested that >95% relative survival, which we considered to reflect minimal excess mortality, was achieved relatively quickly by endometrial cancer survivors overall, at 4 years after diagnosis. However, this was largely driven by women with more favorable disease characteristics, namely those with localized and grade 1 disease, whose relative survival exceeded 95% at diagnosis and consistently thereafter. In contrast, among women with regional or distant stage disease, undifferentiated disease, and non-endometrioid histologies, relative survival increased over time since diagnosis but did not reach 95% within the study period of up to 12 years post-diagnosis. Understanding which subgroups of survivors, defined by demographic and cancer-related characteristics, continue to have lower than expected survival for many years after cancer treatment can help in predicting the type and intensity of care that will be needed across various phases of survivorship.

In addition to estimating conditional relative survival, we also used SMRs and AERs to quantify excess deaths from all causes and specific causes among women with endometrial cancer within specified post-diagnosis time windows. Our findings suggested that even at 5-<10 and 10+ years post-diagnosis, the greatest contributor to excess mortality relative to the general population was still death from endometrial cancer. However, it was notable that certain subgroups, particularly Black women and those with more advanced stage or higher grade disease had excess deaths attributable to other cancers, CVD, and other causes within certain post-diagnosis time periods. These findings underscore the importance of long-term follow-up and monitoring of women with an endometrial cancer history, particularly for Black women and those whose initial prognosis was less favorable.

Associations between obesity and endometrial cancer incidence(11) suggest that endometrial cancer survivors may have elevated rates of CVD incidence and mortality relative to the general population. Women with more advanced stage disease, though they comprise a minority of all endometrial cancer patients, may also be treated with certain chemotherapeutic agents that may have cardiotoxic effects and could also contribute to future risk of adverse cardiovascular outcomes.(12,13) A previous study using SEER data reported that women diagnosed with endometrial cancer between 1988 and 2012 were 8.8 (95% CI: 8.7–9.0) times more likely to die from CVD than women in the general population. (14) Our analyses suggested a smaller, though still significant increase in CVD mortality, which was most apparent among endometrial cancer survivors who were non-White, younger, or had more advanced stage disease. We also found that the magnitude of the SMR was not consistent across time periods, with greater elevations in CVD mortality within the first year after endometrial cancer diagnosis and at 10+ years post-diagnosis. It is unclear the extent to which excess mortality from CVD within the year after diagnosis reflects a direct impact of endometrial cancer diagnosis and treatment on CVD deaths, or misattribution of cancer-related death to CVD. Nevertheless, these results suggest the importance of monitoring cardiovascular health during the initial cancer diagnosis and treatment period.

Excess CVD mortality among longer-term endometrial cancer survivors in our study also suggests that CVD prevention efforts should begin early in follow-up care. Neither the earlier SEER report nor ours were able to account for CVD risk factors, such as obesity and diabetes, or specific cancer treatments, since this information is not available in SEER. Future studies may be warranted to investigate the impact of these factors on CVD outcomes among endometrial cancer survivors, and why risk relative to the general population may vary according to time since endometrial cancer diagnosis.

Prior reports have documented pronounced racial disparities in endometrial cancer outcomes, with lower 5-year survival among Black women than White women that is not fully explained by different distributions of stage, grade, or histologic subtype by race.(15–17) Our findings add information on the extent to which these disparities persist among longer term survivors. Overall and in every subgroup defined by disease characteristics, conditional relative survival among Black women increased steadily over time since diagnosis but remained slightly lower than that of White women at 12 years, and >95% relative survival was reached later among Black women than White women. Likewise, in all post-diagnosis time windows up to 10+ years, both SMRs and AERs for all-cause mortality were consistently higher for Black women than for White women, even among those with localized stage or lower grade disease, and they tended to be higher for cause-specific mortality as well. Calculation of relative survival and SMRs accounts for race and, when stratified by race, estimates therefore reflect excess mortality among endometrial cancer survivors compared to women of the same race in the general population. Persistently lower conditional relative survival and higher SMRs long after diagnosis suggest a greater and more lasting impact of an endometrial cancer diagnosis on mortality among Black women, relative to their cancer-free peers, than among White women, and the need for efforts to reduce disparities not just among recently diagnosed patients, but also among long-term survivors.

Our study has several strengths and limitations. Use of the SEER database allowed for a large sample size and examination of long-term patterns of mortality according to basic demographic and disease-related characteristics. However, SEER data lacks information on cancer recurrence, and information on first course of cancer treatment is thought to be fairly incomplete,(18) so we were unable to consider these factors in our analyses. For some cancer characteristics, such as grade, a relatively high proportion of patients had missing information. We also did not have information on factors such as comorbidities, income, or obesity, all of which may be associated with patterns of mortality after endometrial cancer. Additionally, because all of our analyses involved comparisons with the general U.S. population, we were limited in our stratified analyses to only those factors accounted for by the U.S. population mortality statistics (e.g. age, sex, race) used in this study. Cause-specific mortality analyses are also subject to potential misclassification due to inaccurate coding of cause of death on death certificates. Finally, race information in the SEER registries comes from patient medical records, and misclassification could occur if the race indicated in the medical record does not match the woman’s identity or experience. Our analyses by race also do not account for diversity within racial categories. Nevertheless, our findings provide insight into how excess mortality among endometrial cancer survivors varies according to

patient characteristics and time since cancer diagnosis, and may inform planning for follow-up care throughout survivorship.

Results of the current study suggest that overall, endometrial cancer survivors have only a small, though significant, survival deficit beyond 4 years post-diagnosis. However, excess mortality was greater in magnitude and persisted longer into survivorship for Black women and those with more advanced stage or higher grade disease. Strategies to mitigate disparities in mortality after endometrial cancer will be needed as the number of endometrial cancer survivors in the U.S. continues to increase.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Financial support: None

References

1. National Cancer Institute. Surveillance, Epidemiology, and End Results Program. Cancer Stat Facts: Uterine Cancer. Available from: https://seer.cancer.gov/statfacts/html/corp.html. Accessed Aug. 13, 2020..
2. American Cancer Society. Cancer Treatment & Survivorship Facts & Figures 2019–2021. Atlanta: American Cancer Society; 2019.
3. Janssen-Heijnen ML, Gondos A, Bray F, Hakulinen T, Brewster DH, Brenner H, et al. Clinical relevance of conditional survival of cancer patients in europe: age-specific analyses of 13 cancers. Journal of clinical oncology : official journal of the American Society of Clinical Oncology 2010;28(15):2520–8 doi 10.1200/jco.2009.25.9697. [PubMed: 20406936]
4. Anderson C, Smitherman AB, Nichols HB. Conditional relative survival among long-term survivors of adolescent and young adult cancers. Cancer 2018;124(14):3037–43 doi 10.1002/cncr.31529. [PubMed: 29742278]
5. Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER Research Data, 18 Registries, Nov 2019 Sub (2000–2017) - Linked To County Attributes - Time Dependent (1990–2017) Income/Rurality, 1969–2018 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2020, based on the November 2019 submission.
6. Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER Research Data, 18 Registries (excl AK), Nov 2019 Sub (2000–2017) for SMRs - Linked To County Attributes - Time Dependent (1990–2017) Income/Rurality, 1969–2018 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2020, based on the November 2019 submission.
7. Surveillance, Epidemiology, and End Results (SEER) Program. Overview of the SEER program. Available from: https://seer.cancer.gov/about/overview.html. Accessed Aug. 14, 2020.
8. Surveillance, Epidemiology, and End Results (SEER) Program. SEER Cause of Death Recode 1969+ (03/01/2018). Available from: https://seer.cancer.gov/codrecode/1969_d03012018/index.html. Accessed Aug 14, 2020.
9. Surveillance, Epidemiology, and End Results Program. Site Recode ICD-O-3/WHO 2008 Definition. Available from: https://seer.cancer.gov/siterecode/icdo3_dwhoheme/. Accessed Aug. 17, 2020.

10. Doll KM, Winn AN. Assessing endometrial cancer risk among US women: long-term trends using hysterectomy-adjusted analysis. American journal of obstetrics and gynecology 2019;221(4):318.e1–.e9 doi 10.1016/j.ajog.2019.05.024. [PubMed: 31125544]

11. Aune D, Navarro Rosenblatt DA, Chan DS, Vingeliene S, Abar L, Vieira AR, et al. Anthropometric factors and endometrial cancer risk: a systematic review and dose-response meta-analysis of prospective studies. Annals of oncology : official journal of the European Society for Medical Oncology 2015;26(8):1635–48 doi 10.1093/annonc/mdv142. [PubMed: 25791635]

12. Albini A, Pennesi G, Donatelli F, Cammarota R, De Flora S, Noonan DM. Cardiotoxicity of anticancer drugs: the need for cardio-oncology and cardio-oncological prevention. Journal of the National Cancer Institute 2010;102(1):14–25 doi 10.1093/jnci/djp440. [PubMed: 20007921]

13. Koh WJ, Abu-Rustum NR, Bean S, Bradley K, Campos SM, Cho KR, et al. Uterine Neoplasms, Version 1.2018, NCCN Clinical Practice Guidelines in Oncology. Journal of the National Comprehensive Cancer Network : JNCCN 2018;16(2):170–99 doi 10.6004/jnccn.2018.0006. [PubMed: 29439178]

14. Felix AS, Bower JK, Pfeiffer RM, Raman SV, Cohn DE, Sherman ME. High cardiovascular disease mortality after endometrial cancer diagnosis: Results from the Surveillance, Epidemiology, and End Results (SEER) Database. International journal of cancer 2017;140(3):555–64 doi 10.1002/ijc.30470. [PubMed: 27741565]

15. Cote ML, Ruterbusch JJ, Olson SH, Lu K, Ali-Fehmi R. The Growing Burden of Endometrial Cancer: A Major Racial Disparity Affecting Black Women. Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology 2015;24(9):1407–15 doi 10.1158/1055-9965.Epi-15-0316.

16. Long B, Liu FW, Bristow RE. Disparities in uterine cancer epidemiology, treatment, and survival among African Americans in the United States. Gynecologic oncology 2013;130(3):652–9 doi 10.1016/j.ygyno.2013.05.020. [PubMed: 23707671]

17. Wright JD, Fiorelli J, Schiff PB, Burke WM, Kansler AL, Cohen CJ, et al. Racial disparities for uterine corpus tumors: changes in clinical characteristics and treatment over time. Cancer 2009;115(6):1276–85 doi 10.1002/cncr.24160. [PubMed: 19204905]

18. Noone AM, Lund JL, Mariotto A, Cronin K, McNeel T, Deapen D, et al. Comparison of SEER Treatment Data With Medicare Claims. Medical care 2016;54(9):e55–64 doi 10.1097/mlr.0000000000000073. [PubMed: 24638121]

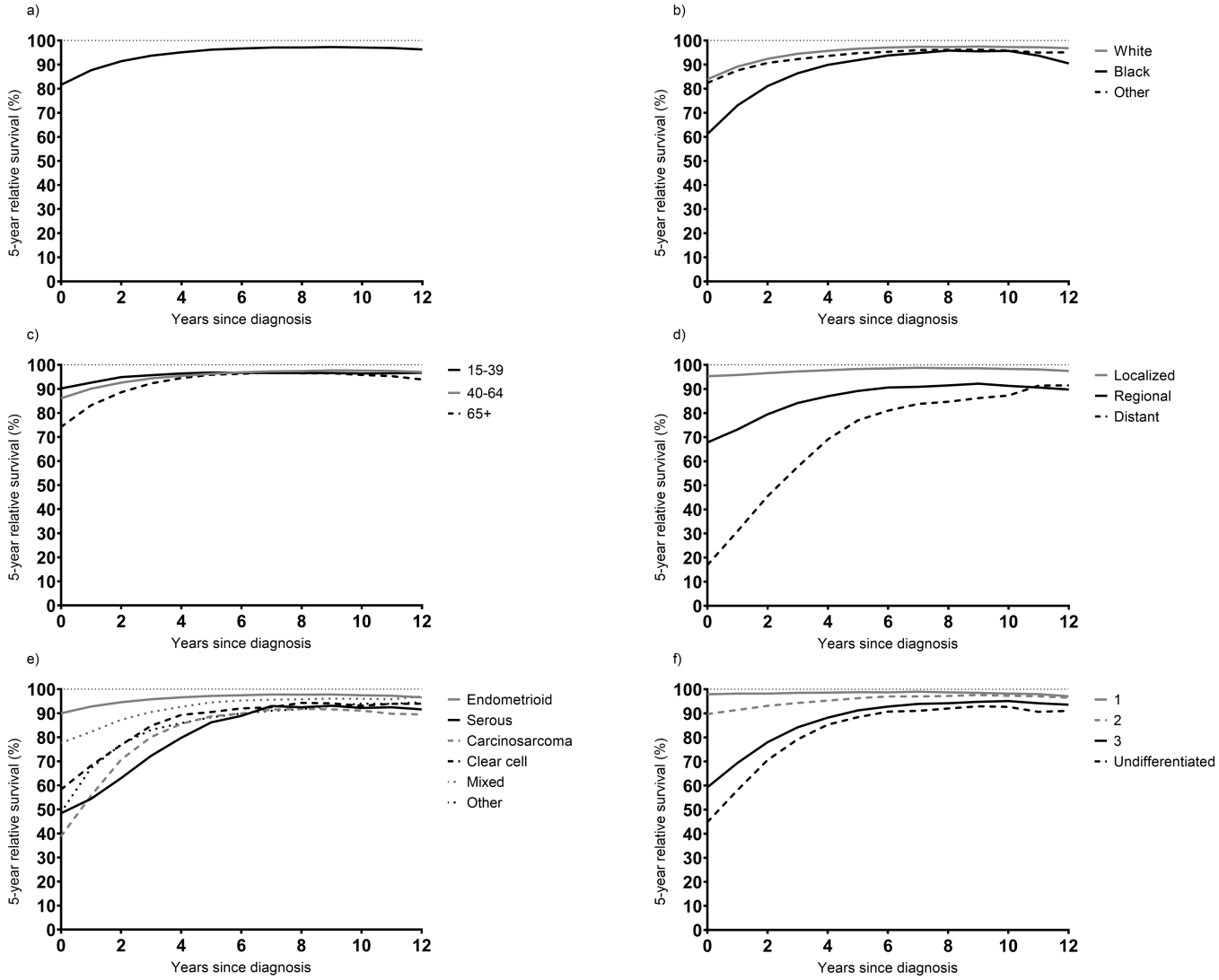

Figure 1.

Conditional relative survival among women with endometrial cancer a) overall, b) by race, c) by age at diagnosis, d) by disease stage, e) by histology, f) by grade.

Table 1.

Conditional relative survival among women with endometrial cancer, SEER 18, 2000–2012

	At diagnosis		At 1 year		At 5 years		At 10 years			
	N at diagnosis	5-year relative survival (95% CI)	N survived to 1 year	5-year relative survival (95% CI)	N survived to 5 years	5-year relative survival (95% CI)	N survived to 10 years	5-year relative survival (95% CI)	>90% from year	>95% from year
All	121273	81.6 (81.4, 81.9)	108,990	87.7 (87.5, 88.0)	88536	96.2 (95.9, 96.5)	42325	97.1 (96.5, 97.6)	2	4
Race										
White	100182	83.9 (83.6, 84.2)	91104	89.2 (88.9, 89.5)	74976	96.6 (96.3, 97.0)	36424	97.3 (96.7, 97.8)	2	4
Black	11532	61.2 (60.2, 62.2)	9182	73.1 (72.0, 74.2)	6293	91.9 (90.5, 93.1)	2609	95.7 (92.7, 97.5)	5	8
Other [a]	9559	82.4 (81.6, 83.2)	8704	87.6 (86.8, 88.4)	7267	94.8 (94.0, 95.6)	3292	95.8 (94.1, 97.0)	2	6
Age at diagnosis										
15–39	4964	90.2 (89.3, 91.0)	4710	92.6 (91.8, 93.4)	4160	96.8 (96.1, 97.4)	2208	96.4 (95.0, 97.4)	0	3
40–64	68053	86.1 (85.8, 86.4)	63536	90.1 (89.8, 90.4)	55128	96.3 (96.0, 96.6)	27922	97.6 (97.1, 98.0)	1	4
65+	48256	74.2 (73.6, 74.7)	40744	83.2 (82.7, 83.8)	29248	95.9 (95.0, 96.6)	12195	95.8 (93.9, 97.2)	3	5
Summary stage										
Localized	82052	95.3 (95.0, 95.5)	79452	95.8 (95.6, 96.1)	70196	98.3 (98.0, 98.6)	34598	98.3 (97.6, 98.8)	0	0
Regional	24452	67.8 (67.1, 68.5)	21421	73.2 (72.5, 73.9)	14744	89.2 (88.3, 90.0)	6209	91.3 (89.7, 92.8)	6	--
Distant	10102	16.9 (16.1, 17.7)	4852	31.0 (29.7, 32.4)	1525	77.0 (74.0, 79.8)	586	87.3 (81.6, 91.3)	11	--
Unknown	4667	52.6 (51.0, 54.2)	3265	68.6 (66.7, 70.4)	2071	85.4 (83.0, 87.6)	932	93.3 (89.9, 95.6)	9	--
Histology										
Endometrioid	93738	90.0 (89.7, 90.2)	88120	92.8 (92.6, 93.1)	75650	97.2 (96.9, 97.5)	37172	97.5 (96.9, 98.0)	1	3
Serous	5830	48.4 (47.0, 49.9)	4796	54.4 (52.8, 56.0)	2458	86.2 (83.5, 88.4)	844	92.2 (85.0, 96.0)	7	--
Carcinosarcoma	5437	38.8 (37.4, 40.3)	3577	55.7 (53.8, 57.6)	1833	88.7 (85.7, 91.0)	719	91.1 (84.3, 95.1)	7 [b]	--
Clear cell	1467	58.3 (55.3, 61.2)	1173	68.2 (64.9, 71.3)	734	90.5 (85.4, 93.8)	313	93.1 (80.8, 97.6)	5	--
Mixed	5453	77.6 (76.2, 78.9)	4953	82.3 (80.9, 83.6)	3774	94.5 (92.6, 95.9)	1288	96.0 (90.7, 98.3)	3	6
Other	9348	48.8 (47.7, 49.9)	6371	67.2 (65.9, 68.5)	4087	88.3 (86.7, 89.6)	1989	94.0 (91.5, 95.7)	7	--
Grade										
1	43704	97.9 (97.6, 98.2)	42608	98.2 (97.9, 98.5)	38755	98.8 (98.3, 99.1)	19736	98.2 (97.3, 98.8)	0	0
2	31171	89.7 (89.2, 90.1)	29549	91.4 (90.9, 91.8)	25015	96.3 (95.7, 96.8)	12752	97.3 (96.2, 98.1)	1	4
3	20868	59.3 (58.5, 60.1)	16846	69.4 (68.6, 70.2)	10855	91.2 (90.2, 92.2)	4909	95.1 (93.1, 96.6)	5	10
Undifferentiated	6553	44.8 (43.5, 46.1)	4772	58.1 (56.5, 59.7)	2595	88.4 (85.9, 90.4)	961	92.7 (87.3, 95.9)	6	--

	At diagnosis		At 1 year		At 5 years		At 10 years			
	N at diagnosis	5-year relative survival (95% CI)	N survived to 1 year	5-year relative survival (95% CI)	N survived to 5 years	5-year relative survival (95% CI)	N survived to 10 years	5-year relative survival (95% CI)	>90% from year	>95% from year
Other/unknown	18977	67.7 (67.0, 68.5)	15215	80.4 (79.6, 81.2)	11316	92.6 (91.6, 93.5)	3967	94.2 (92.1, 95.8)	4	--

[a] Asian/Pacific Islander, American Indian/Alaska Native

[b] Exceeded 90% at indicated year but decreased to <90% before 12 years after diagnosis

Table 2.

Standardized mortality ratios for all-cause mortality among women with endometrial cancer, SEER 18, 2000–2017

		Diagnosis - <1 year			1 year- <5 years			5 years-<10 years			10+ years			Total		
	N women	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER
All	183153	16055	5.90 (5.81, 5.99)	806	22641	2.76 (2.72, 2.79)	311	9317	1.30 (1.28, 1.33)	68	5122	1.16 (1.13, 1.19)	47	53135	2.36 (2.34, 2.38)	279
Race																
White	148936	11667	5.00 (4.91, 5.09)	688	17566	2.43 (2.39, 2.46)	265	7992	1.24 (1.21, 1.27)	57	4555	1.13 (1.10, 1.16)	41	41780	2.09 (2.07, 2.11)	235
Black	18586	3320	11.06 (10.68, 11.44)	1917	3607	5.11 (4.95, 5.28)	792	855	1.75 (1.63, 1.87)	172	344	1.34 (1.20, 1.49)	100	8126	4.64 (4.54, 4.74)	774
Other [a]	15631	1068	11.92 (11.21, 12.66)	696	1468	5.48 (5.21, 5.77)	310	470	2.05 (1.87, 2.25)	95	223	1.62 (1.41, 1.84)	76	3229	4.46 (4.31, 4.62)	280
Age at diagnosis																
15–39	7425	235	36.89 (32.32, 41.92)	333	395	16.89 (15.26, 18.64)	179	122	4.90 (4.07, 5.85)	62	75	3.63 (2.85, 4.55)	67	827	10.97 (10.24, 11.75)	146
40–64	102227	5768	11.26 (10.97, 11.56)	558	8674	4.81 (4.71, 4.91)	246	3285	1.83 (1.76, 1.89)	73	1746	1.29 (1.23, 1.35)	39	19473	3.56 (3.51, 3.61)	207
65+	73501	10052	4.56 (4.47, 4.65)	1219	13572	2.13 (2.09, 2.16)	437	5910	1.11 (1.08, 1.14)	58	3301	1.08 (1.05, 1.12)	64	32835	1.93 (1.91, 1.96)	432
Summary stage																
Localized	124020	2767	1.57 (1.52, 1.63)	87	9086	1.48 (1.45, 1.51)	82	6323	1.09 (1.06, 1.12)	21	3982	1.07 (1.04, 1.11)	22	22158	1.27 (1.26, 1.29)	56
Regional	36506	3859	6.32 (6.13, 6.53)	978	7793	4.93 (4.82, 5.04)	737	2254	2.00 (1.92, 2.09)	226	908	1.60 (1.50, 1.71)	167	14814	3.82 (3.75, 3.88)	582
Distant	15892	7596	40.70 (39.79, 41.62)	7148	4390	20.85 (20.23, 21.47)	3302	363	4.14 (3.72, 4.59)	581	101	1.92 (1.57, 2.34)	257	12450	23.16 (22.76, 23.57)	4018
Unknown	6735	1833	10.88 (10.39, 11.39)	3255	1372	5.11 (4.84, 5.39)	946	377	2.54 (2.29, 2.81)	319	131	1.49 (1.25, 1.77)	120	3713	5.52 (5.34, 5.70)	1103

	Diagnosis - <1 year				1 year- <5 years			5 years-<10 years			10+ years			Total		
	N women	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER
Histology																
Endometrioid	139258	6631	3.32 (3.24, 3.40)	359	12688	1.91 (1.87, 1.94)	156	7387	1.20 (1.17, 1.23)	45	4458	1.13 (1.10, 1.17)	40	31164	1.66 (1.64, 1.68)	135
Serous	10478	1539	7.27 (6.91, 7.64)	1464	3042	6.76 (6.52, 7.00)	1453	482	1.99 (1.81, 2.17)	319	147	1.23 (1.04, 1.45)	104	5210	5.09 (4.95, 5.23)	1130
Carcinosarcoma	8465	2528	16.27 (15.64, 16.91)	3553	2277	8.10 (7.77, 8.44)	1685	325	1.76 (1.58, 1.97)	234	131	1.46 (1.22, 1.73)	175	5261	7.40 (7.20, 7.60)	1692
Clear cell	2256	408	8.11 (7.34, 8.94)	1840	533	4.61 (4.22, 5.01)	964	125	1.59 (1.33, 1.90)	186	48	1.24 (0.91, 1.64)	90	1114	3.93 (3.71, 4.17)	847
Mixed	9084	722	5.01 (4.65, 5.39)	697	1433	3.51 (3.33, 3.70)	474	401	1.42 (1.28, 1.57)	98	125	1.16 (0.97, 1.38)	48	2681	2.84 (2.74, 2.95)	381
Other	13612	4227	25.87 (25.09, 26.66)	3963	2668	8.82 (8.49, 9.16)	1038	597	2.70 (2.49, 2.93)	256	213	1.64 (1.43, 1.87)	115	7705	9.43 (9.22, 9.64)	1254
Grade																
1	61484	1050	1.38 (1.30, 1.46)	49	3335	1.17 (1.13, 1.21)	25	3043	1.05 (1.02, 1.09)	11	2090	1.08 (1.04, 1.13)	23	9518	1.13 (1.11, 1.15)	23
2	41228	1689	2.55 (2.43, 2.68)	263	4612	1.99 (1.93, 2.04)	185	2815	1.27 (1.22, 1.31)	63	1647	1.15 (1.09, 1.20)	46	10763	1.62 (1.59, 1.65)	137
3	29325	5129	9.24 (8.99, 9.50)	1796	7000	4.99 (4.87, 5.11)	916	1748	1.66 (1.58, 1.74)	183	757	1.28 (1.19, 1.38)	99	14634	4.06 (4.00, 4.13)	781
Undifferentiated	11508	2702	14.66 (14.11, 15.22)	2687	2906	7.74 (7.46, 8.03)	1438	423	1.86 (1.68, 2.04)	235	145	1.41 (1.19, 1.66)	133	6176	6.93 (6.76, 7.11)	1375
Other/unknown	39608	5485	9.82 (9.56, 10.08)	1484	4788	3.82 (3.71, 3.93)	480	1288	1.68 (1.59, 1.78)	148	483	1.33 (1.21, 1.45)	94	12044	4.09 (4.02, 4.17)	588

[a] Asian/Pacific Islander, American Indian/Alaska Native

Table 3.

Standardized mortality ratios for all-cause mortality among women with endometrial cancer, stratified by race according to cancer characteristics SEER 18, 2000–2017

	Diagnosis - <1 year			1 year- <5 years			5 years-<10 years			10+ years			Total		
	N Deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER
Stage															
Localized															
White	2123	1.38 (1.32, 1.44)	60	7367	1.34 (1.31, 1.37)	62	5496	1.05 (1.02, 1.08)	11	3558	1.05 (1.01, 1.08)	15	18544	1.18 (1.17, 1.20)	40
Black	512	3.24 (2.97, 3.53)	383	1198	2.55 (2.41, 2.70)	285	531	1.45 (1.33, 1.58)	102	252	1.25 (1.10, 1.42)	74	2493	2.09 (2.00, 2.17)	224
Other [a]	132	2.26 (1.89, 2.69)	76	521	2.64 (2.42, 2.88)	112	296	1.64 (1.45, 1.83)	58	172	1.53 (1.31, 1.78)	66	1121	2.04 (1.93, 2.17)	85
Regional															
White	2809	5.55 (5.35, 5.76)	877	5907	4.37 (4.26, 4.48)	665	1897	1.93 (1.85, 2.02)	220	794	1.59 (1.48, 1.71)	173	11407	3.42 (3.35, 3.48)	526
Black	790	9.40 (8.75, 10.07)	1789	1380	7.92 (7.51, 8.35)	1497	234	2.31 (2.03, 2.63)	344	70	1.57 (1.23, 1.99)	182	2474	6.13 (5.89, 6.37)	1199
Other [a]	260	13.00 (11.47, 14.68)	802	506	9.28 (8.49, 10.13)	584	123	2.95 (2.45, 3.52)	178	44	1.85 (1.35, 2.49)	106	933	6.67 (6.25, 7.11)	461
Distant															
White	5303	36.58 (35.60, 37.58)	6776	3244	18.70 (18.06, 19.36)	3124	285	3.69 (3.28, 4.15)	535	89	1.87 (1.50, 2.30)	260	8921	20.13 (19.71, 20.55)	3700
Black	1705	49.25 (46.94, 51.65)	9253	787	28.05 (26.12, 30.08)	4719	47	6.40 (4.70, 8.51)	926	8	2.36 (1.02, 4.66)	307	2547	34.70 (33.36, 36.07)	6197
Other [a]	588	83.29 (76.69, 90.30)	6125	359	39.63 (35.63, 43.95)	2867	31	9.52 (6.47, 13.51)	655	4	2.76 (0.75, 7.08)	172	982	47.16 (44.26, 50.21)	3506
Histology															
Endometrioid															
White	5204	2.94 (2.86, 3.02)	315	10464	1.75 (1.72, 1.78)	136	6471	1.16 (1.13, 1.19)	37	4001	1.11 (1.07, 1.14)	34	26140	1.54 (1.52, 1.56)	116
Black	1005	6.12 (5.75, 6.51)	908	1475	3.18 (3.02, 3.34)	405	562	1.56 (1.43, 1.69)	128	262	1.32 (1.17, 1.49)	94	3304	2.78 (2.69, 2.88)	373

	Diagnosis - <1 year			1 year- <5 years			5 years-<10 years			10+ years			Total		
	N Deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER
Other [a]	422	6.64 (6.02, 7.30)	326	749	3.55 (3.30, 3.81)	168	354	1.85 (1.66, 2.05)	74	195	1.59 (1.38, 1.83)	73	1720	2.92 (2.79, 3.06)	151
Serous															
White	963	6.08 (5.70, 6.48)	1268	2157	6.19 (5.93, 6.45)	1403	358	1.82 (1.63, 2.01)	281	121	1.19 (0.99, 1.43)	91	3599	4.47 (4.32, 4.62)	1029
Black	474	10.38 (9.47, 11.36)	2150	679	8.04 (7.45, 8.67)	1685	98	2.69 (2.19, 3.28)	514	19	1.29 (0.78, 2.02)	127	1270	7.01 (6.63, 7.41)	1543
Other [a]	102	13.28 (10.83, 16.12)	1295	206	12.06 (10.47, 13.83)	1339	26	2.83 (1.85, 4.14)	294	7	2.15 (0.86, 4.42)	249	341	9.16 (8.22, 10.19)	1062
Carcinosarcoma															
White	1673	14.71 (14.01, 15.43)	3366	1527	6.91 (6.57, 7.26)	1483	256	1.72 (1.52, 1.94)	229	106	1.46 (1.20, 1.77)	182	3562	6.41 (6.20, 6.62)	1506
Black	697	19.01 (17.63, 20.48)	4194	617	12.06 (11.13, 13.05)	2518	58	1.88 (1.43, 2.43)	267	22	1.40 (0.88, 2.12)	170	1394	10.37 (9.83, 10.93)	2419
Other [a]	158	31.66 (26.92, 37.00)	3245	133	14.97 (12.53, 17.74)	1567	11	2.34 (1.17, 4.19)	195	3	1.60 (0.33, 4.67)	86	305	14.92 (13.29, 16.69)	1656
Clear cell															
White	285	7.27 (6.45, 8.16)	1724	379	4.23 (3.82, 4.68)	895	100	1.59 (1.29, 1.93)	191	41	1.30 (0.93, 1.76)	117	805	3.60 (3.36, 3.86)	785
Black	98	10.60 (8.61, 12.92)	2659	109	5.25 (4.31, 6.33)	1334	18	1.55 (0.92, 2.45)	199	5	0.91 (0.29, 2.11)	−47	230	4.88 (4.27, 5.55)	1280
Other [a]	25	13.54 (8.76, 19.99)	1259	45	8.35 (6.09, 11.18)	914	7	1.81 (0.73, 3.74)	131	2	1.20 (0.15, 4.33)	29	79	6.19 (4.90, 7.72)	683
Mixed															
White	529	4.35 (3.99, 4.74)	607	1109	3.11 (2.93, 3.30)	421	336	1.35 (1.21, 1.50)	84	113	1.16 (0.96, 1.40)	51	2087	2.53 (2.42, 2.64)	333
Black	137	7.79 (6.54, 9.20)	1368	223	5.71 (4.98, 6.51)	962	36	1.62 (1.14, 2.24)	157	8	1.36 (0.59, 2.68)	93	404	4.77 (4.31, 5.25)	820
Other [a]	56	11.26 (8.51, 14.63)	717	101	7.72 (6.29, 9.38)	486	29	2.78 (1.86, 3.99)	185	4	0.89 (0.24, 2.27)	−16	190	5.76 (4.97, 6.64)	408
Other															
White	3013	23.18 (22.36, 24.03)	3812	1930	7.88 (7.53, 8.24)	976	471	2.57 (2.34, 2.81)	254	173	1.57 (1.35, 1.83)	111	5587	8.36 (8.14, 8.58)	1176

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	Diagnosis - <1 year			1 year- <5 years			5 years-<10 years			10+ years			Total		
	N Deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER
Black	909	33.76 (31.60, 36.03)	5120	504	11.05 (10.11, 12.06)	1368	83	2.94 (2.34, 3.65)	270	28	1.77 (1.17, 2.55)	127	1524	13.07 (12.42, 13.74)	1746
Other [a]	305	46.76 (41.66, 52.32)	3083	234	19.53 (17.11, 22.20)	1018	43	4.56 (3.30, 6.14)	250	12	2.86 (1.48, 5.00)	138	594	18.49 (17.03, 20.03)	1111
Grade															
1, 2															
White	2248	1.76 (1.69, 1.83)	117	6663	1.42 (1.39, 1.46)	74	5135	1.10 (1.07, 1.13)	22	3372	1.09 (1.05, 1.12)	27	17418	1.27 (1.25, 1.29)	56
Black	350	3.46 (3.11, 3.85)	394	839	2.55 (2.38, 2.73)	269	423	1.54 (1.39, 1.69)	112	203	1.29 (1.12, 1.48)	79	1815	2.11 (2.01, 2.21)	215
Other [a]	141	3.13 (2.64, 3.69)	115	445	2.72 (2.48, 2.99)	107	300	1.89 (1.68, 2.12)	74	162	1.55 (1.32, 1.81)	64	1048	2.22 (2.09, 2.36)	92
3, undifferentiated															
White	5468	9.29 (9.04, 9.54)	1854	7294	4.96 (4.84, 5.07)	943	1775	1.64 (1.56, 1.71)	185	767	1.28 (1.19, 1.37)	102	15304	4.09 (4.02, 4.15)	815
Black	1762	14.23 (13.58, 14.91)	2996	1866	7.78 (7.43, 8.14)	1608	280	1.93 (1.71, 2.17)	271	88	1.29 (1.04, 1.59)	106	3996	6.92 (6.71, 7.14)	1524
Other [a]	601	22.49 (20.73, 24.36)	1887	746	11.25 (10.46, 12.09)	993	116	2.32 (1.92, 2.78)	168	47	1.78 (1.31, 2.36)	122	1510	8.91 (8.47, 9.37)	864

[a] Asian/Pacific Islander, American Indian/Alaska Native

Cancer Epidemiol Biomarkers Prev. Author manuscript; available in PMC 2022 June 01.

Table 4.

Standardized mortality ratios for cause-specific mortality among women with endometrial cancer, overall and stratified by race, SEER 18, 2000–2017

	Diagnosis - <1 year			1 year- <5 years			5 years-<10 years			10+ years			Total		
	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER
Endometrial cancer mortality															
All	10517	472.67 (463.68, 481.79)	634	12769	192.85 (189.52, 196.22)	274	2041	38.32 (36.68, 40.02)	62	308	10.37 (9.24, 11.59)	19	25635	149.54 (147.72, 151.38)	232
White	7628	443.27 (433.38, 453.34)	561	9648	180.72 (177.13, 184.36)	247	1644	37.02 (35.25, 38.85)	59	267	10.51 (9.29, 11.85)	19	19187	136.65 (134.72, 138.60)	206
Black	2123	515.09 (493.41, 537.47)	1345	2189	217.16 (208.16, 226.45)	594	247	37.03 (32.55, 41.94)	113	20	6.44 (3.93, 9.94)	19	4579	190.95 (185.46, 196.57)	553
Other [a]	766	832.46 (774.55, 893.56)	544	932	339.29 (317.85, 361.79)	240	150	68.80 (58.23, 80.73)	58	21	17.65 (10.93, 26.99)	18	1869	265.60 (253.69, 277.92)	208
Other cancer mortality															
All	2594	3.93 (3.78, 4.08)	117	4206	2.14 (2.08, 2.21)	48	1970	1.26 (1.21, 1.32)	13	913	1.06 (1.00, 1.13)	4	9683	1.92 (1.88, 1.96)	42
White	1834	3.25 (3.10, 3.40)	94	3206	1.86 (1.80, 1.93)	38	1657	1.19 (1.13, 1.25)	10	814	1.05 (0.98, 1.12)	3	7511	1.69 (1.65, 1.72)	33
Black	597	8.44 (7.78, 9.15)	334	738	4.42 (4.10, 4.75)	156	199	1.84 (1.59, 2.11)	43	56	1.11 (0.84, 1.44)	6	1590	4.01 (3.82, 4.21)	145
Other [a]	163	6.42 (5.47, 7.49)	98	262	3.50 (3.09, 3.95)	48	114	1.92 (1.58, 2.31)	21	43	1.34 (0.97, 1.80)	10	582	3.03 (2.79, 3.29)	44
Cardiovascular disease mortality															
All	1387	1.53 (1.45, 1.61)	29	2554	0.95 (0.91, 0.99)	−3	2355	1.01 (0.97, 1.05)	1	1687	1.16 (1.10, 1.22)	16	7983	1.08 (1.06, 1.10)	5
White	1045	1.36 (1.28, 1.44)	20	2121	0.90 (0.86, 0.94)	−6	2071	0.99 (0.95, 1.04)	−1	1490	1.13 (1.07, 1.19)	14	6727	1.03 (1.01, 1.06)	2
Black	282	2.57 (2.27, 2.88)	109	306	1.21 (1.08, 1.35)	14	192	1.10 (0.95, 1.26)	8	130	1.41 (1.18, 1.67)	43	910	1.44 (1.35, 1.54)	34
Other [a]	60	2.12 (1.62, 2.74)	23	127	1.51 (1.26, 1.79)	11	92	1.25 (1.01, 1.53)	7	67	1.47 (1.14, 1.87)	19	346	1.49 (1.34, 1.66)	13
Other cause mortality															
All	1557	1.38 (1.31, 1.45)	26	3112	0.89 (0.86, 0.92)	−8	2951	0.92 (0.89, 0.95)	−8	2214	1.06 (1.02, 1.11)	9	9834	0.99 (0.97, 1.01)	−1

	Diagnosis - <1 year			1 year- <5 years			5 years-<10 years			10+ years			Total		
	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER	N deaths	SMR (95% CI)	AER
White	1160	1.18 (1.12, 1.25)	13	2591	0.83 (0.80, 0.86)	−13	2620	0.90 (0.87, 0.93)	−11	1984	1.04 (0.99, 1.09)	6	8355	0.94 (0.92, 0.96)	−6
Black	318	2.75 (2.46, 3.07)	129	374	1.36 (1.23, 1.51)	27	217	1.09 (0.95, 1.24)	8	138	1.25 (1.05, 1.48)	32	1047	1.50 (1.41, 1.59)	42
Other [a]	79	2.25 (1.78, 2.81)	31	147	1.39 (1.17, 1.63)	11	114	1.22 (1.00, 1.46)	8	92	1.56 (1.26, 1.91)	29	432	1.47 (1.34, 1.62)	15

[a] Asian/Pacific Islander, American Indian/Alaska Native

Cancer Epidemiol Biomarkers Prev. Author manuscript; available in PMC 2022 June 01.