

ALASKA NATIVE CANCER SURVIVAL REPORT

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Introduction

This is the first report of survival rates from cancer for Alaska Natives. Information on cancer in American Indians/Alaska Natives (AI/AN) is scarce. The most available cancer information on AI/AN nationwide is mortality data based on death certificates (1). These data indicate that cancer rates differ between various groups of AI/AN throughout the United States. Incidence data (new patients diagnosed each year) are available on an ongoing basis only for American Indians of New Mexico/Arizona and Alaska Natives - Eskimo, Aleut, Indian (2,3).

Data from the Alaska Native Tumor Registry document that cancer patterns in Alaska Natives differ from those of Whites and Blacks and other minority populations in the United States (2,3). Cancer rates among Alaska Natives also differ from those of American Indians of New Mexico/Arizona. Within Alaska there are also differences by ethnic group, Eskimo, Aleut, Indian (2). Although cancer was considered a rare disease in Alaska Natives as recently as the mid-twentieth century, incidence rates now equal those of U.S. Whites, and mortality rates *exceed* those of U.S. Whites (2). Cancer is now the leading cause of death among Alaska Native women, and ranks third among men.

There are even fewer published reports of survival rates from cancer for AI/AN than incidence and mortality reports for these populations. Reports include survival rates for Indians in Montana, Western Washington and New Mexico/Arizona for all cancers combined (4-6). For specific cancer sites, survival data are available largely for American Indians of New Mexico/Arizona (7-10). Cancer survival rates for most minority populations in the United States are lower than for U.S. Whites (11). The lowest rates reported are among American Indians in New Mexico/Arizona (11).

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This report presents Alaska Native cancer survival rates and stage of disease at diagnosis. Data on survival and stage at diagnosis are given for all cancers combined, and for select primary cancer sites (the organ in which the cancer first began). Survival rates are given for only those cancers for which there were enough patients to calculate reliable estimates. The focus is on five year *relative* survival rates because these rates are most commonly used in the cancer literature and most appropriate for comparisons between populations. This report compares survival rates for Alaska Natives with those of U.S. Whites. These survival rates are specific for Alaska Natives and cannot be extrapolated to American Indian or other indigenous populations.

Methods

Data are available on cancer in Alaska Natives since 1969 from the Alaska Native Tumor Registry. This registry was established and is currently partially funded by the National Cancer Institute (NCI). Although not an official member of the National Cancer Institute Surveillance Epidemiology and End Results (SEER) program, the Alaska Native Tumor Registry has consistently adhered to SEER standards for case identification, data collection, coding, and follow-up methods. The registry records invasive cancers diagnosed in Alaska Natives who are residents of Alaska at the time of diagnosis and who provide documentation of eligibility for health care from the Indian Health Service. Native cancer patients are identified statewide from hospital tumor registries, hospital and outpatient lists of discharge diagnoses and purpose of visit, pathology reports, death certificates, and from the Cancer Surveillance System, Fred Hutchinson Cancer Research Center, Seattle, WA. Follow-up status is determined at least annually for all patients by review of medical and/or death records. Patients who have no current records in the Alaska Area Native Health Service and are not being actively followed by the tumor registry ('lost to follow-up') and have no death certificate recorded in Alaska are

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submitted to the National Death Index. This national system identifies patients who may have died but were not Alaska residents at the time of death. For the two time periods used in calculation of survival rates, specifically 1969-83 and 1984-94, we determined follow-up status through 1994. Follow-up was complete for 99% of patients in both groups.

All data recording and reporting procedures of the Alaska Native Tumor Registry are consistent with the NCI SEER program. The cancer site group classification also follows these standards. The specific primary site and histology ICD-O (International Classification of Disease - Oncology) codes of cancer groups used in this report are shown in Table 1. Because rates of nasopharynx cancer are many times higher in the Alaska Native than in the U.S. White population, in our report nasopharynx cancer cases are reported both separately and included in the oral cavity and pharynx cancer group.

Survival rates were calculated using the actuarial method in accordance with the National Cancer Institute Surveillance Epidemiology and End Results program (12). Data for two time periods were analyzed: 1984–1994, and 1969–1983. These dates were chosen to: estimate current survival rates for Alaska Natives; compare Alaska Native survival rates for a current and earlier time period; and compare survival rates for Alaska Natives with those for U.S. Whites.

Both observed and relative survival rates were calculated. Relative survival rates were derived by dividing the calculated observed survival by the probability of a person of the same age, sex and race surviving an additional year. Ethnic specific life expectancy tables for 1980 were used to determine the probability of survival for Alaska Natives and U.S. Whites, respectively.

This report emphasizes five-year survival rates; however, rates are also reported for each year up to 10 years following diagnosis. To examine changes over time, survival rates were calculated for patients diagnosed in two time periods: 1984 through 1994, and 1969 through

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1983. Survival rates were calculated only for those cancer sites where the total patients diagnosed numbered 20 or more for the specific cancer in each time period. For two sites, multiple myeloma and brain, patients for the entire period 1969-94 were used to provide sufficient numbers of patients to calculate five-year relative survival rates.

Confidence intervals (95%) were calculated for all estimates. These are included in the tables by showing the upper and lower confidence limit for each estimate. The 95% confidence interval provides a range around the calculated rate. Based on probability, 95% of the time the true rate falls within the upper and lower confidence limits. In the figures, the 95% Confidence Intervals (CI) around each estimate are represented by single lines extending from the bars. Lack of overlap of the CI lines for estimates for two groups being compared indicates a statistically significant difference at the $p < .05$ level, i.e. a less than 5% probability that the difference noted occurred by chance alone.

Survival rates for U.S. Whites for the selected time periods were obtained directly from the NCI SEER program data set (12). SEER has collected data since 1973. Confidence intervals for both observed and expected survival rates were calculated using methods specified for the SEER registry (12). Only patients whose cancer was determined to be “invasive” (in contrast to “in situ”) are included in survival calculations for Alaska Natives and U.S. Whites. Also only “primary” not “secondary” (metastatic or recurrent) cancers are included. Calculations of survival are from the date of diagnosis of the cancer. One person may develop more than one cancer. Each cancer is included in the analysis. Consistent with SEER methodology, patients whose cancer information was available only from death certificate or at the time of autopsy are excluded from survival rate calculations. The number of Alaska Native patients deleted for this reason was 19 out of a total of 2043 cases for 1984-94 and 47 out of 1493 cases for 1969-83. The Alaska Native Tumor Registry attempts to identify medical records on all patients first identified from death certificate.

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For the 1984-1994 data, five-year survival rates are shown for males and females separately, for both sexes combined, and by stage at diagnosis. The distribution (percent) of cancers by stage at diagnosis (local, regional, distant, and unknown) was also determined. Prior to 1984 the Alaska Native Tumor Registry did not collect information on stage at diagnosis. Likelihood ratio statistics were used to test for association between the distribution by stage and race (Alaska Native, U.S. White) for all cancers and each cancer site (13). A p value of 0.05 or less is considered statistically significant.

Results

This report is organized in the following manner. Data are presented in both Figures and Tables. The Figures include three summary graphs and then a series of graphs for each cancer site (in alphabetic order of the cancer term commonly used). The Tables provide the data on which the figures are based, as well as additional detail not present on the figures. The primary focus of the report is on the more current data, specifically cancers diagnosed during the eleven-year period 1984 through 1994.

Table 1 lists the cancer group name and the ICD-O primary site and histology codes for each cancer reported. Tables 2 shows the number of cancer cases registered in the Alaska Native Tumor Registry and used for survival calculations for the two time periods examined in this report. Table 3 compares calculated observed with relative survival rates. Table 4 and Figure 1 compare five-year relative survival rates for Alaska Natives and U.S. Whites for 1984-94. Survival rates for Alaska Natives for two different time periods, 1984-94 and 1969-83, are compared in Table 5 and Figure 2. For all cancers combined and for each primary site, results are presented in a series of figures (Figures 4 through 24), each of which includes four charts on two opposing pages. The charts show: five year relative survival rate for males, females,

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and both sexes combined (upper left); five year relative survival rate by stage at diagnosis (lower left); relative survival rate by year up to 10 years following diagnosis (upper right); and the percent distribution of cases by stage of disease (lower right). In each chart, calculated estimates for Alaska Natives are compared to U.S. Whites.

Table 3 compares observed and relative five-year survival rates for Alaska Natives. The observed rate specifies the calculated percent of patients with cancer diagnosed in the specified time period who survive the stated length of time after diagnosis (e.g. five years). Observed survival rates are useful clinically to provide estimates of Alaska Native patients' chances of survival. Relative survival rates are the observed rate divided by the expected probability of an Alaska Native of a given age and sex surviving the same stated length of time. Observed rates are lower than relative rates because the relative rate calculation adjusts for deaths due to causes other than cancer. For Alaska Natives for all cancers combined calculated five year observed and relative survival rates differed by less than 9%. For specific cancer sites differences ranged from 0% to 20%. Differences between observed and relative survival rates were larger for cancers that tend to occur among the older patients (e.g. prostate cancer) than for those cancers that occur in younger patients (e.g. leukemia).

Figure 1 and Table 4 compare the five year survival rates for males and females and both sexes combined, for all cancers and for select cancer sites for patients diagnosed from 1984 through 1994 in the Alaska Native and U.S. White populations. The figure suggests differences in the calculated survival rates for the two populations for all cancers combined and for nearly every site. However, the corresponding confidence intervals indicate significant differences exist for only certain sites. Cancer survival for all cancers combined is 11% lower among Alaska Natives than U.S. Whites. Five-year cancer survival rates are also lower for Alaska Natives for cancers of the oral cavity and pharynx, nasopharynx specifically, and lung, with differences of 20%,

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26%, and 5% respectively. Conversely, Alaska Native cancer survival rates are significantly higher for cancers of the liver and uterus, with differences of 36% and 14% respectively.

Survival rates were also calculated for multiple myeloma and brain using data for all patients diagnosed 1969-94. These sites are not included in the Tables and Figures as there were insufficient cases to determine a reliable estimate for the shorter period of 1984-94. Relative five year survival rates for Alaska Natives and U.S. White do not differ significantly for these cancers: brain 30% (95% confidence interval: 10.5% - 49.5%) versus 23.8% (23.2% - 24.4%), and multiple myeloma 44.1% (17.2% - 71.0%) versus 26.9 % (26.0% - 27.8%), respectively.

Survival rates comparing Alaska Natives and U.S. Whites by sex are shown in Table 4 and in the first chart of Figures 4 - 24. For both males and females, Alaska Native five year relative survival rates are significantly lower than U.S. Whites. Similar to U.S. Whites, five-year relative survival rates for all cancer sites combined are significantly higher in Alaska Native females (51.5%) than males (40.3). Cancers of specific sites often occur exclusively or predominantly in only one sex, making male-female comparisons possible for only a few sites. No significant differences were found between males and females in survival rates for cancers of the colon/rectum, pancreas, kidney, lung, oral cavity/pharynx, or stomach.

Five-year relative survival rates of Alaska Native cancer patients diagnosed in the more recent period (1984-1994) are compared with those registered in the earlier years (1969-1983) in Table 5 and Figure 2. The five-year survival for all cancers is six percent higher in the more recent time period, with the difference approaching statistical significance. Significant improvements were noted for colorectal cancer (20% increase), and liver cancer (42% increase). Rates for survival from leukemia also suggest an increase in survival (24%) from the earlier to the more recent time period, although this increase is not statistically significant. No sites showed significant decreases in percent survival from the earlier to more recent time period.

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One of the most important factors determining length of survival following diagnosis and treatment for cancer is the stage at diagnosis. Stage of disease is determined at diagnosis and indicates the extent the cancer has spread from the organ in which it started. Cancer that has not extended beyond the location (site) of origin is categorized 'local'; cancer which has gone beyond the organ but not beyond the surrounding lymph nodes and adjacent tissues is 'regional'; and cancer which has spread extensively is 'distant'. Leukemia is not classified by stage, since leukemia by definition is a disseminated disease, originating in the blood system and not in a specific organ. The percent distribution by stage at diagnosis (local, regional, distant, unknown) for all cancers combined and each cancer site separately is displayed in the lower right chart of Figures 4 – 25. Survival by stage at diagnosis for all cancers combined and for select cancer sites among Alaska Natives was compared to U.S. Whites. Interpretation of results from comparison of stage at diagnosis is difficult because of the high proportion of U.S. patients whose stage of disease is classified 'unknown'. We analyzed the data both with and without inclusion of those classified as stage "unknown". Only those for which the distribution appeared significantly different by both analyses are described.

Differences between Alaska Native and U.S. White cancer patients by distribution of stage of disease at diagnosis were significant for: all cancers combined, cancers of the oral cavity and pharynx group, and nasopharynx alone. For these sites, Alaska Native patients had a larger proportion of patients diagnosed with regional or distant disease and fewer with local disease than did U.S. Whites.

The distribution by stage of disease also differed significantly between Alaska Native and U.S. Whites for patients with cancer of the liver. The proportion of patients diagnosed with local disease was higher among Alaska Native than U.S. patients.

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Discussion

This is the first comprehensive report of survival rates for Alaska Native cancer patients.

Previous publications have shown that incidence patterns in the Alaska Native population differ markedly from those of other U.S. populations (2,3). Mortality data suggest differences in cancer exist between Alaska Natives and American Indians in the contiguous United States. (1)

Cancer survival rates have been reported to be lower among minority than White populations in the US, and lowest among American Indians (3,11). However, overall cancer survival rates have been reported only for Indians of Western Washington, Montana, and New Mexico/Arizona (4-6). In these populations, survival rates were low even after adjustment for other factors: age, gender, histologic grade of the cancer, stage at diagnosis, and treatment.

The ratios of current age-adjusted *incidence* rates for all cancers in Alaska Natives compared to U.S. Whites are 0.9 and 1.0 for Alaska Native males and females, respectively. However, comparative ratios for cancer *mortality* are higher, 1.0 for males and 1.3 for females (2). Higher relative ratios for mortality than incidence suggest poorer survival rates for Alaska Native patients with cancer.

Our report examines cancer survival rates in Alaska Natives for patients diagnosed during a recent time period, 1984-94. Five year relative survival rates for all Alaska Natives patients diagnosed with cancer in these years were significantly lower than those of U.S. Whites by 11% (45.4% vs 56.7%). Similar to the US, survival rates in Alaska Natives were better among women than men (51.5% vs 40.3%) for all cancers combined. However, overall cancer survival rates for both Alaska Native men and women were significantly lower than rates for U.S. men and women, respectively (40.3% vs 54.9% and 51.5% vs 61.5%).

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As stated previously in this report, significant differences in five-year survival between Alaska Natives vs U.S. Whites were detected for some specific cancer sites. Some of the largest differences occurred in liver cancer, where Alaska Native rates exceed those of US Whites. Much of the improved survival for liver cancer has resulted from periodic screening of hepatitis B surface antigen (HbsAg) positive Alaska Natives for the tumor marker, alpha-fetoprotein (AFP). This program began in 1982. Surveillance for liver cancer has been complete statewide since 1969. Approximately 80% of liver cancer in the Alaska Native population is associated with persistent hepatitis B viral (HBV) infection (14). Between 1981-1987 nearly all Alaska Natives were screened for markers of HBV virus (15). Persons who had not been infected were immunized. Those identified as carriers (HbsAg positive) have since been tested for AFP twice yearly. Screening of carriers has led to detection of liver cancer at an earlier stage and thus to improved survival (16,17). Indeed, 60% of Alaska Natives with liver cancer diagnosed from 1984-94 had local disease, compared to 21% of U.S. White liver cancer patients. As shown in Figure 13, the improvement in survival rate appears to persist for at least nine years after diagnosis.

Alaska Native women with cancer of the uterus also appear to have better survival than U.S. White women and a larger proportion are diagnosed with local disease (86% vs. 75%). However, this estimate is based on only 21 patients. Cancer of the uterus is known to occur relatively infrequently in Alaska Natives (2). Whether the causes of this cancer or the risk factors differ in Alaska Natives and U.S. Whites is unknown.

Survival from lung cancer in Alaska Natives is 5% lower than survival in U.S. Whites. The lower survival appears to occur in both men and women and for patients with local and regional disease. Though the difference is small (5%), it is important as lung cancer is the most frequent cause of cancer death among Alaska Natives, and thus contributes to higher cancer death rates and poorer overall cancer survival.

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This report indicates an overall improvement (6%) in cancer survival for patients diagnosed with cancer 1984 -94 compared with 1969-83. The biggest changes in cancer survival for patients diagnosed most recently (1984-94) compared with those diagnosed earlier (1969-83) were among patients with cancers of the liver and colon/rectum. Cancer of the liver has been discussed above. Five year relative survival rates for cancer of the colon/rectum increased by 20%, and improvement was noted in both men and women (Table 5). As shown in Figure 7, current survival rates are now similar to those of U.S. Whites by sex and stage of disease. The distribution by stage of disease is also similar. Unfortunately, the Tumor Registry did not collect information on stage of disease at diagnosis and treatment during the early time period. Therefore it is not possible to determine whether the improvement in survival was a result of improvement in stage at diagnosis, treatment, or other factors. The age and sex distribution of patients did not change from the earlier to more recent time period.

Alaska Native survival rates for oral cavity and pharynx cancer as a group, and for nasopharynx cancer (NPC) specifically, are significantly lower than those for U.S. Whites. Alaska Natives are at a much higher risk (fifteen fold or greater) for developing nasopharyngeal cancer. These cancers occur at a younger age and are of a more aggressive histologic type than cancers of the nasopharynx that most frequently occur in the U.S. White population (18,19). Patients with these types of nasopharyngeal cancer have a poorer survival. The high rates of nasopharynx cancer, the high proportion of these cancers in the category oral cavity and pharynx, and the poorer survival rates of this cancer are responsible for the low survival in the oral cavity and pharynx group.

This report shows Alaska Native patients diagnosed with invasive cancer have an 11% lower chance of surviving five years from their disease than U.S. Whites. Poor survival from cancer has been described for other minority populations, and has been reported to persist even after stage at disease, treatment, and other factors were taken into consideration (7-10). We

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propose that the difference in survival between U.S. Whites and Alaska Natives may be partially attributable to the types of cancers that occur frequently in this population. Many cancers with poor survival are more prevalent among Alaska Natives, while cancers with promising survival are less prevalent in Alaska Natives. Figure 3 shows a graph of cancers organized in order of increasing survival (for Alaska Natives) next to a graph showing the percent distribution of each cancer among Alaska Natives and U.S. Whites. The first cancer sites listed (esophagus, pancreas, lung, ill defined, gallbladder, nasopharynx,) have the poorest survival rates among Alaska Natives), yet account for a greater percentage of all cancers diagnosed among Alaska Natives than among U.S. Whites. Conversely, other cancers with better survival rates are more prevalent among U.S. Whites than among Alaska Natives. For example, prostate cancer with a 5-year survival rate of at least 80% accounts for nearly 15% of all cancers in U.S. Whites, but it accounts for only 5% of Alaska Native cancers. Breast cancer also occurs relatively less frequently. Hence survival rates for all cancers combined among Alaska Natives are lower largely because of the occurrence of a larger proportion of cancers that have poor survival in any population.

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Summary

This is the first report of survival rates and stage at diagnosis for Alaska Native cancer patients. Cancer survival rates for Alaska Natives (AN) are compared with US Whites (US). Survival rates are also presented for Alaska Natives patients diagnosed for two time periods, 1969-1983 and 1984-1994. *Observed survival rates* are most useful in the clinical setting. *Relative survival rates* allow accurate comparison of one population to another, e.g. Alaska Native vs. US White. This report emphasizes *five year* survival rates (the likelihood that patients will live five years after the diagnosis of cancer) because this measure is most frequently used in the cancer literature.

Estimates of observed survival rates indicate that among all AN patients diagnosed with cancer less than half (37%) will be alive five years after diagnosis. A larger percent of women (45%) than men (32%) will survive five years. The likelihood of surviving five years varies markedly by the primary site, the organ in which the cancer first occurs (range 0 to 100%). Nearly all patients diagnosed with cancers of the thyroid, testis, and uterus were alive five years after diagnosis; while none of those with cancers of the esophagus or pancreas survived five years. Five year survival rates for other primary sites were intermediate.

Comparison of Alaska Native and US White five year *relative* survival show that rates for all cancers combined are 11% lower (45.4 vs 56.7), and lower in both AN men and AN women. Comparing survival rates (AN vs US) for specific primary cancer sites identified significant differences for a few cancers. Alaska Native five year survival rates were significantly *higher* for cancers of the liver (42% vs 6%) and uterus (100% vs 86%). Survival rates were significantly *lower* for Alaska Natives for cancers of the oral cavity/pharynx (36% vs 55%), nasopharynx (18% vs 44%), and lung (9% vs 14%). No significant differences were found in many of the frequently occurring cancers: stomach, colon/rectum, gallbladder, pancreas, breast, prostate, kidney.

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Stage (extent or spread of disease) at diagnosis is another important determinant of cancer survival. Early detection can mean prompt treatment and cure. Some cancers are very difficult to detect early. For all cancers combined, Alaska Natives had a higher proportion of cancers diagnosed at later stages than US Whites. For specific cancers, AN liver cancer was more often diagnosed at an early stage than in the US. The opposite was true for oral cavity/pharynx. The stage at diagnosis of all other cancers diagnosed among Alaska Natives did not differ significantly from US Whites.

To examine changes over time, survival rates for Alaska Natives diagnosed in two time periods were compared (1969-1983, 1984-1994). The five year relative survival for all cancers combined increased by 6% from the earlier to the more recent time period, with the improvement approaching statistical significance. For specific cancer sites, significant increases were noted among cancers of the colon/rectum (20%) and liver (42%). There were no significant decreases in survival from cancer of any site from the early to later time period.

A limitation of this report is the relatively small numbers of cancer for many primary sites and the associated wide confidence intervals for estimates among Alaska Natives. However, this report suggests that survival rates and stage at diagnosis of Alaska Natives for most primary cancers do not differ significantly from the rates of US Whites. Differences in survival rates and stage at diagnosis result more from the frequency and types of cancers which Alaska Natives develop than from differences in medical diagnosis and treatment.

Alaska Native Cancer Survival Report Primary Cancer Sites Based on ICD-0¹

Primary Site	Site/Type ²	Excluding Type ³
Oral Cavity and Pharynx:	C000-C0148	9590-9970
Salivary Gland	C079-C089	9590-9970
Nasopharynx	C110-C119	9590-9970
Gum & Other Mouth	C030-C039	9590-9970
	C050-C059	9590-9970
	C060-C069	9590-9970
Other Oral Cavity and Pharynx	C000-C009	9590-9970
	C019-C029	9590-9970
	C040-C049	9590-9970
	C090-C109	9590-9970
	C129	9590-9970
	C130-139	9590-9970
	C140-C148	9590-9970
Digestive System		
Esophagus	C150-C159	9590-9970
Stomach	C160-C169	9590-9970
Colon excluding rectum	C180-C189	9590-9970
	C260	9590-9970
Rectosigmoid Junction	C199	9590-9970
Rectum	C209	9590-9970
Liver	C220	9590-9970
Gallbladder	C239	9590-9970
Other Biliary	C240-249	9590-9970
Pancreas	C250-C259	9590-9970
Other Digestive System	C170-C179	9590-9970
	C210-C212	9590-9970
	C218	9590-9970
	C221	9590-9970
	C268-C269	9590-9970
	C480-C482	9590-9970
	C488	9590-9970
Respiratory System		
Lung & Bronchus	C340-C349	9590-9970
Larynx	C320-C329	9590-9970
Other Respiratory System	C300-C301	9590-9970
	C310-C319	9590-9970
	C339	9590-9970
	C381-C383	9590-9970
	C388	9590-9970
	C390	9590-9970
	C398	9590-9970
	C399	9590-9970

¹ ICD-O = International Classifications of Disease - Oncology

² Site = ICD-O topography codes without decimal point

³ Excluding Type = histology type excluded from category

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Primary Site	Site/Type	Excluding Type
Bones & Joints	C400-C419	9590-9970
Soft Tissue	C380	9590-9970
	C470-C479	9590-9970
	C490-C499	9590-9970
Skin		
Melanoma	C440-C449/8720-8790	
Non-epithelial	C440-C449	8000-8004
		8010-8012
		8070-8076
		8090-8096
		8720-8790
		9700-9701
Breast	C500-C509	9590-9970
Female Genital System		
Cervix uteri	C530-C539	9590-9970
Corpus uteri/Uterus, NOS	C540-C549	9590-9970
	C559	9590-9970
Ovary	C569	9590-9970
Other Female Genital Organs	C510-C519	9590-9970
	C529	9590-9970
	C570-C589	9590-9970
Male Genital		
Prostate	C619	9590-9970
Testis	C620-C629	9590-9970
Other Male Genital Organs	C600-C609	9590-9970
	C630-C639	9590-9970
Urinary System		
Bladder	C670-C679	9590-9970
Kidney & Renal Pelvis	C649-C659	9590-9970
Other Urinary Organs	C669	9590-9970
	C680-C689	9590-9970
Eye & Orbit	C690-C699	9590-9970
Brain & Nervous System		
Brain	C710-C719	9590-9970
		9530-9539
Other Nervous System	C700-C709	9590-9970
	C710-C719/9530-9539	
	C720-C729	9590-9970
Endocrine		
Thyroid	C739	9590-9970
Other Endocrine	C379	9590-9970
	C740-C749	9590-9970
	C750-C759	9590-9970

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Primary Site	Site/Type	Excluding Type
Lymphomas:		
Hodgkin's	9650-9667	
Non-Hodgkin's	9590-9595	
	9670-9714	
Multiple Myeloma	9731-9732	
Leukemia	9800-9804	
	9820-9827	
	9830	
	9840-9842	
	9850	
	9860-9864	
	9866-9868	
	9870	
	9880	
	9890-9894	
	9900	
	9910	
	9930-9931,9941	
Ill Defined & Unspecified	9720-9723	
	9740	
	9741	
	9760-9764	
	9950-9989	
	C760-C768	9590-9970
	C809	9590-9970
	C420-C424	9590-9940
	C770-C779	9590-9750

Alaska Native Cancer Survival Report

Number of Cases by Site, 1969-1983 and 1984-1994

Group	Primary Cancer	Alaska Natives		
		1969-1983	1984-94	Total
	All sites	1446	2024	3470
	Oral Cavity/Pharynx	84	99	183
01	Lip	0	0	0
02	Tongue	3	11	14
03	Major Salivary Glands	13	10	23
04	Floor of Mouth	5	8	13
05	Gum & Other Mouth	10	9	19
06	Nasopharynx	47	50	97
07	Tonsil	1	1	2
08	Oropharynx	3	2	5
09	Hypopharynx	1	7	8
10	Pharynx/Other Buccal	1	1	2
11	Esophagus	26	30	56
12	Stomach	67	97	164
13	Small Intestine	2	2	4
	Colon/Rectum	256	360	616
14	Colon	185	275	460
15	Rectosigmoid Junction	23	21	44
16	Rectum	47	64	111
17	Anus	1	2	3
18	Liver	36	35	71
19	Intrahepatic Bile Duct	0	6	6
20	Gallbladder	35	18	53
21	Other Biliary	6	19	25
22	Pancreas	43	51	94
23	Retroperitoneum	1	0	1
24	Peritoneum	2	0	2
25	Other Digestive	12	1	13
26	Nasal Cavity	2	3	5
27	Larynx	7	11	18
28	Lung	198	389	587
29	Pleura	1	3	4
30	Trachea	3	0	3
31	Bones & Joints	10	12	22
32	Soft Tissue	11	8	19
33	Breast	120	256	376
34	Cervix	79	59	138
35	Corpus Uteri	6	21	27
36	Uterus, NOS	6	1	7
37	Ovary	26	43	69
38	Vagina	1	3	4
39	Vulva	1	3	4
40	Other Female Genital	3	4	7
41	Prostate	65	113	178
42	Testis	18	22	40
43	Penis	3	5	8
44	Other Male Genital	2	1	3
45	Urinary Bladder	27	34	61
46	Kidney	54	99	153
47	Ureter	2	1	3
48	Other Urinary	0	1	1
49	Eye	5	4	9
50	Brain	17	14	31
51	Other Nervous System	1	0	1
52	Thyroid	31	30	61
53	Other Endocrine	3	2	5
58	Ill Defined	98	62	160
61	Multiple Myeloma	13	15	28
62	Leukemia	23	39	62
63	Skin Melanoma	5	8	13
64	Other Skin (Non-epithelial)	0	7	7
65	Hodgkin's Disease	5	8	13
66	Non-Hodgkin's Lymphoma	31	38	69

Alaska Native Cancer Survival Report

Observed vs. Relative Five Year Survival 1984-1994

		Observed Survival				Relative Survival		
		N	5 Year Survival	95% Confidence Interval		5 Year Survival	95% Confidence Interval	
				Lower	Upper		Lower	Upper
All sites	All	2024	36.7	34.1	39.2	45.4	42.2	48.6
	Male	970	32.2	28.7	35.8	40.3	35.8	44.7
	Female	1054	45.0	41.5	48.5	51.5	47.4	55.5
Oral Cavity/Pharynx	All	99	30.0	18.7	41.3	35.6	22.2	49.0
	Male	63	25.8	11.9	39.6	30.9	14.3	47.6
	Female	36	36.9	17.7	56.1	42.7	20.5	64.9
Nasopharynx	All	50	15.1	3.1	27.2	17.7	3.6	31.8
	Male	37	14.0	0.5	27.4	16.8	0.6	32.9
	Female	13						
Esophagus	All	30	0.0	0.0	9.7	0.0	0.0	9.7
	Male	23	0.0	0.0	13.0	0.0	0.0	13.0
	Female	7						
Stomach	All	97	19.1	9.6	28.6	22.5	11.3	33.8
	Male	68	19.3	8.7	30.0	23.3	10.5	36.1
	Female	29	15.4	0.0	35.2	17.3	0.0	39.7
Colon/Rectum	All	360	48.6	42.5	54.7	61.5	53.8	69.2
	Male	177	49.5	40.7	58.3	63.9	52.6	75.3
	Female	183	47.9	39.5	56.3	59.4	48.9	69.8
Liver	All	35	35.8	18.5	53.1	42.0	21.7	62.4
	Male	22	38.9	17.3	60.6	44.7	19.9	69.6
	Female	13						
Gallbladder	All	37	12.4	0.0	25.1	15.3	0.0	30.9
	Male	19						
	Female	18						
Pancreas	All	51	0.0	0.0	5.9	0.0	0.0	5.9
	Male	19	0.0	0.0	14.3	0.0	0.0	14.3
	Female	32	0.0	0.0	9.1	0.0	0.0	9.1
Lung	All	389	7.7	4.4	10.9	9.4	5.4	13.4
	Male	236	8.0	3.6	12.3	10.1	4.5	15.6
	Female	153	7.4	2.6	12.3	8.8	3.0	14.5
Breast	All							
	Male							
	Female	256	70.1	63.2	77.1	76.6	69.0	84.2
Cervix	All							
	Male							
	Female	59	61.2	47.8	74.7	63.9	49.9	78.0
Uterus	All							
	Male							
	Female	21	95.0	85.3	100.0	100.0	89.2	100.0
Ovary	All							
	Male							
	Female	43	40.6	22.0	59.2	44.0	23.8	64.1
Prostate	All							
	Male	113	57.9	45.0	70.9	78.0	60.6	95.4
	Female							
Testis	All							
	Male	22	89.2	74.8	100.0	93.4	78.3	100.0
	Female							
Urinary Bladder	All	34	63.5	45.6	81.4	79.7	57.3	102.1
	Male	26	70.2	51.3	89.1	87.3	63.7	110.8
	Female	8						
Kidney	All	99	41.3	30.0	52.6	50.4	36.7	64.2
	Male	47	38.3	22.7	53.8	49.4	29.3	69.5
	Female	52	44.0	27.8	60.2	51.5	32.6	70.4
Thyroid	All	30	92.6	82.5	100.0	99.5	88.7	100.0
	Male	4						
	Female	26	91.7	80.4	100.0	98.4	86.2	100.0
Leukemia	All	39	33.8	15.1	52.4	36.0	16.1	55.8
	Male	20	33.2	7.4	59.0	35.4	7.9	62.9
	Female	19						
Non-Hodgkin's Lymphoma	All	38	50.3	32.6	68.1	59.2	38.4	80.1
	Male	20	47.5	21.9	73.2	58.5	26.9	90.1
	Female	18						
Ill Defined	All	62	9.4	1.7	17.0	11.8	2.2	21.4
	Male	36	0.0	0.0	8.3	0.0	0.0	8.3
	Female	26	17.3	2.1	32.4	22.2	2.7	41.7

Alaska Native Cancer Survival Report

Five Year Relative Survival Rates 1984-1994, Alaska Native vs US

		Alaska Natives				US Whites			
		5 Year		95% Confidence Interval		5 Year		95% Confidence Interval	
		N	Survival	Lower	Upper	N	Survival	Lower	Upper
All sites	All	2024	45.4	42.2	48.6	796,682	56.7	56.5	56.9
	Male	970	40.3	35.8	44.7	413,830	54.9	54.7	55.2
	Female	1054	51.5	47.4	55.5	382,852	61.5	61.2	61.7
Oral Cavity/Pharynx	All	99	35.6	22.2	49.0	20,074	55.3	54.3	56.2
	Male	63	30.9	14.3	47.6	13,652	52.6	51.5	53.8
	Female	36	42.7	20.5	64.9	6,422	60.8	59.2	62.5
Nasopharynx	All	50	17.7	3.6	31.8	799	43.8	39.3	48.2
	Male	37	16.8	0.6	32.9	545	46.0	40.4	51.6
	Female	13				254	39.2	31.8	46.7
Esophagus	All	30	0.0	0.0	9.7	6,406	11.7	10.6	12.8
	Male	23	0.0	0.0	13.0	4,634	11.4	10.1	12.7
	Female	7				1,772	12.4	10.3	14.5
Stomach	All	97	22.5	11.3	33.8	13,995	18.8	18.0	19.7
	Male	68	23.3	10.5	36.1	8,836	16.3	15.2	17.3
	Female	29	17.3	0.0	39.7	5,159	23.2	21.7	24.8
Colon/Rectum	All	360	61.5	53.8	69.2	97,416	61.5	61.0	62.0
	Male	177	63.9	52.6	75.3	49,457	62.0	61.3	62.6
	Female	183	59.4	48.9	69.8	47,959	61.1	60.4	61.7
Liver	All	35	42.0	21.7	62.4	4,021	6.5	5.5	7.5
	Male	22	44.7	19.9	69.6	2,688	4.3	3.1	5.4
	Female	13				1,333	10.5	8.4	12.7
Gallbladder	All	37	15.3	0.0	30.9	4,682	15.1	13.7	16.5
	Male	19				1,760	16.9	14.4	19.3
	Female	18				2,922	14.0	12.3	15.8
Pancreas	All	51	0.0	0.0	5.9	18,044	3.5	3.1	3.9
	Male	19	0.0	0.0	14.3	8,755	3.3	2.7	3.8
	Female	32	0.0	0.0	9.1	9,289	3.7	3.2	4.3
Lung	All	389	9.4	5.4	13.4	110,473	14.1	13.8	14.3
	Male	236	10.1	4.5	15.6	68,141	12.6	12.3	12.9
	Female	153	8.8	3.0	14.5	42,332	16.3	15.9	16.8
Breast	All								
	Male								
	Female	256	76.6	69.0	84.2	119,301	84.3	84.0	84.7
Cervix	All								
	Male								
	Female	59	63.9	49.9	78.0	8,966	71.1	69.9	72.3
Uterus	All								
	Male								
	Female	21	100.0	89.2	100.0	24,759	86.4	85.7	87.1
Ovary	All								
	Male								
	Female	43	44.0	23.8	64.1	16,481	44.8	43.8	45.8
Prostate	All								
	Male	113	78.0	60.6	95.4	113,300	87.8	87.3	88.3
	Female								
Testis	All								
	Male	22	93.4	78.3	100.0	6,138	94.5	93.7	95.3
	Female								
Urinary Bladder	All	34	79.7	57.3	100.0	37,293	82.5	81.8	83.2
	Male	26	87.3	63.7	100.0	27,943	84.8	83.9	85.6
	Female	8				9,350	76.0	74.6	77.4
Kidney	All	99	50.4	36.7	64.2	16,411	59.1	58.0	60.1
	Male	47	49.4	29.3	69.5	10,066	60.0	58.6	61.4
	Female	52	51.5	32.6	70.4	6,345	57.7	56.0	59.3
Thyroid	All	30	99.5	88.7	100.0	9,825	95.2	94.4	95.9
	Male	4				2,597	92.1	90.2	93.9
	Female	26	98.4	86.2	100.0	7,228	96.2	95.5	97.0
Leukemia	All	39	36.0	16.1	55.8	21,462	42.1	41.2	43.0
	Male	20	35.4	7.9	62.9	12,303	42.9	41.7	44.1
	Female	19				9,159	41.0	39.7	42.4
Non-Hodgkin's Lymphoma	All	38	59.2	38.4	80.1	30,689	52.6	51.8	53.3
	Male	20	58.5	26.9	90.1	16,805	49.3	48.2	50.3
	Female	18				13,884	56.5	55.4	57.7
Ill Defined	All	62	11.8	2.2	21.4	20,985	11.3	10.7	11.9
	Male	36	0.0	0.0	8.3	10,199	12.0	11.2	12.9
	Female	26	22.2	2.7	41.7	10,786	10.6	9.8	11.4

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Five Year Relative Survival, Alaska Natives: 1984-1994 vs 1969-1983

		Alaska Natives 1984-1994					Alaska Natives 1969-1983				
		N	Percent	5 Year Relative Survival	95 % Confidence Interval		N	Percent	5 Year Relative Survival	95 % Confidence Interval	
					Lower	Upper				Lower	Upper
All sites	All	2024		45.4	42.2	48.6	1,446		39.2	35.9	42.4
	Male	970	47.9	40.3	35.8	44.7	745	51.5	30.8	26.4	35.1
	Female	1054	52.1	51.5	47.4	55.5	701	48.5	47.4	42.7	52.1
Oral Cavity/Pharynx	All	99		35.6	22.2	49.0	84		40.7	28.3	53.2
	Male	63	63.6	30.9	14.3	47.6	45	53.6	41.8	24.9	58.7
	Female	36	36.4	42.7	20.5	64.9	39	46.4	39.0	20.6	57.3
Nasopharynx	All	50		17.7	3.6	31.8	47		28.9	14.0	43.7
	Male	37	74.0	16.8	0.6	32.9	32	68.1	38.9	19.3	58.5
	Female	13	26.0				15	31.9			
Esophagus	All	30		0.0	0.0	9.7	26		18.2	0.0	37.1
	Male	23	76.7	0.0	0.0	13.0	19	73.1			
	Female	7	23.3				7	26.9			
Stomach	All	97		22.5	11.3	33.8	67		14.0	3.6	24.3
	Male	68	70.1	23.3	10.5	36.1	51	76.1	12.8	1.0	24.5
	Female	29	29.9	17.3	0.0	39.7	16	23.9			
Colon/Rectum	All	360		61.5	53.8	69.2	255		41.9	33.7	50.1
	Male	177	49.2	63.9	52.6	75.3	125	49.0	38.1	26.4	49.8
	Female	183	50.8	59.4	48.9	69.8	130	51.0	45.2	33.6	56.7
Liver	All	35		42.0	21.7	62.4	36		0.0	0.0	8.3
	Male	22	62.9	44.7	19.9	69.6	31	86.1	0.0	0.0	9.7
	Female	13	37.1				5	13.9			
Gallbladder	All	37		15.3	0.0	30.9	41		8.4	0.0	19.0
	Male	19	51.4				12	29.3			
	Female	18	48.6				29	70.7	8.8	0.0	20.7
Pancreas	All	51		0.0	0.0	5.9	43		0.0	0.0	7.0
	Male	21	38.9	0.0	0.0	14.3	22	51.2	0.0	0.0	13.6
	Female	33	61.1	0.0	0.0	9.1	21	48.8	0.0	0.0	14.3
Lung	All	389		9.4	5.4	13.4	198		7.5	2.4	12.7
	Male	236	60.7	10.1	4.5	15.6	150	75.8	6.4	1.2	11.6
	Female	153	39.3	8.8	3.0	14.5	48	24.2	10.4	0.0	24.7
Breast	All										
	Male										
	Female	256	100.0	76.6	69.0	84.2	119	100.0	80.4	70.3	90.4
Cervix	All										
	Male										
	Female	59	100.0	63.9	49.9	78.0	79	100.0	66.4	52.8	80.0
Ovary	All										
	Male										
	Female	43	100.0	44.0	23.8	64.1	26	100.0	49.8	26.4	73.2
Prostate	All										
	Male	113	100.0	78.0	60.6	95.4	65	100.0	78.3	56.9	99.8
	Female										
Urinary Bladder	All	34		79.7	57.3	100.0	27		71.0	46.6	95.5
	Male	26	76.5	87.3	63.7	100.0	20	74.1	76.9	48.8	100.0
	Female	8	23.5				7	25.9			
Kidney	All	99		50.4	36.7	64.2	54		53.4	35.8	71.0
	Male	47	47.5	49.4	29.3	69.5	27	50.0	45.8	20.2	71.4
	Female	52	52.5	51.5	32.6	70.4	27	50.0	60.6	37.1	84.1
Thyroid	All	30		99.5	88.7	100.0	31		100.0	91.4	100.0
	Male	4	13.3				7	22.6			
	Female	26	86.7	98.4	86.2	100.0	24	77.4	97.1	86.8	100.0
Leukemia	All	39		36.0	16.1	55.8	23		11.7	0.0	27.1
	Male	20	51.3	35.4	7.9	62.9	15	65.2			
	Female	19	48.7				8	34.8			
Non-Hodgkin's Lymphoma	All	38		59.2	38.4	80.1	31		61.1	38.0	84.1
	Male	20	52.6	58.5	26.9	90.1	22	71.0	57.9	29.0	86.7
	Female	18	47.4				9	29.0			
Ill Defined	All	62		11.8	2.2	21.4	98		4.9	0.0	10.3
	Male	36	58.1	0.0	0.0	8.3	44	44.9	3.3	0.0	9.7
	Female	26	41.9	22.2	2.7	41.7	54	55.1	5.9	0.0	14.2

Alaska Native Cancer Survival Report

Five Year Relative Survival by Stage, 1984-1994, Alaska Native vs US

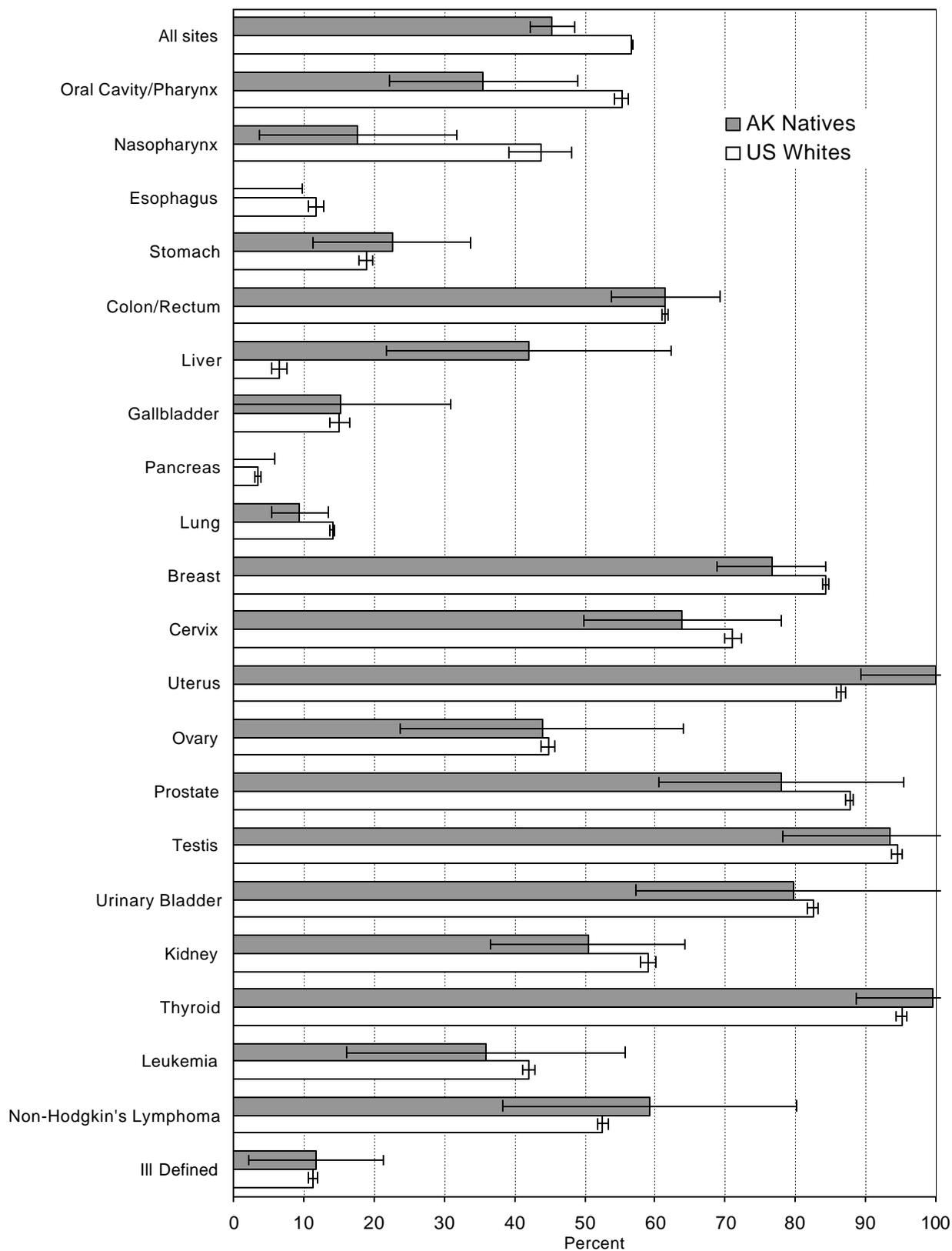
		Alaska Natives					US Whites				
		N	%	5 Year Relative Survival	95% Confidence Interval		N	%	5 Year Relative Survival	95% Confidence Interval	
Stage					Lower	Upper				Lower	Upper
All sites	All	2,024					796,682				
	Local	762	37.6	66.8	61.8	71.9	322,287	40.5	90.3	90.1	90.5
	Regional	586	29.0	34.4	29.5	39.3	184,510	23.2	57.1	56.8	57.4
	Distant	519	25.6	10.3	7.1	13.5	161,769	20.3	15.5	15.3	15.8
	Unknown	157	7.8	14.3	7.3	21.3	128,116	16.1	33.8	33.5	34.2
Oral Cavity/Pharynx	All	99					20,074				
	Local	27	27.3	77.8	51.6	100.0	7,793	38.8	81.5	80.0	83.0
	Regional	47	47.5	24.7	6.4	43.0	8,332	41.5	43.5	42.1	44.9
	Distant	24	24.2	15.3	0.0	32.7	1,676	8.3	19.9	17.4	22.3
	Unknown	1	1.0				2,273	11.3	37.0	34.3	39.7
Nasopharynx	All	50					799				
	Local	5	10.0				106	13.3	66.6	54.9	78.3
	Regional	23	46.0	14.2	0.0	33.0	411	51.4	47.5	41.1	53.9
	Distant	22	44.0	16.8	0.0	35.9	151	18.9	19.0	11.0	27.0
	Unknown	0	0.0				131	16.4	42.2	30.9	53.4
Esophagus	All	30					6,406				
	Local	9	30.0				1,531	23.9	25.5	22.4	28.6
	Regional	11	36.7				1,546	24.1	10.9	8.7	13.0
	Distant	8	26.7				1,659	25.9	1.5	0.7	2.3
	Unknown	2	6.7				1,670	26.1	10.6	8.5	12.7
Stomach	All	97					13,995				
	Local	21	21.6	62.6	33.6	91.7	2,520	18.0	57.7	54.6	60.7
	Regional	37	38.1	18.3	0.0	37.3	4,379	31.3	20.6	19.0	22.2
	Distant	33	34.0	0.0	0.0	9.1	5,040	36.0	2.0	1.4	2.5
	Unknown	6	6.2				2,056	14.7	11.2	9.2	13.3
Colon/Rectum	All	360					97,416				
	Local	151	41.9	89.2	78.0	100.0	36,243	37.2	91.9	91.1	92.6
	Regional	131	36.4	62.8	49.7	75.9	36,812	37.8	63.2	62.4	63.9
	Distant	69	19.2	6.9	0.0	15.2	18,687	19.2	7.3	6.8	7.8
	Unknown	9	2.5				5,674	5.8	34.1	32.2	35.9
Liver	All	35					4,021				
	Local	21	60.0	59.4	31.3	87.5	888	22.1	15.1	11.9	18.3
	Regional	6	17.1				832	20.7	5.5	3.4	7.7
	Distant	5	14.3				918	22.8	3.5	2.0	5.0
	Unknown	3	8.6				1,383	34.4	3.3	2.0	4.7
Gallbladder	All	37					4,682				
	Local	6	16.2				1,038	22.2	36.1	32.0	40.3
	Regional	20	54.1	25.4	2.3	48.6	1,659	35.4	16.0	13.5	18.5
	Distant	11	29.7				1,363	29.1	1.4	0.5	2.2
	Unknown	0	0.0				622	13.3	6.7	3.7	9.8
Pancreas	All	51					18,044				
	Local	4	7.8				1,446	8.0	11.7	9.3	14.0
	Regional	12	23.5				4,113	22.8	5.0	4.0	5.9
	Distant	32	62.7	0.0	0.0	9.4	8,718	48.3	1.5	1.1	1.8
	Unknown	3	5.9				3,767	20.9	3.8	2.9	4.7
Lung	All	389					110,473				
	Local	67	17.2	31.7	14.4	48.9	16,991	15.4	48.7	47.6	49.7
	Regional	117	30.1	11.7	3.5	19.9	28,755	26.0	17.6	17.0	18.2
	Distant	159	40.9	1.5	0.0	3.8	48,251	43.7	1.8	1.7	2.0
	Unknown	46	11.8	7.0	0.0	16.3	16,476	14.9	7.8	7.3	8.4
Breast	All	256					119,312				
	Local	146	57.0	89.3	79.6	99.0	70,839	59.4	96.7	96.4	97.1
	Regional	91	35.5	68.8	56.6	81.1	37,657	31.6	76.5	75.9	77.2
	Distant	13	5.1				6,872	5.8	20.9	19.6	22.2
	Unknown	6	2.3				3,944	3.3	56.1	53.8	58.5

Alaska Native Cancer Survival Report

		Alaska Natives					US Whites				
Stage	N	%	5 Year Relative Survival	95% Confidence Interval Lower Upper		N	%	5 Year Relative Survival	95% Confidence Interval Lower Upper		
Cervix	All	59				8,966					
	Local	39	66.1	78.0	62.2	93.7	4,820	53.8	91.8	90.6	92.9
	Regional	14	23.7				2,806	31.3	52.0	49.6	54.3
	Distant	6	10.2				721	8.0	11.5	8.5	14.4
	Unknown	0	0.0				619	6.9	62.1	56.8	67.3
Uterus	All	21				24,759					
	Local	18	85.7				18,706	75.6	96.3	95.6	97.0
	Regional	2	9.5				2,972	12.0	70.5	68.1	72.9
	Distant	0	0.0				2,127	8.6	30.1	27.6	32.6
	Unknown	1	4.8				954	3.9	60.6	55.9	65.3
Ovary	All	43				16,481					
	Local	13	30.2				3,892	23.6	92.1	90.7	93.6
	Regional	6	14.0				2,498	15.2	47.9	45.4	50.4
	Distant	22	51.2	26.7	1.5	51.9	9,190	55.8	23.7	22.5	24.9
	Unknown	2	4.7				901	5.5	27.2	23.2	31.3
Prostate	All	113				113,300					
	Local	80	70.8	86.5	65.6	100.0	66,878	59.0	99.1	98.5	99.7
	Regional	20	17.7	87.8	55.2	100.0	20,546	18.1	92.9	91.8	94.0
	Distant	9	8.0				12,268	10.8	30.7	29.5	32.0
	Unknown	4	3.5				13,608	12.0	82.1	80.4	83.8
Testis	All	22				6,138					
	Local	14	63.6				4,025	65.6	98.2	97.4	98.9
	Regional	4	18.2				1,232	20.1	96.6	95.1	98.1
	Distant	4	18.2				715	11.6	71.8	68.0	75.7
	Unknown	0	0.0				166	2.7	90.1	83.9	96.2
Urinary Bladder	All	34				37,293					
	Local	23	67.6	92.6	66.3	100.0	27,706	74.3	94.2	93.7	94.6
	Regional	7	20.6				6,809	18.3	49.5	48.1	50.8
	Distant	2	5.9				1,094	2.9	7.3	5.8	8.8
	Unknown	2	5.9				1,684	4.5	64.6	62.3	66.9
Kidney	All	99				16,411					
	Local	50	50.5	72.3	52.5	92.1	7,497	45.7	88.4	87.0	89.8
	Regional	14	14.1				3,896	23.7	60.1	57.8	62.4
	Distant	30	30.3	17.6	0.0	35.8	3,980	24.3	9.2	8.1	10.4
	Unknown	5	5.1				1,038	6.3	31.9	27.8	36.0
Thyroid	All	30				9,825					
	Local	20	66.7	99.4	88.3	100.0	5,811	59.1	100.0	99.4	100.6
	Regional	9	30.0				3,132	31.9	93.6	92.2	95.0
	Distant	1	3.3				453	4.6	47.0	41.1	53.0
	Unknown	0	0.0				429	4.4	79.8	74.2	85.4
Leukemia	All	39				13,552					
	Local	0	0.0				0	0.0			
	Regional	0	0.0				0	0.0			
	Distant	39	100.0	32.7	12.7	52.7	13,552	100.0	42.2	40.9	43.4
	Unknown	0	0.0				0	0.0			
Non-Hodgkin's Lymphoma	All	38				20,676					
	Local	17	44.7				6,234	30.2	64.4	62.5	66.4
	Regional	8	21.1				2,698	13.0	59.6	56.6	62.5
	Distant	13	34.2				9,578	46.3	40.1	38.6	41.6
	Unknown	0	0.0				2,166	10.5	56.8	53.5	60.0
Ill Defined	All	60				20,985					
	Local	0	0.0				0	0.0			
	Regional	0	0.0				0	0.0			
	Distant	0	0.0				405	1.9	49.4	40.2	58.5
	Unknown	60	100.0	10.1	0.9	19.3	20,580	98.1	10.5	10.0	11.1

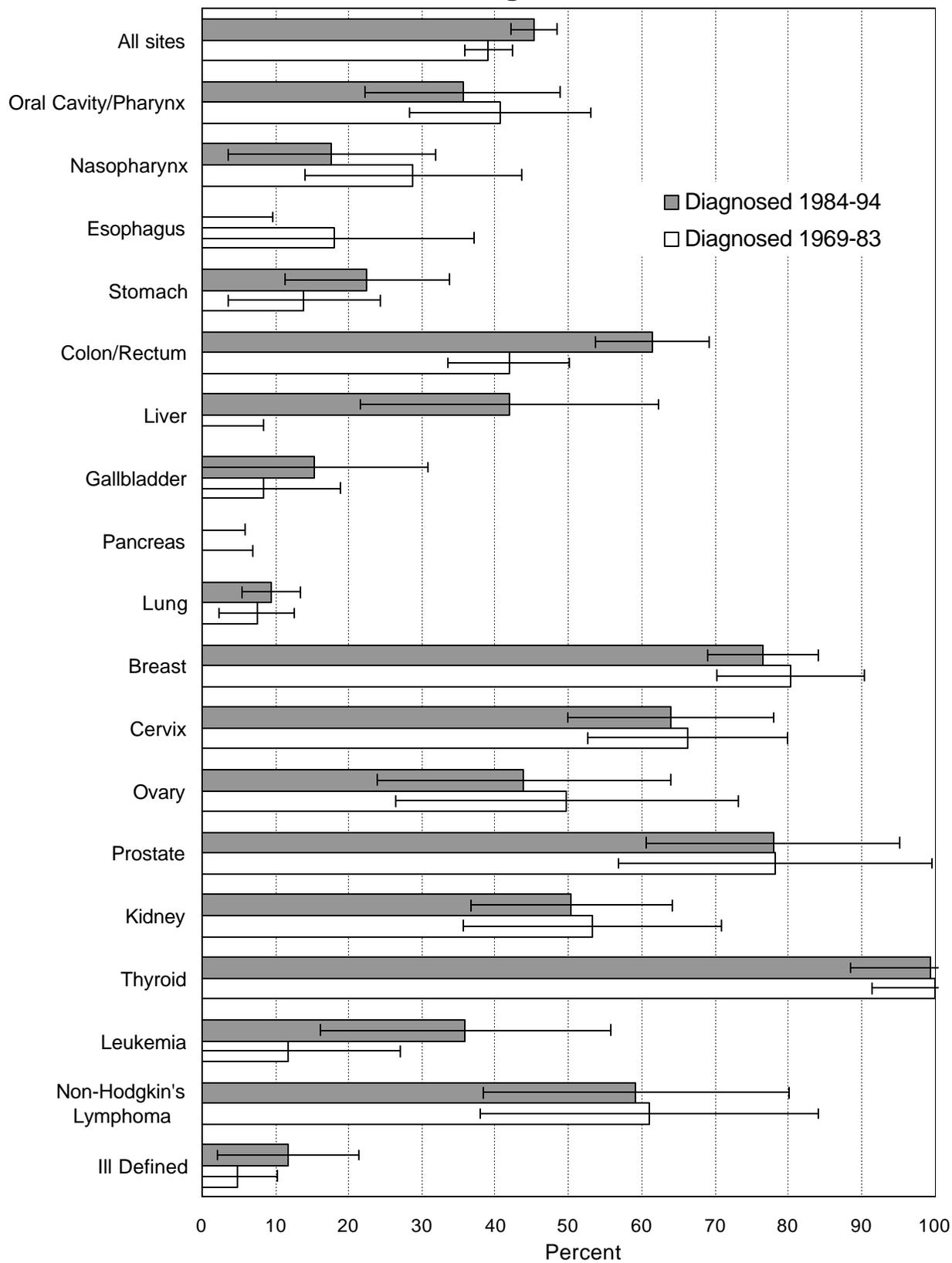
Alaska Native Cancer Survival Report

1984-94 Five Year Relative Survival, Alaska Native vs US White



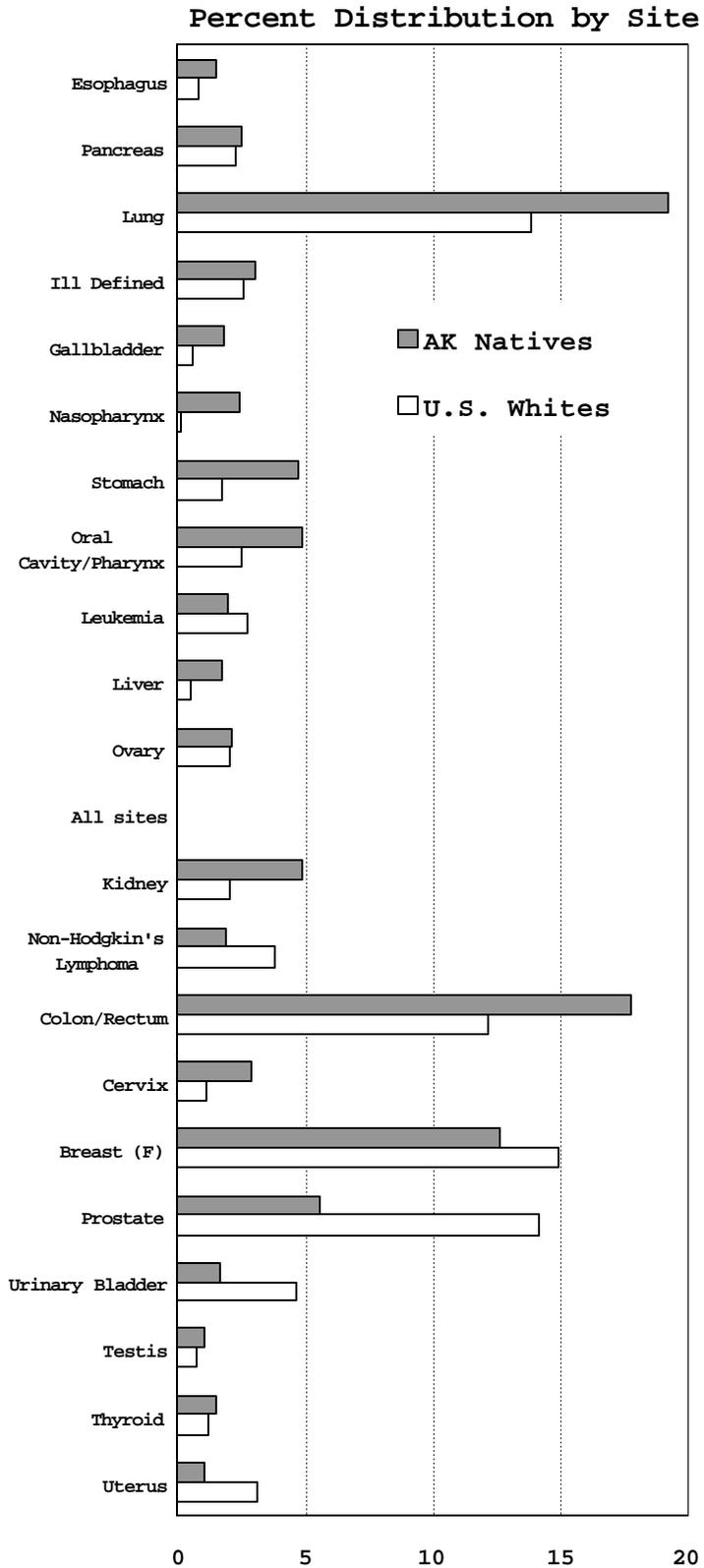
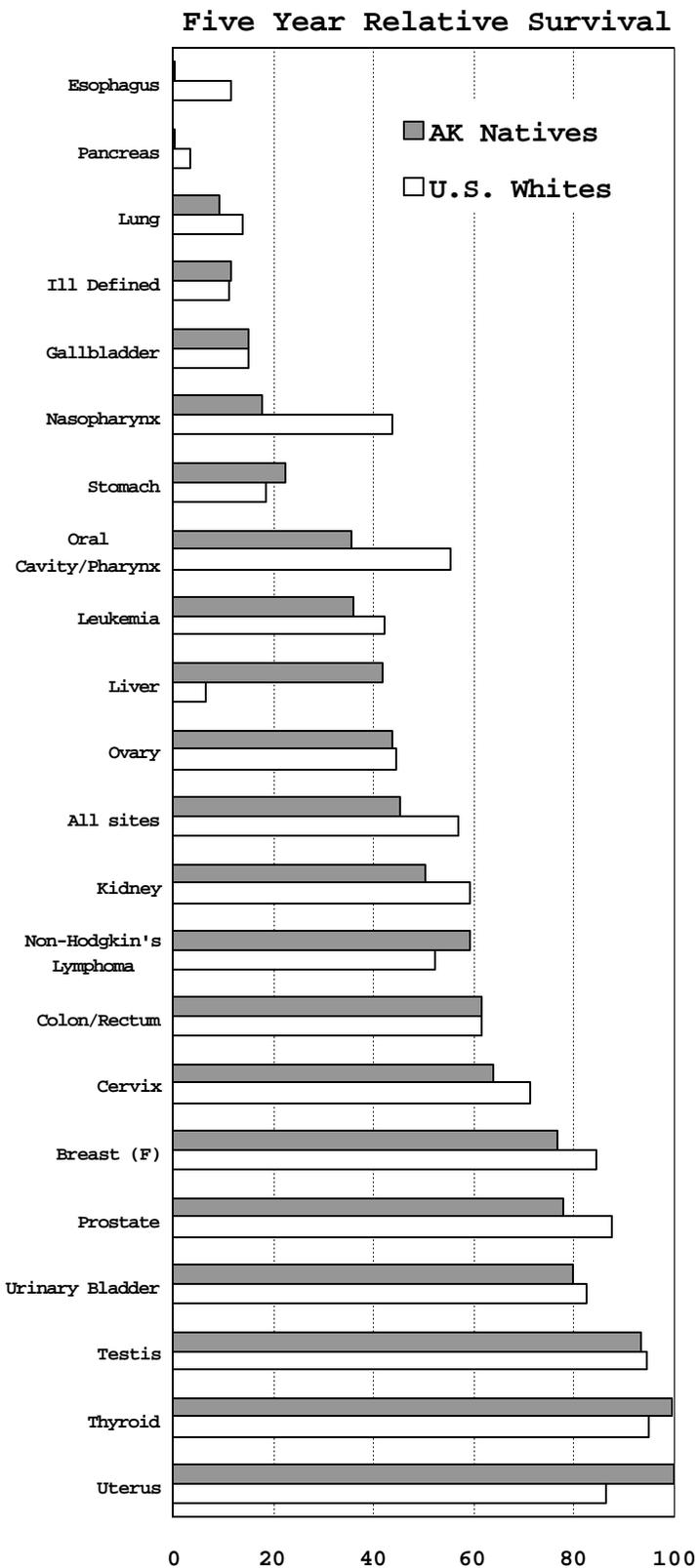
Alaska Native Cancer Survival Report

5 Year Relative Survival: Patients Diagnosed 1984-94 vs 1968-83



Alaska Native Cancer Survival Report

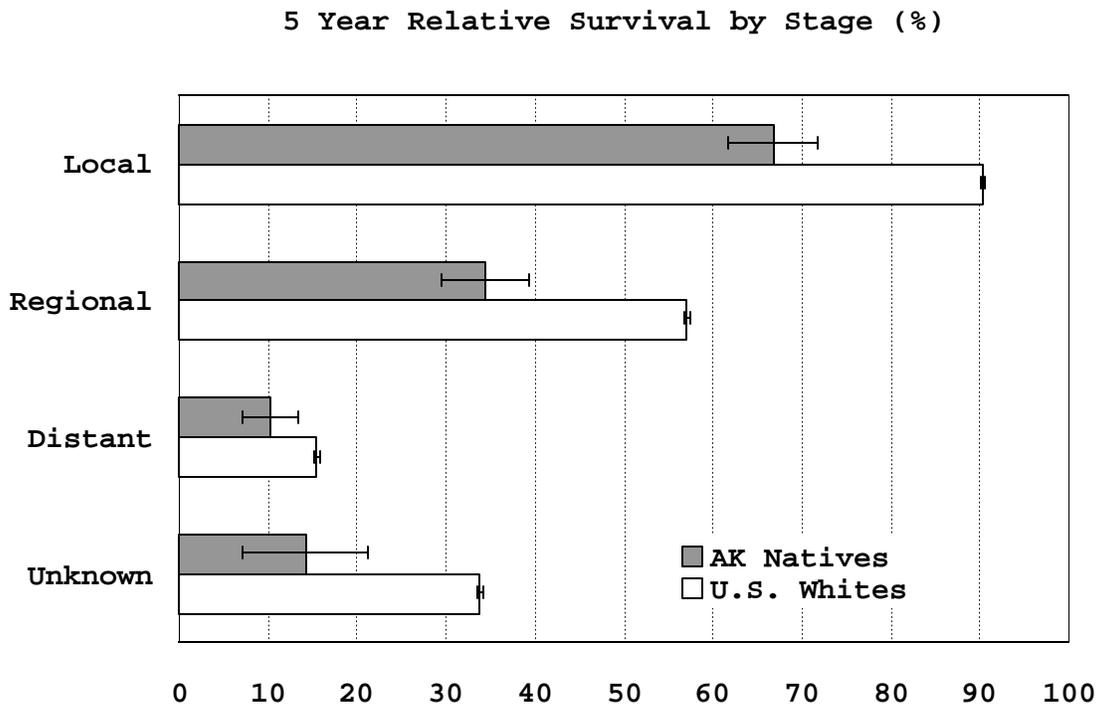
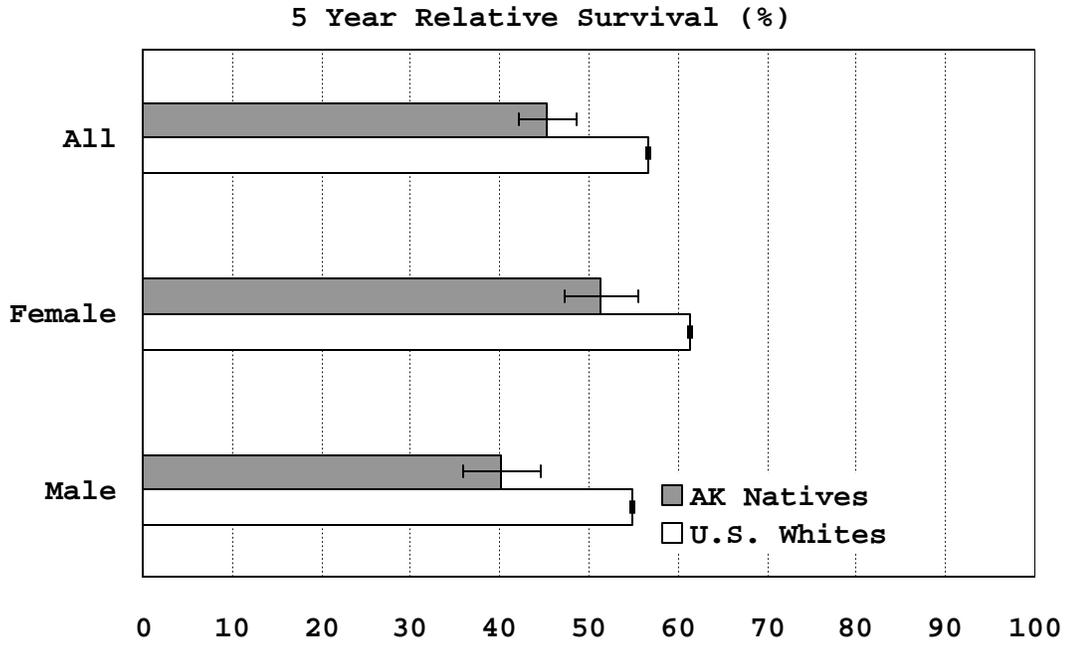
Cancer Survival and Cancer Distribution by Site, 1984-1994



Alaska Native Cancer Survival Report

All Sites

N=2024

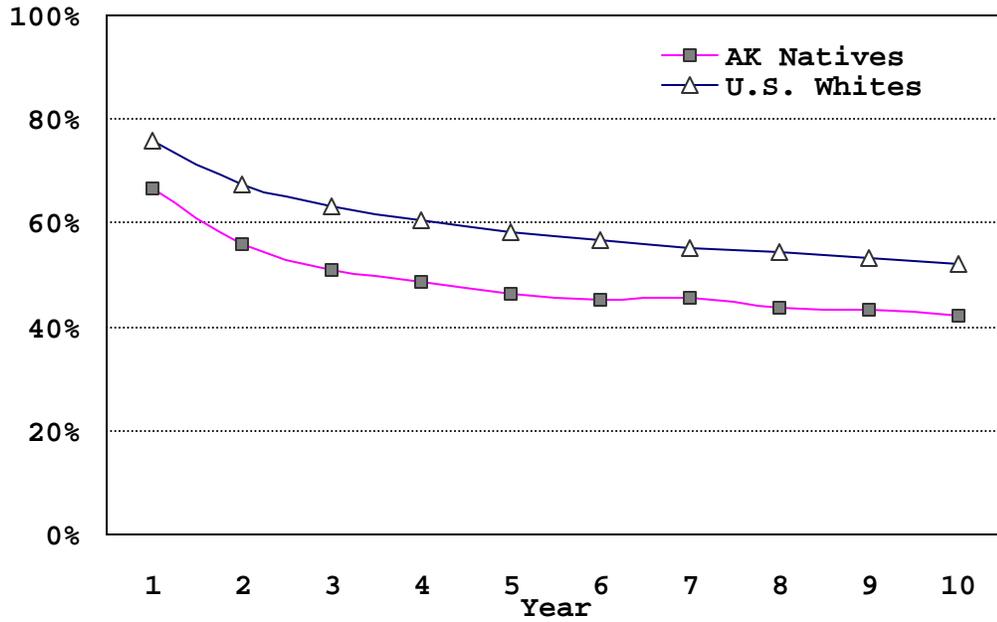


Alaska Native Cancer Survival Report

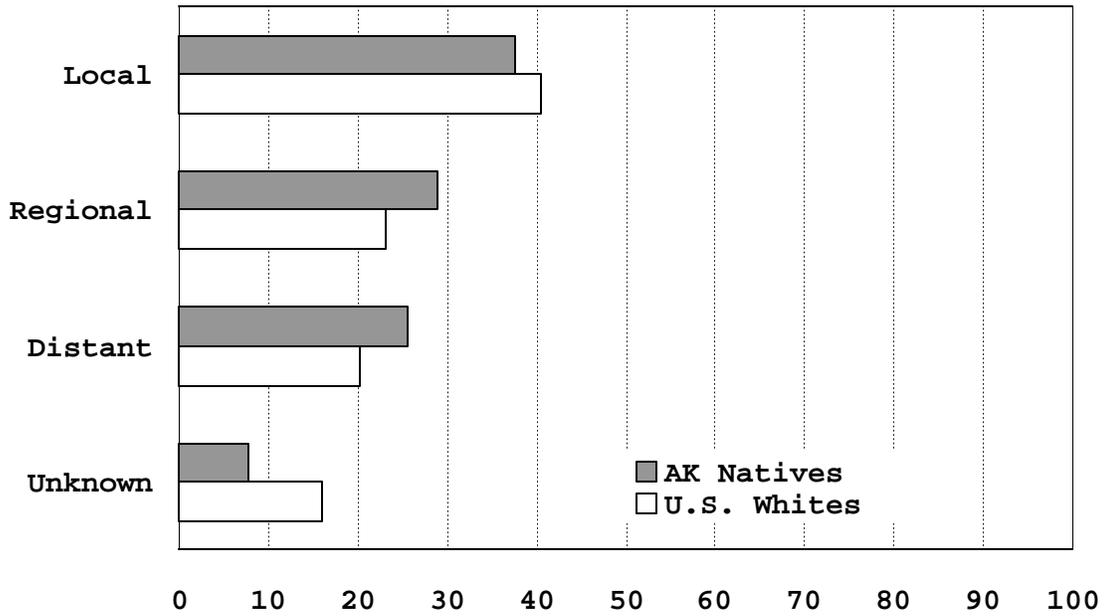
All Sites

N=2024

Relative Survival



Distribution by Stage (%)

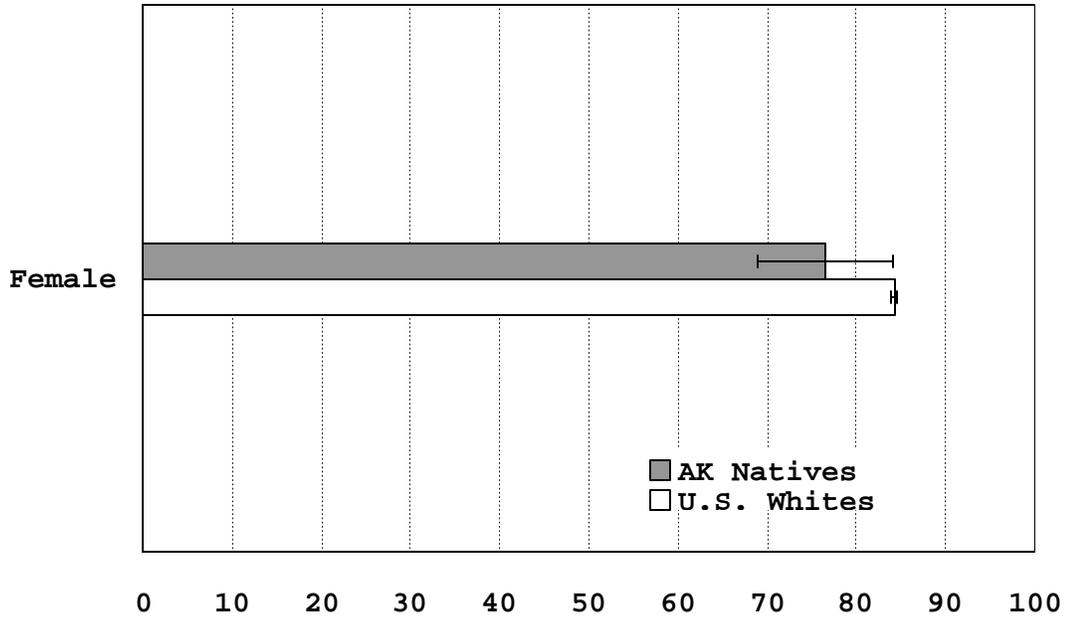


Alaska Native Cancer Survival Report

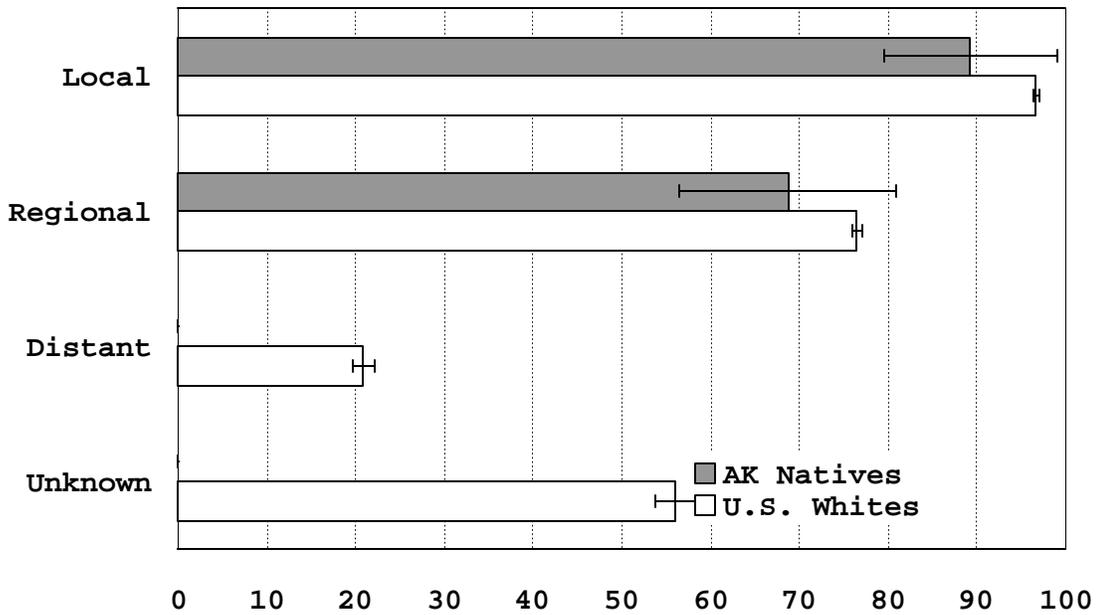
Breast

N=256

5 Year Relative Survival (%)



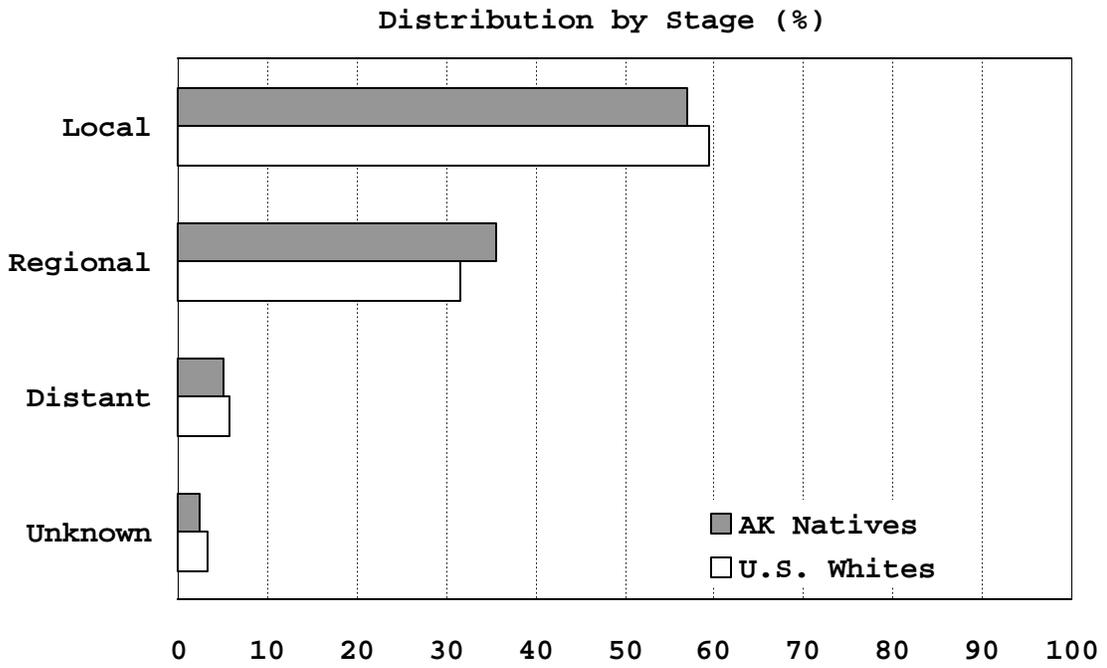
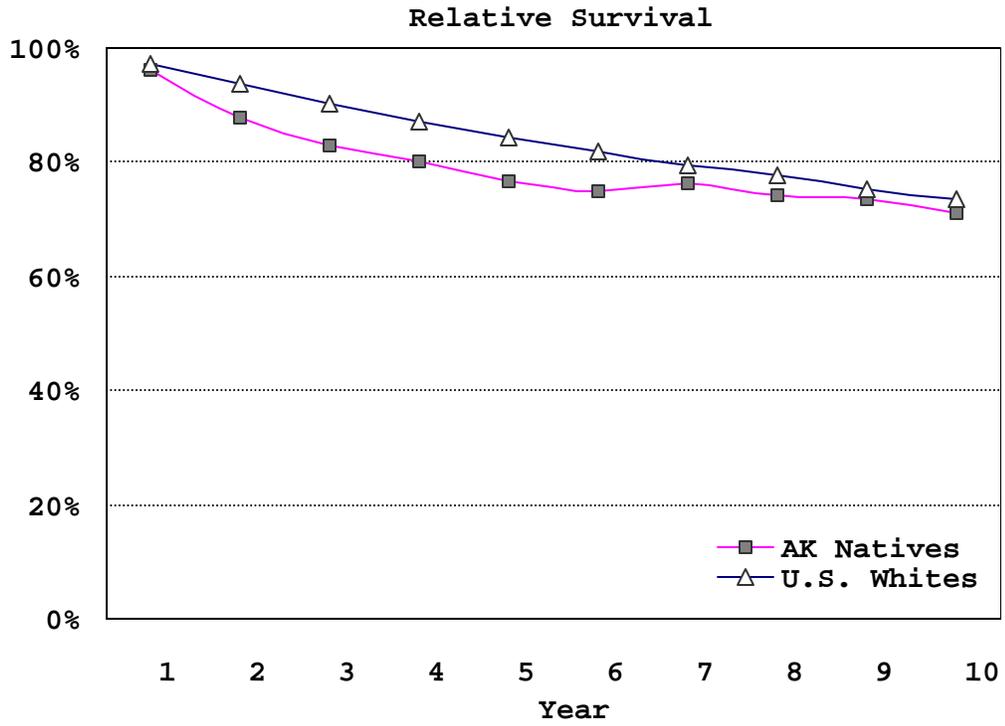
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

Breast

N=256

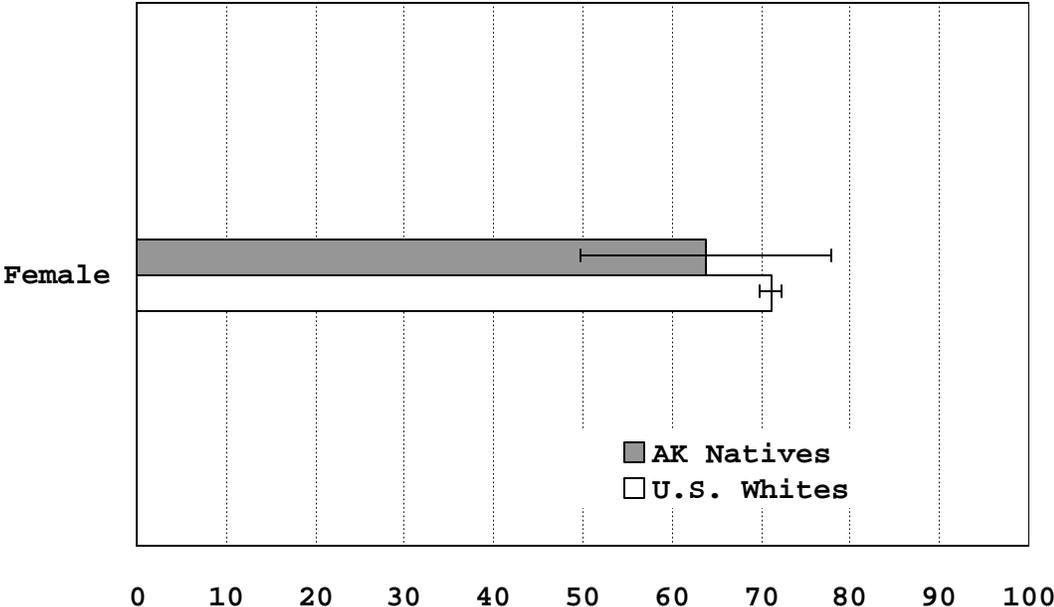


Alaska Native Cancer Survival Report

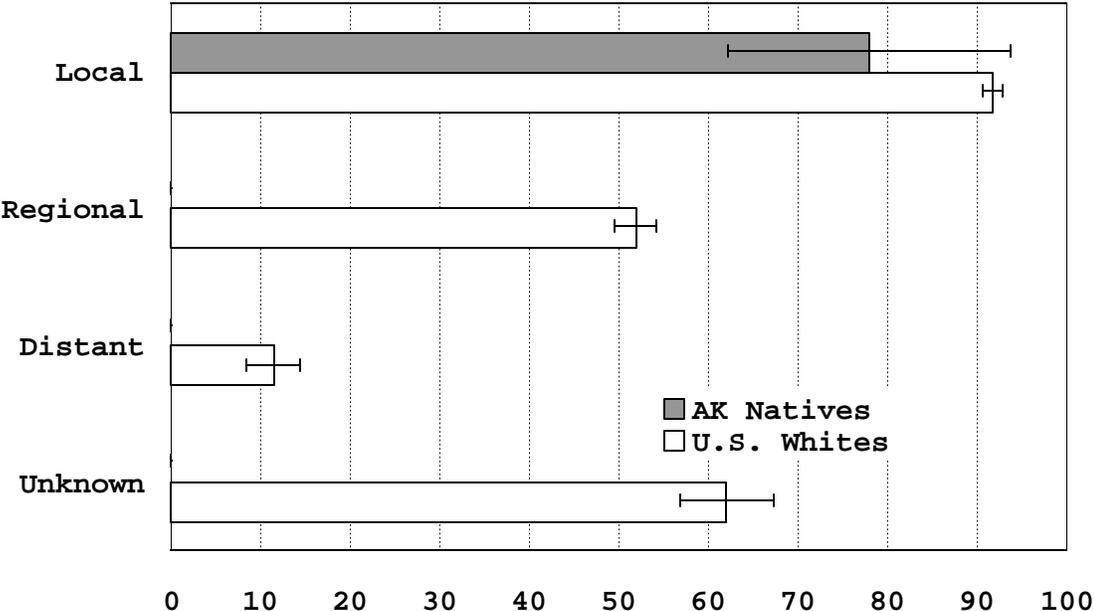
Cervix

N=59

5 Year Relative Survival (%)



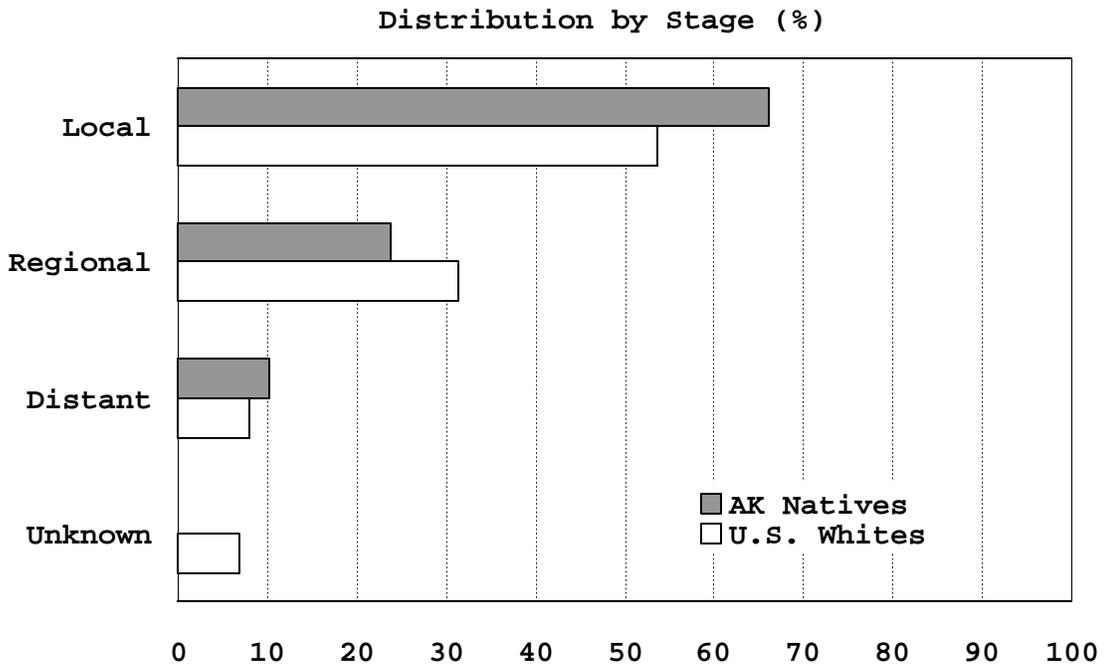
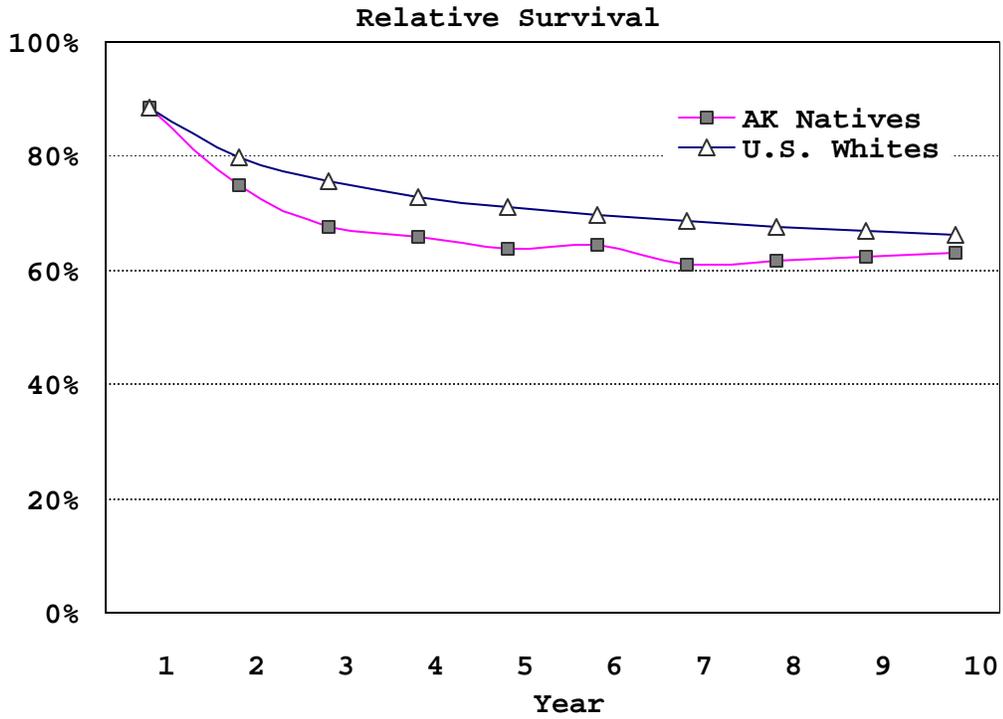
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

Cervix

N=59

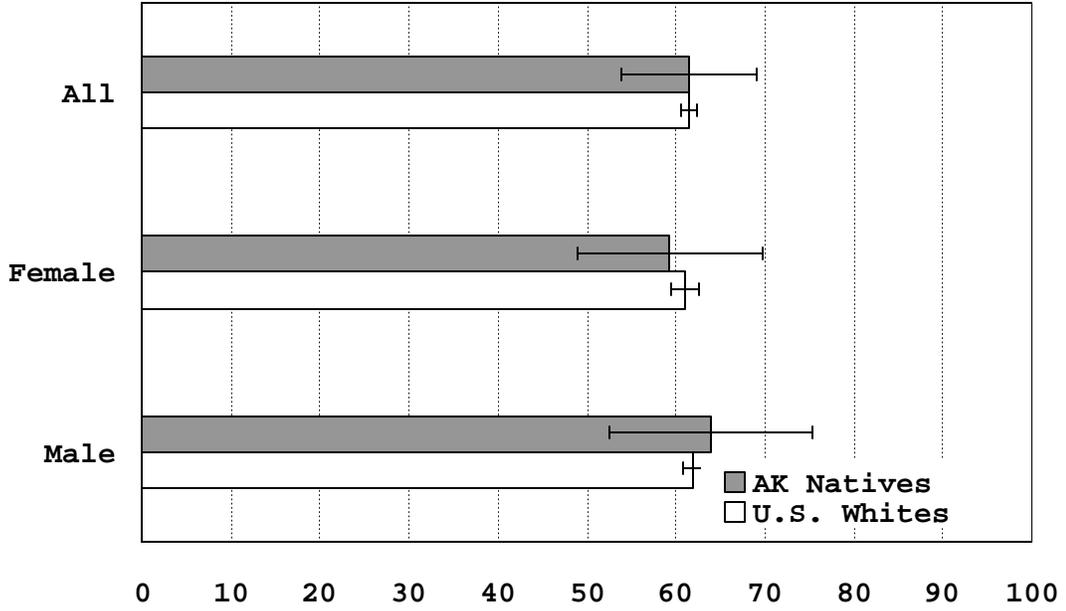


Alaska Native Cancer Survival Report

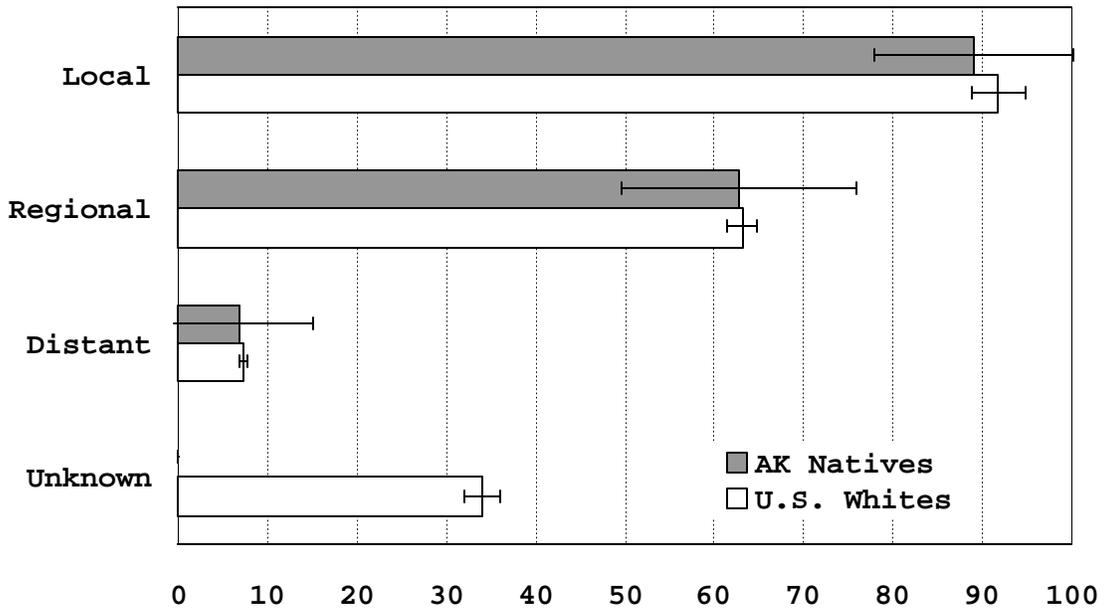
Colon/Rectum

N=360

5 Year Relative Survival (%)



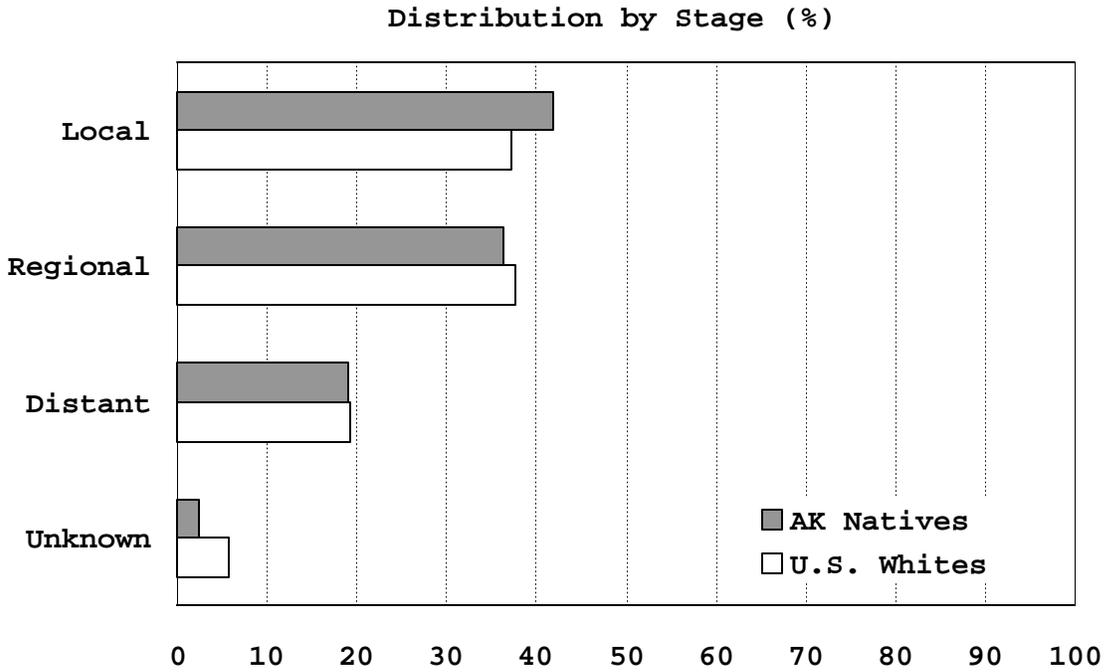
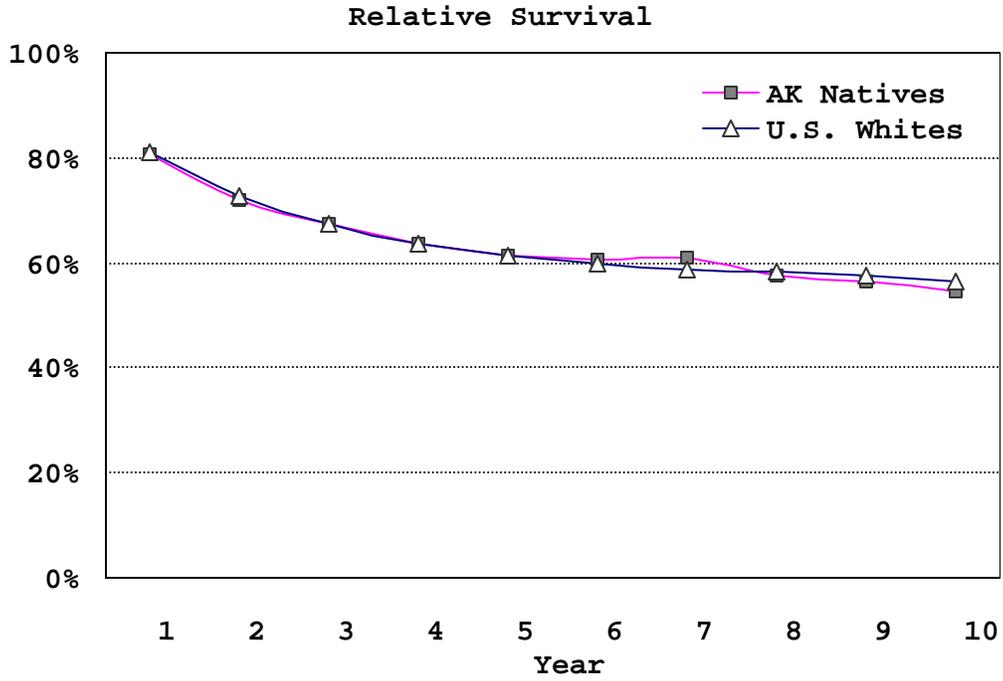
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

Colon/Rectum

N=360

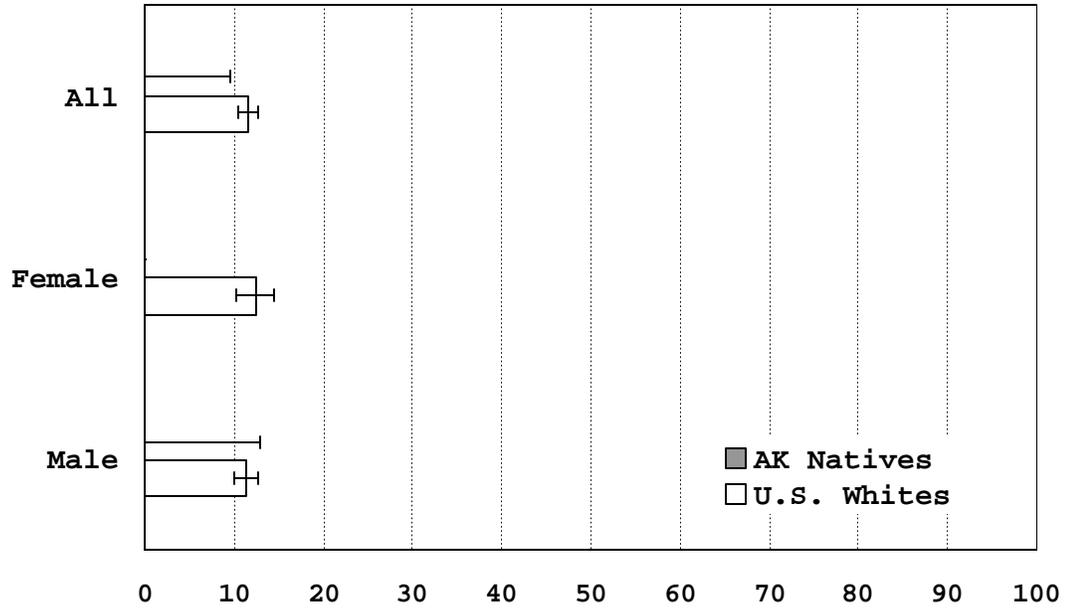


Alaska Native Cancer Survival Report 1984-1994

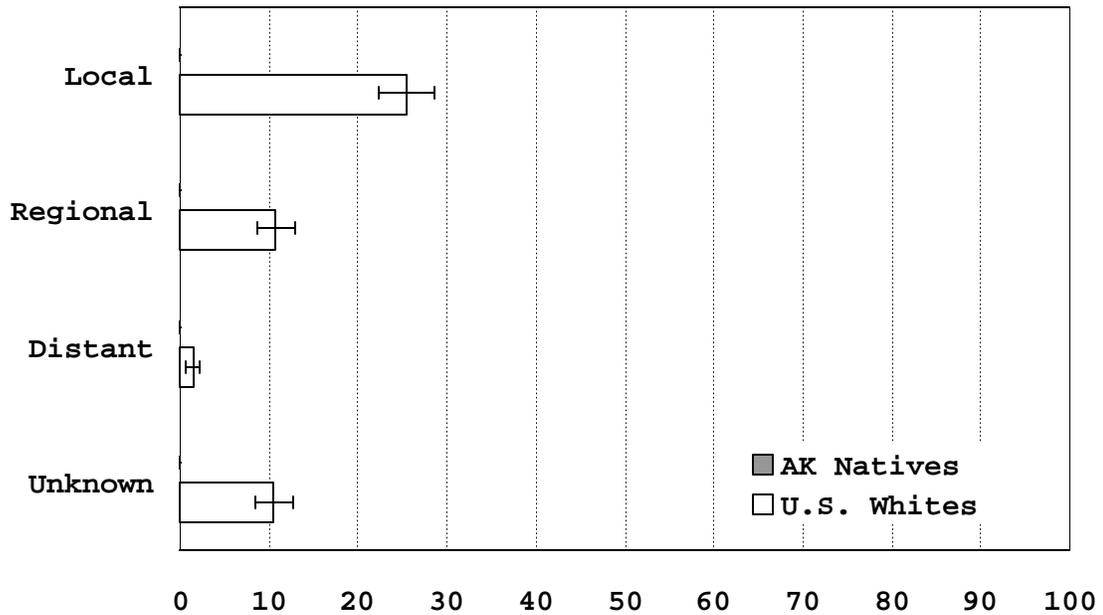
Esophagus^a

N=30

5 Year Relative Survival (%)



5 Year Relative Survival by Stage (%)



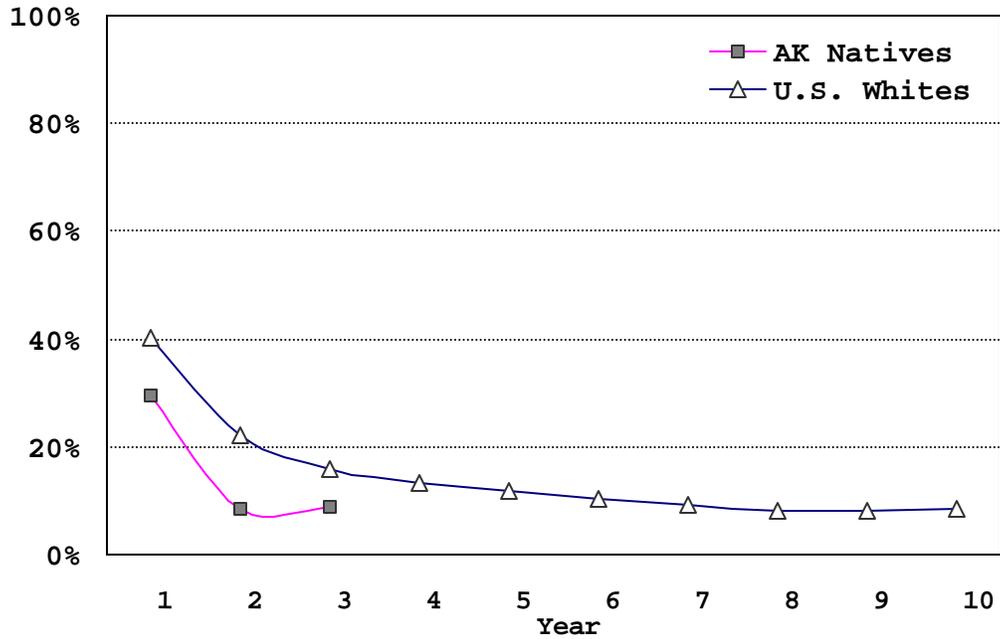
^a No Alaska Natives with esophageal cancer survived five years from diagnosis, however it is still possible to estimate a confidence interval for the zero five year survival.

Alaska Native Cancer Survival Report 1984-1994

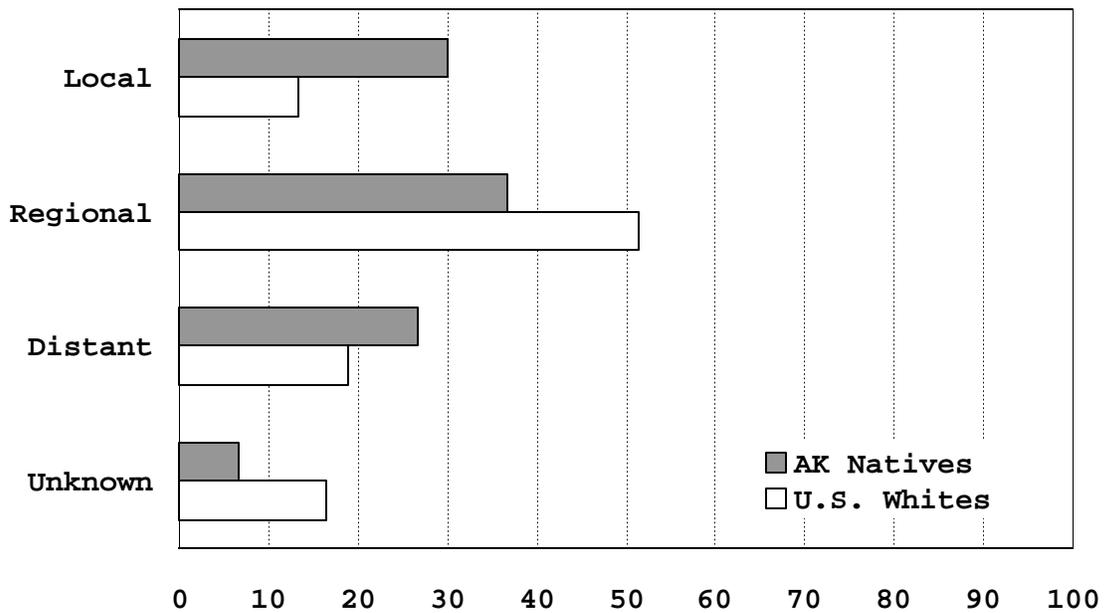
Esophagus

N=30

Relative Survival



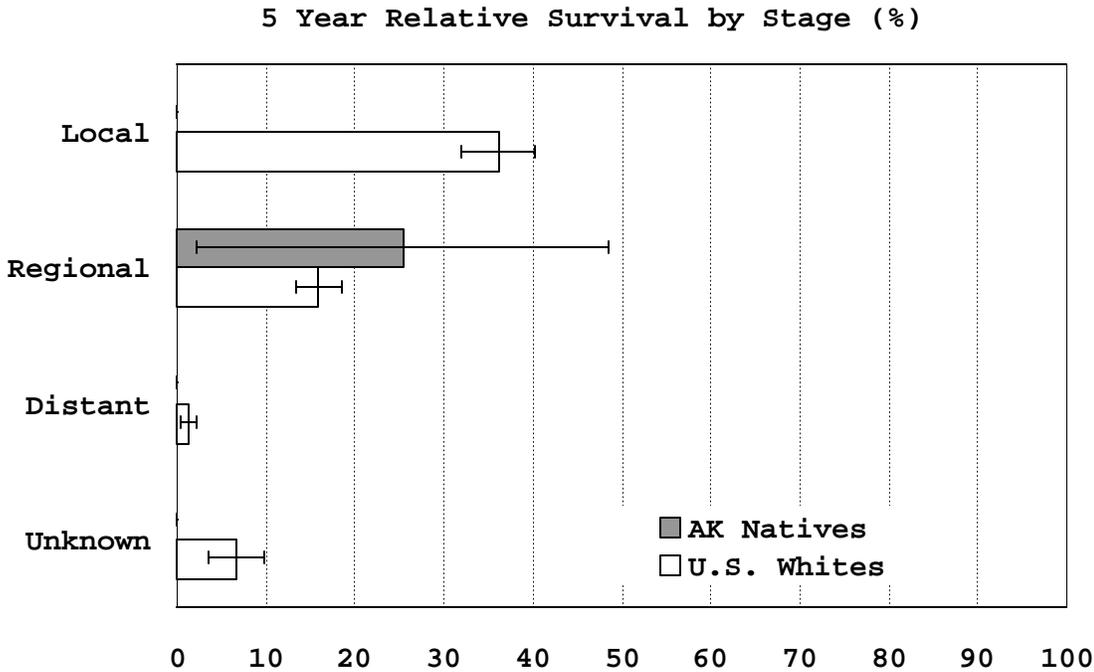
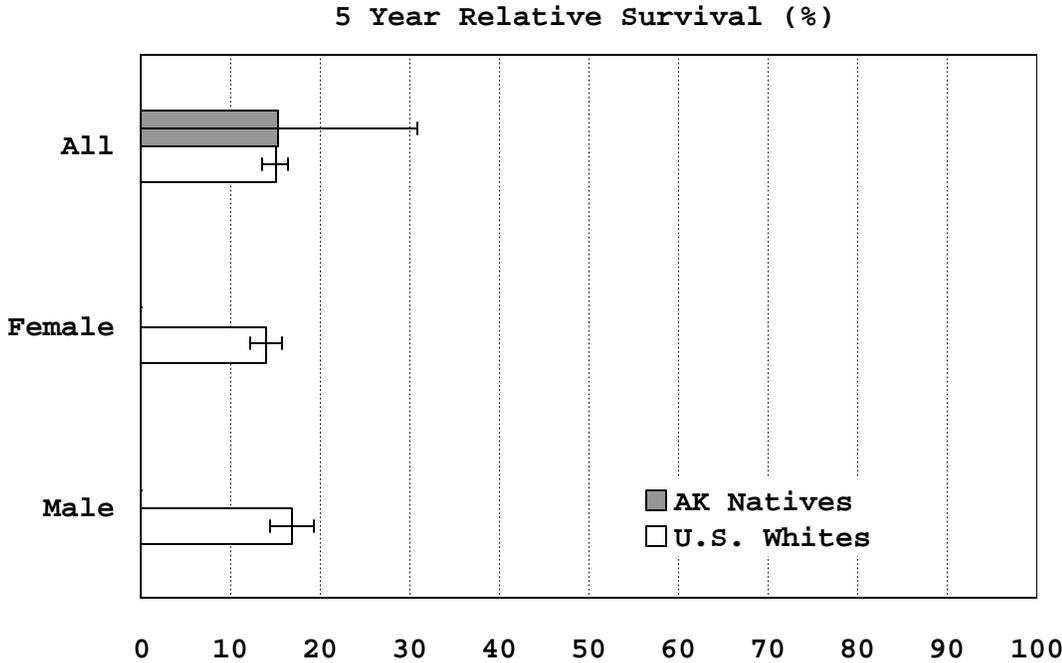
Distribution by Stage (%)



Alaska Native Cancer Survival Report

Gallbladder

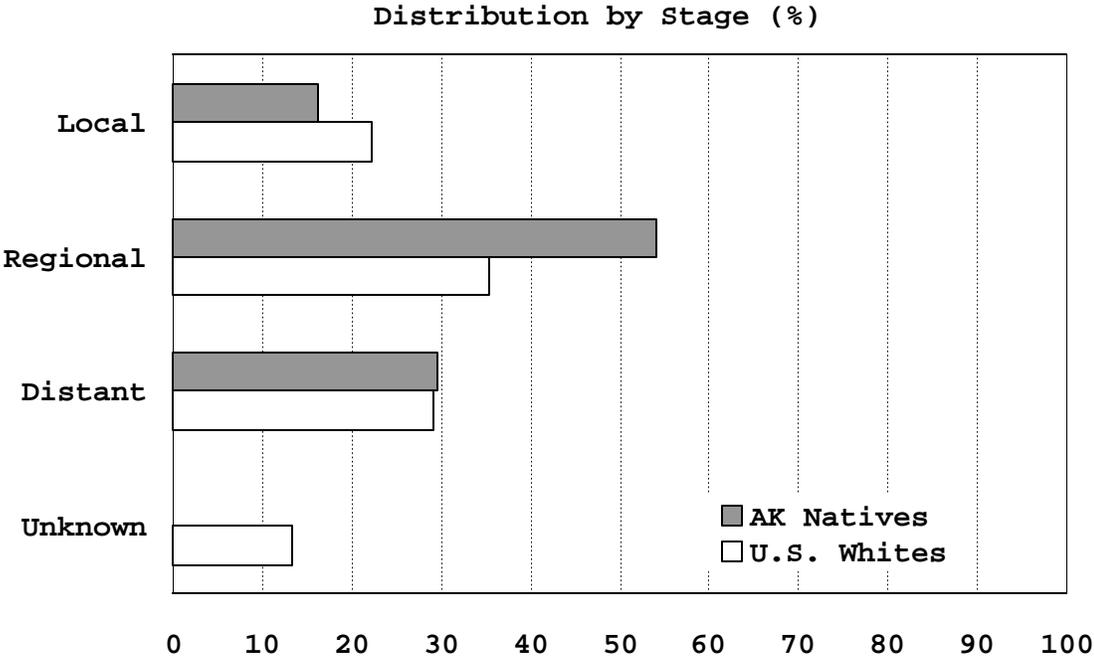
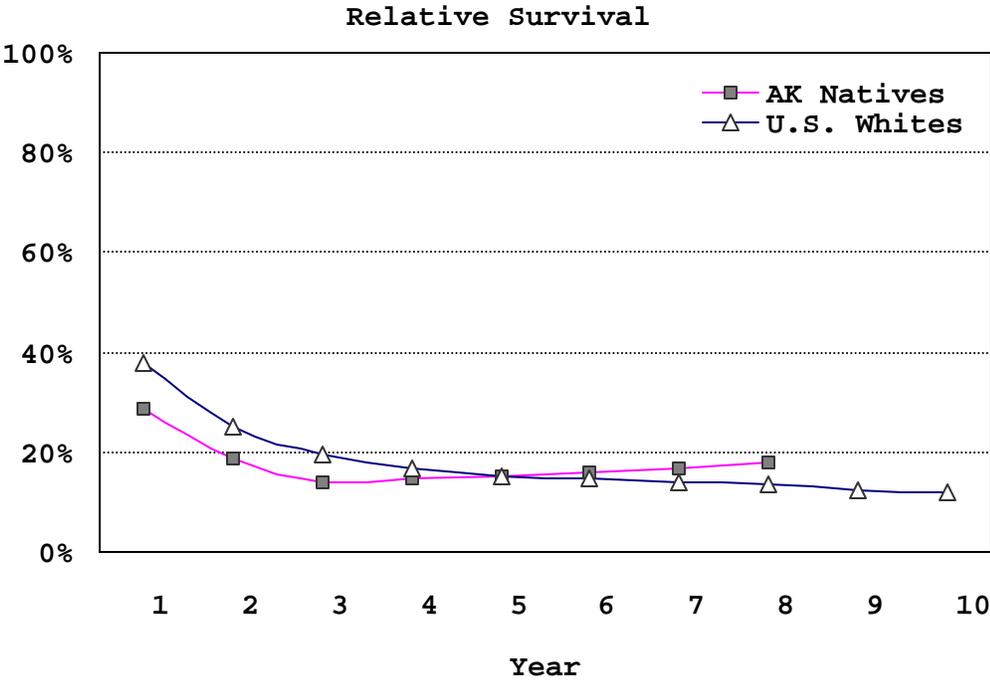
N=37



Alaska Native Cancer Survival Report

Gallbladder

N=37

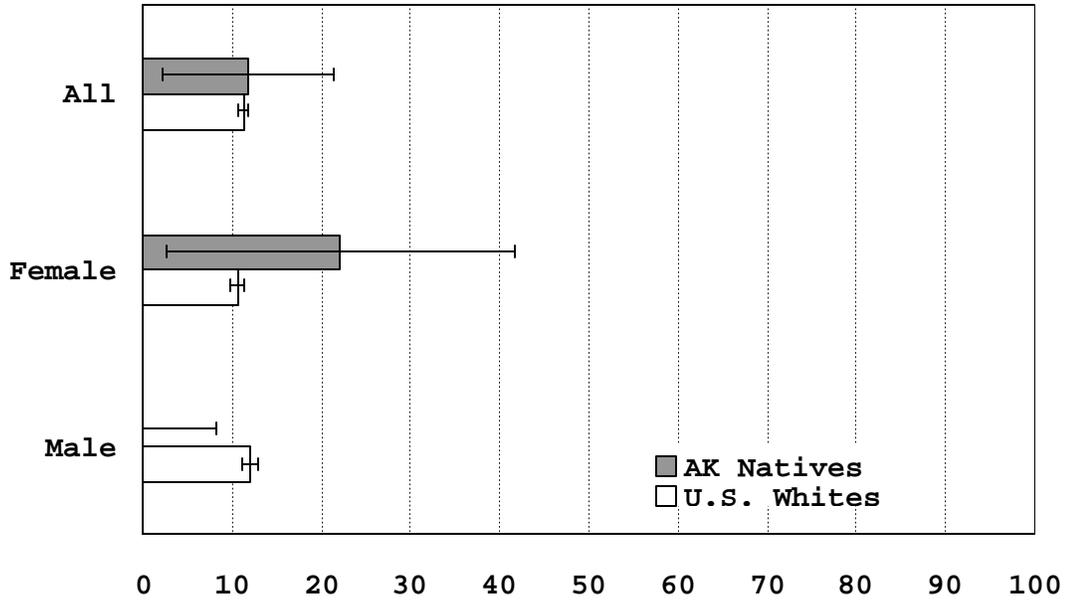


Alaska Native Cancer Survival Report

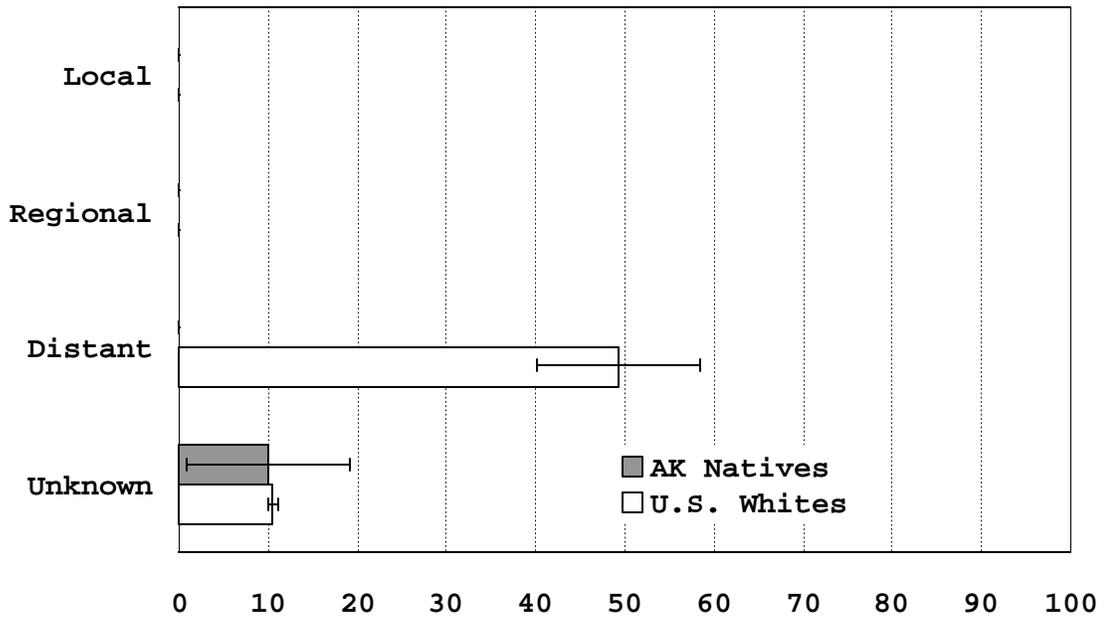
III Defined

N=62

5 Year Relative Survival (%)



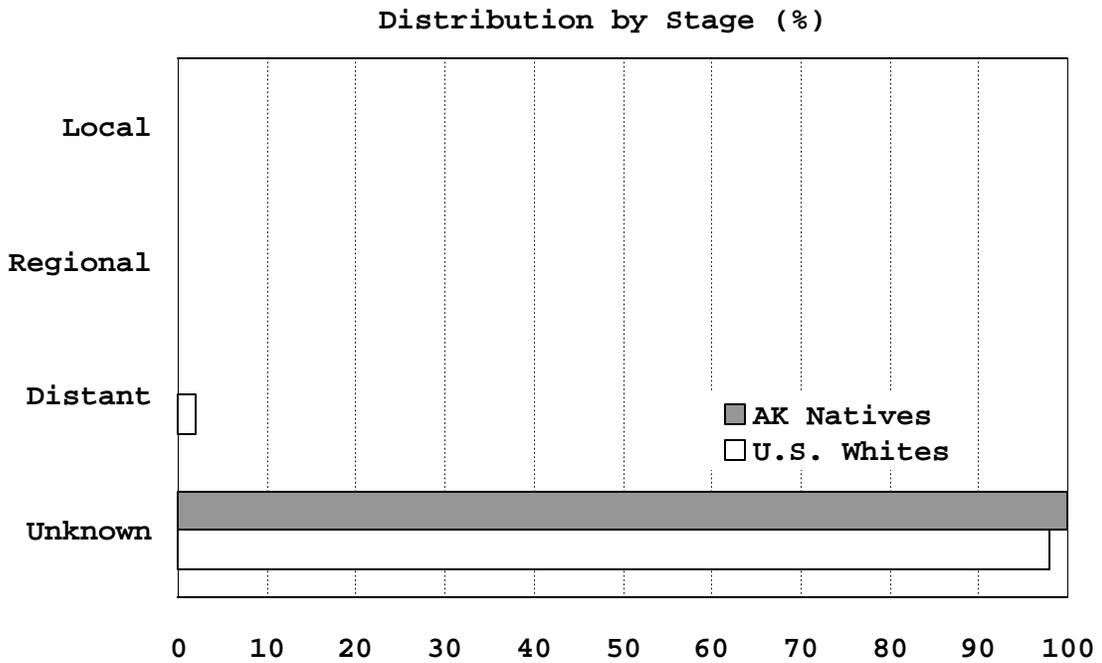
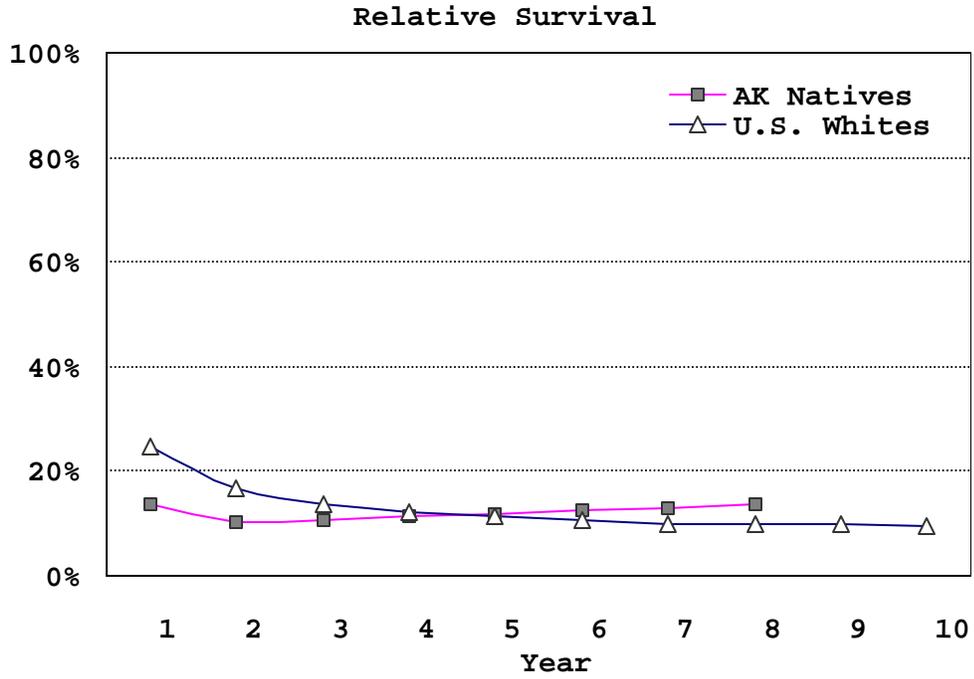
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

III Defined

N=62

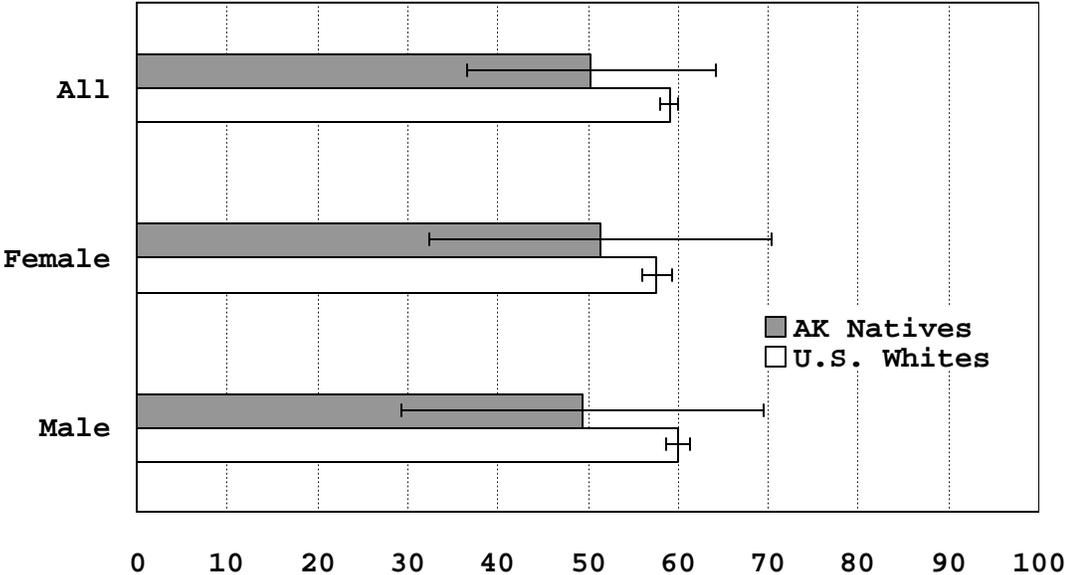


Alaska Native Cancer Survival Report

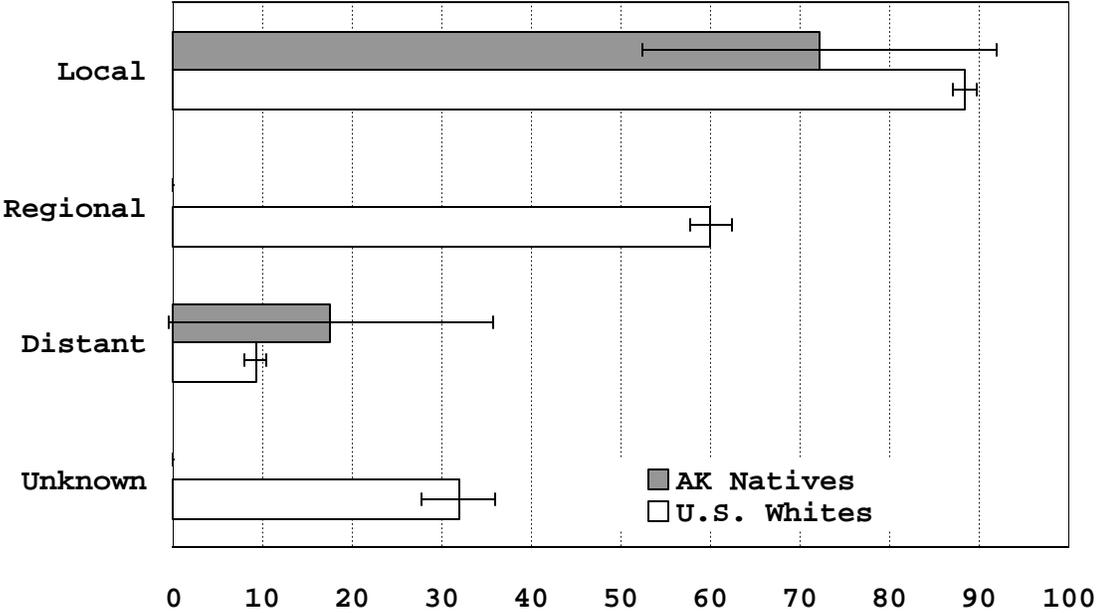
Kidney

N=99

5 Year Relative Survival (%)



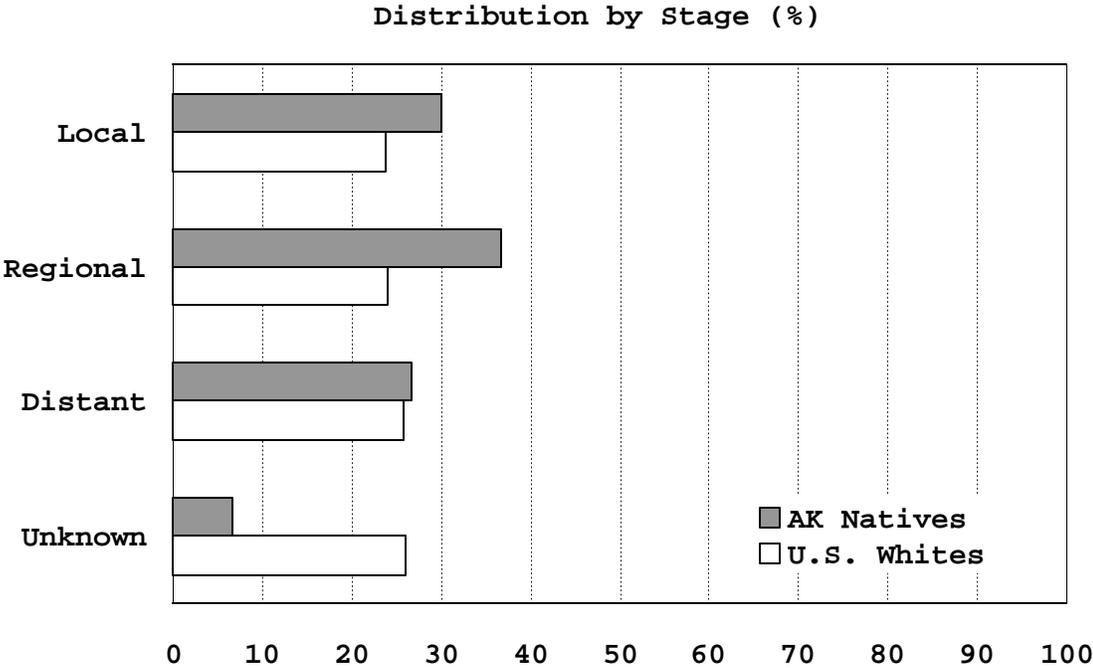
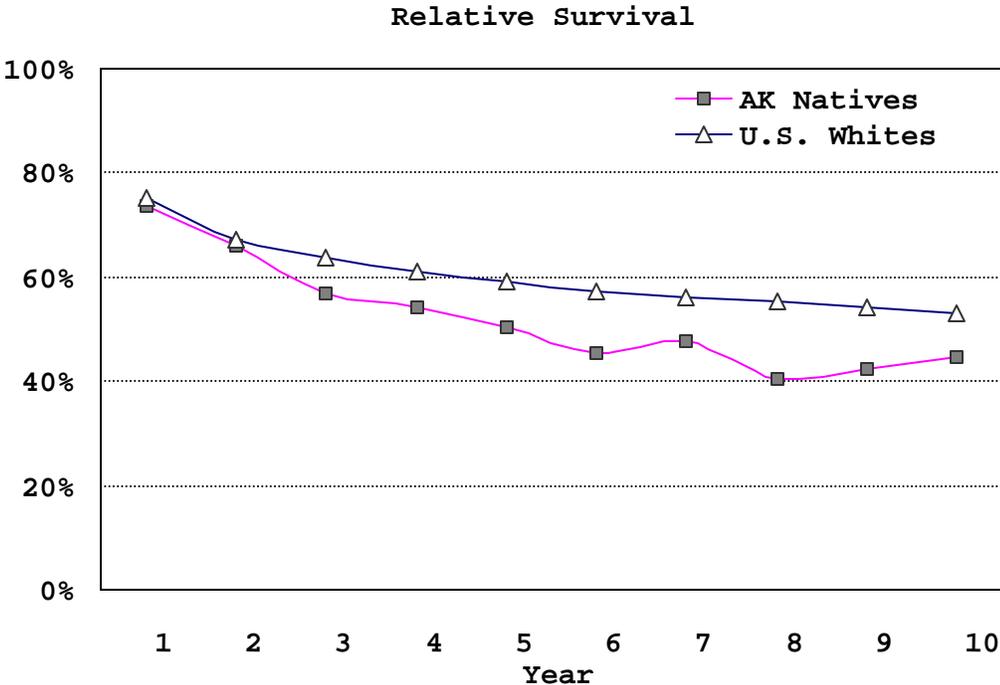
5 Year Relative Survival by Stage (%)



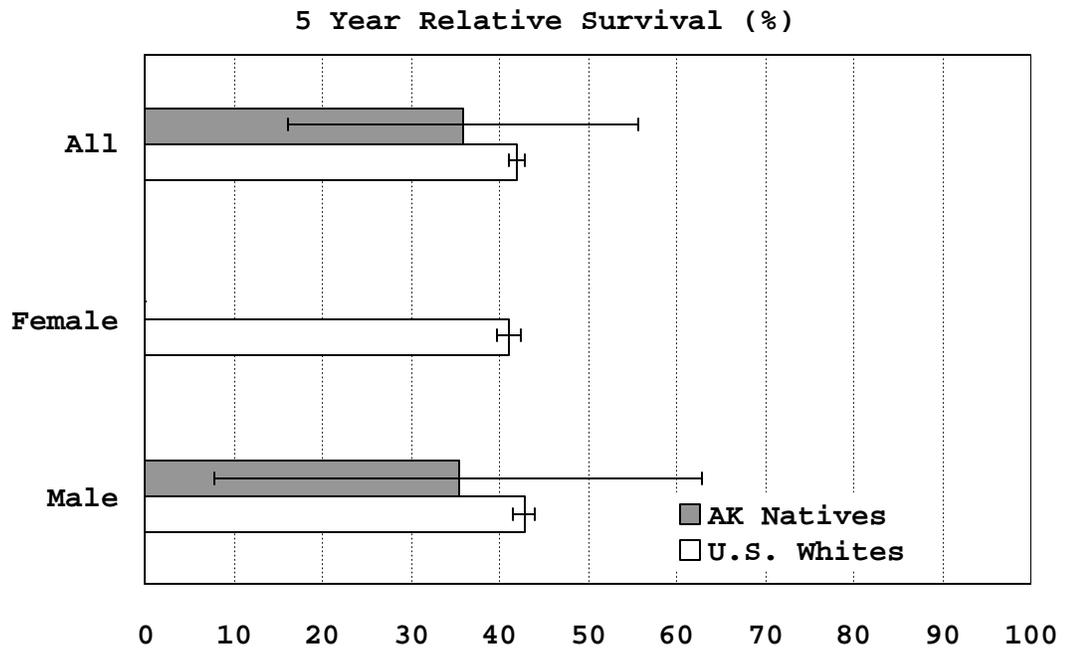
Alaska Native Cancer Survival Report

Kidney

N=99

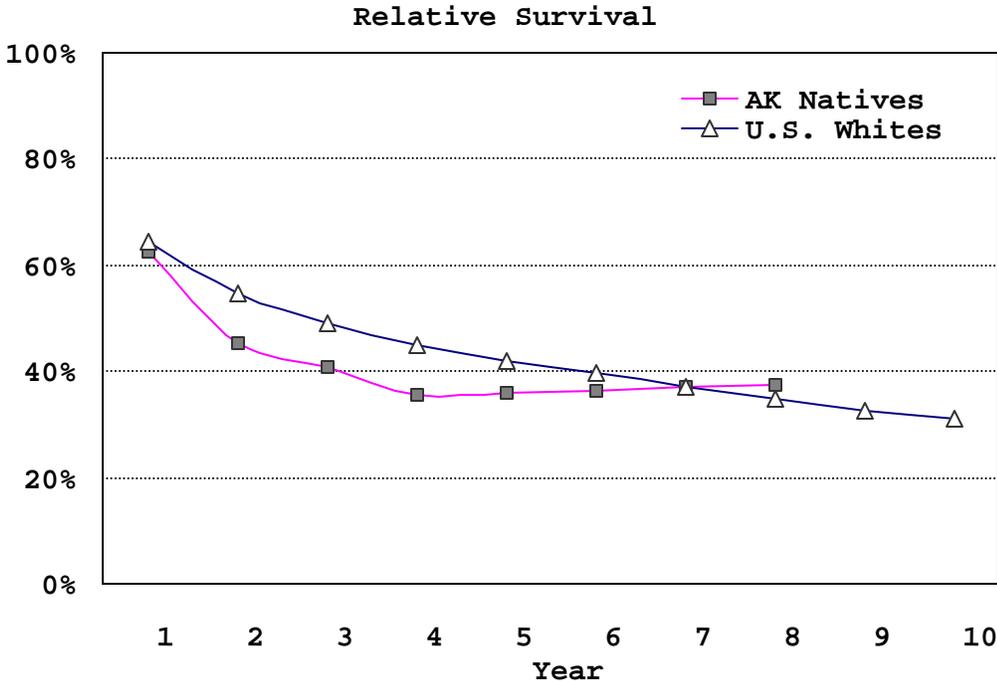


Alaska Native Cancer Survival Report
Leukemia
N=39



Leukemia is classified a disseminated disease, therefore staging is not applicable.

Alaska Native Cancer Survival Report
Leukemia
N=39



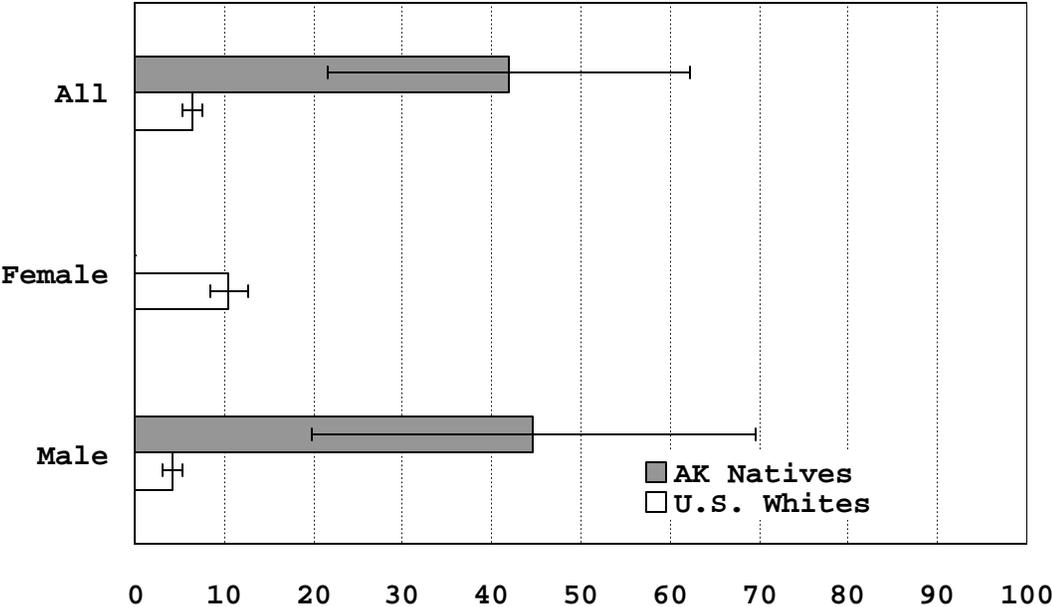
Leukemia is classified a disseminated disease, therefore staging is not applicable.

Alaska Native Cancer Survival Report

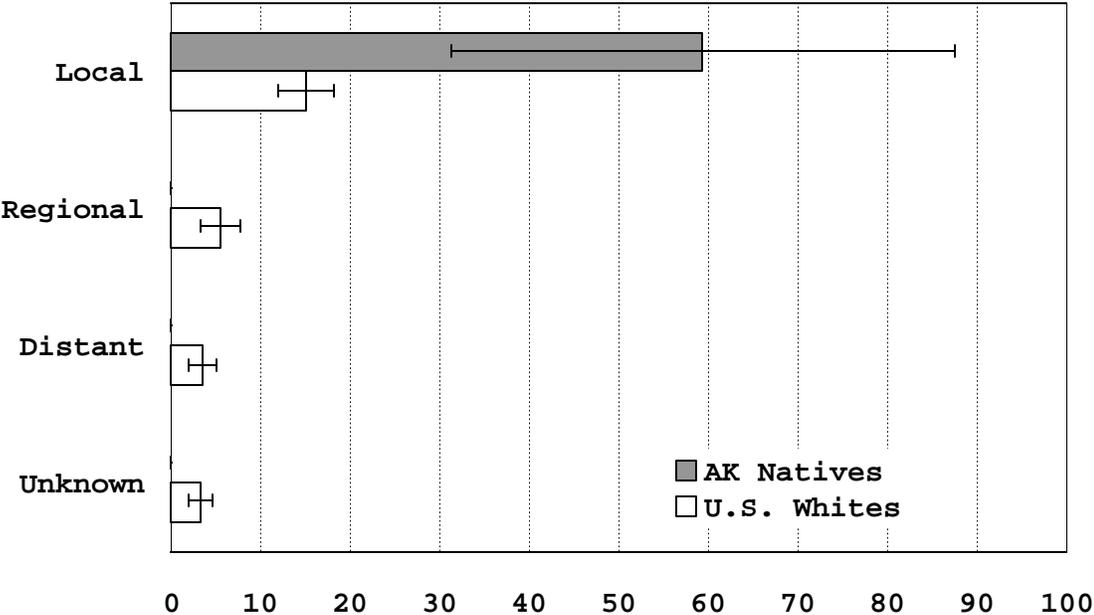
Liver

N=35

5 Year Relative Survival (%)



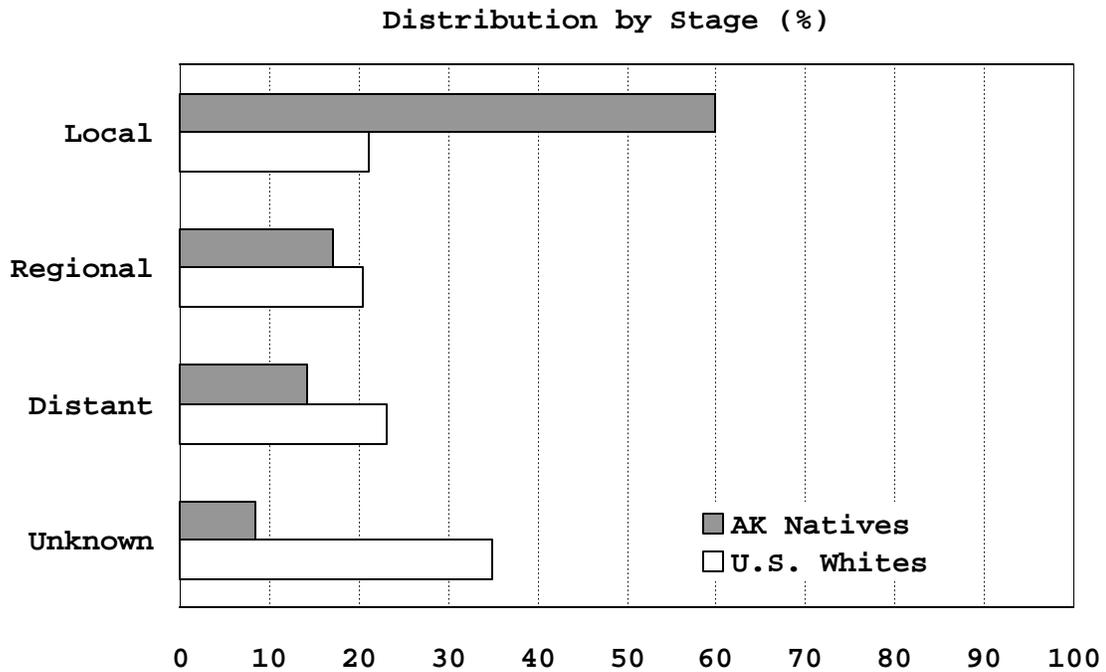
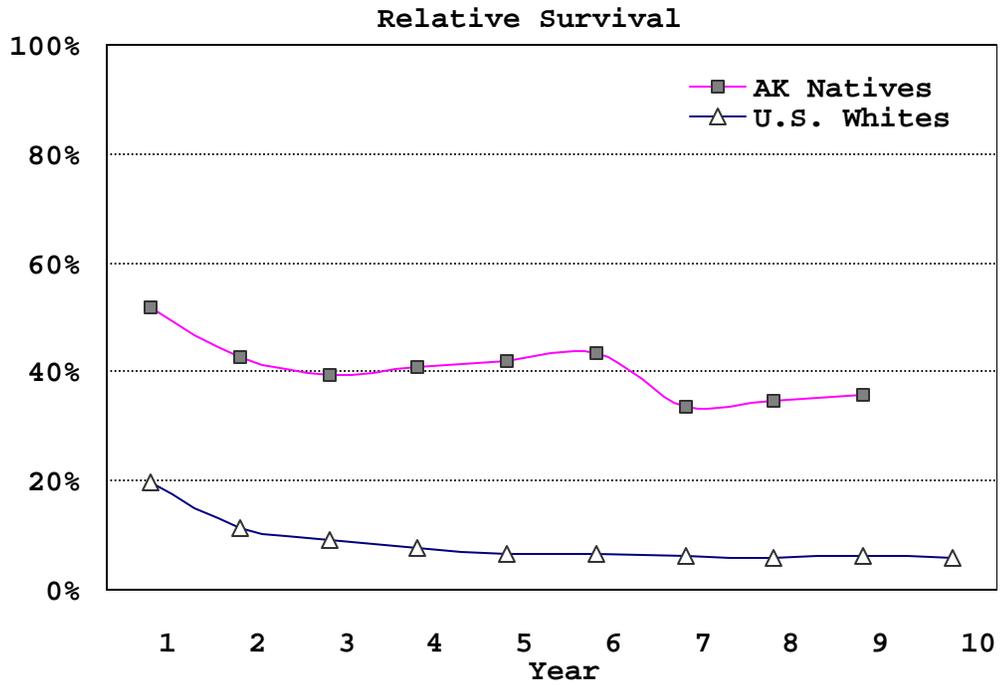
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

Liver

N=35

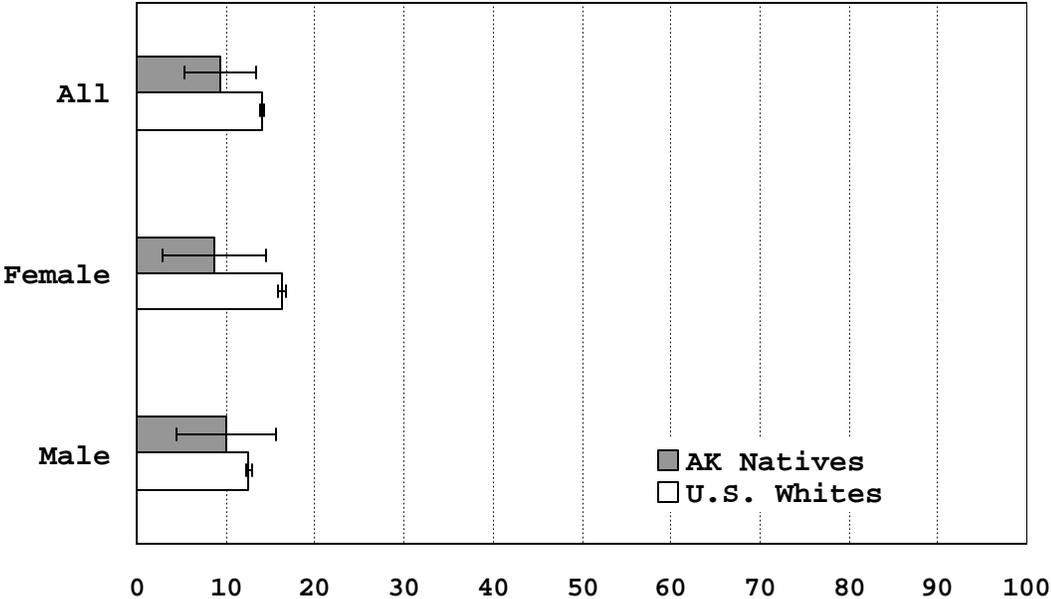


Alaska Native Cancer Survival Report

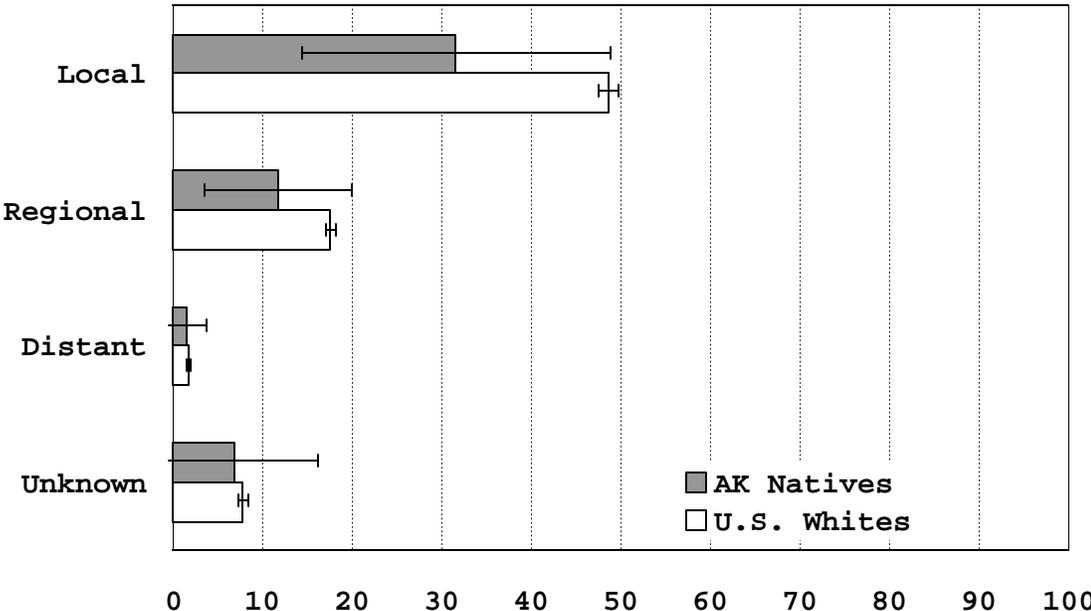
Lung

N=389

5 Year Relative Survival (%)



5 Year Relative Survival by Stage (%)

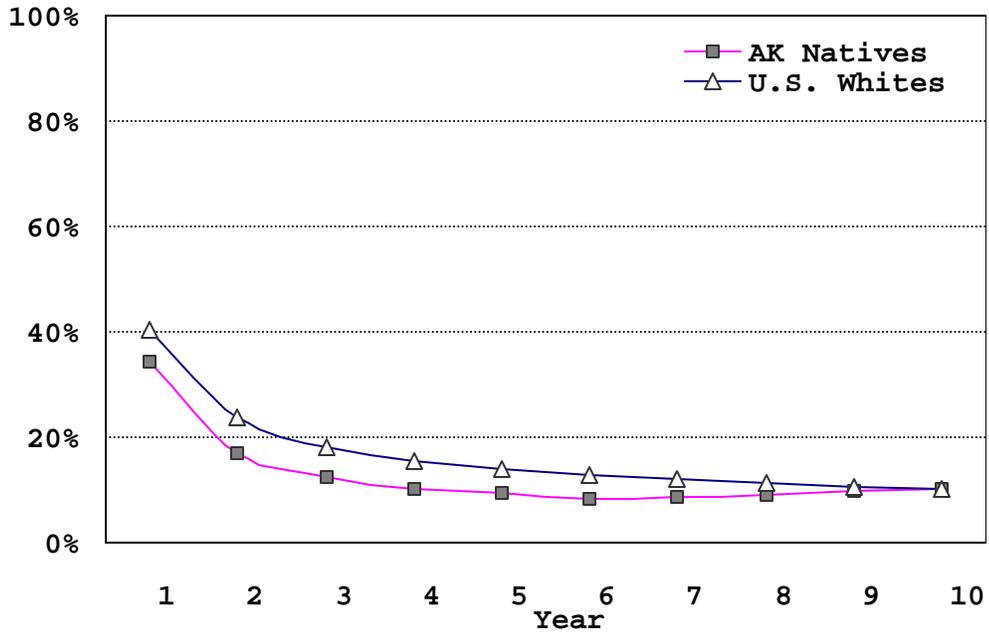


Alaska Native Cancer Survival Report

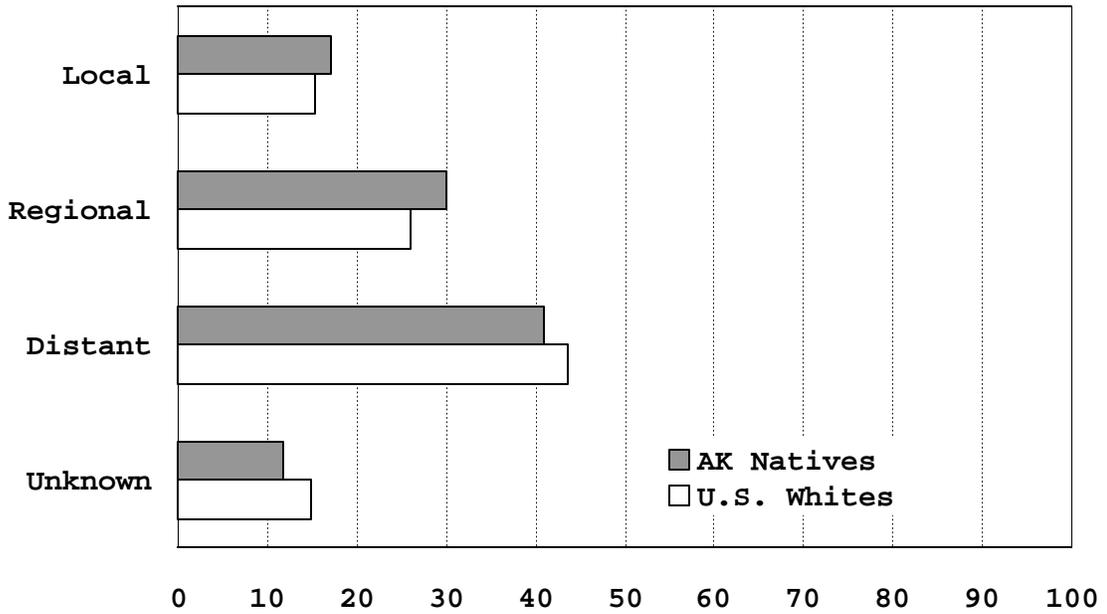
Lung

N=389

Relative Survival



Distribution by Stage (%)

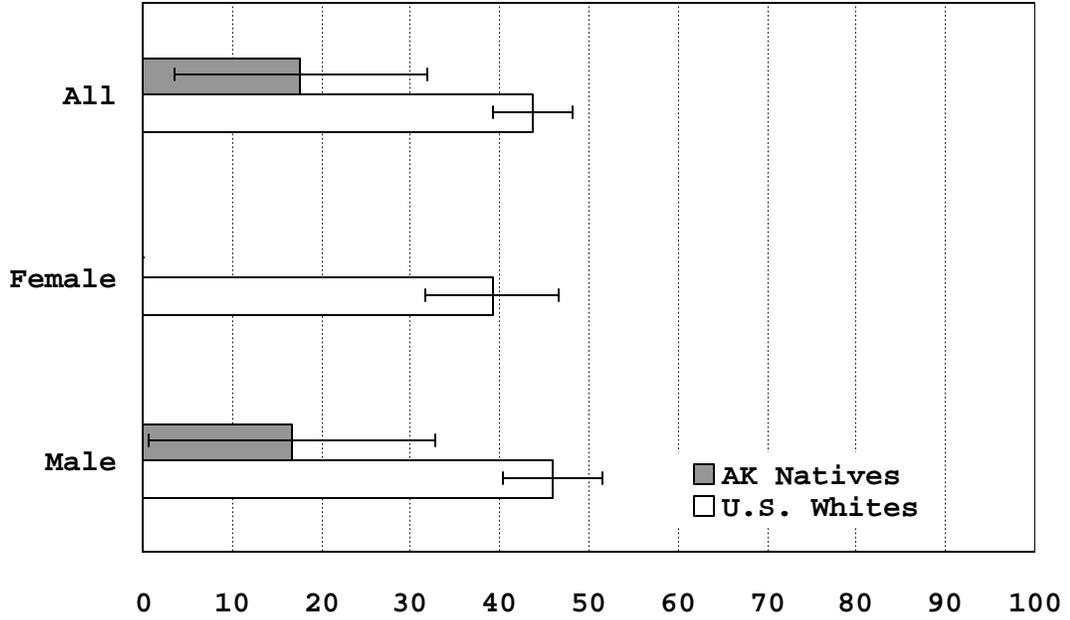


Alaska Native Cancer Survival Report

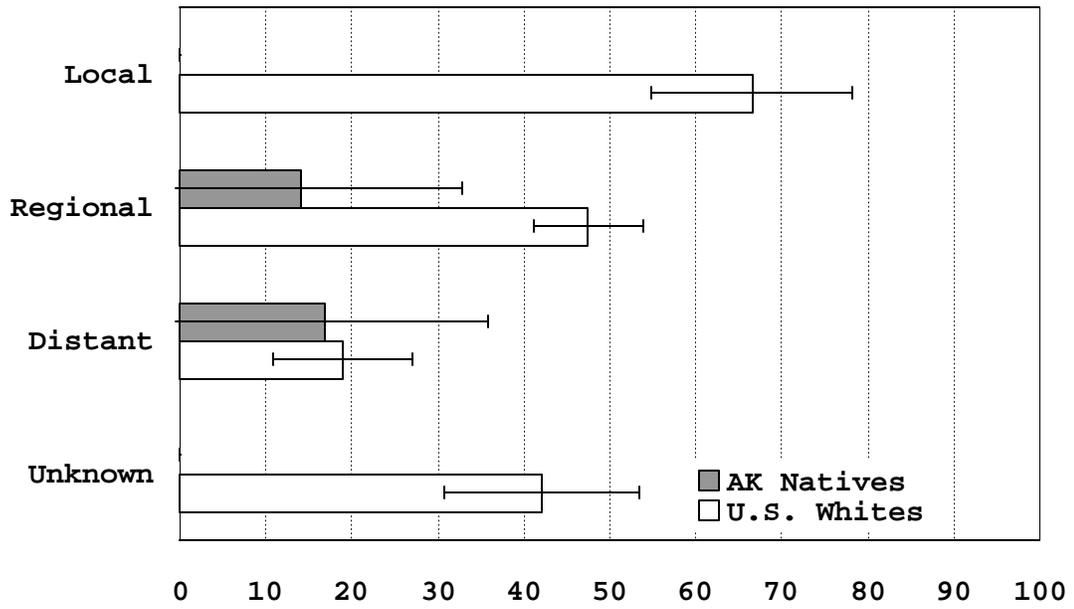
Nasopharynx

N=50

5 Year Relative Survival (%)



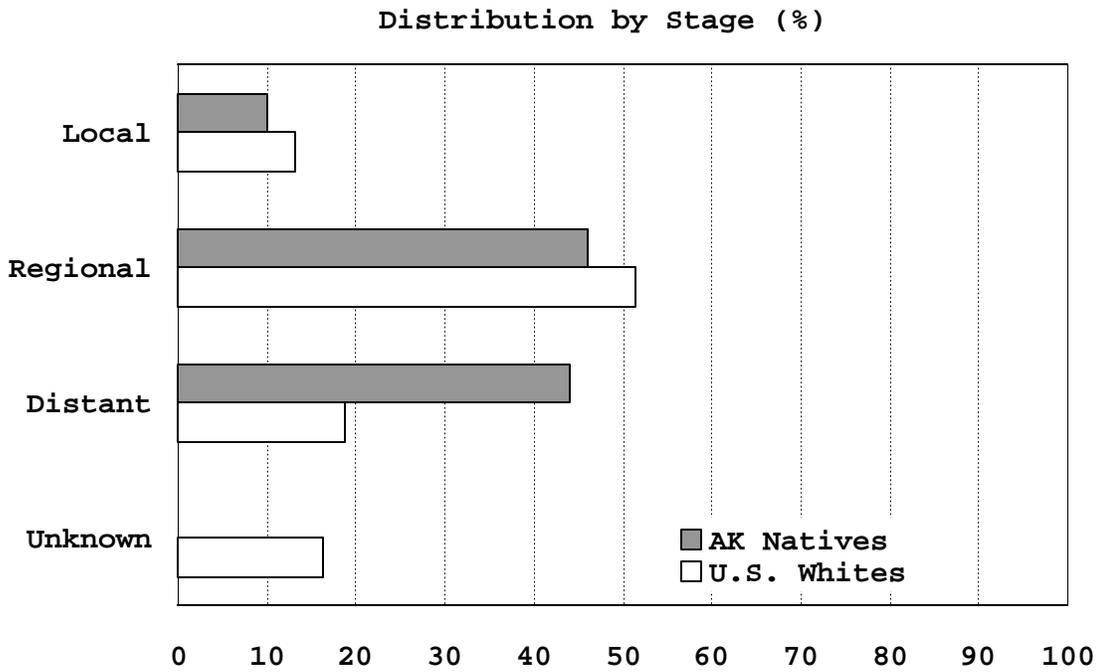
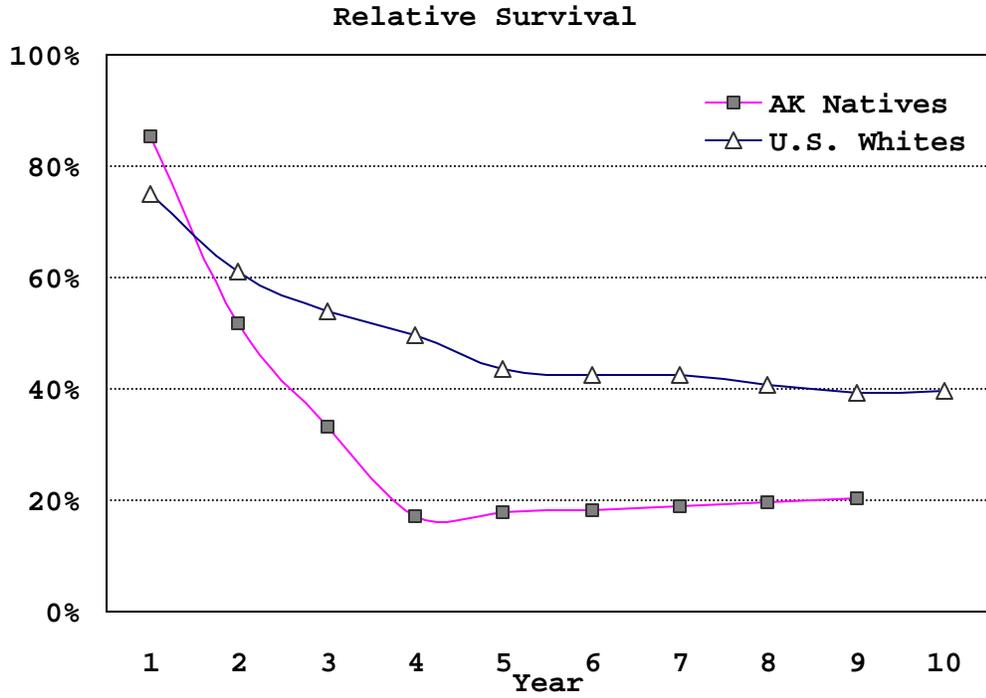
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

Nasopharynx

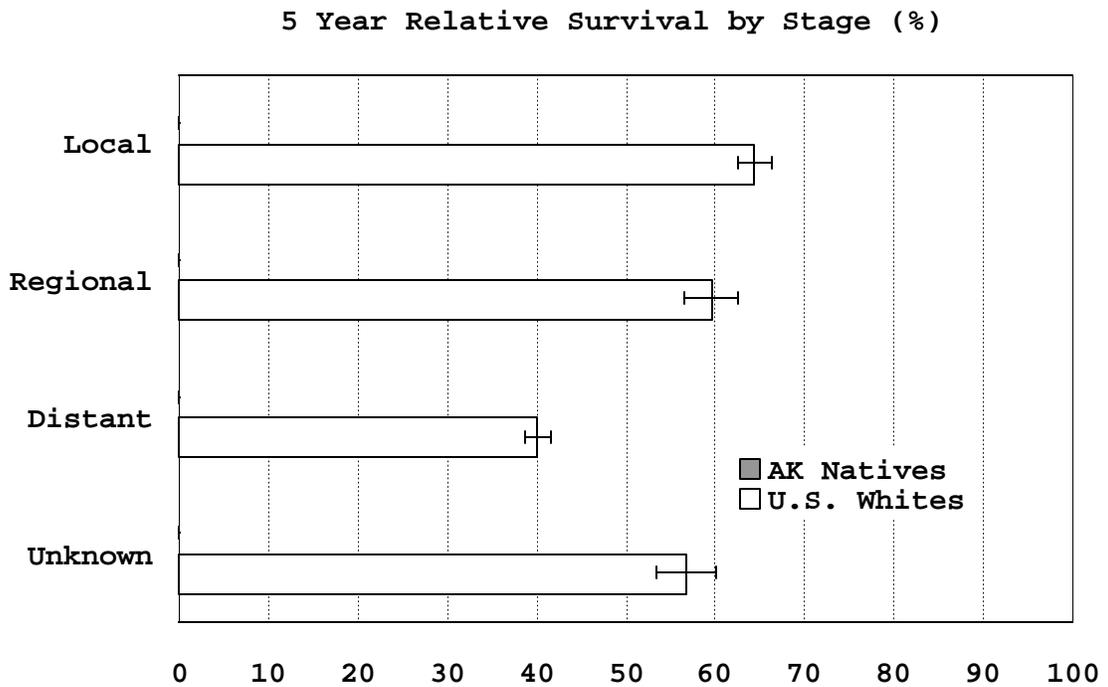
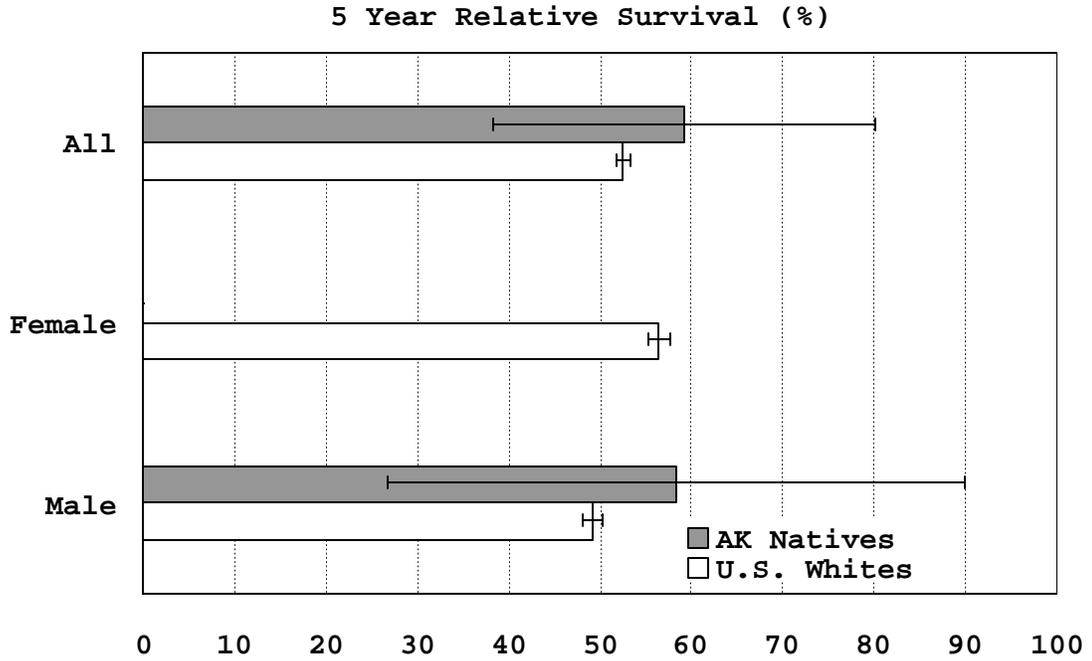
N=50



Alaska Native Cancer Survival Report

Non-Hodgkins Lymphoma

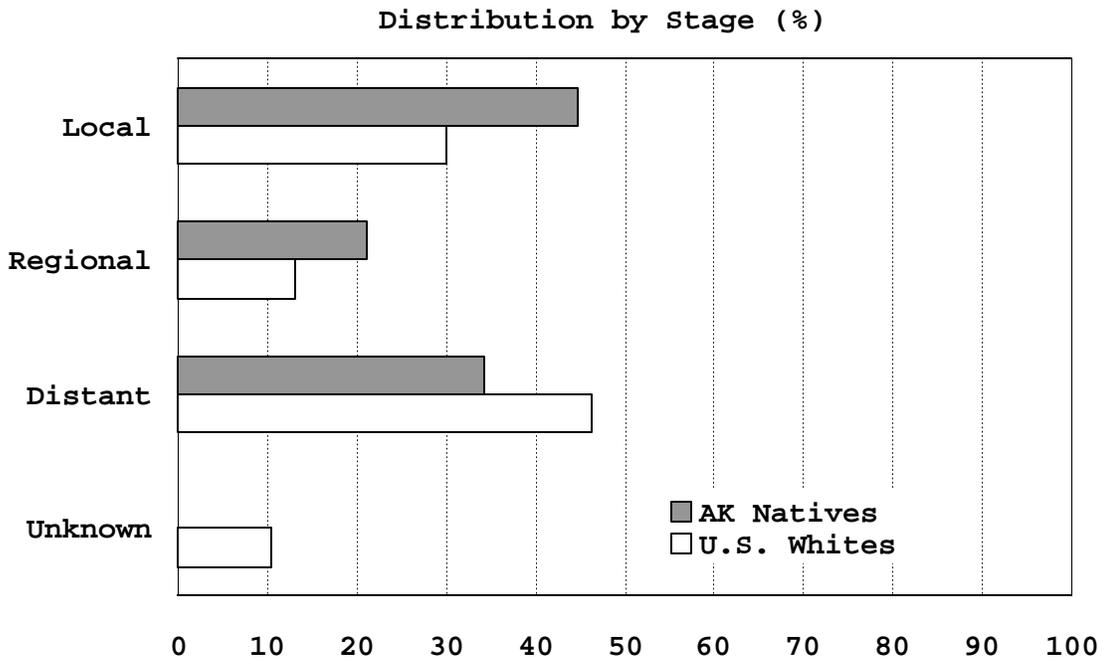
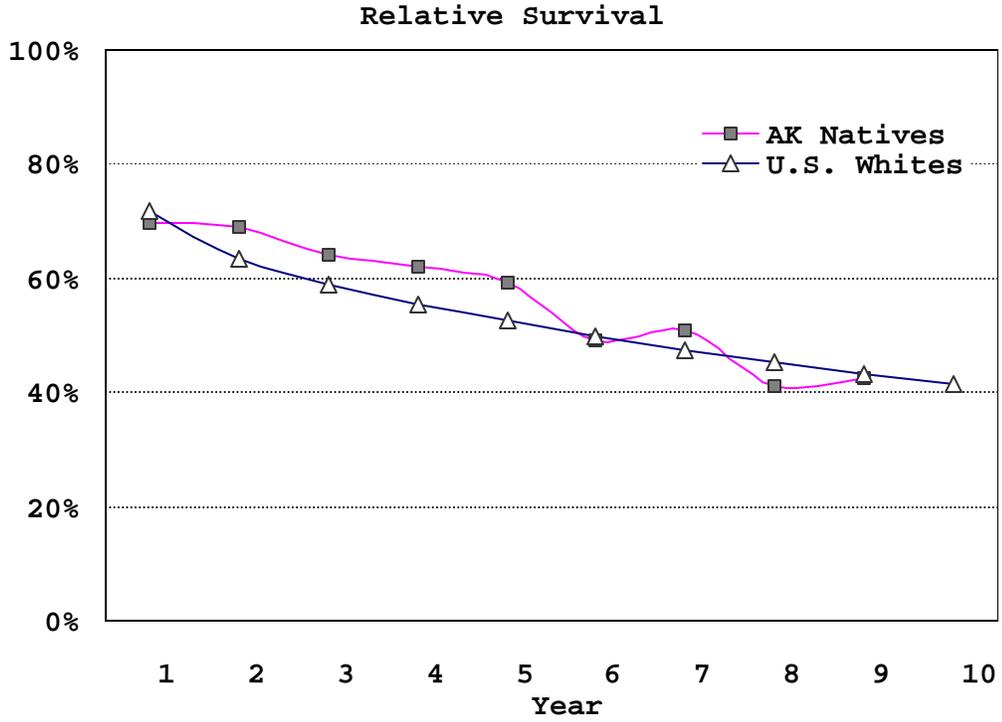
N=38



Alaska Native Cancer Survival Report

Non-Hodgkins Lymphoma

N=38

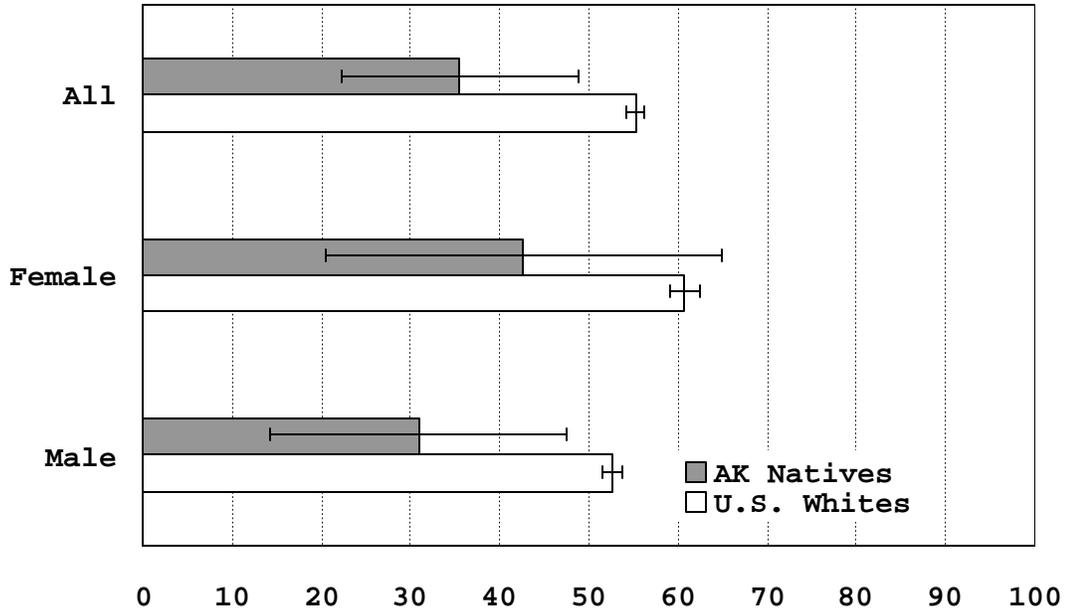


Alaska Native Cancer Survival Report

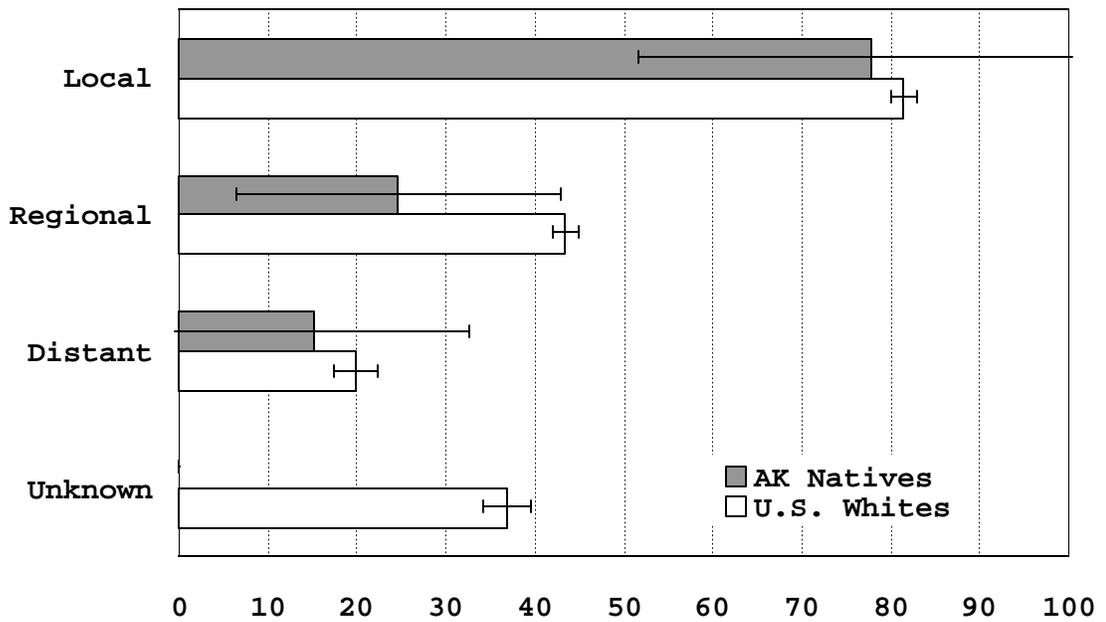
Oral Cavity and Pharynx

N=99

5 Year Relative Survival (%)



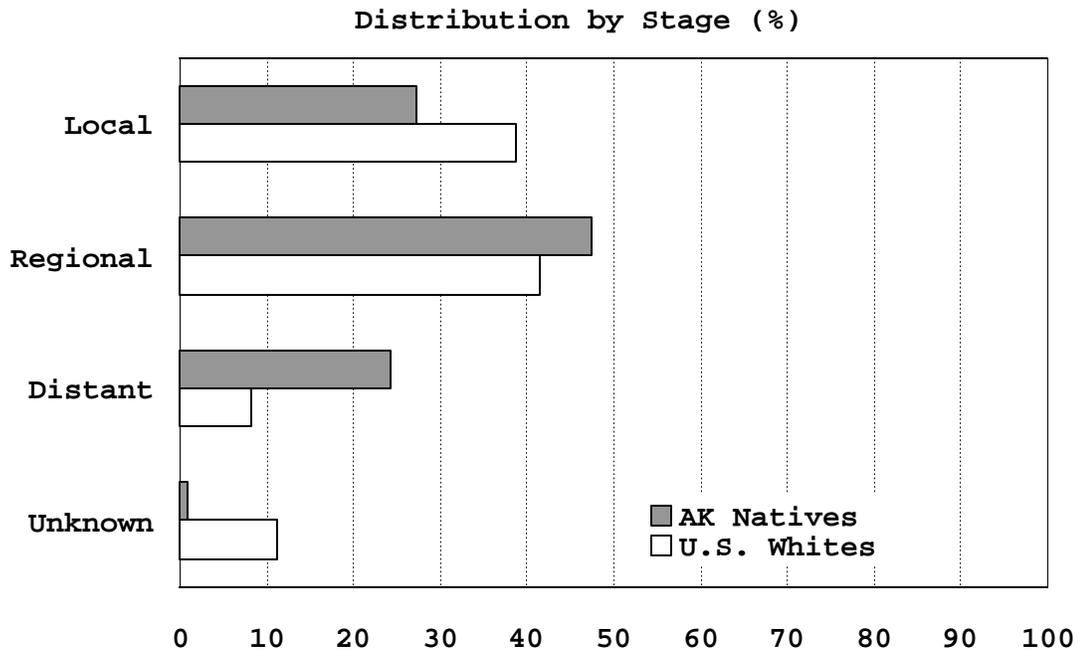
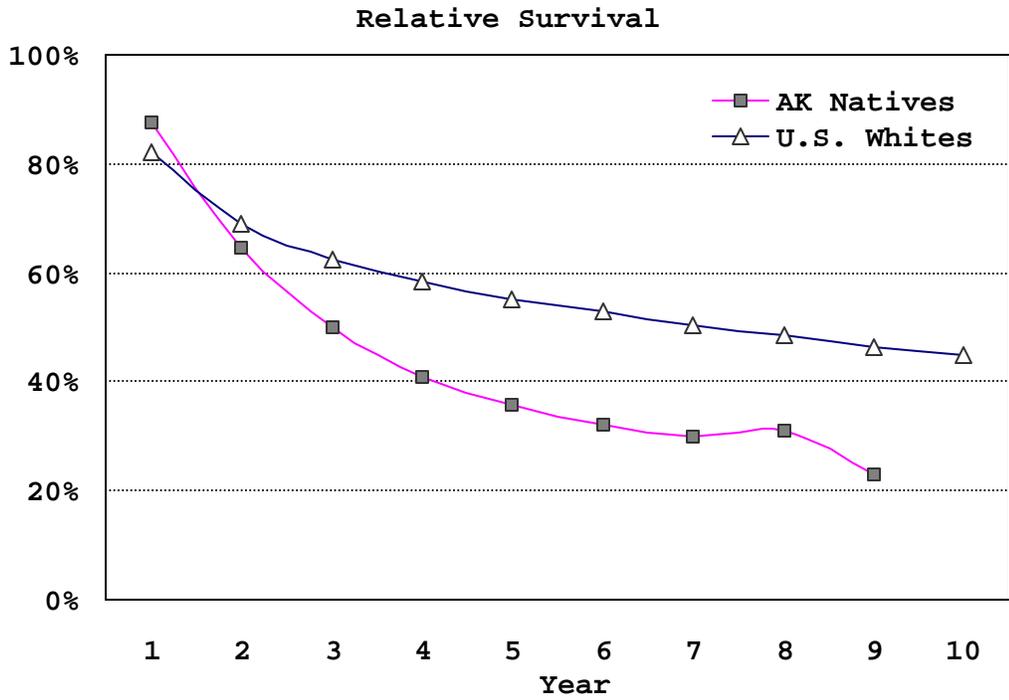
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

Oral Cavity and Pharynx

N=99

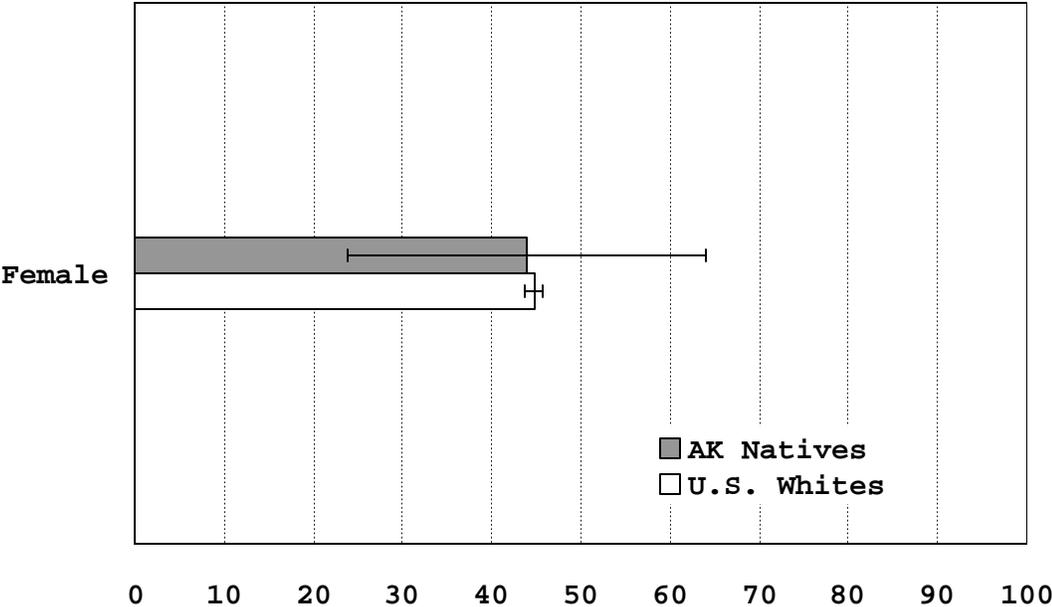


Alaska Native Cancer Survival Report

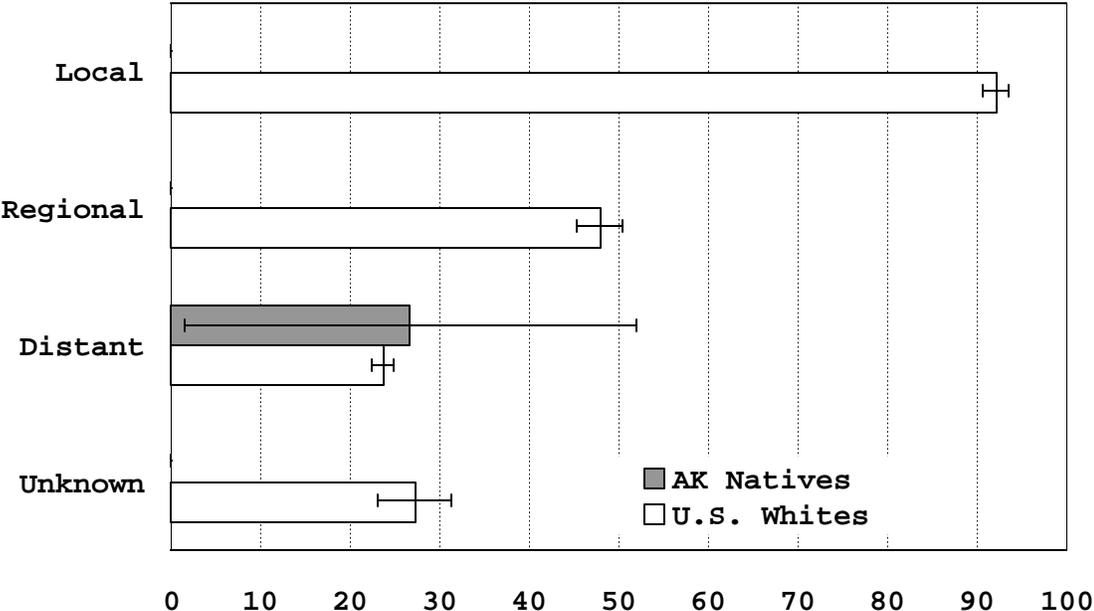
Ovary

N=43

5 Year Relative Survival (%)



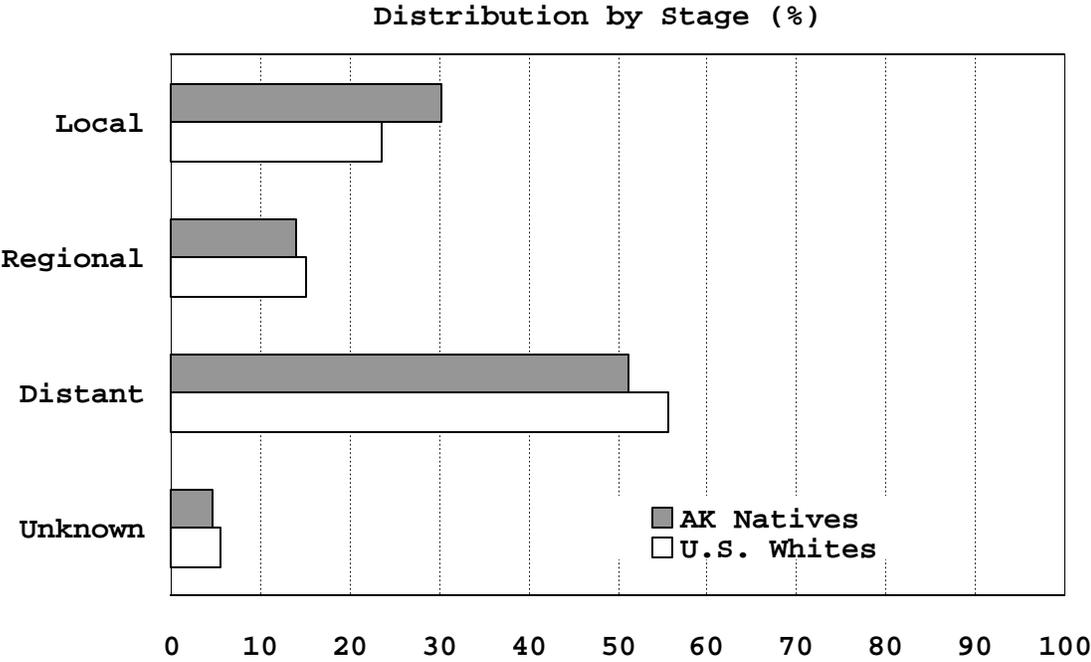
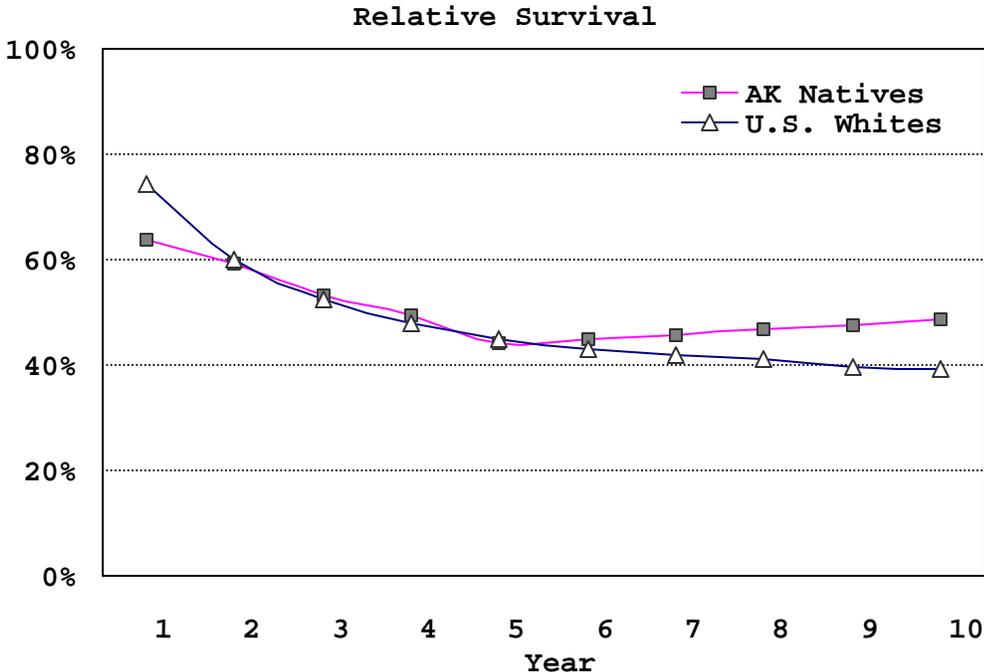
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

Ovary

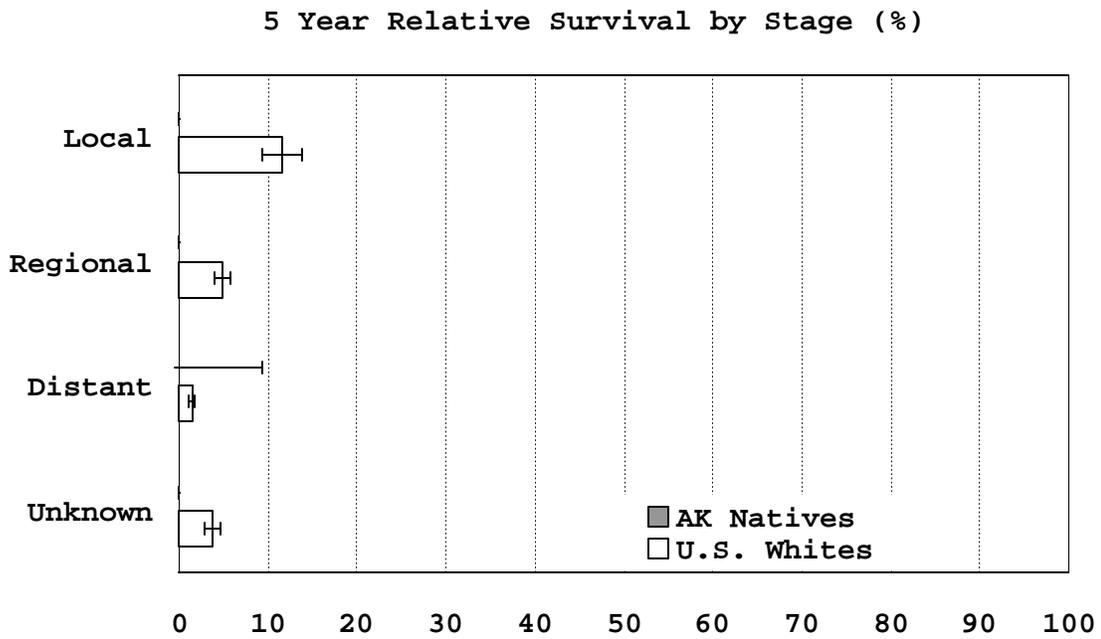
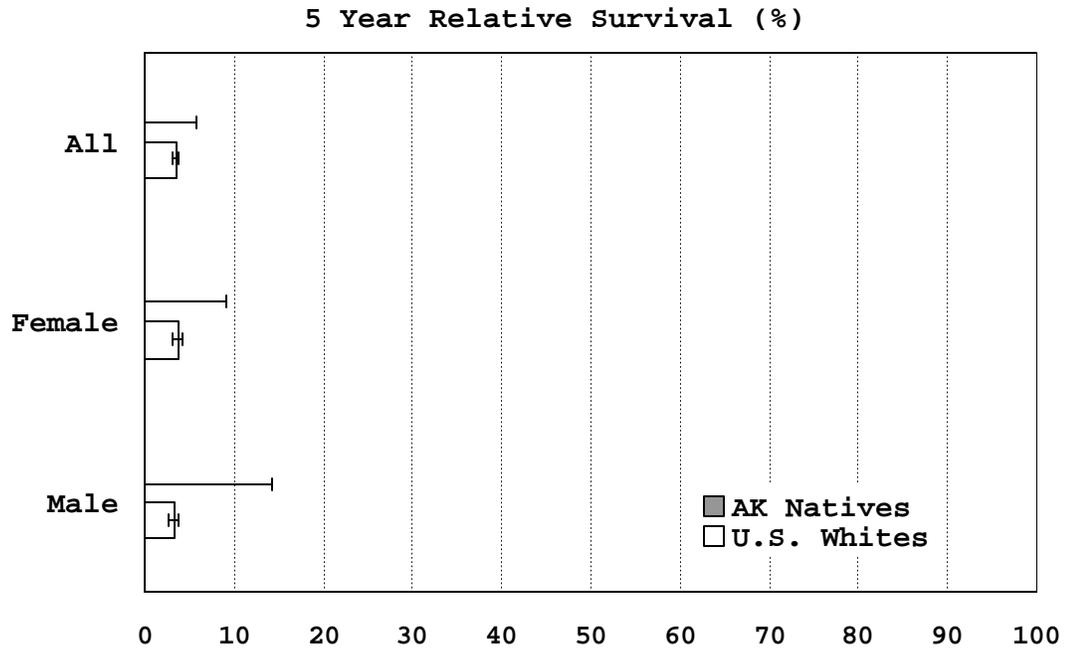
N=43



Alaska Native Cancer Survival Report

Pancreas^Δ

N=51

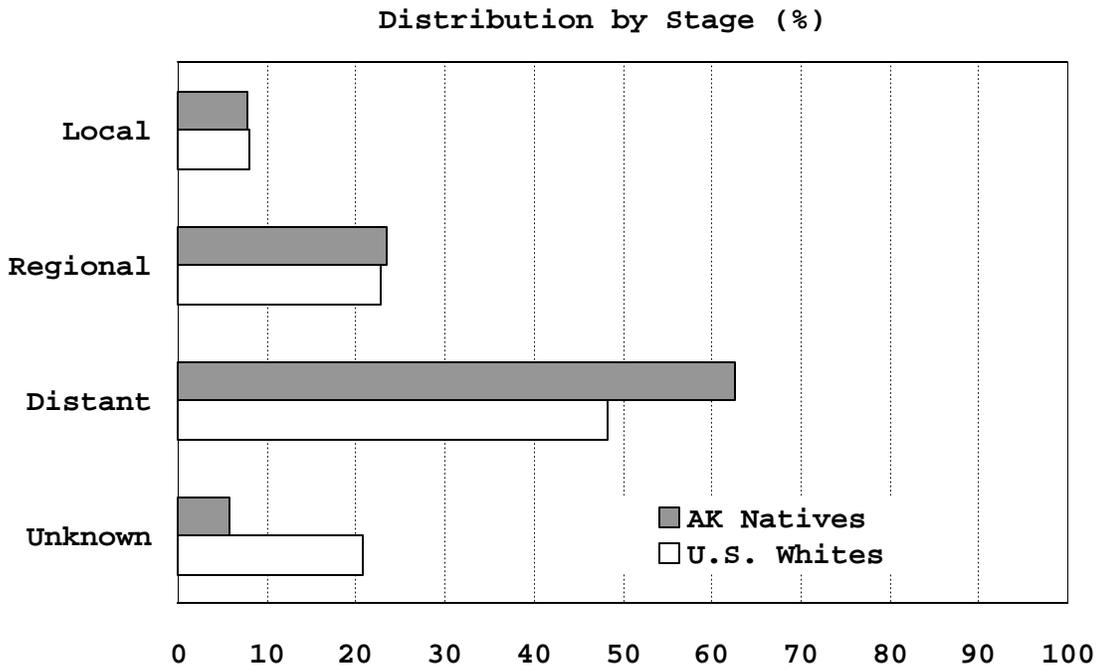
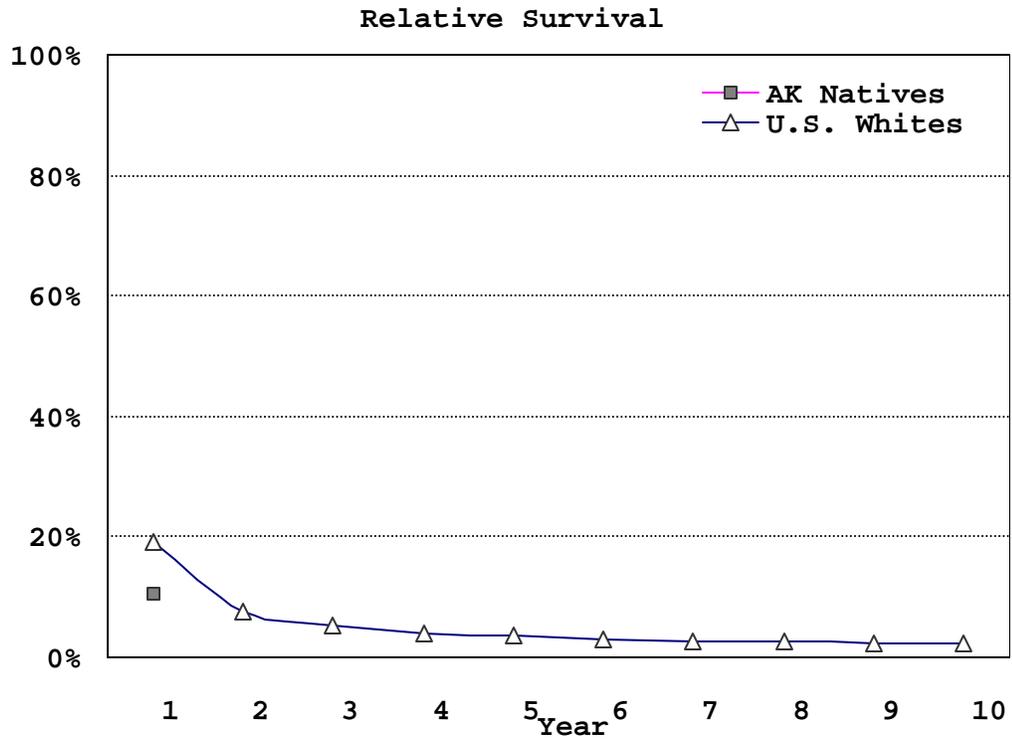


^Δ No Alaska Natives with pancreas cancer survived five years from diagnosis, however it is still possible to estimate a confidence interval for the zero five year survival.

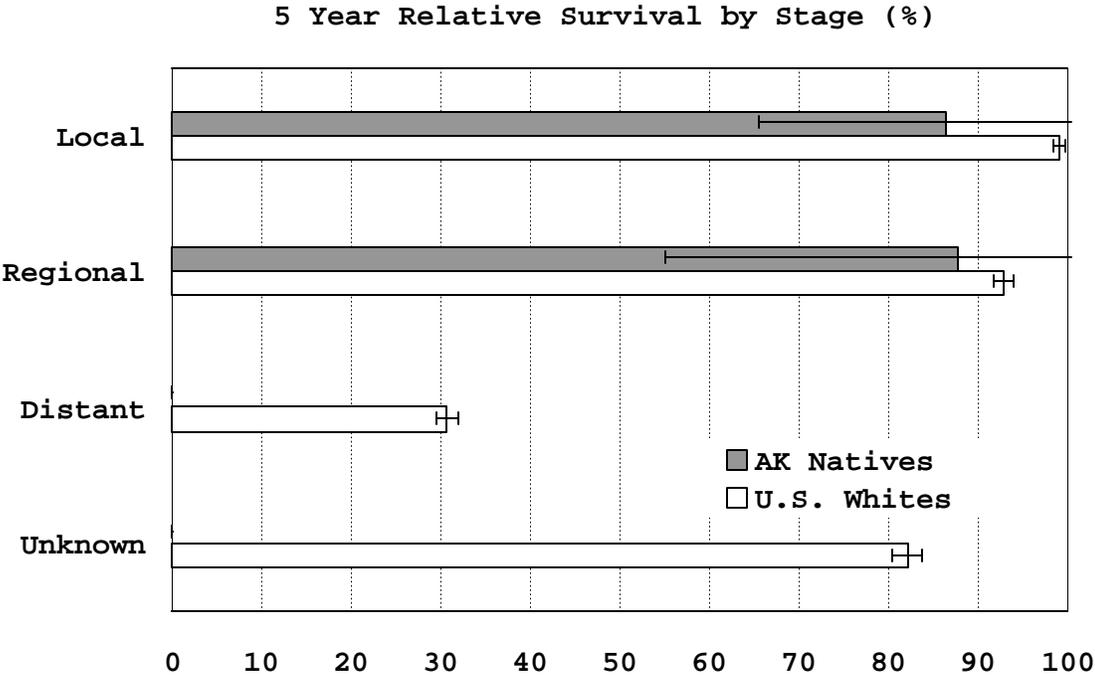
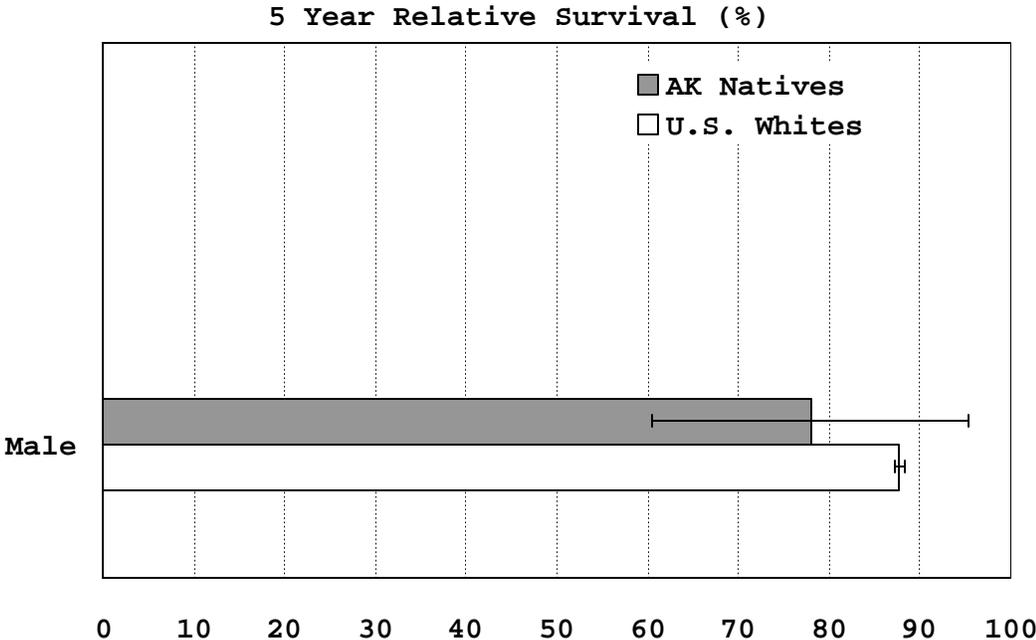
Alaska Native Cancer Survival Report

Pancreas

N=51



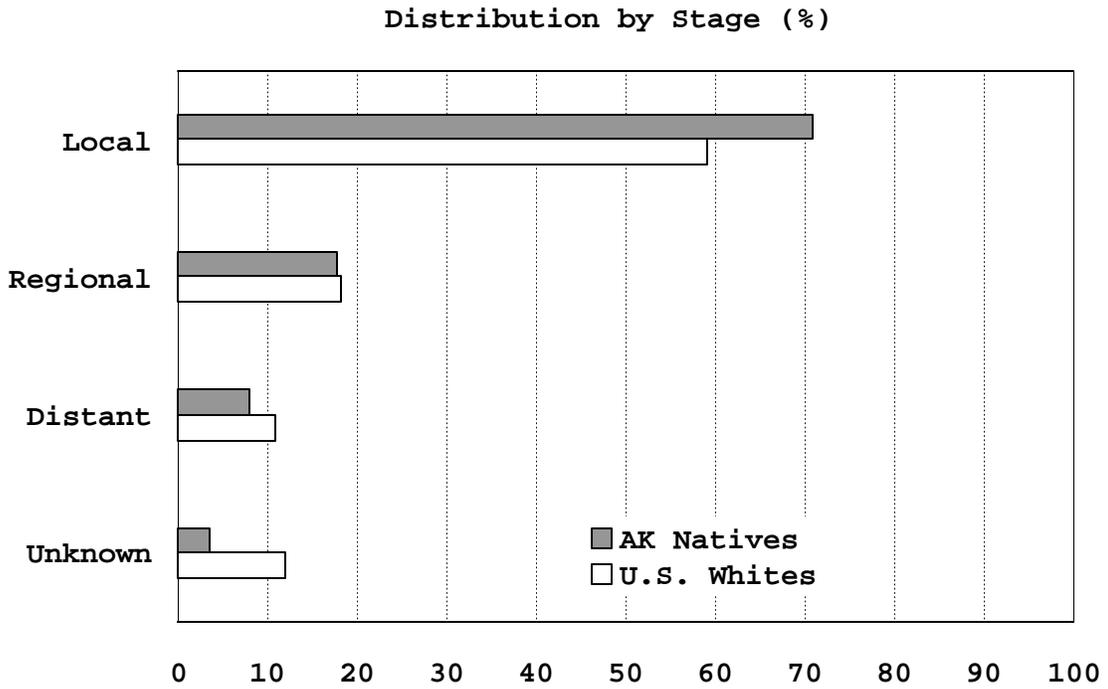
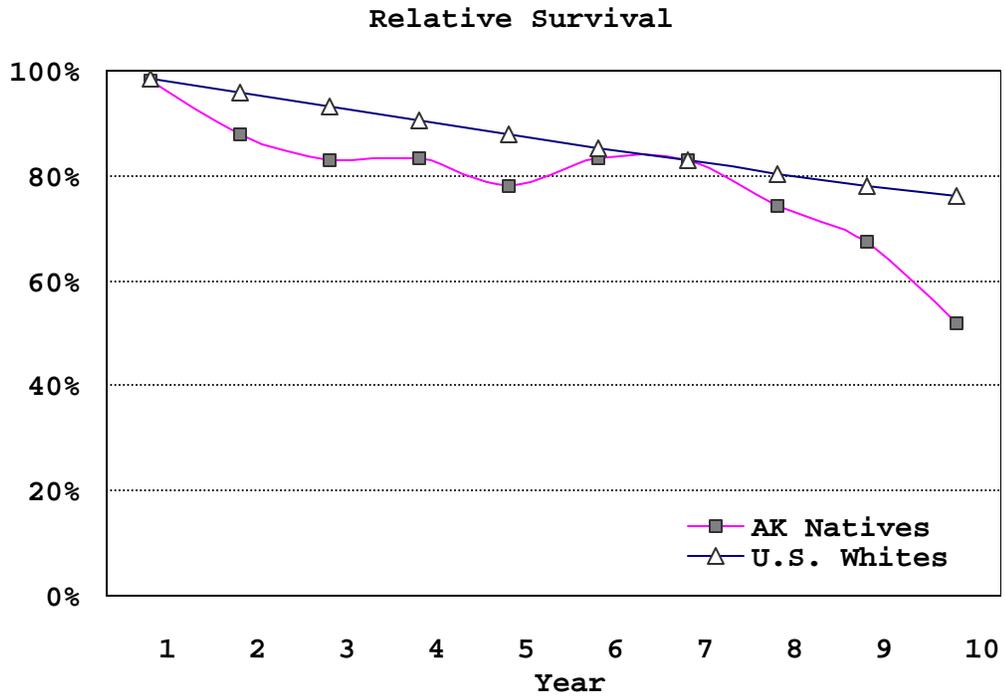
Alaska Native Cancer Survival Report
Prostate
N=113



Alaska Native Cancer Survival Report

Prostate

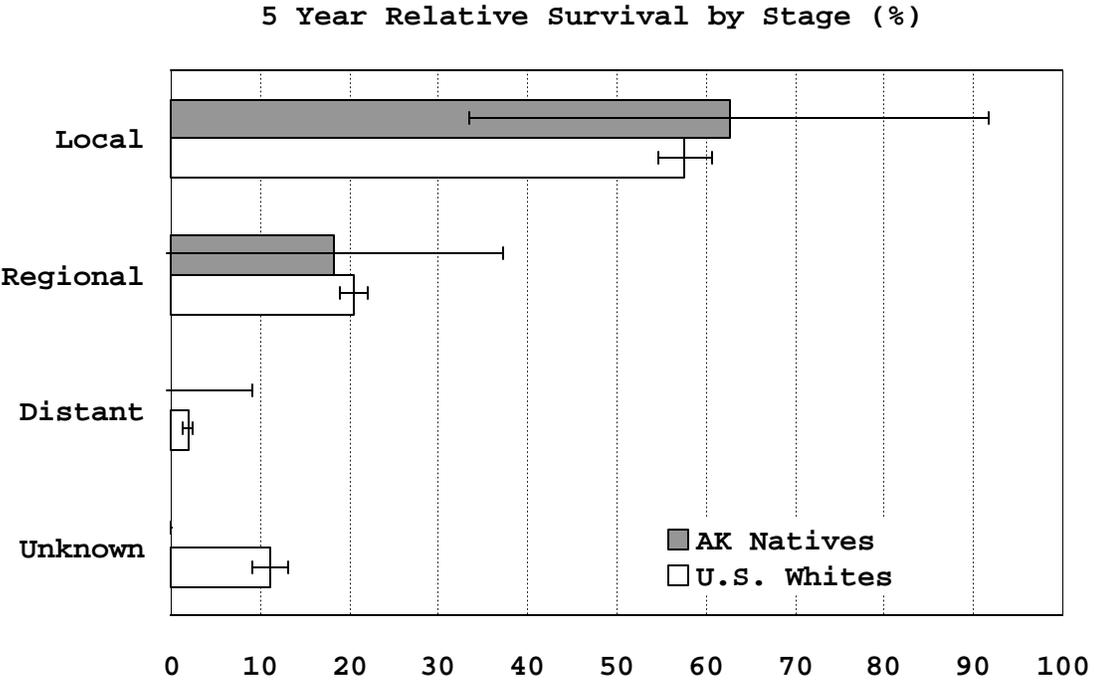
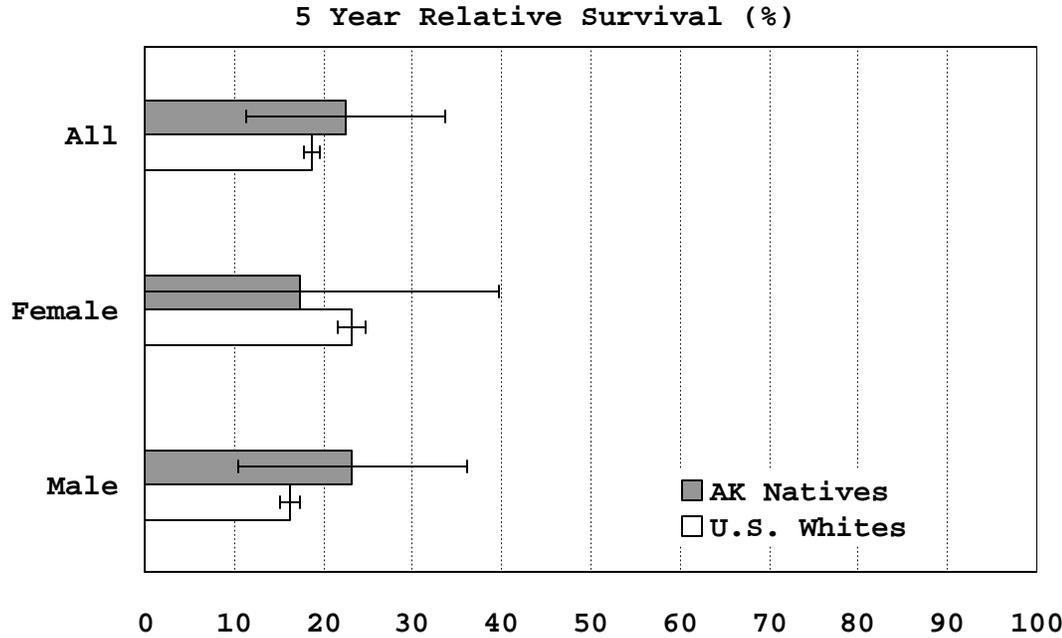
N=113



Alaska Native Cancer Survival Report

Stomach

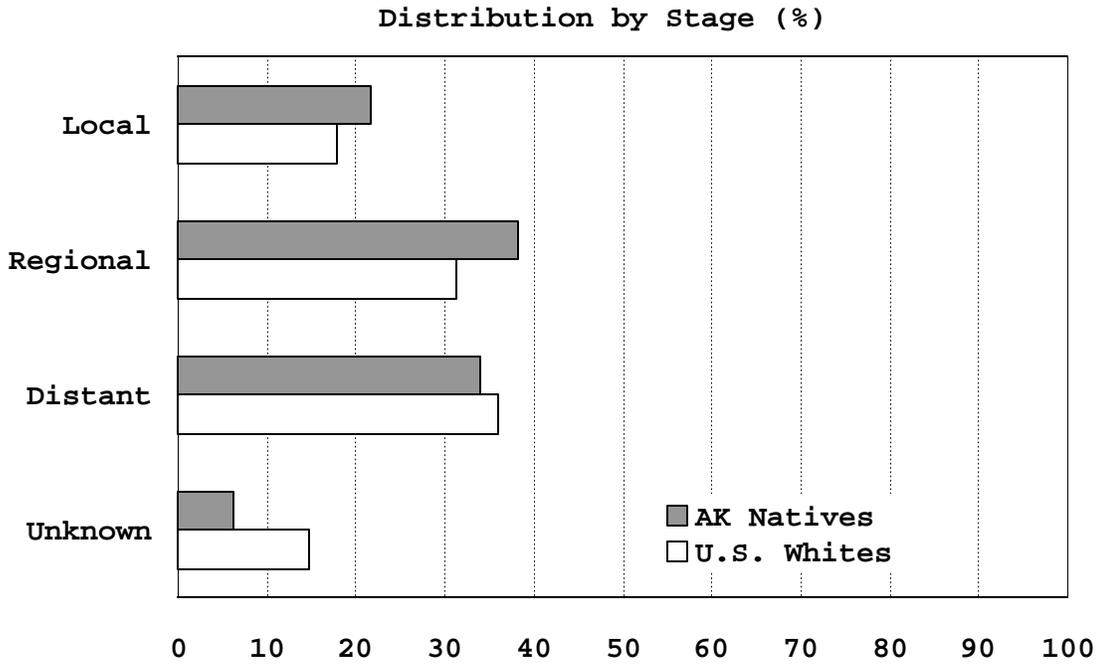
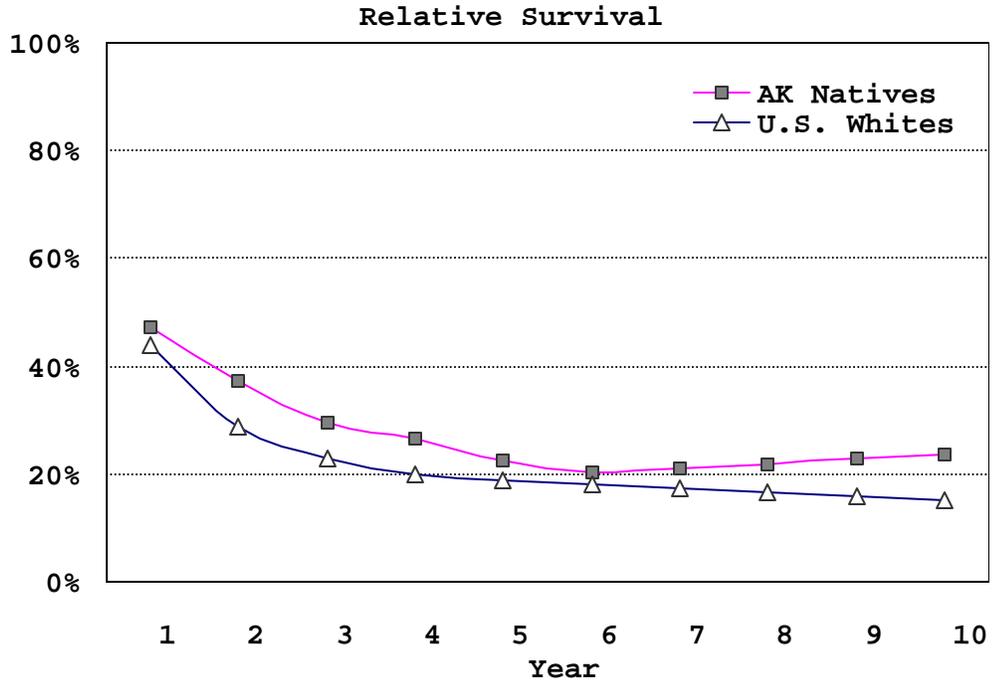
N=97



Alaska Native Cancer Survival Report

Stomach

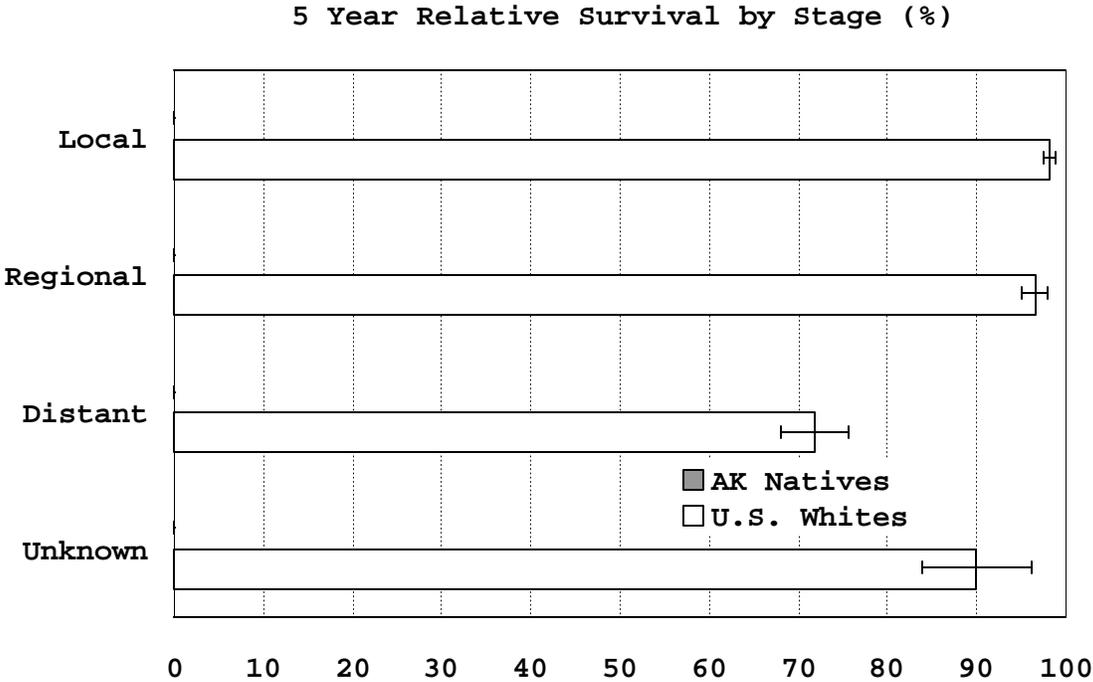
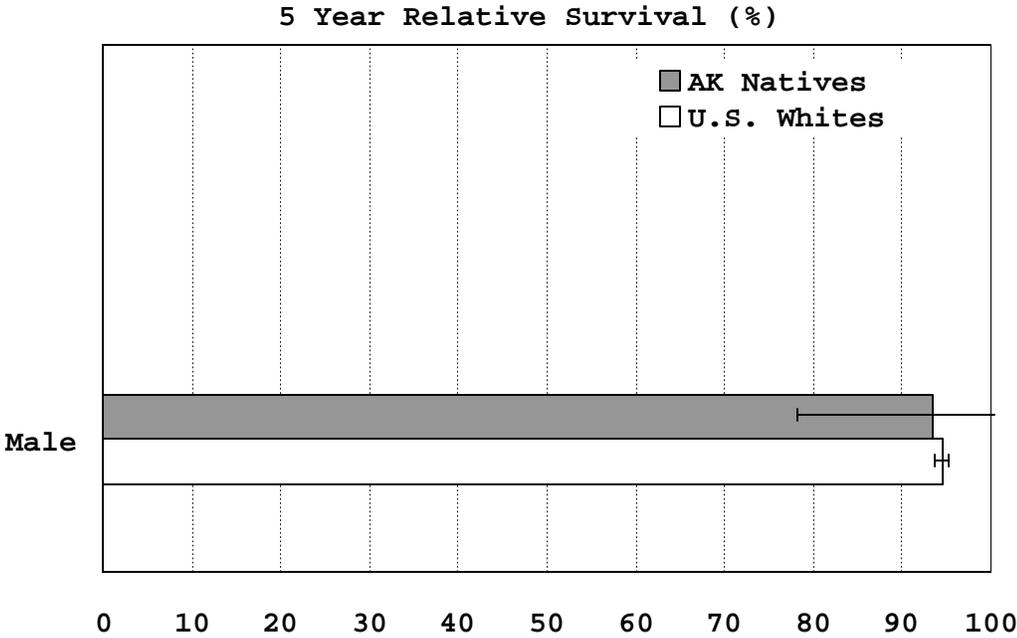
N=97



Alaska Native Cancer Survival Report

Testis

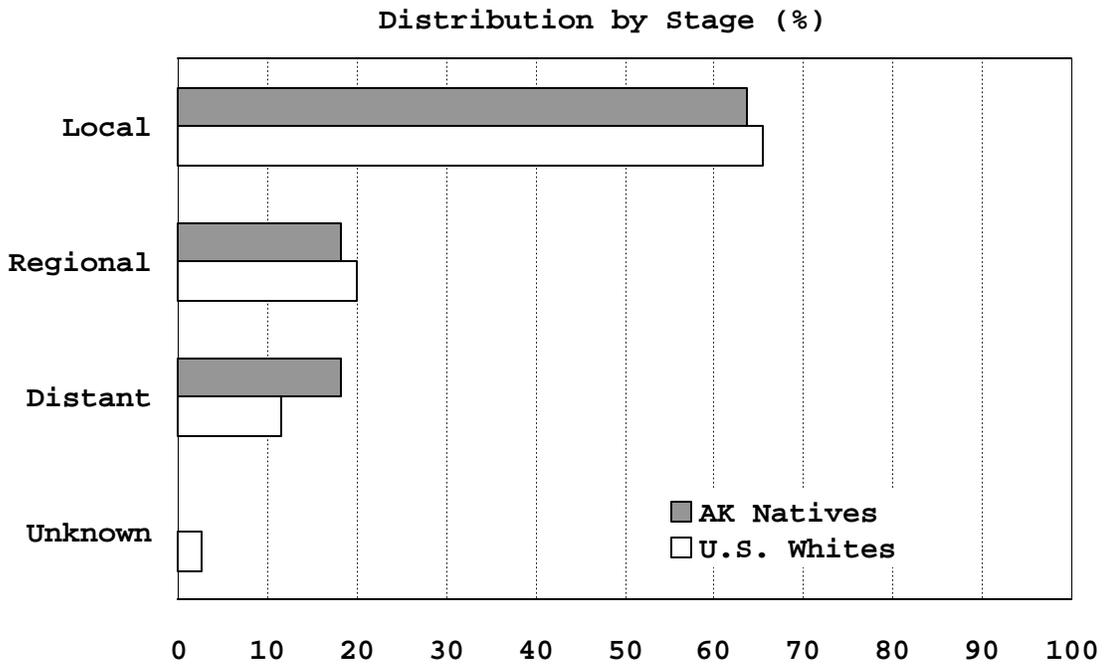
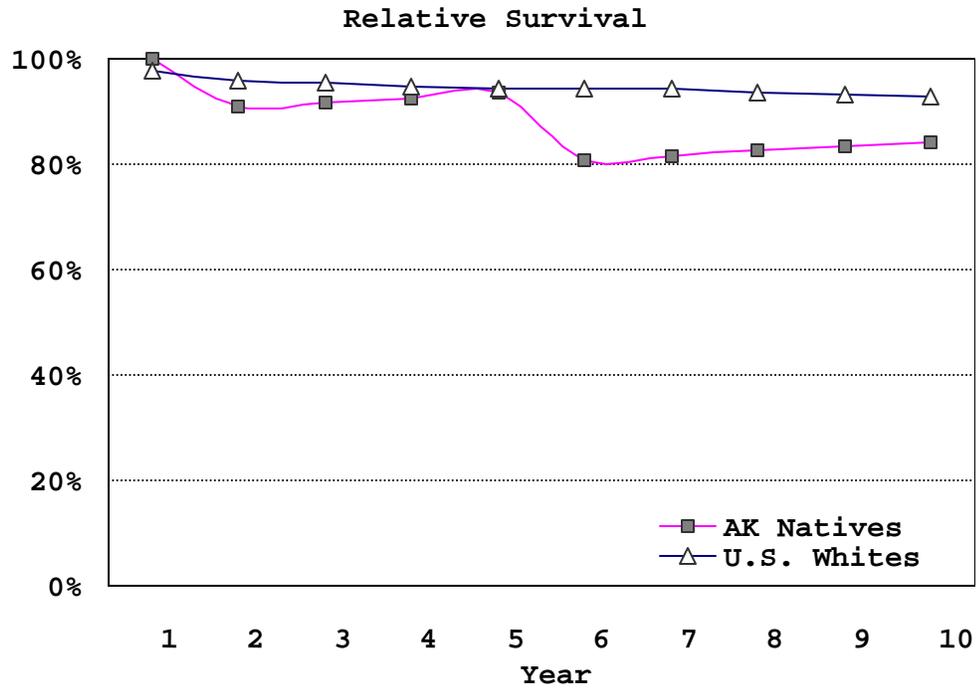
N=22



Alaska Native Cancer Survival Report

Testis

N=22

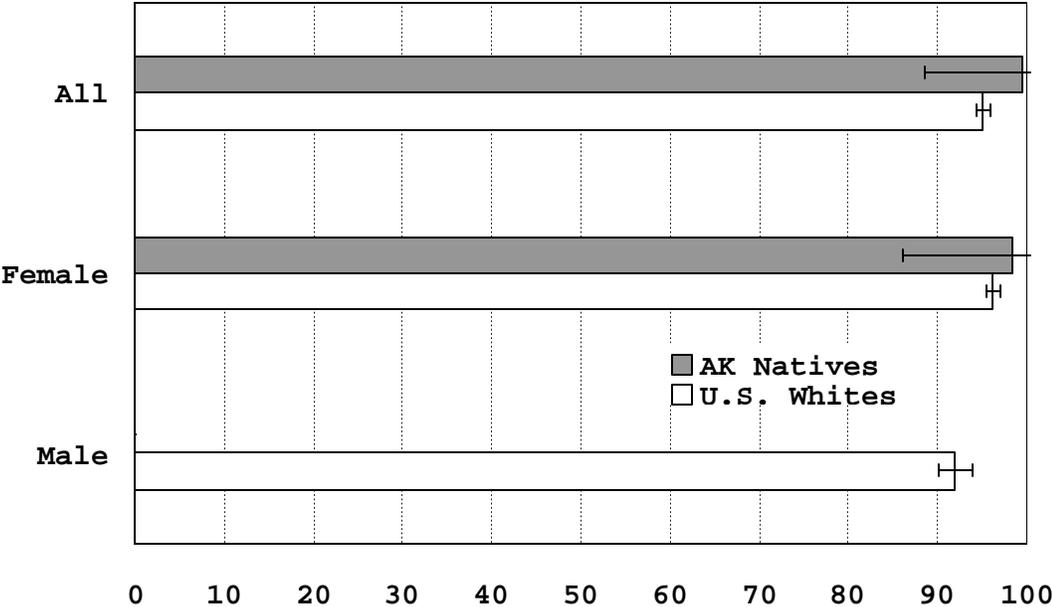


Alaska Native Cancer Survival Report

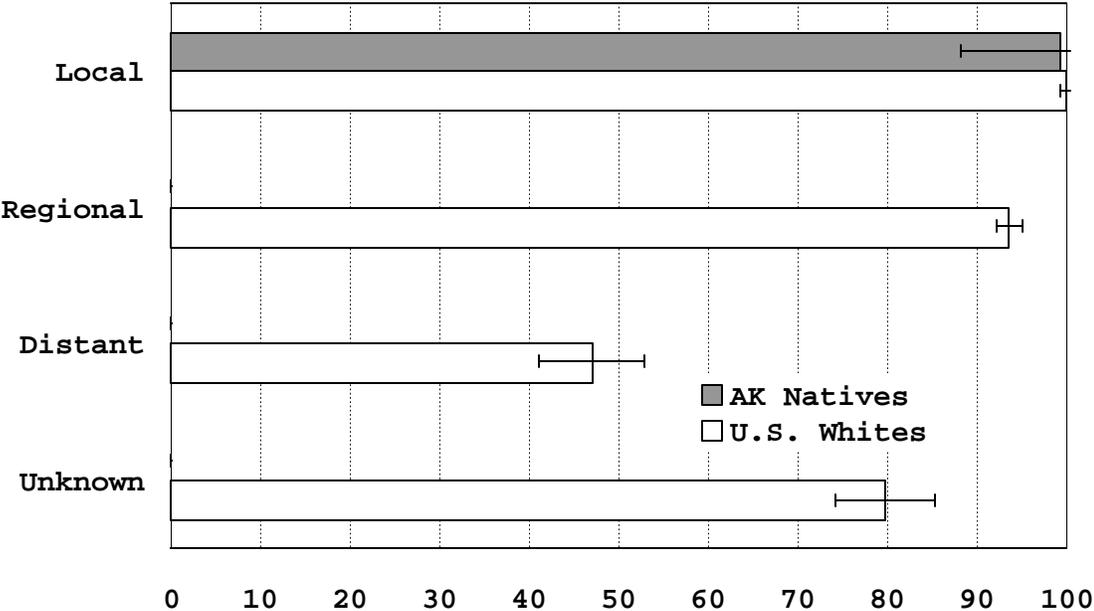
Thyroid

N=30

5 Year Relative Survival (%)



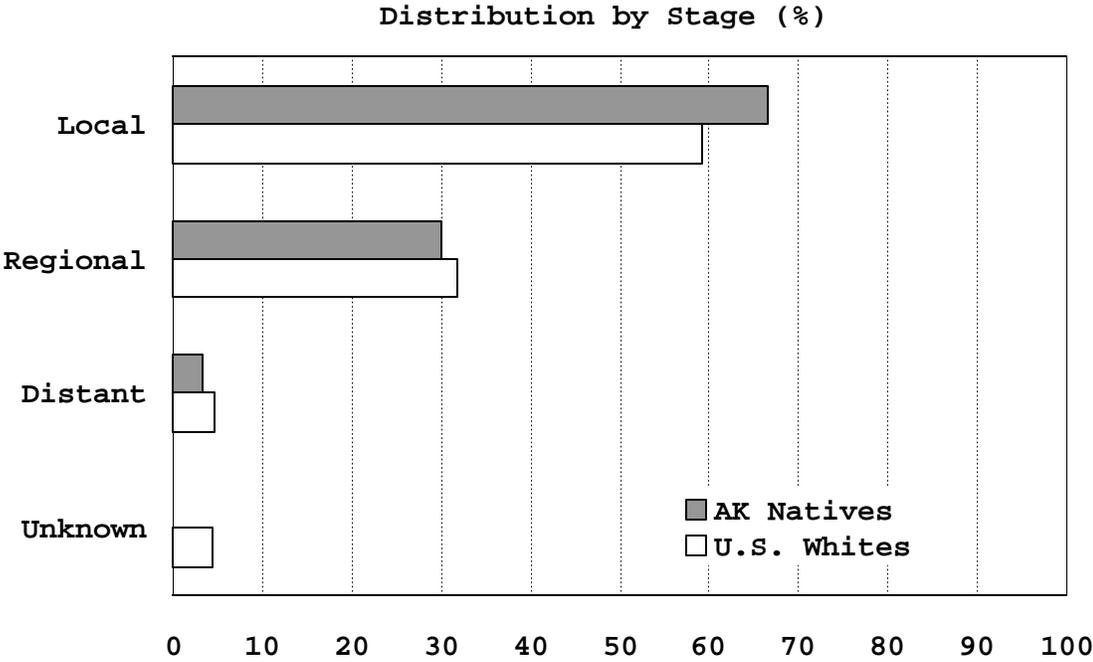
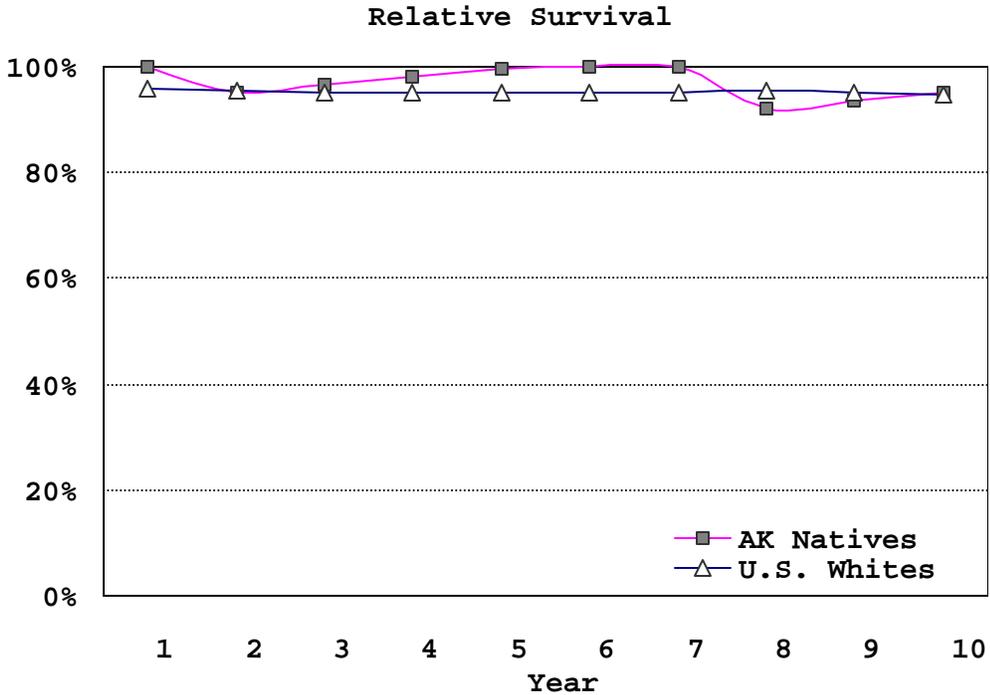
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

Thyroid

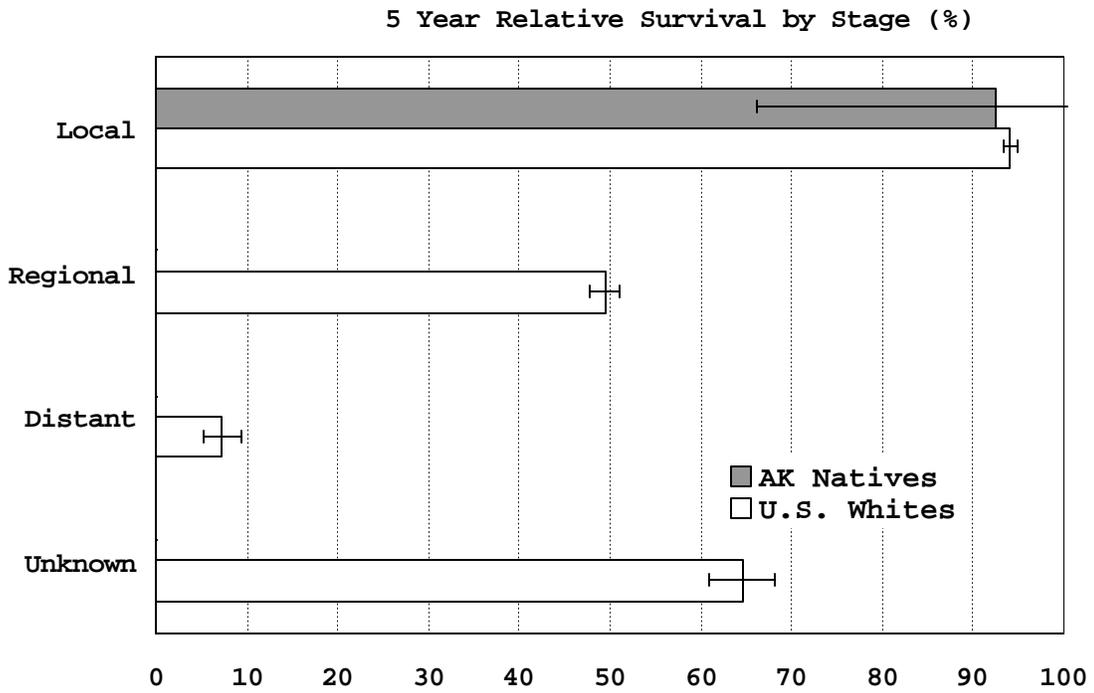
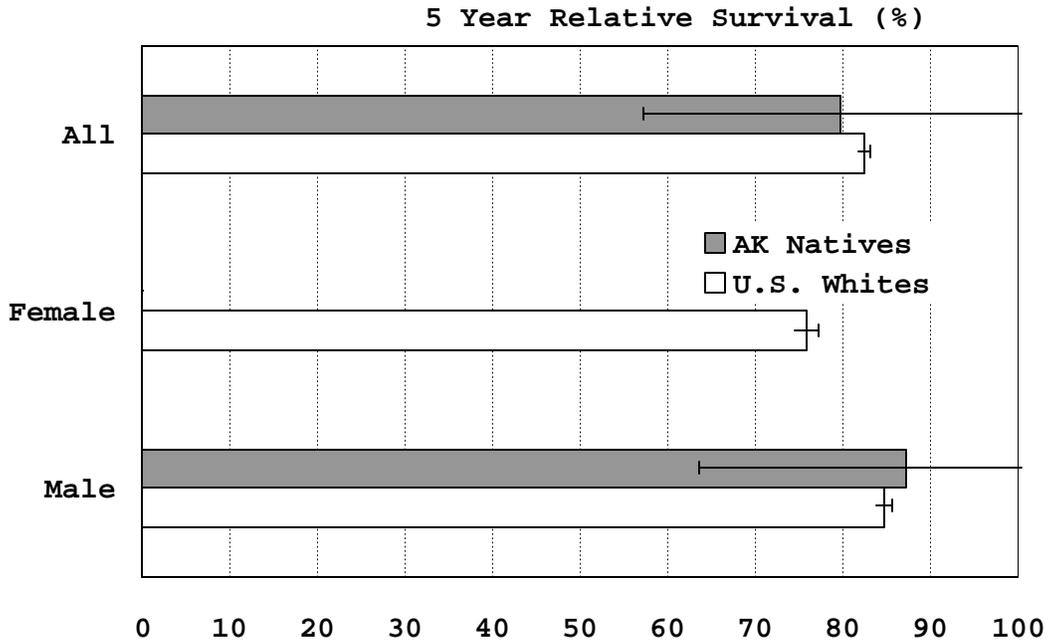
N=30



Alaska Native Cancer Survival Report

Urinary Bladder

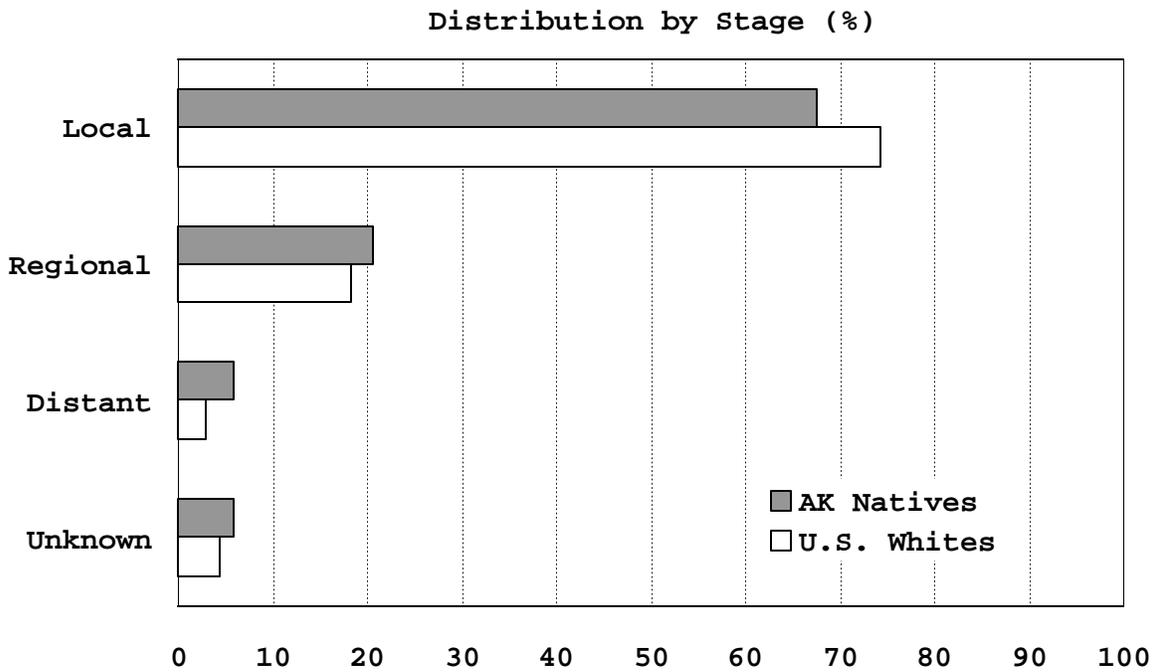
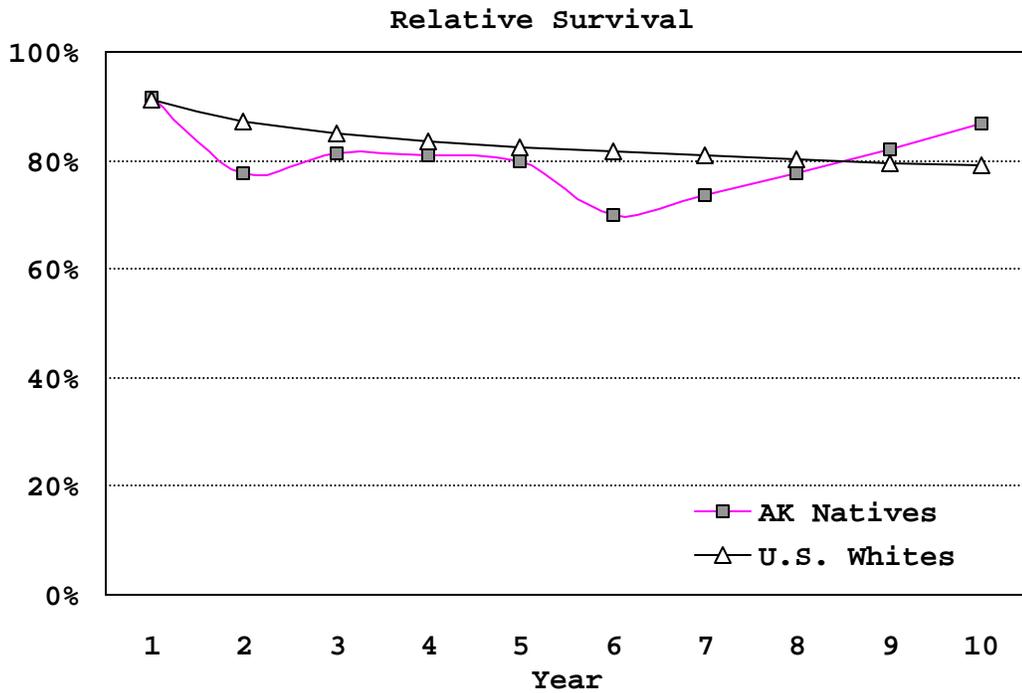
N=34



Alaska Native Cancer Survival Report

Urinary Bladder

N=34

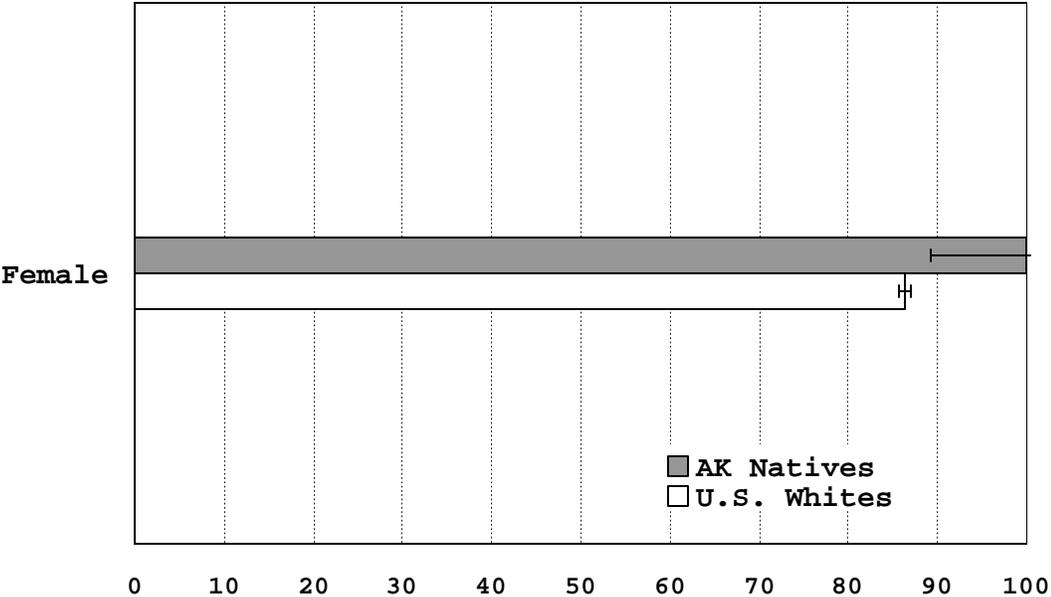


Alaska Native Cancer Survival Report

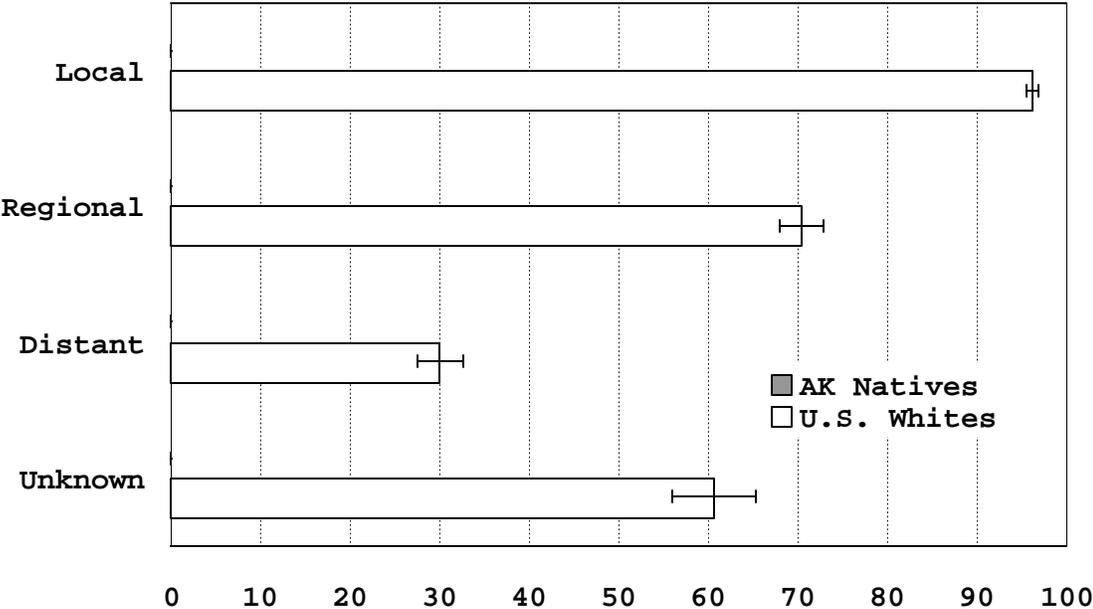
Uterus

N=21

5 Year Relative Survival (%)



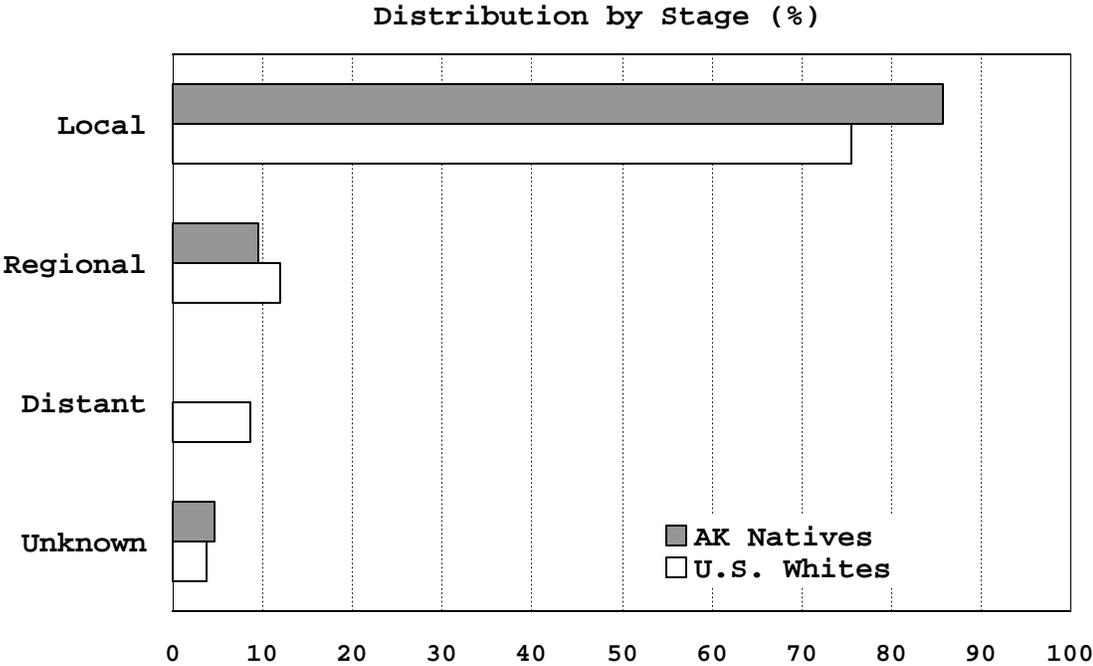
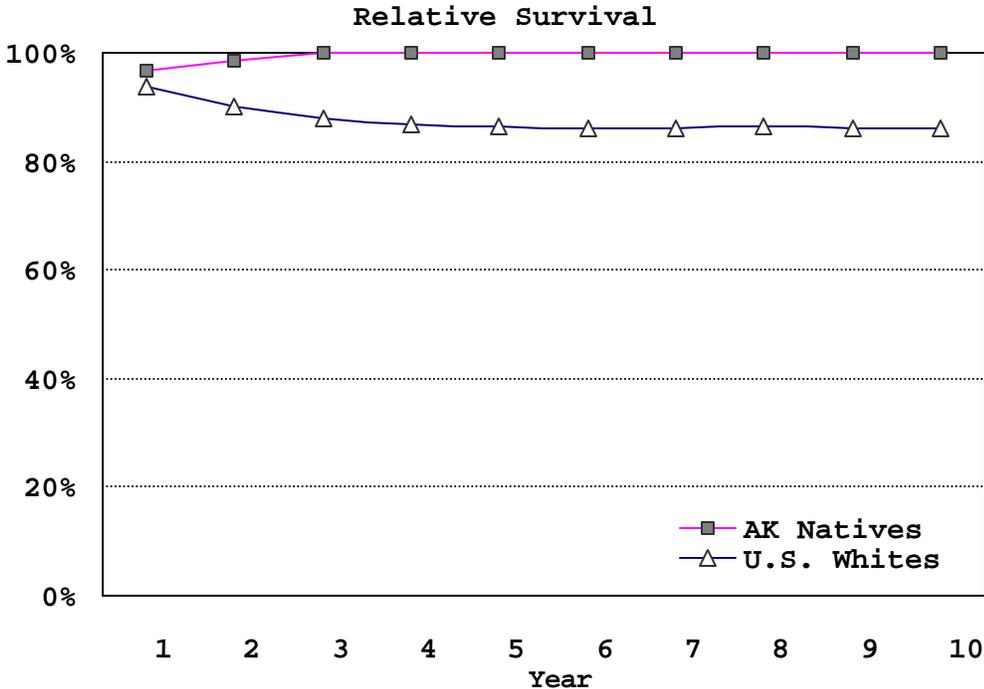
5 Year Relative Survival by Stage (%)



Alaska Native Cancer Survival Report

Uterus

N=21



Alaska Native Cancer Survival Report

Glossary

Actuarial method: one of two similar commonly used statistical methods to estimate survival rates (the other is the Kaplan-Meier method).

AFP: alpha-fetoprotein; a protein in the blood that suggest the presence of a liver tumor.

Age-adjusted incidence rates: rates are adjusted to allow valid comparisons between populations with different age distributions. Rates of the comparative populations are each adjusted to a standard population, e.g. U.S. 1940, U.S. 1970.

Cancer : a disease characterized by uncontrolled growth of cells that form a mass, invade and destroy surrounding tissue and/or spread through the body by the lymph system or bloodstream. The term cancer currently includes at least 100 different diseases with many different causes.

Cancer site group: cancers grouped by site (organ) in which they first developed.

Confidence intervals: a range around an estimated survival rate within which we can be reasonably confident the true survival rate falls.

Crude rate: the actual number of cases occurring in a given population in a stated period of time, usually expressed as number per 100,000 population per year.

Diagnosis: identification of a disease based on signs and symptoms, x-rays, biopsy/surgery, microscopic appearance, and laboratory tests.

Disseminated: a cancer which occurs throughout the whole body, such as leukemia.

Distant: (see stage).

Epidemiology: the study of the distribution of a disease and the risk factors for the disease in a population.

Grade: describes how abnormal cells look under the microscope. Cancers are graded from the least to most abnormal, grade 1 to 3 or well, moderately, or poorly differentiated.

Hepatitis: inflammation of the liver

HbsAg: hepatitis B surface antigen, a protein made by the hepatitis B virus.

HCC: hepatocellular carcinoma, cancer of the liver.

HBV: hepatitis B virus.

Histology: study of cells and tissues under the microscope.

ICD-O: International Classification of Disease – Oncology; a standardized system for classifying cancers by primary site and histology.

In situ: cancer confined to the cells in which it started and has not spread beyond that cell layer.

Alaska Native Cancer Survival Report

Incidence rate: number of *new cases* of a specific disease identified in a specified time period (usually one year), in a specified population.

Invasive cancer: cancer that has spread beyond the cells in which it developed and has the potential to involve adjacent tissues, organs, or lymph nodes, or extend to distant areas of the body.

Leukemia: cancer of the white blood cells.

Life expectancy tables: tables based on death data which specify the chance of dying of a person of a given age and sex.

Local: (see stage).

Lost to follow-up: patients in a registry whose health status is not currently known.

Lymph nodes: collections of immune system tissue and cells (mainly lymphocytes) that help fight infections and cancer.

Melanoma: a cancer that starts in the cells of the skin that produce pigment.

Metastasis: cancer which is present in the body far from the site (organ) in which it first developed.

Mortality rate: numbers of *deaths* occurring in a specified time period, (usually one year) in a specified population (usually expressed as rate per 100,000 per year).

NCI: National Cancer Institute, the federal agency conducting research on cancer

Observed Survival: the survival rate estimated without any adjustment for a person's life expectancy of persons in the specified population.

Oncology: the study of tumors; an oncologist is a physician who specializes in the treatment of cancer.

p value: the probability an observed event may have happened by chance.

Pathology: study of abnormal cells and tissue under the microscope.

Primary cancer: the site (usually the organ) where cancer begins (e.g. breast cancer).

Rate: the number of occurrences of a disease in a population in a given time period, usually expressed as a number per 100,000 population per year.

Recurrence: cancer which returned after treatment

Regional: (see stage)

Relative Survival: survival rate taking into account (average) life expectancy of a person of the same age and sex.

Alaska Native Cancer Survival Report

Risk factor: anything that increases a person's chance of developing a disease, (e.g. family history of the disease, tobacco, etc.).

Screening: examinations or tests done on a patient to detect disease before the disease has caused symptoms or illness.

SEER: Surveillance, Epidemiology & End Results; a program sponsored by the National Cancer Institute to collect detailed information on cancer occurrence, treatment and outcome in the U.S.

Site: refers to the place (usually organ) of the body where the cancer started.

Stage: the extent or degree of spread of cancer from the original site to the other parts of the body: *local* - confined to the site of origin; *regional* - spread to nearby organs or lymph nodes, *distant* -extended far from the original site.

Survival rate: the percentage of patients (calculated by a mathematical procedure) who survive a certain period of time following diagnosis of cancer.

Tissue: a collection of cells which work together to perform a particular body function

Tumor: an abnormal growth of cells which may be benign or malignant (cancer)

Tumor registry: a standard system of identifying patients with cancer, collecting information on diagnosis and treatment, and assuring timely clinical follow-up and care.

Alaska Native Cancer Survival Report

References

1. Cobb N, Paisano, RE. Cancer Mortality among American Indians and Alaska Natives in the United States: Regional Differences in Indian Health, 1989-93. Indian Health Service. IHS Pub No. 97-615-23. Rockville, MD, 1997.
2. Lanier AP, Kelly J, Smith B, Amadon C, Harpster A, Peters H, Tanttila H. Cancer in Alaska Natives. A Twenty-Five Year Report 1969-1993. Incidence and Mortality. Anchorage, AK, 1996, Alaska Area Native Health Service.
3. Miller BA, Kolonel LN, Bernstein L, et al (eds.). Racial/Ethnic Patterns of Cancer in the United States 1988-1992. National Cancer Institute. NIH Pub. No. 96-4104. Bethesda, MD, 1996.
4. Bleed DM, Risser DR, Sperry S, Hellhake D, Helgerson SD. Cancer Incidence and Survival among American Indians Registered for Indian Health Service Care in Montana, 1982-1987. *Journal of the National Cancer Institute* 1992; 84:1500-5.
5. Sugarman JR, Dennis LK, White E. Cancer Survival among American Indians in Western Washington State (United States). *Cancer Causes Control* 1994;5:440-8.
6. Gilliland FD, Hunt WC, Key CR. Trends in Survival Of American Indian, Hispanic and Non-Hispanic White Cancer Patients in New Mexico and Arizona, 1969-1994. *Cancer* 1998; 82:1769-83.
7. Frost F, Tollestrup K, Hunt WC, Gilliland F, Key CR, Urbina CE. Breast Cancer Survival among New Mexico Hispanic, American Indian, and Non-Hispanic White Women (1973-1992). *Cancer Epidemiology, Biomarkers & Prevention* 1996;5:861-6.
8. Gilliland FD, Hunt WC, Key CR. Ethnic Variation in Prostate Cancer Survival in New Mexico. *Cancer Epidemiology, Biomarkers & Prevention* 1996;5:247-51.
9. Schiff M, Key CR, Gilliland FD, Becker TM. Ethnic Differences in Uterine Corpus Cancer Incidence and Mortality in New Mexico's American Indians, Hispanics and Non Hispanic Whites. *International Journal of Epidemiology* 1997;26:249-55.
10. Foucar K, Duncan M, Stidley C, Wiggins C, Hunt W, Key C. Survival of Children and Adolescents with Acute Lymphoid Leukemia. *Cancer* 1991; 67(8):2125-30.
11. Baquet CR. Native Americans' Cancer Rates in Comparison with other Peoples of Color. *Cancer* 1996;78(7):1538-44.
12. Surveillance, Epidemiology, and End Results (SEER) Program Public-Use CD-ROM (1973-1995), National Cancer Institute, DCPC, Surveillance Program, Cancer Statistics Branch, released October 1997.
13. Agresti A. An Introduction to Categorical Data Analysis. New York: John Wiley & Sons, 1996.
14. Lanier AP, McMahon BJ, Alberts SR, Popper H, Heyward WL. Primary Liver Cancer in Alaska Natives 1980-1985. *Cancer* 1987;60:1915-1920.
15. McMahon BJ, Rhodes E, Heyward W, Tower E, Ritter D, Lanier AP, Wainwright R, Helminiak C. A Comprehensive Programme to Reduce the Incidence of Hepatitis B Virus Infection and its Sequelae in Alaska Natives. *Lancet* 1987;(2):1134-6.
16. McMahon, BJ, Wainwright RW, Lanier AP. The Alaska Native HCC Screening Program: A Population-Based Screening Program for Hepatocellular Carcinoma. In Tabor E, DiBisceglie AM, Purcell RH (eds.). Etiology, Pathology and Treatment of Hepatocellular Carcinoma in North America. *Advances in Biotechnology Series*, 13; Houston,1991.
17. McMahon BJ, Bulkow L, Harpster A, Snowball M, Lanier AP, Sacco F, Williams J. Early Detection of Hepatocellular Carcinoma (HCC) in HBsAg-Positive Carriers: A 15 Year Prospective Population-Based Study in Alaska. (Abstract) *Hepatology* October 1998; 338A.
18. Lanier AP, Bender T, Talbot M, Wilmeth S, Tscopp C, Henle W, Henle G, Ritter D, Teraski P. Nasopharyngeal Carcinoma in Alaskan Eskimos Indians, and Aleuts: A Review of Cases and Study of Epstein-Barr Virus, HLA, and Environmental Risk Factors. *Cancer* 1980;46(9):2100-6.
19. Lanier AP, Bender TR. Nasopharyngeal Carcinoma in Alaskan Natives. In: Resnick G, Stinson SF, (eds). *Nasal Tumors in Animals and Man: Anatomy, Physiology and Epidemiology*. Boca Raton, Florida: CRC Press, Inc. 1983:249-260.