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Development of National Program of Cancer Registries SAS Tool for Population-Based Cancer Relative Survival Analysis

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Abstract

Background: Studying population-based cancer survival by leveraging the high-quality cancer incidence data collected by the Centers for Disease Control and Prevention's National Program of Cancer Registries (NPCR) can offer valuable insight into the cancer burden and impact in the United States. We describe the development and validation of a SAS-macro tool that calculates population-based cancer site-specific relative survival estimates comparable to those obtained through SEER*Stat.

Methods: The NPCR relative survival analysis SAS tool (NPCR SAS tool) was developed based on the relative survival method and SAS macros developed by Paul Dickman. NPCR cancer incidence data from 25 states submitted in November 2012 were used, specifically cases diagnosed from 2003 to 2010 with follow-up through 2010. Decennial and annual complete life tables published by the National Center for Health Statistics (NCHS) for 2000 through 2009 were used. To assess comparability between the 2 tools, 5-year relative survival rates were calculated for 25 cancer sites by sex, race, and age group using the NPCR SAS tool and the National Cancer Institute's SEER*Stat 8.1.5 software. A module to create data files for SEER*Stat was also developed for the NPCR SAS tool.

Results: Comparison of the results produced by both SAS and SEER*Stat showed comparable and reliable relative survival estimates for NPCR data. For a majority of the sites, the net differences between the NPCR SAS tool and SEER*Stat-produced relative survival estimates ranged from -0.1% to 0.1%. The estimated standard errors were highly comparable between the 2 tools as well.

Implications: The NPCR SAS tool will allow researchers to accurately estimate cancer 5-year relative survival estimates that are comparable to those produced by SEER*Stat for NPCR data. Comparison of output from the NPCR SAS tool and SEER*Stat provided additional quality control capabilities for evaluating data prior to producing NPCR relative survival estimates.

Keywords

cancer survival; National Program of Cancer Registries; relative survival rates; SAS

Introduction

The Centers for Disease Control and Prevention (CDC) identified a need to validate a methodology of calculating relative survival rates in SEER*Stat using National Program of Cancer Registries (NPCR) data and subsequently developed a SAS tool that allows NPCR cancer registries and researchers to estimate site-specific relative survival independent of the SEER*Stat program using population-based cancer data. NPCR, which was established in 1992 and is administered by CDC, consists of 45 states, the District of Columbia, Puerto Rico, and the US Pacific Island Jurisdictions, and covers about 96% of the US population. Through NPCR, CDC works with central cancer registries to collect high quality population-based cancer incidence data annually. CDC, in collaboration with the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program, publishes annual population-based cancer statistics in the *United States Cancer Statistics (USCS)*, the official federal government statistics on cancer.¹ In 2014, CDC added NPCR-based relative survival estimates to USCS. Studying NPCR population-based cancer survival statistics offers insight into the cancer burden and impact in the United States.

Cancer survival analysis examines the time from the date of diagnosis to the date of death in a population. The *survival rate* refers to the proportion of cancer patients surviving after diagnosis within a defined study period. The study periods can be 1 year, 5 years, 10 years, and even as long as 20 years or more. Cancer patients will experience many competing causes of death, such as natural causes of population mortality, during the course of cancer. For instance, older cancer patients will experience causes of death related to the natural aging process and age-related diseases as compared to younger patients. To deal with the effect of competing risks for survival analyses, relative survival, represented by the ratio of the observed survival in a patient cohort and the expected survival of a comparable cancer-free group from the general population, was developed to estimate the proportion of patients at time t who would have survived t or more years after cancer diagnosis if the cancer of interest were the only cause of death, by employing the assumption that the cancer deaths are a trivial proportion of all deaths.² Relative survival has the advantage of measuring the excess mortality in cancer patients without the burden of providing the cause of death information whose availability and accuracy can be problematic.³

Observed survival, 1 of the 2 basic components to calculate relative survival and estimated using the actuarial life table method, measures the survival probability of a cohort of cancer patients with a specified time frame regardless of causes of death. The other basic component of relative survival is the *expected survival*, estimated from a general population which is similar to the cancer patient cohort, and is assumed to be free of the specific cancer under investigation. The ratio of observed and expected survival is relative survival. There are 3 widely used methods to estimate expected survival rates, Ederer I, Ederer II, and Hakulinen.^{2,4-5} These methods differ in calculating the expected survival of comparable general populations. With the actuarial method, the standard error of the observed survival rate is estimated by Greenwood's method.⁸ In general, the standard error of the relative survival is given as the standard error of observed survival divided by the expected survival

rate.² Voutilainen gave a comprehensive overview of the mathematical details of the relative survival method.⁶

The Ederer I method finds a matching population for cancer patients determined to be alive at the beginning of the follow-up period to estimate expected survival until the end of the follow-up period without considering any censoring and event during the follow-up.² The Ederer II method was developed to take censoring and event into consideration.⁴ For each follow-up interval, the expected survival rate is estimated only for those patients alive at the start of that interval.⁶ The Hakulinen method was designed to accommodate heterogeneous follow-up time and to be independent of the observed mortality of the cancer patients.^{5,7} The differences of relative survival estimated among these 3 methods are very minor if the follow-up time is short, eg, less than 10 years. The study conducted by Cho et al, using SEER data, concluded that there were no differences among 5-year expected survival rates estimated by the 3 methods over 100 plus cancer sites.⁹ The marked differences were seen if the follow-up time was more than 10 years; specifically, when the follow-up time extended to 30 years, the Ederer II method estimated more reasonable relative survival rates than the other 2 methods.^{6,9}

In this study, we developed the NPCR SAS tool and examined whether it was able to estimate relative survival comparable to the results from SEER*Stat.¹⁰ NPCR envisions a SAS tool may allow users, who have limited capability to use SEER*Stat, to calculate estimates without using the SEER*Stat software, and to switch to SEER*Stat at later time for more options of survival methods if they prefer.

Methods

The ascertainment of adequate and complete follow-up information of cancer patients is essential to the relative survival analysis. The case follow-up is deemed complete if the vital status (alive or dead) and the corresponding date of last contact of a cancer patient are known at the study cutoff date, otherwise it is deemed incomplete. The absence of complete follow-up information of cancer cases may be supplemented by active follow-up with cancer patients, family members, physician's offices, medical records, licensing bureaus, voter registration offices, and even home visits. NPCR registries primarily use passive follow-up activities to obtain complete follow-up information of cancer cases, except for population migration and rare losses, by verifying vital status and date of last contact through linkage with various information systems, such as state mortality information, Medicare and Medicaid Services, and Social Security Administration. Starting in 2008, CDC made the National Death Index (NDI) linkage available at no cost to all NPCR-funded central cancer registries. CDC recommends the linkage be conducted by NPCR registries at least every 2 years as the NDI linkage further enhances the accuracy of the follow-up information for deceased cases.

There were 25 NPCR registries who had conducted NDI linkages or adequate active follow-up prior to submission of their data to CDC in November 2012: Alabama, Alaska, Arizona, California, Georgia, Idaho, Kansas, Kentucky, Louisiana, Maryland, Mississippi, Montana, North Carolina, Nebraska, New Hampshire, New Jersey, New York, Ohio, Oklahoma,

Oregon, Pennsylvania, South Carolina, Tennessee, Wisconsin, and West Virginia. Cancer incidence data submitted to NPCR in November 2012 by these registries were used in this study and represent 54% of the US population.

The study population was male and female malignant cancer cases (except for urinary bladder cancer, which included in situ cases) diagnosed from 2003 to 2010 with follow-up through 2010, whose ages at diagnosis were from 0 to 99 years, inclusive. Cases diagnosed based on autopsy only and death certificate only were excluded. Cases with unknown vital status differ from those where vital status is presumed alive in that insufficient information is available in the report to determine actual death certificate linkage and the vital status is reported as unknown; cases with unknown vital status were also excluded. Cancer cases diagnosed between July 1, 2005 and December 31, 2005 in Louisiana were removed from the study according to the SEER rules for treating Katrina-impacted cancer cases. For cases with missing or invalid month or day information in the date of last contact fields, the SEER missing month and day imputation SAS program was used for imputation.¹¹ Cases where a valid date of last contact could not be determined after the date of imputation were removed. Furthermore, cases were removed if their presumed-alive date flags generated by the date imputation program were coded as “invalid or bad dates.” The total number cancer cases admitted into the study was 6,383,241.

The data elements required by this study are reported annually by NPCR registries to CDC: primary site, histology, behavior, date of diagnosis, method of diagnosis, sequence number, vital status, date of last contact, source of follow-up, birth date, race/ethnicity, sex, and state of residence at diagnosis. Malignancy was defined according to the 2001 and current cancer behavior coding rules. The primary cancer histology coding and site grouping were based on the 3rd edition of the *International Classification of Diseases for Oncology (ICD-O-3)* and SEER site recode rules.^{12–13} The current SEER standardized multiple primary coding rules are used to identify concurrent or subsequent cancers.¹⁴

Recent studies have promoted the benefits of including multiple primary cancer cases in survival analysis over the first-primary-cancer-only selection.^{15–20} We included multiple primary cases for cancer site-specific survival analysis in this study. The 5-year relative survival rates were computed for the 24 cancer sites and groups that are published annually in the *USCS*. All sites combined used the first primary cancer while other cancer sites allowed multiple primaries to be included in the relative survival estimation while assuring 1 tumor per case. The expected survival rates were calculated using the 2000 to 2009 US complete decennial and annual life tables published by the National Center for Health Statistics (NCHS) with updates in 2014.²¹ For cases with missing or unknown race information, the all-race life tables were used. For some older age cases, the attained ages at subsequent follow-up intervals might be greater than 99 years. Bounded by the 0–99 age limitation of the NCHS life tables, the NPCR relative survival estimation ignored the follow-up intervals of these cases whose attained follow-up ages were greater than 100 years.

Using SAS version 9.2, we developed and validated a set of macros to process NPCR data and estimate relative survival based on the SAS macros developed by Paul Dickman using the Ederer II method.¹⁰ Two scenarios were devised to validate the NPCR method. Scenario

1 (S1) used the NPCR SAS tool with NPCR data and NCHS life tables. Scenario 2 (S2) used SEER*Stat (version 8.1.5) with the same NPCR data and NCHS life tables. Relative survival rates and their standard errors were estimated by sex, race, and age groups for both scenarios. The age groups were 0–44, 45–54, 55–64, 65–75, and 75–99 years. The SAS macros that were validated in these 2 scenarios form the foundation of the NPCR SAS tool.

The NPCR SAS tool included 3 basic modules: NPCR incidence data processing, relative survival estimation (report generation), and SEER*Stat database creation module through which the user can create data files for uploading to SEER*Stat (including customized life tables). SEER*Stat options, parameters, and comparison to the NPCR macros are summarized in Table 1. The NPCR SAS tool, by default, allowed estimation of relative survival for multiple cancer sites simultaneously with predetermined categorizations, such as sex, race, age grouping, diagnosis year, and cancer stage. The tool also provided mechanisms which closely resembled those SEER*Stat was implementing, to adjust relative survival rates when the estimated rates showed abnormal patterns, eg, relative survival rates greater than 100% or increasing with increased follow-up time.

Results

Relative survival rates estimated by age at diagnosis, race, and sex from S1 (NPCR SAS tool) and S2 (SEER*Stat) were summarized in Table 2. Overall, the net differences of relative survival estimates between the 2 tools ranged from –0.3% to 0.1%; the majority of them, however, was between –0.1% and 0.1%. The NPCR SAS tool and SEER*Stat estimated the same relative survival estimates for individuals aged less than 55 years, except for leukemia. Slight differences were seen for ages 55 years and older in some subpopulations; differences were age and sex dependent. Slight differences were more likely in older age and/or female subpopulations; eg, higher occurrences in white and black females.

The comparisons of the standard errors of relative survival rates estimated from NPCR SAS tool and SEER*Stat by age at diagnosis, race, and sex are presented in Table 3. The standard errors estimated from both tools were almost identical except for slight differences among black males, especially among the 3 age groups ≥ 55 years of some cancers sites (for example, urinary bladder, kidney and renal pelvis, and brain and other nervous systems). Further comparisons of death and lost-to-follow-up counts between SEER*Stat and NPCR SAS Tool may indicate the joint effects of 2 possible factors: lost-to-follow-up (withdrawn) cases and relative survival adjustment. For instance, when the counts of dead and lost-to-follow-up cases were compared between SEER*Stat and NPCR SAS Tool, the death counts usually match between the 2 tools. However, the lost-to-follow-up cases differ slightly indicating that the algorithms to determine lost-to-follow-up may be slightly different. The relative survival adjustment algorithm, which is a built-in function of SEER*Stat, is worthy of further review.

Discussion

The relative survival rates and standard errors demonstrate that the NPCR relative survival SAS macros are able to estimate relative survival rates with a high degree of agreement with those generated from SEER*Stat using the same data and life tables with similar options and parameters.

Further investigation of alive, dead, and withdrawn counts at each survival table interval suggests that implementation of the underlying relative survival methodology for assigning lost-to-follow up or withdrawn may be slightly different between the NPCR macro and SEER*Stat. Another possible factor might be the algorithm for adjusting relative survival in the NPCR SAS tool. Normally, the death counts of a cancer cohort decreases with the increased follow-up intervals. The occurrences of low death counts can be frequent at late follow up intervals of some small population cohorts, such as females, blacks, and older age groups as well as some cancer sites with low survival rates. For these subpopulations, sometimes single digit or even zero death counts could be seen at the late stage follow-up intervals. In these occasions, the relative survival may be greater than 100% or even increasing with the increased follow up time, which warrant some kind of adjustments. The NPCR SAS tool employed algorithms for adjustment that are similar to, but not exactly like SEER*Stat in both situations. However, the results clearly show the high degree of similarity of relative survival rates between the approaches.

A strength of this study was the large number of data that was available from the 25 NCPR states, representing 54% of the US population. While we cannot yet produce complete national estimates, the NPCR data provides an increased geographical and demographic representativeness to what has previously been provided through SEER registries alone. A potential weakness of this approach is that the size of the case load in NPCR registries prevents active follow-up within a practical time duration and available resources. Unpublished data indicated that the method for ascertaining date of last contact for patients considered alive varies widely among NPCR registries. However, in order to mitigate this potential for misclassification, only states that conducted NDI linkage through death year 2010 are included in this analysis.

The NPCR SAS tool provides an enhanced capability to carry out highly customized population-based cancer relative survival analyses, such as those studies requiring tracking individual patient's diagnosis history over time, which can't be done in existing tools. The NPCR SAS tool is utilized as a quality control tool for NPCR's internal assessment of many relative survival-related outcomes, such as the quality control of relative survival rates published in *USCS*, or to verify outcomes from other analytical tools such as SEER*Stat. The NPCR SAS tool, in general, can benefit cancer researchers who do not use SEER*Stat or need an independent tool to conduct unconventional relative survival analysis at the national level.

This study indicates that as long as the researcher retains the same source of life tables for the same set of data, the results from the NPCR SAS Tool will be almost identical to those from SEER*Stat, which suggests that, if a researcher is ready to move studies into

SEER*Stat, previous research outcomes and conclusions estimated with the NPCR SAS Tools will remain the same, and valid. Currently, the NPCR relative survival SAS tool can estimate national-level cancer relative survival with NPCR cancer incidence data. Future plans are to add a state-level relative survival estimation component.

The CDC plans to continue to publish NPCR 5-year relative survival rates on the *USCS* and CDC WONDER websites. The NPCR SAS Tool is available upon request by contacting NPCR at www.cdc.gov/info, with the subject line “NPCR Survival SAS Tool.”

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Table 1.

Comparisons of Detailed Setup in Methodology, Options and Parameters of the National Program of Cancer Registries (NPCR) Relative Survival Tool and SEER*Stat: (1) Data Components, Primaries, Case Inclusion and Exclusion Criteria; (2) Life Tables (3) Relative Survival Methodology (Note: Both NPCR SAS Macro and SEER*Stat Used NPCR Data and National Center for Health Statistics Life Tables in the Study)

	NPCR SAS Tool	SEER*Stat Setup
Data Components, Inclusion/Exclusion Criteria		
Study period	Diagnosed between 2003–2010 and followed up to 2010	Diagnosed between 2003–2010 and followed up to 2010
Data submission	By 11/30/2012	By 11/30/2012
Registries	25 NPCR registries	25 NPCR registries
Cases not known deceased	Presumed-alive	Presumed-alive
Primaries	1. All-site-combined: first primary 2. Other cancer sites: multiple primaries	1. All-site-combined: first primary 2. Other cancer sites: multiple primaries
	1. Exclude death certificate and autopsy only cases (cleaned from NPCR data)	1. Check: Death certificate and autopsy only cases in “Exclude”
	2. Include ages between 0–99	2. Include ages between 0–99
	3. Include malignant behavior only (except for bladder cancer which includes in situ cases) defined by 2001 and later behavior rules	3. Uncheck: Malignant behavior in “Select Only” to admit malignant cases defined after 2001 behavior rules
Case inclusion	4. Include both active and non-actively followed	4. Uncheck: Actively followed
	5. Male and female only	5. Check: Male and female in “Select Only”
	6. Known Age	6. Check: Known Age in “Select Only”
	7. Include both microscopically and non-microscopically confirmed cases	*7. Uncheck: Microscopically Confirmed in “Select Only”
	8. Include alive cases with zero survival time	8. Uncheck: Alive with No Survival Time in “Exclude”
Life Tables		
Life tables	NCHS US 2000–2009 life tables by individual year (white and black), Ages 0–99	NCHS US 2000–2009 life tables by individual year (White and Black), Ages 0–99
Relative Survival Methodology		
Method of observed survival	Actuarial method	Actuarial method
Method of expected survival	Ederer II	Ederer II
Survival calculation	1. Precalculated presumed-alive survival duration (survival months from compete dates) 2. No cases with ages exceed the maximum age in the life tables (ages 0–99) with omission of follow up intervals with attained age greater than 100	1. Precalculated presumed-alive survival duration (survival months from compete dates) 2. No cases with ages exceed the maximum age in the life tables (ages 0–99) and Check “Censor When Attained Age Exceeds Expected Table Max”
Intervals	1. Follow-up interval: 5 years with annual rollup	1. Interval Numbers=5

SEER*Stat Setup	**2, Months Per Intervals2	Interval=5	NPCR SAS Tool	5-year	Cumulative summary
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* This study included only the malignant cancer cases in the research data. By unchecking the "Malignant Only" option in SEER*Stat, we were able to include the malignant cases that were excluded by checking "Malignant Only" option: a) cases that are considered malignant in ICD-O-3, but would not have been if they were diagnosed in 2000 (ICD-O-2) or earlier; b) cases that are considered malignant in ICD-O-3 (2010 or later diagnosis), but would not have been considered malignant if diagnosed in ICD-O-2 or in ICD-O-3 prior to 2010.

** SEER*Stat was instructed to perform annual rollup instead of monthly rollup by default.

Table 2.

Comparisons of 5-Year Relative Survival Rates Estimated from National Program of Cancer Registries (NPCR) SAS Tool and SEER*Stat Using National Center for Health Statistics (NCHS) Annual Life Tables from 2000–2009 age 0–99 years (Inclusive) by the 24 Cancer Site Groups Published in *United States Cancer Statistics (USCS)*, Age, Race, and Sex among Cases Diagnosed from 2003–2010 with Follow-up to 2010 (NPCR, 25 States, Data Submitted by November 2012)

Age at Diagnosis (years)	S1 - NPCR SAS Tool with NCHS Life Tables Using NPCR Data						S2 - SEER*Stat with NCHS Life Tables Using NPCR Data						Net Differences between S1 and S2						
	White			Black			White			Black			White			Black			
	Male	Female		Male	Female		Male	Female		Male	Female		Male	Female		Male	Female		
All Cancer Site Combined	Ages <45	78.1%	85.5%	63.5%	74.5%		78.1%	85.5%	63.5%	74.5%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 45–54	67.5%	78.6%	60.6%	65.3%		67.5%	78.6%	60.6%	65.3%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 55–64	68.9%	70.5%	65.8%	59.1%		68.9%	70.5%	65.8%	59.1%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 65–74	66.9%	61.6%	66.3%	52.5%		66.9%	61.6%	66.3%	52.5%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 75–99	55.5%	50.2%	51.5%	41.1%		55.5%	50.3%	51.5%	41.2%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Oral Cavity and Pharynx	Ages <45	77.3%	85.2%	57.9%	78.2%		77.3%	85.2%	57.9%	78.2%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 45–54	67.9%	73.0%	39.4%	54.2%		67.9%	73.0%	39.4%	54.2%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 55–64	62.6%	68.2%	38.7%	51.6%		62.6%	68.2%	38.7%	51.5%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 65–74	55.4%	60.6%	31.4%	51.8%		55.4%	60.6%	31.3%	51.9%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 75–99	49.5%	50.6%	28.8%	40.6%		49.5%	50.7%	28.8%	40.7%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Esophagus	Ages <45	24.1%	29.0%	15.7%	18.6%		24.1%	29.0%	15.7%	18.6%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 45–54	21.6%	31.5%	10.9%	15.2%		21.6%	31.5%	10.9%	15.2%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 55–64	21.2%	24.3%	11.7%	12.1%		21.2%	24.3%	11.7%	12.1%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 65–74	20.4%	22.4%	11.0%	14.4%		20.4%	22.4%	11.1%	14.4%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 75–99	14.5%	13.5%	8.4%	9.2%		14.6%	13.5%	8.4%	9.2%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stomach	Ages <45	31.2%	41.2%	28.9%	37.4%		31.2%	41.2%	28.9%	37.4%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 45–54	28.3%	37.8%	30.8%	40.8%		28.3%	37.8%	30.8%	40.8%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 55–64	28.2%	36.9%	29.6%	37.2%		28.2%	37.0%	29.6%	37.2%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 65–74	28.0%	34.4%	28.6%	36.4%		28.0%	34.4%	28.6%	36.4%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ages 75–99	21.3%	25.4%	19.3%	24.5%		21.3%	25.4%	19.3%	24.7%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Liver and Intrahepatic Bile Ducts	Ages <45	34.7%	43.0%	24.0%	36.7%		34.7%	43.0%	24.0%	36.7%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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Age at Diagnosis (years)	S1 - NPCR SAS Tool with NCHS Life Tables Using NPCR Data				S2 - SEER*Stat with NCHS Life Tables Using NPCR Data				Net Differences between S1 and S2			
	White		Black		White		Black		White		Black	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ages 45-54	19.1%	24.6%	13.7%	19.6%	19.1%	24.6%	13.7%	19.6%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	17.8%	23.8%	12.1%	17.2%	17.8%	23.9%	12.1%	17.2%	0.0%	-0.1%	0.0%	0.0%
Ages 65-74	12.8%	15.9%	9.9%	19.1%	12.8%	15.9%	9.9%	19.1%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	8.9%	7.7%	12.4%	6.9%	8.9%	7.7%	12.4%	6.9%	0.0%	0.0%	0.0%	0.0%
Ages <45	21.2%	31.9%	19.9%	35.6%	21.2%	31.9%	19.9%	35.6%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	11.6%	14.9%	9.6%	13.7%	11.6%	14.9%	9.6%	13.7%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	8.5%	9.9%	6.9%	9.3%	8.5%	9.9%	6.9%	9.3%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	7.3%	7.8%	7.2%	6.7%	7.3%	7.8%	7.2%	6.7%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	5.3%	4.6%	5.8%	4.5%	5.3%	4.7%	5.8%	4.5%	0.0%	-0.1%	0.0%	0.0%
Ages <45	67.3%	71.8%	61.0%	63.8%	67.3%	71.8%	61.0%	63.8%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	69.8%	73.1%	61.5%	66.7%	69.8%	73.0%	61.5%	66.7%	0.0%	0.1%	0.0%	0.0%
Ages 55-64	68.5%	70.1%	60.6%	64.7%	68.5%	70.1%	60.6%	64.7%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	66.1%	68.1%	57.0%	61.9%	66.1%	68.0%	56.9%	61.9%	0.0%	0.1%	0.1%	0.0%
Ages 75-99	59.5%	60.1%	47.2%	50.4%	59.5%	60.2%	47.3%	50.4%	0.0%	-0.1%	-0.1%	0.0%
Ages <45	75.4%	75.0%	55.9%	53.4%	75.4%	75.0%	55.9%	53.4%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	64.6%	67.0%	53.5%	53.4%	64.6%	67.0%	53.5%	53.4%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	62.8%	60.2%	52.3%	53.9%	62.9%	60.2%	52.3%	53.8%	-0.1%	0.0%	0.0%	0.1%
Ages 65-74	61.0%	53.8%	56.2%	45.6%	61.0%	53.8%	56.2%	45.6%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	59.9%	47.3%	52.2%	42.5%	59.9%	47.4%	52.2%	42.5%	0.0%	-0.1%	0.0%	0.0%
Ages <45	25.6%	33.3%	19.2%	27.6%	25.6%	33.3%	19.2%	27.6%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	18.7%	27.4%	15.0%	22.2%	18.7%	27.4%	15.0%	22.2%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	18.0%	25.6%	14.8%	21.0%	18.0%	25.6%	14.8%	21.1%	0.0%	0.0%	0.0%	-0.1%
Ages 65-74	17.3%	23.3%	14.0%	19.4%	17.3%	23.3%	14.1%	19.4%	0.0%	0.0%	-0.1%	0.0%
Ages 75-99	13.2%	16.6%	10.1%	14.4%	13.2%	16.7%	10.2%	14.5%	0.0%	-0.1%	-0.1%	-0.1%
Ages <45	90.5%	96.2%	+	+	90.5%	96.2%	+	+	0.0%	0.0%	+	+
Ages 45-54	88.1%	94.1%	+	+	88.1%	94.1%	+	+	0.0%	0.0%	+	+
Ages 55-64	87.9%	92.0%	+	+	87.9%	92.0%	+	+	0.0%	0.0%	+	+

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Age at Diagnosis (years)	S1 - NPCR SAS Tool with NCHS Life Tables Using NPCR Data				S2 - SEER*Stat with NCHS Life Tables Using NPCR Data				Net Differences between S1 and S2			
	White		Black		White		Black		White		Black	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ages 65-74	87.3%	90.6%	+	+	87.3%	90.6%	+	+	0.0%	0.0%	+	+
Ages 75-99	83.9%	85.6%	+	+	83.9%	85.7%	+	+	0.0%	-0.1%	+	+
Ages <45	+	89.3%	+	+	+	89.3%	+	+	+	0.0%	+	0.0%
Ages 45-54	+	90.9%	+	+	+	90.9%	+	+	+	0.0%	+	0.1%
Ages 55-64	+	90.4%	+	+	+	90.4%	+	+	+	0.0%	+	0.1%
Ages 65-74	+	90.7%	+	+	+	90.7%	+	+	+	0.0%	+	0.0%
Ages 75-99	+	88.6%	+	+	+	88.6%	+	+	+	0.0%	+	0.0%
Ages <45	+	82.1%	+	+	+	82.1%	+	+	+	0.0%	+	0.0%
Ages 45-54	+	70.3%	+	+	+	70.3%	+	+	+	0.0%	+	0.0%
Ages 55-64	+	61.6%	+	+	+	61.6%	+	+	+	0.0%	+	0.0%
Ages 65-74	+	56.1%	+	+	+	56.1%	+	+	+	0.0%	+	-0.1%
Ages 75-99	+	38.8%	+	+	+	38.8%	+	+	+	0.0%	+	-0.2%
Ages <45	+	91.6%	+	+	+	91.6%	+	+	+	0.0%	+	0.0%
Ages 45-54	+	89.9%	+	+	+	89.9%	+	+	+	0.0%	+	0.0%
Ages 55-64	+	87.0%	+	+	+	87.0%	+	+	+	0.0%	+	0.0%
Ages 65-74	+	80.4%	+	+	+	80.4%	+	+	+	0.0%	+	0.1%
Ages 75-99	+	69.7%	+	+	+	69.7%	+	+	+	0.0%	+	0.0%
Ages <45	+	75.4%	+	+	+	75.4%	+	+	+	0.0%	+	0.0%
Ages 45-54	+	59.7%	+	+	+	59.7%	+	+	+	0.0%	+	0.0%
Ages 55-64	+	49.4%	+	+	+	49.4%	+	+	+	0.0%	+	0.1%
Ages 65-74	+	39.0%	+	+	+	39.0%	+	+	+	0.0%	+	0.0%
Ages 75-99	+	22.7%	+	+	+	22.7%	+	+	+	0.0%	+	0.0%
Ages <45	95.2%	+	96.5%	+	95.2%	+	96.5%	+	0.0%	+	0.0%	+
Ages 45-54	98.0%	+	97.5%	+	98.0%	+	97.5%	+	0.0%	+	0.0%	+
Ages 55-64	99.3%	+	97.9%	+	99.3%	+	97.9%	+	0.0%	+	0.0%	+
Ages 65-74	99.8%	+	97.1%	+	99.8%	+	97.1%	+	0.0%	+	0.0%	+
Ages 75-99	94.4%	+	87.3%	+	94.5%	+	87.3%	+	-0.1%	+	0.0%	+

Age at Diagnosis (years)	S1 - NPCR SAS Tool with NCHS Life Tables Using NPCR Data				S2 - SEER*Stat with NCHS Life Tables Using NPCR Data				Net Differences between S1 and S2				
	White		Black		White		Black		White		Black		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Testis	Ages <45	96.1%	+	90.4%	+	96.1%	+	90.4%	+	0.0%	+	0.0%	+
	Ages 45-54	95.4%	+	87.6%	+	95.4%	+	87.6%	+	0.0%	+	0.0%	+
	Ages 55-64	91.6%	+	85.4%	+	91.6%	+	85.4%	+	0.0%	+	0.0%	+
	Ages 65-74	89.1%	+	80.5%	+	89.2%	+	80.5%	+	-0.1%	+	0.0%	+
	Ages 75-99	81.6%	+	+	+	81.6%	+	+	+	+	+	+	+
Urinary Bladder	Ages <45	88.5%	87.8%	78.4%	60.3%	88.5%	87.8%	78.4%	60.3%	0.0%	0.0%	0.0%	0.0%
	Ages 45-54	84.7%	84.4%	75.8%	60.0%	84.7%	84.4%	75.8%	60.0%	0.0%	0.0%	0.0%	0.0%
	Ages 55-64	82.6%	82.3%	72.0%	64.1%	82.6%	82.4%	72.0%	64.1%	0.0%	-0.1%	0.0%	0.0%
	Ages 65-74	79.1%	77.4%	70.2%	59.5%	79.1%	77.4%	70.1%	59.5%	0.0%	0.0%	0.1%	0.0%
	Ages 75-99	71.8%	65.7%	59.5%	49.8%	71.8%	65.8%	59.4%	49.9%	0.0%	-0.1%	0.1%	-0.1%
Kidney and Renal Pelvis	Ages <45	86.4%	90.1%	76.2%	82.3%	86.4%	90.1%	76.1%	82.3%	0.0%	0.0%	0.1%	0.0%
	Ages 45-54	77.2%	83.0%	74.7%	79.2%	77.2%	83.0%	74.7%	79.2%	0.0%	0.0%	0.0%	0.0%
	Ages 55-64	72.3%	76.9%	70.4%	74.7%	72.3%	76.9%	70.4%	74.7%	0.0%	0.0%	0.0%	0.0%
	Ages 65-74	70.1%	71.3%	68.8%	69.5%	70.1%	71.3%	68.8%	69.5%	0.0%	0.0%	0.0%	0.0%
	Ages 75-99	61.0%	58.4%	58.3%	57.2%	61.0%	58.4%	58.4%	57.3%	0.0%	0.0%	-0.1%	-0.1%
Brain and Other Nervous Systems	Ages <45	66.5%	71.3%	61.9%	66.2%	66.5%	71.3%	61.9%	66.2%	0.0%	0.0%	0.0%	0.0%
	Ages 45-54	28.6%	37.1%	29.1%	37.8%	28.6%	37.1%	29.1%	37.8%	0.0%	0.0%	0.0%	0.0%
	Ages 55-64	15.7%	19.9%	16.8%	27.2%	15.7%	20.0%	16.8%	27.2%	0.0%	-0.1%	0.0%	0.0%
	Ages 65-74	9.1%	12.2%	11.9%	15.2%	9.1%	12.2%	11.9%	15.2%	0.0%	0.0%	0.0%	0.0%
	Ages 75-99	6.4%	6.3%	11.0%	13.5%	6.4%	6.3%	11.0%	13.5%	0.0%	0.0%	0.0%	0.0%
Thyroid	Ages <45	98.4%	99.7%	94.9%	99.4%	98.4%	99.7%	94.9%	99.4%	0.0%	0.0%	0.0%	0.0%
	Ages 45-54	96.1%	99.4%	94.7%	97.5%	96.1%	99.4%	94.7%	97.5%	0.0%	0.0%	0.0%	0.0%
	Ages 55-64	93.3%	98.0%	91.0%	95.9%	93.3%	98.0%	91.0%	95.9%	0.0%	0.0%	0.0%	0.0%
	Ages 65-74	90.8%	96.2%	84.0%	92.6%	90.8%	96.2%	84.0%	92.6%	0.0%	0.0%	0.0%	0.0%
	Ages 75-99	82.7%	87.0%	65.9%	78.9%	82.8%	87.0%	65.9%	78.9%	-0.1%	0.0%	0.0%	0.0%
Hodgkin Lymphoma	Ages <45	93.0%	94.9%	83.5%	90.8%	93.0%	94.9%	83.5%	90.8%	0.0%	0.0%	0.0%	0.0%
	Ages 45-54	84.3%	89.2%	73.3%	86.3%	84.3%	89.2%	73.3%	86.3%	0.0%	0.0%	0.0%	0.0%

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Age at Diagnosis (years)	S1 - NPCR SAS Tool with NCHS Life Tables Using NPCR Data				S2 - SEER*Stat with NCHS Life Tables Using NPCR Data				Net Differences between S1 and S2			
	White		Black		White		Black		White		Black	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ages 55-64	75.5%	76.8%	59.7%	71.8%	75.5%	76.8%	59.7%	71.8%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	57.6%	61.3%	58.9%	61.4%	57.6%	61.3%	58.9%	61.4%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	40.2%	44.1%	54.4%	40.9%	40.2%	44.1%	54.4%	40.9%	0.0%	0.0%	0.0%	0.0%
Ages <45	78.4%	86.1%	64.2%	68.5%	78.4%	86.1%	64.2%	68.5%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	76.1%	84.0%	57.7%	70.0%	76.1%	84.0%	57.7%	70.0%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	72.9%	79.3%	59.3%	71.5%	72.9%	79.3%	59.3%	71.4%	0.0%	0.0%	0.0%	0.1%
Ages 65-74	65.4%	71.7%	55.3%	63.4%	65.3%	71.7%	55.3%	63.4%	0.1%	0.0%	0.0%	0.0%
Ages 75-99	52.5%	55.3%	49.1%	52.2%	52.5%	55.3%	49.2%	52.2%	0.0%	0.0%	-0.1%	0.0%
Ages <45	69.6%	66.6%	60.9%	72.5%	69.6%	66.6%	60.9%	72.5%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	59.7%	62.4%	50.8%	55.7%	59.8%	62.4%	50.8%	55.7%	-0.1%	0.0%	0.0%	0.0%
Ages 55-64	53.8%	53.0%	52.0%	54.9%	53.8%	53.0%	52.0%	54.9%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	42.6%	42.8%	40.0%	42.7%	42.6%	42.8%	40.0%	42.7%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	27.4%	26.0%	26.3%	29.9%	27.4%	26.0%	26.3%	30.2%	0.0%	0.0%	0.0%	-0.3%
Ages <45	71.8%	72.1%	62.2%	62.7%	71.8%	72.1%	62.3%	62.7%	0.0%	0.0%	-0.1%	0.0%
Ages 45-54	67.8%	62.3%	54.6%	50.0%	67.8%	62.3%	54.6%	49.9%	0.0%	0.0%	0.0%	0.1%
Ages 55-64	59.3%	59.5%	49.5%	46.1%	59.3%	59.5%	49.5%	46.1%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	48.9%	50.8%	38.2%	40.8%	48.9%	50.8%	38.2%	40.8%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	34.0%	35.3%	27.5%	28.2%	34.0%	35.4%	27.5%	28.3%	0.0%	-0.1%	0.0%	-0.1%

Table 3.

Comparisons of Standard Errors of 5-Year Relative Survival Rates Estimated by National Program of Cancer Registries (NPCR) SAS Tool and SEER*Stat and by the 24 Cancer Site Groups Published in *United States Cancer Statistics (USCS)*, Age, Race and Sex among Cases Diagnosed from 2003–2010 with Follow-up to 2010 (NPCR, 25 States, Data Submitted by November 2012)

Age at Diagnosis (years)	SI - NPCR SAS Tool with NCHS Life Tables Using NPCR Data				S2 - SEER*Stat with NCHS Life Tables Using NPCR Data				Net Differences between S1 and S2			
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ages <45	0.1%	0.1%	0.4%	0.2%	0.1%	0.1%	0.1%	0.1%	0.4%	0.2%	0.0%	0.0%
Ages 45–54	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.0%	0.0%
Ages 55–64	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.0%	0.0%
Ages 65–74	0.1%	0.1%	0.2%	0.3%	0.1%	0.1%	0.1%	0.1%	0.2%	0.3%	0.0%	0.0%
Ages 75–99	0.1%	0.1%	0.4%	0.3%	0.1%	0.1%	0.1%	0.1%	0.4%	0.3%	0.0%	0.0%
Ages <45	0.7%	0.7%	1.8%	1.7%	0.7%	0.7%	0.7%	0.7%	1.8%	1.7%	0.0%	0.0%
Ages 45–54	0.4%	0.7%	1.1%	1.8%	0.4%	0.7%	0.4%	0.7%	1.1%	1.8%	0.0%	0.0%
Ages 55–64	0.4%	0.7%	1.1%	1.9%	0.4%	0.7%	0.4%	0.7%	1.1%	1.9%	0.0%	0.0%
Ages 65–74	0.5%	0.7%	1.4%	2.3%	0.5%	0.7%	0.5%	0.7%	1.4%	2.4%	0.0%	-0.1%
Ages 75–99	0.8%	0.8%	2.6%	2.8%	0.8%	0.8%	0.8%	0.8%	2.6%	2.8%	0.0%	0.0%
Ages <45	1.4%	3.2%	3.2%	4.5%	1.4%	3.2%	1.4%	3.2%	3.2%	4.5%	0.0%	0.0%
Ages 45–54	0.7%	1.8%	1.2%	2.2%	0.7%	1.8%	0.7%	1.8%	1.2%	2.2%	0.0%	0.0%
Ages 55–64	0.5%	1.2%	0.9%	1.7%	0.5%	1.2%	0.5%	1.2%	0.9%	1.7%	0.0%	0.0%
Ages 65–74	0.5%	1.0%	1.1%	1.9%	0.5%	1.0%	0.5%	1.0%	1.1%	1.9%	0.0%	0.0%
Ages 75–99	0.5%	0.7%	1.5%	1.7%	0.5%	0.7%	0.5%	0.7%	1.4%	1.7%	0.0%	0.0%
Ages <45	1.2%	1.4%	2.2%	2.4%	1.2%	1.4%	1.2%	1.4%	2.2%	2.4%	0.0%	0.0%
Ages 45–54	0.8%	1.1%	1.6%	2.0%	0.8%	1.1%	0.8%	1.1%	1.6%	2.0%	0.0%	0.0%
Ages 55–64	0.6%	0.9%	1.3%	1.8%	0.6%	0.9%	0.6%	0.9%	1.3%	1.8%	0.0%	0.0%
Ages 65–74	0.6%	0.8%	1.3%	1.6%	0.6%	0.8%	0.6%	0.8%	1.3%	1.6%	0.0%	0.0%
Ages 75–99	0.6%	0.6%	1.4%	1.3%	0.6%	0.6%	0.6%	0.6%	1.4%	1.3%	0.0%	0.0%
Ages <45	1.3%	1.9%	2.1%	3.5%	1.3%	1.9%	1.3%	1.9%	2.1%	3.5%	0.0%	0.0%
Ages 45–54	0.5%	1.2%	0.9%	2.0%	0.5%	1.2%	0.5%	1.2%	0.9%	2.0%	0.0%	0.0%

Age at Diagnosis (years)	SI - NPCR SAS Tool with NCHS Life Tables Using NPCR Data				S2 - SEER*Stat with NCHS Life Tables Using NPCR Data				Net Differences between S1 and S2			
	White		Black		White		Black		White		Black	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ages 55-64	0.5%	0.9%	0.8%	1.8%	0.5%	0.9%	0.8%	1.8%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.5%	0.8%	1.2%	2.0%	0.5%	0.8%	1.2%	2.0%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	0.5%	0.5%	1.9%	1.5%	0.5%	0.5%	1.9%	1.5%	0.0%	0.0%	0.0%	0.0%
Ages <45	1.2%	1.4%	2.4%	2.9%	1.2%	1.4%	2.4%	2.9%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.5%	0.6%	1.0%	1.2%	0.5%	0.6%	1.0%	1.2%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.3%	0.4%	0.7%	0.8%	0.3%	0.4%	0.7%	0.8%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.3%	0.3%	0.7%	0.7%	0.3%	0.3%	0.7%	0.7%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	0.2%	0.2%	0.8%	0.5%	0.2%	0.2%	0.8%	0.5%	0.0%	0.0%	0.0%	0.0%
Ages <45	0.5%	0.5%	1.2%	1.1%	0.5%	0.5%	1.2%	1.1%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.3%	0.3%	0.8%	0.7%	0.3%	0.3%	0.8%	0.7%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.3%	0.3%	0.7%	0.7%	0.3%	0.3%	0.7%	0.7%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.3%	0.3%	0.8%	0.7%	0.3%	0.3%	0.8%	0.7%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	0.3%	0.3%	1.0%	0.8%	0.3%	0.3%	1.0%	0.8%	0.0%	0.0%	0.0%	0.0%
Ages <45	1.5%	2.3%	3.9%	7.3%	1.5%	2.3%	3.9%	7.3%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.8%	1.5%	1.7%	3.3%	0.8%	1.5%	1.7%	3.3%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.6%	1.2%	1.4%	2.9%	0.6%	1.2%	1.4%	2.9%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.7%	1.3%	1.8%	3.1%	0.7%	1.3%	1.8%	3.1%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	1.1%	1.9%	3.1%	5.2%	1.1%	1.9%	3.1%	5.2%	0.0%	0.0%	0.0%	0.0%
Ages <45	0.6%	0.6%	1.2%	1.4%	0.6%	0.6%	1.2%	1.4%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.3%	0.3%	0.5%	0.6%	0.3%	0.3%	0.5%	0.6%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.2%	0.2%	0.4%	0.5%	0.2%	0.2%	0.4%	0.5%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.1%	0.2%	0.4%	0.5%	0.1%	0.2%	0.4%	0.5%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	0.1%	0.2%	0.5%	0.5%	0.1%	0.2%	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%
Ages <45	0.3%	0.2%	+	+	0.3%	0.2%	+	+	0.0%	0.0%	+	+
Ages 45-54	0.3%	0.2%	+	+	0.3%	0.2%	+	+	0.0%	0.0%	+	+
Ages 55-64	0.3%	0.3%	+	+	0.3%	0.3%	+	+	0.0%	0.0%	+	+
Ages 65-74	0.4%	0.4%	+	+	0.4%	0.4%	+	+	0.0%	0.0%	+	+

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Age at Diagnosis (years)	SI - NPCR SAS Tool with NCHS Life Tables Using NPCR Data						S2 - SEER*Stat with NCHS Life Tables Using NPCR Data						Net Differences between S1 and S2			
	White		Black		White		Black		White		Black		White		Black	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ages 75-99	0.6%	0.7%	+	+	0.6%	0.7%	+	+	0.6%	0.7%	+	+	0.0%	0.0%	+	+
Ages <45	+	0.1%	+	0.4%	+	0.1%	+	0.4%	+	0.1%	+	0.4%	+	0.0%	+	0.0%
Ages 45-54	+	0.1%	+	0.3%	+	0.1%	+	0.3%	+	0.1%	+	0.3%	+	0.0%	+	0.0%
Ages 55-64	+	0.1%	+	0.4%	+	0.1%	+	0.4%	+	0.1%	+	0.4%	+	0.0%	+	0.0%
Ages 65-74	+	0.1%	+	0.5%	+	0.1%	+	0.5%	+	0.1%	+	0.5%	+	0.0%	+	0.0%
Ages 75-99	+	0.2%	+	0.8%	+	0.2%	+	0.8%	+	0.2%	+	0.8%	+	0.0%	+	0.0%
Ages <45	+	0.3%	+	1.0%	+	0.3%	+	1.0%	+	0.3%	+	1.0%	+	0.0%	+	0.0%
Ages 45-54	+	0.6%	+	1.3%	+	0.6%	+	1.3%	+	0.6%	+	1.3%	+	0.0%	+	0.0%
Ages 55-64	+	0.7%	+	1.5%	+	0.7%	+	1.5%	+	0.7%	+	1.5%	+	0.0%	+	0.0%
Ages 65-74	+	1.0%	+	1.9%	+	1.0%	+	1.9%	+	1.0%	+	1.9%	+	0.0%	+	0.0%
Ages 75-99	+	1.3%	+	2.4%	+	1.3%	+	2.4%	+	1.3%	+	2.4%	+	0.0%	+	0.0%
Ages <45	+	0.3%	+	1.2%	+	0.3%	+	1.2%	+	0.3%	+	1.2%	+	0.0%	+	0.0%
Ages 45-54	+	0.2%	+	1.1%	+	0.2%	+	1.1%	+	0.2%	+	1.1%	+	0.0%	+	0.0%
Ages 55-64	+	0.2%	+	0.9%	+	0.2%	+	0.9%	+	0.2%	+	0.9%	+	0.0%	+	0.0%
Ages 65-74	+	0.3%	+	1.0%	+	0.3%	+	1.0%	+	0.3%	+	1.0%	+	0.0%	+	0.0%
Ages 75-99	+	0.5%	+	1.4%	+	0.5%	+	1.4%	+	0.5%	+	1.4%	+	0.0%	+	0.0%
Ages <45	+	0.6%	+	1.4%	+	0.6%	+	1.4%	+	0.6%	+	1.4%	+	0.0%	+	0.0%
Ages 45-54	+	0.5%	+	1.6%	+	0.5%	+	1.6%	+	0.5%	+	1.6%	+	0.0%	+	0.0%
Ages 55-64	+	0.5%	+	1.5%	+	0.5%	+	1.5%	+	0.5%	+	1.5%	+	0.0%	+	0.0%
Ages 65-74	+	0.5%	+	1.5%	+	0.5%	+	1.5%	+	0.5%	+	1.5%	+	0.0%	+	0.0%
Ages 75-99	+	0.4%	+	1.4%	+	0.4%	+	1.4%	+	0.4%	+	1.4%	+	0.0%	+	0.0%
Ages <45	0.5%	+	0.7%	+	0.5%	+	0.7%	+	0.5%	+	0.7%	+	0.0%	+	0.0%	+
Ages 45-54	0.1%	+	0.3%	+	0.1%	+	0.3%	+	0.1%	+	0.3%	+	0.0%	+	0.0%	+
Ages 55-64	0.1%	+	0.2%	+	0.1%	+	0.2%	+	0.1%	+	0.2%	+	0.0%	+	0.0%	+
Ages 65-74	0.1%	+	0.3%	+	0.1%	+	0.3%	+	0.1%	+	0.3%	+	0.0%	+	0.0%	+
Ages 75-99	0.2%	+	0.7%	+	0.2%	+	0.7%	+	0.2%	+	0.7%	+	0.0%	+	0.0%	+
Ages <45	0.2%	+	1.2%	+	0.2%	+	1.2%	+	0.2%	+	1.2%	+	0.0%	+	0.0%	+

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Age at Diagnosis (years)	SI - NPCR SAS Tool with NCHS Life Tables Using NPCR Data				S2 - SEER*Stat with NCHS Life Tables Using NPCR Data				Net Differences between S1 and S2			
	White		Black		White		Black		White		Black	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ages 45-54	0.4%	+	3.1%	+	0.4%	+	3.1%	+	0.0%	+	0.0%	+
Ages 55-64	1.2%	+	10.9%	+	1.2%	+	11.0%	+	0.0%	+	-0.1%	+
Ages 65-74	2.9%	+	10.1%	+	2.9%	+	10.2%	+	0.0%	+	-0.1%	+
Ages 75-99	6.5%	+	+	+	6.5%	+	+	+	+	+	+	+
Ages <45	0.6%	0.9%	2.6%	4.9%	0.6%	0.9%	2.6%	4.9%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.4%	0.6%	1.6%	2.7%	0.4%	0.6%	1.6%	2.7%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.3%	0.5%	1.4%	2.0%	0.3%	0.5%	1.4%	2.0%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.3%	0.5%	1.4%	1.8%	0.3%	0.5%	1.4%	1.8%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	0.4%	0.5%	1.9%	1.8%	0.4%	0.5%	1.8%	1.8%	0.0%	0.0%	0.1%	0.0%
Ages <45	0.5%	0.5%	1.3%	1.3%	0.5%	0.5%	1.3%	1.3%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.4%	0.5%	1.0%	1.2%	0.4%	0.5%	1.1%	1.2%	0.0%	0.0%	-0.1%	0.0%
Ages 55-64	0.4%	0.5%	1.1%	1.3%	0.4%	0.5%	1.1%	1.3%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.4%	0.5%	1.4%	1.4%	0.4%	0.5%	1.4%	1.4%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	0.6%	0.6%	2.4%	2.0%	0.6%	0.6%	2.3%	2.0%	0.0%	0.0%	0.1%	0.0%
Ages <45	0.5%	0.5%	1.5%	1.5%	0.5%	0.5%	1.5%	1.5%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.7%	0.9%	2.4%	2.7%	0.7%	0.9%	2.4%	2.7%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.5%	0.6%	1.9%	2.4%	0.5%	0.6%	2.0%	2.4%	0.0%	0.0%	-0.1%	0.0%
Ages 65-74	0.4%	0.5%	2.1%	2.4%	0.4%	0.5%	2.2%	2.4%	0.0%	0.0%	-0.1%	0.0%
Ages 75-99	0.5%	0.4%	2.8%	2.5%	0.5%	0.4%	2.8%	2.4%	0.0%	0.0%	0.0%	0.1%
Ages <45	0.2%	0.1%	1.4%	0.2%	0.2%	0.1%	1.4%	0.2%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.4%	0.1%	1.6%	0.6%	0.4%	0.1%	1.6%	0.6%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.5%	0.2%	1.8%	0.9%	0.5%	0.2%	1.8%	0.9%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.8%	0.5%	3.5%	1.4%	0.8%	0.5%	3.5%	1.4%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	1.8%	0.6%	7.9%	3.2%	1.8%	0.6%	7.8%	3.2%	0.0%	0.0%	0.1%	0.0%
Ages <45	0.3%	0.3%	1.1%	0.9%	0.3%	0.3%	1.1%	0.9%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	1.0%	1.0%	2.7%	2.5%	1.0%	1.0%	2.7%	2.5%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	1.3%	1.5%	4.0%	4.4%	1.3%	1.5%	4.0%	4.4%	0.0%	0.0%	0.0%	0.0%

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Age at Diagnosis (years)	SI - NPCR SAS Tool with NCHS Life Tables Using NPCR Data				S2 - SEER*Stat with NCHS Life Tables Using NPCR Data				Net Differences between S1 and S2			
	White		Black		White		Black		White		Black	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ages 65-74	1.8%	1.9%	6.9%	6.3%	1.8%	1.9%	7.0%	6.3%	0.0%	0.0%	-0.1%	0.0%
Ages 75-99	2.2%	1.9%	10.4%	7.3%	2.2%	1.9%	10.4%	7.3%	0.0%	0.0%	0.0%	0.0%
Ages <45	0.4%	0.4%	1.0%	1.2%	0.4%	0.4%	1.0%	1.2%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.4%	0.4%	1.2%	1.3%	0.4%	0.4%	1.2%	1.3%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.4%	0.4%	1.3%	1.3%	0.4%	0.4%	1.3%	1.3%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.4%	0.4%	1.8%	1.5%	0.4%	0.4%	1.8%	1.5%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	0.5%	0.4%	2.6%	1.9%	0.5%	0.4%	2.6%	1.9%	0.0%	0.0%	0.0%	0.0%
Ages <45	1.7%	2.3%	3.2%	2.5%	1.7%	2.3%	3.2%	2.5%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	1.1%	1.3%	1.9%	1.9%	1.1%	1.3%	1.9%	1.9%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.8%	0.9%	1.5%	1.6%	0.8%	0.9%	1.5%	1.6%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.8%	0.8%	1.6%	1.5%	0.8%	0.8%	1.6%	1.5%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	0.7%	0.7%	2.0%	1.6%	0.7%	0.7%	2.0%	1.6%	0.0%	0.0%	0.0%	0.0%
Ages <45	0.4%	0.5%	1.2%	1.4%	0.4%	0.5%	1.2%	1.4%	0.0%	0.0%	0.0%	0.0%
Ages 45-54	0.6%	0.7%	2.0%	2.0%	0.6%	0.7%	2.0%	2.0%	0.0%	0.0%	0.0%	0.0%
Ages 55-64	0.5%	0.6%	1.8%	1.8%	0.5%	0.6%	1.8%	1.8%	0.0%	0.0%	0.0%	0.0%
Ages 65-74	0.5%	0.6%	1.8%	1.9%	0.5%	0.6%	1.8%	1.9%	0.0%	0.0%	0.0%	0.0%
Ages 75-99	0.5%	0.5%	2.1%	1.8%	0.5%	0.5%	2.1%	1.8%	0.0%	0.0%	0.0%	0.0%