

Alaska Native Mortality 1980-1998



**Alaska Area Native Health Service - Alaska Native Tribal Health Consortium
Division of Planning, Evaluation, and Health Statistics**

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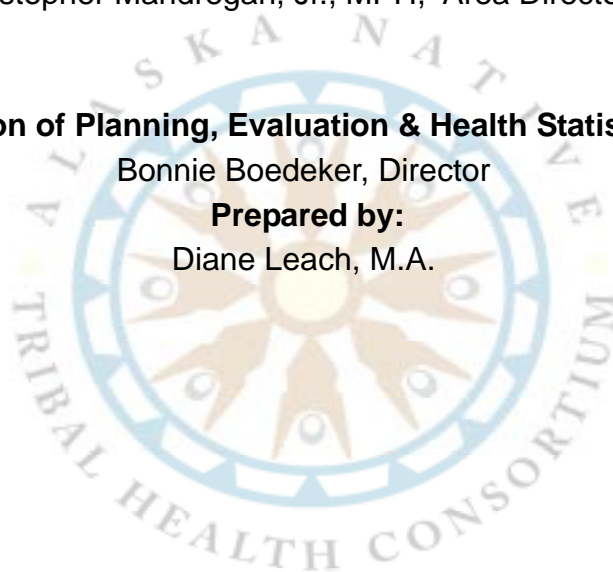
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INTRODUCTION

Alaska Native Mortality represents a summary of trends in the health status of Alaska Natives as indicated by their death rates. Population statistics for Alaska Natives from the U.S. Census Bureau along with population projections make it possible to estimate reliable patterns of death rate changes. These data are used to examine Alaska Native cause-specific death rates for all Alaska Natives and by Alaska Area service units.

Alaska is divided among nine service units: Anchorage, Annette Island, Barrow, Bristol Bay, Interior Alaska, Kotzebue, Mt. Edgecumbe, Norton Sound, and Yukon-Kuskokwim Delta Service Units. A service unit is the local administrative unit of the Indian Health Service (IHS).

Data for each service unit (including Alaska) is presented in Appendix, Tables 3 and 4. Table 3 shows the number of Alaska Native deaths and the three-year crude death rate by leading cause of death; Table 4 presents the number of Alaska Native deaths by age group for the service units and Alaska's age-specific, three-year mortality rates.

METHODOLOGY

Data on Alaska Native deaths were provided by the State of Alaska, Department of Health and Social Services, Bureau of Vital Statistics and are based on officially recorded death certificates. Because some service units report few (three or less) observations in each cell and to ensure confidentiality of descendants, single years are not published for individual service units. Instead, three-year moving averages have been tabulated. Also, in small populations, causes of deaths due to specific diseases and deaths are often too small to be useful over time or in relation to other causes. So, averages are often calculated over a specific time frame. The "moving average" methodology reduces the effect of year-to-year variations in categories where small numbers of deaths occur.

POPULATION STATISTICS

Population figures used in calculating the death rates are based on the U. S. Census figures for Alaska Natives/American Indians in Alaska. Official population counts were used for 1980 and 1990. Populations between Census years 1980 and 1990 are estimated by a smoothing technique in order to show a gradual transition between Census years. Populations beyond the latest Census year (1990) are projected through linear regression techniques, using the most current 10 years of birth and death data provided by the National

Center for Health Statistics. The natural change is by the estimated number of births minus the estimated number of deaths and is applied to the latest Census numeration.

NUMBER OF DEATHS

Appendix, Table 1 shows the actual number of deaths by year for Alaska Natives from 1980 through 1998 by cause of death. The order of each cause of death is ranked by their relative importance based on the number of deaths in 1998. Single year death rates are the best measure for multiple regression analysis such as those done on Chart A, pages 3 through 5. On the other hand, three-year average death rates are the best measure for a particular time period when the population and incidence of death are relatively small.

CRUDE DEATH RATES

The crude death rate is the number of deaths in a year divided by the estimated population and multiplied by a constant of proportionality. The number of deaths occurring in a certain time period is expressed as number of deaths per 100,000 population. Currently, 100,000 is used for the standard unit of population. The deaths are summed, divided by the population and multiplied by 100,000 to determine the crude death rate. For example, in 1998, there were 605 Alaska Native deaths from all causes and an estimated population of 103,688 (revised

November 1998). The 1998 crude death rate calculation for Alaska Natives from all causes is 583.5:

$$(605/103,688)*100,000 = 583.5$$

The crude death rate represents the average chance of dying during a specified period for persons in the entire population.

THREE-YEAR MOVING AVERAGES

Appendix, Table 2, page 15, presents the three-year average crude death rates per 100,000 population by major cause of death from 1980 through 1998. These rates were computed by averaging the total number of deaths for the three-year time period for the numerator and using the mid-year population for the denominator.

$$(3\text{-yr. Average Number of Deaths / Mid-Year Population}) * 100,000$$

For example, the average number of 1996-1998 deaths and the 1997 Alaska Native population are used to compute the three year average, 1996-1998, crude death rate of 599.9.

Chart A.
Crude Death Rates for Single Years and Regression Line for Alaska Natives
by Major Cause of Death, 1980-1998

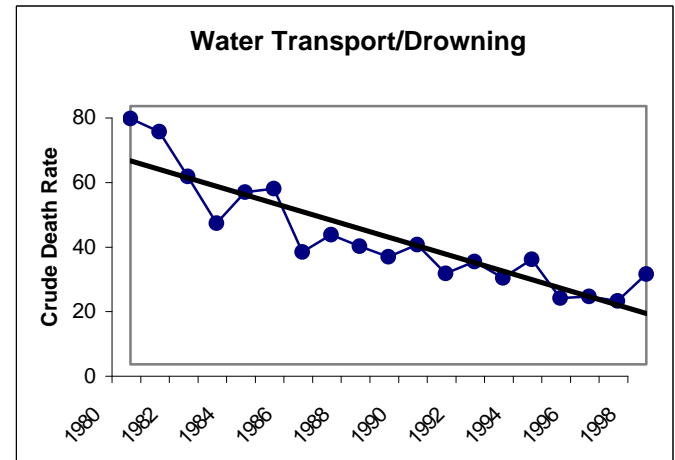
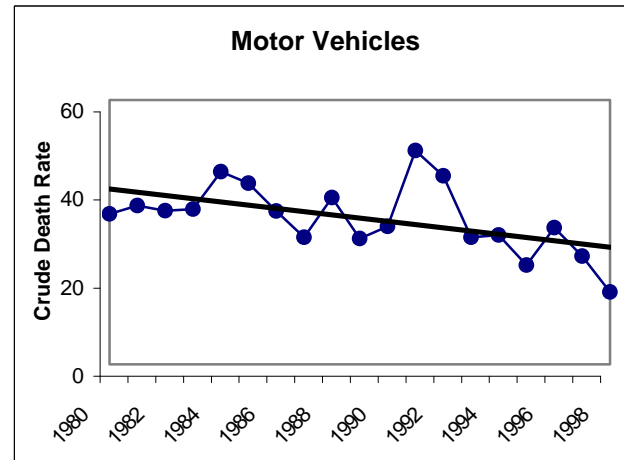
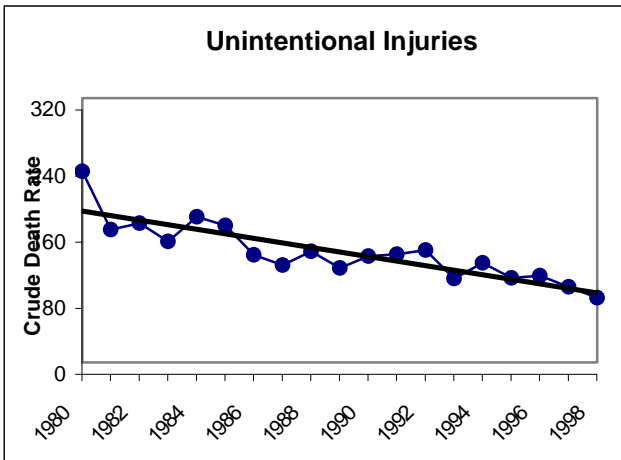
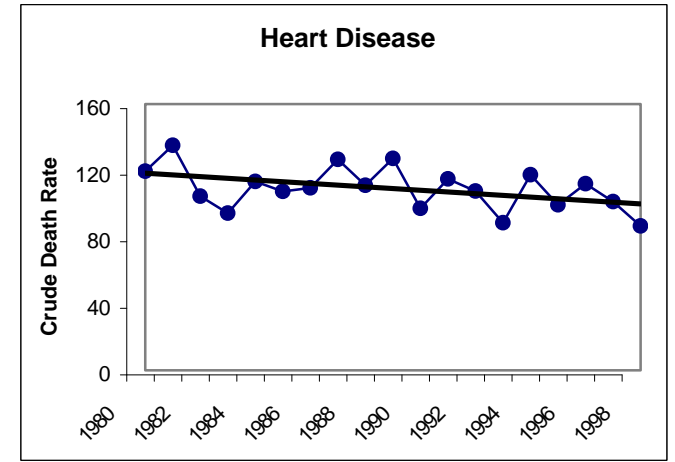
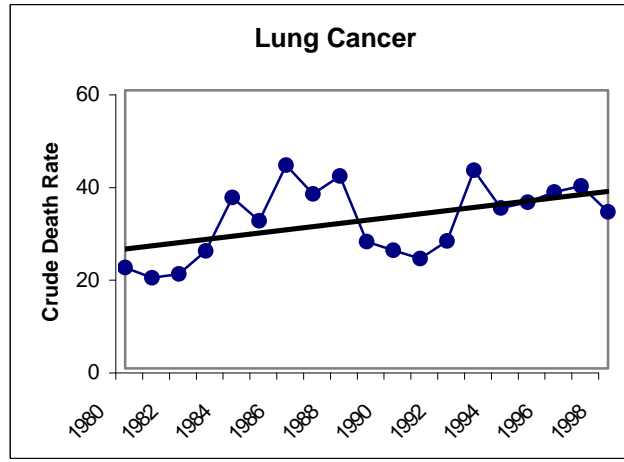
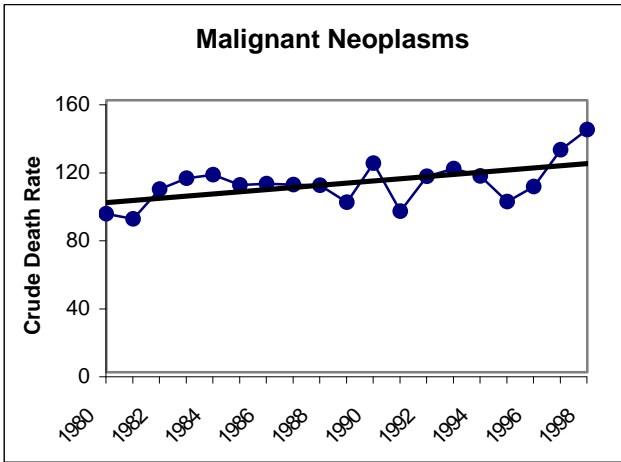


Chart A.
Crude Death Rates for Single Years and Regression Line for Alaska Natives
by Major Cause of Death, 1980-1998

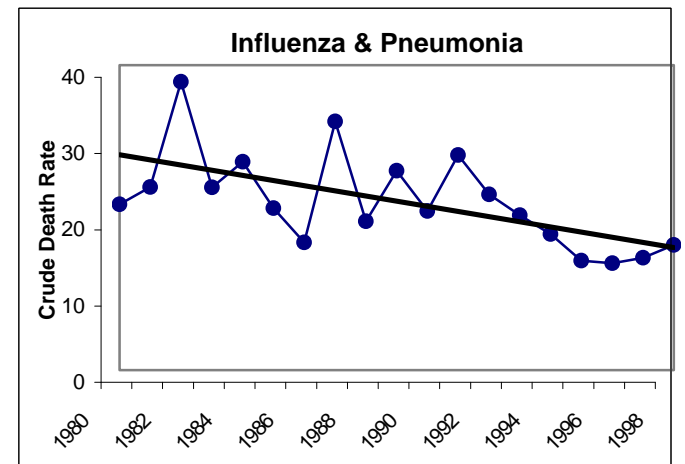
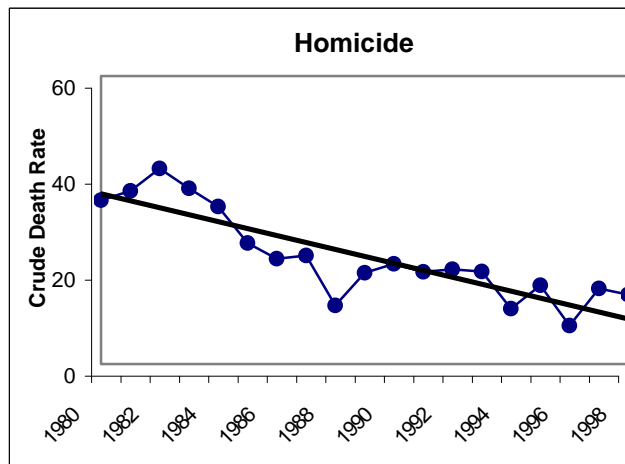
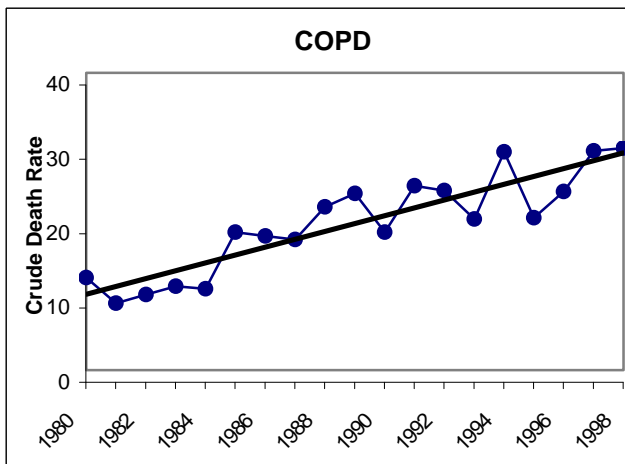
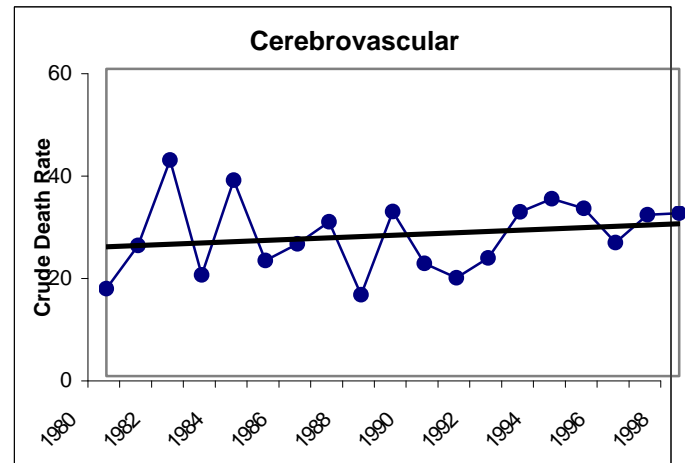
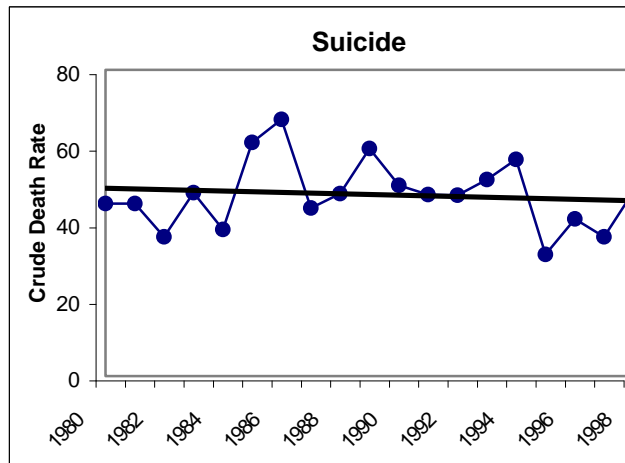
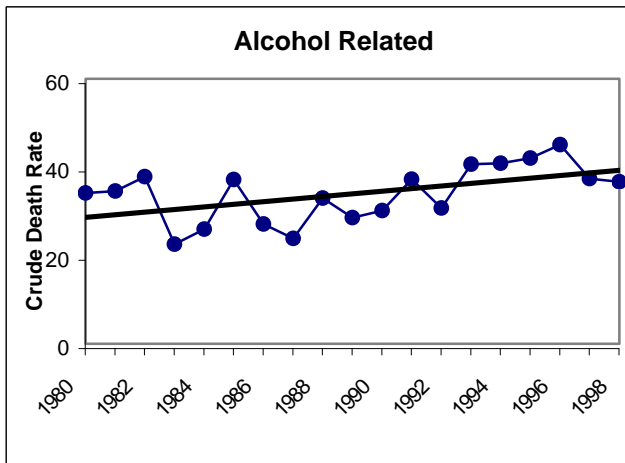
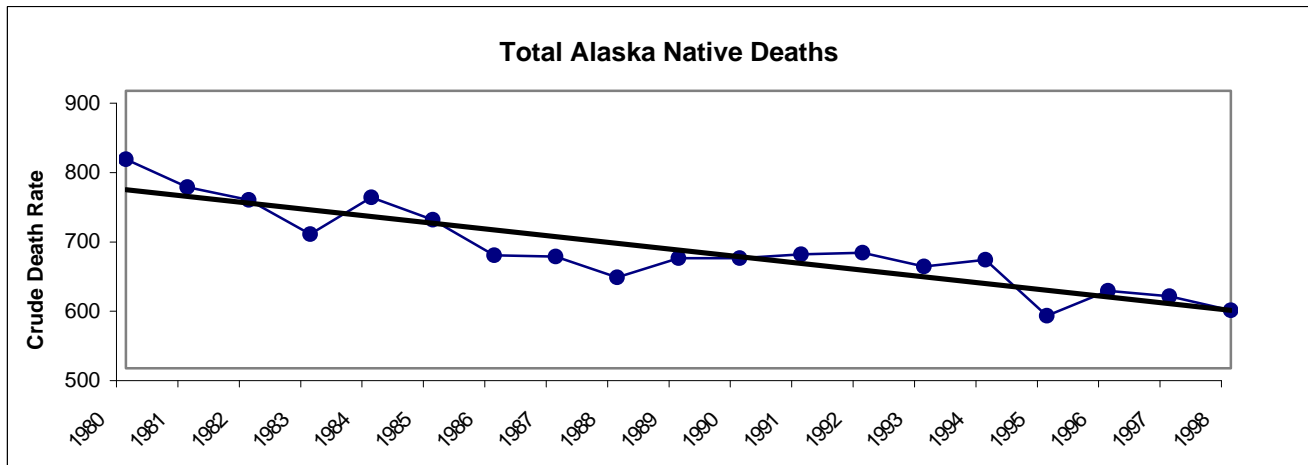
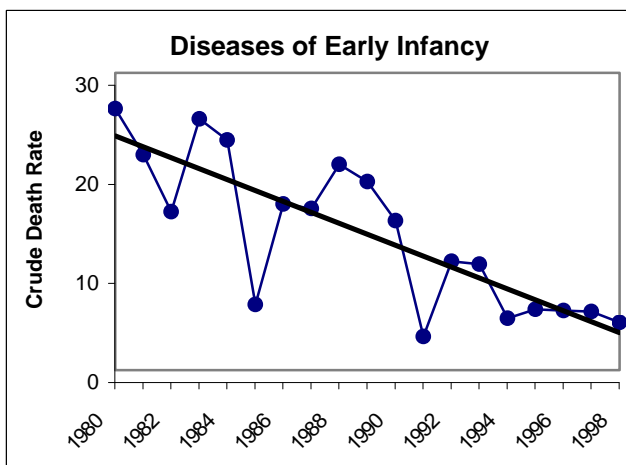
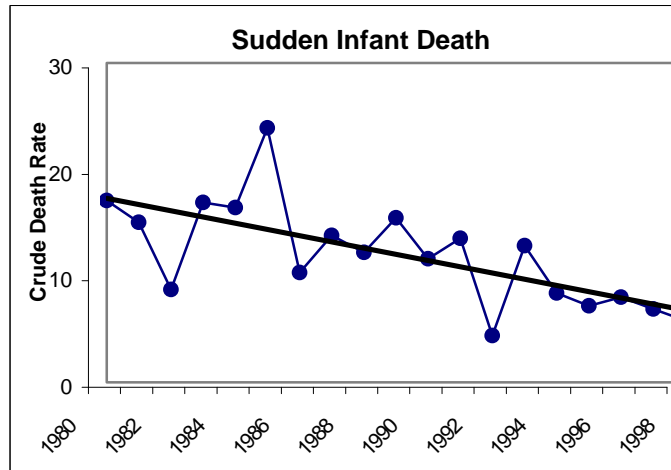
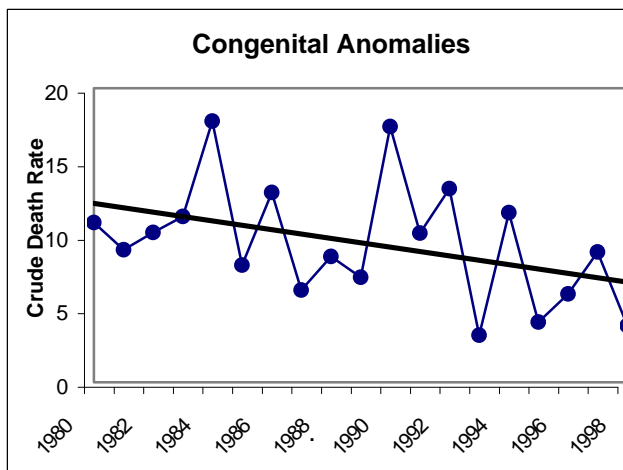
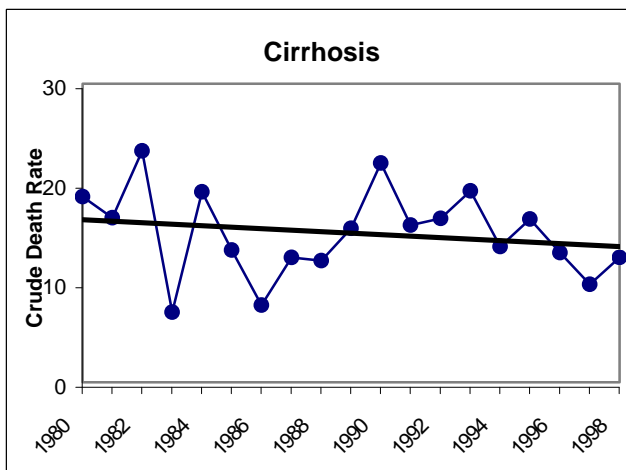


Chart A.
Crude Death Rates for Single Years and Regression Line for Alaska Natives
by Major Cause of Death, 1980-1998



AGE-SPECIFIC RATES

Comparing different population groups in terms of age-specific rates is another way of avoiding the problems of different age distributions between populations. This does not give an overall indicator of health status for each population, but it is useful in highlighting a relatively high rate for a particular age group. It also indicates which age groups within a population are experiencing the highest mortality or morbidity rates. Three-year (1996-1998), age-specific rates for Alaska only are shown in Appendix, Table 4, page 21.

AGE-ADJUSTED RATES

A generally accepted method of eliminating the differences between observed rates that result from age differences in population composition is through the computation of age-adjusted rates. Rates can be age adjusted by applying the age-specific rates in a population to a standardized age distribution. Age-adjusted rates were computed by using the 1940 U.S. standard population. The 1940 standard one million population is used in this publication whenever age-adjusting occurs.

Age-adjusted rates are viewed as a construct or an index rather than as a direct or actual measure of mortality risk. Statistically, it is a weighted average of the age-specific

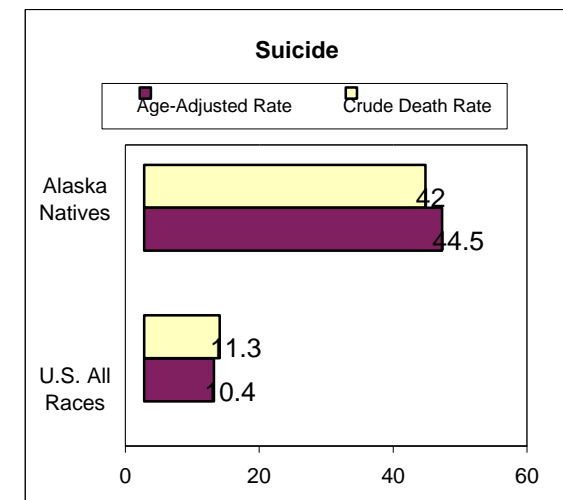
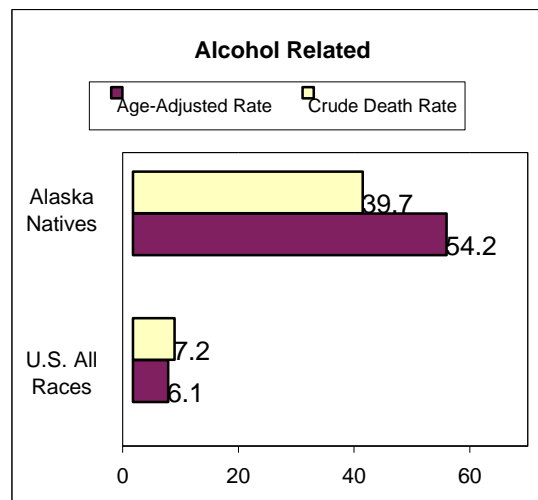
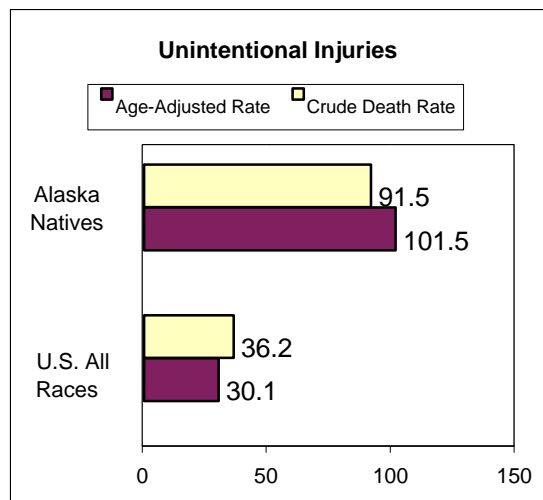
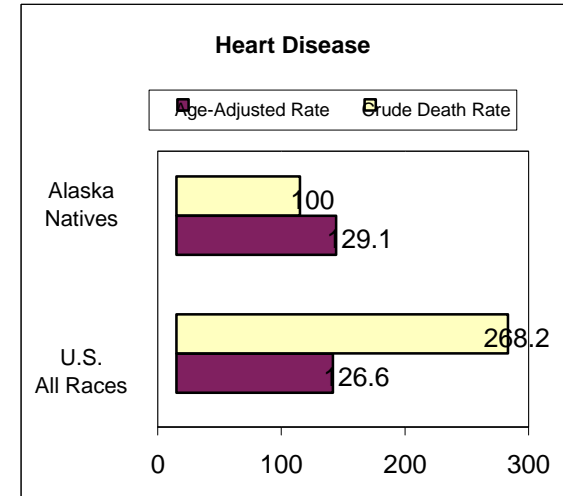
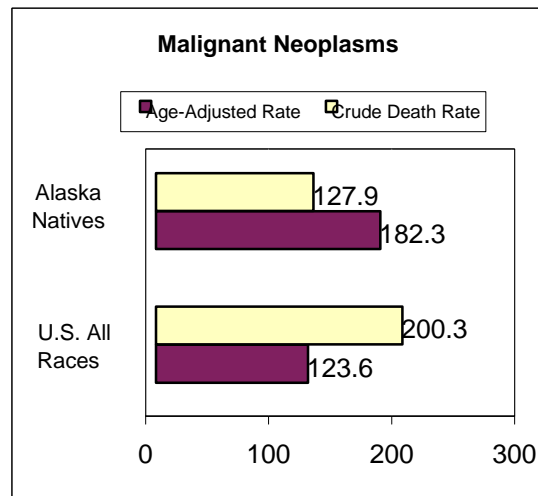
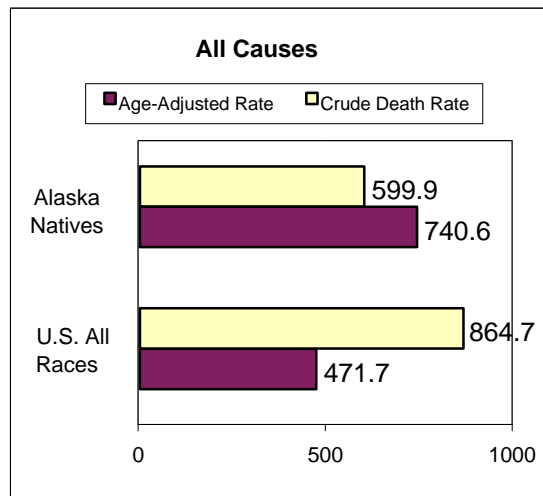
death rates, where the weights represent the fixed population proportions by age.

For example, historically, the crude death rate indicated that proportionately fewer Alaska Natives die from heart disease than do those in the total United States population. However, it is not known how much of the difference is due to variations in the actual risk to individuals and how much is caused by the differences in the age structures of the two populations. This is because heart disease affects primarily older persons and Alaska Natives are on the average younger than the U.S. total population. Chart B, page 7, presents the 1996-1998 five leading and all causes of Alaska Native crude and age-adjusted death rates.

ODDS RATIOS

An Odds Ratio is a mathematical estimation of relative risk between two groups. It measures the ratio of the odds of a specific, age-adjusted cause of death among Alaska Natives to that same cause of death among U.S. All Races. The ratio determines if any association exists between the two groups. A measure greater than 1.0 indicates a positive or increased risk while a measure less than 1.0 indicates a negative or decreased risk. Table 5 on page 23 shows the Odds Ratios for four leading causes of death among Alaska Natives as well as all causes of death. A 95% confidence interval for

**Chart B. 1996-98 All Causes and Five Leading Causes of Alaska Native Deaths
Compared to 1998 Deaths, U.S. All Races
Crude and Age-Adjusted Death Rates per 100,000 population**



each ratio is also calculated. To illustrate, the odds ratio for malignant neoplasms is 1.4. That means that Alaska Natives are 1.4 times more likely to die from malignant neoplasms than U.S. All Races. To relate the ratio another way, Alaska Natives have a 40% greater risk of dying from malignant neoplasms than U.S. All Races.

Detailed information regarding cancer among Alaska Natives is available on-line from the Alaska Native Epidemiology Center, a program of the Alaska Native Health Board (ANHB). The four publications available are: *Alaska Native Cancer Update, 1986-98*; *Alaska Native Cancer Survival Report*; *Alaska Native Cancer Update, 1985-1997*; and *Cancer in Alaska Natives, 1969-1993*. The Epidemiology Center's address for their publication's page is <http://www.anhb.org/sub/epi/publications.html>.

COMPARISONS: U.S. - ALASKA NATIVE DEATHS

The most recent cause of death data available for the United States is 1998. Data for the United States is from the Centers for Disease Control and Prevention, National Center for Health Statistics, *Murphy SL. Deaths: Final Data for 1998. National vital statistics reports; vol 48 no.11. Hyattsville, Maryland: National Center for Health Statistics. 2000.* (http://www.cdc.gov/nchs/data/nvsr/nvsr48/nvs48_11.pdf)

Comparisons between the United States (All Races) and Alaska Native deaths are shown in the Appendix, Table 5, page 23, and Chart B, page 7. Table 5 compares the three year average (1996-1998) number of deaths, crude and age-adjusted rates of Alaska Natives, to the 1998 United States (All Races) for all causes and the five leading causes of deaths among Alaska Natives.

Highlights of the five leading causes of deaths and deaths from all causes:

- The total number of deaths nationwide for 1998 is 2,337,256 (all races). This represents a crude death rate of 864.7 and an age-adjusted rate of 471.1. Compared to Alaska Natives, the 1996-1998 average number of deaths is 609.7. The three-year average crude death rate is 599.9; age-adjusted, it is 740.6. The Odds Ratio for Alaska Natives from all causes is 1.5 or one-and-a-half times that of the United States.
- Cancer and heart disease are the two leading causes of death in both the Alaska Native and U.S. populations. Their order, however, is reversed between the two populations. Cancer is the leading cause of death among Alaska Natives while heart disease is responsible for nearly one-third of U.S. deaths. Cancer and heart disease together account for 38% of Alaska Native deaths, but they account for 54.2% of U.S. deaths.

- *Malignant Neoplasm* deaths in the United States recorded a crude rate of 200.3 with an age-adjusted rate of 123.6. For Alaska Natives, the crude death rate is 127.9 while the age-adjusted rate is 182.3. The Odds Ratio value of 1.4 indicates that Alaska Natives die from malignant neoplasms at 1.4 times of the U.S. All Races.
- The crude death rate for *heart disease* in the United States is 268.2; and, age-adjusted, it is 126.6. The Alaska Native crude death rate is 100.0; the age-adjusted rate is 129.1. The Odds Ratio is 1.0, or a nearly equivalent risk of heart disease mortality.
- Proportionally, there are fewer U.S. All Races *Unintentional Injury* deaths than those among Alaska Natives. For U.S. All Races, the crude death rate is 36.2 and the age-adjusted rate is 30.1. The crude death rate among Alaska Natives is 91.5 and the age-adjusted rate is 101.5. The Odds Ratio is 3.3 which means that Alaska Natives are 3.3 times more likely to die from Unintentional Injuries than U.S. All Races.
- The 1998 *suicide* crude death rate for U.S. All Races is 11.3 and the age-adjusted rate is 10.4. For Alaska Natives the crude death rate for suicide is 42.0. The age-adjusted rate is 44.5. The Odds Ratio of 4.6 means that Alaska Natives are 4.6 times, or 460%, more likely to commit suicide than U.S. All Races.
- The U.S. *Alcohol Related* crude death rate in 1998 is 7.2; and, age-adjusted, it is 6.1. For the fifth leading cause of death among Alaska Natives, the crude death rate is 39.7. The age-adjusted rate among Alaska Natives is 54.2. Alcohol related deaths in the U.S. accounted for 0.8% or less than 1% of all 1998 U.S. deaths. Among Alaska Native deaths for the three year period 1996-1998, alcohol related deaths are 6.9% of total Alaska Native deaths.

CAUSE-OF-DEATH CODING

The reported cause of death is the underlying source shown on the death certificate as defined by the World Health Organization's International Classification of Diseases, Ninth Revision (ICD-9 Codes). The ICD-9 codes are used in defining the categories and are explained below. In some situations, ICD-9 Codes are preceded by the letter "E." This designation permits the classification of environmental events, circumstances, and conditions as the cause of injury, poisoning, and other adverse effects. ICD-9 Codes E800-E999 are a classification of external causes of injury and poisoning.

The grouping of deaths by cause categories used in analysis will vary from one report to another. For the purpose of mortality statistics, every death is attributed to

one underlying condition. This is based on information reported on the death certificate and utilizing the international rules for selecting the underlying cause of death from the reported conditions.

ICD-9 CODE(S) AND DESCRIPTION

This report identifies 16 individual causes of deaths among Alaska Natives. Because lung cancer deaths are included in malignant neoplasms and motor vehicle and water transport/drowning deaths are included in accidents, the number of leading causes of death among Alaska Natives is limited to thirteen (13).

Each cause of death that follows includes a brief description and the applicable ICD-9 Code(s). They are shown in alphabetical order:

Alcohol Related. Alcohol related deaths include ICD-9 Nos. 291, 303, 305, 357.5, 425.5, 535.3, 571.0-3, 790.3, and E860.0-E860.1. These deaths include alcoholic psychoses, alcohol dependence syndrome, alcohol abuse, alcoholic liver disease and cirrhosis, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, excessive blood level of alcohol, and accidental poisoning by alcoholic beverages and ethyl alcohol.

Cerebrovascular. ICD-9 Nos. 430-438 are those deaths associated with subarachnoid and intracerebral

hemorrhage, occlusion and stenosis of precerebral and cerebral arteries, transient cerebral ischemia, and acute and other ill-defined and late effects of cerebrovascular diseases.

Chronic Obstructive Pulmonary Disease (COPD).

Deaths associated with chronic obstructive pulmonary disease consist of ICD-9 Nos. 490-496. This group includes bronchitis, emphysema, asthma, bronchiectasis, extrinsic allergic alveolitis and chronic airway obstruction.

Cirrhosis. Chronic liver diseases and cirrhosis include alcoholic fatty liver, acute alcoholic hepatitis, alcoholic cirrhosis of liver and unspecified liver damage; they are included in ICD-9 No. 571.

Congenital Anomalies. Deaths attributed to congenital anomalies include ICD-9 Nos. 740-759: Anencephalus and similar anomalies, spina bifida, other congenital anomalies of nervous system, eye, ear, heart, circulatory and respiratory system, cleft palate and lip, upper alimentary tract, digestive system, genital organs, urinary system, congenital musculoskeletal deformities, limbs, integument, and chromosomal anomalies.

Diseases of Early Infancy. These are certain conditions originating in the perinatal period, ICD-9 Nos. 760-779. This category includes fetus or newborn affected by maternal conditions which may be unrelated to present pregnancy, maternal complications.

Heart Disease. ICD-9 Nos. 390-429 are those deaths associated with heart disease: acute rheumatic fever, chronic rheumatic heart disease, hypertensive disease, ischemic heart, diseases of pulmonary circulation, and other forms of heart diseases.

Homicide. E960-E969 includes deaths by fight, brawl, rape, assault by corrosive or caustic substances and poisoning, hanging and strangulation, firearms and explosives, cutting and piercing instrument, child battering and other maltreatment, by other and unspecified means, and late effects of injury purposely inflicted by other person.

Influenza and Pneumonia. Influenza and pneumonia are included in ICD-9 Nos. 480-487: viral, pneumococcal, and other bacterial pneumonia, pneumonia due to other specified organism and infectious diseases, broncho-pneumonia, pneumonia, organism unspecified, and influenza.

Lung Cancer. ICD-9 No. 162, Lung Cancer are deaths attributed to malignant neoplasm of the trachea (cartilage and mucosa), main bronchus, and upper, middle, lower lobe, bronchus or lung.

Malignant Neoplasms. Deaths associated with malignant neoplasm are of the lip, oral cavity, and pharynx and the digestive, respiratory, and intrathoracic organs and peritoneum. Also included in malignant neoplasm is malignant neoplasm of the bone, connective tissue, skin,

breast, and genitourinary organs and other unspecified sites, including lymphatic and hematopoietic tissue. These ICD-9 codes are Nos. 140-208.

Motor Vehicles. Cause of death attributable to motor vehicles include ICD-9 Nos. E810-E825. This category includes motor vehicle traffic and nontraffic accidents. A motor vehicle is any mechanically or electrically powered device, not operated on rails, upon which any person or property may be transported or drawn upon a highway. Any object such as a trailer, coaster, sled, or wagon being towed by a motor vehicle is considered a part of the motor vehicle.

Sudden Infant Death. ICD-9 No. 798 includes sudden infant death syndrome, instantaneous death, death occurring in less than 24 hours from onset of symptoms, not otherwise explained, and unattended death.

Suicide. This category includes ICD-9 Nos. E950-E959: suicide and self-inflicted poisoning by solid or liquid substances, gases and vapors, hanging, strangulation, and suffocation, submersion, firearms and explosives, cutting and piercing instruments, self-inflicted injury, and jumping.

Unintentional Injuries. Cause of death attributable to accident mortality include ICD-9 Nos. E800-E949. This category includes such accidents as railway, motor vehicle traffic and nontraffic, water, air, and space

transport, accidental poisoning by drugs and gases, surgical and medical procedures, accidental falls, accidents caused by fire and flames, and natural and environmental factors, and accidents caused by submersion, suffocation, and foreign bodies. This category does not include injuries purposefully inflicted or injuries undetermined whether purposefully or accidentally inflicted.

Water Transport and Drowning. ICD-9 Nos. for water transport and drowning include E830-E838 and E910. These are accidents to watercraft causing submersion and other injury, drowning in water transport accident, fall on stairs or ladders in water, machinery accident in water, explosion, fire or burning in watercraft; accidental drowning and submersion.

In some instances, there is an overlap of ICD-9 groupings. Because of this variation, rankings of leading causes should be taken in context of the breakdown used. As previously noted, motor vehicles and water transport/drowning are also computed in unintentional injuries; cirrhosis is also counted in alcohol related; and lung cancer is included in malignant neoplasms.

DATA LIMITATIONS

There is a limitation to the data: the number of deaths for some service units is too small for reliable data analysis. Although three-year moving averages are used to reduce this limitation, the numbers for some service units are still small. Service unit data are provided as a source of information for users. Generalizations can be established for this data; however, the data should be used with some degree of caution.

On Table 3 (Number of Alaska Native Deaths and Three Year, 1996-1998, Crude Death Rate by Leading Cause of Death and Service Unit), pages 16-20, all the service units have fewer than the 13 causes of death listed for Alaska. If there were less than 5 deaths by cause of death over a three-year period, that particular cause of death was not reported for the service unit. The eliminated causes of death follow the guidelines of the Bureau of Vital Statistics, Department of Health and Social Services, State of Alaska that requests users of state mortality data to not disclose values less than three. This rule of three is for confidentiality.



Appendix

Table 1. Number of Alaska Native Deaths by Year and Major Cause of Death, 1980-1998 (Single Year)

Alaska

Cause of Death	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
1) Malignant Neoplasms ¹	60	60	74	81	85	83	86	88	90	84	106	84	105	112	110	98	109	133	148
Lung Cancer	14	13	14	18	27	24	34	30	34	23	22	21	25	40	33	35	38	40	35
2) Heart Disease	77	90	72	67	83	81	85	101	91	107	84	102	98	83	112	97	112	103	90
3) Unintentional Injuries ²	149	107	116	104	129	125	101	94	110	96	111	116	124	95	115	100	105	93	81
Motor Vehicles	22	24	24	25	32	31	27	23	31	24	27	43	39	27	28	22	31	25	17
Water Transport/Drowning	49	48	40	31	39	41	27	32	30	28	32	25	29	25	31	20	21	20	29
4) Suicide	29	30	25	34	28	46	52	35	39	50	43	42	43	48	54	31	41	37	50
5) Alcohol Related ³	22	23	26	16	19	28	21	19	27	24	26	33	28	38	39	41	45	38	38
6) Cerebrovascular	11	17	29	14	28	17	20	24	13	27	19	17	21	30	33	32	26	32	33
7) Chronic Obst. Pul. Disease	8	6	7	8	8	14	14	14	18	20	16	22	22	19	28	20	24	30	31
8) Influenza & Pneumonia	14	16	26	17	20	16	13	26	16	22	18	25	21	19	17	14	14	15	17
9) Homicide	22	24	28	26	24	19	17	18	10	16	18	17	18	18	11	16	8	16	15
10) Cirrhosis	12	11	16	5	14	10	6	10	10	13	19	14	15	18	13	16	13	10	13
11) Sudden Infant Death	11	10	6	12	12	18	8	11	10	13	10	12	4	12	8	7	8	7	6
12) Diseases of Early Infancy	17	14	11	18	17	5	13	13	17	16	13	3	10	10	5	6	6	6	5
13) Congenital Anomalies	7	6	7	8	13	6	10	5	7	6	15	9	12	3	11	4	6	9	4
Total Number of Deaths	516	507	511	492	546	538	514	527	517	554	568	589	607	605	626	562	611	614	605

¹Lung Cancer is included in Malignant Neoplasms.

²Motor Vehicles and Water Transport/Drowning are also counted in the total Unintentional Injuries. This category does not include alcohol related deaths. It does not include any injuries coded E980-E989 (ICD9 Codes): Injury Undetermined whether Accidentally or Purposely Inflicted.

³Alcohol Related deaths include alcoholic psychoses, alcohol dependence syndrome, alcohol abuse, alcoholic liver disease and cirrhosis, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, excessive blood level of alcohol, and accidental poisoning by alcoholic beverages and ethyl alcohol.

**Table 2. Alaska Native Crude Death Rates per 100,000 Population
By Major Cause of Death, 1980-1998 (Three-Year Averages)**

Alaska

Cause of Death	80-82	81-83	82-84	83-85	84-86	85-87	86-88	87-89	88-90	89-91	90-92	91-93	92-94	93-95	94-96	95-97	96-98
1) Malignant Neoplasms ¹	97.1	104.2	112.7	113.4	112.3	110.5	110.4	106.6	111.0	105.9	110.9	110.2	116.5	111.8	108.2	113.5	127.9
Lung Cancer	20.5	21.8	27.7	31.4	37.6	37.8	41.0	35.4	31.3	25.5	25.6	31.5	34.9	37.7	36.2	37.7	37.0
2) Heart Disease	119.6	111.0	104.3	105.2	110.1	114.8	115.8	121.7	111.8	113.2	106.8	103.6	104.4	102.0	109.6	104.1	100.0
3) Unintentional Injuries ²	186.2	158.5	163.9	163.1	157.0	137.6	127.5	122.1	125.7	124.8	132.0	122.6	119.0	108.3	109.3	99.5	91.5
Motor Vehicles	35.0	35.4	38.0	40.1	39.8	34.8	33.9	31.7	32.5	36.3	41.0	39.9	33.5	26.9	27.7	26.0	23.9
Water Transport/Drowning	68.6	57.7	51.7	50.6	47.3	43.0	37.2	36.6	35.7	32.8	32.3	28.9	30.3	26.6	24.6	20.4	22.9
4) Suicide	42.0	43.1	40.9	49.2	55.7	57.2	52.7	50.5	52.3	52.2	48.1	48.7	51.7	46.5	43.0	36.4	42.0
5) Alcohol Related ³	35.5	31.5	28.6	28.7	30.1	29.2	28.0	28.5	30.5	32.1	32.7	36.2	37.4	41.2	42.7	41.4	39.7
6) Cerebrovascular	28.5	29.1	33.3	26.9	28.8	26.2	23.8	26.0	23.4	24.3	21.4	24.9	29.9	33.2	31.1	30.0	29.8
7) Chronic Obst. Pul. Disease	10.5	10.2	10.8	13.7	15.9	18.1	19.2	21.2	21.4	22.4	22.6	23.1	24.6	23.4	24.6	24.7	27.9
8) Influenza & Pneumonia	28.0	28.6	29.6	24.1	21.7	23.6	23.0	26.0	22.2	25.1	24.1	23.8	20.3	17.5	15.4	14.4	15.1
9) Homicide	37.0	37.8	36.6	31.4	26.5	23.2	18.8	17.9	17.4	19.7	19.9	19.4	16.7	15.7	11.9	13.4	12.8
10) Cirrhosis	19.5	15.5	16.4	13.2	13.3	11.2	10.9	13.4	16.7	17.8	18.0	17.2	16.4	16.4	14.3	13.0	11.8
11) Sudden Infant Death	13.5	13.6	14.1	19.1	16.8	15.9	12.1	13.8	13.1	13.5	9.8	10.2	8.6	9.4	7.9	7.3	6.9
12) Congenital Anomalies	10.0	10.2	13.1	12.3	12.8	9.0	9.2	7.3	11.1	11.6	13.5	8.8	9.3	6.3	7.2	6.3	6.2
13) Diseases of Early Infancy	21.0	20.8	21.6	18.2	15.5	13.3	18.0	18.7	18.2	12.4	9.8	8.4	8.9	7.3	5.8	6.0	5.6
Total	767.8	731.7	727.4	718.0	706.8	678.7	651.4	650.3	649.8	661.2	663.3	659.1	655.0	626.6	614.2	596.4	599.9

¹ Lung Cancer is included in Malignant Neoplasms.

² Motor Vehicles and Water Transport/Drowning are also counted in the total Unintentional Injuries. This category does not include alcohol related deaths. It does not include any injuries coded E980-E989 (ICD9 Codes): Injury Undetermined whether Accidentally or Purposely Inflicted.

³ Alcohol Related deaths include alcoholic psychoses, alcohol dependence syndrome, alcohol abuse, alcoholic liver disease and cirrhosis, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, excessive blood level of alcohol, and accidental poisoning by alcoholic beverages and ethyl alcohol.

**Table 3. Number of Alaska Native Deaths and Three Year (1996-1998)
Crude Death Rate by Leading Cause of Death and Service Unit**

Alaska			Anchorage Service Unit		
Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998	Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998
1) Malignant Neoplasms ¹	390	127.9	1) Malignant Neoplasms ¹	140	148.5
Lung Cancer	113	37.0	Lung Cancer	38	40.3
2) Heart Disease	305	100.0	2) Heart Disease	89	94.4
3) Unintentional Injuries ²	279	91.5	3) Unintentional Injuries ²	83	88.1
Motor Vehicles	73	23.9	Motor Vehicles	29	30.8
Water Transport/Drowning	70	22.9	Water Transport/Drowning	8	8.5
4) Suicide	128	42.0	4) Alcohol Related ³	48	50.9
5) Alcohol Related ³	121	39.7	5) Cerebrovascular	40	42.4
6) Cerebrovascular	91	29.8	6) Chronic Obst. Pul. Diseases	25	26.5
7) Chronic Obst. Pul. Diseases	85	27.9	7) Homicide	20	21.2
8) Influenza & Pneumonia	46	15.1	8) Suicide	16	17.0
9) Homicide	39	12.8	9) Influenza & Pneumonia	15	15.9
10) Cirrhosis	36	11.8	10) Cirrhosis	15	15.9
11) Sudden Infant Death	21	6.9	11) Sudden Infant Death	9	9.5
12) Congenital Anomalies	19	6.2	12) Congenital Anomalies	7	7.4
13) Diseases of Early Infancy	17	5.6			
Total Number of Deaths	1830	599.9	Total Number of Deaths	596	632.4

¹ Lung Cancer is included in Malignant Neoplasms.

² Motor Vehicles and Water Transport/Drowning are also counted in the total Unintentional Injuries. This category does not include alcohol related deaths. It does not include any injuries coded E980-E989 (ICD9 Codes): Injury Undetermined whether Accidentally or Purposely Inflicted.

³ Alcohol Related deaths include alcoholic psychoses, alcohol dependence syndrome, alcohol abuse, alcoholic liver disease and cirrhosis, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, excessive blood level of alcohol, and accidental poisoning by alcoholic beverages and ethyl alcohol.

Table 3.
Number of Alaska Native Deaths and Three Year (1996-1998)
Crude Death Rate by Leading Cause of Death and Service Unit

Annette Island Service Unit			Barrow Service Unit		
Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998	Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998
1) Heart Disease	10	241.7	1) Malignant Neoplasms ¹	19	152.8
			Lung Cancer	5	40.2
			2) Unintentional Injuries ²	16	128.7
			3) Heart Disease	14	112.6
			4) Suicide	9	72.4
			5) Alcohol Related ³	7	56.3
Total Number of Deaths	25	604.3	Total Number of Deaths	82	659.6

¹ Lung Cancer is included in Malignant Neoplasms.

² Motor Vehicles and Water Transport/Drowning are also counted in the total Unintentional Injuries. This category does not include alcohol related deaths. It does not include any injuries coded E980-E989 (ICD9 Codes): Injury Undetermined whether Accidentally or Purposely Inflicted.

³ Alcohol Related deaths include alcoholic psychoses, alcohol dependence syndrome, alcohol abuse, alcoholic liver disease and cirrhosis, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, excessive blood level of alcohol, and accidental poisoning by alcoholic beverages and ethyl alcohol.

Table 3.
Number of Alaska Native Deaths and Three Year (1996-1998)
Crude Death Rate by Leading Cause of Death and Service Unit

Bristol Bay Service Unit			Interior Alaska Service Unit		
Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998	Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998
1) Unintentional Injuries ²	21	133.6	1) Heart Disease	41	119.5
Motor Vehicles	5	31.8	2) Malignant Neoplasms ¹	34	99.1
Water Transport/Drowning	5	31.8	Lung Cancer	10	29.1
2) Malignant Neoplasms ¹	19	120.9	3) Unintentional Injuries ²	32	93.3
Lung Cancer	5	31.8	Motor Vehicles	6	17.5
3) Heart Disease	12	76.4	Water Transport/Drowning	9	26.2
4) Cerebrovascular	9	57.3	4) Alcohol Related ³	18	52.5
5) Chronic Obst. Pul. Diseases	8	50.9	5) Suicide	16	46.6
6) Suicide	5	31.8	6) Cerebrovascular	9	26.2
			7) Chronic Obst. Pul. Diseases	9	26.2
			8) Homicide	8	23.3
			9) Cirrhosis	6	17.5
			10) Influenza & Pneumonia	5	14.6
Total Number of Deaths	91	579.0	Total Number of Deaths	207	603.4

¹ Lung Cancer is included in Malignant Neoplasms.
² Motor Vehicles and Water Transport/Drowning are also counted in the total Unintentional Injuries. This category does not include alcohol related deaths. It does not include any injuries coded E980-E989 (ICD9 Codes): Injury Undetermined whether Accidentally or Purposely Inflicted.
³ Alcohol Related deaths include alcoholic psychoses, alcohol dependence syndrome, alcohol abuse, alcoholic liver disease and cirrhosis, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, excessive blood level of alcohol, and accidental poisoning by alcoholic beverages and ethyl alcohol.

Table 3.
Number of Alaska Native Deaths and Three Year (1996-1998)
Crude Death Rate by Leadig Cause of Death and Service Unit

Kotzebue Service Unit			Mt. Edgecumbe Service Unit		
Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998	Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998
1) Malignant Neoplasms ¹	23	112.8	1) Heart Disease	50	124.4
Lung Cancer	5	24.5	2) Malignant Neoplasms ¹	46	114.5
2) Heart Disease	20	98.1	Lung Cancer	13	32.3
3) Unintentional Injuries ²	15	73.5	3) Unintentional Injuries ²	30	74.6
Water Transport/Drowning	6	29.4	Motor Vehicles	9	22.4
4) Suicide	14	68.6	Water Transport/Drowning	10	24.9
5) Alcohol Related ³	7	34.3	4) Alcohol Related ³	12	29.9
6) Chronic Obst. Pul. Diseases	5	24.5	5) Suicide	11	27.4
			6) Chronic Obst. Pul. Diseases	9	22.4
			7) Influenza & Pneumonia	8	19.9
			8) Cirrhosis	7	17.4
Total Number of Deaths	109	534.4	Total Number of Deaths	218	542.4

¹ Lung Cancer is included in Malignant Neoplasms.

² Motor Vehicles and Water Transport/Drowning are also counted in the total Unintentional Injuries. This category does not include alcohol related deaths. It does not include any injuries coded E980-E989 (ICD9 Codes): Injury Undetermined whether Accidentally or Purposely Inflicted.

³ Alcohol Related deaths include alcoholic psychoses, alcohol dependence syndrome, alcohol abuse, alcoholic liver disease and cirrhosis, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, excessive blood level of alcohol, and accidental poisoning by alcoholic beverages and ethyl alcohol.

Table 3.
Number of Alaska Native Deaths and Three Year (1996-1998)
Crude Death Rate by Leading Cause of Death and Service Unit

Norton Sound Service Unit			Yukon-Kuskokwim Delta Service Unit		
Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998	Cause of Death	Total Deaths 1996-1998	3 Yr Rate 1996-1998
1) Malignant Neoplasms ¹	36	166.4	1) Malignant Neoplasms ¹	69	111.4
Lung Cancer	13	60.1	Lung Cancer	23	37.1
2) Unintentional Injuries ²	30	138.7	2) Unintentional Injuries ²	49	79.1
Motor Vehicles	9	41.6	Motor Vehicles	8	12.9
Water Transport/Drowning	10	46.2	Water Transport/Drowning	19	30.7
3) Heart Disease	22	101.7	3) Heart Disease	46	74.2
4) Suicide	14	64.7	4) Suicide	41	66.2
5) Alcohol Related ³	12	55.5	5) Chronic Obst. Pul. Diseases	14	22.6
6) Chronic Obst. Pul. Diseases	12	55.5	6) Cerebrovascular	14	22.6
7) Cerebrovascular	11	50.8	7) Alcohol Related ³	13	21.0
8) Homicide	5	23.1	8) Influenza & Pneumonia	10	16.1
			9) Congenital Anomalies	6	9.7
			10) Diseases of Early Infancy	5	8.1
			11) Sudden Infant Death	5	8.1
Total Number of Deaths	173	799.6	Total Number of Deaths	325	524.5

¹ Lung Cancer is included in Malignant Neoplasms.

² Motor Vehicles and Water Transport/Drowning are also counted in the total Unintentional Injuries. This category does not include alcohol related deaths. It does not include any injuries coded E980-E989 (ICD9 Codes): Injury Undetermined whether Accidentally or Purposely Inflicted.

³ Alcohol Related deaths include alcoholic psychoses, alcohol dependence syndrome, alcohol abuse, alcoholic liver disease and cirrhosis, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, excessive blood level of alcohol, and accidental poisoning by alcoholic beverages and ethyl alcohol.

**Table 4. Age-Specific Alaska Native Mortality Rates for Alaska and
Three-Year Total Number of Deaths by Age Group and Service Unit, 1996-1998**

ALASKA		
Age at Death	Total # of Deaths 1996-1998	Age-Specific 3 Year Rate, 1996-1998
Under 5	98	227.6
5-9	16	44.1
10-14	18	61.6
15-24	125	248.5
25-44	339	360.7
45-64	421	1083.0
65+	806	5562.5
Age Unknown	3	
Area Unknown	4	

ANCHORAGE		ANNETTE ISLAND		BARROW		BRISTOL BAY	
Age at Death	Total # of Deaths 1996-1998	Age at Death	Total # of Deaths 1996-1998	Age at Death	Total # of Deaths 1996-1998	Age at Death	Total # of Deaths 1996-1998
Under 5	31	Under 5	3	Under 5	2	Under 5	4
5-9	5	5-9	0	5-9	2	5-9	0
10-14	3	10-14	0	10-14	2	10-14	1
15-24	21	15-24	0	15-24	6	15-24	6
25-44	115	25-44	3	25-44	20	25-44	21
45-64	179	45-64	7	45-64	21	45-64	13
65+	242	65+	12	65+	29	65+	46
Age Unknown	0	Age Unknown	0	Age Unknown	0	Age Unknown	0

Table 4. Age-Specific Alaska Native Mortality Rates for Alaska and Three-Year Total Number of Deaths by Age Group and Service Unit, 1996-1998

INTERIOR ALASKA		KOTZEBUE		MT. EDGE CUMBE		NORTON SOUND	
Age at Death	Total # of Deaths 1996-1998	Age at Death	Total # of Deaths 1996-1998	Age at Death	Total # of Deaths 1996-1998	Age at Death	Total # of Deaths 1996-1998
Under 5	9	Under 5	8	Under 5	7	Under 5	10
5-9	0	5-9	2	5-9	1	5-9	3
10-14	1	10-14	0	10-14	2	10-14	2
15-24	20	15-24	12	15-24	10	15-24	13
25-44	34	25-44	24	25-44	34	25-44	40
45-64	47	45-64	23	45-64	44	45-64	36
65+	95	65+	40	65+	120	65+	69
Age Unknown	1	Age Unknown	0	Age Unknown	0	Age Unknown	0

YUKON-KUSKOKWIM DELTA	
Age at Death	Total # of Deaths 1996-1998
Under 5	24
5-9	3
10-14	7
15-24	37
25-44	48
45-64	51
65+	153
Age Unknown	2

The Age-Specific Rate is a three year average of total deaths by age group divided by 1997 age grouped populations. The age group populations were derived by applying the 1990 percentage distributions by age for the Revised 1990 Census (**Table 18: Percent Distribution of American Indian and Alaska Native Service Population by Single Year of Age for Selected Ages, by IHS Area for 1990 based on Revised 1990 Census Data, Prepared March 1995**) to the IHS Projected 1997 Population (**Table 30: Projected American Indian and Alaska Native IHS Service Population by Area, 1990-2015, Prepared November 2000**). Both tables are prepared by the Division of Program Statistics, Indian Health Service Headquarters, Rockville, Maryland.

Table 5.
1996-1998 Alaska Native and 1998 U.S. All Races Number of Deaths, Death Percentages,
Crude and Age-Adjusted Death Rates and Odds Ratios

Cause of Death	Number of Deaths		Percentage of Total Deaths		Crude Death Rates		Age-Adjusted Rates ³		Age-Adjusted Odds Ratio	95% Confidence Interval of OR	
	1996-1998	1998 U.S.	AK Natives ¹	US All Races ²	AK Natives ¹	US All Races ²	AK Natives ¹	US All Races ²	(OR)	Lower	Upper
All Causes	609.7	2,337,256	100.0%	100.0%	599.9	864.7	740.6	471.7	1.5*	1.44	1.59
Malignant Neoplasms	130.0	541,532	21.3%	23.2%	127.9	200.3	182.3	123.6	1.4*	1.30	1.59
Heart Disease	101.7	724,859	16.7%	31.0%	100.0	268.2	129.1	126.6	1.0	0.89	1.12
Unintentional Injuries	92.7	97,835	15.2%	4.2%	91.5	36.2	101.5	30.1	3.3*	2.93	3.71
Suicide	42.7	30,575	7.0%	1.3%	42.0	11.3	44.5	10.4	4.6*	3.90	5.52
Alcohol Related	42.0	19,515	6.9%	0.8%	39.7	7.2	54.2	6.1	see below ⁴		

¹Data for Alaska Natives is a three-year average for 1996-1998.

²Data for the United States represents the single year, 1998.

³Age-adjusted computations are based on the 1940 Standard Million Population

⁴There is no Age-Adjusted Odds Ratio calculated for Alcohol Related Mortality because U.S. alcohol related deaths are not age-adjusted in Murphy's *Deaths: Final Data for 1998* NCHS publication. The alcohol related death rate for Alaska Natives is statistically significant at p<.01.

* These numbers are statistically significant at p<.05.

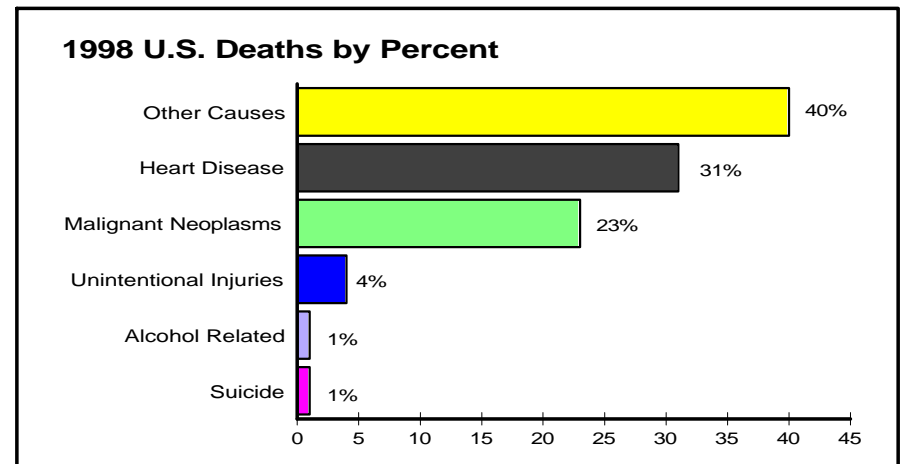
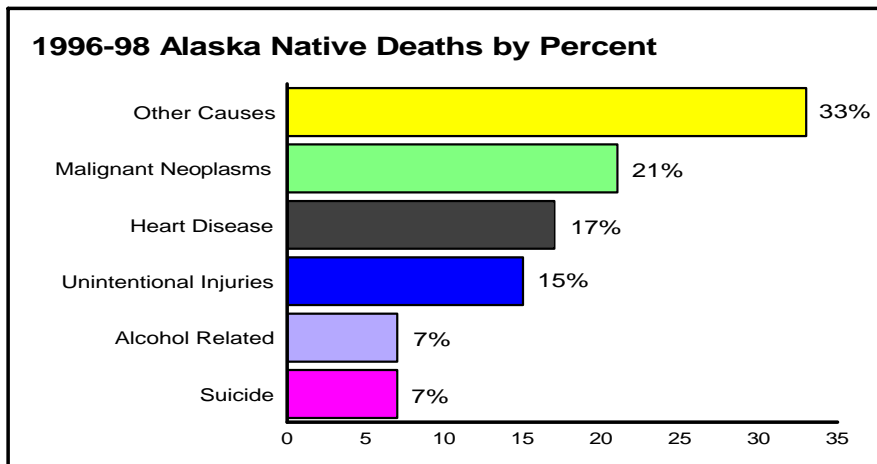


Table 6.
Other Causes of Death among Alaska Natives
Crude Death Rates per 100,000
Six Year Averages, 1981 - 1998

Cause of Death	ICD9 Code	Deaths 1981-1986	Mortality Rate 1981-1986 ¹	Deaths 1987-1992	Mortality Rate 1987-1992 ¹	Deaths 1993-1998	Mortality Rate 1993-1998 ¹
Infectious & Parasitic Diseases	001-139.8	44	10.2	82	16.0	79	13.3
Total Tuberculosis ²	010-018.9; 137-137.4	19	4.4	15	2.9	12	2.0
Septicemia	038-038.9	12	2.8	24	4.7	27	4.6
HIV Infection	042-044.9	0	n/a	12	2.3	19	3.2
Diabetes	250-250.9	15	3.5	39	7.6	54	9.1
Hypertensive Disease	401-405.9	12	2.8	12	2.3	22	3.7
Ischemic Heart Disease	410-414.9	258	59.7	318	62.1	293	49.5
Other Forms of Heart Disease	420-429.9	184	42.5	220	43.0	252	42.6
Other Diseases of Respiratory System	510-519.9	47	10.9	35	6.8	46	7.8
Nephritis, Nephrotic Syndrome, & Nephrosis	580-589.9	32	7.4	19	3.7	24	4.1
Motor-Driven Snow Machine	E820-E820.9	21	4.9	56	10.9	37	6.3
Other Off-Road Vehicle	E821-E821.9	11	2.5	12	2.3	4	---
Accidental Falls	E880-E888	19	4.4	20	3.9	35	5.9
Accidents Caused by Fire and Flames	E890-E899	52	12.0	49	9.6	46	7.8
Injury Undetermined ³	E980-E989	38	8.8	30	5.9	13	2.2
Total Firearm Deaths	see below ⁴	285	65.9	250	48.9	242	40.9
Assault by Firearm	E965.0-E965.4	78	18.0	44	8.6	29	4.9
Total Suicide	E950-E959	215	49.7	252	49.2	261	44.1
Firearm Suicide ⁵	E955.0-E955.4	167	38.6	185	36.2	192	32.4

¹ Average Population, 1981-1986=72,074; Average Population, 1987-1992=85,282; Average Population, 1993-1998=98,632. Population Source: Table 31, *Projected American Indian and Alaska Native IHS Service Population by Area and Service Unit*. Prepared November 1998. Indian Health Service Headquarters publication.

² This includes deaths from Tuberculosis and Late Effects of Tuberculosis

³ Deaths which cannot be determined whether the injuries are accidental, suicidal, or homicidal. These deaths are **NOT** included in the "Unintentional Injury" category of the 10 Leading Causes of Death from this office's annual *Alaska Native Mortality Report*

⁴ E922-E922.9, Accident caused by firearm missile; E955.0-E955.4, Suicide and self-inflicted injury by firearms; E965.0-E965.4, Assault by firearms; E970, Injury due to legal intervention by firearm; E985.0-E985.4, Injury by firearms, undetermined whether accidentally or purposely inflicted

⁵ The Firearm Suicide deaths are also included in the Total Firearm Deaths and the Total Suicide deaths

DISCUSSION:

When 1999 mortality data is released, the data will be coded using the Tenth Revision to the World Health Organization's International Classification of Diseases, commonly known as ICD10 classification codes, to update the current ICD9 coding system. Also, age-adjustment of 1999 mortality rate calculations will begin using the 2000 U.S. Standard Million population instead of the current 1940 U.S. Standard Million population. Direct comparisons of 1999 mortality data to previous years cannot be made until adjustment procedures are determined.

Because of changes to next year's data, it is an appropriate time to examine other causes of death among Alaska Natives. Table 6 examines mortality data from 1981 – 1998. The eighteen years of data are divided into six year increments to report numbers and rates.

This table records both decreases and increases in causes of death. *Tuberculosis* was the leading cause of death among Alaska Natives from after World War II to the mid-1950's. The three year mortality rate from 1949 – 1951 was 641.1 deaths per 100,000 population. The final three year period that tuberculosis was the leading cause of death was 1953 – 1955. By then, the mortality rate declined to 218.8 per 100,000. From 1955 – 1957 the mortality rate dropped further to 96.8 deaths per 100,000. (*Indian Health Highlights, 3rd Edition, Bureau of*

Medical Services, Public Health Service, U.S. Department of Health, Education, and Welfare, 1957, p 36.) The tuberculosis mortality rates for the past eighteen years plummeted compared to the mortality rates of the 1950's.

Diabetes is a disease that is pandemic among some Native American tribes. Diabetes is an emerging health concern in Alaska as more Alaska Natives develop this disease. Some areas of Alaska have diabetes rates that are almost four times higher than that of U.S. All Races. The rates for the numbers of new diagnoses (incidence rates) are increasing. Since 1985 diabetes has increased among Alaska Natives from 18% to 125%, depending upon the area of Alaska. Western Alaska experienced the highest increases from 62% to 125%. (*Jane Kelly, Diabetes among Alaska Natives: an emerging epidemic, National Indian Council on Aging, Inc., NICOA Monograph Series, Vol. 1, Number 2, 1999*), <http://www.nicoa.org/pdf/akdiab.pdf>. The diabetes mortality rate will continue its increase since diabetes has become more prevalent in the Alaska Native population.

The diabetes mortality rates were 3.5 deaths per 100,000 population for 1981 – 1986, 7.6 per 100,000 for 1987 – 1992, and 9.1 per 100,000 for 1993 – 1998. These deaths represent **only** those deaths coded to diabetes from 1981 – 1998. Not included are those diabetic deaths that result from complications such as heart disease, cerebrovascular disease or kidney disease. The reported diabetic deaths therefore underrepresent the

true diabetes mortality rate among the Alaska Native population.

Total deaths from *Infectious and Parasitic Diseases* are reported as one group. Within this ICD9 group, deaths from *tuberculosis, septicemia and HIV infection* are also reported separately.

The annual mortality publication documents Heart Disease deaths. This table breaks that number into three smaller categories: *hypertensive disease*, ischemic heart disease, and other forms of heart disease. *Ischemic heart disease* includes acute myocardial infarction, other acute and subacute forms of ischemic heart disease, old myocardial infarction, angina pectoris, and other forms of chronic ischemic heart disease.

Other forms of Heart Disease include the following: acute pericarditis, acute and subacute endocarditis, acute myocarditis, other diseases of pericardium, other diseases of endocardium, cardiomyopathy, conduction disorders, cardiac dysrhythmias, heart failure, ill-defined descriptions and complications of heart disease.

Other Diseases of Respiratory System include empyema, pleurisy, pneumothorax, abscess of lung and mediastinum, pulmonary congestion and hypostasis, postinflammatory pulmonary fibrosis, other alveolar and parietoalveolar pneumonopathy, other diseases of lung, and other diseases of respiratory system.

Deaths from *motor-driven snow machines, other off-road vehicles, accidental falls and accidents caused by fire and flames* are included in Unintentional Injury death category in the annual mortality publication, but these causes of death are listed singly on this table.

Injury Undetermined deaths are not reported in the Unintentional Injury counts of the annual mortality publication. The difference between the categories, unintentional injuries and injury undetermined, is that the medical examiner, coroner or legal authority cannot determine if the injuries are accidental, suicidal or homicidal. From 1981 to 1998, eighty-one injury deaths among Alaska Natives were classified as Injury Undetermined.

Firearm deaths are reported three different ways on Table 6. Total firearm deaths include accidents caused by firearm missile, suicide and self-inflicted injury by firearms, assault by firearms, injury due to legal intervention by firearm, and injury by firearms undetermined whether accidentally or purposely inflicted.

Assault by firearm is also reported separately from total firearm deaths.

Suicide deaths are published annually, but they are included to highlight the fact that roughly three-fourths of suicides among Alaska Natives from 1981 – 1998 were a result of firearms.



Alaska Native Mortality

1980 – 1998



Department of Health & Human Services
Public Health Service
Indian Health Service
Alaska Area Native Health Service
Alaska Native Tribal Health Consortium

