

Cancer Incidence and Mortality in Alaska, 1996-2002



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

June 2006

Cancer Incidence and Mortality in Alaska, 1996-2002
A report from the Alaska Cancer Registry
June 2006 (revised May 2008)

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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 1996-2002 (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 7-year period of 1996 to 2002 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, 1996-2002

The tables below show the types of cancers with the highest rates and number of cases. During this time period, they represent 63.4% of all 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	172.7	1,994	173.2
2. Female Breast	137.2	2,189	134.4
3. Lung and Bronchus	76.0	1,878	62.1
4. Colorectal	59.5	1,426	53.5
5. Bladder	23.6	545	20.4
6. Uterus	20.9	320	24.4

Highest-Ranked Cancers by Number of Cases

Type of Cancer	Rate per 100,000	Number of Cases	U.S. Rate
1. Female Breast	137.2	2,189	134.4
2. Prostate	172.7	1,994	173.2
3. Lung and Bronchus	76.0	1,878	62.1
4. Colorectal	59.5	1,426	53.5
5. Non-Hodgkin's Lymphoma	20.7	605	19.3
6. Bladder	23.6	545	20.4

Mortality – Malignant Cancers in Alaska, 1996-2002

The tables below show the highest death rate and death count in Alaska by types of cancer. During this time period, they represent 59.4% 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	1,349	56.2
2. Prostate	27.7	189	31.6
3. Female Breast	24.1	339	27.1
4. Colorectal	20.6	434	20.8
5. Pancreas	11.0	263	10.5
6. Ovary	8.6	110	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	1,349	56.2
2. Colorectal	20.6	434	20.8
3. Female Breast	24.1	339	27.1
4. Pancreas	11.0	263	10.5
5. Non-Hodgkin's Lymphoma	8.2	192	8.3
6. Prostate	27.7	189	31.6

Incidence by Race – Whites and Natives, 1996-2002

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	132.9	323	143.4	1739	62.6
2. Colorectal	108.6	400	51.1	941	36.9
3. Lung and Bronchus	93.4	349	73.9	1,414	36.0
4. Prostate	84.3	134	184.9	1697	62.6
5. Stomach	25.8	104	6.1	110	11.6
6. Kidney and Renal Pelvis	19.4	79	12.9	295	11.3

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	108.6	400	51.1	941	36.9
2. Lung and Bronchus	93.4	349	73.9	1,414	36.0
3. Female Breast	132.9	323	143.4	1739	62.6
4. Prostate	84.3	134	184.9	1697	62.6
5. Stomach	25.8	104	6.1	110	11.6
6. Kidney and Renal Pelvis	19.4	79	12.9	295	11.3

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	184.9	1,697	84.3	134	168.6
2. Female Breast	143.4	1,739	132.9	323	140.8
3. Lung and Bronchus	73.9	1,414	93.4	349	62.9
4. Colorectal	51.1	941	108.6	400	53.2
5. Bladder	27.1	484	11.2	42	22.5
6. Non-Hodgkin's Lymphoma	23.1	511	11.7	59	20.3

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	143.4	1,739	132.9	323	140.8
2. Prostate	184.9	1,697	84.3	134	168.6
3. Lung and Bronchus	73.9	1,414	93.4	349	62.9
4. Colorectal	51.1	941	108.6	400	53.2
5. Non-Hodgkin's Lymphoma	23.1	511	11.7	59	20.3
6. Bladder	27.1	484	11.2	42	22.5

Mortality by Race – Whites and Natives, 1996-2002

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	67.9	240	57.3	1,044	36.2
2. Colorectal	37.0	123	17.8	288	14.2
3. Female Breast	22.2	52	24.8	262	14.2
4. Prostate	21.8	22	29.3	159	20.2
5. Stomach	17.5	74	4.0	69	5.4
6. Pancreas	15.1	58	10.8	197	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	67.9	240	57.3	1,044	36.2
2. Colorectal	37.0	123	17.8	288	14.2
3. Stomach	17.5	74	4.0	69	5.4
4. Pancreas	15.1	58	10.8	197	6.5
5. Female Breast	22.2	52	24.8	262	14.2
6. Prostate	21.8	22	29.3	159	20.2

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	1,044	67.9	240	56.3
2. Prostate	29.3	159	21.8	22	29.0
3. Female Breast	24.8	262	22.2	52	26.6
4. Colorectal	17.8	288	37.0	123	20.3
5. Pancreas	10.8	197	15.1	58	10.3
6. Ovary	9.3	89	5.7	13	9.2

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	1,044	67.9	240	56.3
2. Colorectal	17.8	288	37.0	123	20.3
3. Female Breast	24.8	262	22.2	52	26.6
4. Pancreas	10.8	197	15.1	58	10.3
5. Non-Hodgkin's Lymphoma	9.3	160	5.7	25	8.7
6. Prostate	29.3	159	21.8	22	29.0

Incidence and Mortality Graphs

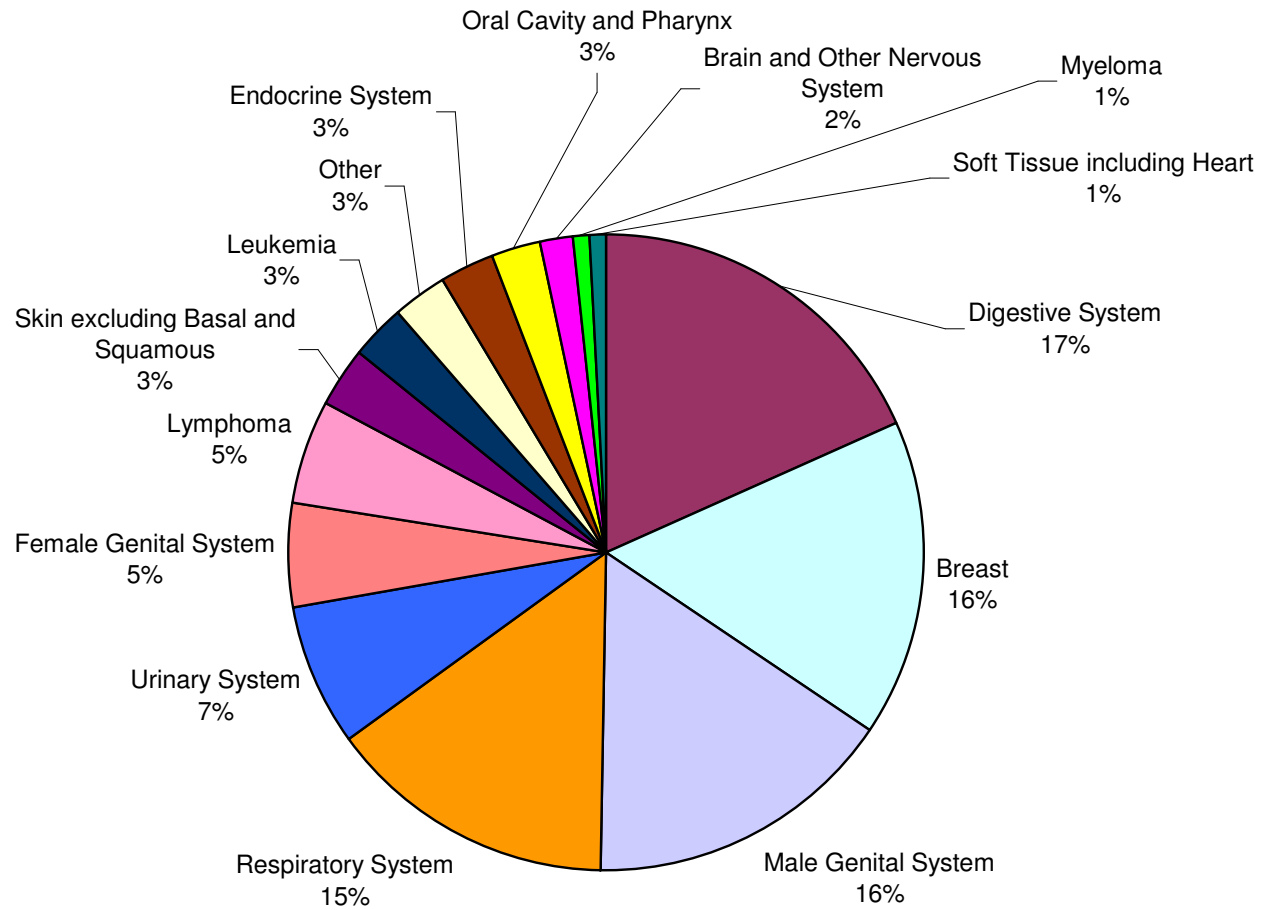
The next several pages consist of graphs illustrating cancer incidence and mortality in Alaska.

The pie charts illustrate the percentage of incidence and mortality cases during 1996-2002 for all types of cancers greater than 1 percent of the total.

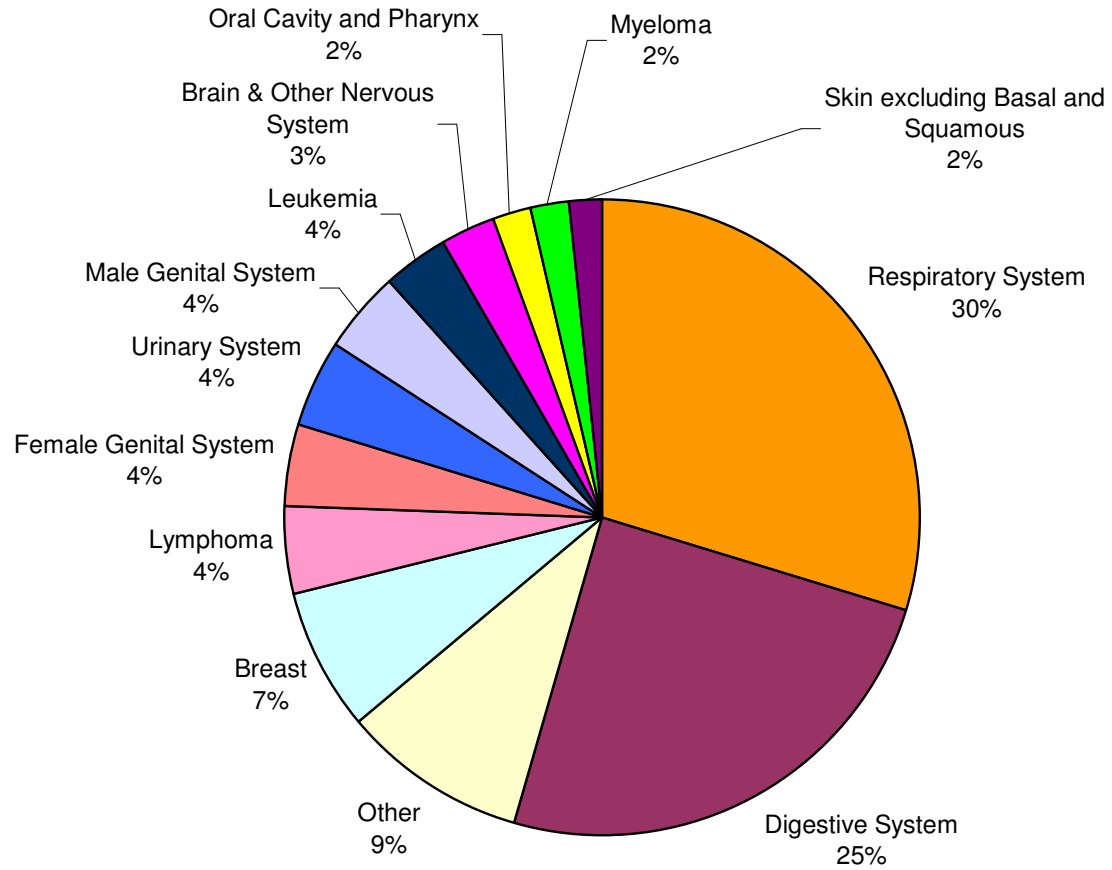
The line graphs illustrate rate trends by year for the six highest-ranking cancers in Alaska compared to the U.S. The trend data for Alaska shows a larger variation than the U.S. data because Alaska has such a small population. Consequently, the number of cancer cases is relatively small. Rates are per 100,000 people and age-adjusted to the year 2000 U.S. Standard Population.

Rates for childhood cancer incidence and mortality are presented in bar graphs. The number of these cases is relatively low – even over a 7-year period, some cancer rates are suppressed because there are less than 6 cases.

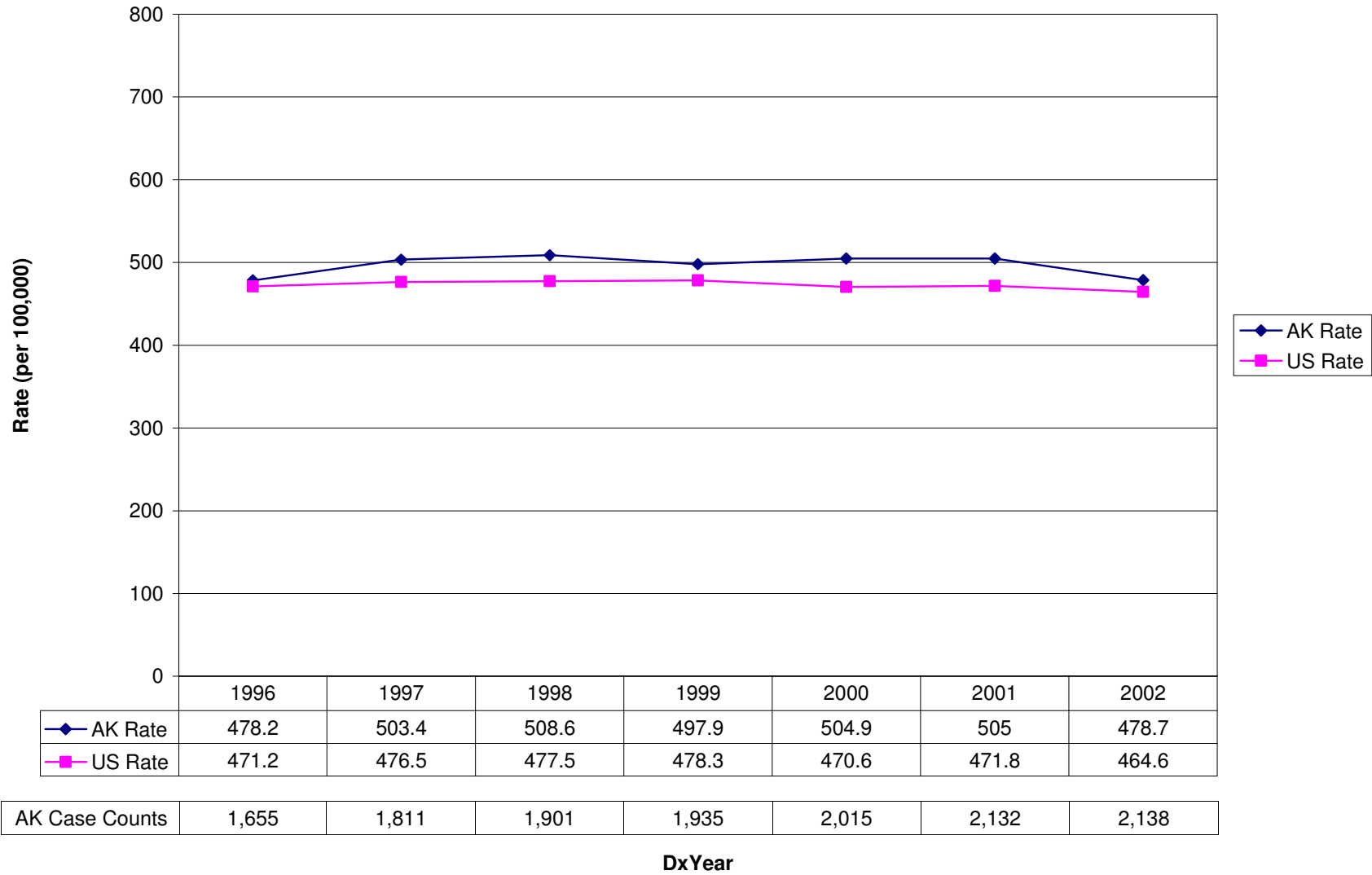
Malignant Cancer Incidence in Alaska, 1996-2002



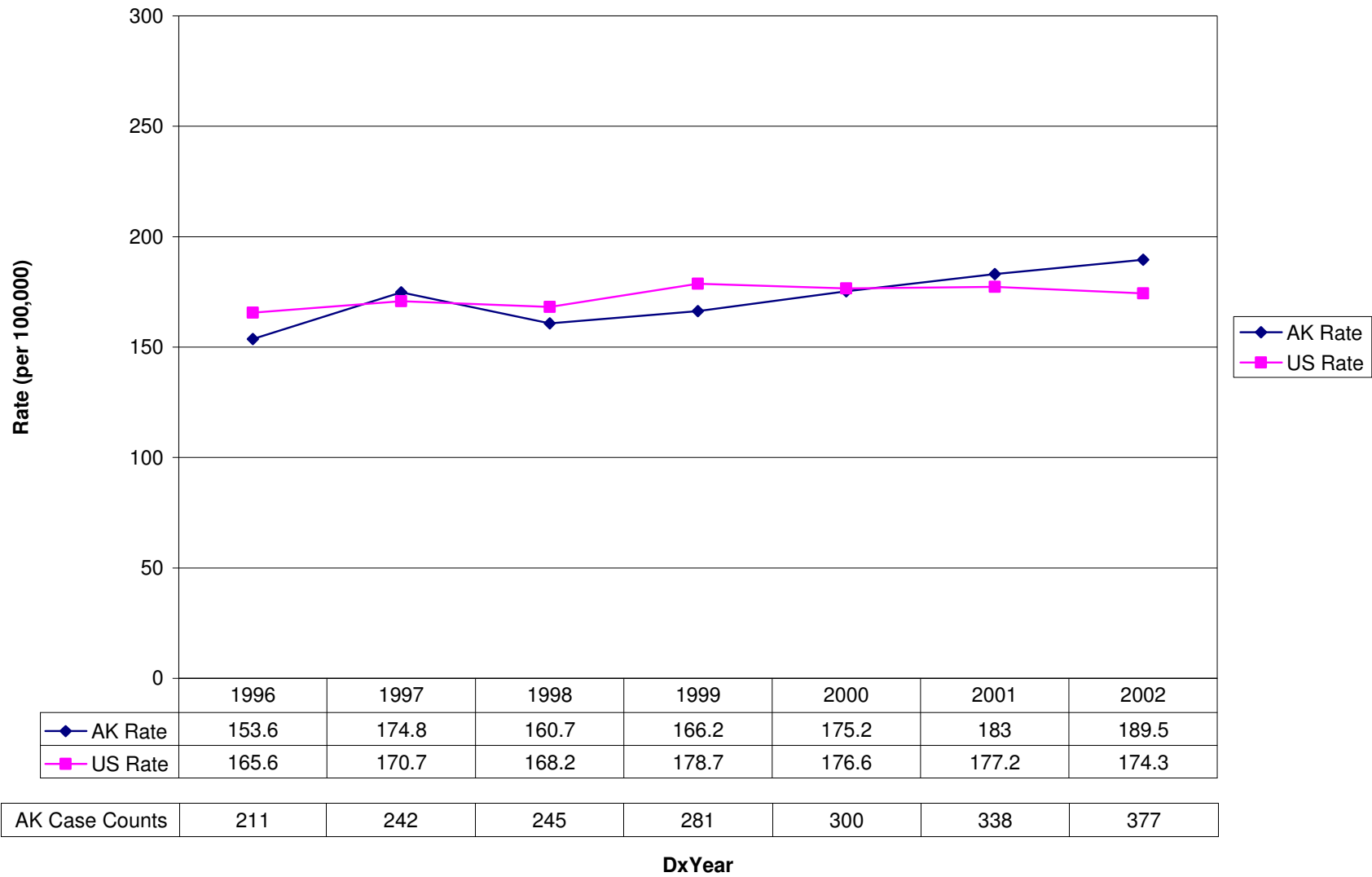
Cancer Mortality in Alaska, 1996-2002



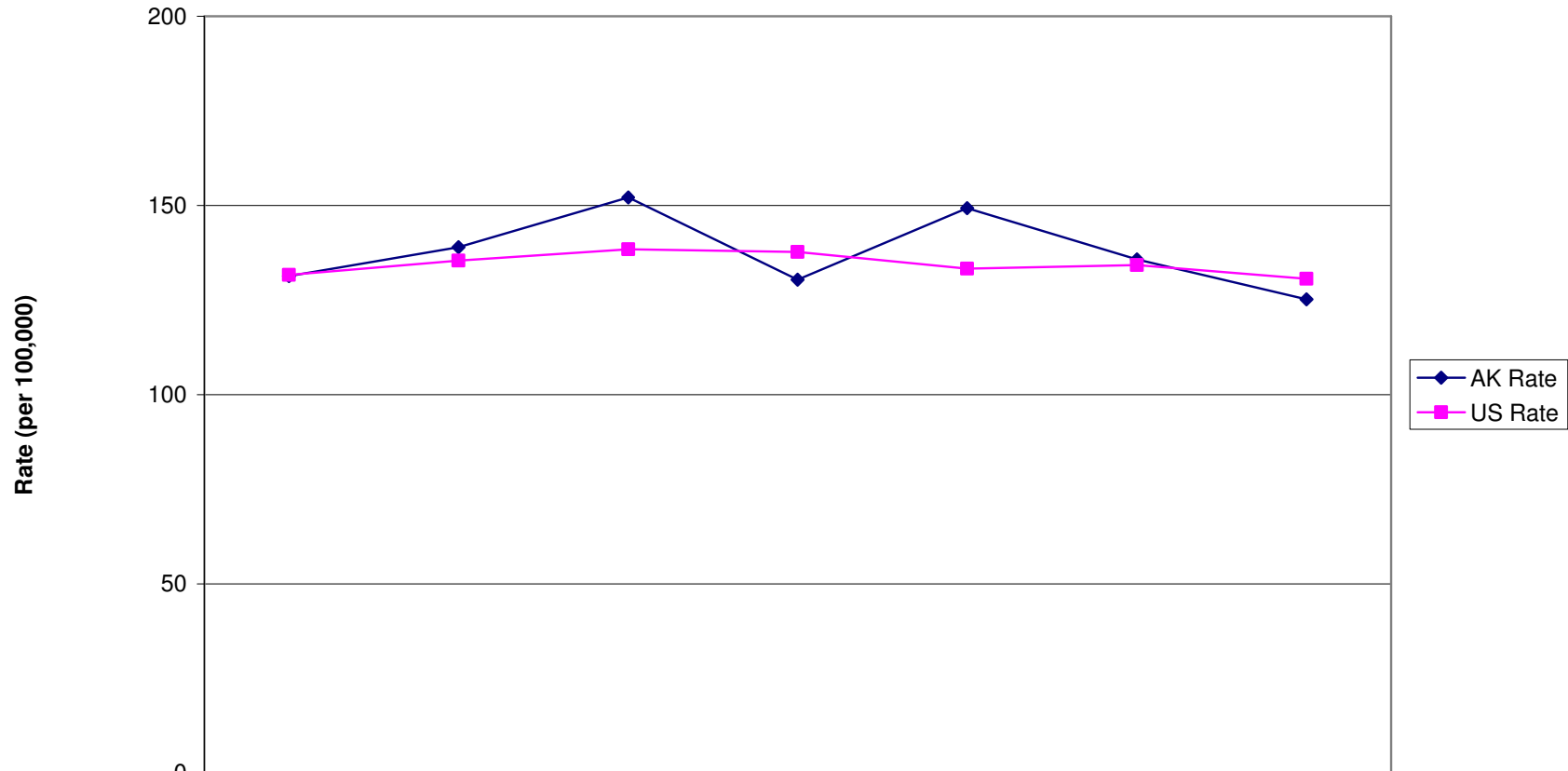
All Sites - Malignant Cancer Incidence, AK and US Rates 1996-2002



Prostate Cancer Incidence - AK and US Rates 1996-2002



Female Breast Cancer Incidence - AK and US Rates 1996-2002

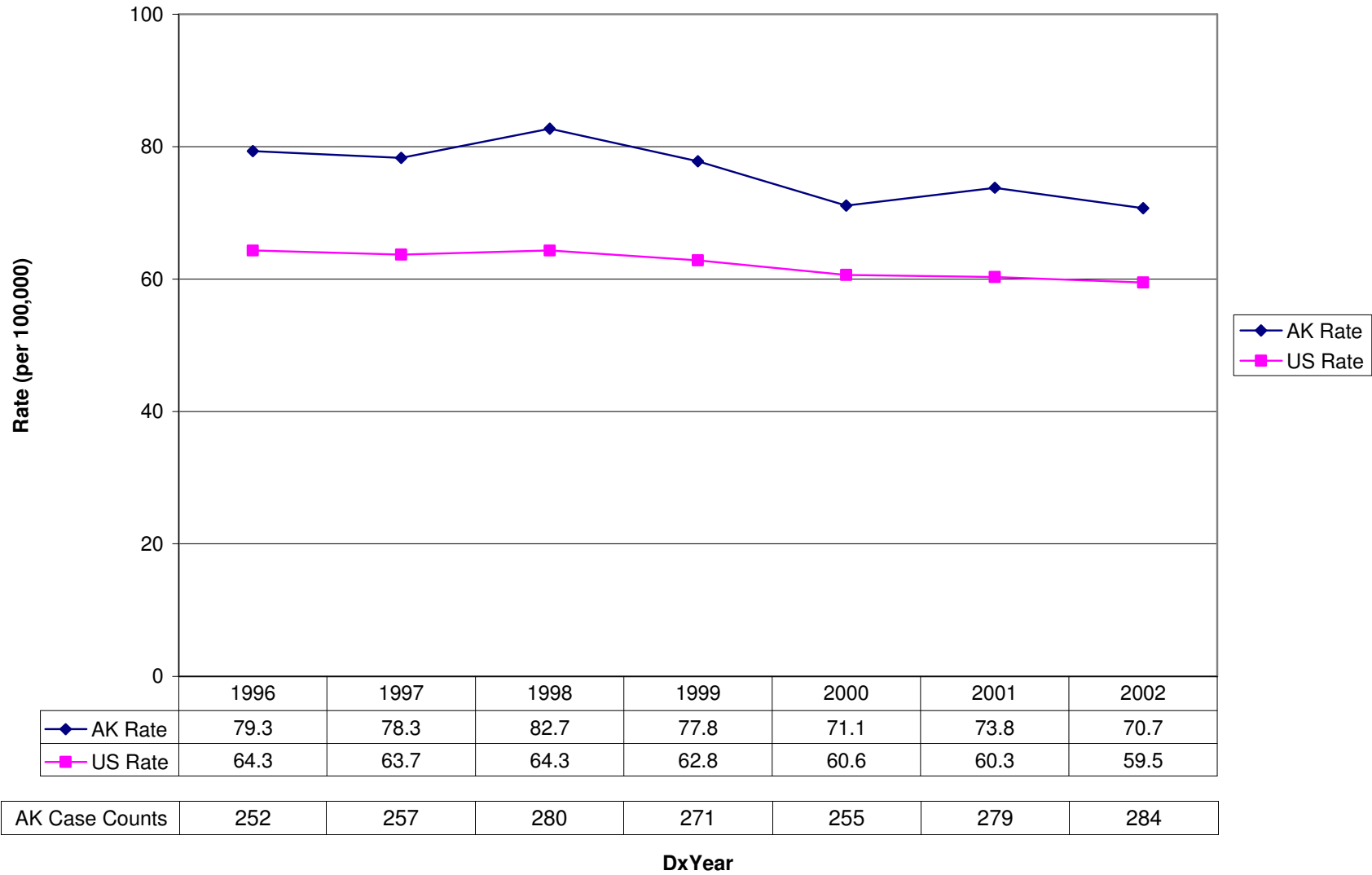


	1996	1997	1998	1999	2000	2001	2002
AK Rate	131.3	139	152.1	130.4	149.3	135.7	125.2
US Rate	131.7	135.4	138.4	137.7	133.3	134.2	130.6

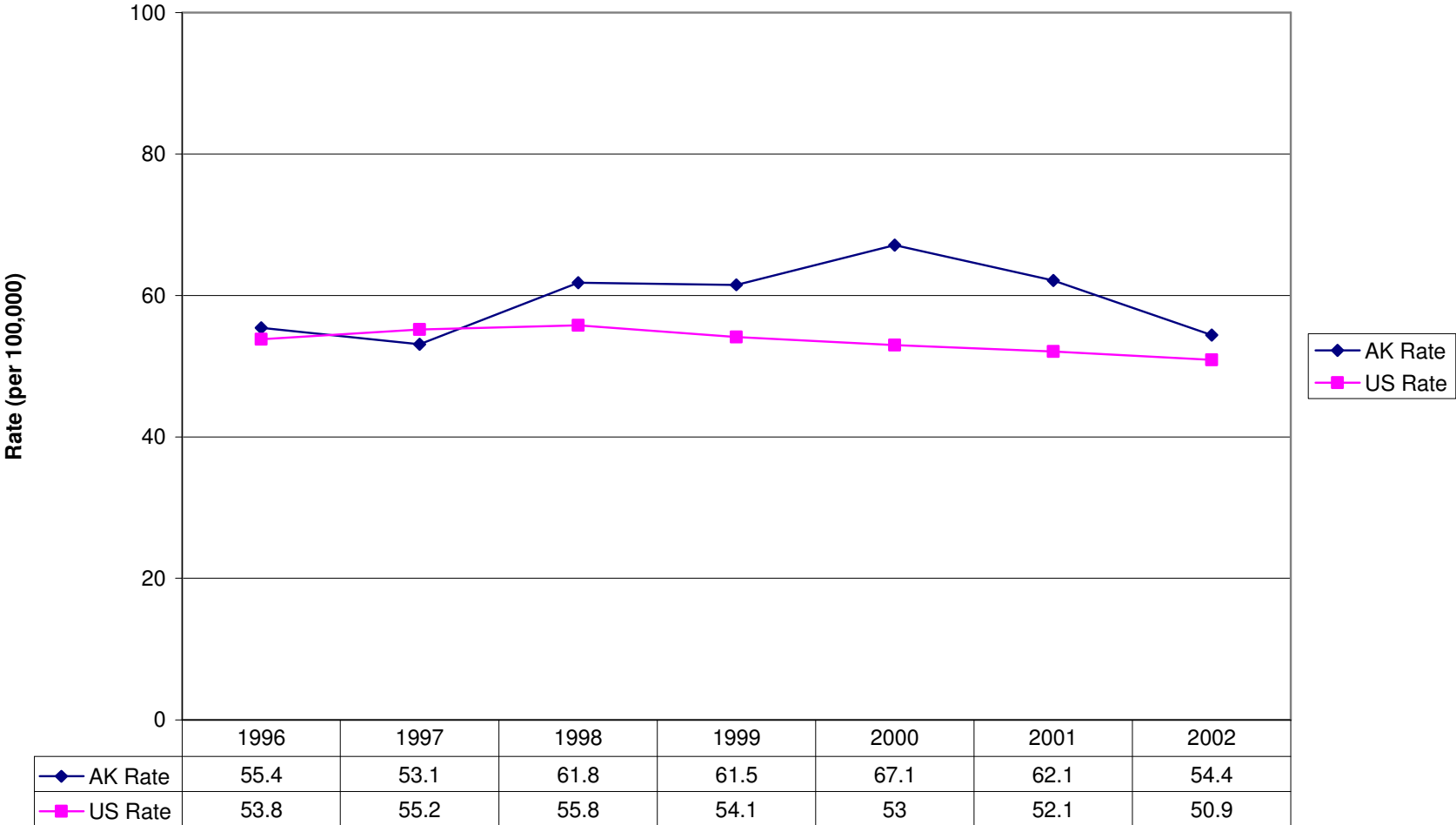
AK Case Counts	266	288	328	299	353	338	317
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DxYear

Lung Cancer Incidence - AK and US Rates 1996-2002



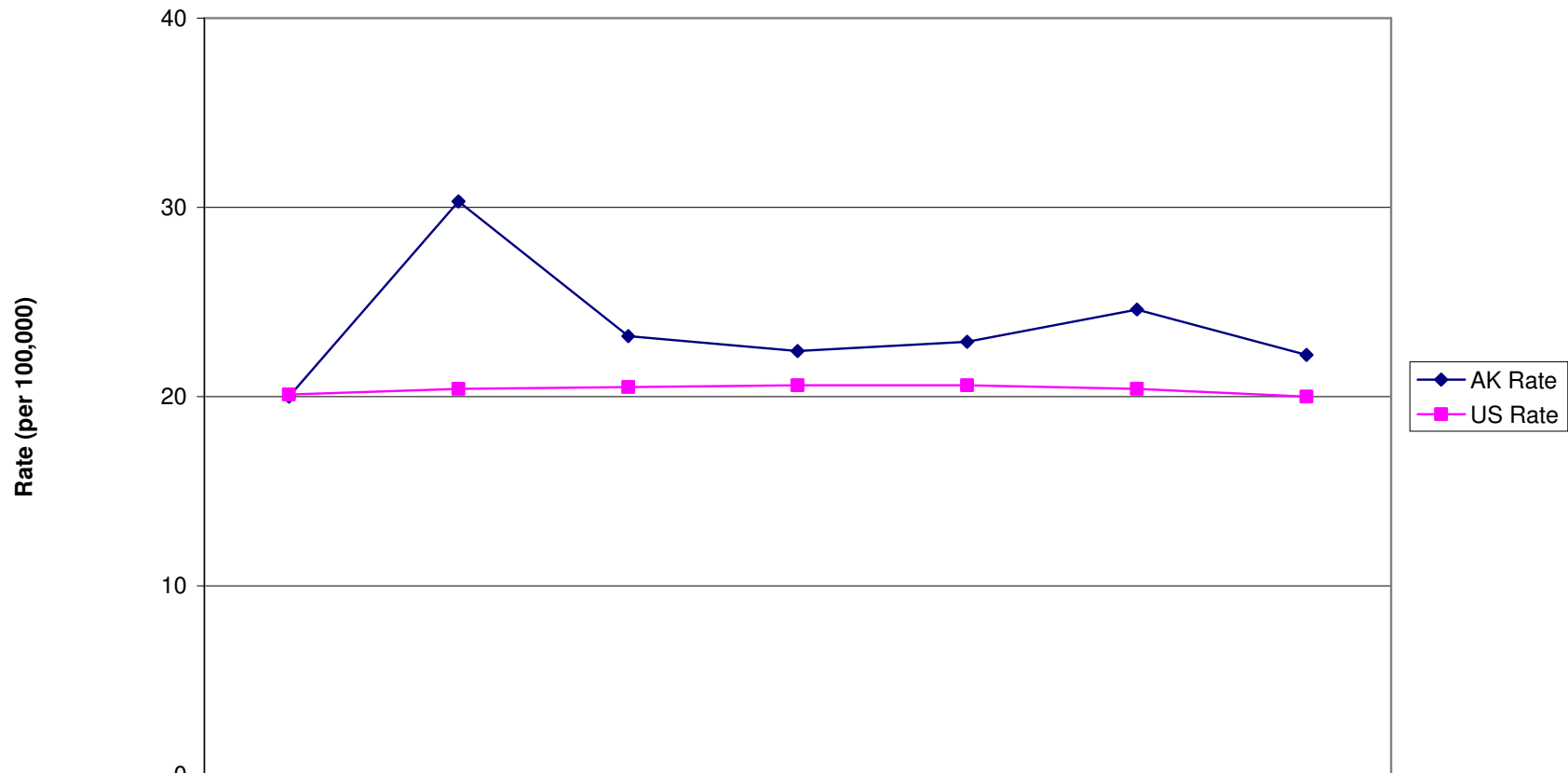
Colorectal Cancer Incidence - AK and US Rates 1996-2002



AK Case Counts	169	177	195	208	233	233	211
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DxYear

Bladder Cancer Incidence - AK and US Rates 1996-2002

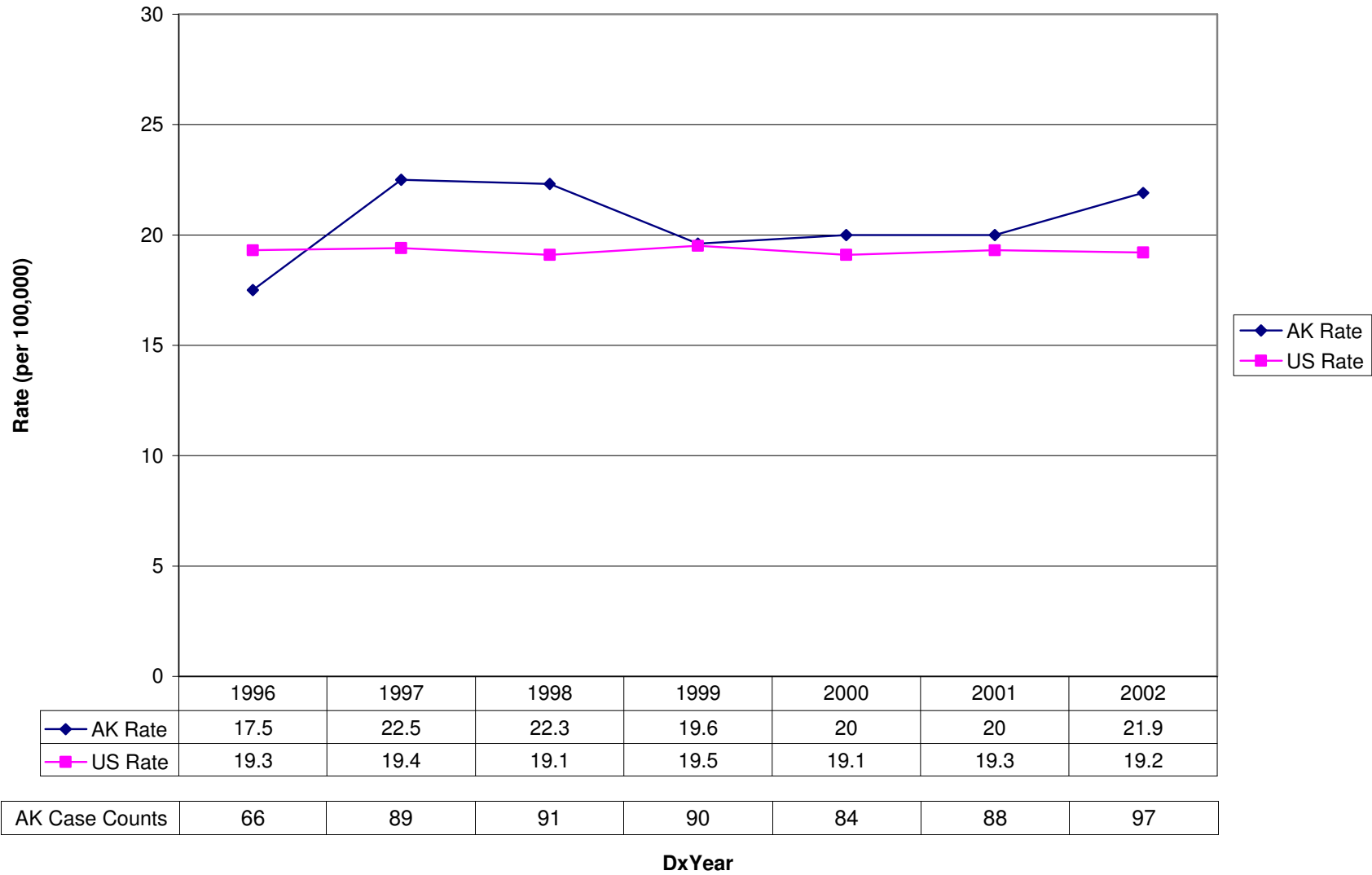


	1996	1997	1998	1999	2000	2001	2002
AK Rate	20	30.3	23.2	22.4	22.9	24.6	22.2
US Rate	20.1	20.4	20.5	20.6	20.6	20.4	20

AK Case Counts	62	88	70	71	76	94	84
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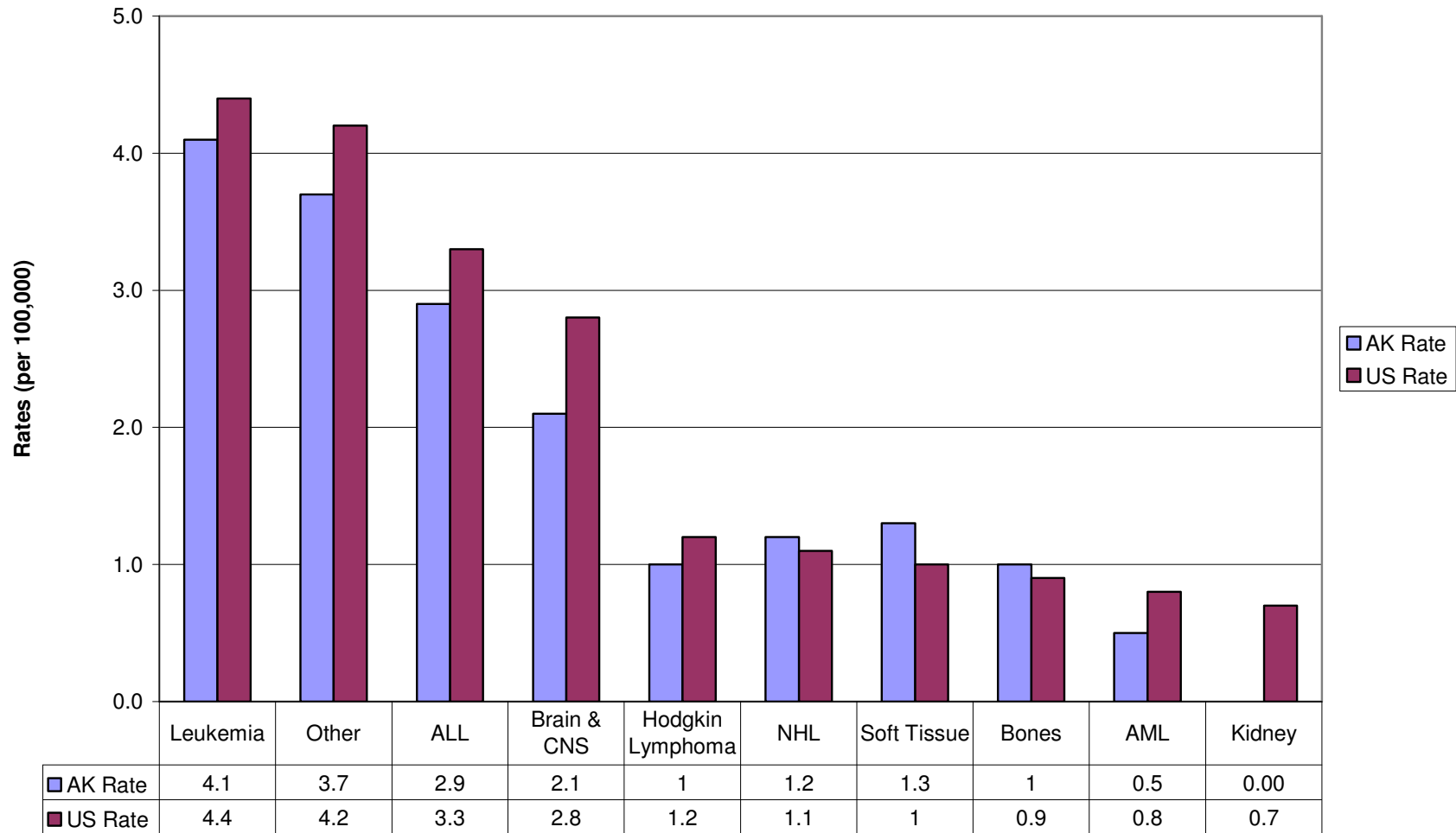
DxYear

Non-Hodgkin's Lymphoma Incidence Rates - AK and US Rates 1996-2002



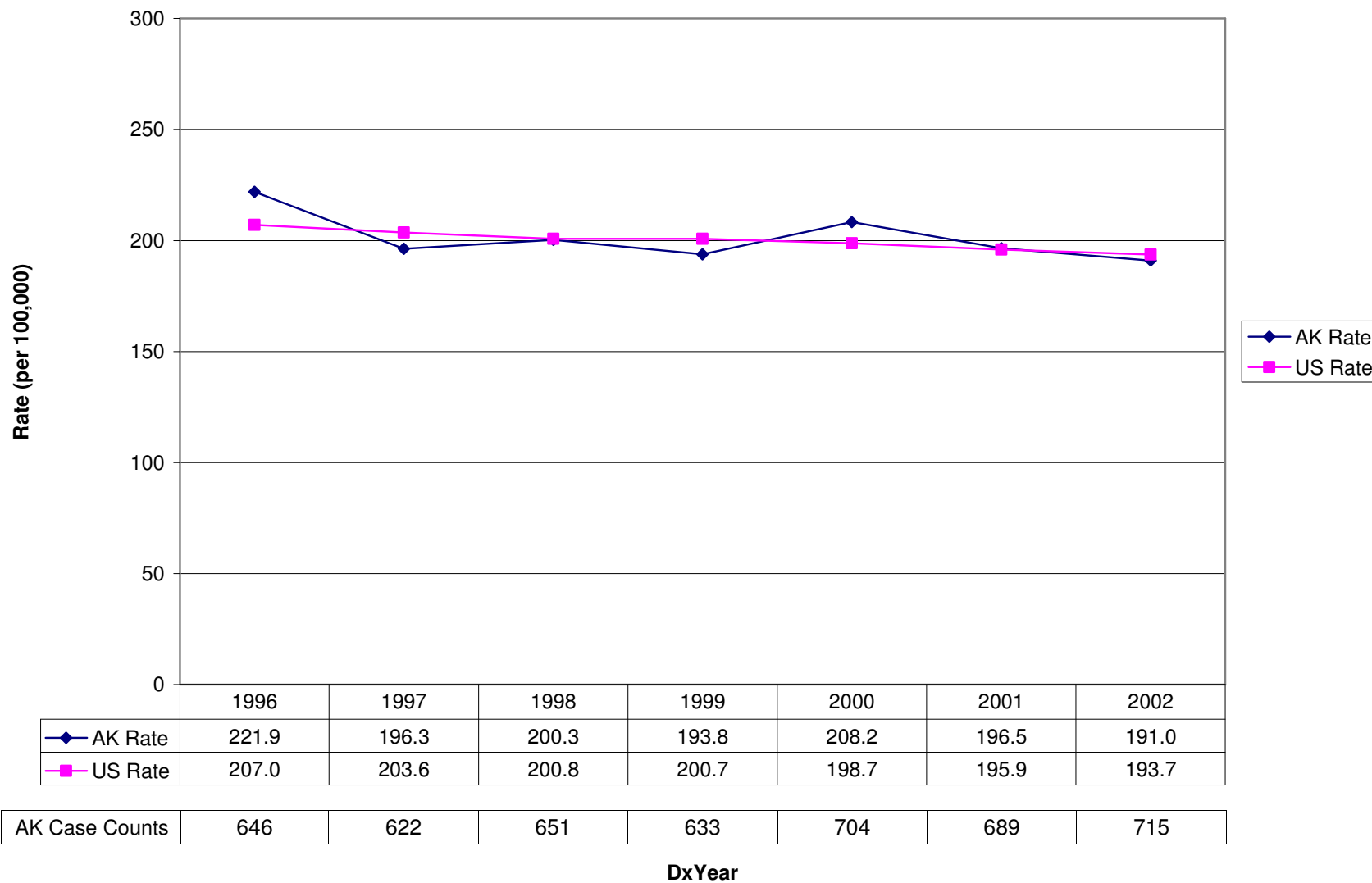
Childhood Cancer Incidence (0-19 yrs) -- AK and US Rates -- 1996-2002

(AK data suppressed when counts are less than 6)

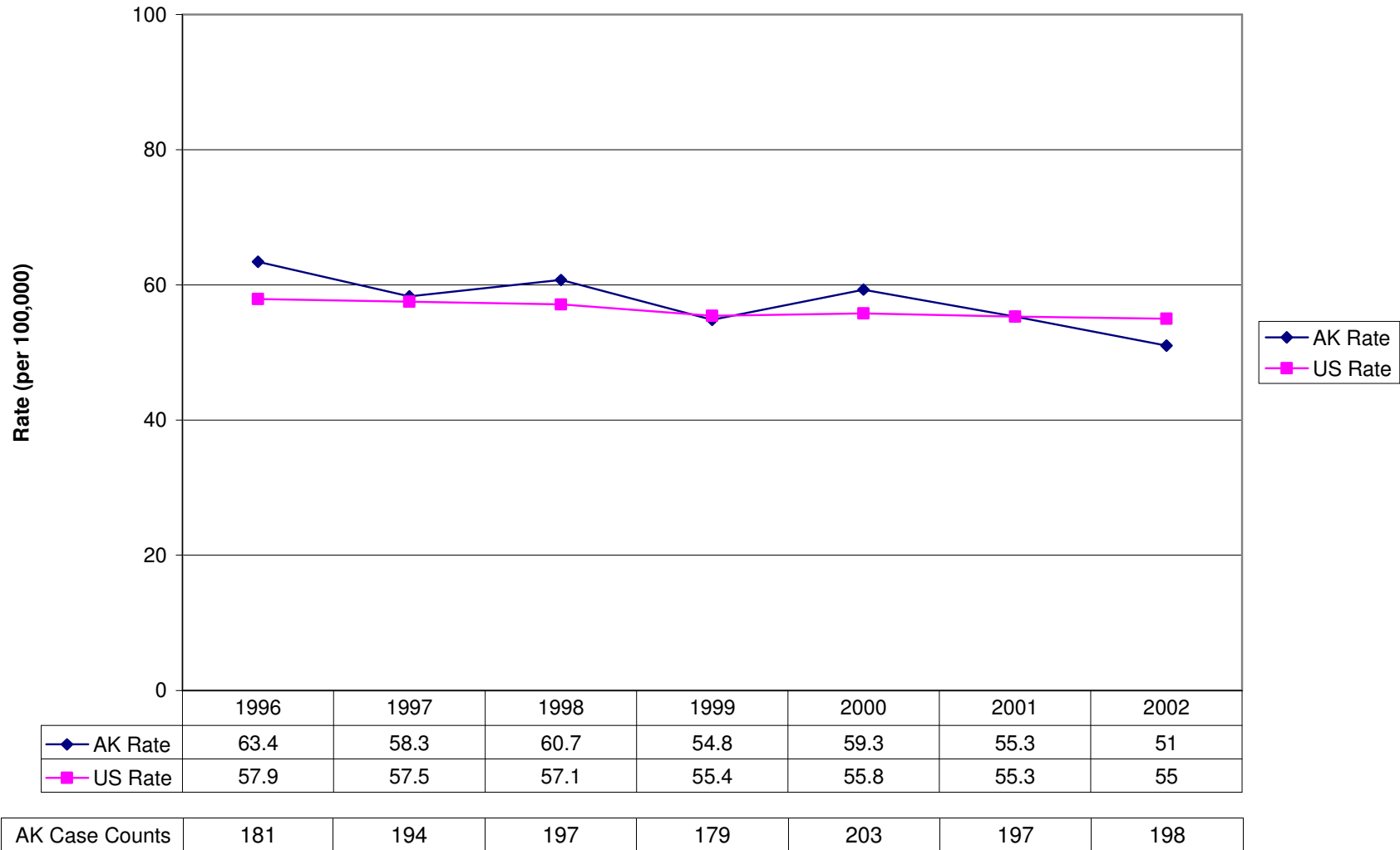


AK Case Counts	58	52	42	30	14	17	18	15	7	<6
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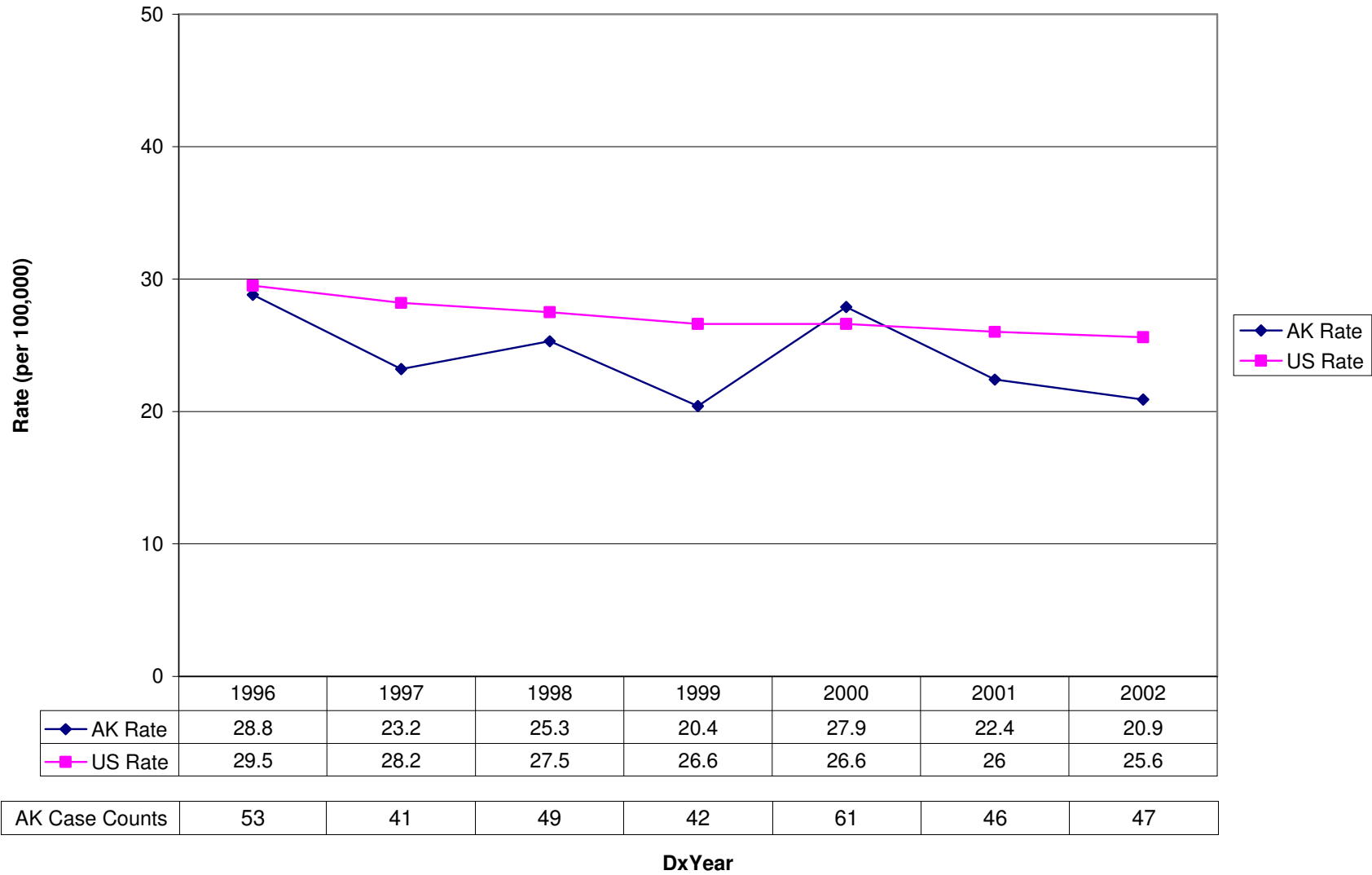
All Sites - Cancer Mortality, AK and US Rates 1996-2002



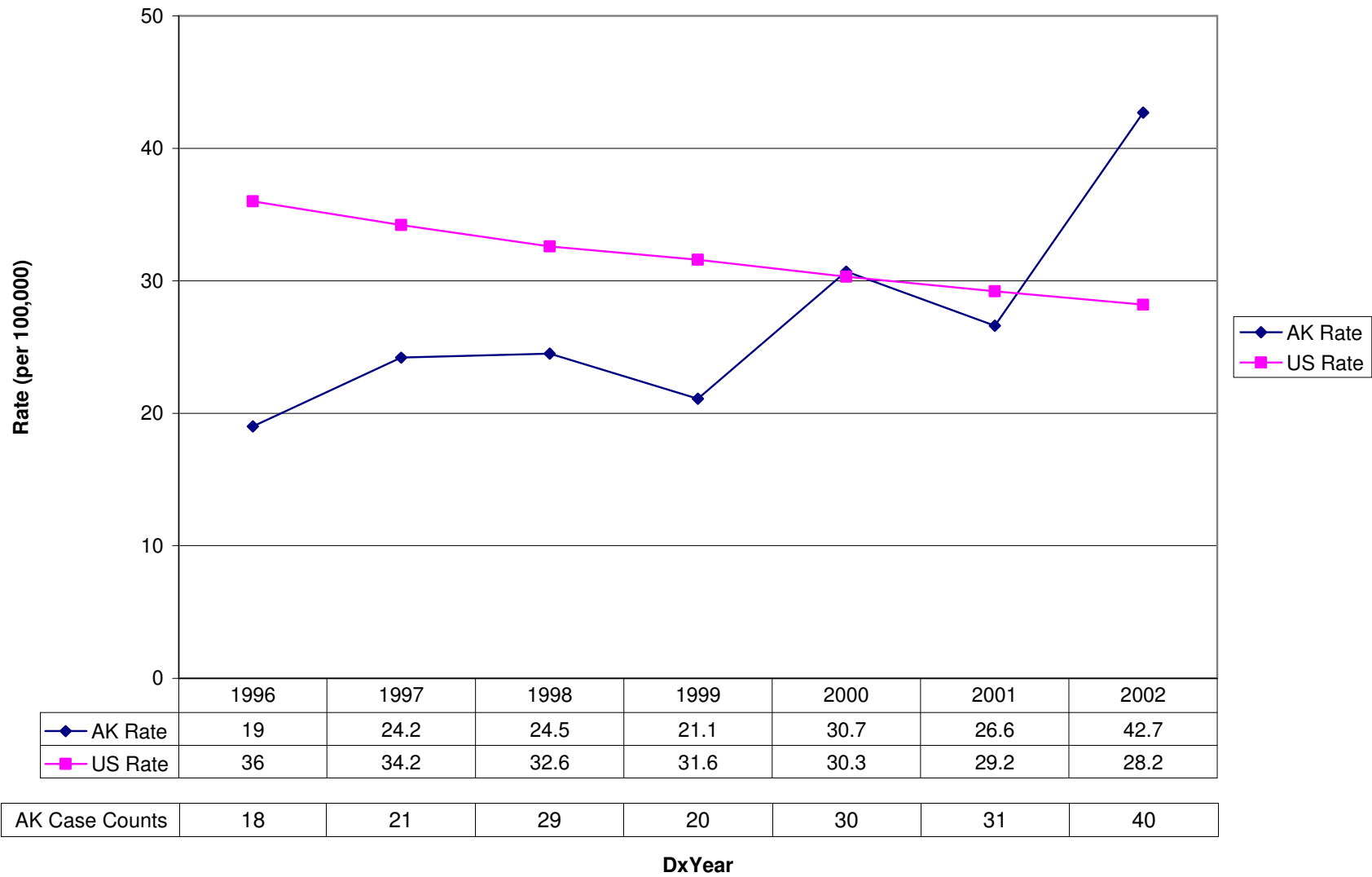
Lung Cancer Mortality - AK and US Rates 1996-2002



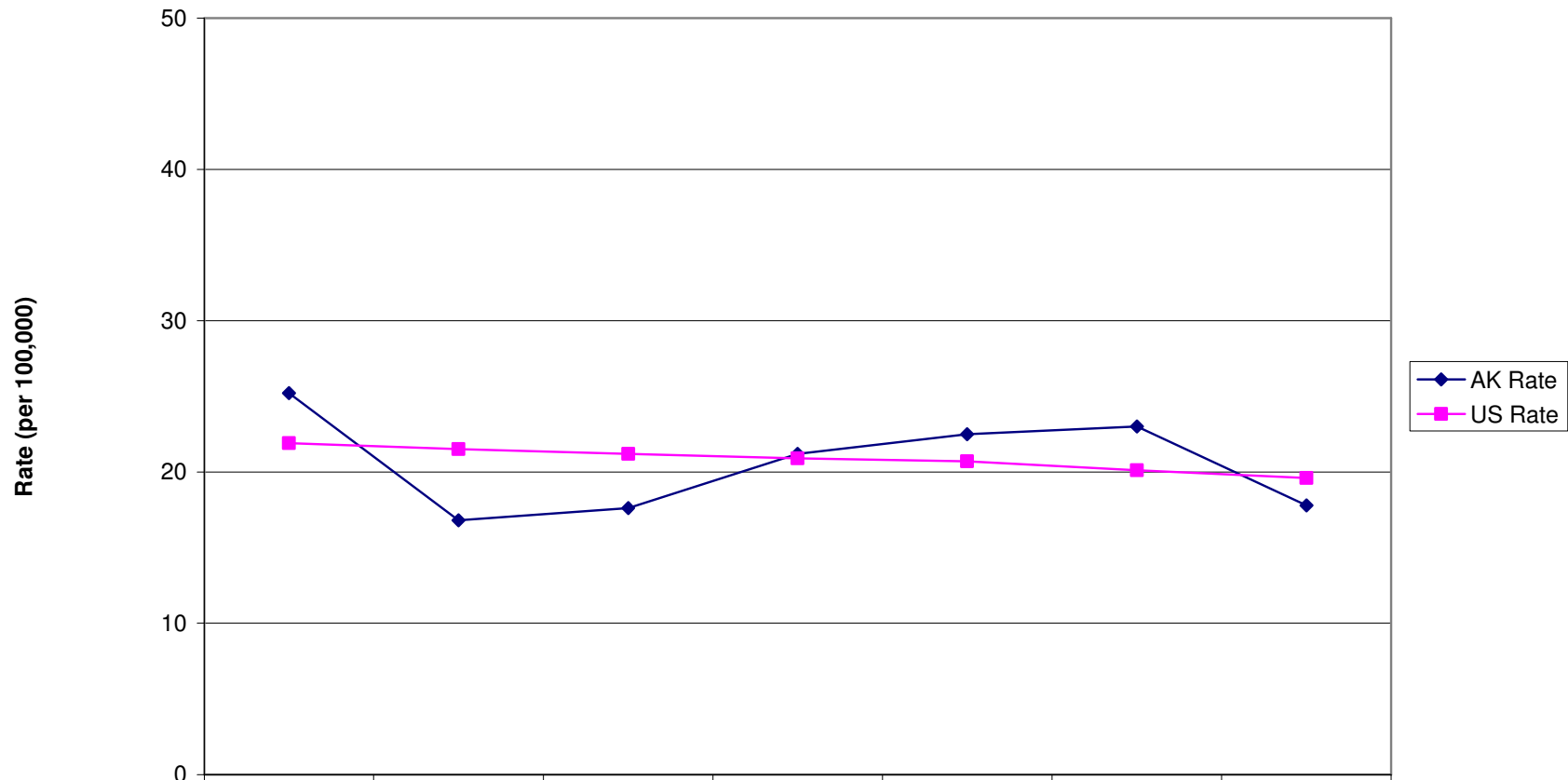
Female Breast Cancer Mortality - AK and US Rates 1996-2002



Prostate Cancer Mortality Rates - AK and US Rates 1996-2002



Colorectal Cancer Mortality - AK and US Rates 1996-2002

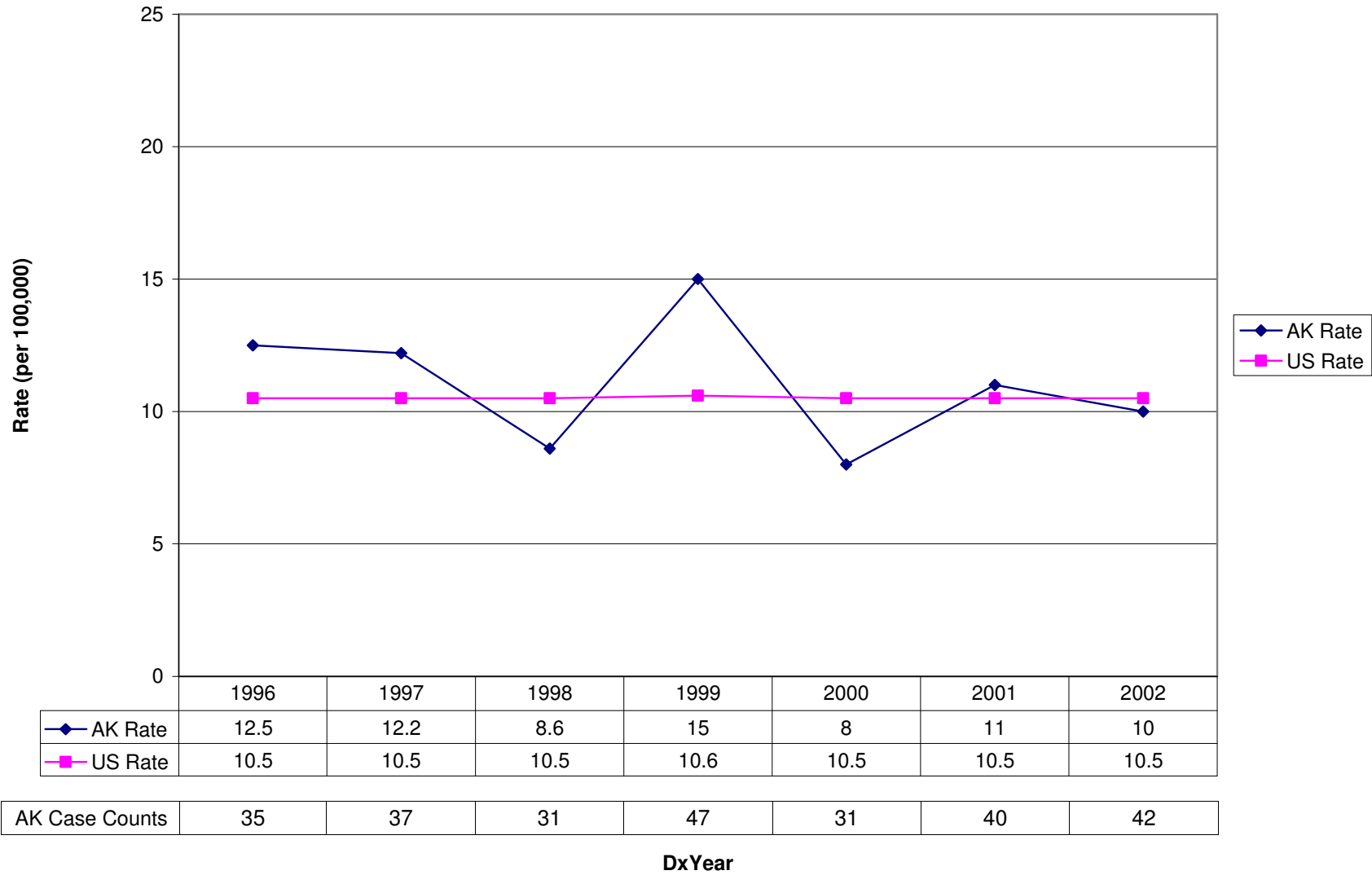


	1996	1997	1998	1999	2000	2001	2002
AK Rate	25.2	16.8	17.6	21.2	22.5	23	17.8
US Rate	21.9	21.5	21.2	20.9	20.7	20.1	19.6

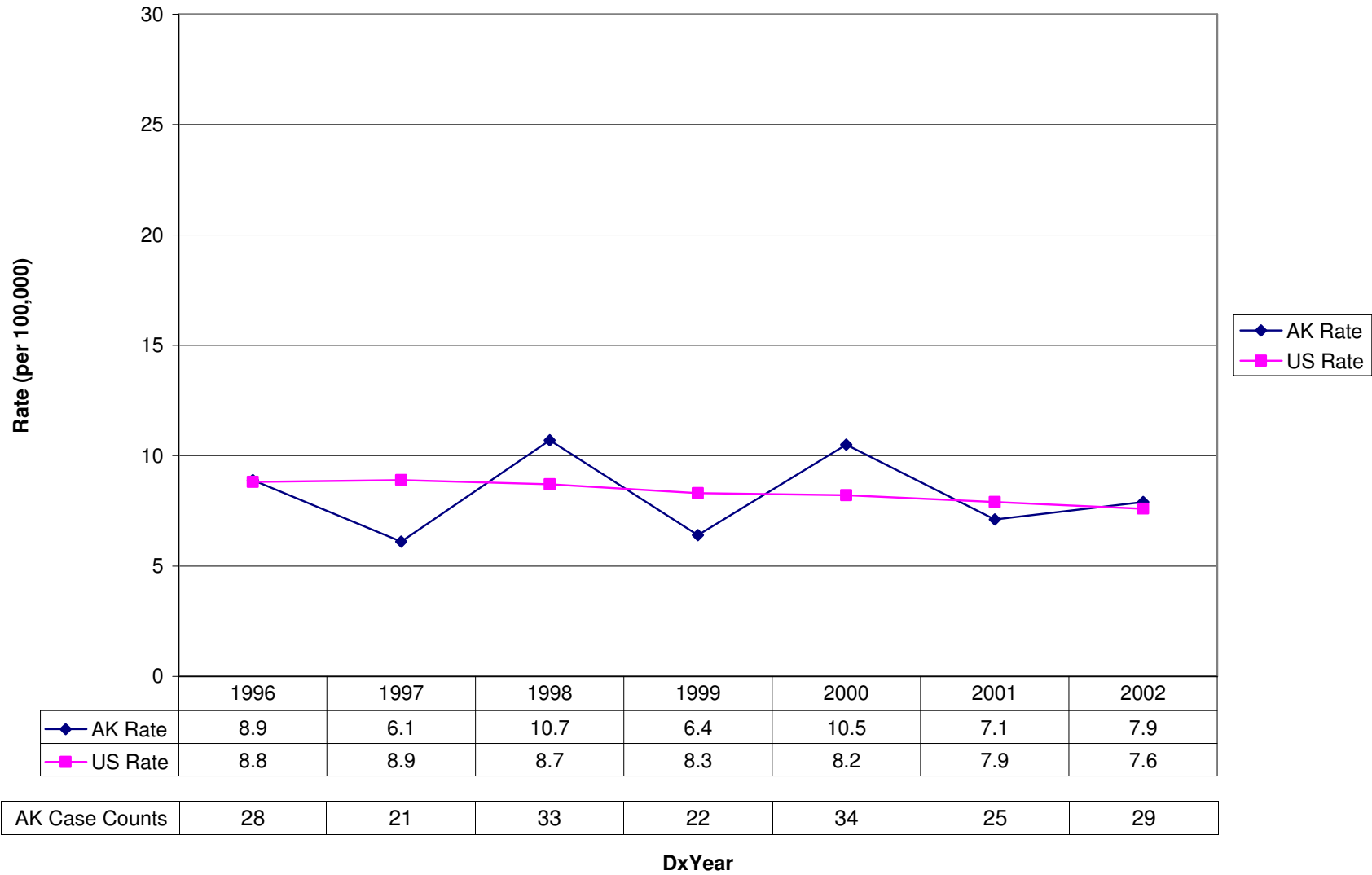
AK Case Counts	62	52	52	61	63	78	66

DxYear

Pancreas Cancer Mortality - AK and US Rates 1996-2002

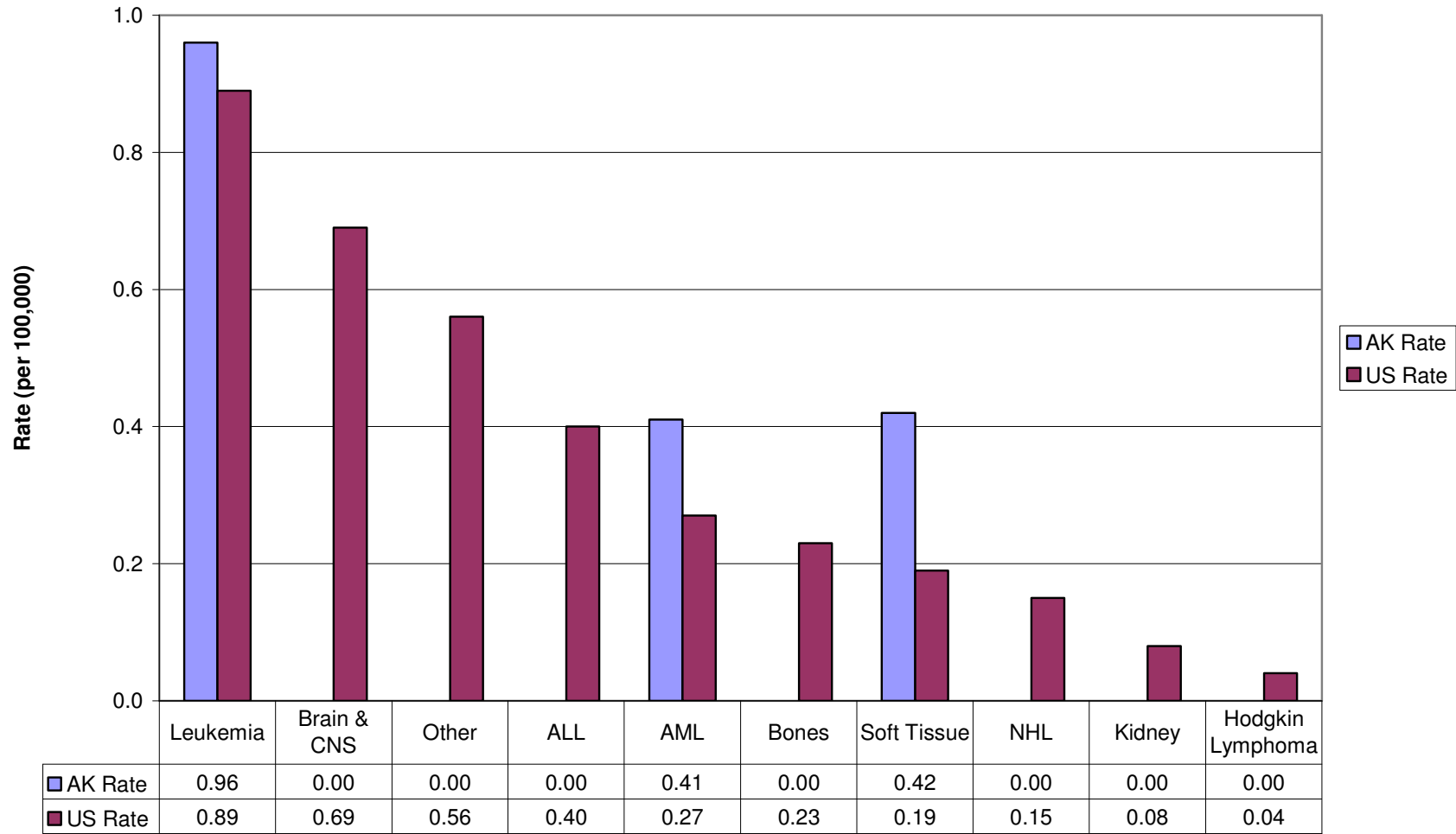


Non-Hodgkin's Lymphoma Mortality - AK and US Rates 1996-2002



Childhood Cancer Mortality (0-19 yrs) -- AK and US Rates -- 1996-2002

(AK data suppressed when counts are less than 6)

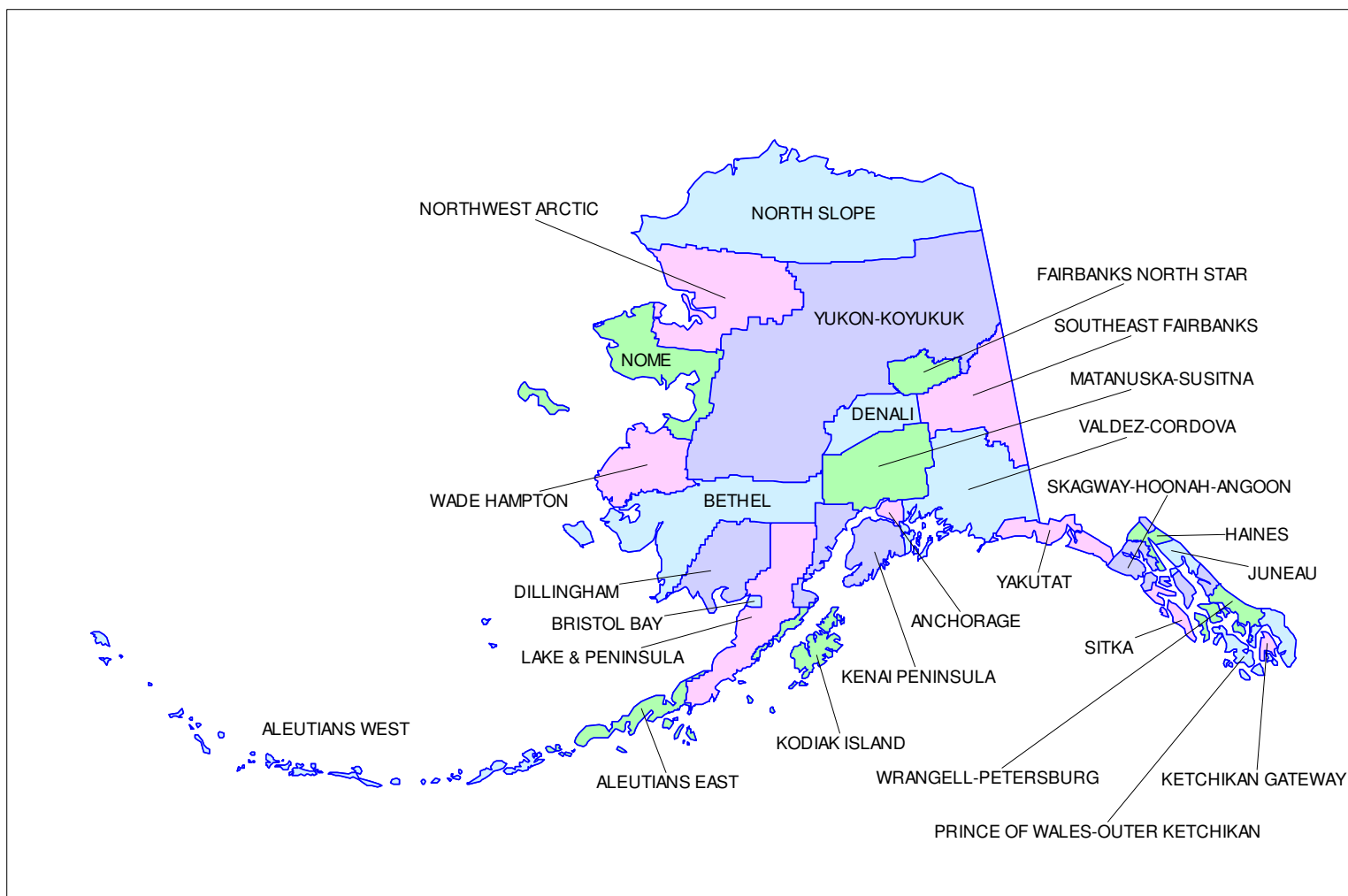


AK Case Counts	14	<6	<6	<6	6	<6	6	<6	<6	<6
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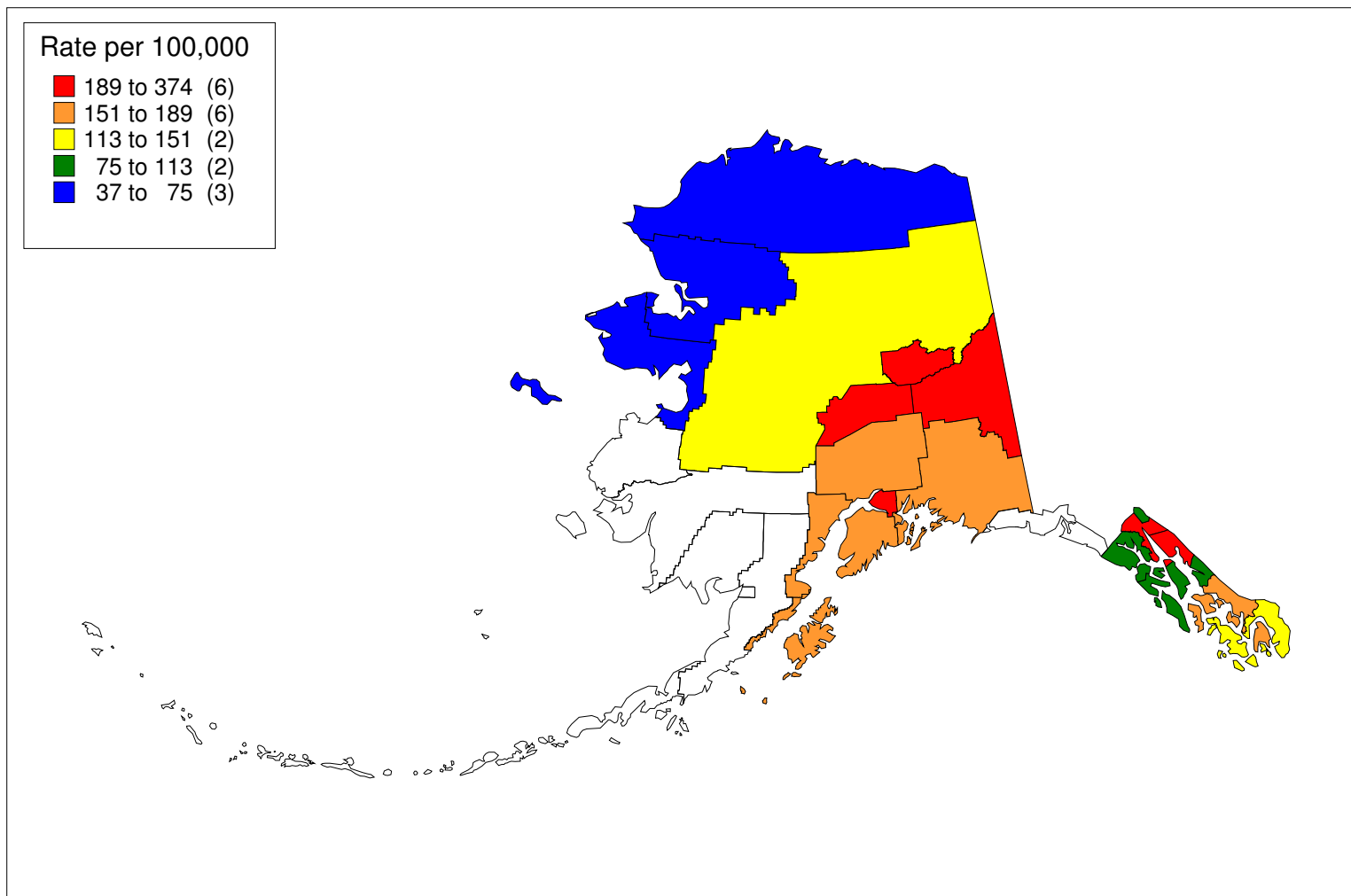
Incidence and Mortality Maps

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.

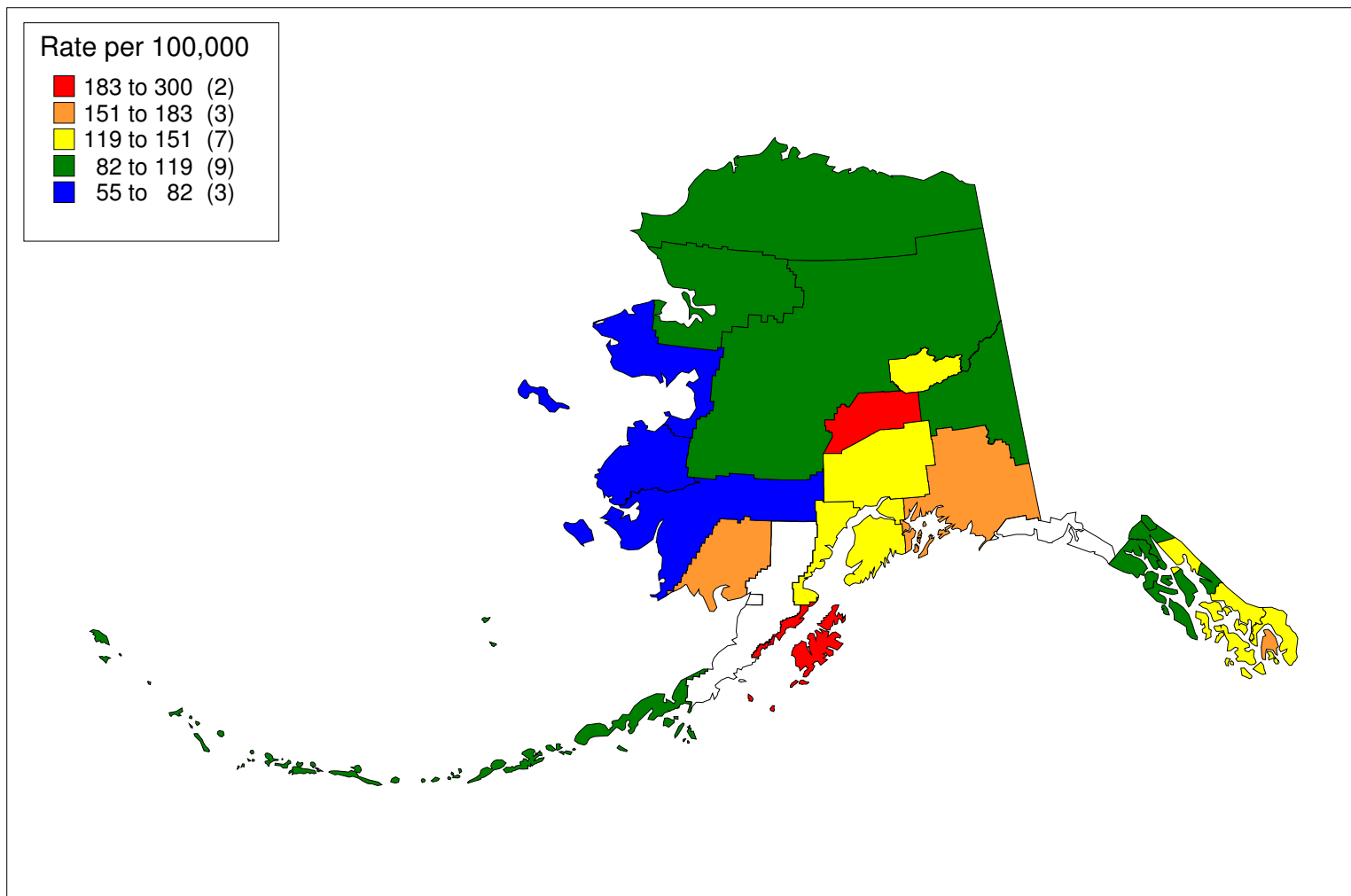
Note that borough/census areas with low populations may have unusually low or high cancer rates. In these situations, the rate may be a result of chance variations within the population rather than a true representation of the burden of cancer. For example, a low-population area may have 5 cases of a 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.



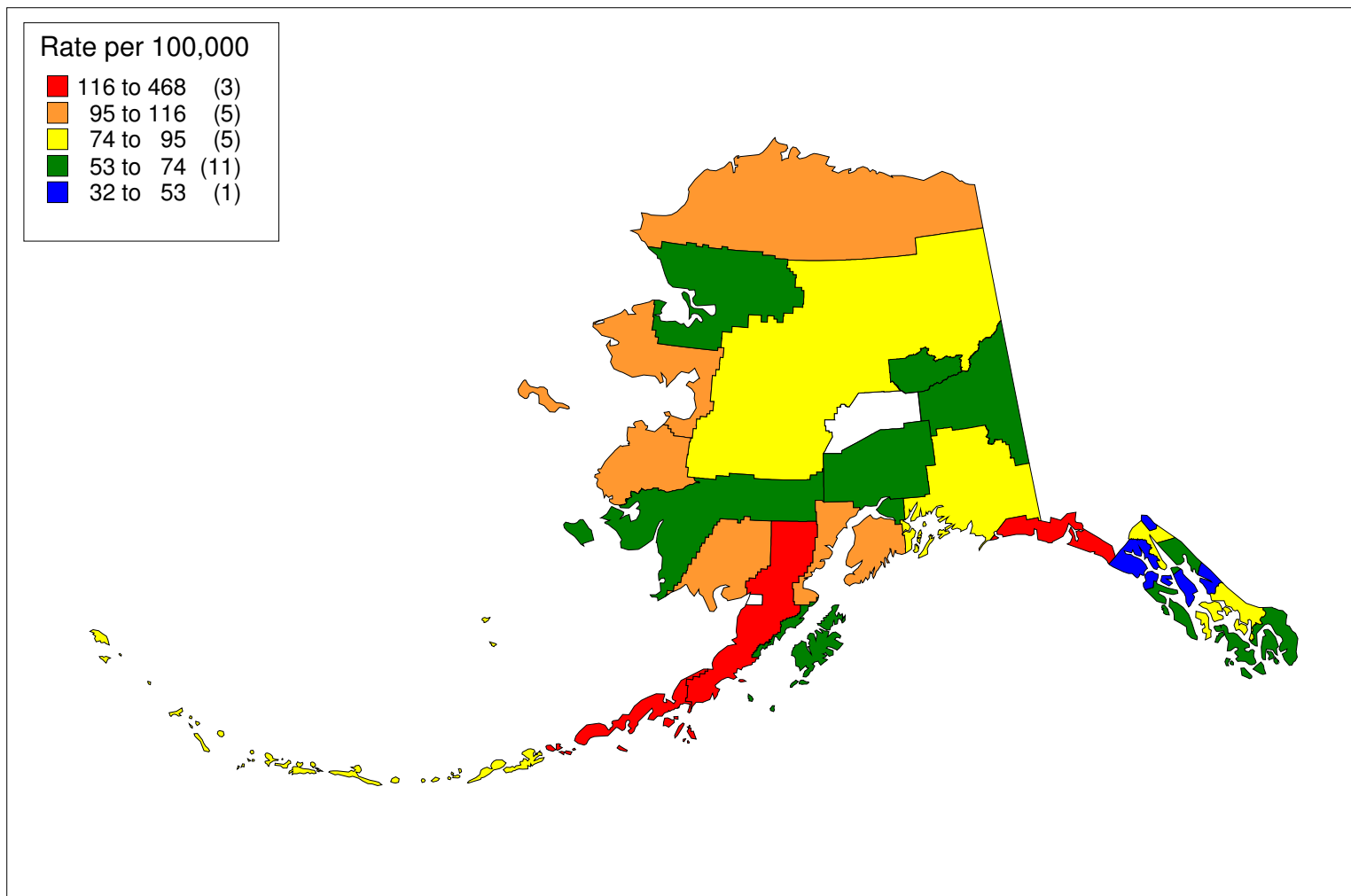
Map of Alaska with Boroughs and Census Areas



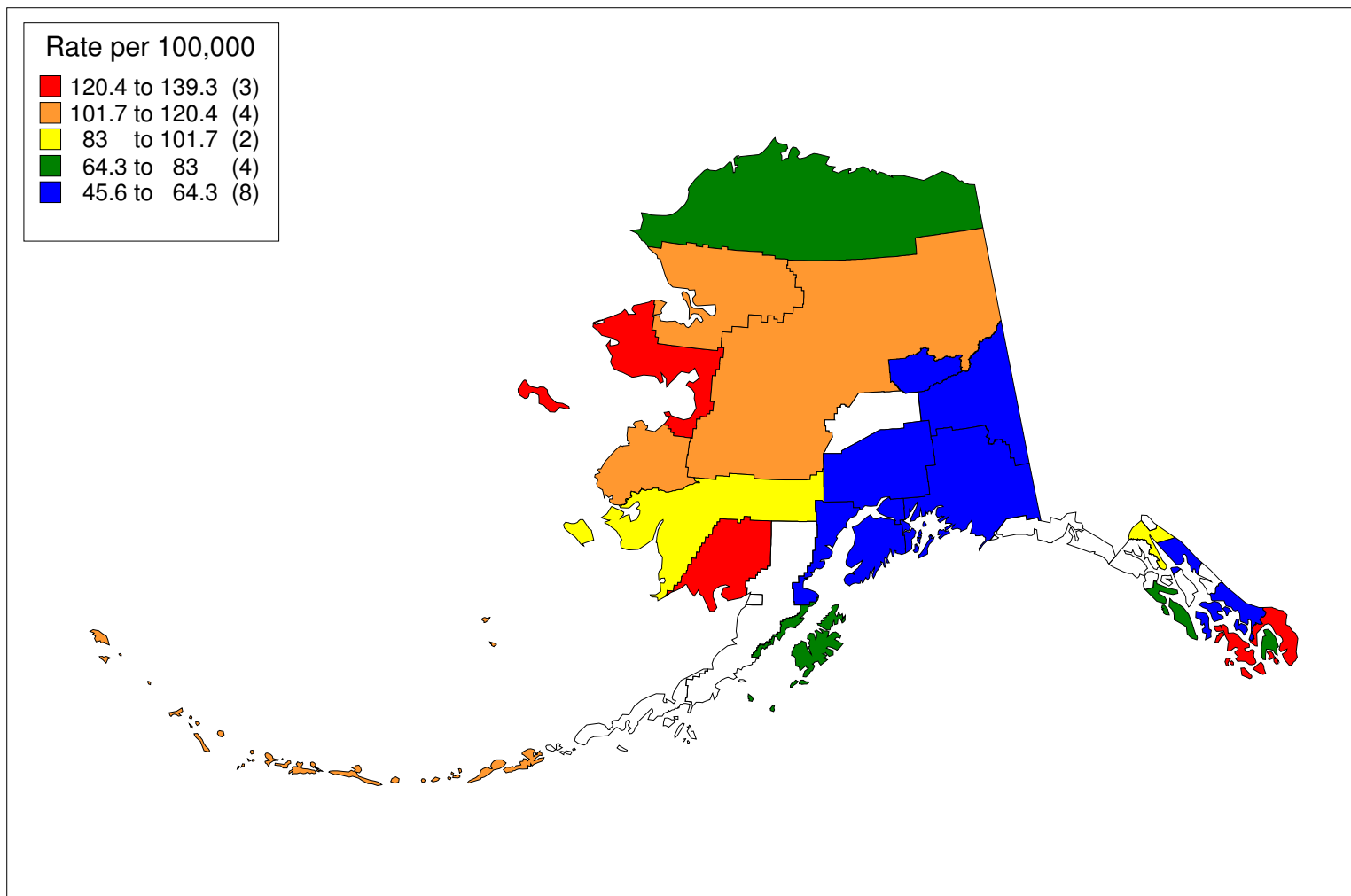
Prostate Cancer Incidence Rates by Borough/Census Area, 1996-2002



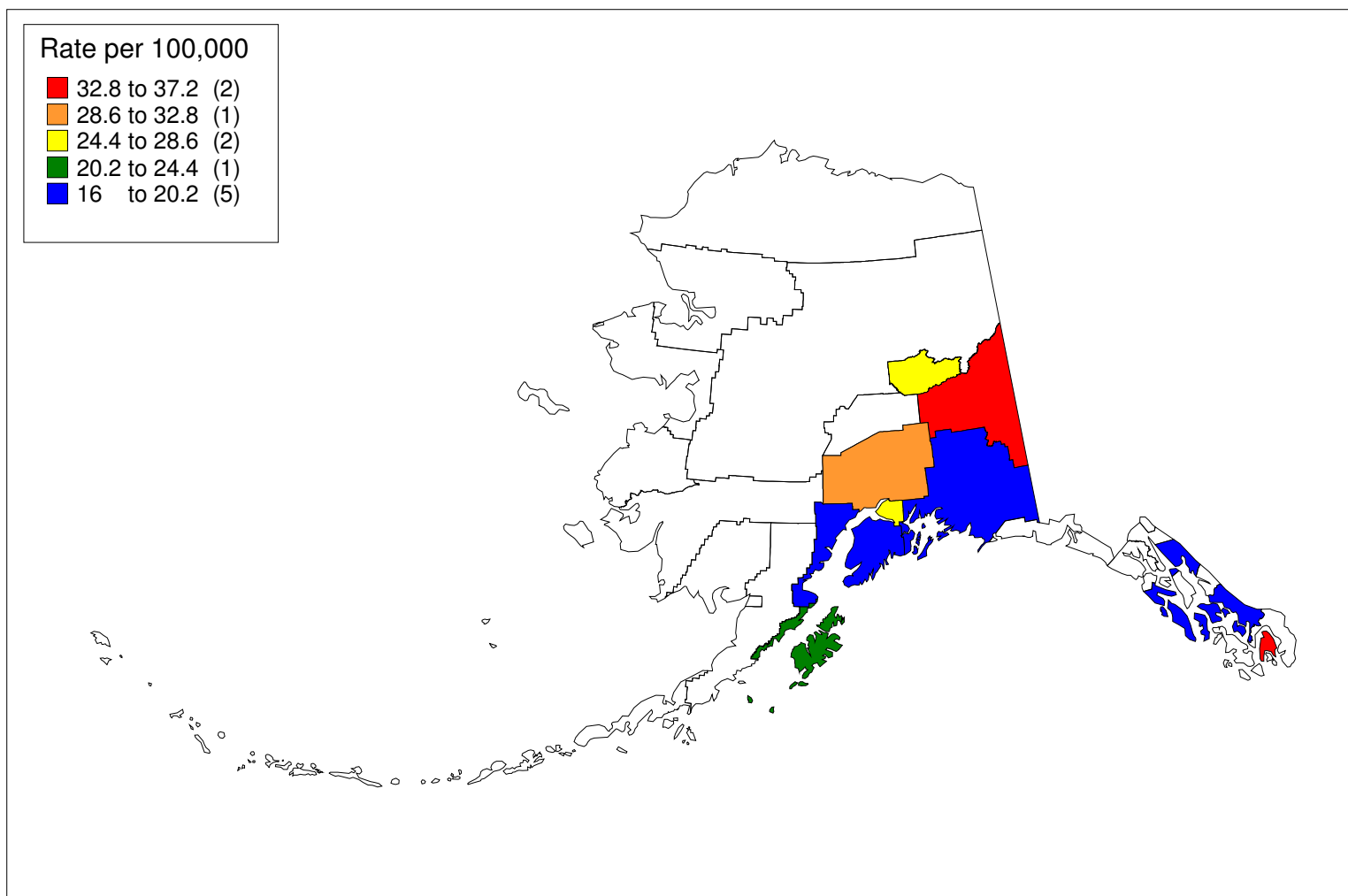
Female Breast Cancer Incidence Rates by Borough/Census Area, 1996-2002



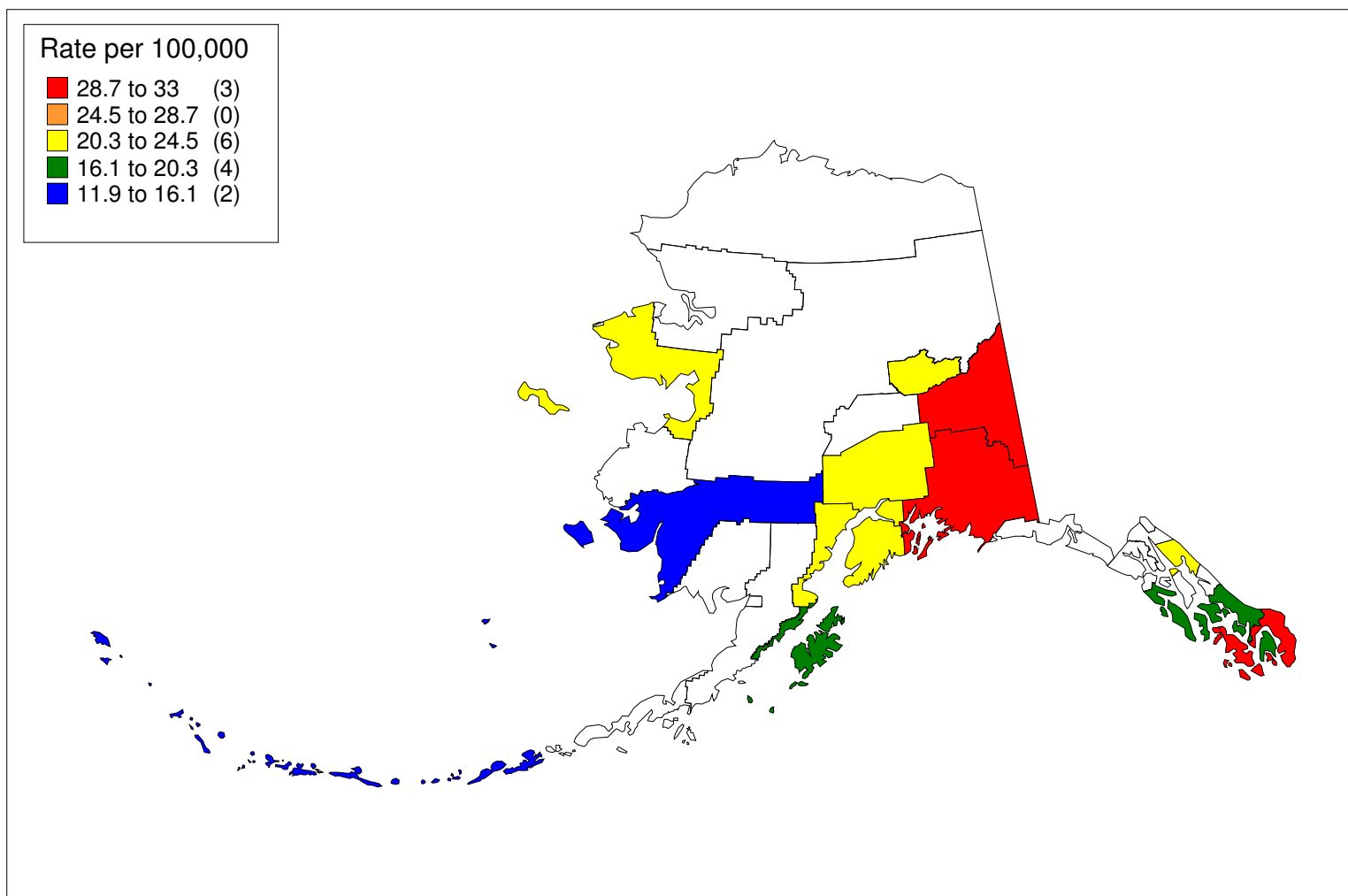
Lung & Bronchus Cancer Incidence Rates by Borough/Census Area, 1996-2002



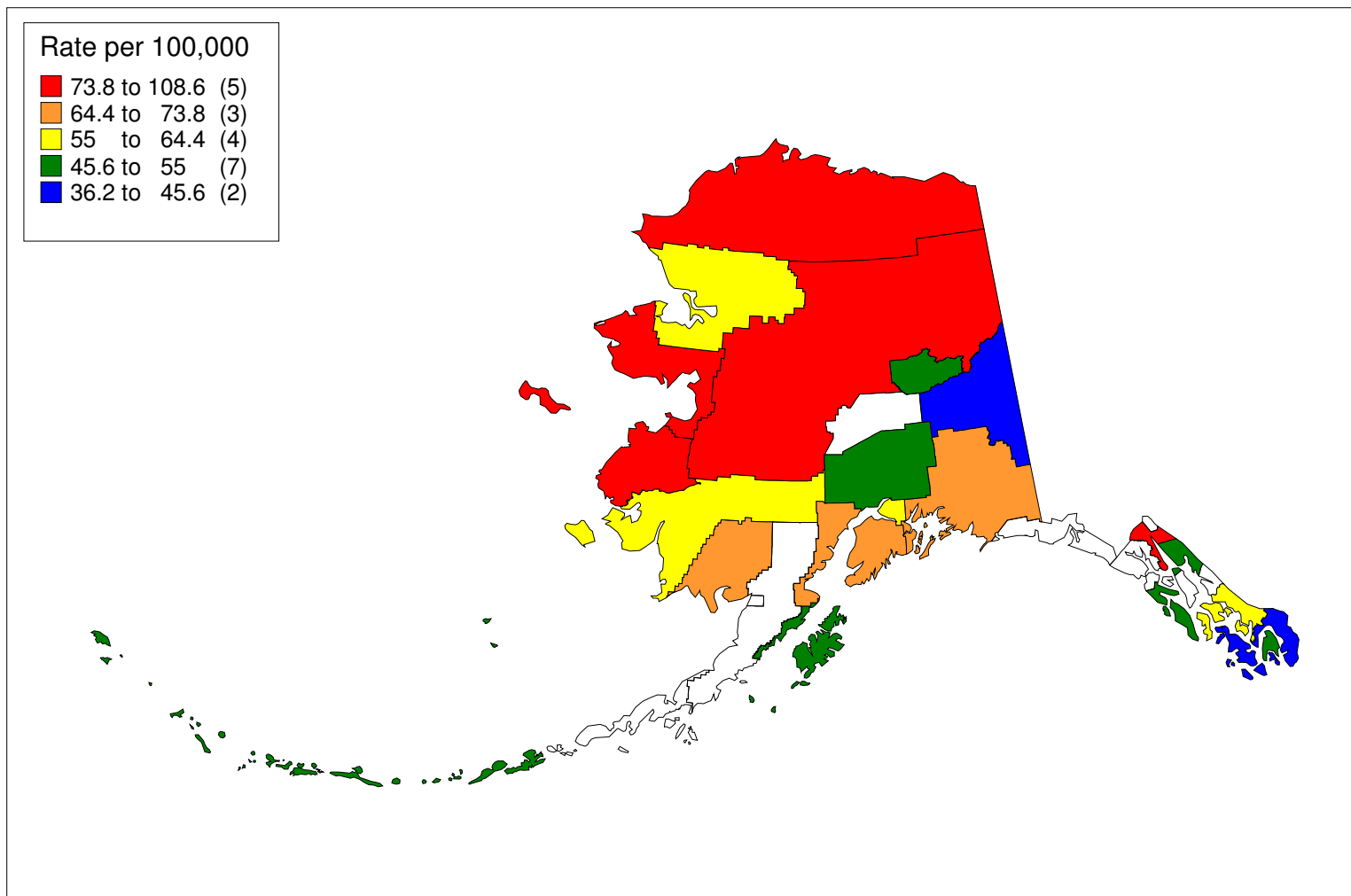
Colorectal Cancer Incidence Rates by Borough/Census Area, 1996-2002



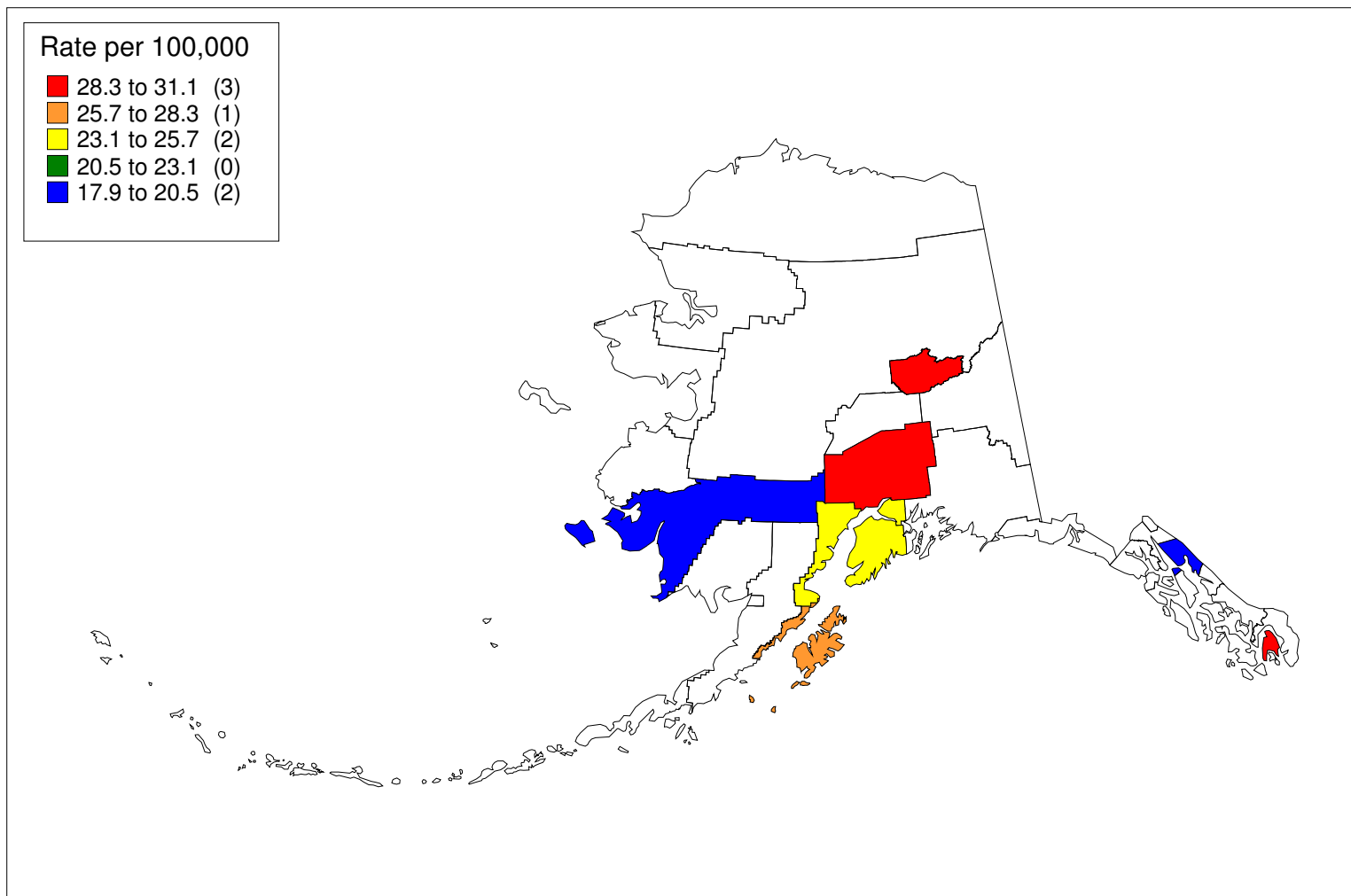
Bladder Cancer Incidence Rates by Borough/Census Area, 1996-2002



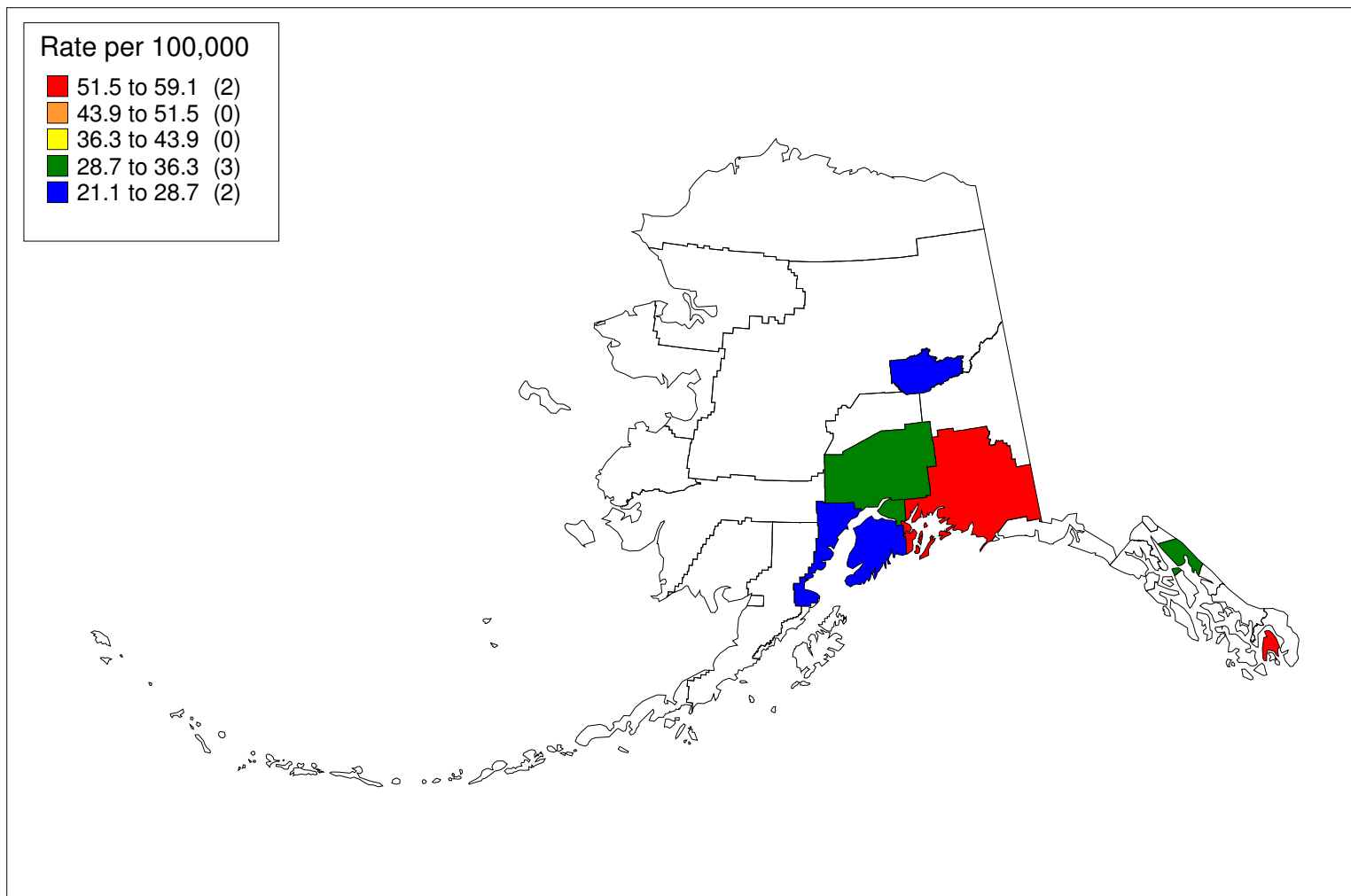
Non-Hodgkin's Lymphoma Incidence Rates by Borough/Census Area, 1996-2002



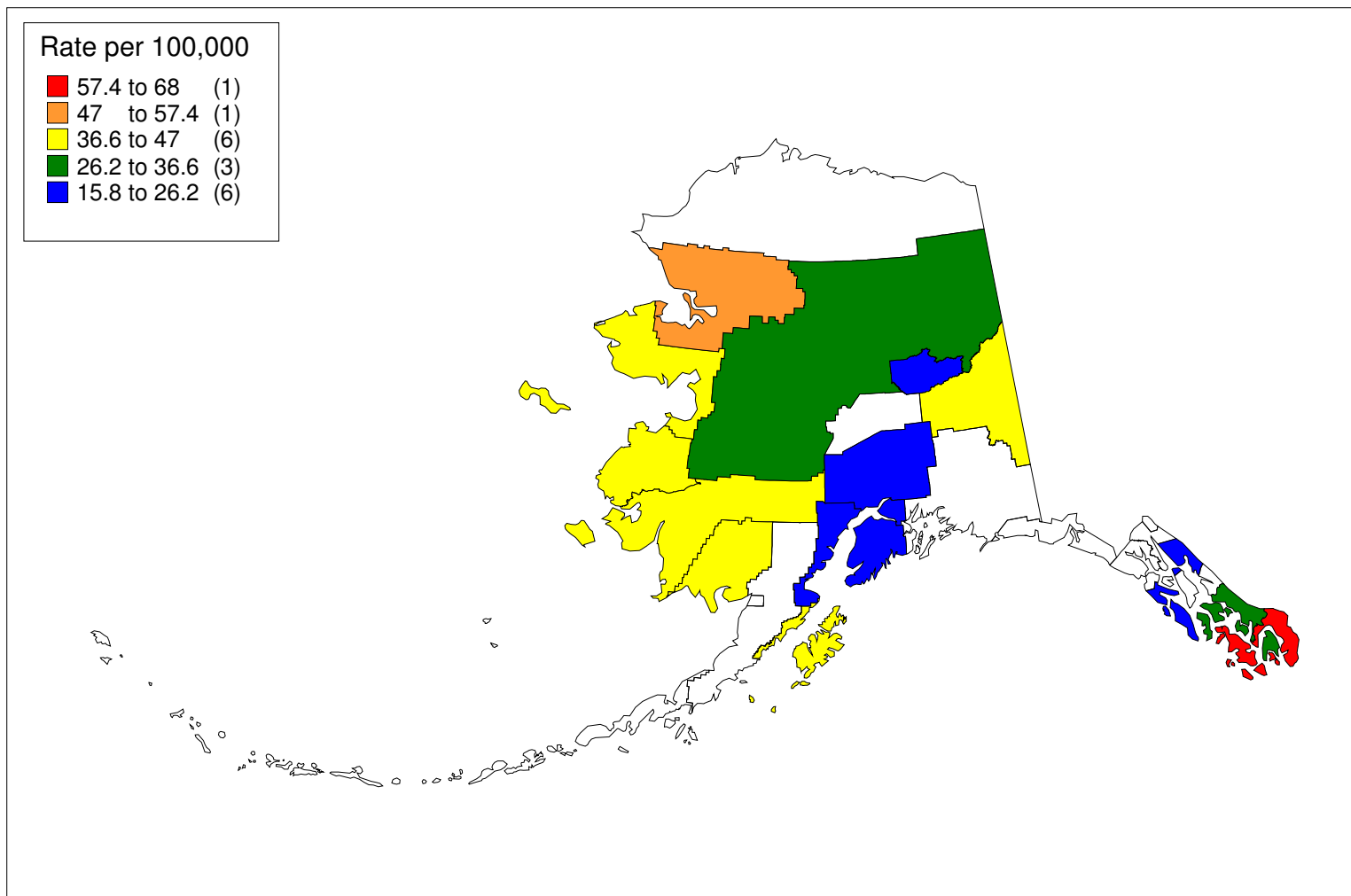
Lung & Bronchus Cancer Mortality Rates by Borough/Census Area, 1996-2002



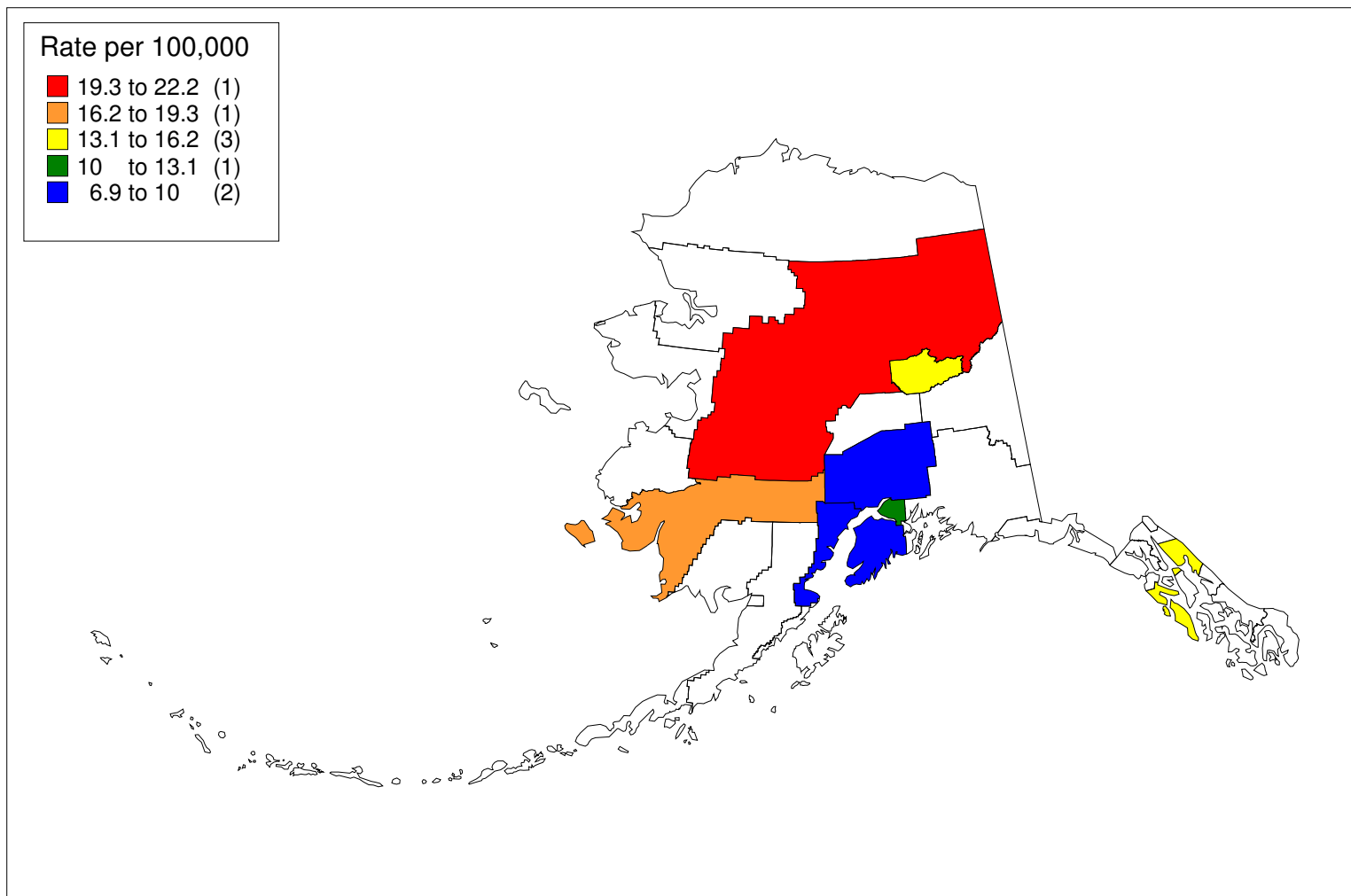
Female Breast Cancer Mortality Rates by Borough/Census Area, 1996-2002



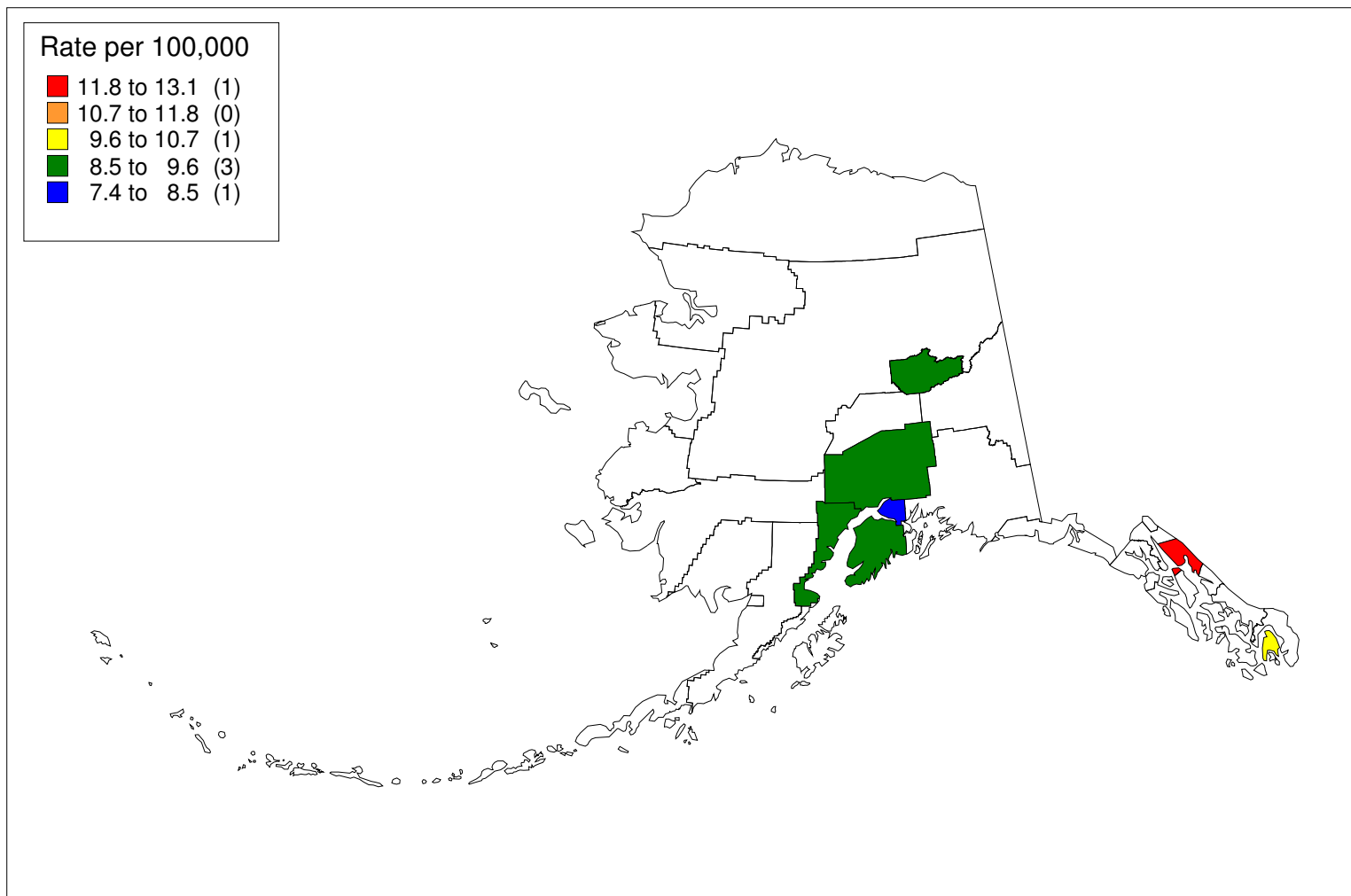
Prostate Cancer Mortality Rates by Borough/Census Area, 1996-2002



Colorectal Cancer Mortality Rates by Borough/Census Area, 1996-2002



Pancreas Cancer Mortality Rates by Borough/Census Area, 1996-2002



Non-Hodgkin's Lymphoma Mortality Rates by Borough/Census Area, 1996-2002

Data Sources

Statistics were generated using the statistical software program SEER*Stat version 6.2.3 (<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 Public-Use, Nov 2005 Sub (1992-2003) - Linked To County Attributes - Total U.S., 1969-2003 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2006, based on the November 2005 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, Aggregated With State, Total U.S. (1990-2003), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2006. 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 May 2006.

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 June 2006.

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 7.0 (<http://www.mapinfo.com/>).