

Cancer Incidence and Mortality in Alaska, 1996-2004



**Alaska Cancer Registry
Section of Chronic Disease Prevention and Health Promotion
Alaska Department of Health and Social Services**

May 2008

Cancer Incidence and Mortality in Alaska, 1996-2004
A report from the Alaska Cancer Registry
May 2008

Prepared by:

David K. O'Brien, PhD, GISP
Lynn Upton, RN, BSN

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The registrars of the Alaska Cancer Registry:
Elizabeth J. Blair, MSN, RN, CTR
James G. Whitecavage, MT(ASCP), MA, CTR
Chris J. Geri, BS, RHIT, CTR

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For more information contact:

Alaska Cancer Registry
Section of Chronic Disease Prevention & Health Promotion
Alaska Department of Health and Social Services
3601 C Street, Suite 722
Anchorage, AK 99503-5923
(907) 269-8047

Or visit our web site: www.hss.state.ak.us/dph/chronic/cancer/registry.htm

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Definitions and Use of Race in this Report

Rates for Whites and Natives are used in this report. These two racial groups make up approximately 91 percent of the population of the state of Alaska during the period 1996-2004 (74 and 17 percent individually). The remaining 9 percent are Asian/Pacific Islander and Blacks (5 and 4 percent individually). Cancer rates for Whites and Natives are the most stable for the comparisons between races because of their larger numbers. Cancer rates for the other races tend to have larger fluctuations from year to year.

AK White: Caucasians in Alaska.

AK Native: Alaska Natives in Alaska. This includes a small population of Native Americans.

U.S. White: Caucasians, including those living in Alaska, covered by the 13 registries of the U.S. SEER program of the National Cancer Institute.

U.S. Native: Native Americans and Alaska Natives, including those living in Alaska, covered by the 13 registries of the U.S. SEER program of the National Cancer Institute.

Incidence Rate: Rate of occurrence of NEW cancer cases diagnosed in a defined population in a given time frame.

Mortality Rate: Rate of cancer deaths occurring in a defined population during a given time frame.

Crude Rate: The number of new cases of cancer, or cancer deaths, during the year expressed as a rate per 100,000 persons in the population, without regard to the age distribution of the population.

Age-Adjusted Rate: Since cancer rates tend to vary with age, and populations vary with respect to their age-distribution, incidence and mortality rates are age-adjusted to allow comparison of rates between different populations with different age distributions. In this report, age-adjusted rates are calculated by the direct method using the age distribution of the 2000 United States standard population with 19 age groups. All age-adjusted rates are expressed per 100,000 individuals per year.

U.S. Rate: Age-adjusted rate for the population covered by the SEER program of the National Cancer Institute. The 13 SEER registries cover approximately 14 percent of the U.S. population, including Alaska (source: <http://seer.cancer.gov/registries/data.html>).

Introduction

This report presents a summary of cancer incidence and mortality for the 9-year period of 1996 to 2004 for the State of Alaska. The information is presented in a series of tables, graphs, and maps.

Incidence and mortality rates for the six highest-ranking cancers in Alaska are presented in tables and are ranked by both age-adjusted rates and by the number of cases during this time period. Rankings are presented for the state population as a whole as well as for Whites and Alaska Natives. Alaska rates are compared to U.S. rates. Incidence and Mortality pie charts illustrate the cancer types greater than 1 percent of the total. Graphs illustrate incidence and mortality trends for the six highest-ranking cancers by diagnosis year and death year for Alaska and the U.S. Rates for childhood cancer incidence and mortality are also presented. Color-coded maps illustrate ranges of incidence and mortality rates for the six highest-ranking cancers in Alaska for each borough/census area.

Causes of Cancer

It is not easy to explain why one person develops cancer and another does not. However, more research is showing that certain risk factors increase the chance that a person will develop cancer and most types of cancers become more common as we get older. The table below identifies established causes of cancer and the percentage of cancer deaths that are attributed to the specific risk factor. Many of the risk factors are preventable by lifestyle choices.

Risk Factor	Percentage of Total Cancer Deaths
Tobacco	30
Adult diet/obesity	25
Sedentary lifestyle	10
Occupational factors	5
Family history of cancer	5
Viruses/other biological events	5
Perinatal factors/growth	5
Reproductive factors	5
Alcohol	3
Socioeconomic status	*
Environmental pollution	2
Ionizing/ultraviolet radiation	2
Prescription drugs/medical procedures	2
Salt/other food additives/contaminants	1

* An important underlying factor operating through other specific causes

Source: W.C. Willett, D. Hunter, and G.A. Colditz, 2000. "Summary – Causes of Cancer". In: *Cancer Prevention: The Causes and Prevention of Cancer, Volume 1*, G.A. Colditz and D. Hunter (eds), Kluwer Academic Publishers, The Netherlands. p.161-171.

Incidence – Malignant Cancers in Alaska, 1996-2004

The tables below show the types of cancers with the highest rates and number of cases. During this time period, they represent 63.1% of all malignant cancers diagnosed in Alaska. Rates are age-adjusted to the 2000 US standard population.

Highest-Ranked Cancers by Rate

Type of Cancer	Rate per 100,000	Number of Cases	U.S. Rate
1. Prostate	165.4	2,629	170.5
2. Female Breast	134.3	2,869	131.3
3. Lung and Bronchus	75.3	2,479	61.2
4. Colorectal	57.2	1,876	52.2
5. Bladder	23.6	741	20.4
6. Uterus	21.1	436	24.2

Highest-Ranked Cancers by Number of Cases

Type of Cancer	Rate per 100,000	Number of Cases	U.S. Rate
1. Female Breast	134.3	2,869	131.3
2. Prostate	165.4	2,629	170.5
3. Lung and Bronchus	75.3	2,479	61.2
4. Colorectal	57.2	1,876	52.2
5. Non-Hodgkin's Lymphoma	19.7	762	19.5
6. Bladder	23.6	741	20.4

Mortality – Malignant Cancers in Alaska, 1996-2004

The tables below show the highest death rate and death count in Alaska by types of cancer. During this time period, they represent 59.0% of all cancer deaths in Alaska. Rates are age-adjusted to the U.S. year 2000 standard population.

Highest-Ranked Cancer Deaths by Rate

Type of Cancer	Rate per 100,000	Number of Cases	U.S. Rate
1. Lung and Bronchus	57.4	1,792	55.6
2. Prostate	26.0	242	30.2
3. Female Breast	23.3	439	26.6
4. Colorectal	19.6	557	20.2
5. Pancreas	10.9	346	10.5
6. Ovary	7.5	129	8.9

Highest-Ranked Cancer Deaths by Number of Cases

Type of Cancer	Rate per 100,000	Number of Cases	U.S. Rate
1. Lung and Bronchus	57.4	1,792	55.6
2. Colorectal	19.6	557	20.2
3. Female Breast	23.3	439	26.6
4. Pancreas	10.9	346	10.5
5. Prostate	26.0	242	30.2
6. Non-Hodgkin's Lymphoma	7.4	234	8.1

Incidence by Race – Whites and Natives, 1996-2004

Incidence rates for Alaska Natives are different than those for Whites.

The following tables list the types of cancers with highest rates for **Alaska Natives** compared to AK Whites and U.S. Natives.

Highest-Ranked Cancers by Rate for Alaska Natives

Type of Cancer	AK Natives		AK Whites		U.S. Natives
	Rate per 100,000	No. of Cases	Rate per 100,000	No. of Cases	Rate per 100,000
1. Female Breast	136.7	446	138.6	2,246	62.8
2. Colorectal	104.9	529	49.1	1,231	36.5
3. Lung and Bronchus	94.8	476	73.1	1,861	36.2
4. Prostate	80.4	174	177.6	2,245	62.8
5. Stomach	23.6	128	5.6	139	10.7
6. Kidney and Renal Pelvis	19.7	109	13.1	397	11.8

Highest-Ranked Cancers by Number of Cases for Alaska Natives

Type of Cancer	AK Natives		AK Whites		U.S. Natives
	Rate per 100,000	No. of Cases	Rate per 100,000	No. of Cases	Rate per 100,000
1. Colorectal	104.9	529	49.1	1,231	36.5
2. Lung and Bronchus	94.8	476	73.1	1,861	36.2
3. Female Breast	136.7	446	138.6	2,246	62.8
4. Prostate	80.4	174	177.6	2,245	62.8
5. Stomach	23.6	128	5.6	139	10.7
6. Kidney and Renal Pelvis	19.7	109	13.1	397	11.8

The following tables list the types of cancers with highest rates for **Whites** compared to Alaska Natives and U.S. Whites. The ranking for Whites is the same as all races combined.

Highest-Ranked Cancers by Rate for Whites

Type of Cancer	AK Whites		AK Natives		U.S. Whites
	Rate per 100,000	No. of Cases	Rate per 100,000	No. of Cases	Rate per 100,000
1. Prostate	177.6	2,245	80.4	174	166.3
2. Female Breast	138.6	2,246	136.7	446	137.4
3. Lung and Bronchus	73.1	1,861	94.8	476	61.9
4. Colorectal	49.1	1,231	104.9	529	51.8
5. Bladder	27.1	658	12.0	58	22.5
6. Uterus	23.3	366	13.4	43	24.2

Highest-Ranked Cancers by Number of Cases for Whites

Type of Cancer	AK Whites		AK Natives		U.S. Whites
	Rate per 100,000	No. of Cases	Rate per 100,000	No. of Cases	Rate per 100,000
1. Female Breast	138.6	2,246	136.7	446	137.4
2. Prostate	177.6	2,245	80.4	174	166.3
3. Lung and Bronchus	73.1	1,861	94.8	476	61.9
4. Colorectal	49.1	1,231	104.9	529	51.8
5. Bladder	27.1	658	12.0	58	22.5
6. Non-Hodgkin's Lymphoma	21.9	642	11.6	75	20.9

Mortality by Race – Whites and Natives, 1996-2004

Mortality rates for Alaska Natives are different than those for Whites.

The following tables list the types of cancers with highest death rates for **Alaska Natives** compared to AK Whites and U.S. Natives.

Highest-Ranked Cancer Deaths by Rate for Alaska Natives

Type of Cancer	AK Natives		AK Whites		U.S. Natives
	Rate per 100,000	No. of Cases	Rate per 100,000	No. of Cases	Rate per 100,000
1. Lung and Bronchus	68.4	327	57.3	1,385	35.9
2. Colorectal	34.4	152	17.3	376	13.8
3. Female Breast	22.6	72	23.7	331	14.4
4. Prostate	19.8	27	27.5	203	19.6
5. Stomach	16.8	93	3.7	86	5.2
6. Pancreas	14.8	76	10.5	256	6.5

Highest-Ranked Cancer Deaths by Number of Cases for Alaska Natives

Type of Cancer	AK Natives		AK Whites		U.S. Natives
	Rate per 100,000	No. of Cases	Rate per 100,000	No. of Cases	Rate per 100,000
1. Lung and Bronchus	68.4	327	57.3	1,385	35.9
2. Colorectal	34.4	152	17.3	376	13.8
3. Stomach	16.8	93	3.7	86	5.2
4. Pancreas	14.8	76	10.5	256	6.5
5. Female Breast	22.6	72	23.7	331	14.4
6. Prostate	19.8	27	27.5	203	19.6

The following tables list the cancer types with highest death rates for **Whites** compared to Alaska Natives and U.S. Whites. The ranking for Whites is the same as all races combined.

Highest-Ranked Cancer Deaths by Rate for Whites

Type of Cancer	AK Whites		AK Natives		U.S. Whites
	Rate per 100,000	No. of Cases	Rate per 100,000	No. of Cases	Rate per 100,000
1. Lung and Bronchus	57.3	1,385	68.4	327	55.7
2. Prostate	27.5	203	19.8	27	27.8
3. Female Breast	23.7	331	22.6	72	26.0
4. Colorectal	17.3	376	34.4	152	19.7
5. Pancreas	10.5	256	14.8	76	10.3
6. Non-Hodgkin's Lymphoma	8.4	198	5.0	28	8.4

Highest-Ranked Cancer Deaths by Number of Cases for Whites

Type of Cancer	AK Whites		AK Natives		U.S. Whites
	Rate per 100,000	No. of Cases	Rate per 100,000	No. of Cases	Rate per 100,000
1. Lung and Bronchus	57.3	1,385	68.4	327	55.7
2. Colorectal	17.3	376	34.4	152	19.7
3. Female Breast	23.7	331	22.6	72	26.0
4. Pancreas	10.5	256	14.8	76	10.3
5. Prostate	27.5	203	19.8	27	27.8
6. Non-Hodgkin's Lymphoma	8.4	198	5.0	28	8.4

Incidence and Mortality Graphs

The next several pages consist of graphs illustrating cancer incidence and mortality in Alaska for the nine-year period 1996-2004. Rates are per 100,000 people and age-adjusted to the year 2000 U.S. Standard Population. Rates based on fewer than 20 occurrences are statistically unreliable and should be used with caution. Data are suppressed if the number of cancer cases is less than 6 for confidentiality purposes.

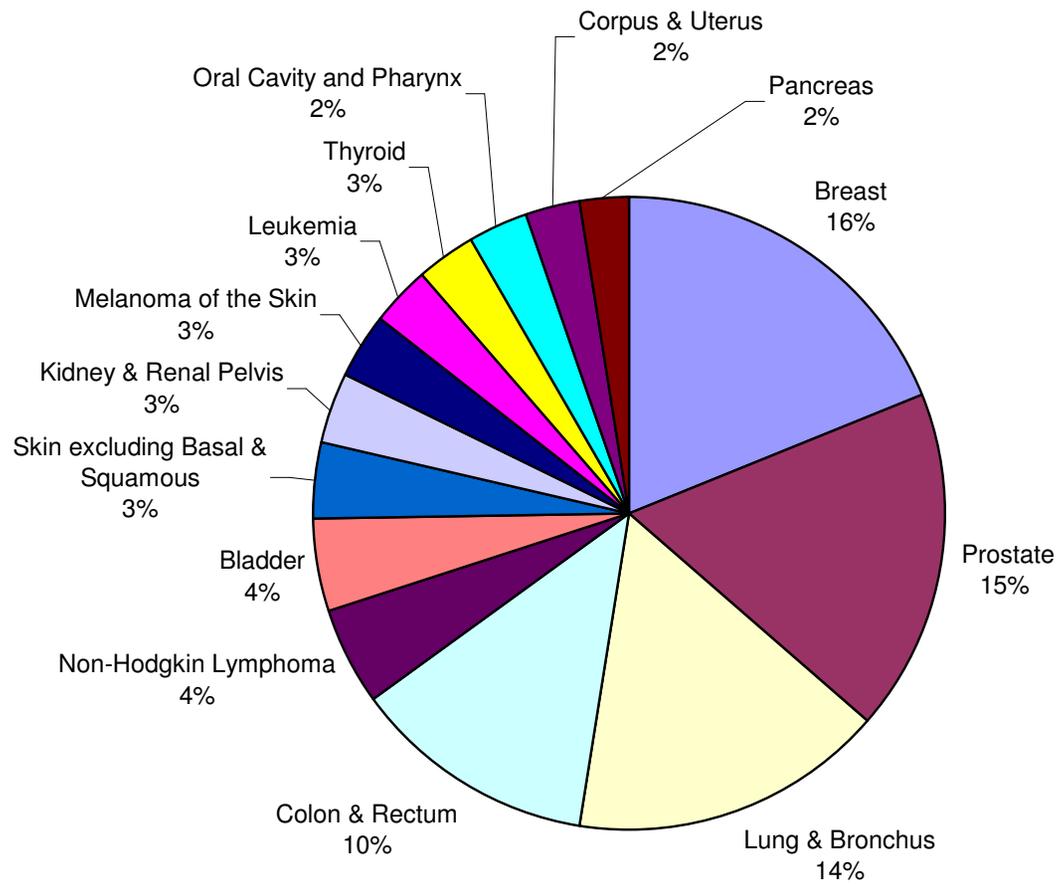
The percentage of incidence and mortality cases for all types of cancers greater than 2 percent of the total are presented as pie charts.

Rate trends by year for the six highest-ranking cancers in Alaska compared to the U.S. are presented as line graphs. The trend data for Alaska shows a larger variation than the U.S. data. This is due to the size of Alaska's population. The state has a relative small population and consequently, the number of cancer cases is relatively small, confidence intervals are wider, and the statistical variation from year to year is higher.

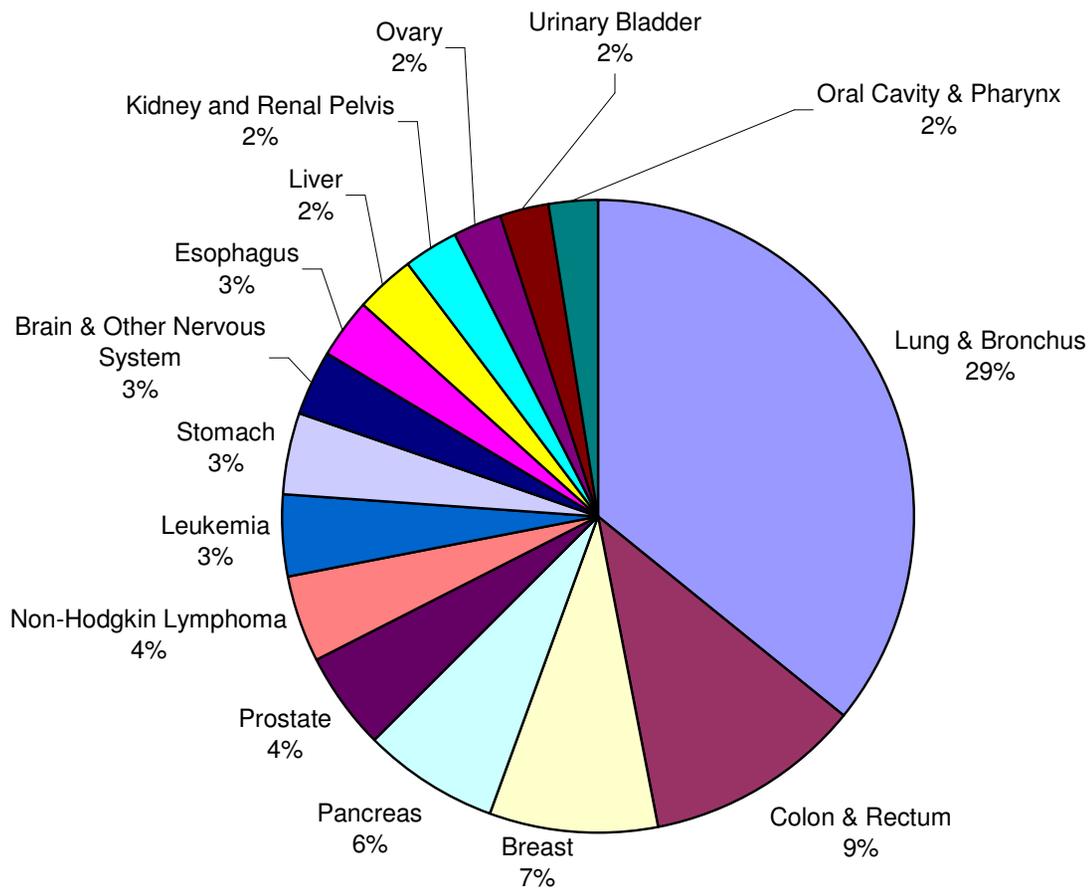
Rates stratified by race (White, Black, Native, and Asian & Pacific Islander) for the six highest-ranking cancers in Alaska compared to the U.S. are presented as bar graphs. It is not practical to illustrate yearly rate trends by race due to the small number of cases for individual race categories.

Rates for childhood cancer incidence and mortality in Alaska compared to the U.S. are presented in bar graphs. The number of these cases is relatively low – even over a 9-year period, some cancer rates are suppressed because there are less than 6 cases.

Malignant Cancer Incidence in Alaska, 1996-2004



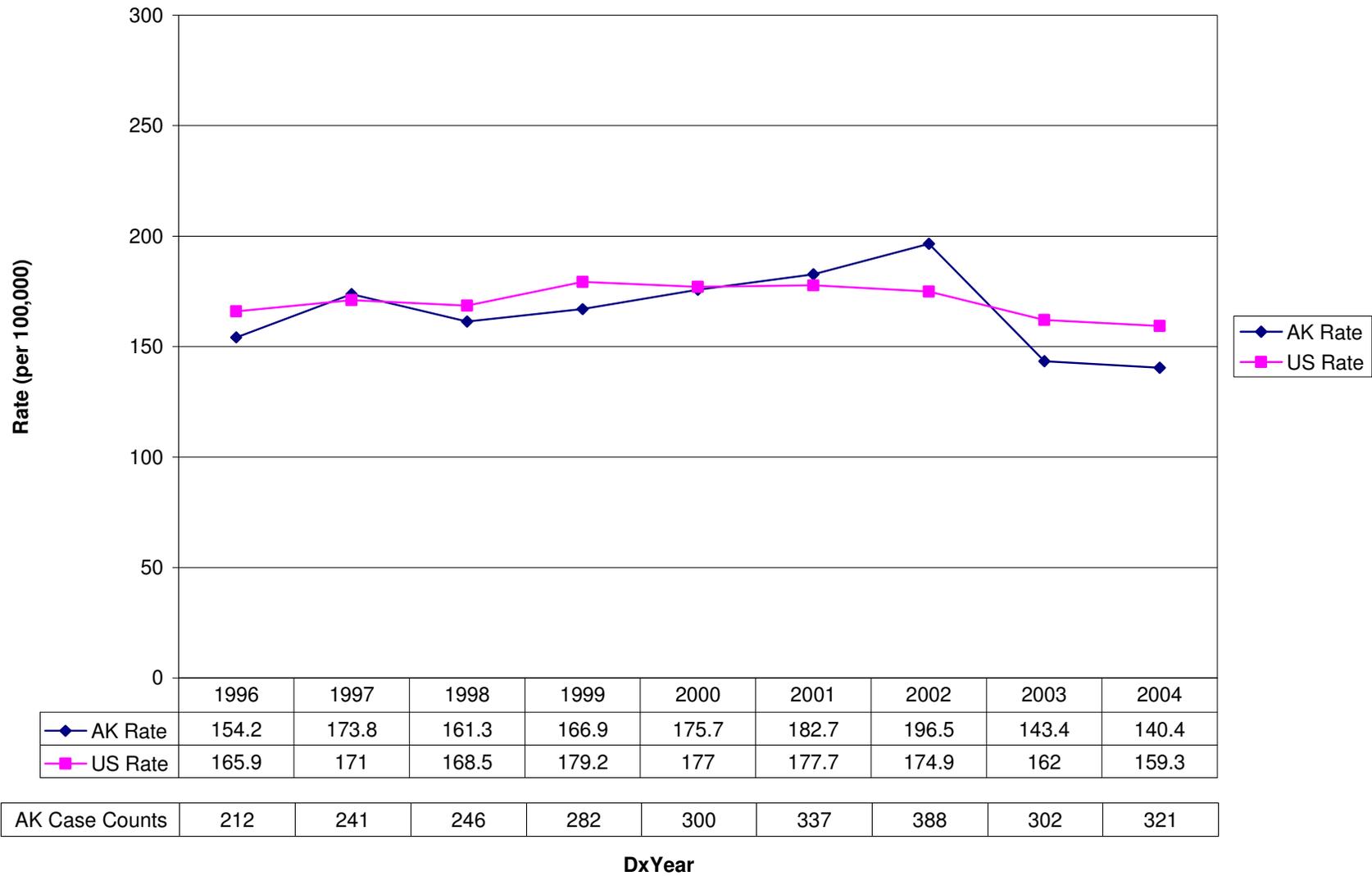
Cancer Mortality in Alaska, 1996-2004



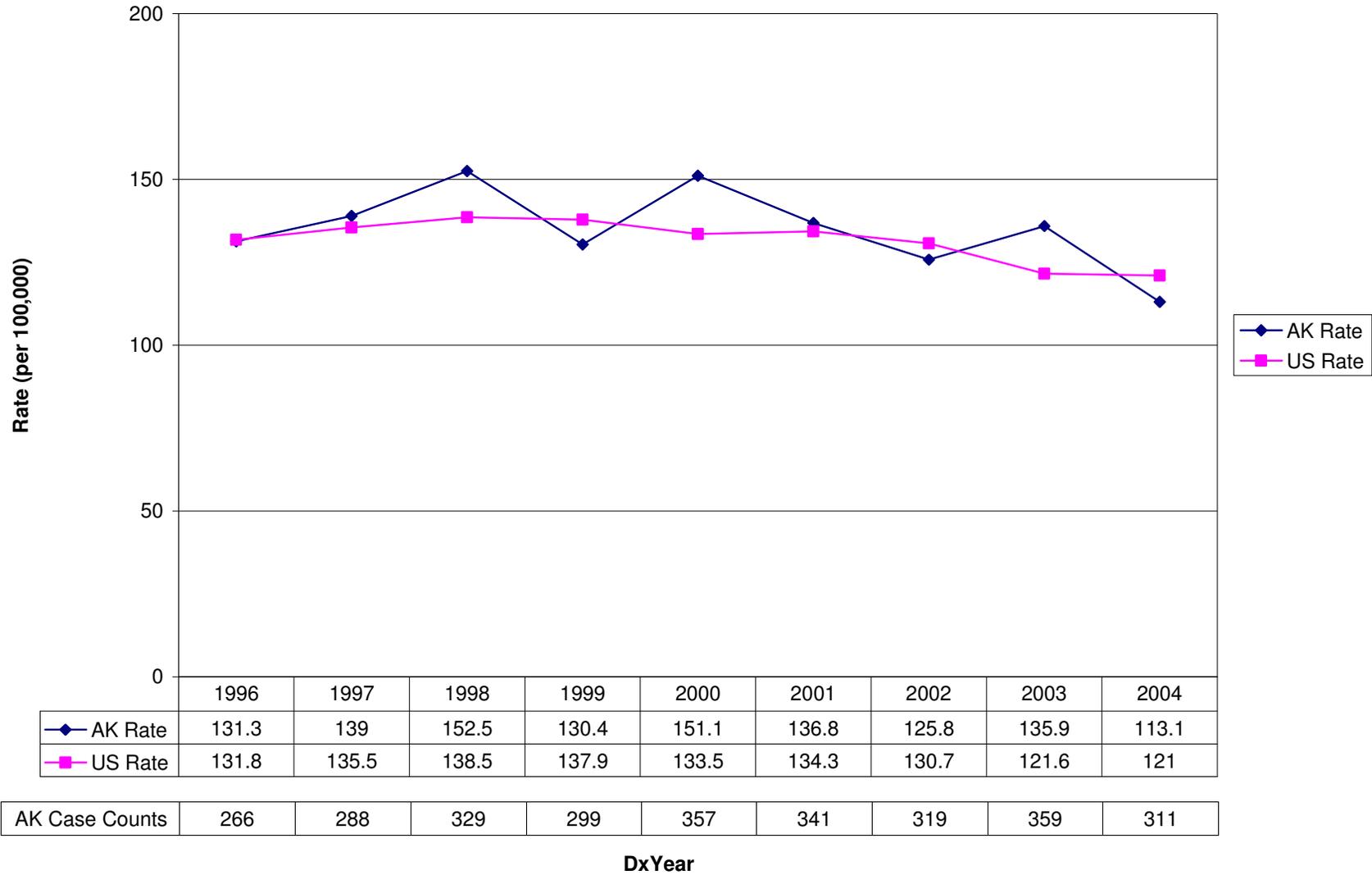
All Sites - Malignant Cancer Incidence, AK and US Rates 1996-2004



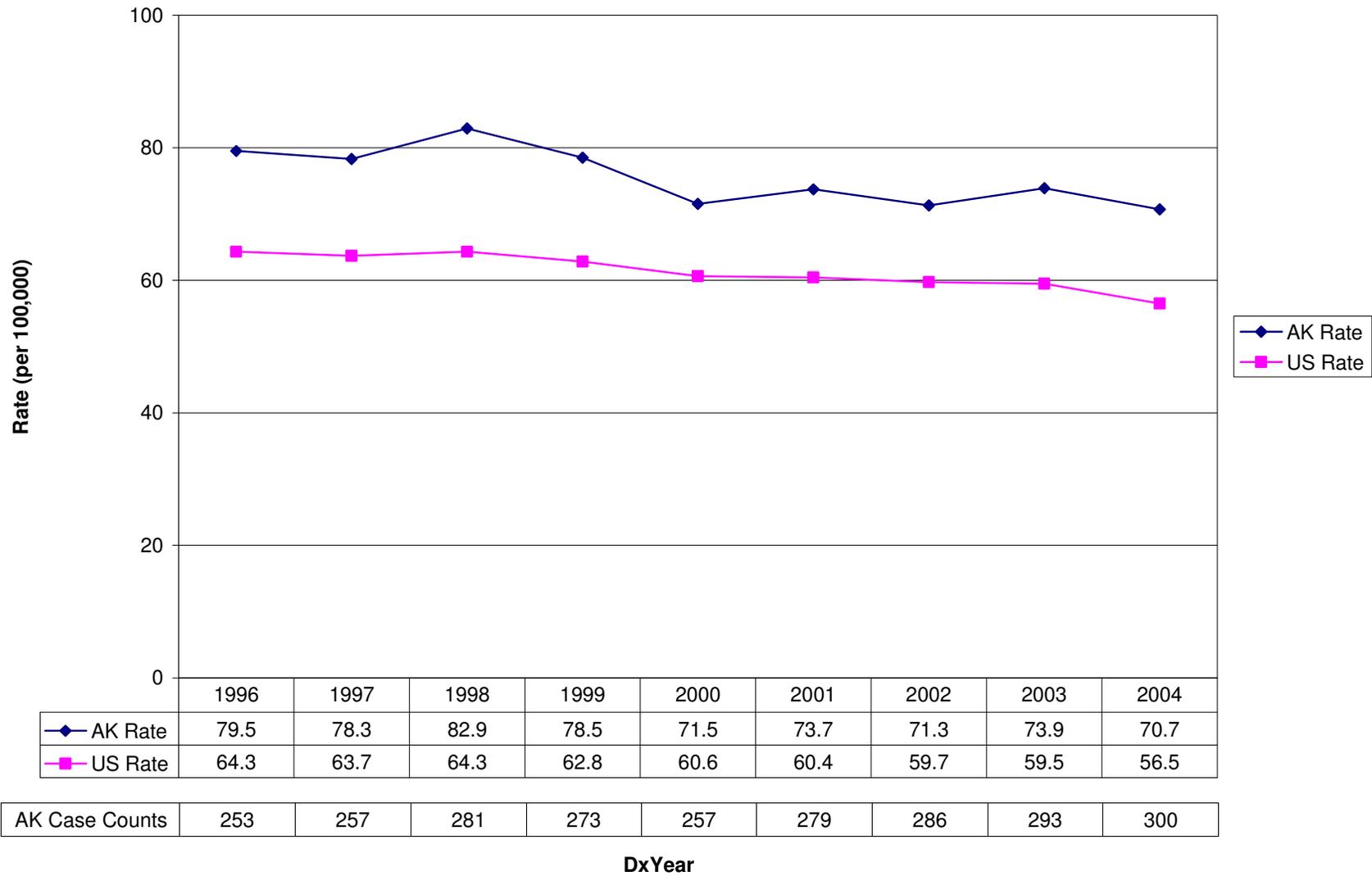
Prostate Cancer Incidence, AK and US Rates 1996-2004



Female Breast Cancer Incidence, AK and US Rates 1996-2004



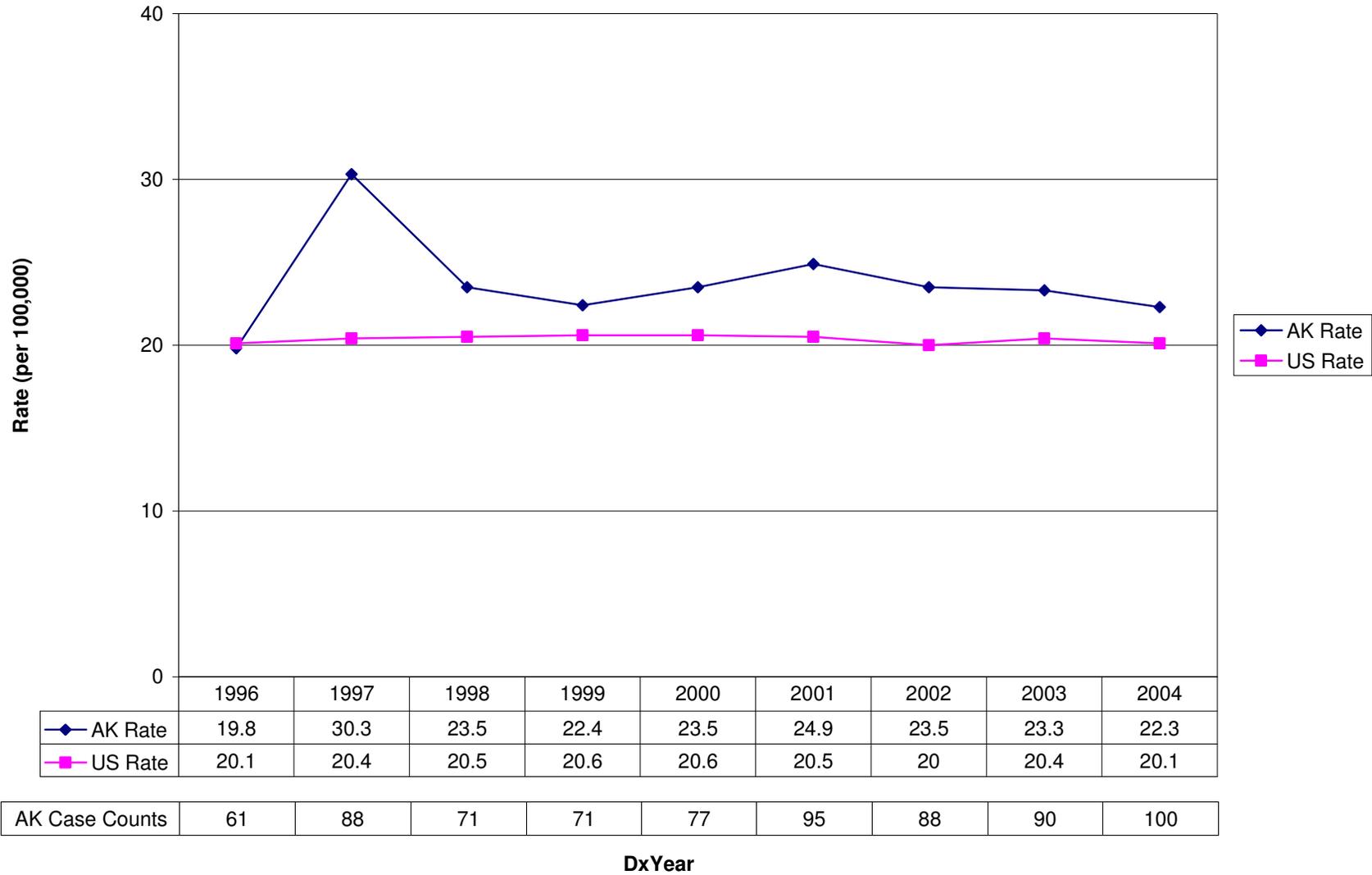
Lung Cancer Incidence, AK and US Rates 1996-2004



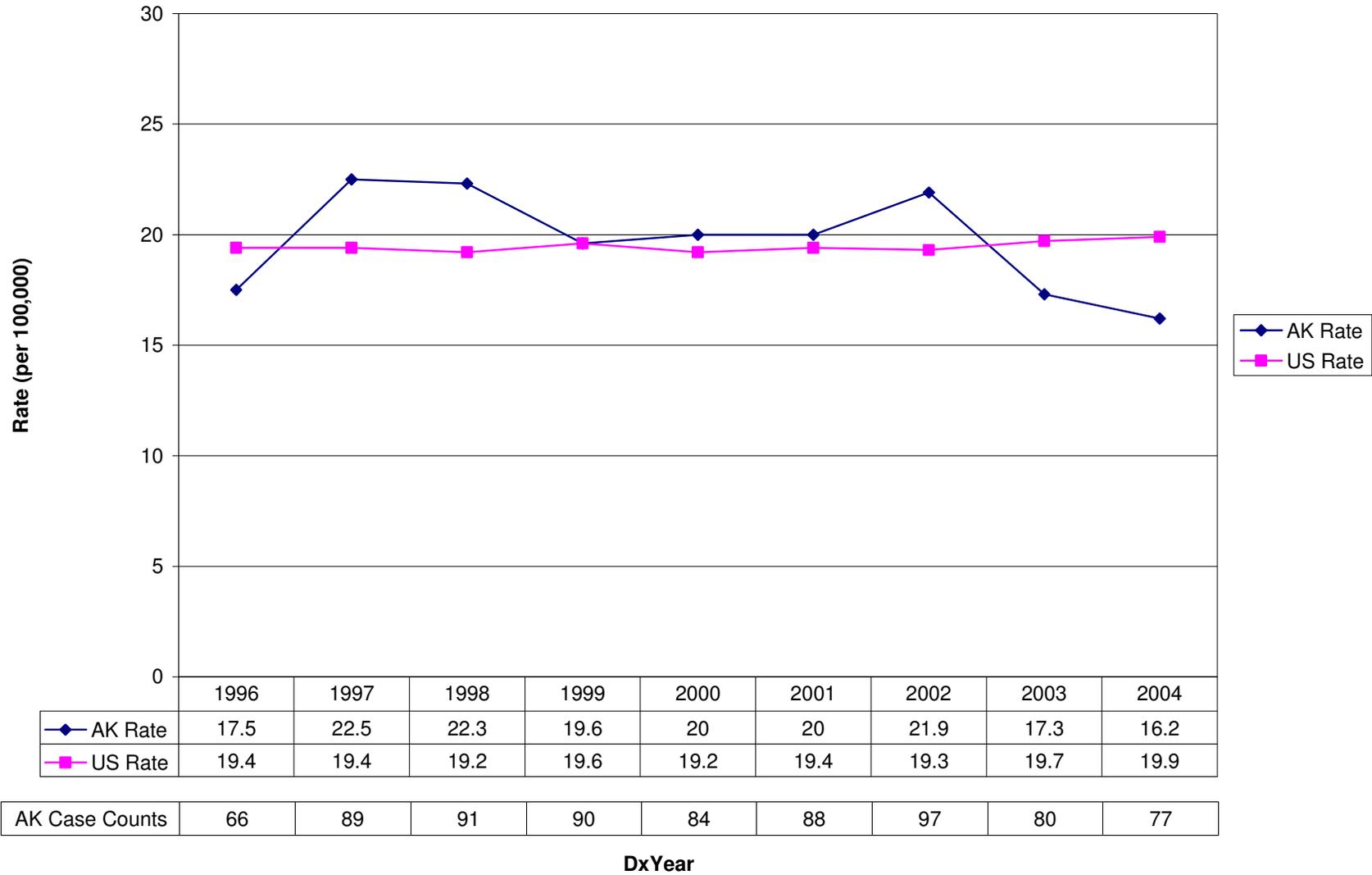
Colorectal Cancer Incidence, AK and US Rates 1996-2004



Bladder Cancer Incidence, AK and US Rates 1996-2004



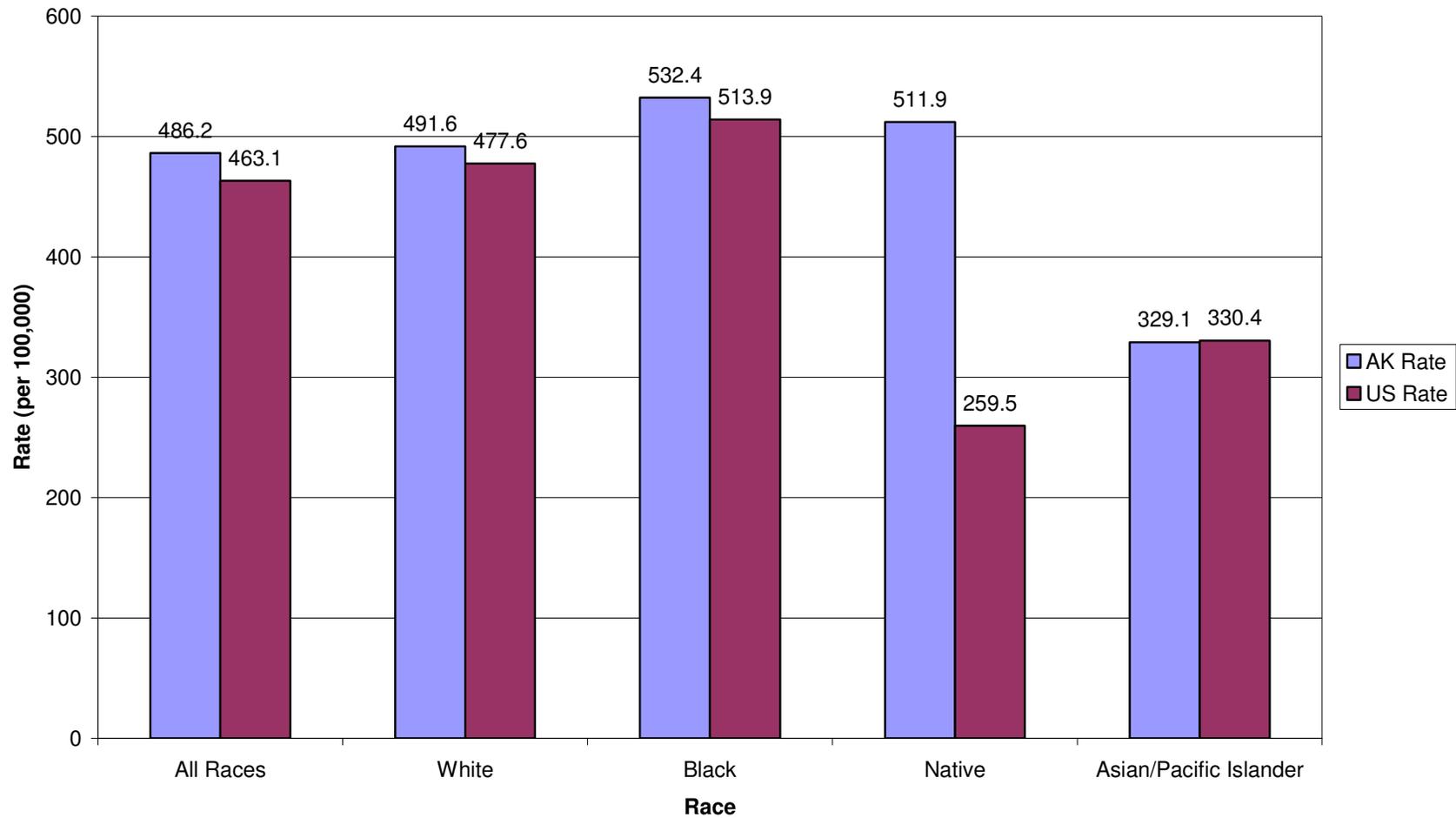
Non-Hodgkin's Lymphoma Incidence, AK and US Rates 1996-2004



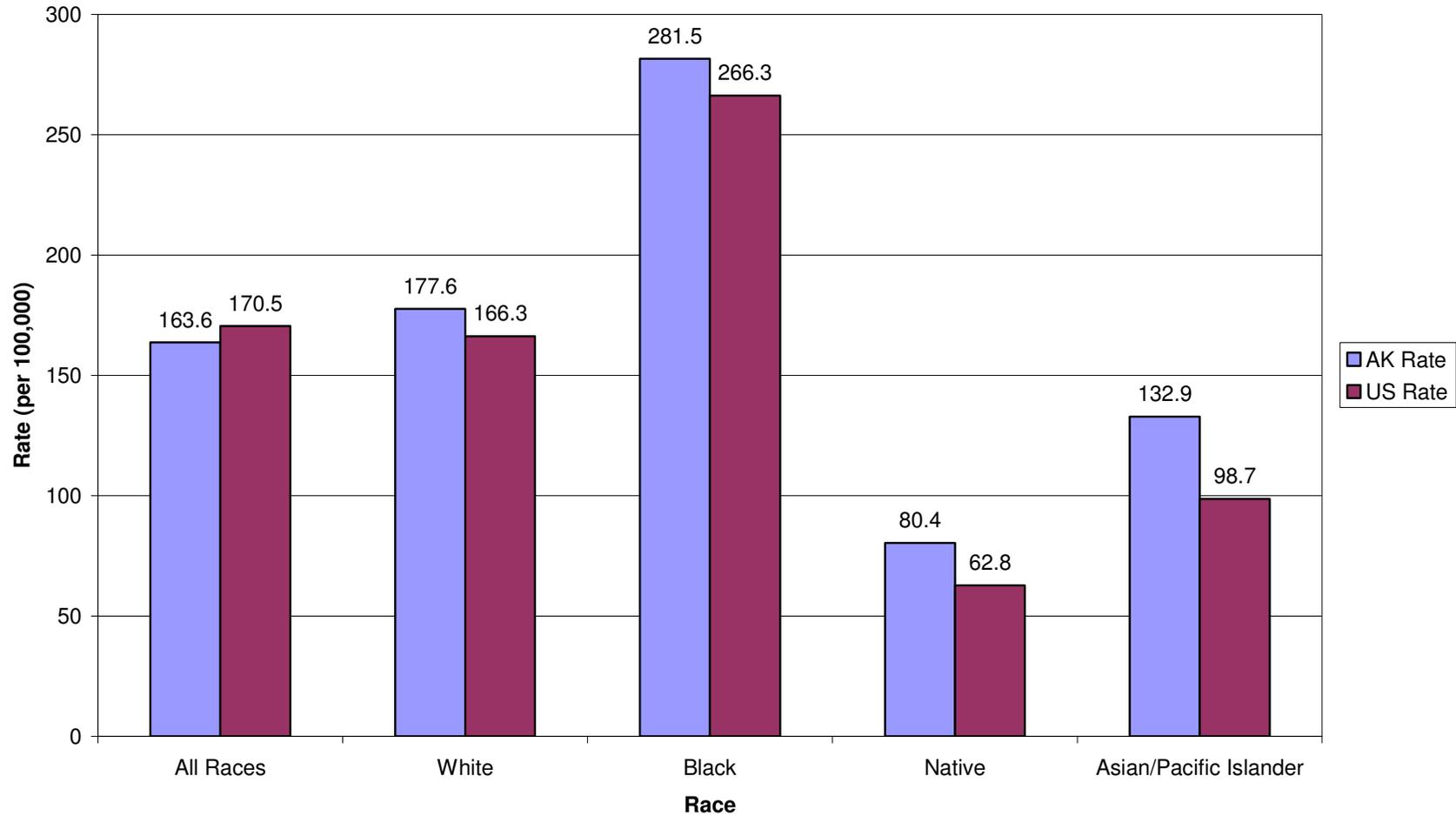
Malignant Uterine Cancer Incidence, AK vs US Rates 1996-2004



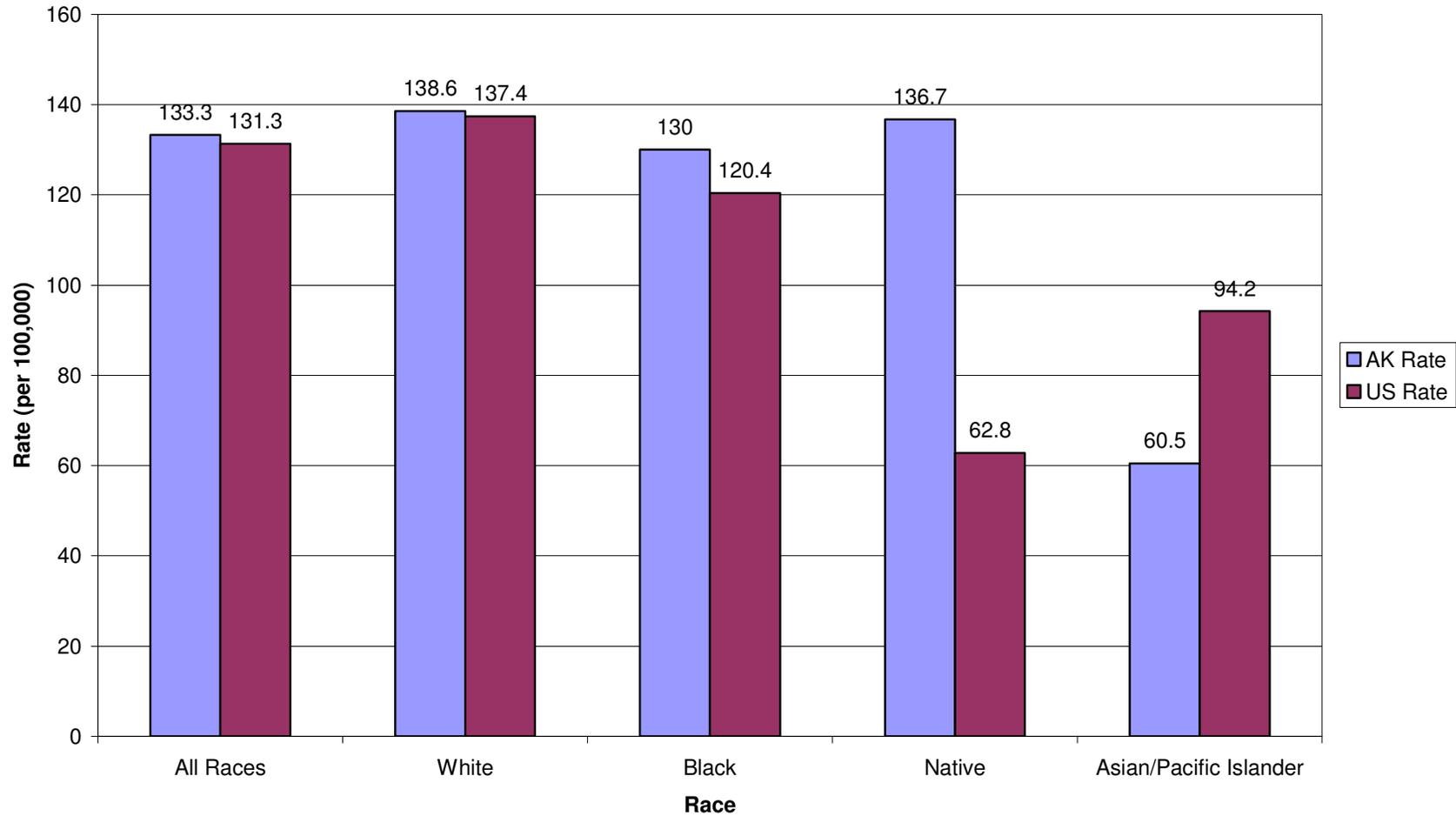
All Sites - Malignant Cancer Incidence by Race, AK and US Rates 1996-2004



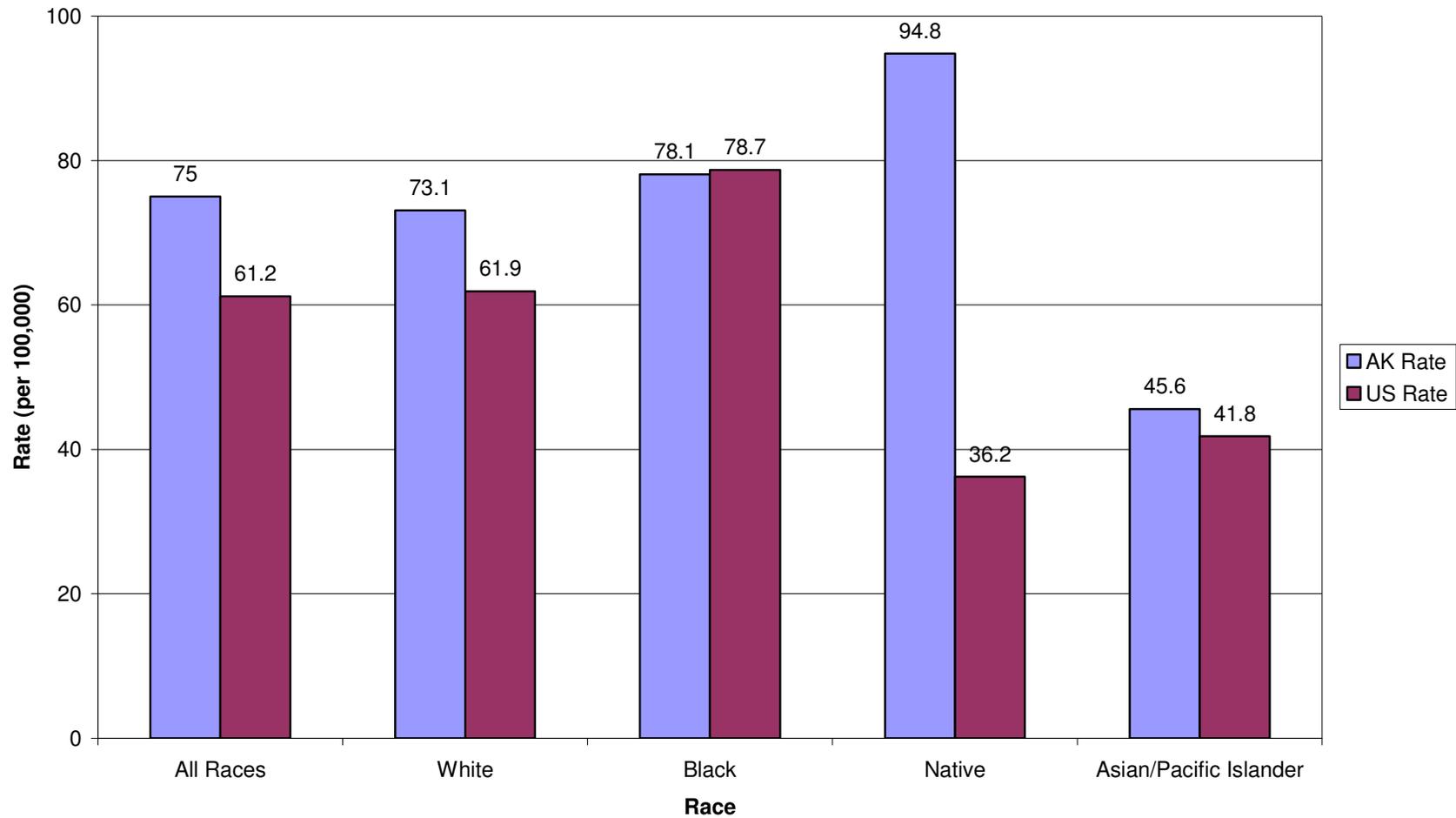
Prostate Cancer Incidence by Race, AK and US Rates 1996-2004



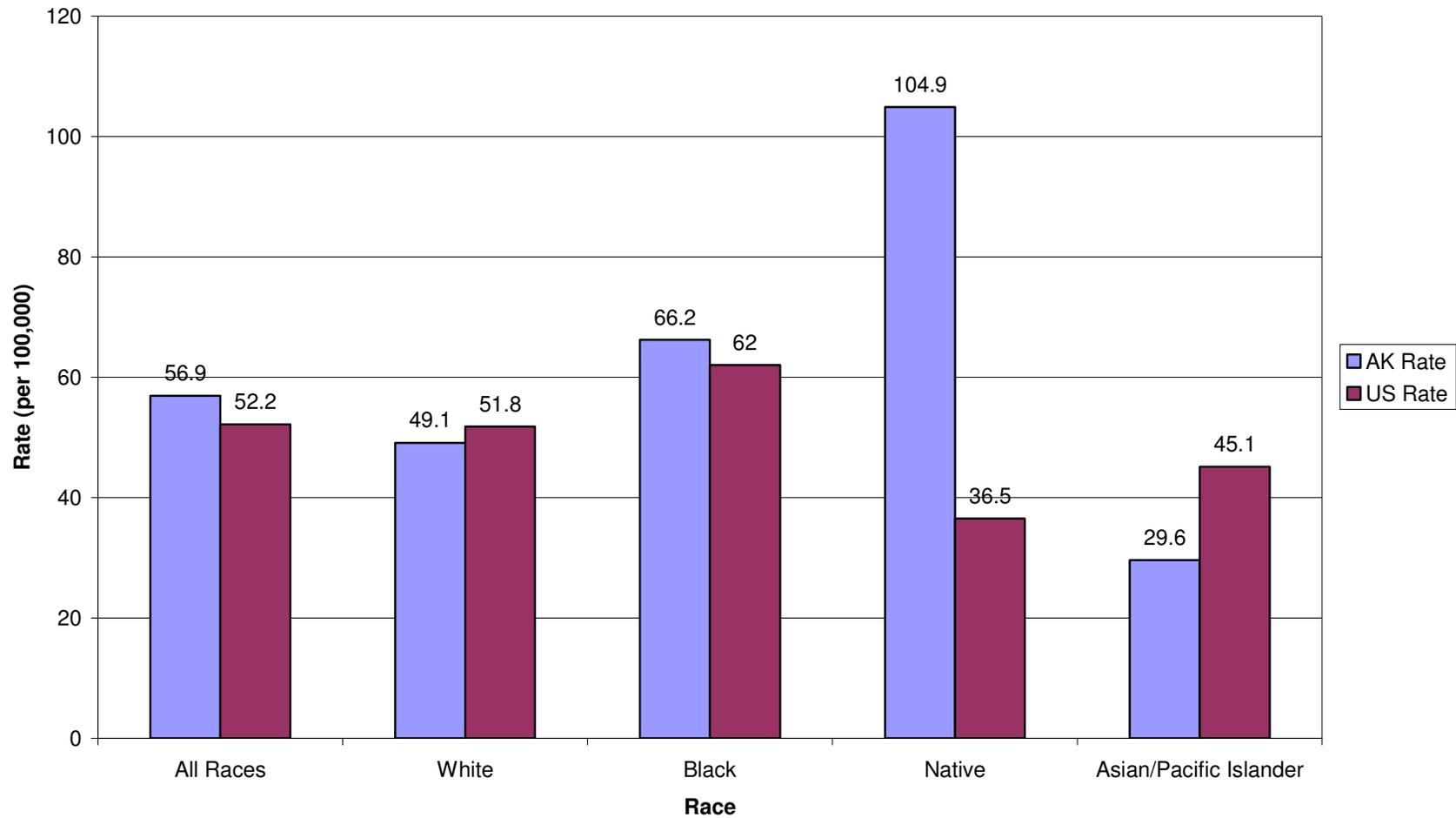
Female Breast Cancer Incidence by Race, AK and US Rates 1996-2004



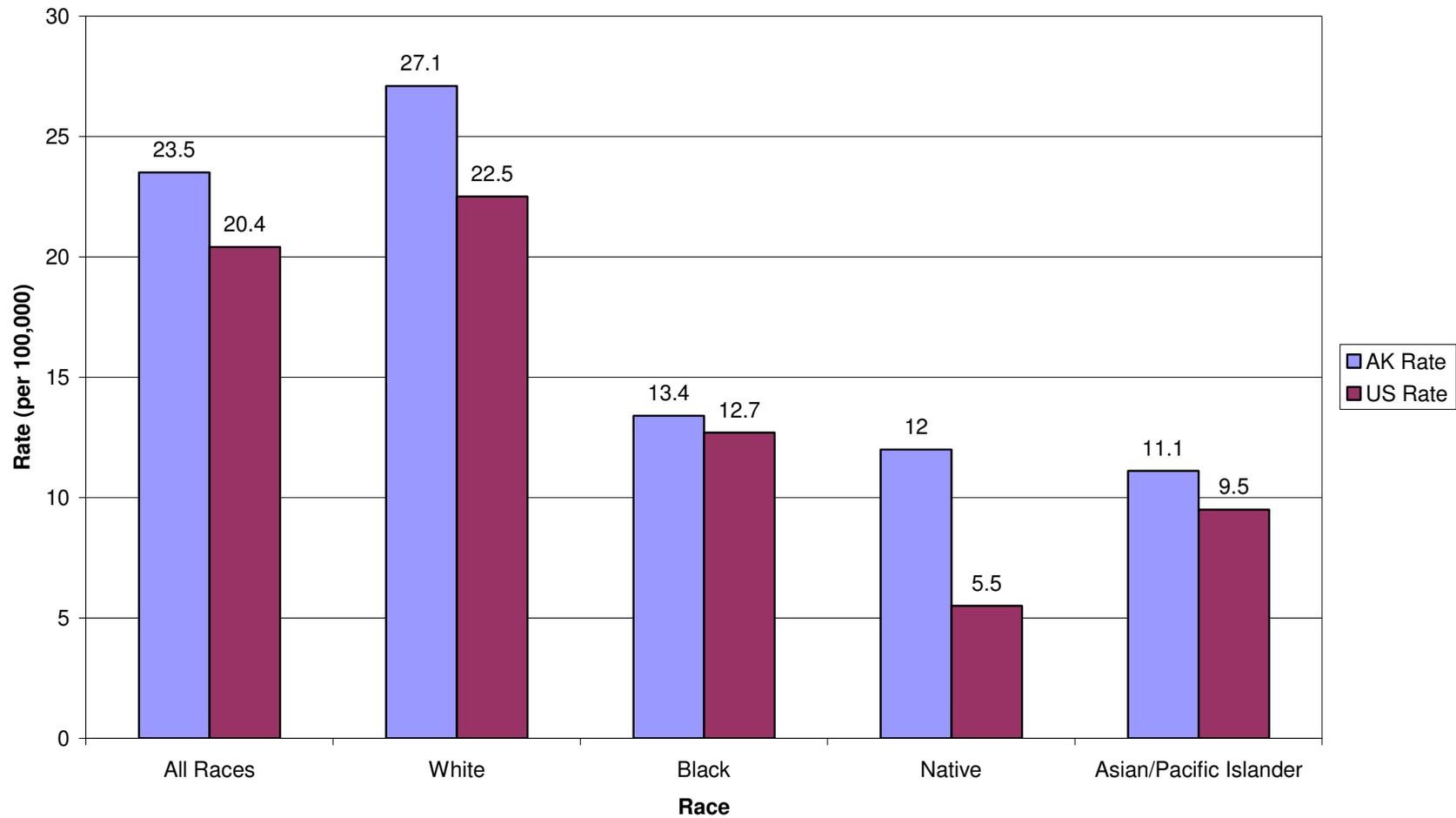
Lung Cancer Incidence by Race, AK and US Rates 1996-2004



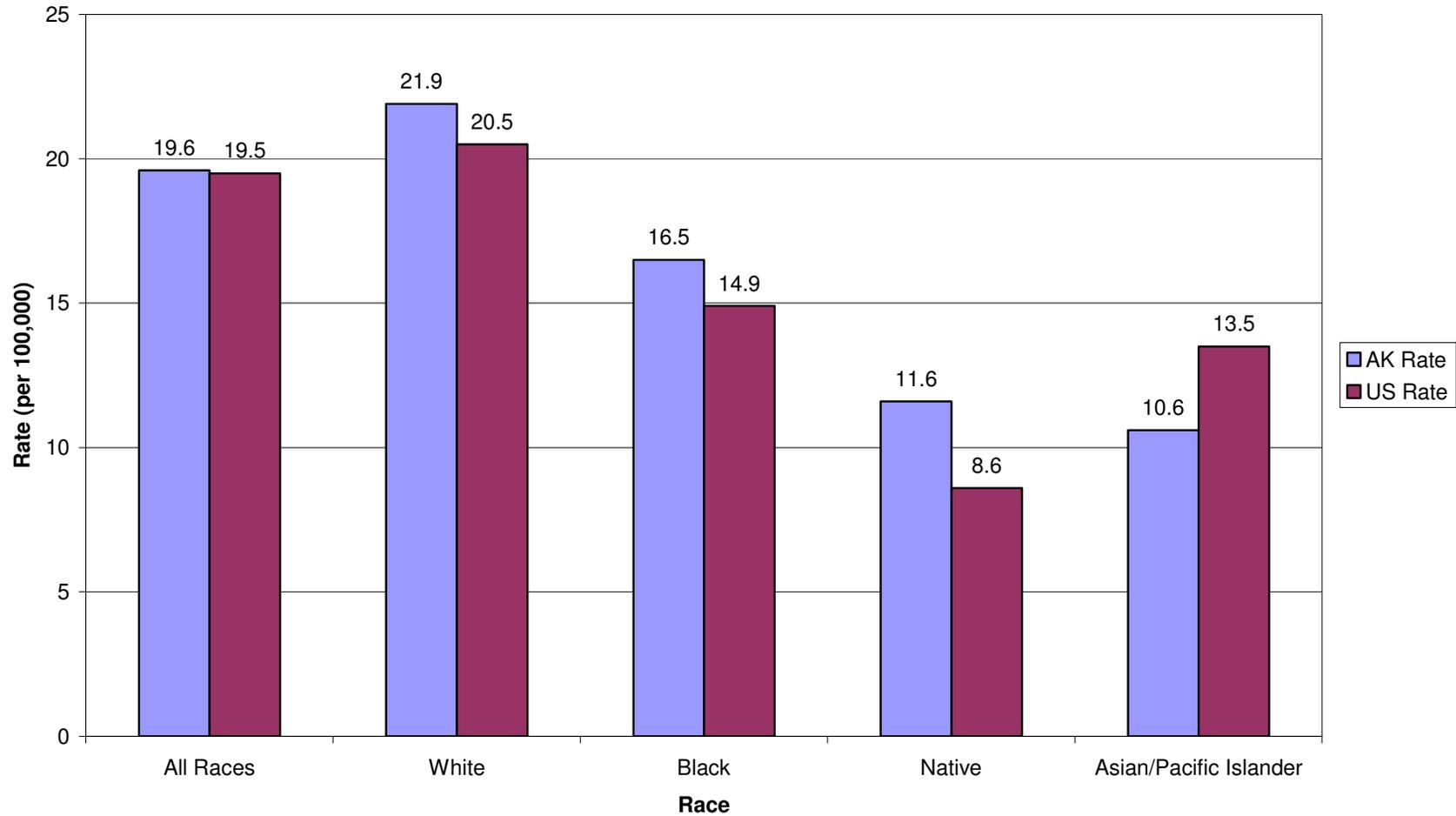
Colorectal Cancer Incidence by Race, AK and US Rates 1996-2004



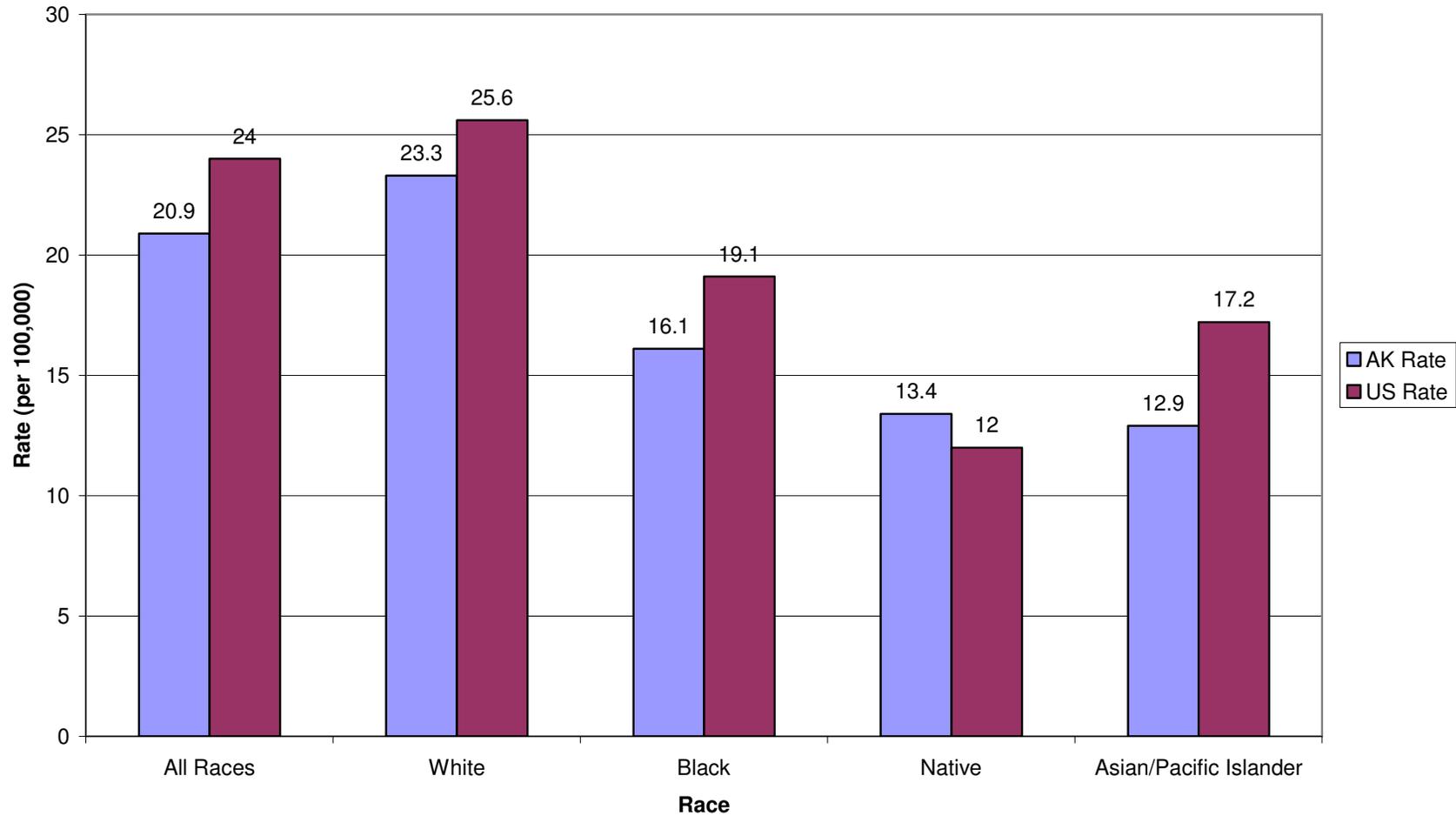
Bladder Cancer Incidence by Race, AK and US Rates 1996-2004



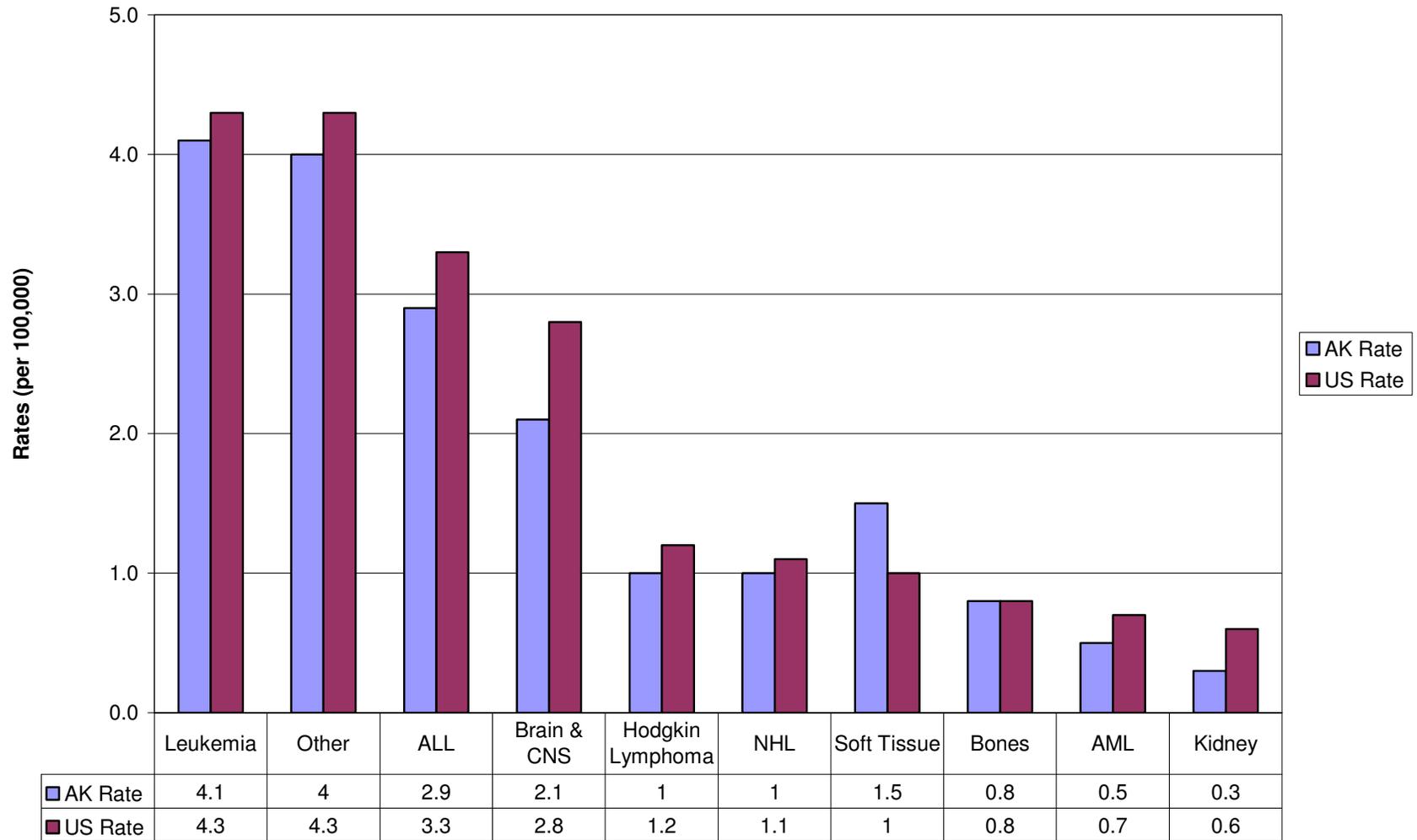
Non-Hodgkin's Lymphoma Incidence by Race, AK and US Rates 1996-2004



Malignant Uterine Cancer Incidence by Race, AK vs US Rates 1996-2004

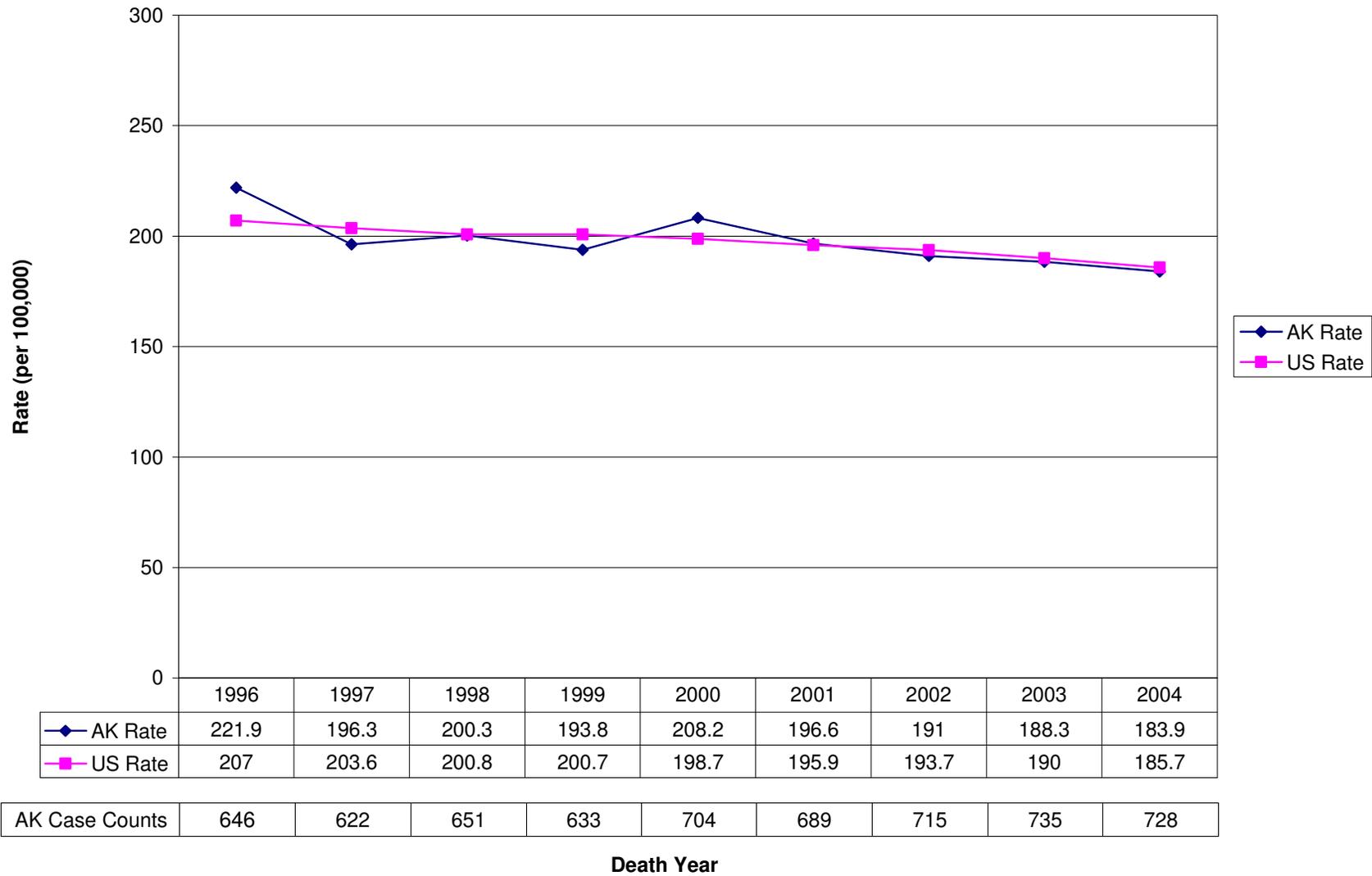


Childhood Cancer Incidence (0-19 yrs) -- AK and US Rates -- 1996-2004

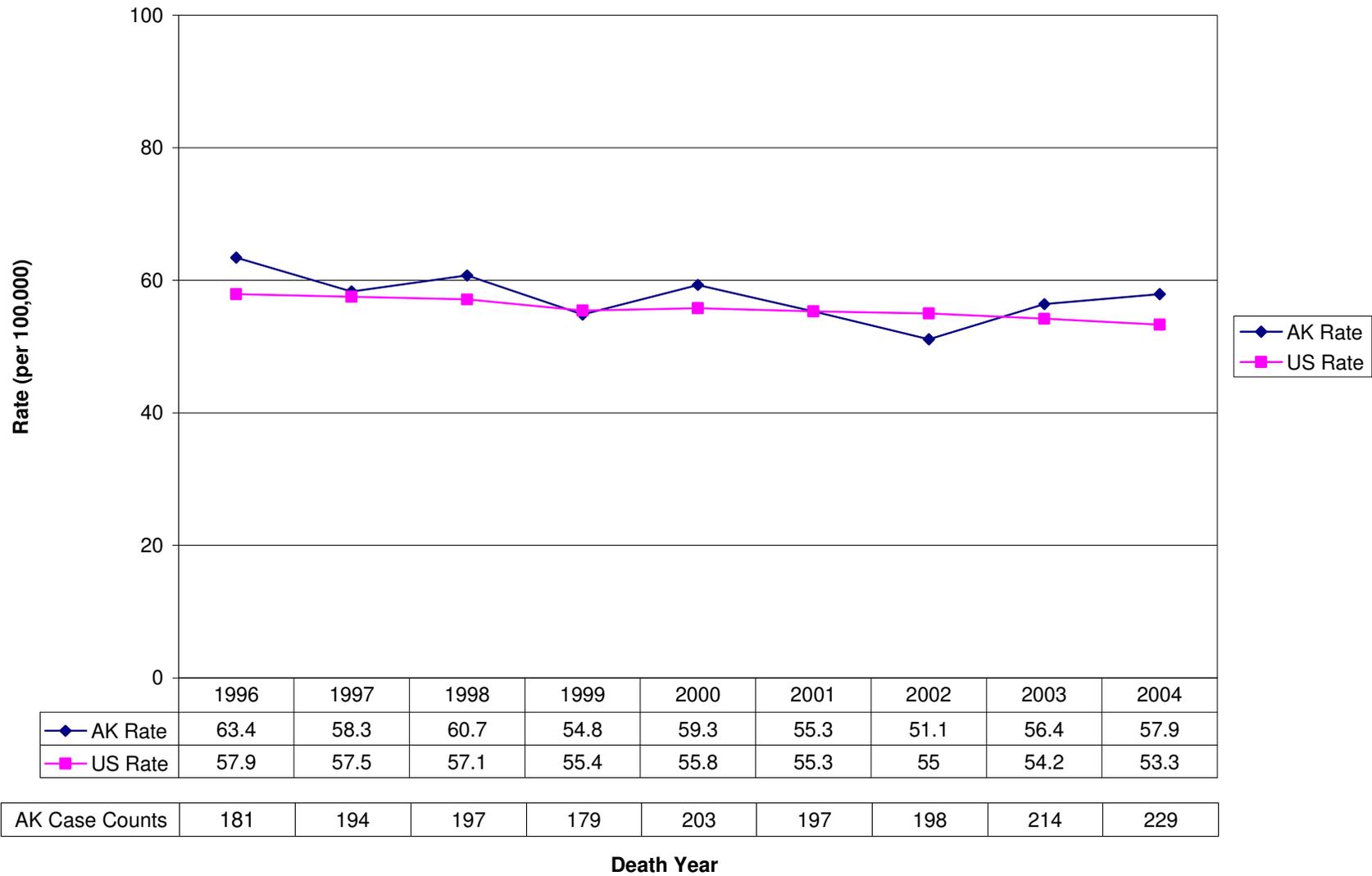


AK Case Counts	76	74	54	40	19	19	27	15	10	6
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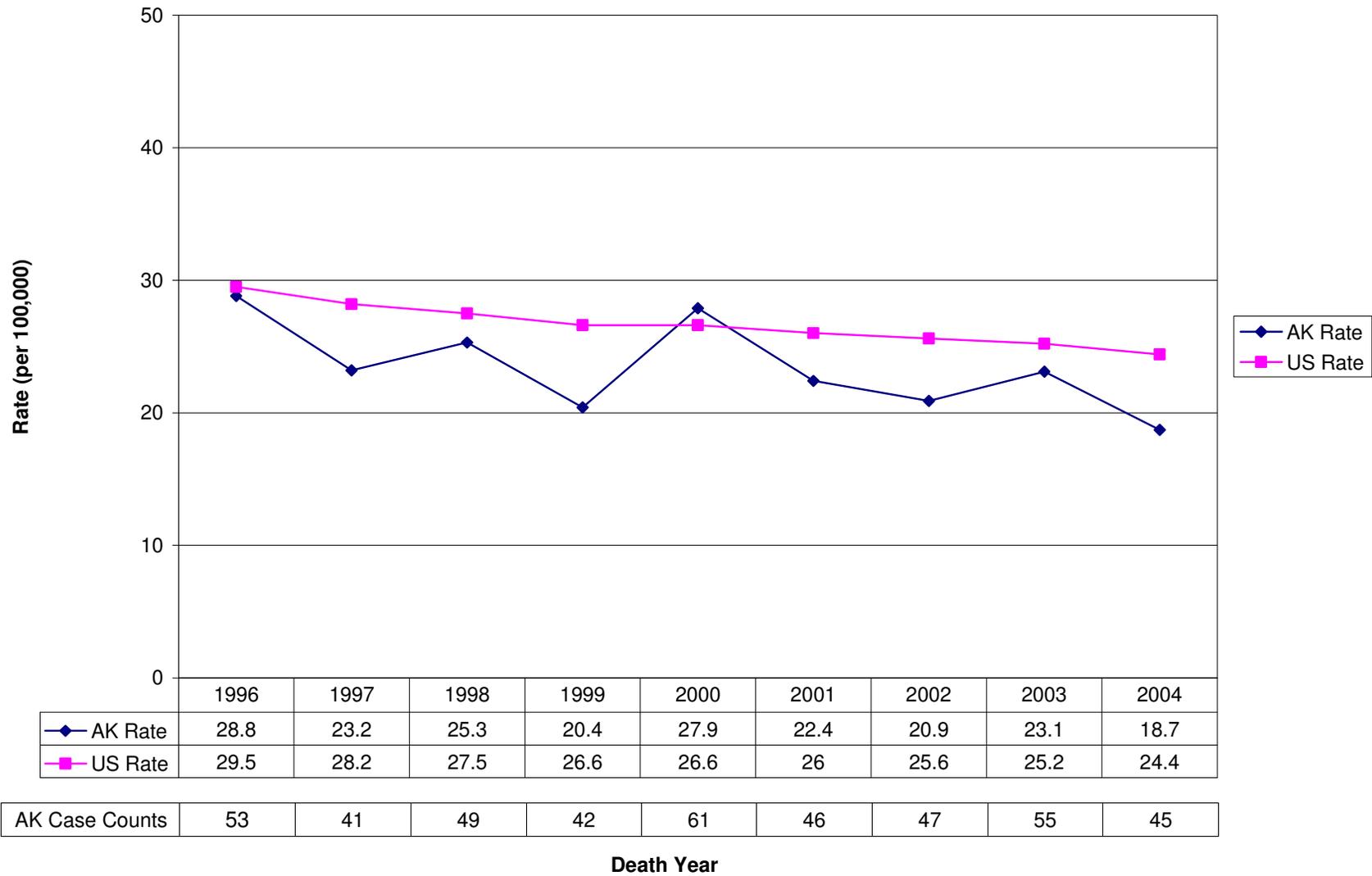
All Sites - Cancer Mortality, AK and US Rates 1996-2004



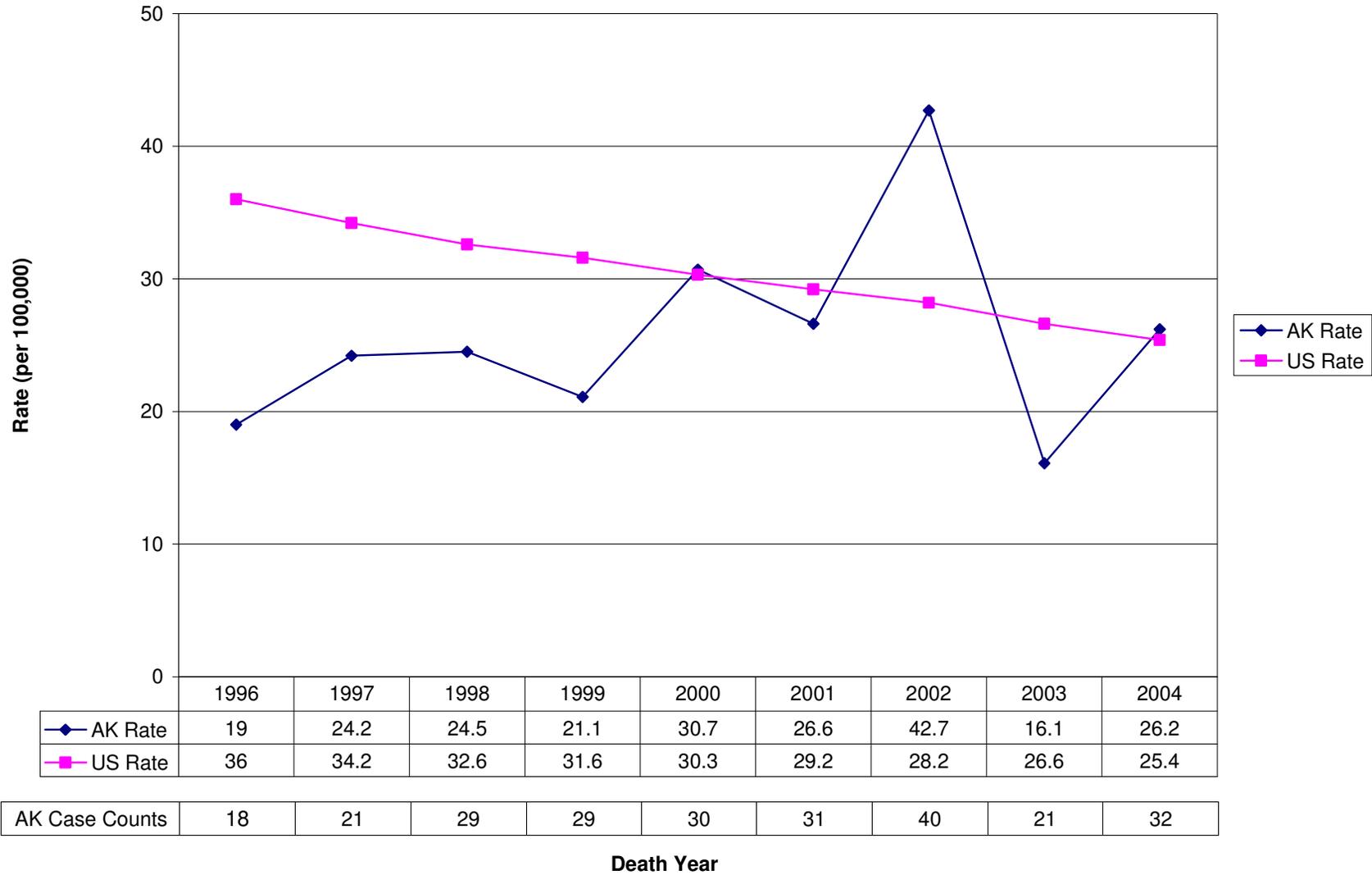
Lung Cancer Mortality, AK and US Rates 1996-2004



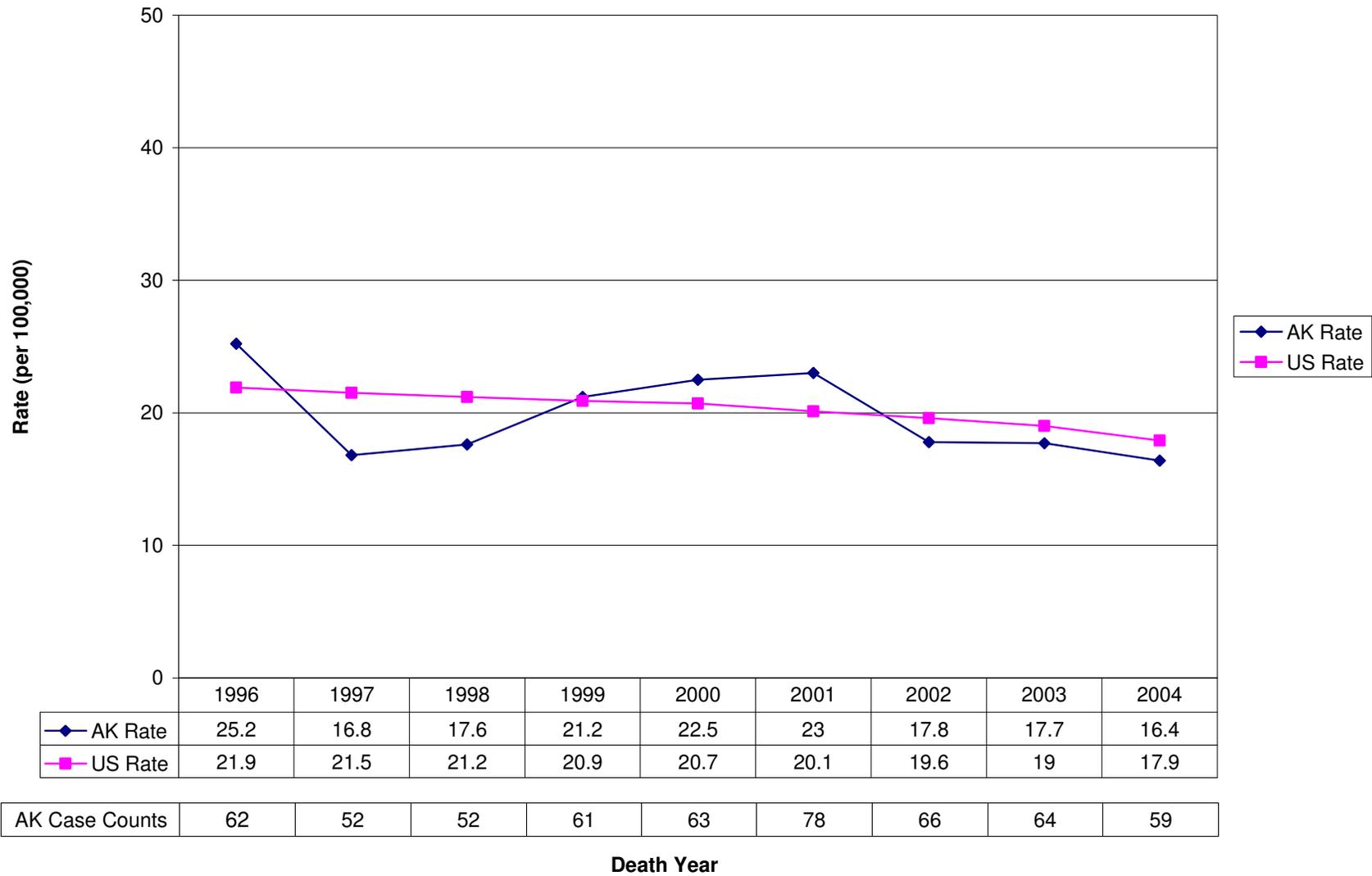
Female Breast Cancer Mortality, AK and US Rates 1996-2004



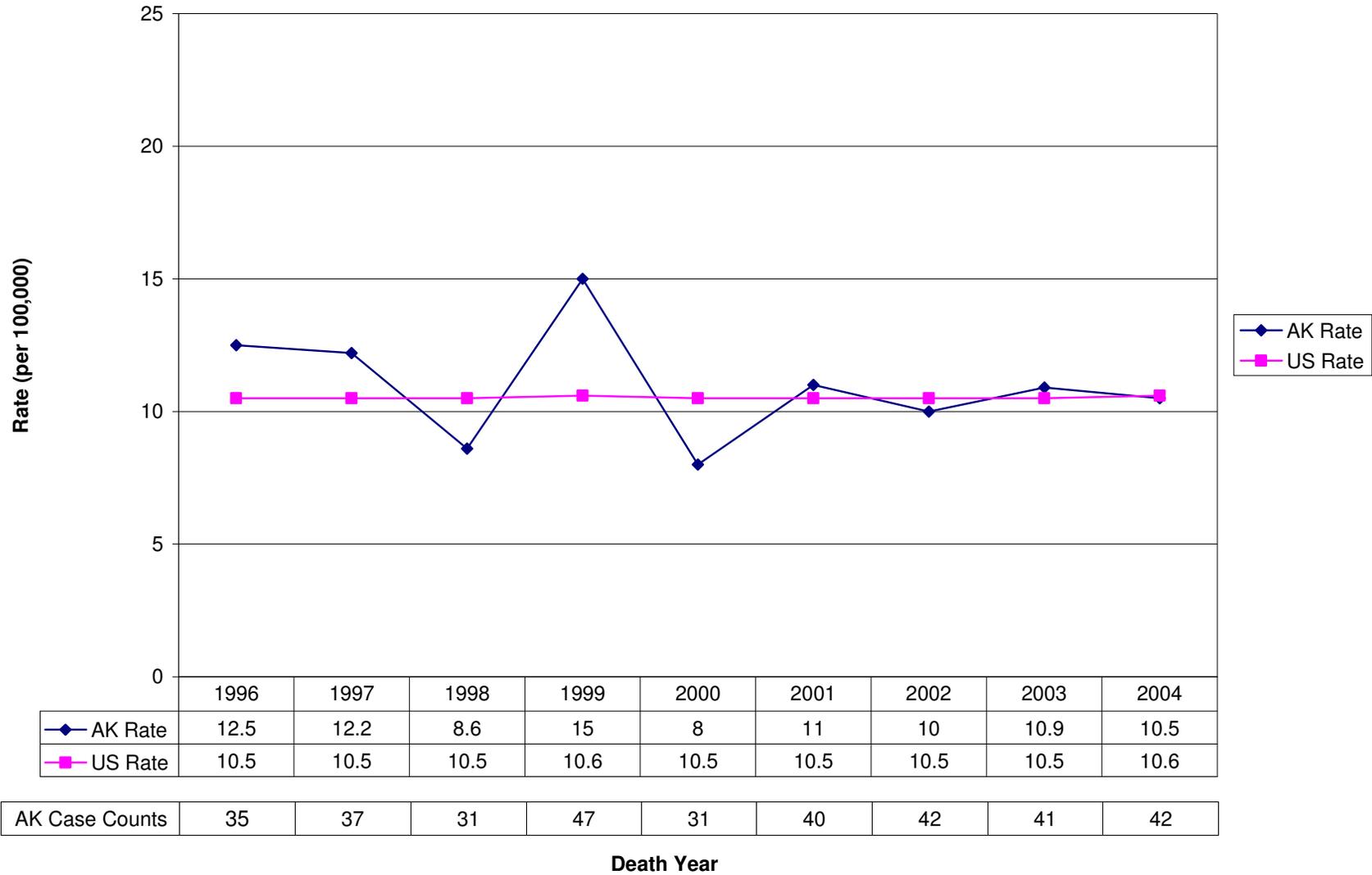
Prostate Cancer Mortality, AK and US Rates 1996-2004



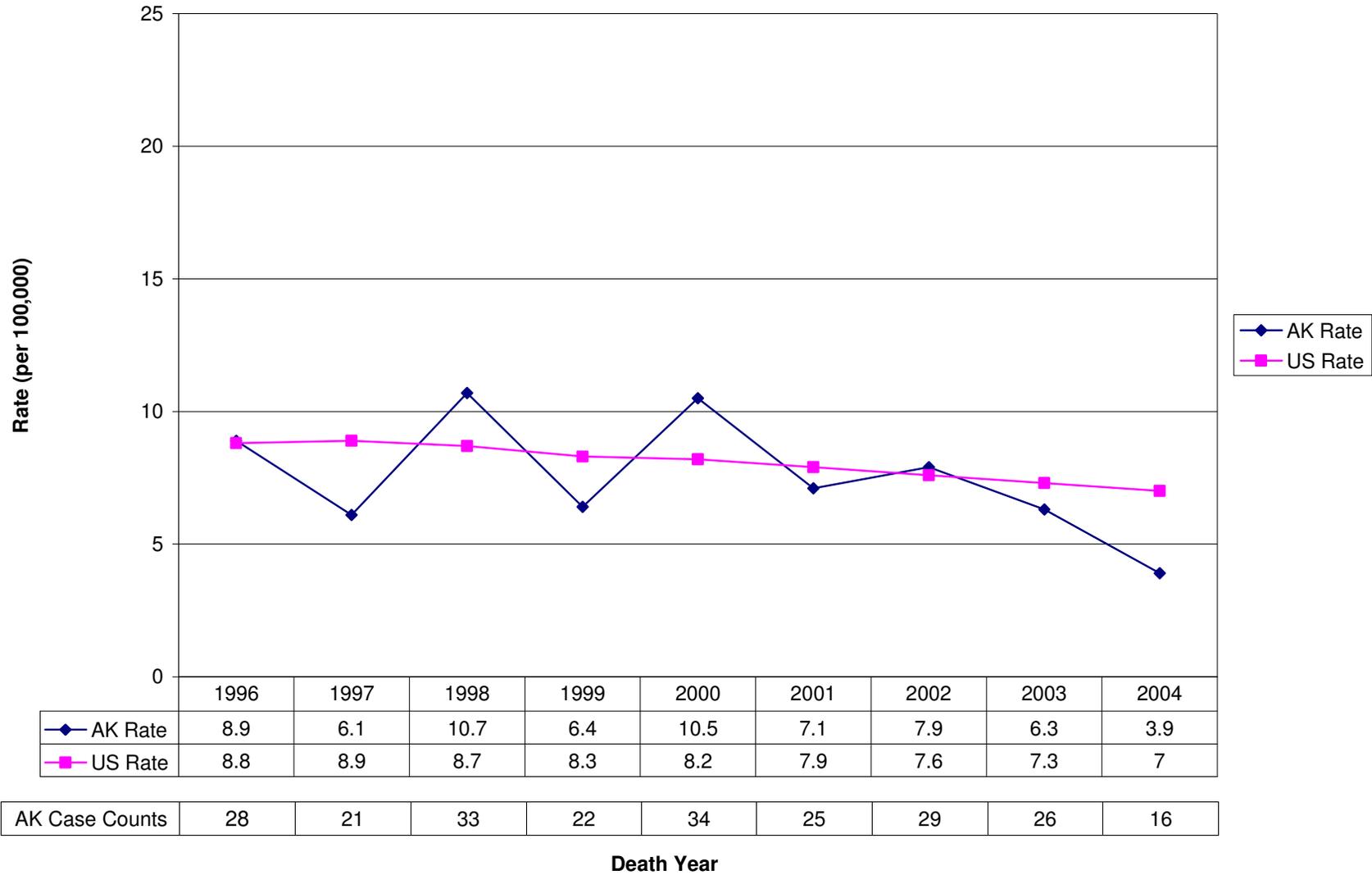
Colorectal Cancer Mortality, AK and US Rates 1996-2004



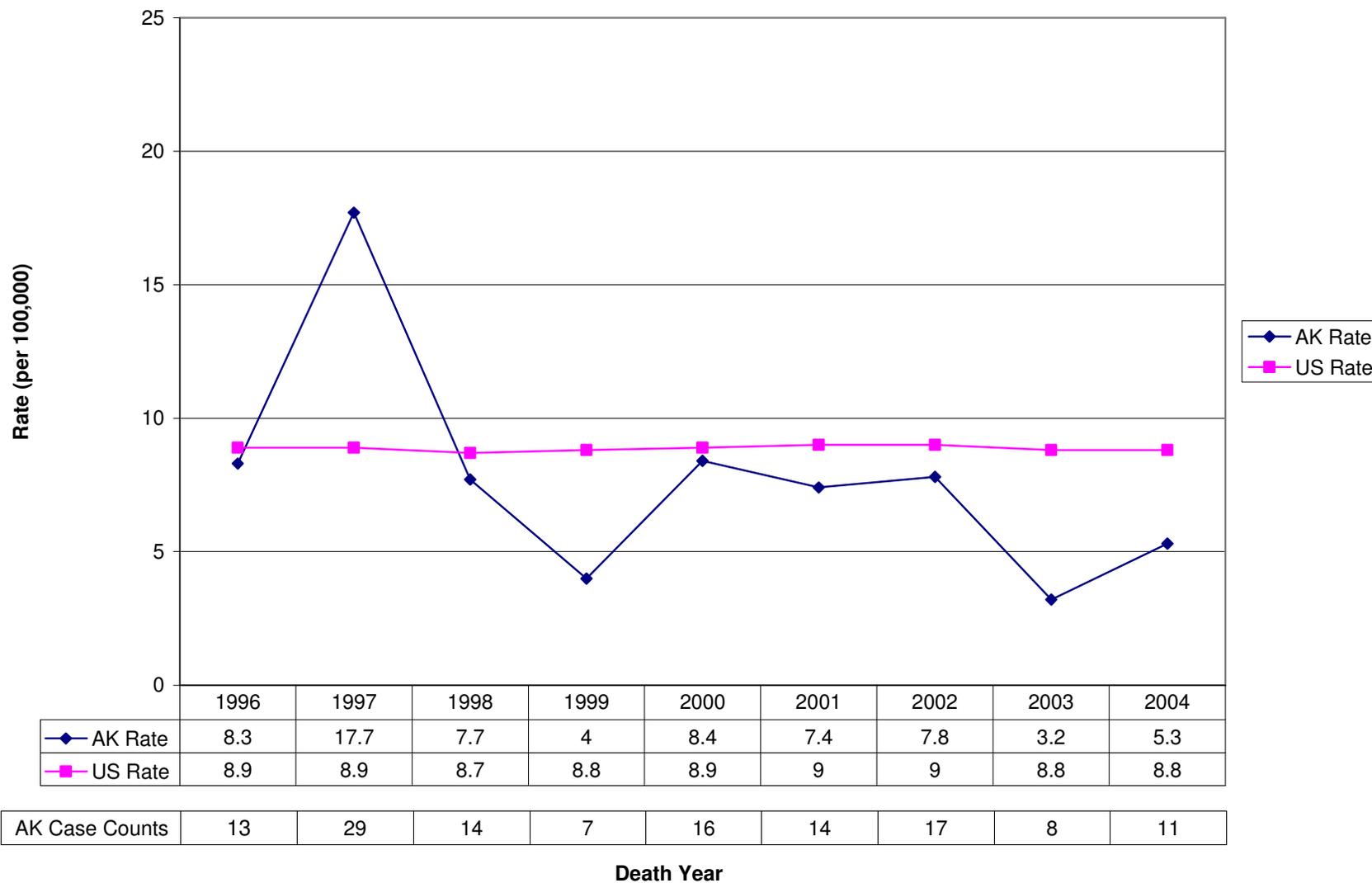
Pancreas Cancer Mortality, AK and US Rates 1996-2004



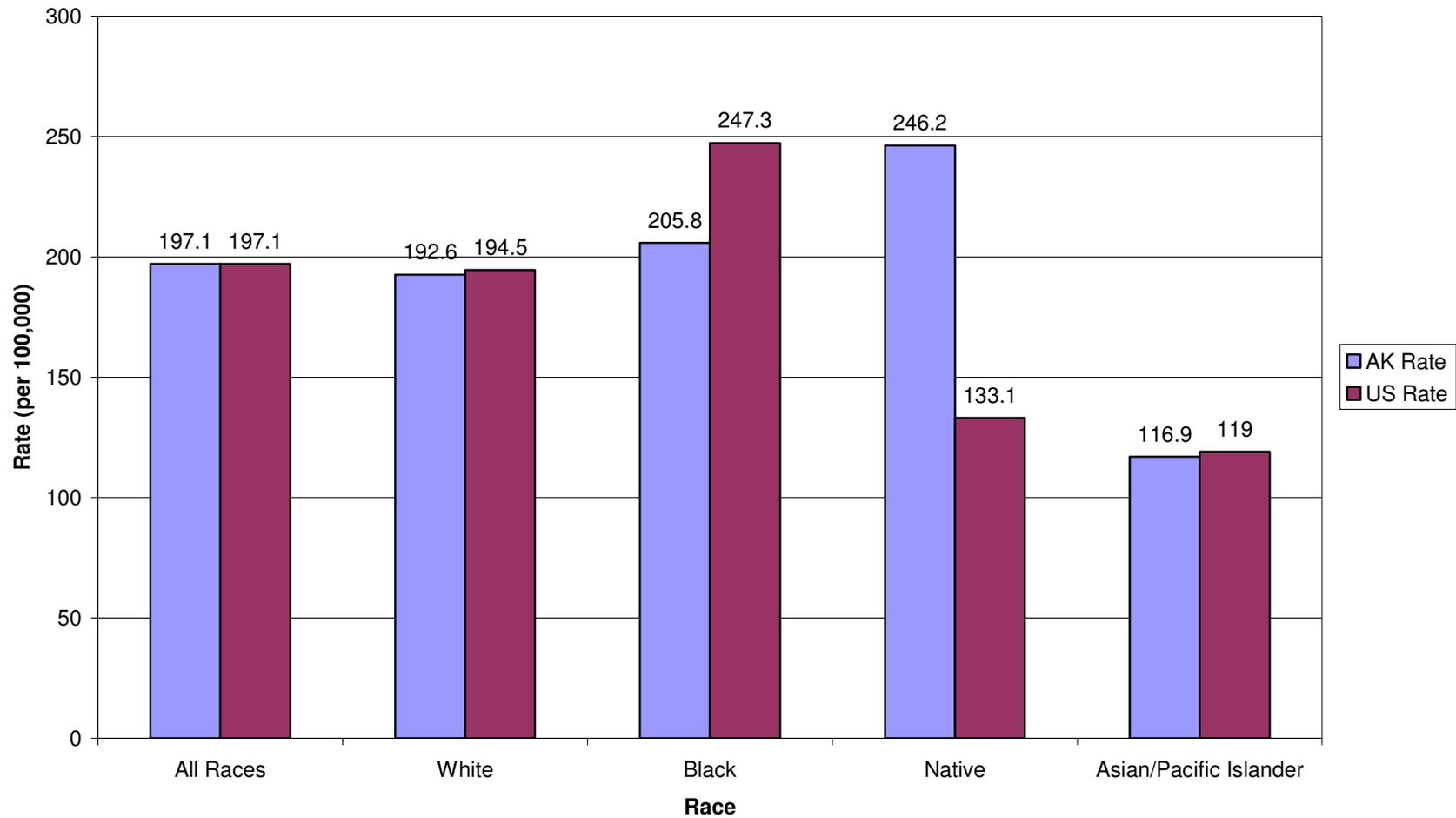
Non-Hodgkin's Lymphoma Mortality, AK and US Rates 1996-2004



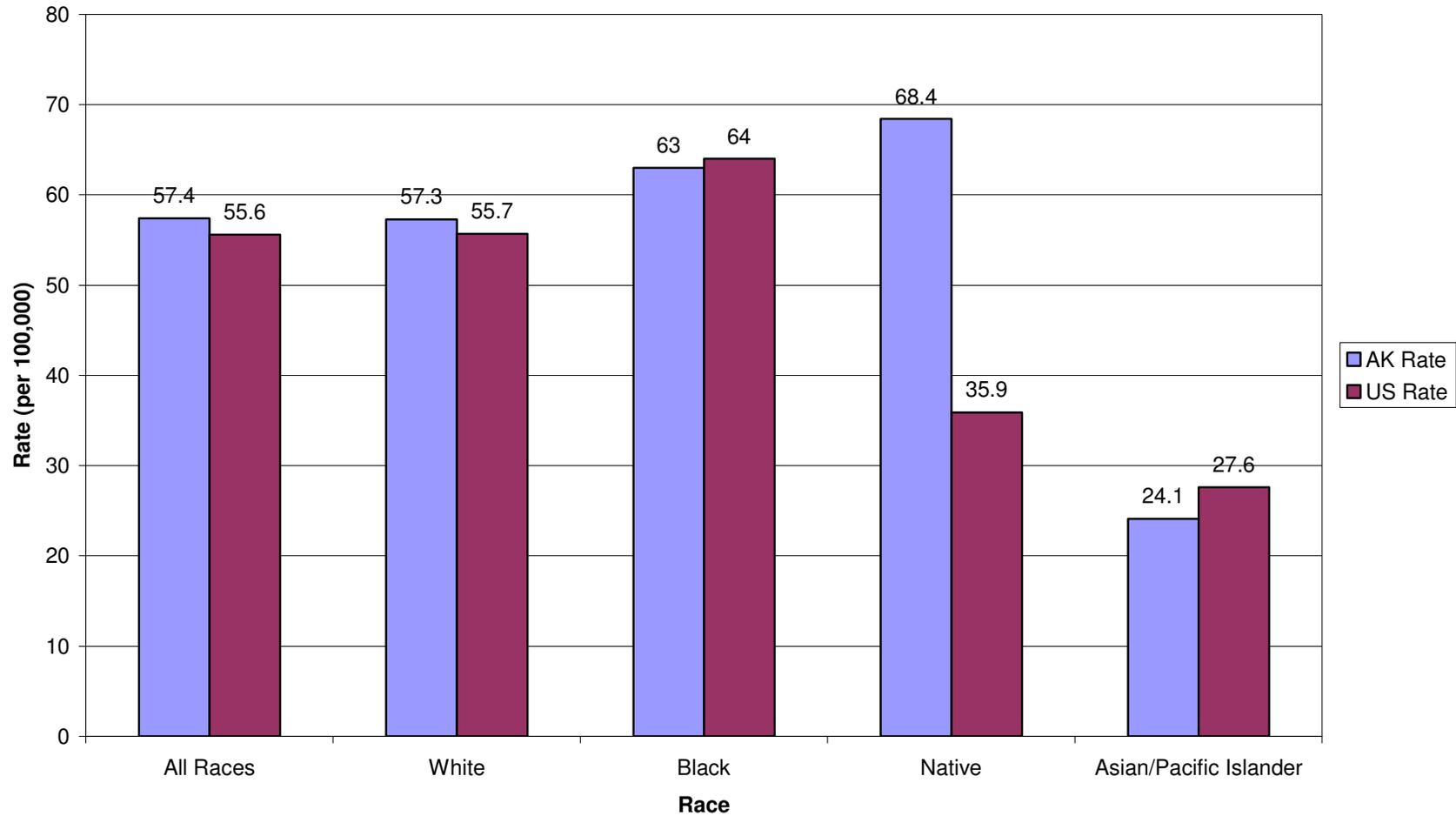
Ovarian Cancer Mortality, AK vs US Rates 1996-2004



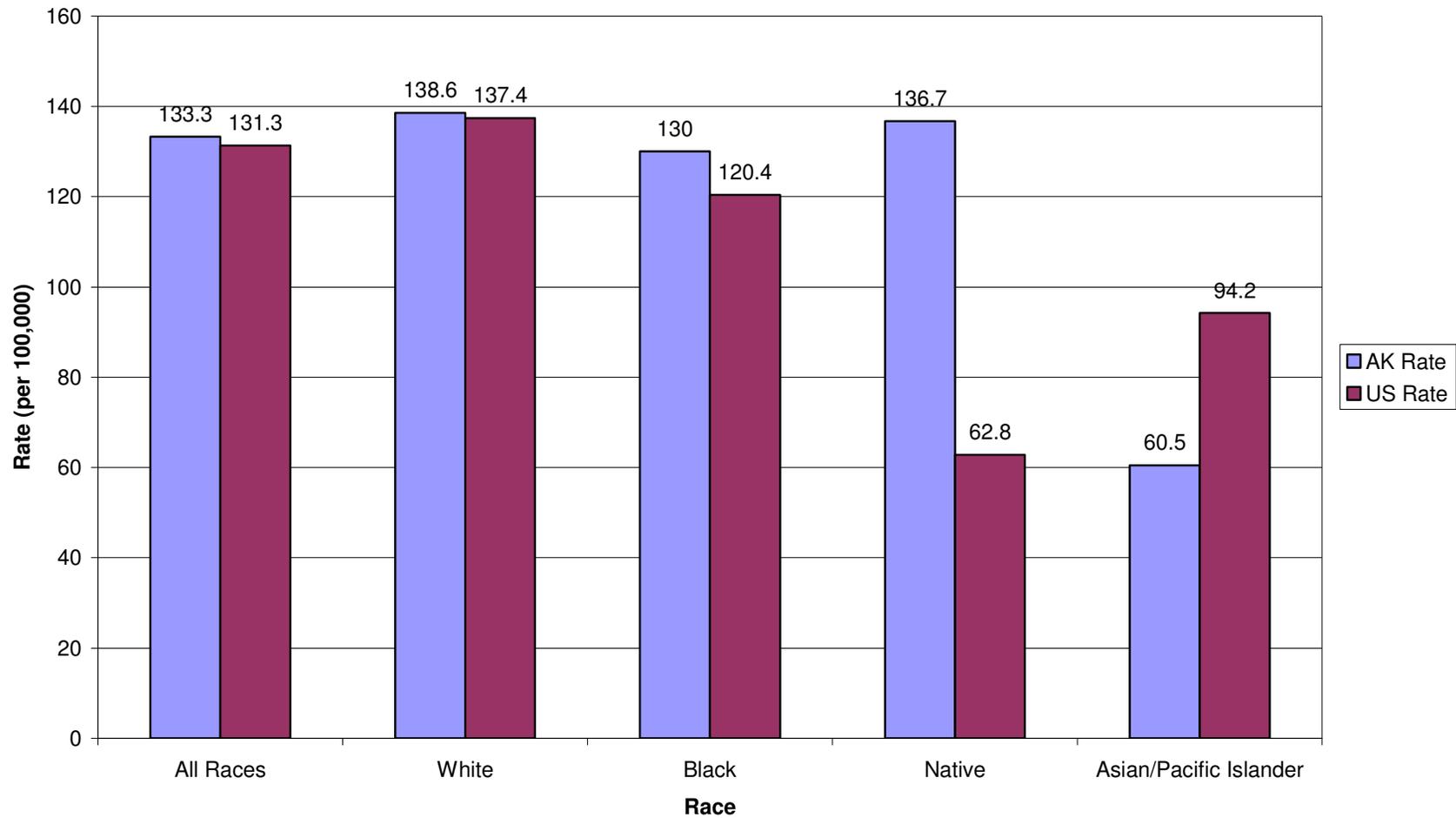
All Sites - Cancer Mortality by Race, AK and US Rates 1996-2004



Lung Cancer Mortality by Race, AK and US Rates 1996-2004

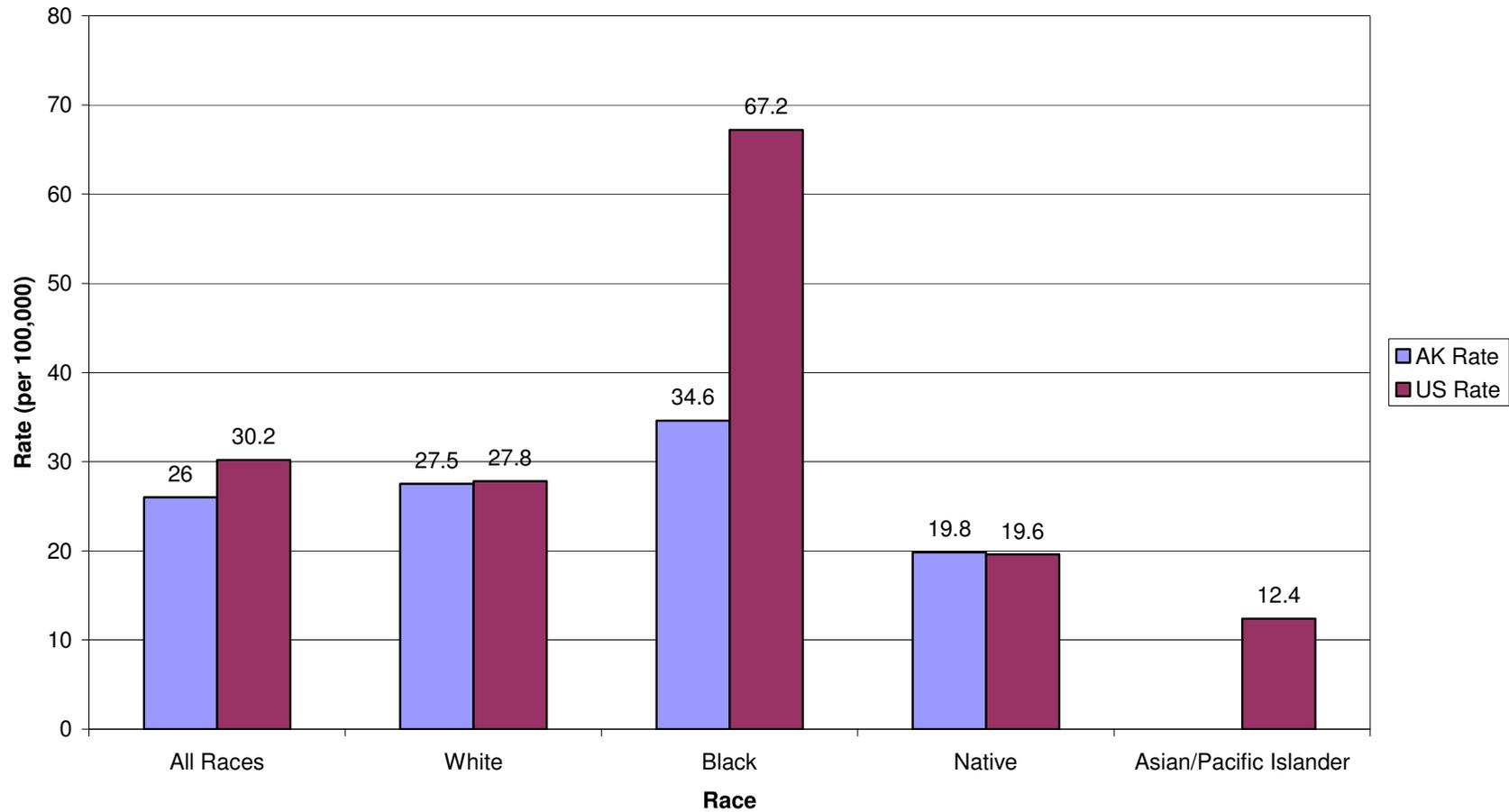


Female Breast Cancer Incidence by Race, AK and US Rates 1996-2004

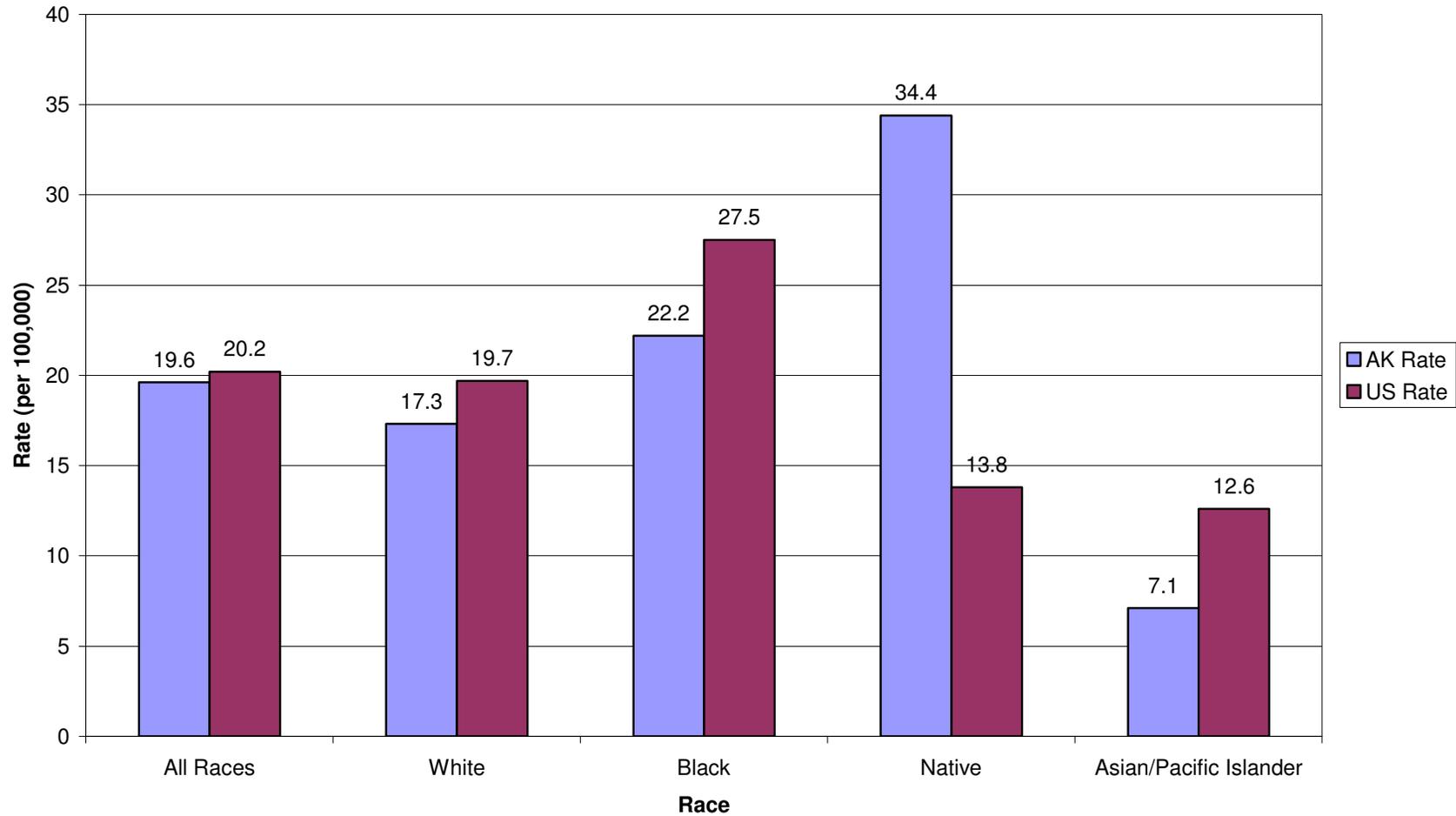


Prostate Cancer Mortality by Race, AK and US Rates 1996-2004

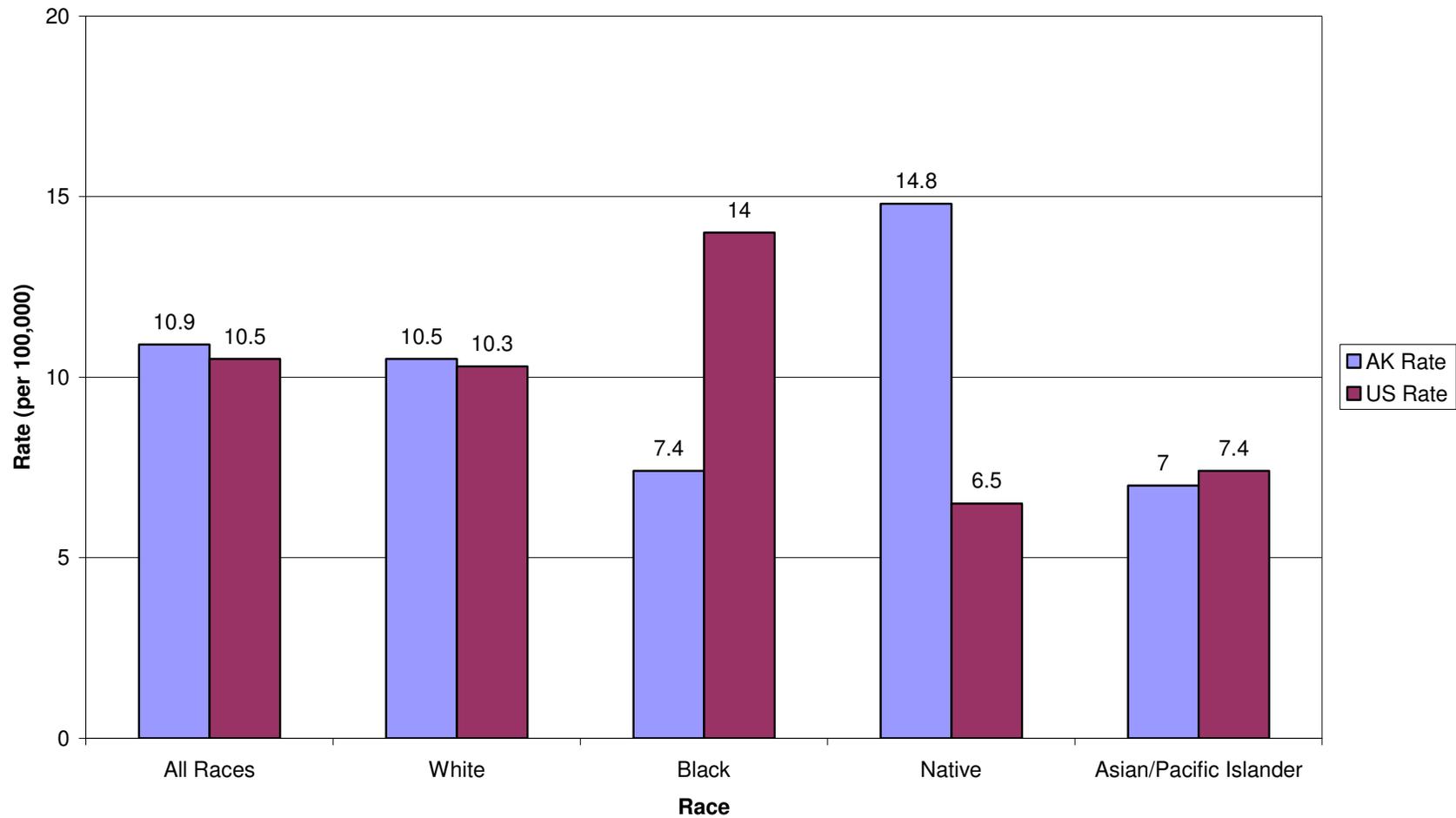
(AK data suppressed when counts are less than 6)



Colorectal Cancer Mortality by Race, AK and US Rates 1996-2004

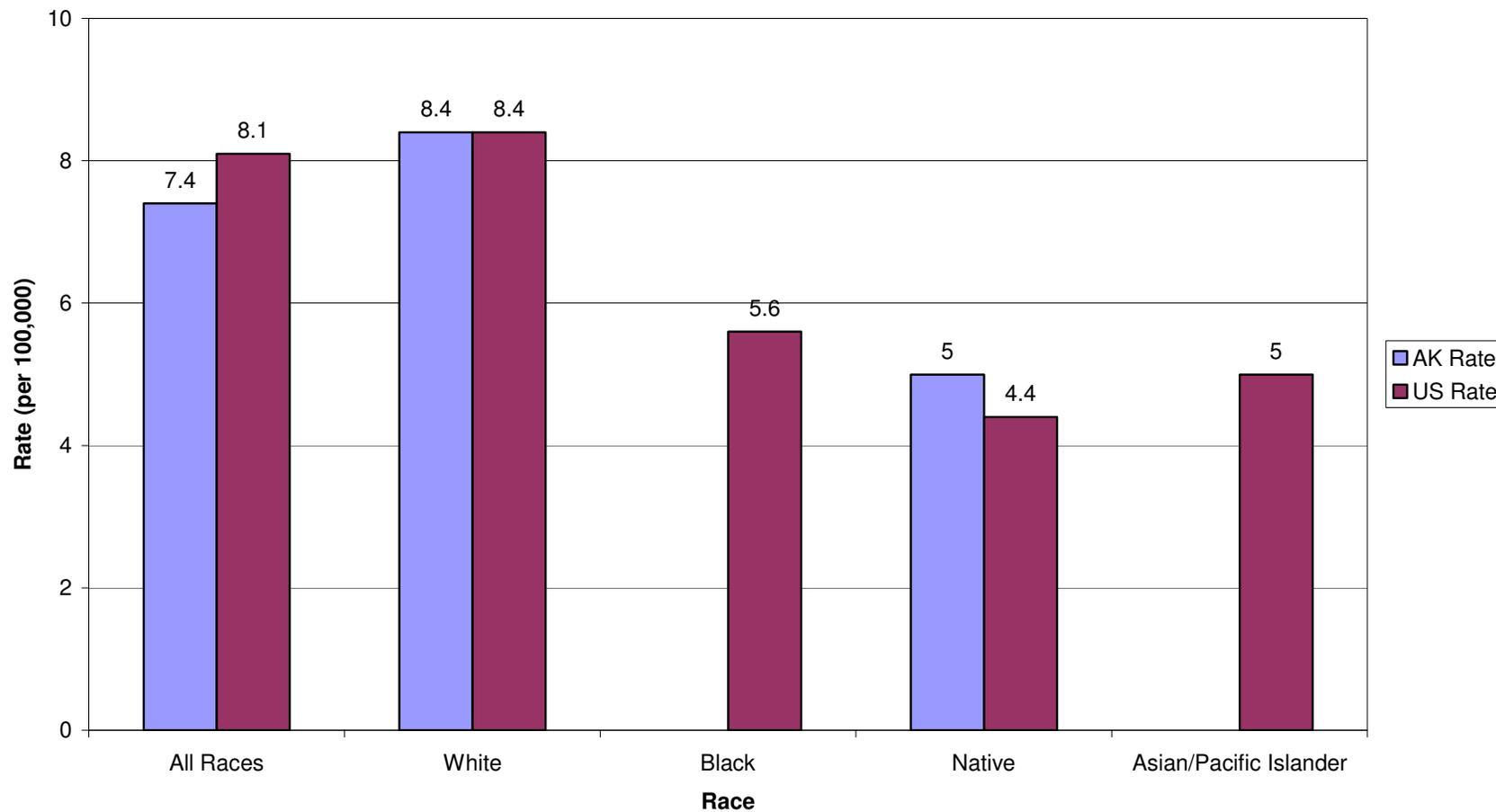


Pancreas Cancer Mortality by Race, AK and US Rates 1996-2004



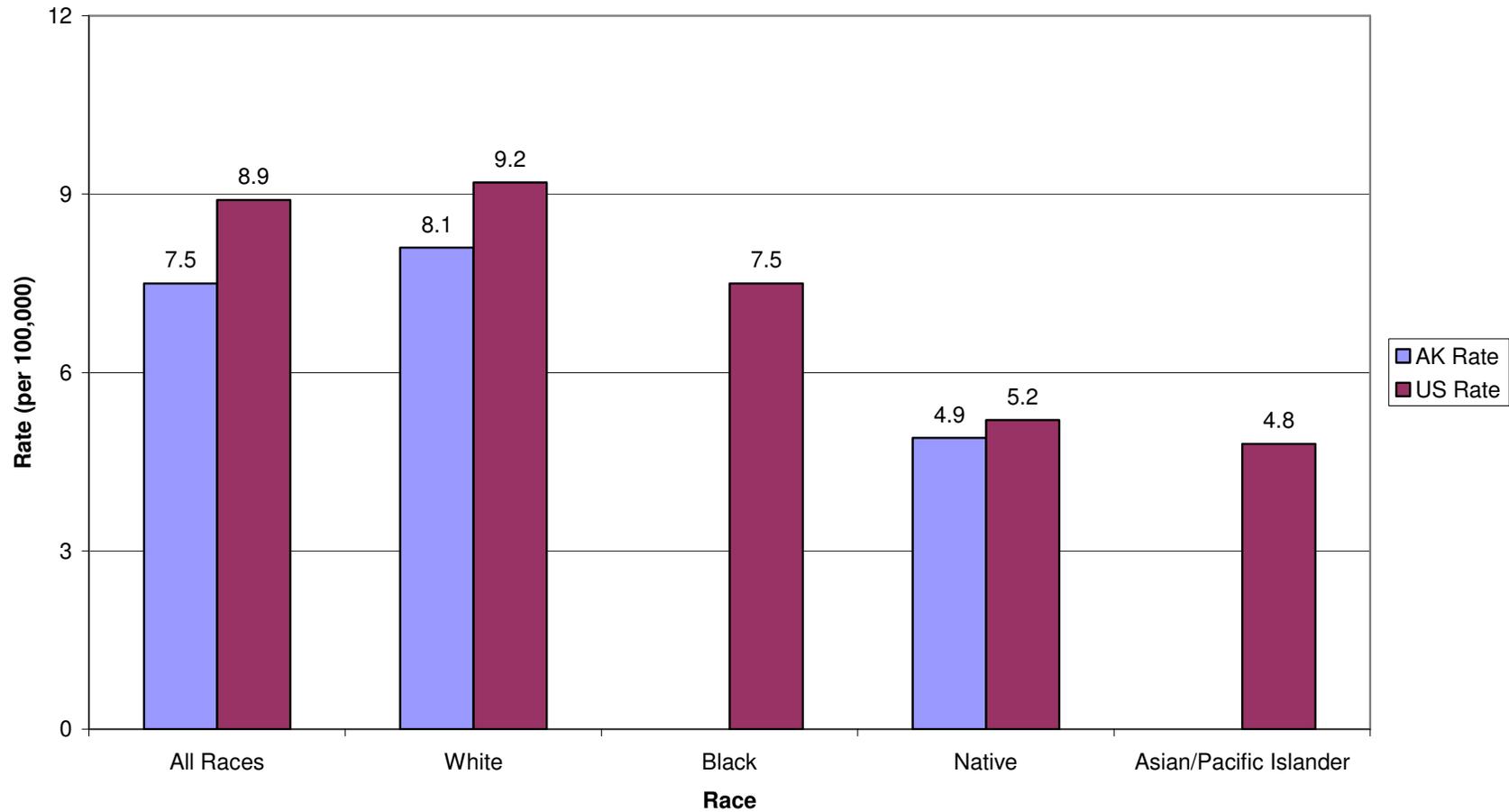
Non-Hodgkin's Lymphoma Mortality by Race, AK and US Rates 1996-2004

(AK data suppressed when counts are less than 6)



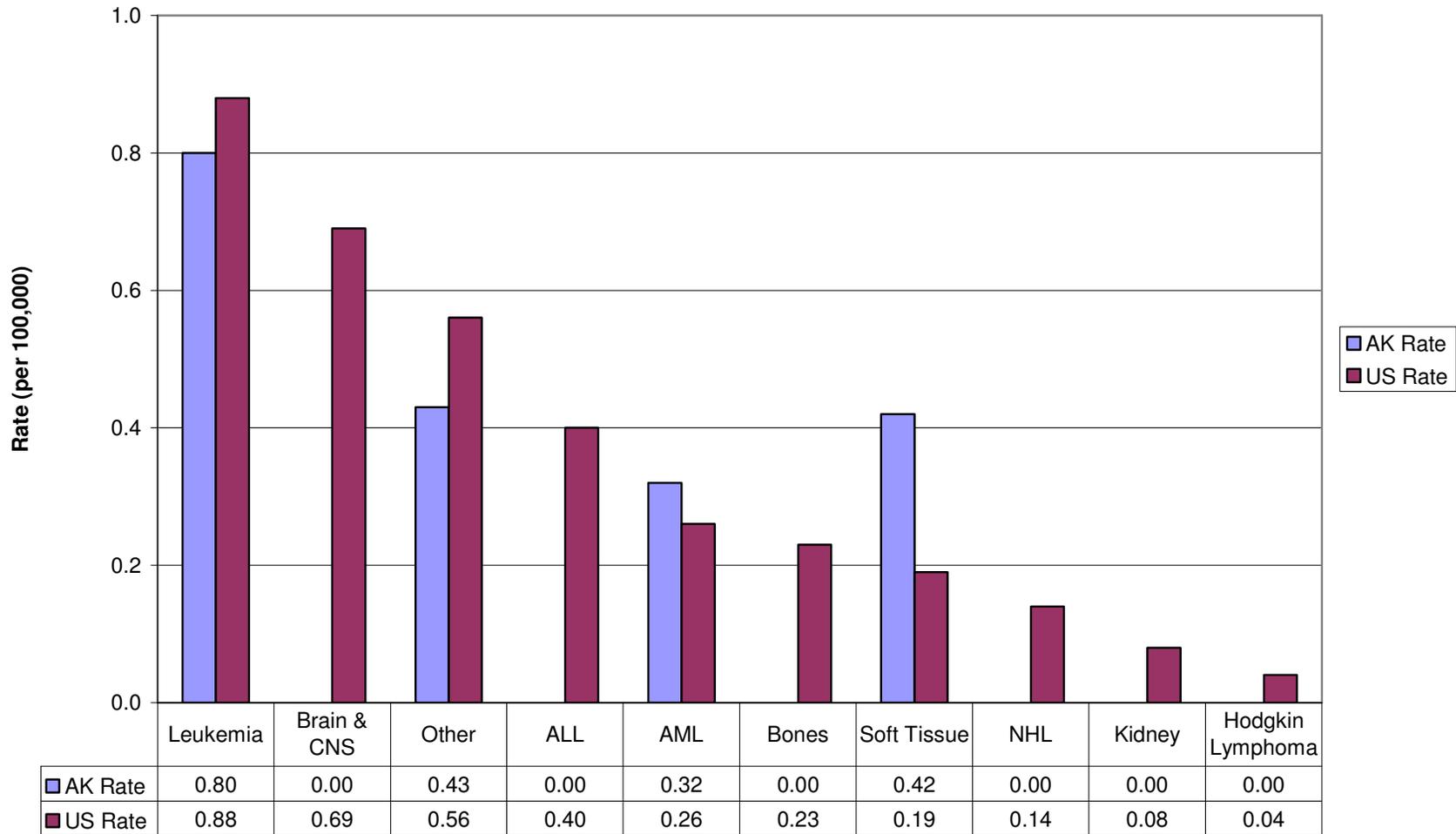
Ovarian Cancer Mortality by Race 1996-2004

(AK data suppressed when counts are less than 6)



Childhood Cancer Mortality (0-19 yrs) -- AK and US Rates -- 1996-2004

(AK data suppressed when counts are less than 6)

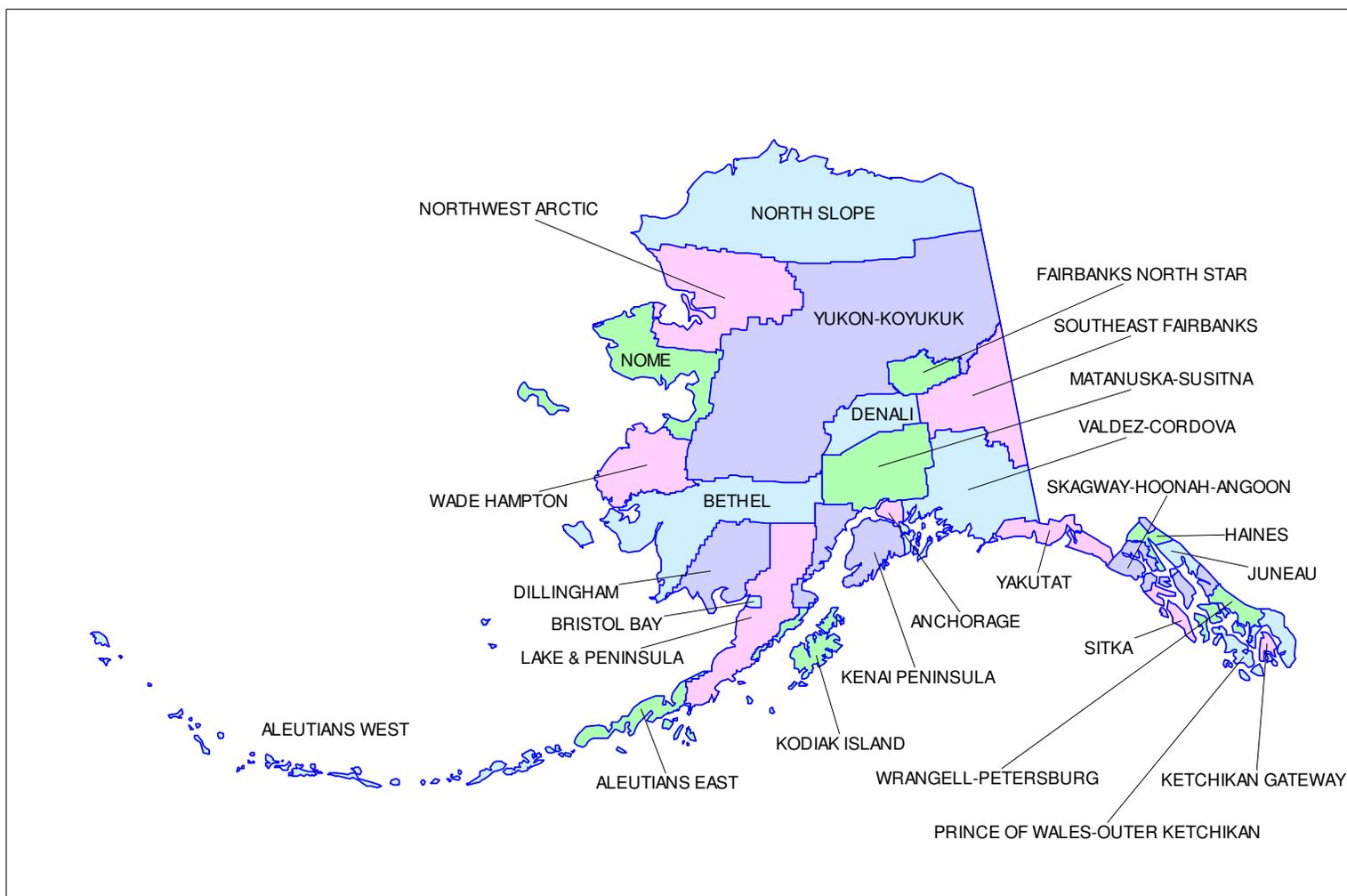


AK Case Counts	15	<6	8	<6	6	<6	8	<6	<6	<6
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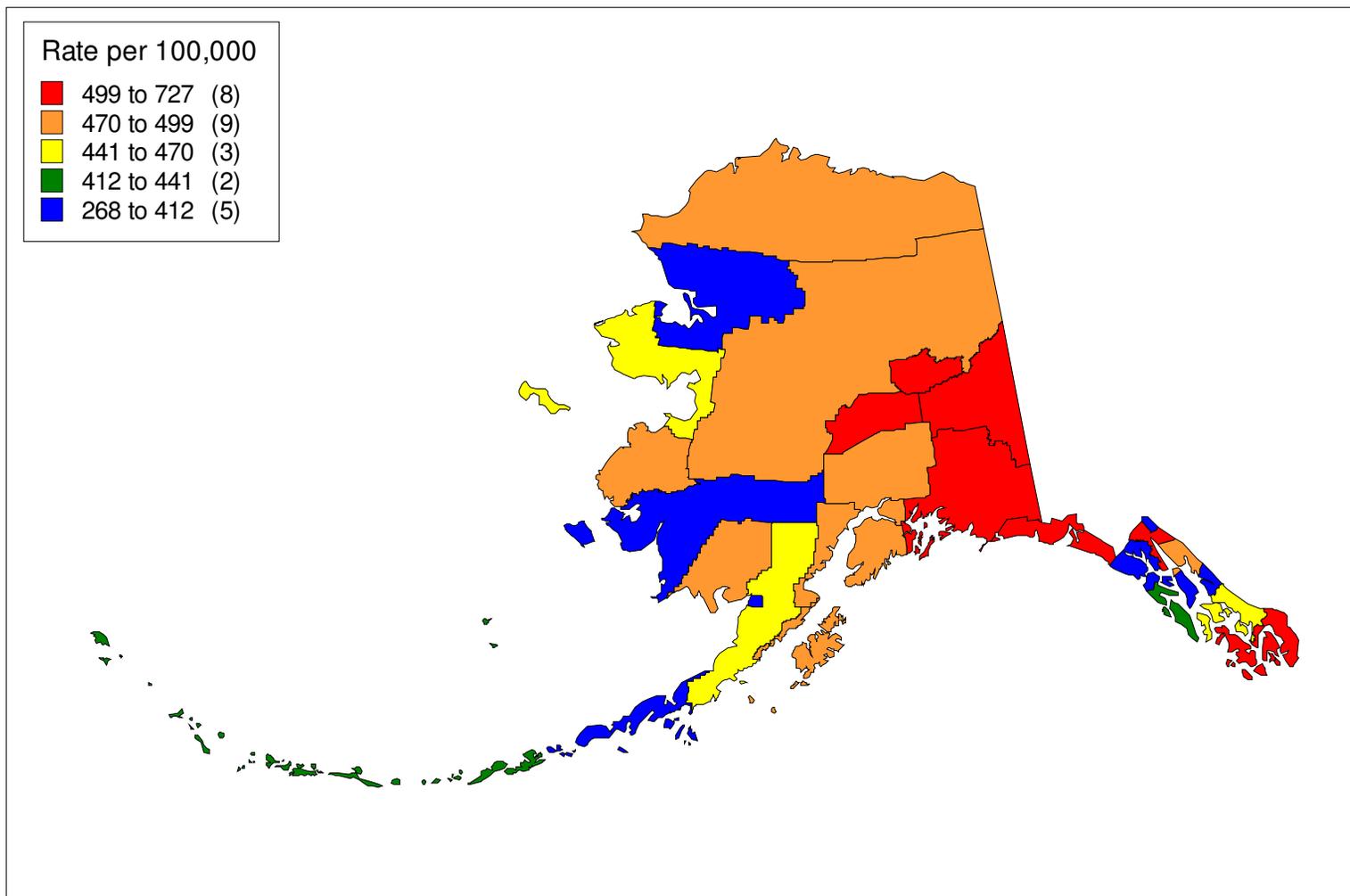
Incidence and Mortality Maps

The next several pages consist of color-coded maps of incidence and mortality rates for the highest ranking six cancers in Alaska for each borough/census area. The color scheme is gradational between red (high rates) and blue (low rates). Blank regions on the map represent areas in which cancer rates were not calculated because there were 5 or fewer cancer cases (or none) in that borough/census area. Numbers in the legend indicate the range of rates (up to but not including the upper value) represented by a specific color, and the numbers in parentheses indicate the number of borough/census areas in that range. Rate ranges are in equal intervals (for example, 10-15, 15-20, 20-25, etc.) except when the minimum or maximum value within a data set is much less than or much greater than the majority of the other values. In these situations, the lower or upper range has been extended to accommodate this outlying value. Rates are per 100,000 people and age-adjusted to the year 2000 U.S. Standard Population.

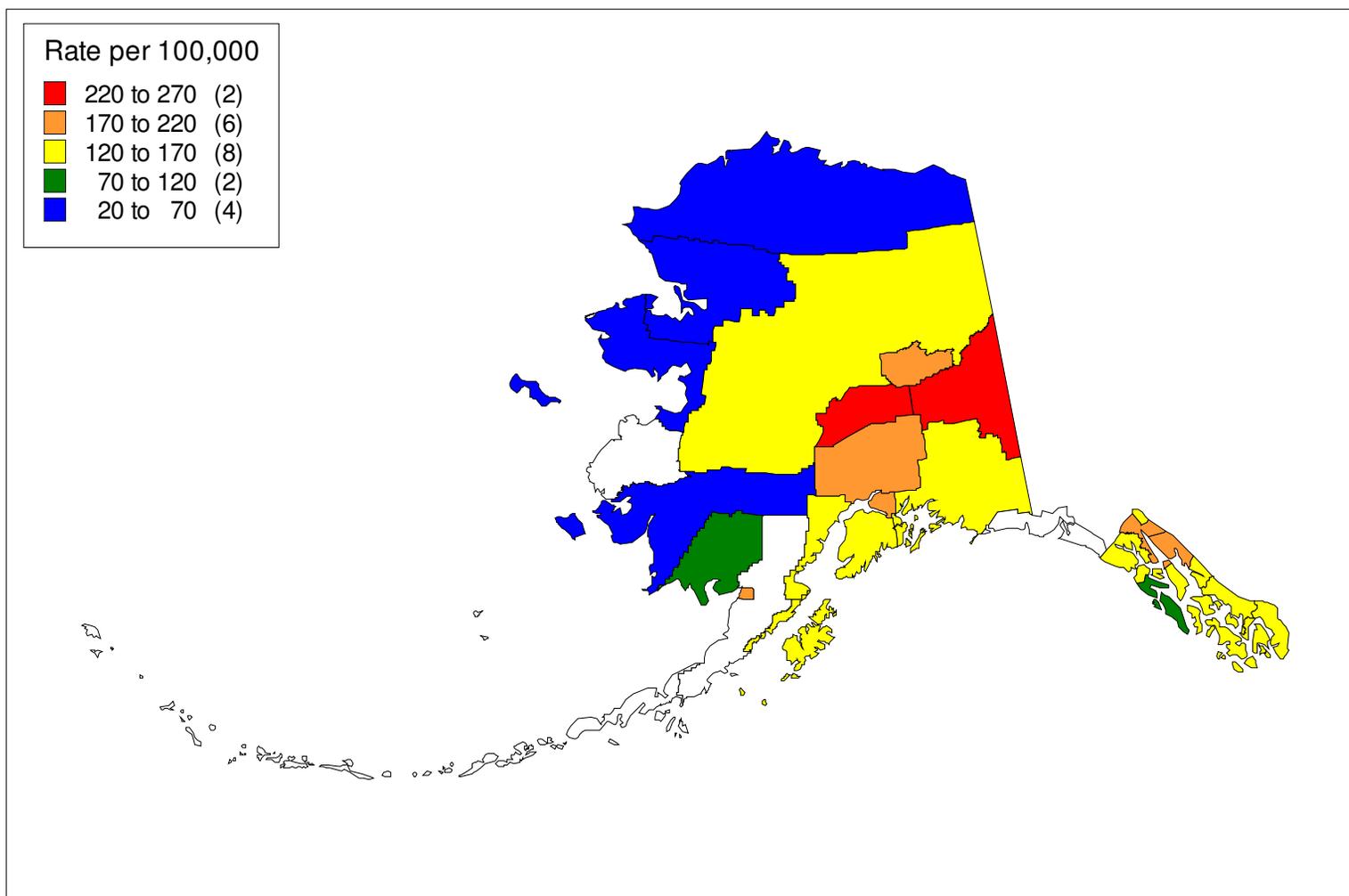
Note that borough/census areas with low populations may have unusually low or high cancer rates. In these situations, the rate may be a result of chance variations within the population rather than a true representation of the burden of cancer. For example, a low-population area may have 5 cases of a certain type of cancer for a given year, and 10 cases the next. If the population is 10,000, then the rate (per 100,000 people) is 50 the first year and 100 the next – a 100% variation. However, a high-population area may have 50 cases of the same type of cancer and 55 cases the next. If the population is 100,000, then the rate (per 100,000 people) is 50 the first year and 55 the next – only a 10% variation. In both situations, the number of cases differing year to year is the same.



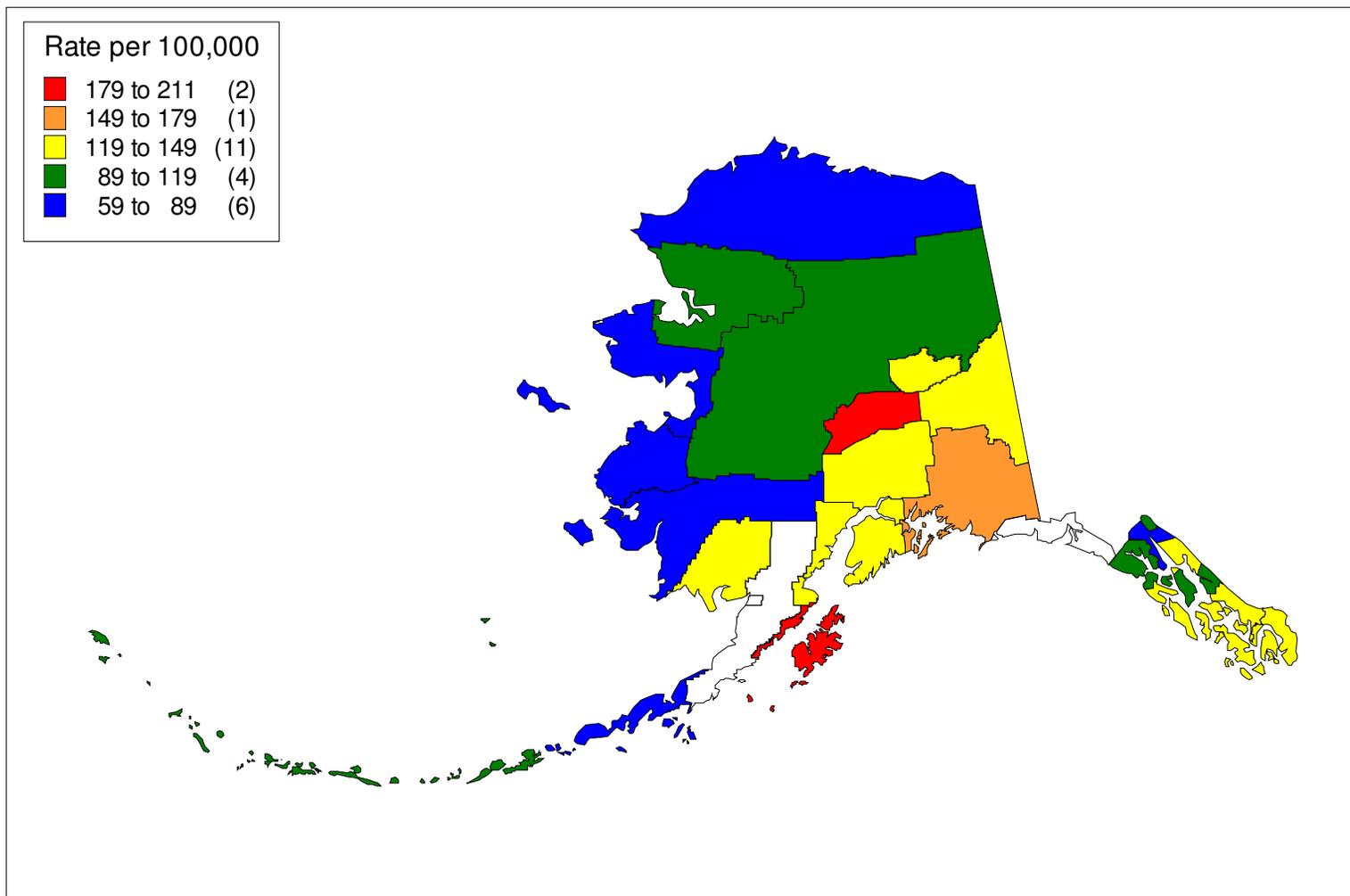
Map of Alaska with Boroughs and Census Areas



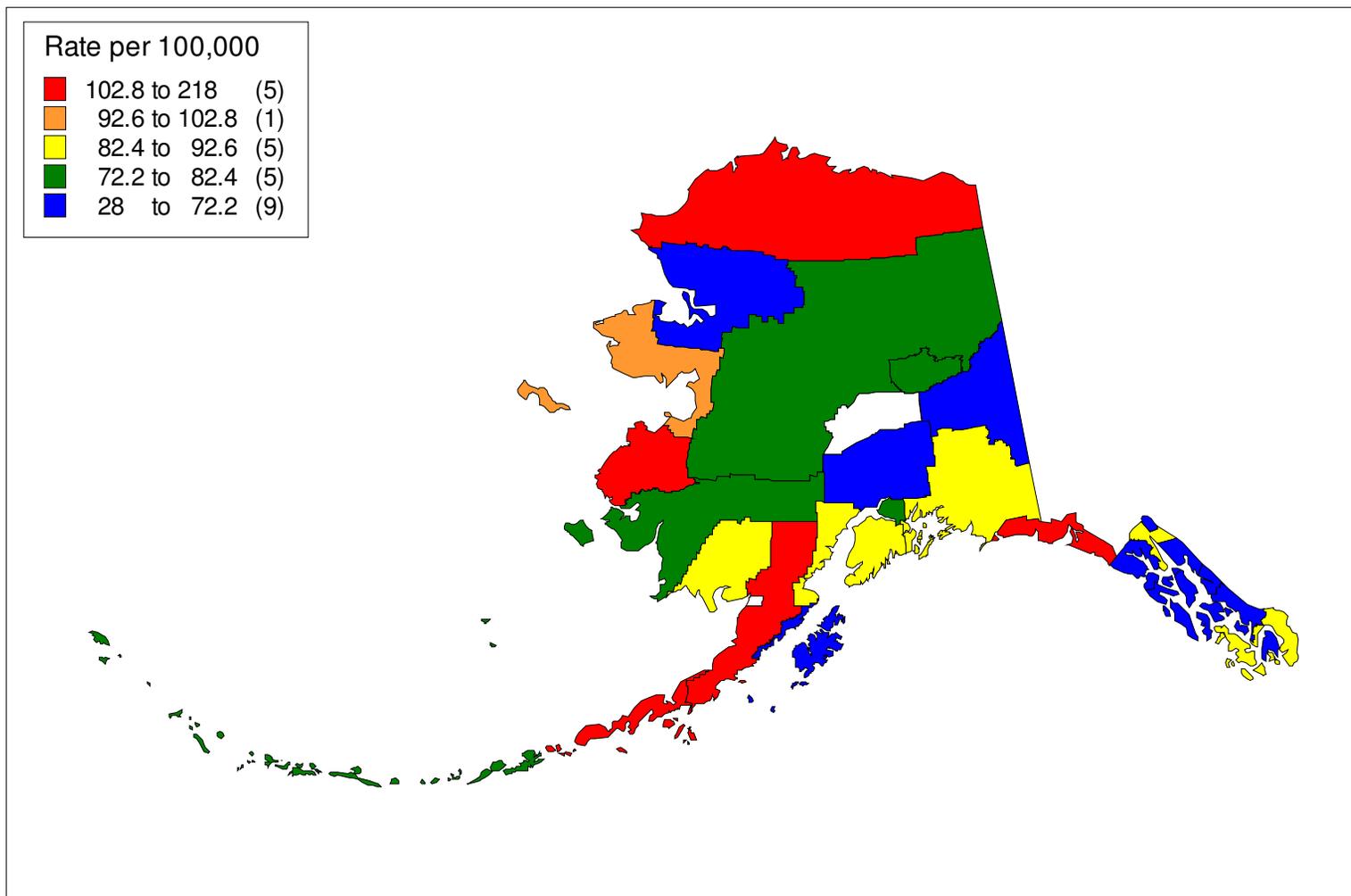
All Sites - Cancer Incidence Rates by Borough/Census Area, 1996-2004



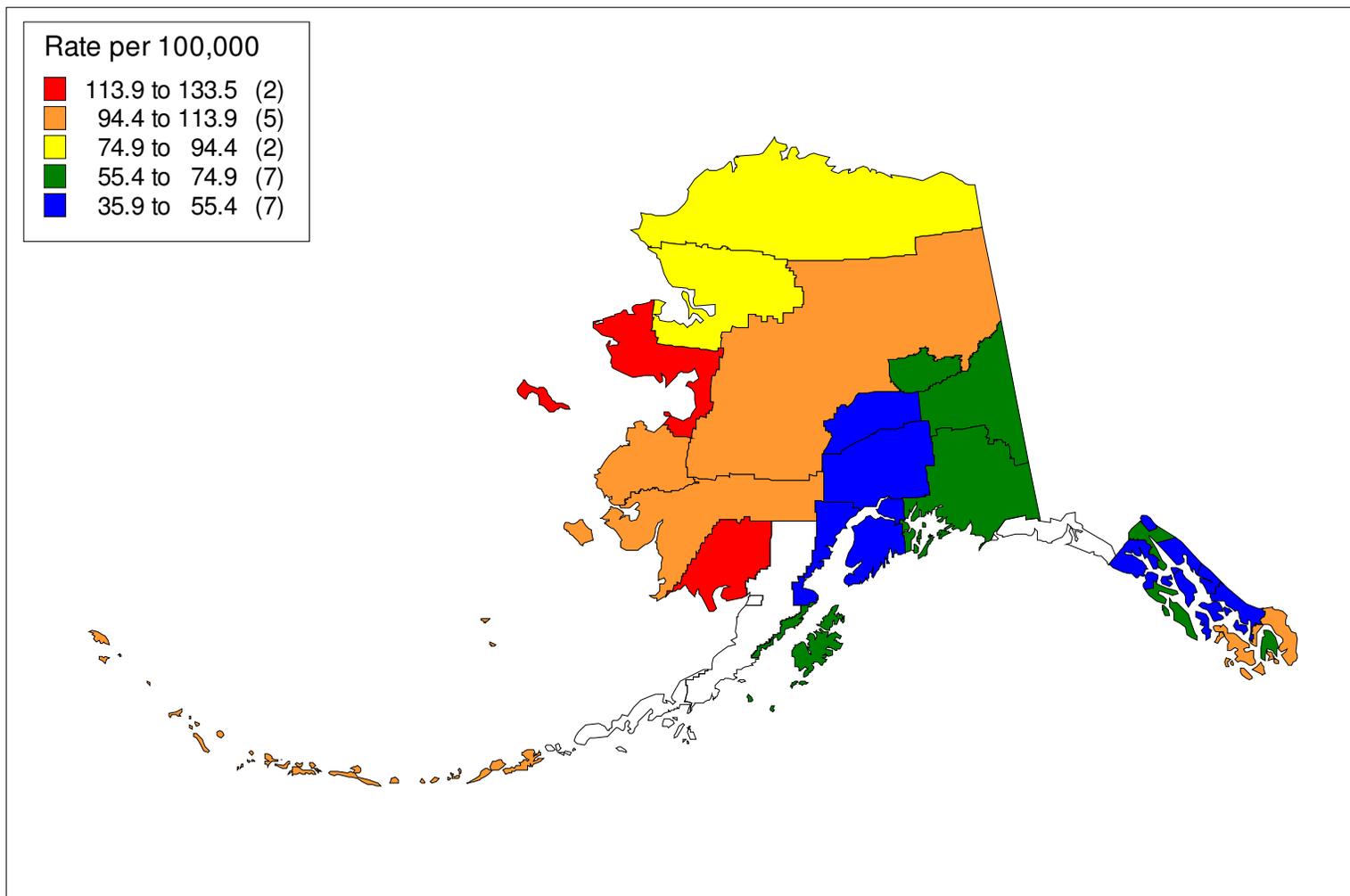
Prostate Cancer Incidence Rates by Borough/Census Area, 1996-2004



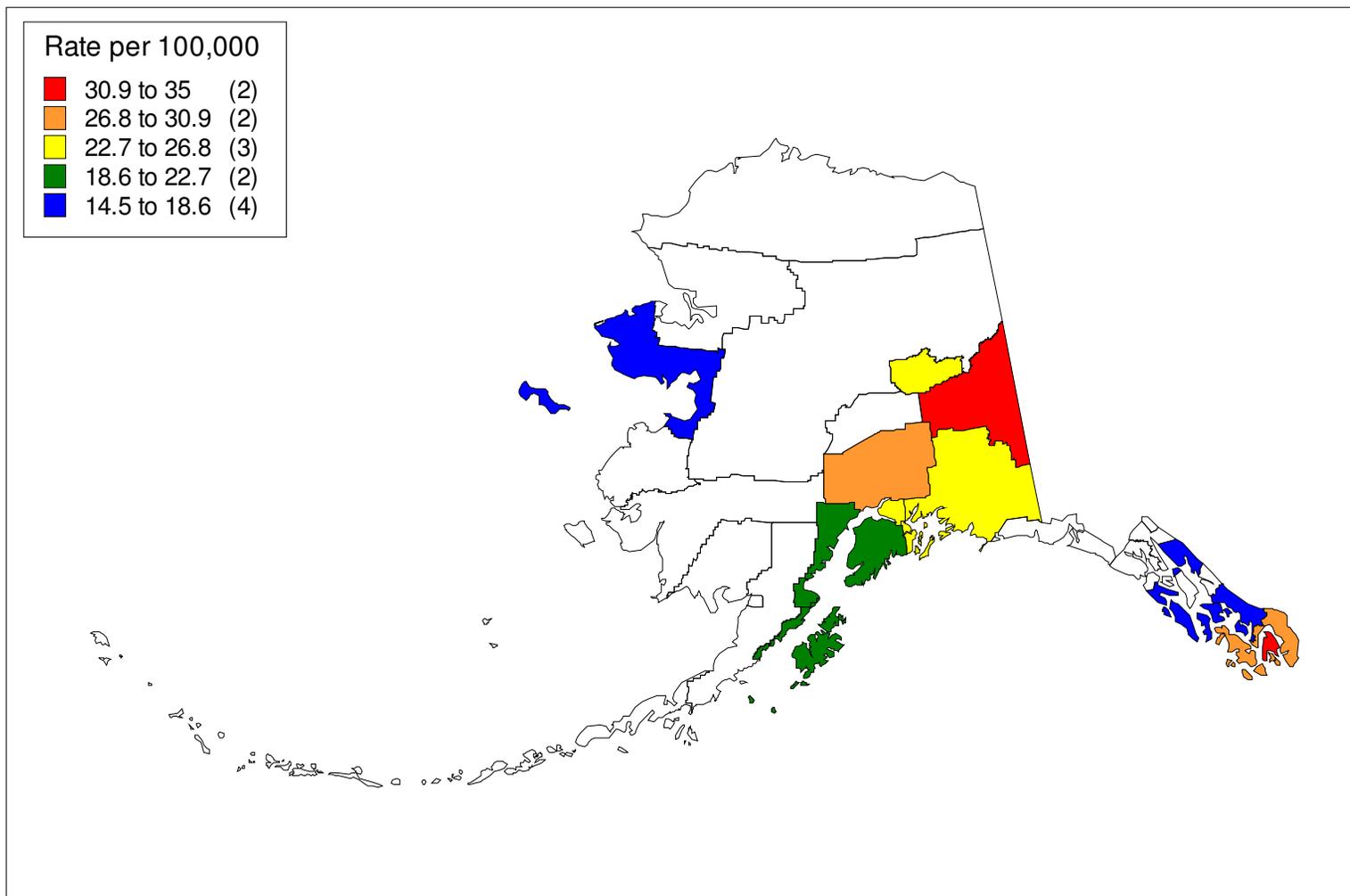
Female Breast Cancer Incidence Rates by Borough/Census Area, 1996-2004



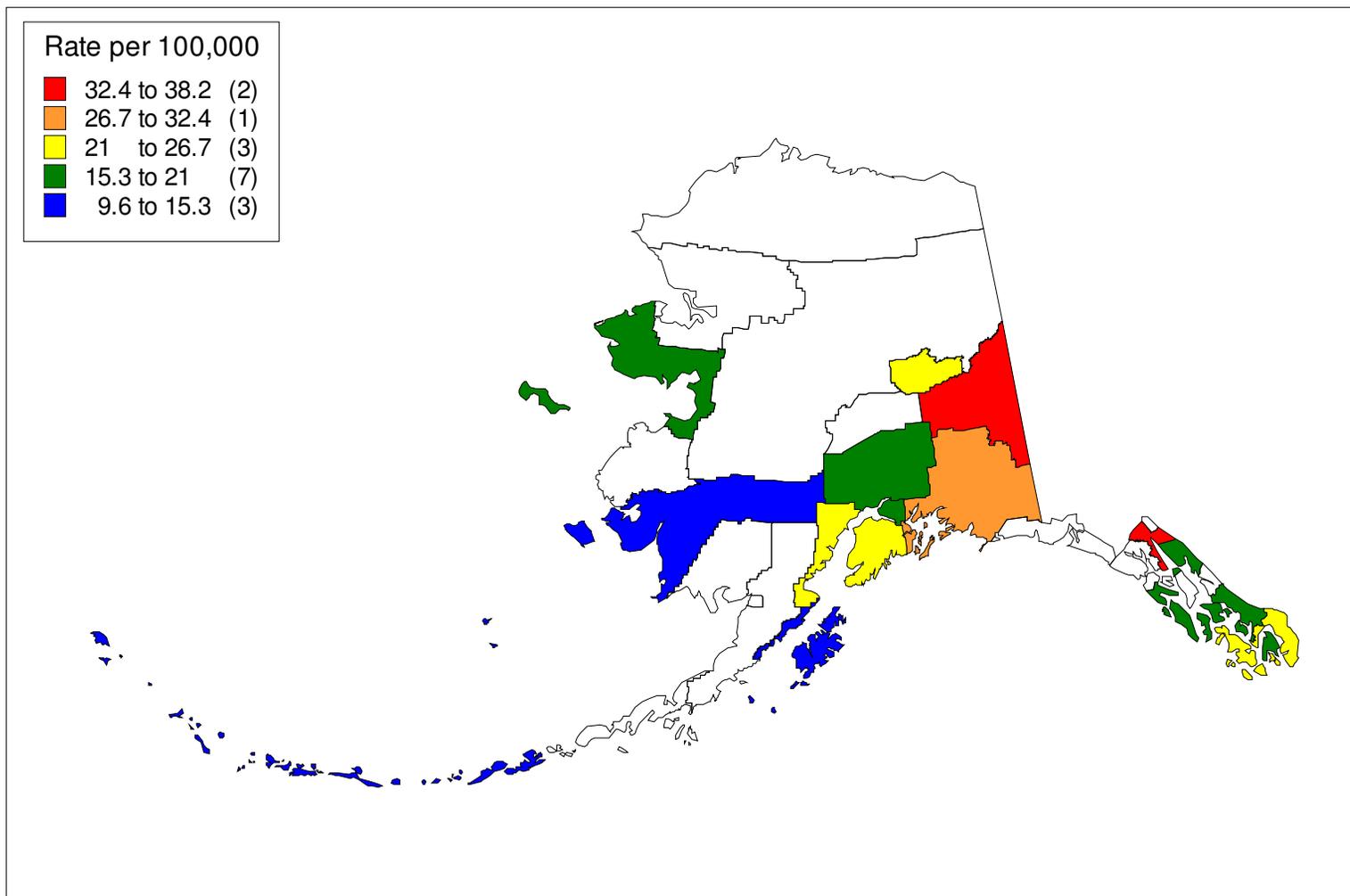
Lung Cancer Incidence Rates by Borough/Census Area, 1996-2004



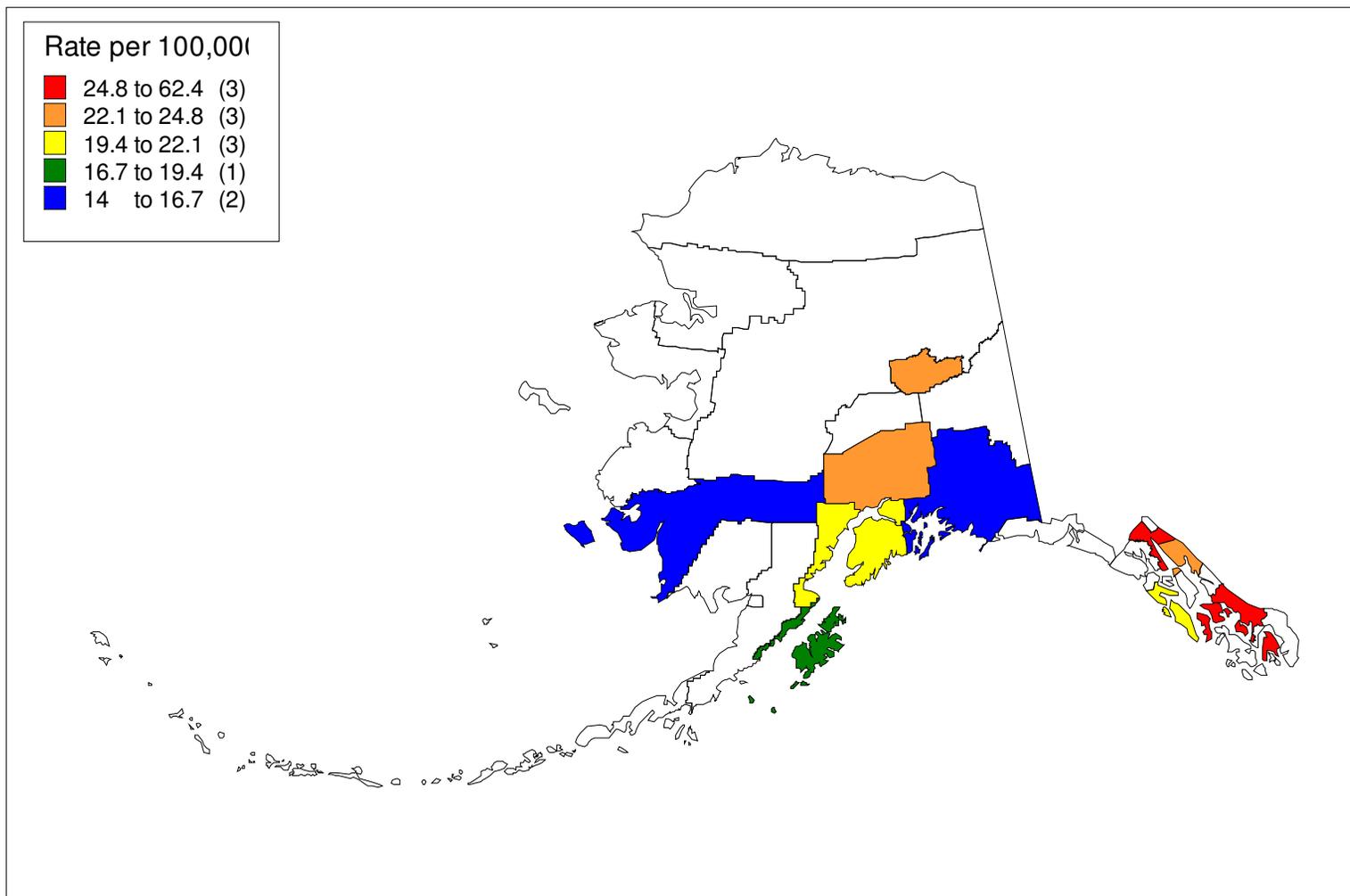
Colorectal Cancer Incidence Rates by Borough/Census Area, 1996-2004



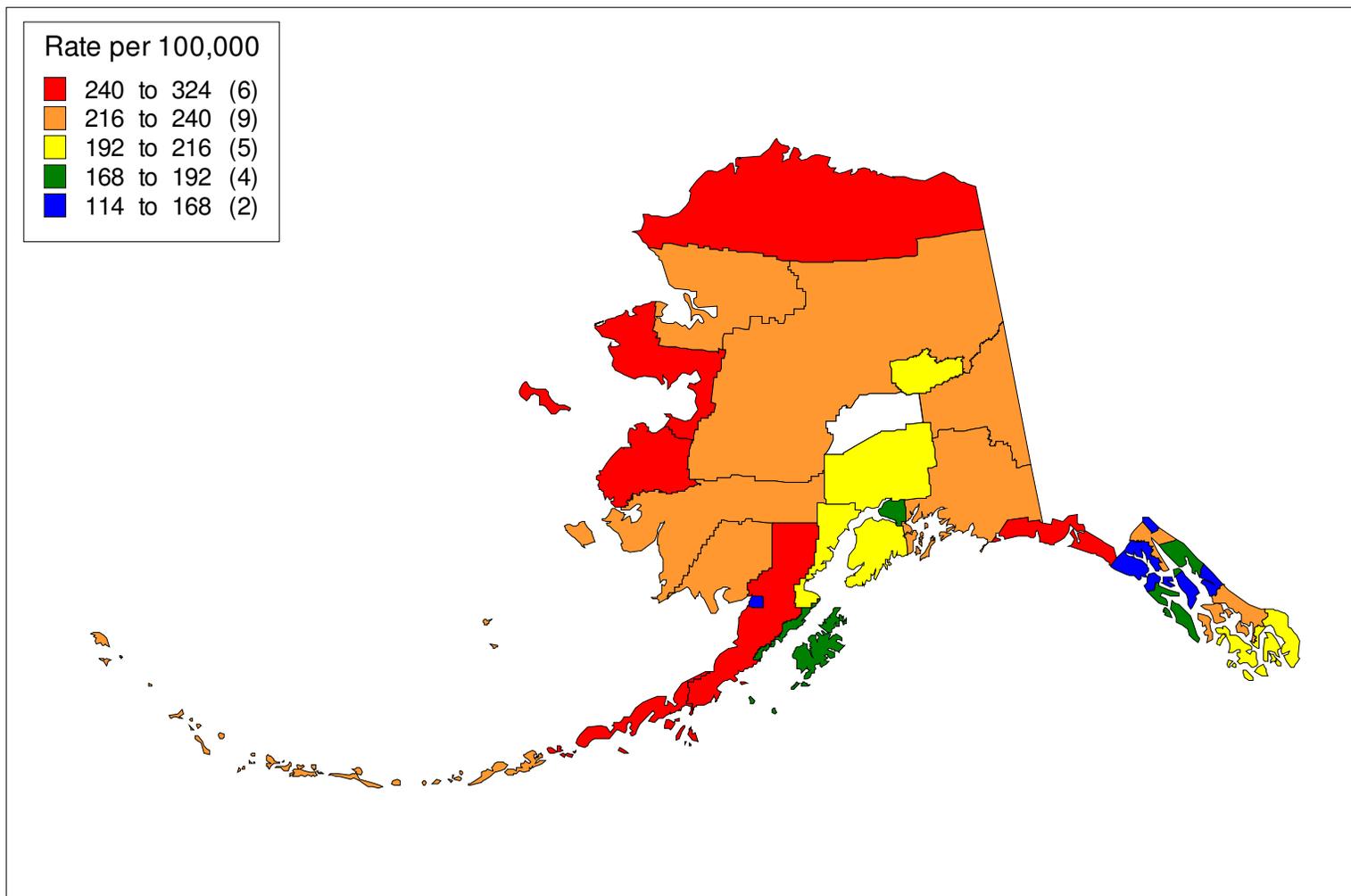
Bladder Cancer Incidence Rates by Borough/Census Area, 1996-2004



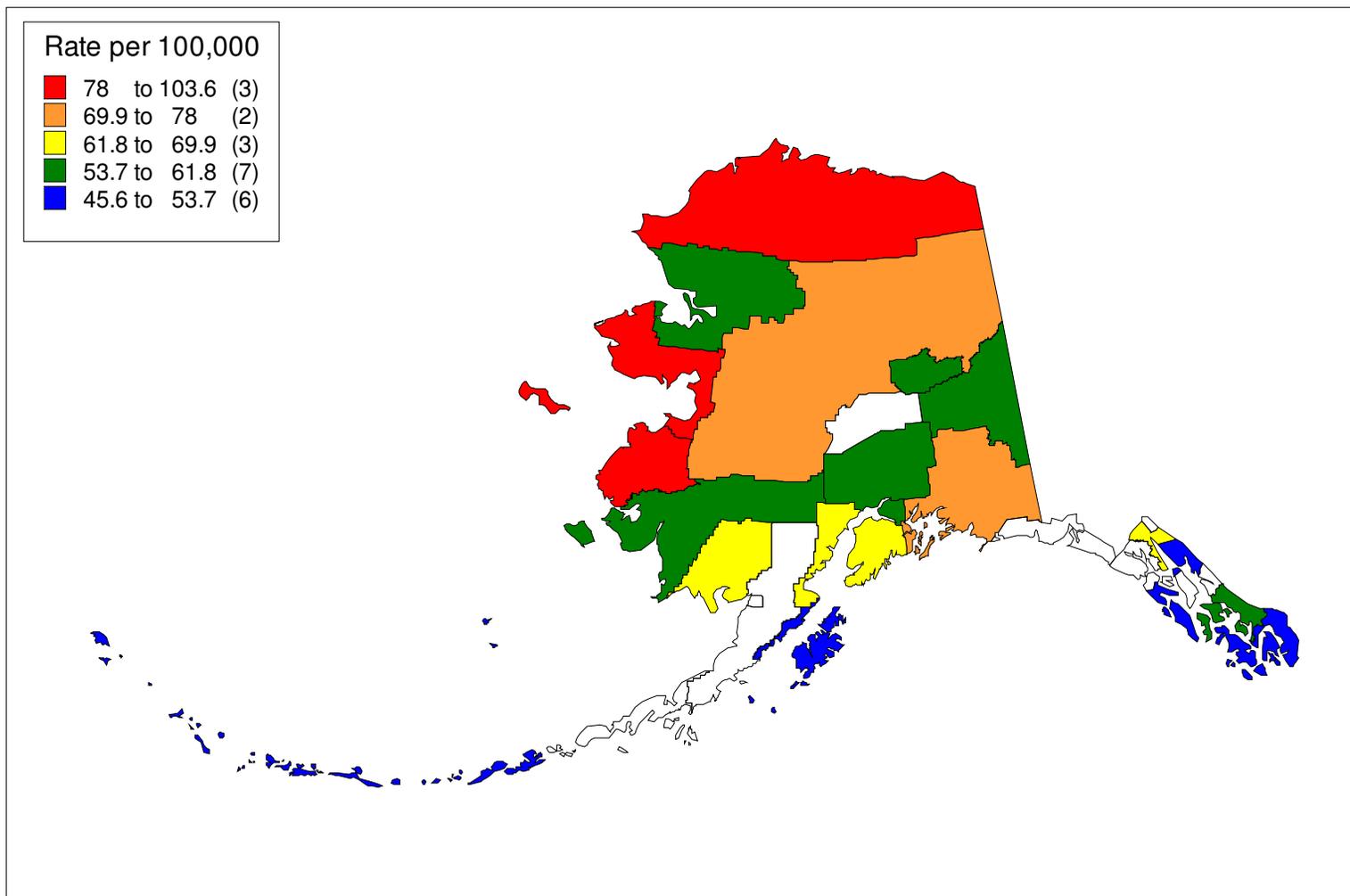
Non-Hodgkin's Lymphoma Incidence Rates by Borough/Census Area, 1996-2004



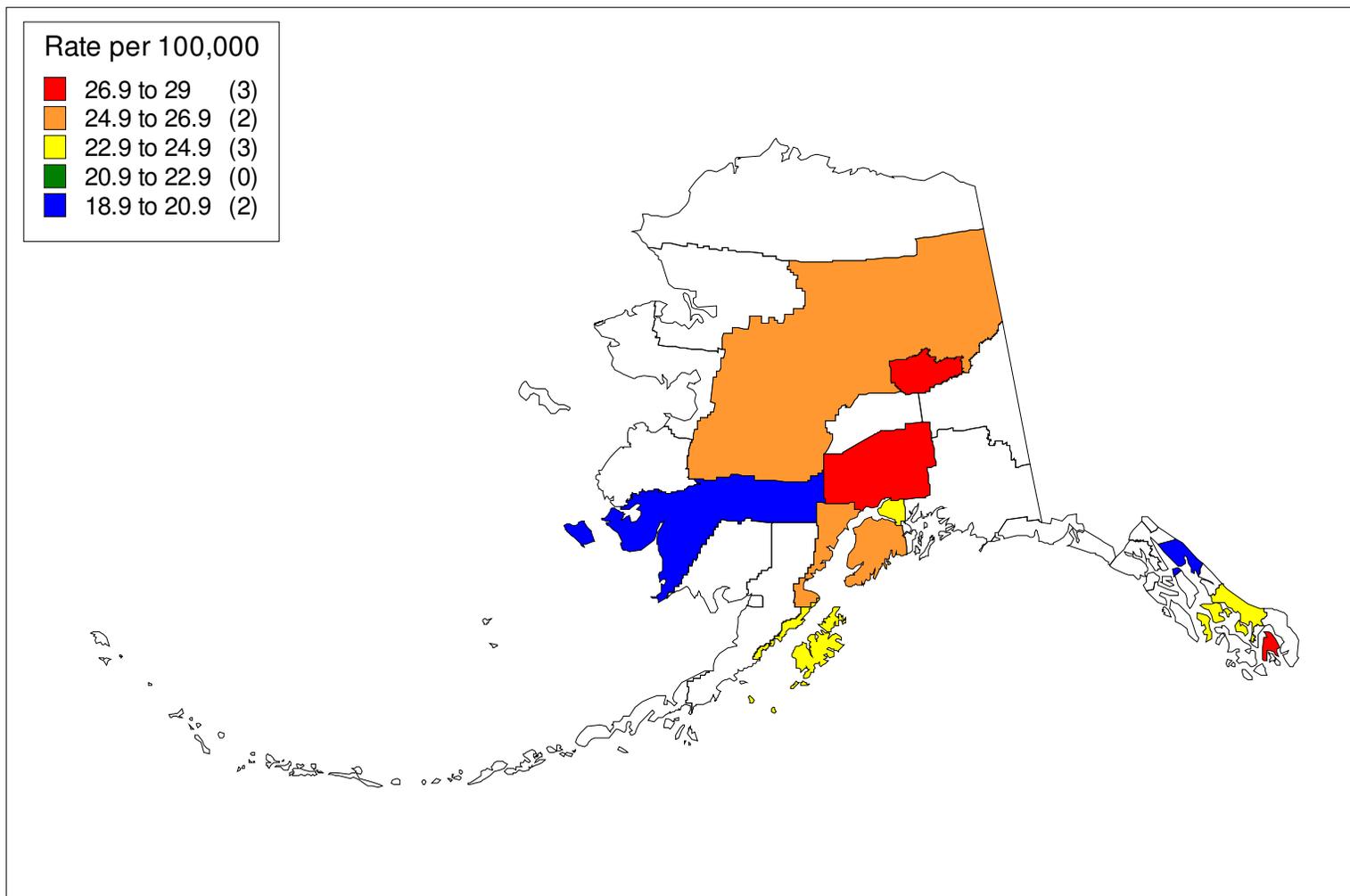
Uterine Cancer Incidence Rates by Borough/Census Area, 1996-2004



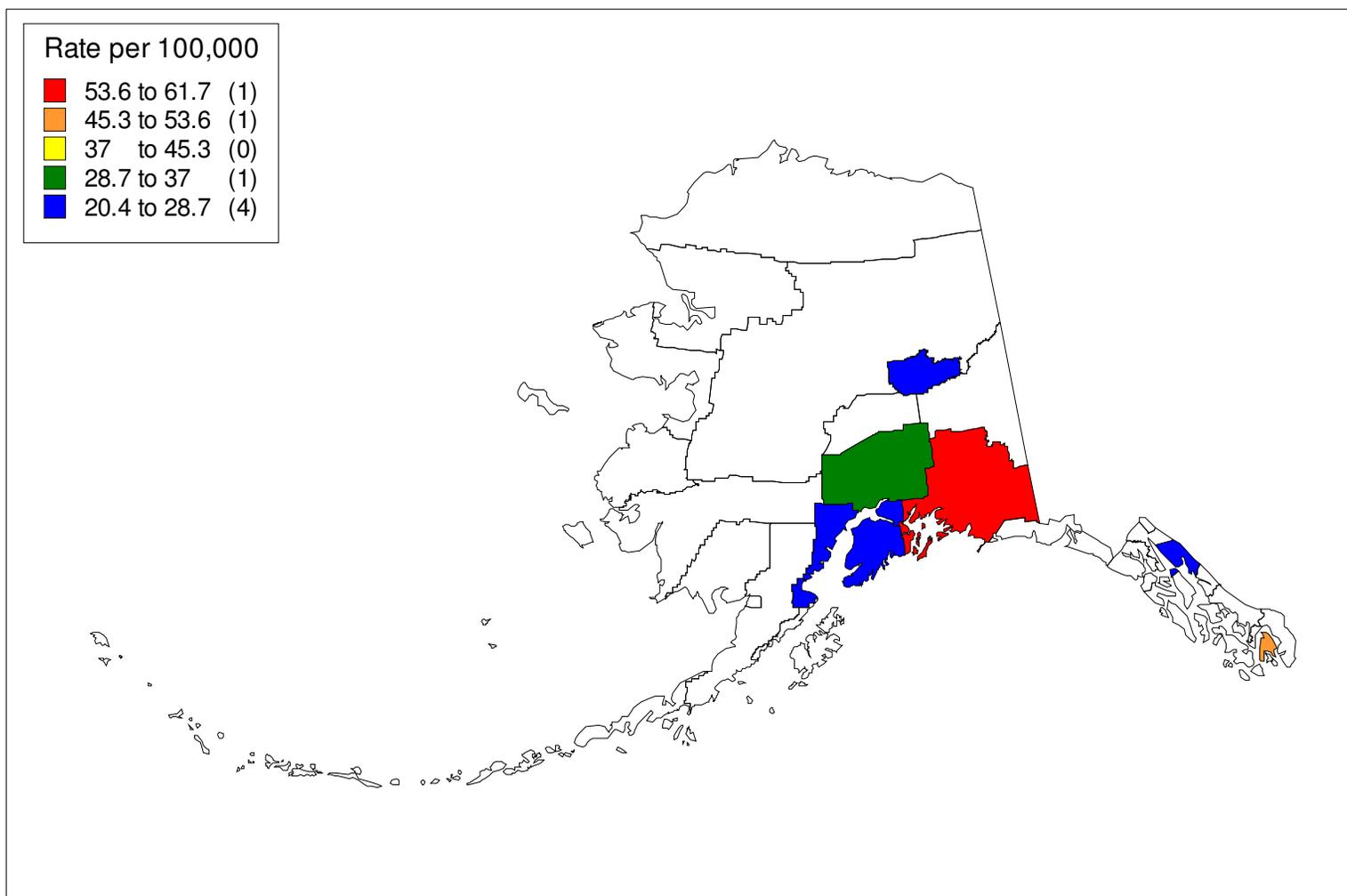
Total Cancer Mortality Rates by Borough/Census Area, 1996-2004



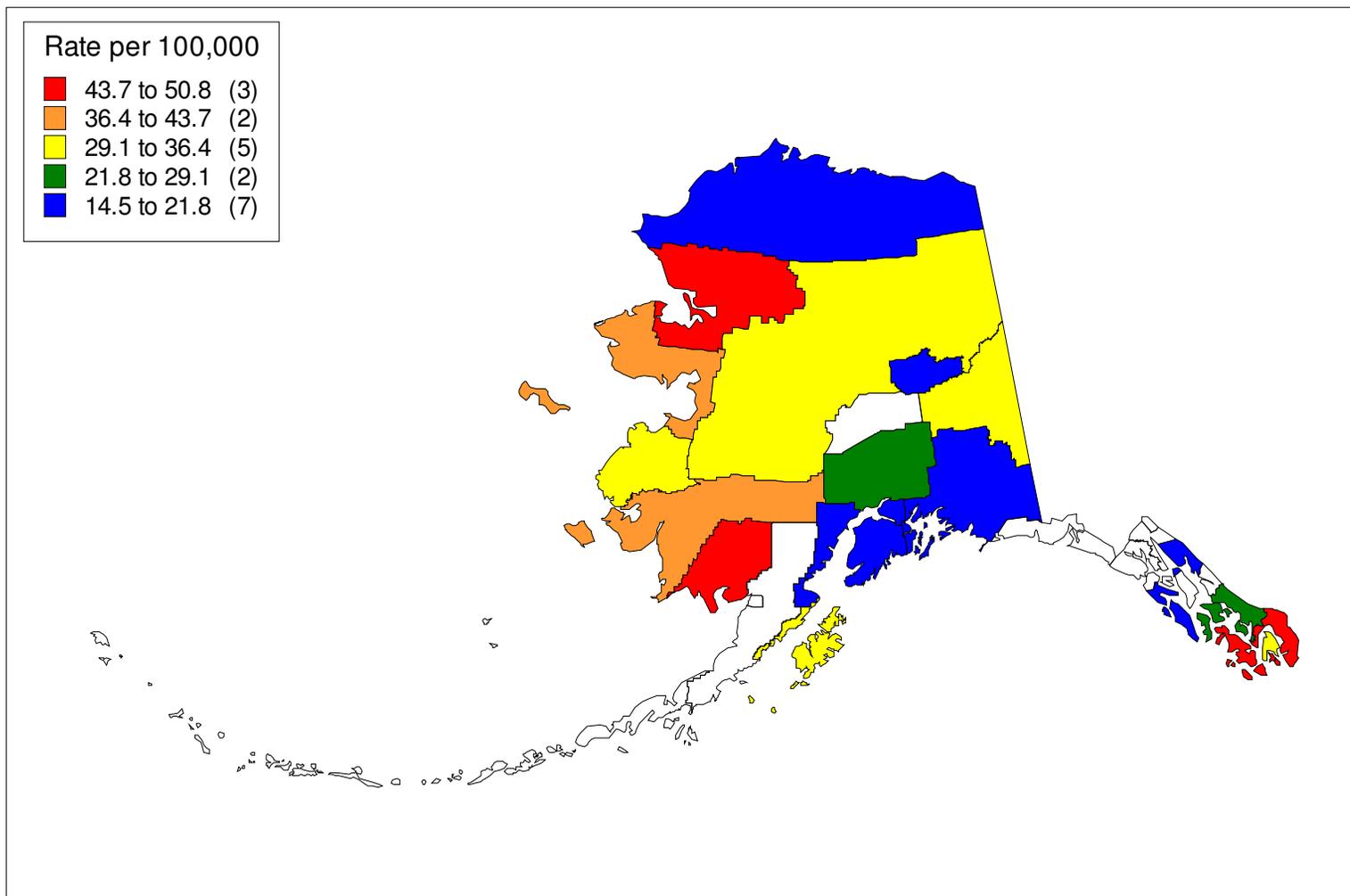
Lung & Bronchus Cancer Mortality Rates by Borough/Census Area, 1996-2004



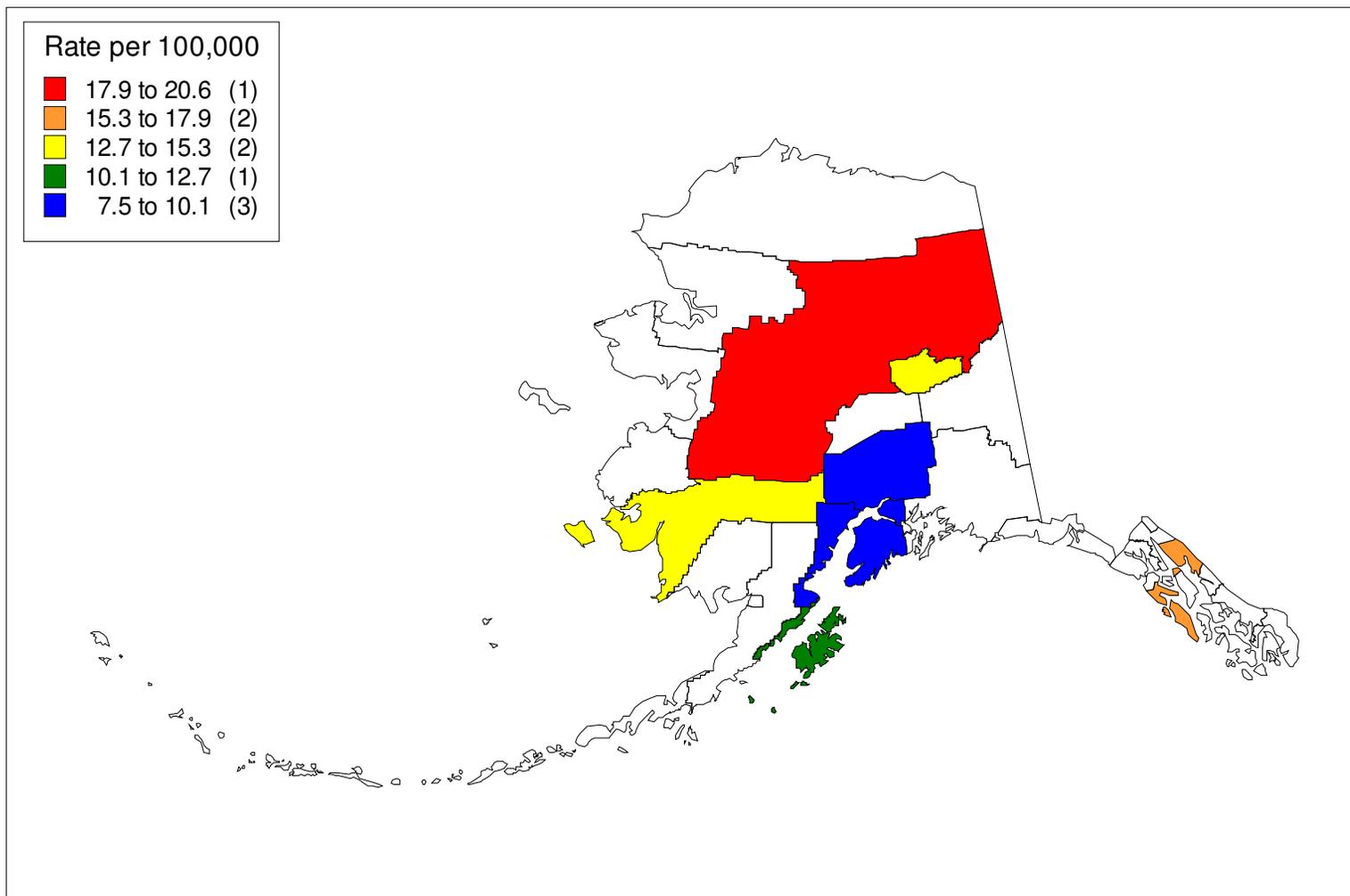
Female Breast Cancer Mortality Rates by Borough/Census Area, 1996-2004



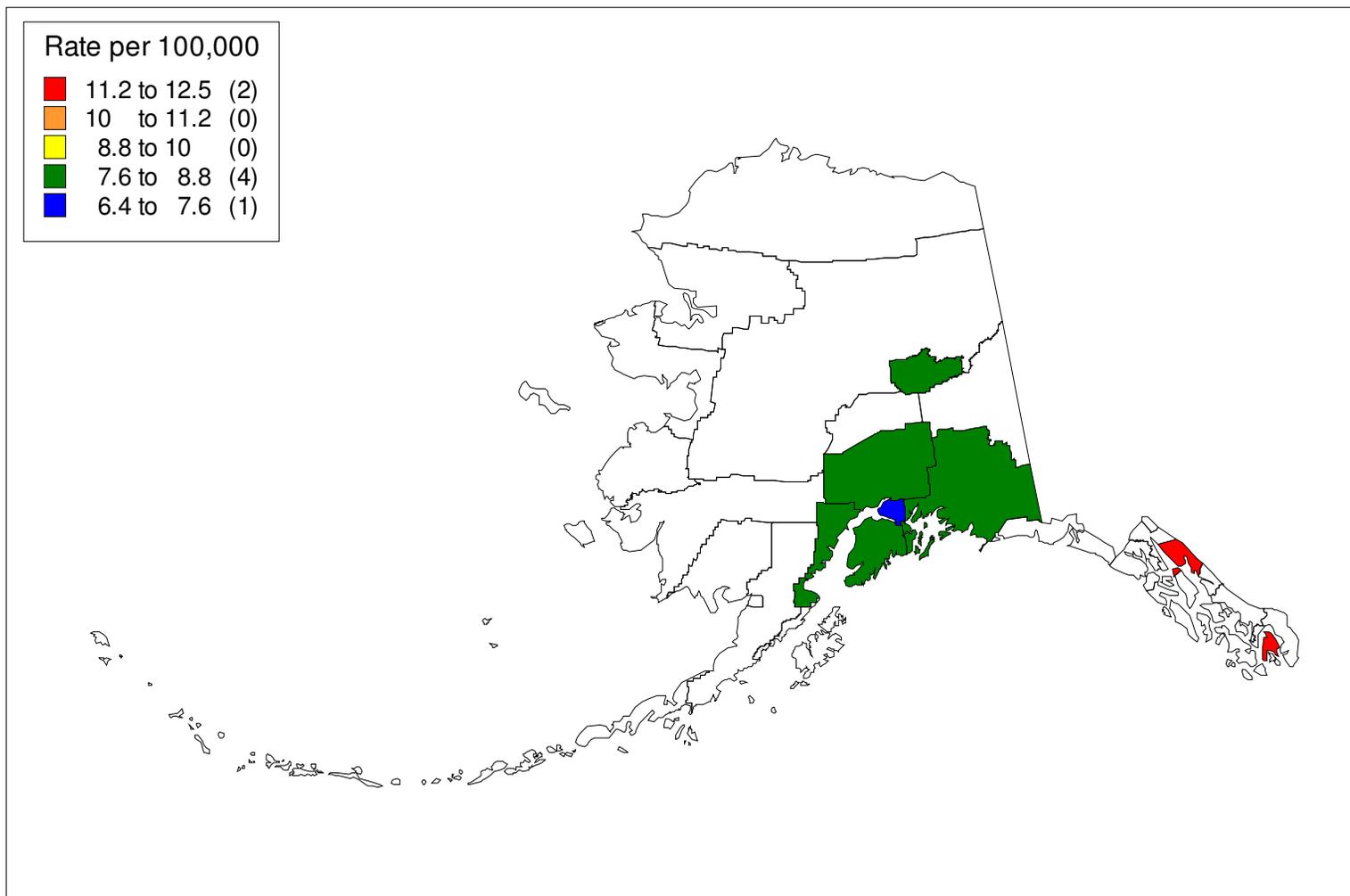
Prostate Cancer Mortality Rates by Borough/Census Area, 1996-2004



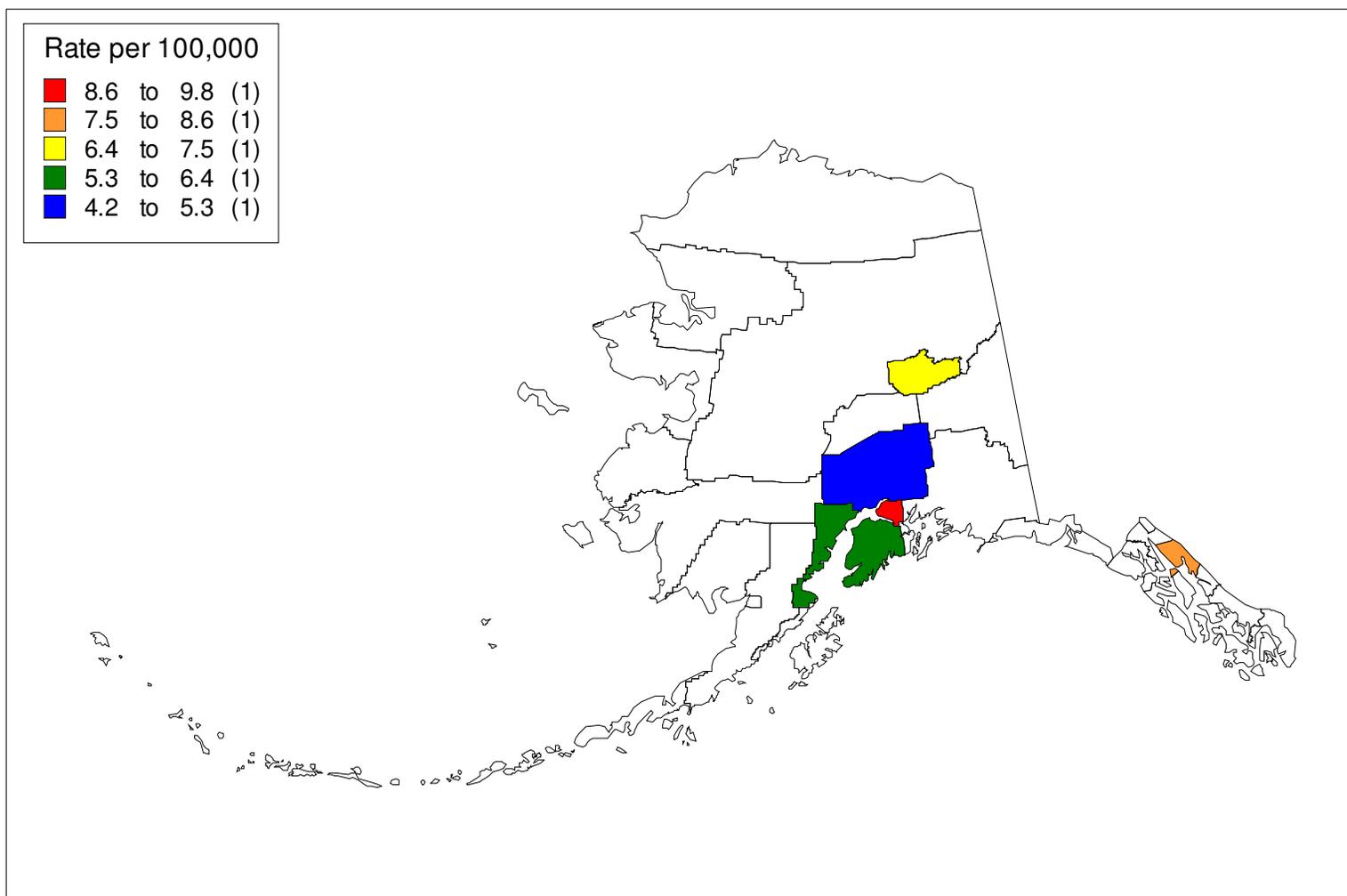
Colorectal Cancer Mortality Rates by Borough/Census Area, 1996-2004



Pancreas Cancer Mortality Rates by Borough/Census Area, 1996-2004



Non-Hodgkin's Lymphoma Mortality Rates by Borough/Census Area, 1996-2004



Ovarian Cancer Mortality Rates by Borough/Census Area, 1996-2004

Data Sources

Statistics were generated using the statistical software program SEER*Stat version 6.3.5 (<http://seer.cancer.gov/seerstat/>) from the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute.

Cancer incidence data for the U.S. were provided by the SEER program and have the following citation: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 13 Regs Limited-Use, Nov 2006 Sub (1992-2004) - Linked To County Attributes - Total U.S., 1969-2004 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2007, based on the November 2006 submission.

Cancer mortality data for Alaska and the U.S. were provided by the SEER program and have the following citation: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Public-Use With State, Total U.S. (1990-2004), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2007. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Cancer incidence data for Alaska were provided by the Alaska Cancer Registry and were formatted for use in SEER*Stat in March 2007.

Cancer mortality data for Alaska boroughs/census areas were provided by the Alaska Bureau of Vital Statistics and were formatted for use in SEER*Stat in May 2008.

Graphs were generated from the SEER*Stat statistics using Microsoft Excel 2003.

Maps were generated from the SEER*Stat statistics using the geographic information systems (GIS) software MapInfo version 8.0 (<http://www.mapinfo.com/>).