Disparities in Ovarian Cancer Survival in the United States (2001-2009): Findings from the CONCORD-2 Study

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Precis: Population-based ovarian cancer survival in the US is moderate (at about 40%) from 2001-2009; however, large and consistent racial disparities were observed in most states with black women having lower survival than white women.

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Abstract

Background: Ovarian cancer is the fifth leading cause of cancer death among women in the United States (US). This study reports ovarian cancer survival by state, race and stage at diagnosis using data from the CONCORD-2 study, the largest and most geographically-comprehensive population-based survival study to date.

Methods: We used data from females diagnosed with ovarian cancer between 2001 and 2009 from 37 states, covering 80% of the US population. We estimated survival up to 5 years, which was adjusted for background mortality (net survival) using state- and race-specific life tables and age-standardized.

Results: Among the 172,849 ovarian cancers diagnosed between 2001 and 2009, more than half were diagnosed at distant stage. Five-year net survival was 39.6% from 2001-2003 and 41.0% from 2004-2009. Black women had consistently worse survival compared to white women (29.6% from 2001-2003 and 31.1% from 2004-2009), despite similar stage distributions. Stage-specific survival for all races combined from 2004-2009 was 86.4% for localized stage, 60.9% for regional stage, 27.4% for distant stage.

Conclusion: Our data show a large and consistent disparity in ovarian cancer survival among black women compared to white women in most states. Clinical efforts and public health efforts that ensure all women diagnosed with ovarian cancer receive appropriate guidelines-based treatment may help to decrease these disparities. Future research that focuses on the development of new methods or modalities to detect ovarian cancer at early stages, when survival is relatively high, will likely improve overall US ovarian cancer survival.

Introduction

Ovarian cancer is the eighth most commonly diagnosed and fifth leading cause of cancer death in the United States (US).[1] Ovarian cancer is a heterogeneous disease, consisting of epithelial and non-epithelial types and subtypes. Because of their similarity to epithelial ovarian cancer in terms of histology, pathogenesis and clinical disease course, primary fallopian tube and primary peritoneal cancers are often included in analyses of ovarian cancer.[2]

Population-based ovarian cancer incidence and mortality (the number of new cases and deaths in a given time period, respectively) are presented annually in several reports.[1, 3, 4] These reports show that age-standardized ovarian cancer incidence and death rates are highest among white women in the United States.[1, 3, 4] Population-based survival is less often reported, and reflects the average survival for *all* cancer patients in the population, regardless of their age, sex, race, health status, clinical disease characteristics (e.g. stage of disease), socioeconomic status, residence at diagnosis or access to care.[5] As such, population-based cancer survival provides an indicator of the overall effectiveness of the healthcare system to deliver cancer screening (if available), early diagnosis, and evidence-based treatment services and follow-up care to all people in the population being served.[5] Population-based survival estimates also allow cancer control practitioners to identify target populations for educational interventions and environmental and health-systems changes that could help cancer patients lead longer, healthier lives.

In the US, information on population-based ovarian cancer survival has come from individual state reports and from the National Cancer Institute's (NCI) Surveillance, Epidemiology and End Results (SEER) Program (covering 9-26% of the US population)[3]. Additional non-population-based survival reports come from individual hospitals or institutions, or the National Cancer Database, which consists only of hospitals accredited by the Commission on Cancer.[6] More recently, the Centers for Disease Control and Prevention's (CDC) National Program of Cancer Registries (NPCR) has begun to

collect high quality survival data.[7] Combined, SEER and NPCR data represent the official US federal government statistics on cancer.[8]

The CONCORD-2 study collaborated with SEER and NPCR cancer registries, along with other population-based cancer registries around the world, to establish surveillance of cancer survival for ten common cancers from 67 countries.[9] CONCORD-2 findings showed that for women diagnosed between 1995 and 2009, international differences in ovarian cancer 5-year age-standardized net survival were wide, even after adjustment for differences in mortality from other causes of death, with survival in the United States improving and among the highest in the world.[9]

The objective of this report is to extend the CONCORD-2 international study, as well as official US government annual reports of cancer incidence and mortality, to provide population-based ovarian cancer survival estimates for 37 US states. This is the largest population-based ovarian cancer survival study in the US to date, covering 80% of the US population, and provides critical information for directing the state-specific ovarian cancer efforts of the National Comprehensive Cancer Control Program (NCCCP).

Methods

A detailed description of data sources, evaluation methods and statistical analyses can be found elsewhere in this Supplement.[10] A brief description follows.

Data Source and Variables

We used data from the 37 NPCR or SEER state-wide cancer registries that participated in the CONCORD-2 study,[9] covering approximately 80% of the US population, and consented to inclusion of their data in the more detailed analysis reported here. We analyzed 172,849 individual tumor records for females (aged 15-99 years) who were diagnosed between 2001 and 2009 (and followed through to December 31, 2009) with cancer of the ovary, fallopian tube, peritoneum and retroperitoneum (henceforth referred to as ovarian cancer) [ICD-O-3 codes[11] for the tumors included in this analysis are

C48.0–C48.2, C56.9, C57.0–C57.4, C57.7–C57.9].[9] Malignant tumors of uterine ligaments, and those from other and unspecified female genital organs were included in this analysis according to the CONCORD-2 protocol as to allow for comparison of survival data across all registries in the CONCORD-2 study.[9] We included only the first primary, malignant cancer of the ovary, regardless of whether a woman had a previous cancer from a different site. Any subsequent ovarian cancer diagnoses from 2001 through 2009 were excluded. All benign and borderline tumors of the ovary were excluded; all malignant ovarian tumors (including epithelial and non-epithelial tumors) were included.

We grouped patients by year of diagnosis into two calendar periods (2001-2003 and 2004-2009) to reflect changes in staging methods used by US cancer registries to collect SEER Summary Stage 2000 (SS2000) at diagnosis. SS2000 is the long-standing staging system routinely used by all US cancer registries and broadly categorizes malignant tumors into localized, regional, distant, and unstaged to allow overall population-based reporting of staging trends.[12] From 2001-2003, cancer registries directly coded SEER Summary Stage 2000 from the medical record, while from 2004-2009 all registries derived SS2000 using a series of data elements collected from the Collaborative Staging System.[13] The derived SS2000 maintains the same stage categorization, but generally results in fewer cases staged as unknown due to the collection of a series of individual data elements related to disease extent and the use of rule-based algorithms to assign a stage from those elements.

All cancer registry data used in this analysis are high-quality, as assessed by the United States Cancer Statistics Working Group[1] and the North American Association of Central Cancer Registries (NAACCR).[14] All SEER and NPCR registries use the same, standardized procedures to collect the majority of information on cancer cases.[10] However, SEER registries conduct both active and passive follow-up to ascertain vital status, while NPCR registries only conduct passive follow-up through linkages with their state vital records and the National Death Index to obtain information on deaths that occurred within their state and elsewhere within the United States.[14]

Survival Analyses

We analysed ovarian cancer survival by state, race (all races combined, black, and white), SS2000, and calendar period of diagnosis (2001-2003 and 2004-2009). The all races combined category includes all ovarian cancer cases in the dataset (black, white, and women of other or unspecified race). We estimated net survival up to 5 years after diagnosis with 95% confidence intervals (CI) using the Pohar Perme estimator.[15] Net survival is interpreted as the probability of survival up to a given time since diagnosis, after controlling for other causes of death (background mortality). To control for wide differences in background mortality among participating registries, we constructed life tables based on published methods[16] of all-cause mortality in the general population of each state from the number of deaths and the populations, by single year of age, sex, calendar year and, where possible by race (white, black), using a flexible Poisson model.[17]

We estimated net survival using the cohort approach for patients diagnosed in 2001-2003, since all patients were followed for at least five years by December 31, 2009. We used the complete approach to estimate net survival for patients diagnosed from 2004-2009, because five years of follow-up data were not available for all patients from this calendar period. Net survival was estimated for five age groups (15-44, 45-54, 55-64, 65-74, 75-99 years). We obtained age-standardized survival estimates using the International Cancer Survival Standard (ICSS) weights.[18] If two or more of the five age-specific estimates could not be obtained, only the pooled, unstandardized survival estimate for all ages combined was presented. Unstandardized survival estimates are italicized in Supplemental Tables showing state-specific data. Trends, geographic variations and differences in age-standardized survival by race are presented graphically and in funnel plots.[19] Funnel plots of net survival in the US by race and state show how much a particular survival estimate deviates from the pooled US estimate, given it's level of precision. More information on these methods can be found in this Supplement.[10]

Results

Of the 172,849 cancer cases included in this analysis, 56,390 women were diagnosed in 2001-2003, and 116,459 in 2004-2009 (Table 1). Over 85% of diagnoses were among white women during both time periods (49,893 from 2001-2003 and 101,717 from 2004-2009) and more than half of all cases (53.5% from 2001-2003 and 56.8% from 2004-2009) were diagnosed at distant stage, with minimal variability in stage distribution by race. State-specific patterns mirrored national patterns in that there were much higher numbers of cases among white women compared to black women, and cases were most often diagnosed at distant stage (Supporting Table 1).

Table 2 shows ovarian cancer age-standardized net survival at 1, 3, and 5 years for ovarian cancer by time period and race. In both calendar periods, survival decreased with increasing time since diagnosis. Between 2004 and 2009, survival was 73.3% (CI:73.0-73.6) at 1-year, 52.8% (CI:52.4-53.1) at 3-years, and 41.0% (CI:40.5-41.5) at 5-years. Five-year survival was at least 10% lower in black women compared to white women in both calendar periods (29.6% [CI:28.1-31.1] compared to 40.1% [CI:39.6-40.6] in 2001-2003 and 31.1% [CI:29.5-32.7] compared to 41.7% [CI:41.2-42.2)] in 2004-2009). The racial gap appeared within the first year after diagnosis and persisted between the two calendar periods. Similar patterns were observed in most states (Supporting Table 2).

Table 3 shows 5-year age-standardized net survival by race, stage at diagnosis and calendar period. For all races combined, stage-specific survival improved between calendar periods; however, black women had lower survival compared to white women at each stage at diagnosis. In the most recent calendar period, survival was highest for localized stage (86.4% [CI:84.8-87.9], followed by regional stage (60.9% [CI:59.7-62.2], and distant stage (27.4% [CI:26.9-28.0]. Similar patterns were observed in most states (Supporting Table 3).

Figure 1 shows the absolute change in ovarian cancer survival from 2001-2003 to 2004-2009. Overall, 5-year net ovarian cancer survival increased 1.5% between 2001-2003 and 2004-2009. Among

states, 27 had increases while 10 had decreases in survival between the two calendar periods. In about half of states (18 of 37), the increase or decrease was less than or equal to 1.5%.

Funnel plots showing 5-year age-standardized net ovarian cancer survival by race are presented in Figure 2. Between 2001 and 2003, the age-standardized estimates for white women ranged from 29.3% to 46.8% and between 2004 and 2009 the range was 33.1% to 51.4%. In the first calendar period, all survival estimates for white women were within the control limits (no more than two or three standard deviations below or above the target of the pooled US all races combined estimate of 39.6%, after controlling for precision). The same pattern was observed in 2004-2009, with estimates within the control limits around the pooled US estimate of 41.0%; however, in this time period, survival for white women in one state improved to a level above these limits. Survival among black women ranged from 24.4% to 33.1% in 2001-2003 and 16.5% to 41.7% in 2004-2009. In both calendar periods, survival for black women was consistently lower in all states than that of the pooled US all races combined estimate and the majority were outside the control limits.

Discussion

Findings from this large population-based study show that US net survival from ovarian cancer is moderate overall, at about 40-41% survival at 5 years. We have also shown a modest increase in survival in the most recent time period examined. The data presented here show a consistent and persistent disparity in ovarian cancer survival among black women compared to white women.

Our overall US survival estimates are somewhat lower than those from US analyses including only SEER registries, which are reported to be 44% survival at five years. With regard to trends, our findings are generally consistent with a recent SEER registry analysis that reported increases in ovarian cancer survival since 1990. NPCR cancer registries contain an older and more rural population than SEER alone, which is a sample population that tends to be more urban and affluent than the general population.[8] Several smaller studies have shown that older populations have lower survival from ovarian

cancer, potentially due to the existence of comorbidities or lack of access to care and other resources.[20, 21] Therefore, the greater inclusion of data from these older individuals likely underlies the somewhat lower survival estimates we report in this comprehensive study. Given the passive only follow-up procedures of NPCR registries, NPCR registries may miss some deaths, particularly for patients who leave the United States between the time of their diagnosis and death, or those with incomplete demographic variables available for matching; this may result in a slight overestimation of survival rates.[14] Therefore, the lower survival estimates observed here are likely true reflections of the broader inclusion of the population with ovarian cancer and not due to differences in vital status follow-up procedures. Internationally, the ovarian cancer survival estimates reported here are similar to those countries with relatively higher estimates of ovarian cancer survival from the CONCORD-2 study, and are slightly higher than those reported from Canada (37.5% 5-year survival from 2005-2009).[9]

Our finding that black women have consistently lower ovarian cancer survival than white women likely reflects a true and widespread racial disparity in ovarian cancer survival, given our inclusion of 80% of the US population. There is general inconsistency among published studies with regard to race-specific ovarian cancer survival. Some articles reported lower survival among black women compared to whites,[6, 22-26] while others reported no difference.[27-29] Additionally, a meta-analysis of pooled 5-year survival results from eight studies (106,704 women) found no difference in survival between black and white women.[30] Because ovarian cancer is diagnosed in much greater numbers among white women than black women, a large study sample size is important in ovarian cancer studies stratified by race. Many smaller studies may not have had enough power to detect a difference in survival between black and white women. Since our data include almost 14,000 cases of ovarian cancer among US black women, it is likely that our findings represent a true and widespread racial disparity in ovarian cancer survival.

The fact that ovarian cancer 5-year net survival is moderate and has not changed considerably over time is likely due to most cases continuing to be diagnosed at distant stage. The preponderance of late-stage diagnoses contributes to ovarian cancer being described as a particularly deadly disease[31]; however, localized and regional stage diagnoses have relatively good survival overall,[32, 33] and stage-specific ovarian cancer survival is similar to that of breast and uterine cancers.[3] The differences in stage distribution seen among these three cancers is likely due to the availability of early detection methods for breast cancer[34] and the presence of gynecologic-specific symptoms such as post-menopausal vaginal bleeding for uterine cancer.[35] While US studies have been conducted to develop effective early detection methods for ovarian cancer, none have been found to provide a shift to earlier stage at diagnosis[36, 37] or an overall mortality benefit,[38] and some have been shown to cause significant harms to women (mainly associated with unnecessary surgery).[38] Recent results from a UK ovarian cancer screening trial have demonstrated more encouraging results with regard to detection of ovarian cancer at earlier stage[39, 40]; however, a reduction in mortality from ovarian cancer has not yet been observed in this trial.[41] Continued follow-up of these trial participants, as well as positive evidence from other screening studies, is necessary before any changes in the current state of ovarian cancer screening among US women may be considered. In lieu of evidence-based screening, symptom recognition may assist with early detection of ovarian cancer.[42] Several studies have examined and defined the presence of a specific set of symptoms that occur in a majority of women prior to an ovarian cancer diagnosis.[43, 44] These symptoms, including bloating, pelvic pain, change in urination frequency and/or intensity, and early satiety after eating, often go unrecognized by women due to their non-gynecologic nature. They can also be associated with other existing conditions, and women may not immediately seek care for such symptoms, which can prolong the time to diagnosis.[45, 46] Increased public education regarding ovarian cancer symptom recognition and prompt care-seeking for those symptoms may help with increasing early stage diagnoses, resulting in increases in ovarian cancer survival.

Clinical Implications

While effective early detection methods that reduce ovarian cancer mortality have yet to be developed, guidelines-based treatment protocols for ovarian cancer are well-established and adherence to these protocols leads to better surgical outcomes and improved survival among all ovarian cancer patients in the United States. Several patient factors are consistently associated with not receiving recommended treatment, including older age, black race, the presence of co-morbid conditions, and low socioeconomic status.[20, 47-50] In contrast, being treated at a high-volume facility, an NCI-designated cancer center, or by a gynecologic oncologist have been consistently associated with receiving guidelines-based, recommended treatment.[47, 51-54] The fact that black women have been consistently shown to not receive guidelines-based treatment compared to white women, even when treated within the same hospital,[26] likely contributes to lower survival seen in this study among black women. It is unclear why black women are not receiving guidelines-based treatment; however, it is possible that difficulty in accessing particular hospitals or physicians may play a role. Geographic disparities in ovarian cancer care have been well-documented, [55-58]and a recent study in one urban NCI-designated cancer center showed that the farther gynecologic cancer patients were required to travel to get to treatment (those traveling above 10 but less than 50 miles), the less likely they were to complete recommended care.[57] Patient influences may be another potential reason that black women may not be receiving guidelines-based care. Fatalistic attitudes and mistrust of the medical system have been found to be more prevalent among black prostate cancer patients compared to white patients.[59] These two factors along with negative beliefs about surgery are thought to explain almost one-third of the observed racial disparities in lung cancer treatment among black patients.[60] Telemedicine, which would allow specialists to consult on patient cases remotely via phone- and/or video-conferencing, is an emerging area that may improve access to quality care in rural or underserved areas, and/or assist patients with being primarily cared for by a physician chosen and trusted by the patient.[61] The utility of this method

for ovarian cancer in the United States is unknown however, and effective delivery of ovarian cancer surgical care, which is a key mediator of improved survival, is still being studied in telemedicine models.[61]

Cancer Control Implications

Public health efforts that educate women about ovarian cancer, and allow women to better navigate an ovarian cancer diagnosis more easily may assist with improvements in ovarian cancer survival. CDC's National Comprehensive Cancer Control Program (NCCCP) operates in all 50 states, the District of Columbia, 7 tribal governments and organizations, and 7 territories and US-associated Pacific Island jurisdictions to support the development and implementation of evidence-based initiatives to prevent and control cancer.[62] Recent studies have documented prior ovarian cancer activities of the NCCCP; nearly half of programs are undertaking activities related to ovarian cancer, which largely center on education, primary prevention, and implementation of interventions to improve ovarian cancer survivors' well-being.[63, 64] Primary prevention activities include promoting smoking cessation and smoke-free environments as smoking is a risk factor for some types of ovarian cancer[65], as well as the promotion of breastfeeding among women who have the opportunity, which several studies have suggested reduces risk for epithelial ovarian cancer.[66] Several NCCCP grantees have partnered with CDC's *Inside Knowledge: Get the Facts about Gynecologic Cancer* campaign[67] to increase knowledge of other risk factors, symptoms, and recommendations for treatment of ovarian cancer among the public and providers. These specific educational efforts are designed to reach and capture traditionally underserved populations in the United States, including black women. Survivor interventions include developing patient navigation programs to assist cancer patients in seeking referrals and follow-up services, scheduling transportation to appointments, and improved communication with their providers among other activities. These efforts may assist ovarian cancer patients with attending all scheduled medical appointments, which may result in longer disease-free intervals[68] and improved survival. Taken

together, these public health efforts have the potential of improving ovarian cancer survival among all women diagnosed in the United States, especially if adopted more widely by a majority of NCCCP grantees.

This study is subject to some limitations. First, the clinical utility of our analysis is limited, given results were not stratified by histologic type of ovarian cancer. Due to the heterogeneity of ovarian cancer, survival varies widely both by histologic type (epithelial vs. non-epithelial)[69] and subtype (e.g., serous adenocarcinoma vs. clear cell adenocarcinoma).[70] Our analysis masked these differences. Second, our high-level analysis does not consider factors known to influence survival from ovarian cancer including age, patient comorbidity status, and treatment.[20, 53] Further, we include only SS2000, the registry staging system, as opposed to FIGO stage which is more commonly used in the clinic. Balanced with these limitations are several strengths. Our study was designed to be particularly useful for public health efforts. This high-level analysis by state provides necessary data for resource allocation within health departments, and actionable items for the NCCCP in their efforts to help reduce the ovarian cancer burden. It also reveals additional health inequities for all public health practitioners and stakeholders to address, and demonstrates the need for continued funding for ovarian cancer, since increases in survival have been modest in recent years. Additionally, the rigorous quality control and statistical methods used ensure that only the highest quality data were included in this analysis.[10] Almost all cases included in this analysis were microscopically confirmed, further ensuring the high quality of the data. Finally, our study includes data from a majority of US states, making it, to our knowledge, the largest and most geographically-comprehensive US ovarian cancer survival analysis. The inclusion of this large number of states allowed for adequate sample size to detect differences among racial populations.

Conclusion

Ovarian cancer survival is moderate across the US; however, black women have consistently lower survival from this disease than white women. Future research focusing on the development of new screening methods or modalities that lead to a greater number of earlier-stage diagnoses will likely improve overall ovarian cancer survival. In the meantime, clinical efforts that ensure all women diagnosed with ovarian cancer receive appropriate guidelines-based treatment, and public health efforts that educate women about the risks factors, signs and symptoms of ovarian cancer may help to decrease current disparities in US ovarian cancer survival.

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Table 1. Ovarian cancer: Number of cases diagnosed among females aged 15-99 years, by stage at diagnosis and calendar period*, 2001-2009

SS2000*		**2001-2003**			**2004-2009**		
		All races	**White**	**Black**	**All races**	**White**	**Black**
No. of patients		56,390	49,893	4,262	116,459	101,717	9,440
Localized	(%)	15.9	15.7	15.4	14.2	13.9	14.5
Regional	(%)	18.9	18.9	16.4	18.9	19.0	15.7
Distant	(%)	53.5	54.1	51.0	56.8	57.4	55.3
Unknown	(%)	11.7	11.3	17.2	10.1	9.7	14.5

*Stage at diagnosis is SEER Summary Stage 2000 (SS2000).

Table 2. Ovarian cancer: Age-standardized net survival (NS %) at 1, 3, and 5 years among females aged 15-99 years, by race and calendar period, 2001-2009

Years	2001-2003									2004-2009								
	All races			White			Black			All races			White			Black		
	NS (%)	95% CI		NS (%)	95% CI		NS (%)	95% CI		NS (%)	95% CI		NS (%)	95% CI		NS (%)	95% CI	
1	**72.3**	71.9	- 72.7	**73.3**	72.9	- 73.7	**59.8**	58.2	- 61.3	**73.3**	73.0	- 73.6	**74.2**	73.9	- 74.5	**62.5**	61.4	- 63.6
3	**50.9**	50.4	- 51.3	**51.6**	51.1	- 52.1	**39.4**	37.8	- 41.0	**52.8**	52.4	- 53.1	**53.6**	53.2	- 54.0	**41.6**	40.3	- 42.9
5	**39.6**	39.1	- 40.0	**40.1**	39.6	- 40.6	**29.6**	28.1	- 31.1	**41.0**	40.5	- 41.5	**41.7**	41.2	- 42.2	**31.1**	29.5	- 32.7

Table 3. Ovarian cancer: Five-year age-standardized net survival (NS %) among females aged 15-99 years, by stage at diagnosis*, race, and calendar period, 2001-2009

SS2000*	2001-2003												2004-2009											
	All races				White				Black				All races				White				Black			
	NS (%)				NS (%)				NS (%)				NS (%)				NS (%)				NS (%)			
All stages	**39.6**	39.1	-	40.0	**40.1**	39.6	-	40.6	**29.6**	28.1	-	31.1	**41.0**	40.5	-	41.5	**41.7**	41.2	-	42.2	**31.1**	29.5	-	32.7
Localized	**84.8**	83.3	-	86.2	**84.9**	83.3	-	86.4	**78.8**	71.9	-	85.7	**86.4**	84.8	-	87.9	**86.9**	85.2	-	88.5	**80.9**	74.8	-	86.9
Regional	**53.9**	52.8	-	55.1	**54.7**	53.5	-	55.9	**38.6**	34.3	-	42.9	**60.9**	59.7	-	62.2	**61.6**	60.3	-	62.9	**45.3**	40.7	-	49.9
Distant	**25.2**	24.7	-	25.7	**25.8**	25.2	-	26.4	**16.3**	14.7	-	18.0	**27.4**	26.9	-	28.0	**28.0**	27.4	-	28.7	**18.6**	16.8	-	20.5
Unknown	**33.1**	31.9	-	34.4	**33.7**	32.4	-	35.1	**26.8**	23.3	-	30.2	**32.6**	31.3	-	33.9	**33.6**	32.2	-	35.0	**25.7**	22.0	-	29.4

*Stage at diagnosis is SEER Summary Stage 2000 (SS2000).

Figure 1. Ovarian cancer: Five-year age-standardized net survival (%) among females aged 15-99 years, and absolute change in net survival (%), by calendar period, 2001-2009
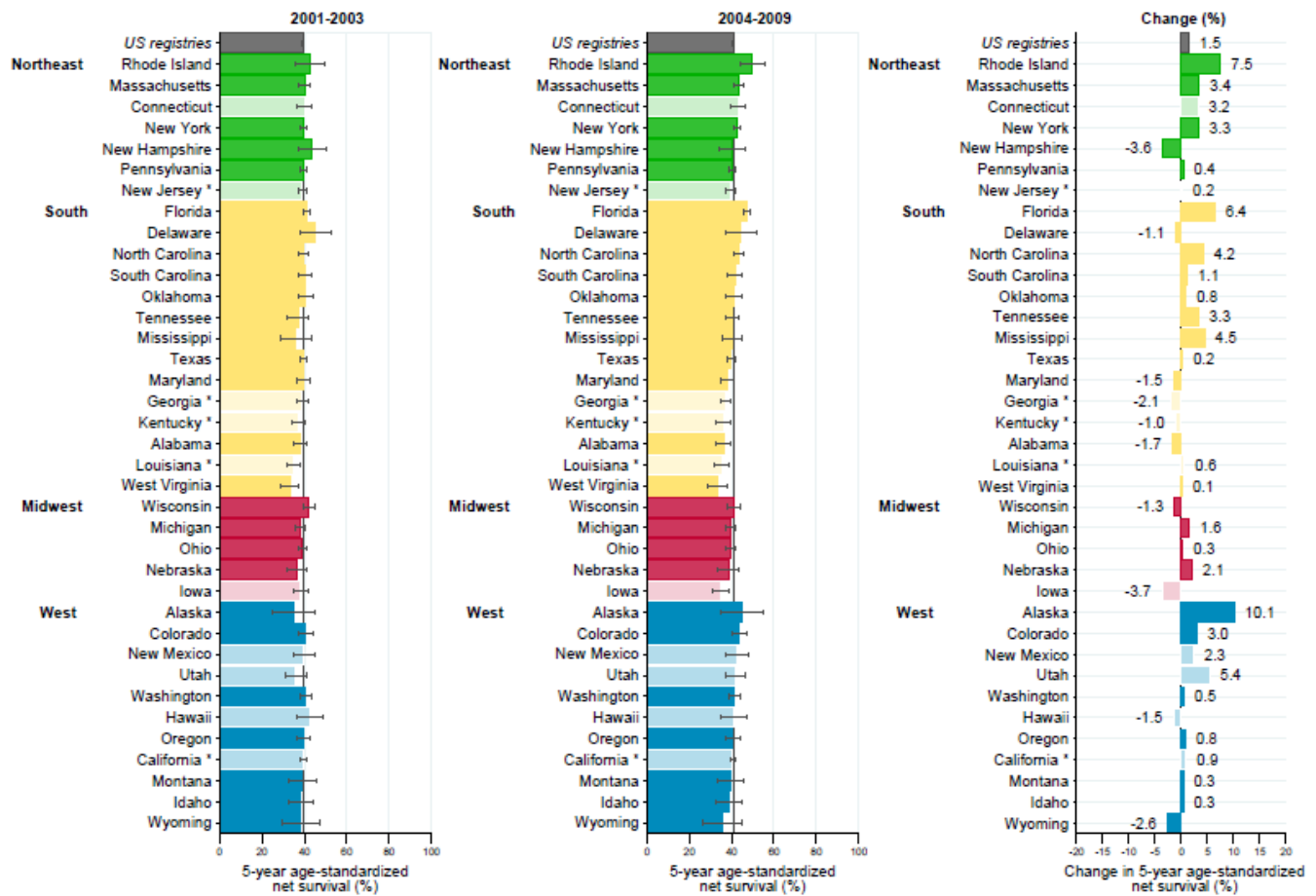
Note: States are ranked within Census Region by the survival estimate for 2004-2009. Dark colors are registries affiliated with the National Program of Cancer Registries (NPCR); pale colors are registries affiliated with the Surveillance, Epidemiology, and End Results (SEER) Program. An asterisk (*) denotes registries affiliated with both programs.

Figure 2. Ovarian cancer: Five-year age-standardized net survival (NS %) among females aged 15-99 years, by state, race and calendar period of diagnosis

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Note: The pooled (US) survival estimates for each calendar period are shown by the horizontal (solid) line with corresponding 95.0% and 99.8% control limits (dotted lines).

Supporting Table 1. Ovarian cancer: Number of cases diagnosed among females aged 15-99 years, by stage at diagnosis, calendar period, and US state (grouped by US Census Region)*, 2001-2009

	Stage		2001-2003			2004-2009		
			All races	White	Black	All races	White	Black
UNITED STATES								
	No. of patients		56,390	49,893	4,262	116,459	101,717	9,440
	Localized	(%)	15.9	15.7	15.4	14.2	13.9	14.5
	Regional	(%)	18.9	18.9	16.4	18.9	19.0	15.7
	Distant	(%)	53.5	54.1	51.0	56.8	57.4	55.3
	Unknown	(%)	11.7	11.3	17.2	10.1	9.7	14.5
NORTHEAST								
New England								
Connecticut	No. of patients		964	914	34	1,921	1,778	92
(SEER)	Localized	(%)	14.4	14.7	11.8	14.0	13.6	17.4
	Regional	(%)	18.6	18.8	20.6	22.1	21.8	23.9
	Distant	(%)	61.4	60.8	64.7	59.8	60.6	56.5
	Unknown	(%)	5.6	5.7	2.9	4.2	4.0	2.2
Massachusetts	No. of patients		1,836	1,749	45	3,602	3,406	98
(NPCR)	Localized	(%)	13.9	13.8	8.9	14.6	14.3	19.4
	Regional	(%)	20.4	20.4	15.6	22.5	22.3	17.3
	Distant	(%)	58.9	58.9	68.9	57.0	57.5	57.1
	Unknown	(%)	6.8	6.9	6.7	5.9	5.9	6.1
New Hampshire	No. of patients		320	310	-	709	689	-
(NPCR)	Localized	(%)	19.1	19.7	0.0	15.2	15.2	0.0
	Regional	(%)	24.1	24.5	0.0	21.7	22.1	0.0
	Distant	(%)	42.5	41.6	100.0	56.3	57.5	100.0
	Unknown	(%)	14.4	14.2	0.0	6.8	5.2	0.0
Rhode Island	No. of patients		252	239	-	463	431	14
(NPCR)	Localized	(%)	24.2	23.8	25.0	-	-	-
	Regional	(%)	14.7	15.1	12.5	-	-	-
	Distant	(%)	55.6	55.6	62.5	-	-	-
	Unknown	(%)	5.6	5.4	0.0	-	-	-
Mid Atlantic								
New Jersey	No. of patients		2,557	2,255	211	4,780	4,145	433
(NPCR/SEER)	Localized	(%)	15.9	15.6	17.5	15.3	14.9	18.0
	Regional	(%)	17.5	17.6	15.2	19.0	19.1	15.2
	Distant	(%)	57.4	58.2	56.9	57.4	58.1	54.7
	Unknown	(%)	9.2	8.7	10.4	8.3	7.9	12.0
New York	No. of patients		5,323	4,566	543	10,463	8,797	1,132
(NPCR)	Localized	(%)	17.2	16.8	17.7	16.0	15.3	16.8
	Regional	(%)	21.4	21.4	19.5	19.6	19.7	17.8
	Distant	(%)	47.5	47.9	47.5	56.8	57.5	57.5
	Unknown	(%)	13.8	13.8	15.3	7.6	7.5	7.9
Pennsylvania	No. of patients		3,750	3,465	205	7,456	6,856	475
(NPCR)	Localized	(%)	17.5	17.3	16.6	14.0	13.9	13.7
	Regional	(%)	20.0	20.2	17.1	20.0	20.1	18.7
	Distant	(%)	53.0	53.0	56.1	59.1	59.3	59.4
	Unknown	(%)	9.5	9.5	10.2	6.8	6.7	8.2
SOUTH								
South Atlantic								
Delaware	No. of patients		208	175	27	433	369	50
(NPCR)	Localized	(%)	16.3	17.1	14.8	9.5	9.8	6.0
	Regional	(%)	23.1	23.4	22.2	20.3	20.6	18.0
	Distant	(%)	50.5	49.1	51.9	64.7	64.2	68.0
	Unknown	(%)	10.1	10.3	11.1	5.5	5.4	8.0
Florida	No. of patients		4,889	4,433	380	9,766	8,771	769
(NPCR)	Localized	(%)	14.6	14.6	12.4	12.7	12.6	13.7
	Regional	(%)	15.7	15.7	15.3	17.6	17.6	16.6
	Distant	(%)	58.3	58.7	55.5	60.3	60.8	57.9
	Unknown	(%)	11.5	11.0	16.8	9.3	9.0	11.8
Georgia	No. of patients		1,829	1,437	365	3,965	3,085	797
(NPCR/SEER)	Localized	(%)	14.7	14.3	15.9	15.2	14.5	17.3
	Regional	(%)	18.2	18.0	18.1	18.9	20.0	14.6
	Distant	(%)	57.6	58.0	57.0	59.3	59.4	60.5
	Unknown	(%)	9.6	9.7	9.0	6.6	6.1	7.7

Table 1 – Stage distribution by state and race – Ovary   Page 1 of 4   Produced 29 July 2016

*Stage at diagnosis is SEER Summary Stage 2000 (SS2000). Information on stage was not available for two states (Maryland and Wisconsin), or for Rhode Island for cases diagnosed from 2004-2009.

Supporting Table 2. Ovarian cancer: Age-standardized net survival (NS %) at 1, 3, and 5 years among females aged 15-99 years, by race, calendar period, and US state (grouped by US Census Region), 2001-2009

| | | 2001-2003 | | | | | | 2004-2009 | | | | | |
| | | All races | | White | | Black | | All races | | White | | Black | |
	Years	NS	95% CI	NS	95% CI	NS	95% CI	NS	95% CI	NS	95% CI	NS	95% CI
UNITED STATES	1	72.3	71.9 - 72.7	73.3	72.9 - 73.7	59.8	58.2 - 61.3	73.3	73.0 - 73.6	74.2	73.9 - 74.5	62.5	61.4 - 63.6
	3	50.9	50.4 - 51.3	51.6	51.1 - 52.1	39.4	37.8 - 41.0	52.8	52.4 - 53.1	53.6	53.2 - 54.0	41.6	40.3 - 42.9
	5	39.6	39.1 - 40.0	40.1	39.6 - 40.6	29.6	28.1 - 31.1	41.0	40.5 - 41.5	41.7	41.2 - 42.2	31.1	29.5 - 32.7
NORTHEAST													
New England													
Connecticut	1	77.8	75.1 - 80.5	78.6	75.8 - 81.4	68.1	52.4 - 83.7	77.1	75.1 - 79.1	77.6	75.5 - 79.6	67.2	57.5 - 77.0
(SEER)	3	54.7	51.3 - 58.0	55.2	51.8 - 58.7	54.4	37.5 - 71.4	54.2	51.4 - 57.0	54.3	51.5 - 57.2	52.4	41.2 - 63.7
	5	40.2	36.8 - 43.6	40.5	37.0 - 43.9	42.9	26.2 - 59.7	43.4	39.9 - 46.8	43.1	39.5 - 46.8	41.7	32.1 - 51.2
Massachusetts	1	73.6	71.5 - 75.7	73.9	71.8 - 76.0	65.3	51.3 - 79.4	75.6	74.2 - 77.1	75.6	74.1 - 77.1	71.5	60.5 - 82.4
(NPCR)	3	50.8	48.4 - 53.2	50.8	48.4 - 53.3	48.2	33.2 - 63.2	55.5	53.5 - 57.5	55.3	53.3 - 57.4	45.1	36.1 - 54.0
	5	40.1	37.7 - 42.5	39.9	37.5 - 42.4	34.7	20.2 - 49.1	43.5	40.9 - 46.0	43.0	40.4 - 45.6	41.7	29.4 - 54.0
New Hampshire	1	75.1	70.0 - 80.2	75.2	70.0 - 80.4		-	74.1	70.7 - 77.6	74.9	71.4 - 78.4		-
(NPCR)	3	52.0	45.9 - 58.1	53.2	46.9 - 59.5		-	54.8	50.2 - 59.3	55.1	50.4 - 59.8		-
	5	43.8	37.4 - 50.3	44.7	38.1 - 51.3		-	40.2	34.3 - 46.2	40.9	34.7 - 47.0		-
Rhode Island	1	77.9	72.6 - 83.2	78.2	72.8 - 83.6		-	72.2	68.0 - 76.3	72.3	68.0 - 76.6	84.6	64.6 - 100.0
(NPCR)	3	51.9	45.0 - 58.8	51.9	44.8 - 58.9		-	54.0	48.8 - 59.2	54.0	48.6 - 59.4	73.4	45.9 - 100.0
	5	42.5	35.5 - 49.5	42.2	35.0 - 49.3		-	50.0	43.9 - 56.0	49.5	43.2 - 55.8	74.1	46.3 - 100.0
Mid Atlantic													
New Jersey	1	70.7	68.9 - 72.5	71.5	69.6 - 73.4	59.3	52.6 - 66.0	72.9	71.6 - 74.3	74.3	72.9 - 75.7	58.2	53.5 - 62.9
(NPCR/SEER)	3	50.3	48.3 - 52.3	51.2	49.0 - 53.3	38.7	32.4 - 45.0	53.4	51.5 - 55.3	53.4	51.5 - 55.3	38.4	32.5 - 44.3
	5	39.2	37.2 - 41.3	39.9	37.7 - 42.0	28.9	23.0 - 34.8	39.4	37.0 - 41.8	40.4	37.9 - 42.9	26.6	20.5 - 32.7
New York	1	71.3	70.0 - 72.5	72.2	70.9 - 73.6	61.6	57.3 - 65.9	73.9	73.0 - 74.8	75.0	74.0 - 75.9	64.7	61.7 - 67.8
(NPCR)	3	50.1	48.7 - 51.5	50.8	49.3 - 52.4	42.3	37.9 - 46.6	53.6	52.4 - 54.8	54.7	53.4 - 56.0	43.5	39.8 - 47.2
	5	39.7	38.2 - 41.1	40.3	38.8 - 41.9	31.5	27.4 - 35.5	43.8	41.4 - 44.6	43.8	42.1 - 45.5	34.8	30.3 - 39.4
Pennsylvania	1	71.7	70.3 - 73.2	72.4	71.0 - 73.9	57.5	50.7 - 64.3	72.2	71.1 - 73.3	72.8	71.7 - 73.9	63.0	58.2 - 67.8
(NPCR)	3	50.3	48.7 - 52.0	51.0	49.3 - 52.7	33.3	27.0 - 39.7	52.3	50.9 - 53.7	52.4	51.0 - 53.9	49.8	44.2 - 55.4
	5	39.8	38.2 - 41.5	40.1	38.3 - 41.8	27.3	21.4 - 33.3	40.2	38.4 - 42.0	40.4	38.5 - 42.2	38.1	30.9 - 45.3
SOUTH													
South Atlantic													
Delaware	1	76.1	70.2 - 82.0	76.5	70.3 - 82.7	85.6	72.4 - 98.8	76.6	72.4 - 80.8	77.6	73.1 - 82.0	74.3	61.6 - 87.0
(NPCR)	3	55.6	48.3 - 62.8	56.4	48.7 - 64.2	53.0	34.2 - 71.8	52.4	46.6 - 58.2	55.0	48.9 - 61.2	36.3	19.7 - 52.9
	5	45.4	37.8 - 53.0	46.8	38.7 - 54.9	46.5	27.3 - 65.6	44.3	37.0 - 51.6	47.0	39.1 - 54.9	23.0	2.8 - 43.3
Florida	1	74.0	72.7 - 75.2	75.2	73.9 - 76.5	58.5	53.2 - 63.8	75.4	74.5 - 76.3	76.4	75.5 - 77.3	63.2	59.5 - 66.9
(NPCR)	3	51.1	49.6 - 52.5	52.0	50.5 - 53.6	39.1	33.7 - 44.6	56.1	54.9 - 57.3	57.0	55.7 - 58.2	45.1	40.7 - 49.6
	5	40.9	39.4 - 42.4	41.7	40.1 - 43.3	29.6	24.6 - 34.7	47.3	45.8 - 48.8	47.8	46.2 - 49.4	39.6	34.4 - 44.8
Georgia	1	70.1	67.9 - 72.3	71.8	69.4 - 74.2	62.6	57.2 - 68.0	70.3	68.8 - 71.9	72.4	70.7 - 74.1	61.6	57.6 - 65.6
(NPCR/SEER)	3	49.3	46.9 - 51.8	51.2	48.5 - 54.0	41.0	35.3 - 46.8	49.8	47.8 - 51.7	51.7	49.5 - 53.9	42.1	37.5 - 46.7
	5	39.2	36.7 - 41.7	40.8	38.0 - 43.5	31.9	26.5 - 37.2	37.1	34.6 - 39.7	39.0	36.1 - 41.8	31.3	26.0 - 36.7
Maryland	1	72.5	69.8 - 75.2	73.1	70.2 - 76.0	68.6	61.3 - 75.8	72.0	70.1 - 74.0	73.9	71.8 - 76.1	63.3	58.2 - 68.4
(NPCR)	3	51.0	47.9 - 54.1	52.7	49.3 - 56.1	43.0	35.2 - 50.8	50.9	48.4 - 53.5	52.9	50.1 - 55.8	42.2	36.1 - 48.2
	5	39.3	36.2 - 42.4	40.8	37.4 - 44.3	31.6	24.2 - 38.9	37.8	34.7 - 40.9	41.4	37.9 - 45.0	21.3	15.0 - 27.6
North Carolina	1	65.4	63.2 - 67.5	66.7	64.4 - 69.0	56.1	49.8 - 62.5	74.2	72.8 - 75.6	75.7	74.2 - 77.2	64.3	60.1 - 68.4
(NPCR)	3	51.1	48.7 - 53.4	52.1	49.6 - 54.6	44.5	37.9 - 51.1	54.3	52.4 - 56.2	56.5	54.5 - 58.6	40.6	36.0 - 45.2
	5	39.3	37.0 - 41.6	40.3	37.8 - 42.7	33.1	26.8 - 39.5	43.5	41.0 - 45.9	45.3	42.6 - 48.0	30.8	25.8 - 35.8
South Carolina	1	75.2	72.4 - 78.0	78.9	75.9 - 81.8	57.3	50.2 - 64.4	76.5	74.5 - 78.6	79.3	77.1 - 81.4	63.3	58.1 - 68.4
(NPCR)	3	53.5	50.2 - 56.8	56.3	52.6 - 60.0	39.6	32.6 - 46.6	54.2	51.4 - 56.9	56.4	53.4 - 59.5	42.6	36.0 - 49.2
	5	40.6	37.3 - 43.9	42.5	38.8 - 46.2	31.8	25.0 - 38.6	41.7	38.2 - 45.2	43.6	39.7 - 47.4	27.4	19.7 - 35.2
West Virginia	1	66.8	62.9 - 70.7	66.6	62.6 - 70.5	68.1	44.8 - 91.5	67.5	64.3 - 70.6	67.7	64.5 - 70.8	45.6	20.5 - 70.7
(NPCR)	3	45.2	41.0 - 49.5	45.3	41.0 - 49.6	36.6	11.5 - 61.6	49.1	45.2 - 53.0	49.1	45.2 - 53.1	30.7	7.5 - 54.0
	5	33.3	29.2 - 37.5	32.8	28.6 - 37.0	36.6	11.5 - 61.6	33.4	28.6 - 38.2	33.1	28.2 - 38.0	33.5	8.1 - 58.9
East South Central													
Alabama	1	71.4	68.6 - 74.1	74.1	71.2 - 77.1	57.3	50.2 - 64.4	70.1	68.1 - 72.0	72.1	69.9 - 74.2	59.4	54.2 - 64.6
(NPCR)	3	49.2	46.1 - 52.4	51.9	48.5 - 55.4	35.0	28.1 - 41.9	49.0	46.5 - 51.5	50.6	47.8 - 53.4	40.3	34.4 - 46.2
	5	37.9	34.7 - 41.1	40.2	36.6 - 43.8	24.5	18.1 - 30.9	36.2	32.9 - 39.4	37.3	33.7 - 41.0	27.3	21.3 - 33.4
Kentucky	1	70.3	67.4 - 73.2	70.6	67.7 - 73.6	69.3	55.4 - 83.2	72.3	70.3 - 74.4	72.0	69.9 - 74.1	78.1	67.5 - 88.8
(NPCR/SEER)	3	48.0	44.6 - 51.3	48.1	44.6 - 51.5	50.3	34.7 - 65.8	50.8	48.1 - 53.6	51.0	48.2 - 53.8	41.1	28.3 - 53.8
	5	37.4	34.1 - 40.7	37.7	34.3 - 41.1	34.7	19.7 - 49.6	36.4	32.8 - 39.9	36.8	33.1 - 40.5	16.5	10.1 - 22.9
Mississippi	1	78.9	72.7 - 85.2	83.9	77.4 - 90.4	69.0	56.0 - 82.0	71.2	68.4 - 74.0	76.9	73.9 - 79.9	51.5	45.4 - 57.5
(NPCR)	3	50.7	43.1 - 58.4	55.8	46.8 - 64.7	45.6	31.4 - 59.8	49.3	45.6 - 52.9	54.8	50.6 - 59.1	29.2	23.2 - 35.1
	5	35.9	28.5 - 43.2	38.1	29.3 - 46.9	37.2	23.3 - 51.1	40.3	35.6 - 45.0	44.4	38.8 - 49.9	23.5	18.4 - 28.6
Tennessee	1	71.2	66.8 - 75.7	74.0	69.4 - 78.6	54.1	39.5 - 68.8	72.1	70.3 - 73.9	73.1	71.2 - 75.0	61.9	55.6 - 68.2
(NPCR)	3	48.6	43.6 - 53.7	49.5	44.0 - 54.9	44.3	29.4 - 59.2	53.1	50.7 - 55.5	54.1	51.5 - 56.6	44.2	36.8 - 51.7
	5	37.2	32.2 - 42.2	37.9	32.5 - 43.3	33.5	19.2 - 47.8	40.5	37.3 - 43.7	41.4	38.1 - 44.8	30.6	22.0 - 39.2
West South Central													
Louisiana	1	67.6	64.5 - 70.6	70.8	67.4 - 74.1	55.4	48.8 - 61.9	69.0	66.8 - 71.3	71.6	69.0 - 74.1	58.9	53.6 - 64.2
(NPCR/SEER)	3	46.1	42.8 - 49.4	48.3	44.6 - 52.1	37.1	30.3 - 43.8	46.4	43.5 - 49.4	50.0	46.7 - 53.3	33.1	26.8 - 39.4
	5	34.9	31.6 - 38.2	37.4	33.7 - 41.1	24.8	18.5 - 31.2	35.5	31.8 - 39.1	38.5	34.3 - 42.7	16.8	11.7 - 21.8
Oklahoma	1	71.2	68.3 - 74.2	71.2	68.0 - 74.3	74.3	61.0 - 87.6	72.9	70.6 - 75.1	73.5	71.2 - 75.9	63.3	51.9 - 74.6
(NPCR)	3	51.4	48.0 - 54.9	51.6	48.0 - 55.2	47.1	31.6 - 62.6	55.7	52.7 - 58.6	57.0	53.9 - 60.1	40.3	28.8 - 51.8
	5	40.4	37.0 - 43.9	40.1	36.4 - 43.8	37.5	22.0 - 53.1	41.3	37.3 - 45.2	42.5	38.2 - 46.7	37.8	27.0 - 48.5
Texas	1	73.4	71.9 - 74.9	74.7	73.1 - 76.2	57.9	52.5 - 63.4	74.0	73.0 - 75.1	74.7	73.6 - 75.8	63.7	59.7 - 67.8
(NPCR)	3	51.0	49.3 - 52.7	52.4	50.6 - 54.2	35.1	29.9 - 40.2	53.1	51.7 - 54.5	53.9	52.4 - 55.4	39.3	34.6 - 44.0
	5	39.5	37.8 - 41.3	40.8	38.9 - 42.6	24.4	19.5 - 29.2	39.8	38.0 - 41.6	40.7	38.8 - 42.7	25.5	20.5 - 30.5

Note: Unstandardized estimates are italicized.

Supporting Table 3. Ovarian cancer: Five-year age-standardized net survival (NS %) among females aged 15-99 years, by stage at diagnosis*, race, calendar period, and US state (grouped by US Census Region), 2001-2009

| | | 2001-2003 | | | | | | 2004-2009 | | | | | |
| | | All races | | White | | Black | | All races | | White | | Black | |
	SEER Summary Stage	NS (%)	95% CI	NS (%)	95% CI	NS (%)	95% CI	NS (%)	95% CI	NS (%)	95% CI	NS (%)	95% CI
UNITED STATES													
	All stages	39.6	39.1 - 40.0	40.1	39.6 - 40.6	29.6	28.1 - 31.1	41.0	40.5 - 41.5	41.7	41.2 - 42.2	31.1	29.5 - 32.7
	Localized	84.8	83.3 - 86.2	84.9	83.3 - 86.4	78.8	71.9 - 85.7	86.4	84.8 - 87.9	86.9	85.2 - 88.5	80.9	74.8 - 86.9
	Regional	53.9	52.8 - 55.1	54.7	53.5 - 55.9	38.6	34.3 - 42.9	60.9	59.7 - 62.2	61.6	60.3 - 62.9	45.3	40.7 - 49.9
	Distant	25.2	24.7 - 25.7	25.8	25.2 - 26.4	16.3	14.7 - 18.0	27.4	26.9 - 28.0	28.0	27.4 - 28.7	18.6	16.8 - 20.5
	Unknown	33.1	31.9 - 34.4	33.7	32.4 - 35.1	26.8	23.3 - 30.2	32.6	31.3 - 33.9	33.6	32.2 - 35.0	25.7	22.0 - 29.4
NORTHEAST													
New England													
Connecticut	All stages	40.2	36.8 - 43.6	40.5	37.0 - 43.9	42.9	26.2 - 59.7	43.4	39.9 - 46.8	43.1	39.5 - 46.8	41.7	32.1 - 51.2
(SEER)	Localized	84.5	74.3 - 94.8	84.0	73.5 - 94.4		-	84.5	74.6 - 94.4	83.4	73.2 - 93.6	100.0	100.0 - 100.0
	Regional	68.7	59.4 - 77.9	69.1	59.6 - 78.6		-	68.2	59.5 - 76.8	67.0	57.9 - 76.1	73.6	49.5 - 97.6
	Distant	24.3	20.7 - 28.0	24.4	20.7 - 28.2	23.9	6.7 - 41.0	27.3	23.2 - 31.4	27.3	23.1 - 31.6	28.3	18.8 - 37.7
	Unknown	20.7	8.7 - 32.7	19.6	7.6 - 31.6		-	21.6	9.1 - 34.1	23.6	10.1 - 37.0		-
Massachusetts	All stages	40.1	37.7 - 42.5	39.9	37.5 - 42.4	34.7	20.2 - 49.1	43.5	40.9 - 46.0	43.0	40.4 - 45.6	41.7	29.4 - 54.0
(NPCR)	Localized	84.6	76.9 - 92.3	85.6	77.9 - 93.2		-	88.1	77.6 - 98.5	87.9	77.2 - 98.7	97.0	85.1 - 100.0
	Regional	56.4	50.4 - 62.5	55.9	49.8 - 62.1		-	65.4	59.6 - 71.2	65.2	59.3 - 71.1	60.4	27.1 - 93.6
	Distant	27.3	24.6 - 30.1	27.1	24.2 - 29.9	27.1	11.1 - 43.0	28.7	25.5 - 31.9	28.2	24.9 - 31.4	20.4	0.0 - 42.3
	Unknown	16.1	8.5 - 23.8	15.6	7.9 - 23.3		-	8.1	1.7 - 14.6	7.4	1.3 - 13.5		-
New Hampshire	All stages	43.8	37.4 - 50.3	44.7	38.1 - 51.3		-	40.2	34.3 - 46.2	40.9	34.7 - 47.0		-
(NPCR)	Localized	87.6	75.5 - 99.6	87.6	75.5 - 99.6		-	86.5	71.7 - 100.0	90.6	75.9 - 100.0		-
	Regional	67.7	54.7 - 80.8	67.6	54.5 - 80.7		-	61.5	46.1 - 76.9	62.2	46.7 - 77.8		-
	Distant	24.4	16.5 - 32.3	24.9	16.7 - 33.1		-	24.2	18.4 - 30.0	23.5	17.7 - 29.3		-
	Unknown	16.9	5.5 - 28.4	17.7	5.8 - 29.6		-	25.2	9.9 - 40.5	35.1	16.0 - 54.2		-
Rhode Island	All stages	42.5	35.5 - 49.5	42.2	35.0 - 49.3		-	50.0	43.9 - 56.0	49.5	43.2 - 55.8	74.1	46.3 - 100.0
(NPCR)	Localized	86.8	75.2 - 98.5	85.8	73.4 - 98.1		-		-		-		-
	Regional	45.5	28.5 - 62.6	46.8	29.4 - 64.2		-		-		-		-
	Distant	25.8	17.8 - 33.7	25.6	17.5 - 33.7		-		-		-		-
	Unknown	31.5	5.8 - 57.2	26.2	1.3 - 51.1		-		-		-		-
Mid Atlantic													
New Jersey	All stages	39.2	37.2 - 41.3	39.9	37.7 - 42.0	28.9	23.0 - 34.8	39.4	37.0 - 41.8	40.4	37.9 - 42.9	26.6	20.5 - 32.7
(NPCR/SEER)	Localized	84.3	77.9 - 90.7	83.9	77.4 - 90.5	95.8	86.5 - 100.0	85.9	78.8 - 93.1	86.6	79.2 - 94.0	62.4	49.3 - 75.5
	Regional	56.0	50.6 - 61.3	56.9	51.2 - 62.6	49.3	30.9 - 67.7	60.5	54.4 - 66.5	61.7	55.3 - 68.1	47.1	31.2 - 63.0
	Distant	23.9	21.6 - 26.2	24.6	22.2 - 27.1	13.4	7.9 - 18.9	24.7	21.9 - 27.5	25.7	22.8 - 28.7	12.1	6.3 - 17.9
	Unknown	35.5	29.1 - 41.8	36.2	29.2 - 43.1	24.1	6.2 - 42.1	32.9	26.7 - 39.0	35.1	27.0 - 43.2	30.9	16.6 - 45.2
New York	All stages	39.7	38.2 - 41.1	40.3	38.8 - 41.9	31.5	27.4 - 35.5	43.0	41.4 - 44.6	43.8	42.1 - 45.5	34.8	30.3 - 39.4
(NPCR)	Localized	81.7	77.1 - 86.4	82.0	77.0 - 87.0	75.5	61.9 - 89.1	88.5	83.9 - 93.1	88.8	83.8 - 93.9	84.5	72.8 - 96.1
	Regional	49.8	46.4 - 53.2	51.4	47.7 - 55.1	36.4	27.0 - 45.8	59.4	55.4 - 63.4	60.3	56.0 - 64.5	45.4	33.7 - 57.1
	Distant	26.8	25.0 - 28.6	27.4	25.4 - 29.3	21.9	16.8 - 27.0	28.5	26.6 - 30.5	29.6	27.5 - 31.7	18.8	14.0 - 23.7
	Unknown	26.7	23.3 - 30.1	26.1	22.4 - 29.9	23.2	17.0 - 29.3	39.4	34.4 - 44.3	37.4	32.1 - 42.7	49.4	36.2 - 62.6
Pennsylvania	All stages	39.8	38.2 - 41.5	40.1	38.3 - 41.8	27.3	21.4 - 33.3	40.2	38.4 - 42.0	40.4	38.5 - 42.2	38.1	30.9 - 45.3
(NPCR)	Localized	86.6	81.4 - 91.9	85.7	80.2 - 91.1	88.3	76.2 - 100.0	84.6	76.7 - 92.4	84.0	76.0 - 92.0	97.3	89.1 - 100.0
	Regional	52.8	48.7 - 56.9	53.3	49.1 - 57.6	42.0	25.2 - 58.8	62.1	57.6 - 66.5	62.8	58.4 - 67.2	42.3	23.7 - 60.8
	Distant	23.4	21.5 - 25.4	23.4	21.4 - 25.5	16.0	9.8 - 22.2	26.0	23.9 - 28.1	25.9	23.7 - 28.0	28.6	20.5 - 36.6
	Unknown	31.7	26.1 - 37.3	33.4	27.4 - 39.4	14.6	0.0 - 29.4	32.0	25.8 - 38.3	33.5	26.8 - 40.3	19.5	2.4 - 36.6
SOUTH													
South Atlantic													
Delaware	All stages	45.4	37.8 - 53.0	46.8	38.7 - 54.9	46.5	27.3 - 65.6	44.3	37.0 - 51.6	47.0	39.1 - 54.9	23.0	2.8 - 43.3
(NPCR)	Localized	92.4	78.6 - 100.0	91.0	75.5 - 100.0		-	90.2	75.8 - 100.0	88.5	72.5 - 100.0		-
	Regional	64.4	48.8 - 79.9	62.4	45.4 - 79.4		-	65.6	49.9 - 81.4	66.4	50.4 - 82.5		-
	Distant	26.1	17.6 - 34.6	27.0	17.7 - 36.3	22.0	1.9 - 42.1	30.9	23.2 - 38.5	34.7	26.2 - 43.3	8.4	0.0 - 20.1
	Unknown	40.5	19.0 - 62.0	41.4	18.1 - 64.7		-	32.4	7.7 - 57.1	28.1	3.3 - 52.9		-
Florida	All stages	40.9	39.4 - 42.4	41.7	40.1 - 43.3	29.6	24.6 - 34.7	47.3	45.8 - 48.9	47.8	46.2 - 49.4	39.6	34.4 - 44.8
(NPCR)	Localized	84.7	80.2 - 89.1	84.1	79.5 - 88.6	94.0	85.7 - 100.0	89.0	84.7 - 93.3	88.8	84.3 - 93.2	95.2	85.5 - 100.0
	Regional	56.2	52.0 - 60.4	57.0	52.7 - 61.4	46.9	35.8 - 58.1	65.5	61.7 - 69.3	66.1	62.0 - 70.1	52.5	40.4 - 64.6
	Distant	27.2	25.5 - 29.0	28.1	26.3 - 29.9	16.4	11.5 - 21.3	34.4	32.5 - 36.4	34.7	32.6 - 36.7	28.9	23.0 - 34.8
	Unknown	39.6	35.0 - 44.2	41.8	36.9 - 46.7	19.3	8.9 - 29.7	47.0	42.3 - 51.6	48.4	43.4 - 53.4	36.5	25.2 - 47.7
Georgia	All stages	39.2	36.7 - 41.7	40.8	38.0 - 43.5	31.9	26.5 - 37.2	37.1	34.6 - 39.7	39.0	36.1 - 41.8	31.3	26.0 - 36.7
(NPCR/SEER)	Localized	83.6	75.0 - 92.1	81.6	72.9 - 90.4	88.9	77.3 - 100.0	84.6	75.8 - 93.5	84.7	73.5 - 96.0	74.4	59.5 - 89.3
	Regional	62.5	56.1 - 69.0	63.0	55.9 - 70.1	60.5	46.5 - 74.6	53.5	46.9 - 60.1	54.5	47.0 - 61.9	45.3	33.9 - 56.7
	Distant	24.4	21.7 - 27.1	27.1	23.9 - 30.3	13.1	8.8 - 17.4	24.3	21.3 - 27.2	26.9	23.5 - 30.3	16.0	10.6 - 21.4
	Unknown	27.8	20.7 - 34.8	27.6	19.6 - 35.5	29.2	12.6 - 45.9	22.1	14.9 - 29.4	21.9	14.2 - 29.6	30.8	14.5 - 47.0
Maryland	All stages	39.3	36.2 - 42.4	40.8	37.4 - 44.3	31.6	24.2 - 38.9	37.8	34.7 - 40.9	41.4	37.9 - 45.0	21.3	15.0 - 27.6
(NPCR)	Localized		-		-		-		-		-		-
	Regional		-		-		-		-		-		-
	Distant		-		-		-		-		-		-
	Unknown		-		-		-		-		-		-

Note: *Stage at diagnosis is SEER Summary Stage 2000 (SS2000). Information on stage was not available for two states (Maryland and Wisconsin), or for Rhode Island for cases diagnosed from 2004-2009. Unstandardized estimates are italicized.