

# INTRODUCTION

---

## ABOUT ALASKA

Alaska is the largest of the 50 states and contains approximately 16% of the country's land mass. Because of its size, Alaska has widely diverse geographic, climatic, and demographic characteristics, all of which affect public health.

Alaska contains roughly 586,412 square miles of land. Alaska's estimated population on July 1, 1996, was 607,314, or slightly more than one person per square mile. Alaska also claims the most northern, western and eastern points of land in the United States, more miles of coastline than all of the contiguous 48 states combined (6,640 miles not including islands), over 5,000 glaciers, over 3 million fresh water lakes (one of which, Iliamna, is the second largest in the U.S.), and 3,000 rivers, of which the Yukon is the third longest river in the United States. Much of the coastline and fresh water areas are used as transportation corridors, as well as fishing grounds. Remote lands are used for hunting and recreational activities.

Unique climatic conditions affect Alaska's people. Temperatures can range from as high as 100°F to lows that approach -80°F. Alaska experiences extremes in precipitation as well. Some areas of the state may receive up to 200 inches of precipitation annually, while other areas receive as little as 12 inches.

Demographically, whites make up 74.6 percent of the total population; Natives<sup>1</sup>, 16.5 percent, blacks, 4.5 percent; and Asian and Pacific Islanders, 4.4 percent. Males comprise 52.2 percent and females, 47.8 percent of the population.<sup>2</sup>

With diverse cultures, sparse population, severe temperatures, vast coastline, and outdoor lifestyles, the state experiences many unique health care challenges. One such challenge is providing adequate medical care and health care assistance to residents who live in remote areas of the state. The federal Indian Health Service (IHS), the State of Alaska, and private entities provide health care in these areas through funding for public health nurses and other health care workers.

The *Bureau of Vital Statistics 1996 Annual Report* focuses on health status indicators in Alaska. Some comparisons between Alaska health status indicators and national indicators are made. Although some similarities between Alaska and the rest of the United States exist, there are many dissimilarities. By reporting these indicators, our hope is to assist other professionals to evaluate the status of health in Alaska. The events and vital statistics discussed throughout this report can be useful tools for health care planners, providers, and professionals, but do not provide answers in themselves.

## HOW VITAL STATISTICS ARE COLLECTED

Section 18.50.010 of the Alaska Statutes establishes the Bureau of Vital Statistics to install, maintain, and operate a system of vital records. These records contain birth, death, fetal death, divorce, marriage, and adoption information.

When a birth occurs in Alaska, there is a legal process for recording that birth (AS 18.50.160). Generally, a physician, midwife, and/or hospital medical records staff person prepares a birth certificate from information provided by the birth mother and the delivery attendant.

Death certificates are usually completed by a funeral home staff member or a local magistrate, and then signed by the attending physician or medical examiner. Death certificates should be filed with the local recording district office

1 In this report, *Native* includes any people indigenous to the Western Hemisphere: Alaska Native, Native mixed, Aleut, Eskimo, Canadian Eskimo and Indian, and American Indian.

2 Alaska Department of Labor, Research and Analysis Section, Demographics Unit, Juneau, Alaska.

within three days of the date of death (AS 18.50.230). After the certificate has been recorded at the local district office, it is then forwarded to the Bureau of Vital Statistics in Juneau for registration.

When a birth or death occurs in Alaska to a resident of another state, the Bureau sends the respective state's registrar a copy of the certificate. Similarly, when a birth or death occurs to an Alaskan resident in another state, that state's registrar, by formal agreement, sends a copy of the certificate the Alaska Bureau of Vital Statistics. This cooperative arrangement allows us to include all births and deaths involving Alaskan residents wherever they occur within the country.

In the past, the Alaska Court System issued a license and filed a certificate for each marriage performed in the state. The certificate was filed with the local recording office of the Court System within seven days of the marriage (AS 18.50.270). The local recording office then forwarded the certificate to the Bureau for registration and permanent retention. In 1997 the Bureau of Vital Statistics began issuing marriage licenses in Juneau, Anchorage, and Fairbanks, as well as registering and providing permanent retention of documents. Marriage licenses in other parts of the state continue to be issued by the Court System.

Divorce, dissolution, and annulment certificates are prepared by a clerk of the court from information provided by the petitioner, plaintiff, and (possibly) court documents. The completed certificate is then forwarded to the Bureau for final registration (AS 18.50.280).

For each adoption granted by the court, a report of adoption is prepared and registered with the Bureau (AS 18.50.210). In the event that a child was born in Alaska and adopted in another state, the Bureau receives that state's equivalent of our report of adoption. These copies may only be used for statistical purposes. They may not be released to third parties. Individuals must obtain copies of their birth record from the jurisdiction (state, county or city) where they were born.

## **POPULATION ESTIMATES**

Population estimates used in this report were obtained from the State of Alaska, Department of Labor (DOL), Research and Analysis Section (R&A), Demographics Unit. Estimates are made by race, age, and geographic area. The 1996 estimated Alaskan population was 607,314 persons, with 316,645 males and 290,669 females. During 1996 there were 108.9 males for every 100 females in Alaska.

The Alaska Department of Labor updates its population estimates annually. The estimate of total population is revised each year to correspond to the U.S. Census Bureau state total. Using the decennial census as a base, birth, death, IRS, Alaska Permanent Fund and education statistics are used to produce annual population estimates for geographic areas.

In Alaska during 1996, 453,117 persons were white, 100,025 were Native, 27,268 were black, and 26,904 were Asian and Pacific Islander. Residents of the Anchorage census area comprised 41.8 percent of the state's population during 1996. About 78.7 percent of Alaska's population was concentrated in six census areas: Anchorage, Fairbanks, Juneau, Kenai, Ketchikan, and Matanuska-Susitna.

The age of a population is important when interpreting vital statistics, because behaviors and health risks of younger populations differ from those exhibited by older populations. Age, race, and sex distributions within a population are also important. The median age for Alaskan males during 1996 was 32.0 years; for females it was 31.8 years; and for all Alaskans it was 31.9 years. There was a difference of more than ten years in the median age of whites (33.9) and Alaska Natives (23.2).<sup>3</sup> The overall median age in the United States during 1996 was 34.6 years. The median age for males in the United States was 33.5 years and for females it was 35.7 years<sup>4</sup>. The median age for U.S. whites was

3 Ibid.

35.7 and for Native Americans it was 27.0. For an example of the disparity of the age distribution of Alaska versus that of the United States, please refer to Chart I.1 in Appendix I. For further information about interpretation of vital statistics, refer to "How to Use Vital Statistics" below.

## HOW CERTIFICATES ARE PROCESSED

In 1994, the Bureau instituted an Electronic Birth Certificate (EBC) system. This system enables hospital and clinic staff to record all birth certificate information by computer. As information is entered for each individual certificate, the computer checks for invalid or improbable data. When the certificate has been entered on the EBC system, the data is certified, recorded, and filed by the Bureau. Each certificate is then examined electronically for missing or out-of-range information and returned to the facility or birth attendant for verification and/or correction. During 1996, more than 95% of all births occurring in Alaska were recorded by EBC.

Other vital records received by the Bureau go through a different verification process. First, a trained documents processor reviews the certificate for completeness. If the certificate is incomplete it is returned to the appropriate office for completion. Once a document has been received and accepted, information is entered into the data base by two different employees. This double-entry verification process reduces data entry errors.

Causes of death are determined by a physician or medical examiner and narrative descriptions are entered on the death certificate. The narrative causes of death are typed into a computer file by Bureau staff. SuperMICAR, a program produced, maintained, and provided by National Center for Health Statistics (NCHS), codes 75-80 percent of causes of death according to ICD-9 standards. (See Appendix C for groupings of ICD-9 causes of death.) The bureau transmits the computer file by diskette or e-mail to NCHS. NCHS completes coding for the remainder of the records. This coding is then returned to the bureau and transmitted into its data base.

## HOW THIS REPORT WAS PREPARED

After documents have been entered into the Bureau's data base, research staff perform computer checks to test for missing, out-of-range, and duplicate data. Because this report is based not only on events which occur in Alaska, but also events which occur in other states to Alaska residents, there may be a significant lag time before data is received. One of the important checks made by research staff is for duplicate entries of events. Waiting for all data to arrive and eliminating duplicate entries are both important steps in ensuring the most accurate report possible. After we believe the data is both accurate and complete, data programs can be run to generate information from which the tables, charts, and narrative analyses can be written for this report.

## HOW TO USE VITAL STATISTICS

### Vital Events

Vital events registered with the Bureau of Vital Statistics include live births, fetal deaths (after at least 20 weeks gestation), adoptions, marriages, divorces, and deaths. Information on each of these events is provided on standard forms. (See Appendix G.) Vital events do not include fetal deaths prior to the 20th week of gestation; living arrangements not formalized through adoption, marriage or divorce; or illnesses which do not result in death.

### Reliability of the Data

Reliability of information may vary depending on the collection method. For instance, some information on birth and death certificates is collected and provided by health facilities or medical professionals (birth weight, complications of labor and delivery, cause of death, etc.), while other information is self-reported or reported by

4 Day, Jennifer Cheeseman, *Population Projections of the United States by Age, Sex, Race, and Hispanic Origin: 1995 to 2050*, U.S. Bureau of the Census, Current Population Reports, P25-1130, U.S. Government Printing Office, Washington, DC, February, 1996, p. 44 (Alaska State Library U.S. Government Publications, reference C3.186).

relatives (smoking during pregnancy, marital status of deceased, etc.). The Bureau of Vital Statistics makes every effort to complete, verify, and correct information which is missing, invalid, or inconsistent. Ultimately, the reliability of the data depends on everyone who is involved in data collection, storage and retrieval: Bureau staff, medical professionals, magistrates, funeral directors, marriage commissioners, judges, and each individual involved in, or witness to, a vital event.

## Counting Number of Events

The most basic data available is the number of events. In any analysis, the most pertinent information must be determined and the limitations of that information must be identified. For instance, if you want to predict public school kindergarten enrollment, the most pertinent vital event data is the number of live births in the period which qualifies children for enrollment. You will want to count only resident births for the geographic area of the appropriate schools. You will need to consider limitations of this data, such as effects of infant and preschool mortality (this information can be obtained from death data), in-migration and out-migration, and potential alternatives to public school enrollment.

## Comparing Different Populations

Comparing the number of events in two separate locations may not be meaningful. We can guess that Anchorage will have more births than Juneau because Anchorage has a larger population. A more meaningful question is, what is the number of births compared to the size of the population? To make this comparison, we calculate a *ratio* by dividing the number of events by the population for which that event could have occurred. For instance, if there are 4,200 births in Anchorage and a population of 280,000 people, then the ratio of births to population is  $4200/280000$  or 0.015 births for every person living in Anchorage. If there are 500 births in Juneau and a population of 30,000 then the ratio of births to population in Juneau is  $500/30000$  or 0.0166666 births for every person living in Juneau.

Since small decimal numbers are awkward to interpret, we change the ratio to a *rate* by multiplying it by a *constant of proportionality*. This constant of proportionality can be any number, as long as the same number is used in calculating every rate. To calculate birth rates, we usually use a constant of proportionality of 1,000. Following this method, the birth rate for Anchorage would be  $0.015 \times 1,000$  or 15 births per 1,000 population. The birth rate for Juneau would be  $0.0166666 \times 1,000$  or 16.6666 births per 1,000 population. We would usually round this number to the nearest tenth (16.7). We can see that while there are fewer births in Juneau in this example, the rate per 1,000 population is greater.

The birth rates described in the last paragraph are *crude birth rates* because they compare events to total population. A more meaningful comparison would be to include in the population only women of child-bearing ages (15-44 years of age). We call this the *fertility rate*. This allows us to compare populations with different ratios of females of child-bearing ages. Let's assume that the number of women ages 15-44 in Anchorage is 66,500 and in Juneau is 7,300. The Anchorage fertility rate would be  $(4200/66500) \times 1000$  or 70.0 births for every 1,000 women of child-bearing age. The Juneau fertility rate would be  $(500/7300) \times 1000$  or 68.5 births for every 1,000 women of child-bearing age. While Anchorage had a lower crude birth rate than Juneau in this example, the Anchorage fertility rate is higher than for Juneau. This is because the ratio of women of childbearing age to the total population in Anchorage ( $66500/280000$  or .2375) is lower than in Juneau ( $7300/30000$  or .243333).

Please note that all of the numbers in the foregoing examples are hypothetical for purposes of illustration.

## Constant of Proportionality

In calculating crude birth rates and fertility rates, we used a constant of proportionality of 1,000. Vital statistics are reported with different constants of proportionality. Readers should familiarize themselves with how rates are calculated so that validity is maintained when comparing rates. Unless rates are calculated with the same constant of proportionality, comparisons will lead to erroneous conclusions. For instance, in this report we calculate death rates per 100,000 population. If the National Center for Health Statistics (NCHS) reported deaths per 1,000 population, we would have to convert NCHS rates to 100,000 population for a valid comparison.

**Small Populations and Few Events**

Data based upon small populations and numbers of events require particular care in data analysis. In Alaska, for example, variability should be expected when looking at small groups within the population. Precautions are taken to avoid drawing false conclusions from random or unusual events. Two methods are used in this report to provide greater validity to calculated rates. They are moving averages and confidence intervals. (For an explanation of each method, see "Vital Statistics Formulas" in Appendix B.

**DETERMINATION OF RACE**

The National Center for Health Statistics (NCHS) issues guidelines for determining the race of a child at birth. With few exceptions, the child's race on the birth certificate is the same as the mother's stated race. These guidelines became effective in 1989. Appendix E provides more details on how the race of the child is determined.

Sometimes race will be recorded differently on death certificates. This can distort death rates, particularly in the case of infant mortality, where a child's race may be reported as white on the birth certificate because the mother is white, and Native on the death certificate because the father is Native. To ensure consistent reporting and calculation of rates, a new procedure was used in this report. All death certificates for decedents who were born in Alaska in 1989 or later are matched with the birth certificate and the child's race at birth is used for calculating deaths and death rates by race.