

# Non-Fatal Injury Hospitalizations Among Alaska Natives, 1994-1999: Results from the Alaska Trauma Registry

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## ABSTRACT

The Alaska Trauma Registry collects data on injuries resulting in hospitalization or transfer to a higher level of care from every hospital in the state. We analyzed non-fatal injuries to Alaska Native and White residents from 1994-1999. Statewide, the five most common causes of injuries to Alaska Natives were falls, suicide attempts, off-road vehicles, motor vehicles, and assaults. These accounted for two-thirds of all injuries; falls accounted for 26.3% of all injuries. For total injuries and for each cause, injury rates were significantly higher for Alaska Natives than Alaska Whites. The greatest discrepancies were for suicide attempts with firearms (Rate Ratio=12.7) and assault by striking (Rate Ratio=8.9). Alcohol was noted on the record of 37.5% of Alaska Native injuries and 15.5% of Alaska White injuries. Alcohol was involved in 60.8% of intentional injuries involving Alaska Natives and 27.1% for Alaska Whites.

## INTRODUCTION

Injuries are the leading cause of death for Alaska Natives between 1 and 74 years of age, and the second leading cause of death for Alaska Natives of all ages. One out of every four deaths among Alaska Natives is caused by an injury. Between 1989 and 1998, the unintentional injury mortality rate for Alaska Natives (118.6 per 100,000) was 2.5 times greater than the Alaska White rate and four times greater than the rate for U.S. Whites (1).

The burden of injury is not limited to loss of life. For example, the direct costs of injury hospitalizations in the Tanana Chiefs Conference (TCC), a small tribal health corporation of interior Alaska, was over \$4 million between 1994 and 1998 (2). The population served by TCC was 11,620 in 1996 (3). This does not include costs that were passed on to third party payers such as private insurance, Medicare, Medicaid, and the Veteran's Administration (2). In addition to the immediate health care costs for non-fatal injuries, there are ongoing costs of permanent disability, possible legal costs, and the reduced quality of life experienced by many survivors (4).

There is not, in the published literature, a comprehensive description of non-fatal injuries among Alaska Natives, or a formal comparison of these injuries by region within Alaska. Regional analysis is important because injury patterns in Alaska vary among regions (5). The purpose of this study was to examine non-fatal injuries to Alaska Natives recorded in the Alaska Trauma Registry from 1994 to 1999. Aggregating six years of data achieves large enough numbers of injuries to support regional analysis.

## METHODS

Injury hospitalization data were obtained from the State of Alaska's Injury Surveillance and Prevention program. This program maintains the Alaska Trauma Registry (ATR). The ATR was established in 1988 as a pilot project and has collected data on injuries resulting in hospitalization from every hospital in Alaska since 1991 (4). Up to 144 data elements, including demographics, diagnoses, circumstances of injury, use of safety equipment, and blood alcohol or drug screening results, may be collected by each hospital's trauma registrar. The registrars abstract the medical records of all injured patients who are admitted to the hospital for at least 24 hours or who are transferred to another facility for a higher level of care (5). Registrars are trained through an annual workshop and onsite visits. A user manual and phone and email support are also available (M. Moore, Department of Health and Social Services, Section of Community Health and EMS, Injury Surveillance and Prevention Unit Manager, personal communication).

To be included in this analysis, each ATR event must have occurred to an Alaska Native or White resident from January 1, 1994 to December 31, 1999; have been assigned a primary diagnosis in the ICD-9-CM nature of injury (N-code) range N800-994.9 (6); and have been admitted to a hospital for 24 or more hours or transferred to a higher level of care. Injuries seen in an emergency department or village health clinic but not admitted to a hospital, and injuries that occurred outside of the state of Alaska are not recorded in the ATR. Injuries that resulted in death were excluded from this analysis because a recent analysis of fatal injuries has been published elsewhere (1).

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Race was determined through a review of the patient's medical record. Alaska Native patients are required to provide proof of Tribal enrollment to be eligible for Tribal or federal health care benefits. The denominators used to calculate rates for Alaska Natives were derived by applying the statewide age distribution of Alaska Natives from the Alaska State Department of Labor (DOL) intercensal estimates for 1996 (midpoint 1994-1999) to the 1996 Indian Health Service (IHS) user population for Alaska Natives (3,7). User populations are defined as American Indian or Alaska Native beneficiaries who used a facility that reports into the IHS national data system at least once in a three-year period (3). These estimates were then multiplied by six to estimate the population for the entire period from 1994 to 1999. Population estimates and age distributions for White residents were taken from the 1996 intercensal estimates from the Alaska State DOL and multiplied by six (7). An age-adjusted overall rate of injuries for Alaska Native and White residents is presented. Age-adjustment was conducted using the direct method and the U.S. 2000 standard population (8). Other rates presented in this document are crude rates.

In addition to the ICD-9-CM N-code, all injuries included in the ATR are assigned an external cause of injury code, or E-code (6). The E-codes are supplementary classifications of the causes of injuries that are assigned in parallel with the ICD code describing the physical nature of the injury. Categories of E-codes have been grouped and are presented according to mechanism of injury and intent (unintentional, suicide attempt, or assault). An additional analysis of subsets within these categories was conducted to focus on injuries particularly important for Alaskans. For example, injuries due to excessive cold and to dog bites, both subheadings of the category "Accidents due to natural and environmental factors," were analyzed individually, as were "Accidents caused by cutting and piercing objects," a subheading of the category "Other."

The 10 leading causes of non-fatal injury hospitalization were identified for Alaska Native and White residents for Alaska as a whole. The leading causes were also identified by age and sex within each race. Further analyses examined alcohol-related injuries, traumatic brain injuries, injuries resulting in permanent disability, and length of hospitalization. To make comparisons between groups, rate ratios and 95% confidence intervals for the rate ratios were calculated. Rates were considered significantly different at  $p < .05$  if the confidence interval around the rate ratio did not include 1.0.

There are nearly 120,000 Alaska Native residents of the state (8), comprising 229 federally-recognized Native Tribes in Alaska and several more that have not yet achieved federal recognition. The recognized Tribes are sovereign entities that deal with the federal government on a government-to-government basis. Most Alaska Tribes have chosen to join one of 22 regional not-for-profit Tribal Health Corporations (THCs) for the purposes of overseeing their own physical and mental health care and social service delivery (Figure 1).

Seven of the regions were selected for separate analysis because the numbers of injuries were large enough to support reliable analysis; specifically, there were at least 400 non-fatal injury hospitalizations in each region during the six-year period included in the analysis. The five leading causes of non-fatal

injury hospitalization for Alaska Natives were identified for the seven Alaska Native Regional Health Corporations.

## RESULTS

### Statewide Analysis

There were 8,356 and 13,117 non-fatal injury hospitalizations among Alaska Native and White residents, respectively, between 1994 and 1999. The age-adjusted injury hospitalization rate for Alaska Natives was 151.0 (per 10,000) compared to 60.0 for Alaska whites, for a rate ratio of 2.5.

The leading causes of non-fatal injury hospitalization among Alaska Natives were unintentional falls (crude rate = 35.5 per 10,000); suicide attempt by poisoning (16.7); unintentional injuries involving "other transport," which includes off-road vehicles (14.1); motor vehicles (12.7); and "assault, struck by or against," which includes unarmed fights or brawls, and strikes with a blunt object (11.9) (Figure 2). Two-thirds of all injury hospitalizations among Alaska Natives were the result of these five causes. The 10 most common causes of injury hospitalization were the same for Alaska Whites, but in a different order (Figure 3).

The disparity between Alaska Native and White residents was greatest for intentional injuries (RR 5.3, CI 5.0 to 5.6) (Table 1). The highest rate ratios among intentional injuries were for suicide attempts involving firearms (RR 12.5, CI 8.4 to 18.5) and assault, struck by or against (RR 8.8, CI 7.8 to 10.0). The greatest injury disparity identified in this study occurred in the 10 to 19 year age stratum. Alaska Natives in this age group were 55 times as likely to be hospitalized for a suicide attempt with a firearm than white residents of the same age. The disparity between Alaska Native and White residents for unintentional injuries was considerably less (RR 2.3, CI 2.2 to 2.4) (Table 2). Injury disparities generally diminished with age.

The greatest number of injury hospitalizations occurred among the 30 to 39 year age group for both Alaska Natives and Whites (N = 1,767 and 2,473, respectively). The greatest rate of injuries occurred among those 80 years and over for both races (376.6 per 10,000 and 338.9, respectively) (Figures 2 and 3). Falls were the leading cause of injury hospitalization among both Alaska Native and White residents of all ages except 10 to 29 years. The rate of hospitalization for falls was highest among those 80 years and over for both races.

Fifty-nine percent of injuries to Alaska Natives were to males (4,891/8,356). Alaska Native males were more often hospitalized for excessive cold (RR = 4.3, CI 2.8 to 6.7) and off-road motor vehicle injuries (RR = 2.9, CI 2.5 to 3.5) than Alaska Native females. Alaska Native females were more often hospitalized for assault, struck by or against (RR = 2.8, CI 2.4 to 3.3) and suicide attempts by poisoning (RR = 2.4, CI 2.1 to 2.7) than Alaska Native males. The differences between the sexes in terms of cause of injury were similar for Alaska Whites with the exception of assault. Alaska White males were six times more likely to suffer this type of injury than Alaska White females.

Overall, alcohol was noted on the medical record for 37.5% (3,135/8,356) of injuries to Alaska Natives and 15.5% (2,032/13,119) of injuries to Alaskan Whites. Alcohol was most frequently

associated with assault struck by, against injuries among both Alaska Native and White residents (68.4% (502/734) and 51.9% (189/364) of assaults respectively) (Figure 4).

Eleven percent (947/8,356) of injuries that resulted in hospitalization among Alaska Natives also resulted in traumatic brain injury (TBI), compared to 12% (1,567/13,119) among Alaska Whites. Falls, motor vehicle injuries, off-road motor vehicle injuries, and assault were the leading causes of TBI among Alaska Natives. These four mechanisms of injury combined accounted for 81% (760/947) of all TBI cases among Alaska Natives (Figure 5). Alaska Whites are more likely to suffer a TBI during a motor vehicle crash than are Alaska Natives (45% (711/1,567) and 21% (202/947) of TBIs, respectively). In contrast, Alaska Natives are more likely to suffer a TBI injury caused by an off-road motor vehicle (18% (174/947) vs. 6% (92/1,567)) or assault struck by or against (18% (172/947) vs. 5% (85/1,567)).

Between 1994 and 1999, 1,238 Alaska Whites and 385 Alaska Natives suffered a permanent disability caused by an injury. Nearly 10% (1,238/13,119) of all injury hospitalizations among Alaska Whites resulted in a disability, making this group twice as likely to be disabled from an injury as Alaska Natives (Figure 6). The leading cause of permanent disability for both groups was injuries caused by motor vehicles. However, Alaska Whites were twice as likely as Alaska Natives to suffer a permanent disability from this cause.

Between 1994 and 1999, Alaska Natives spent 46,678 days in acute care Alaskan hospitals for the treatment of injuries. The median length of stay (LOS) for injuries from all causes was three days for Alaska Natives and two days for Alaska Whites. More than one-quarter of all injury-related hospital days among Alaska Natives were caused by falls (28%). Fall injuries had a median LOS of three days. Three of the injury causes examined here resulted in a median LOS greater than three. Pedestrian injuries, excessive cold, and fire/burn injuries had median LOS of four, 5.5, and six days, respectively.

### Regional Analysis

Only one of the seven Tribal Health Corporation regions we were able to analyze separately had crude injury hospitalization rates less than 100.0 per 10,000 population (Table 5). Falls were the leading cause of injury hospitalization for all but one of the Tribal Health Corporations examined here (Figure 7). In general, the most rural areas experienced the highest rates of hospitalization from injuries involving off-road vehicles and the lowest rates from motor vehicle injuries. In part this reflects the lack of roads in rural Alaska and consequent reliance on ATVs and snowmachines. Tribal Health Corporations including urban and suburban residents had higher rates of injuries caused by motor vehicles. Intentional injuries were among the top five causes of injury hospitalization in every THC examined here, but varied considerably in their degree of importance.

### DISCUSSION

The ATR data are very comprehensive. They are derived from a standardized chart abstraction from every hospital in Alaska. Nevertheless, some limitations of this study should be mentioned.

Only injuries that led to a hospitalization of 24 hours or more, or transfer to another facility for a higher level of care, are captured in the ATR. Many injuries are serious enough to lead to a visit to a health care provider or emergency room but are not represented in these data (5). Due to the isolated nature of rural regions of Alaska, injuries that might have resulted in hospitalization in Anchorage, Fairbanks, or a hub town with a regional hospital may not result in hospitalizations in other parts of the state, often because of limited access to facilities. This means that injury estimates from this study are conservative and likely are underestimates of the true injury burden in Alaska Natives, relative to other Alaska residents, because Alaska Natives are disproportionately rural residents (9).

The ATR data are collected by abstracting medical records, which may have incomplete data. Alcohol and drug involvement are particularly problematic. The absence of a clinical note or blood test result does not necessarily mean that alcohol or drugs were not involved; our ability to retrieve this information depends on a clinician making a note in the chart or ordering a laboratory test that is recorded on the chart. Thus, the results presented here pertaining to substance involvement are likely to be underestimates.

This study has shown that Alaska Natives are disproportionately affected by injury. Alaska Natives make up just 19% of Alaska's population (9), but they accounted for 37% of the state's admissions for injury from 1994 to 1999. Overall, the age-adjusted injury hospitalization rate among Alaska Natives exceeds that of Alaska Whites by two and one-half times.

Falls were the most frequent cause of non-fatal injury hospitalization among Alaska Natives, accounting for 26% of injuries, 28% of hospital days and 20% of permanent disabilities. Falls can have a diverse set of causes, many of which are preventable. They may be as basic as slipping on a loose area rug or tripping on the stairs at home, or may involve substantial falls, such as from a building.

Intentional injuries, both assault and suicide, are also a very large problem among Alaska Natives, especially in the late teens and young adults age groups and were often associated with alcohol use. In fact, 61% of all intentional injuries to Alaska Natives examined here involved alcohol.

### Prevention Programs

Although Alaska has a high rate of injury morbidity, several successful programs have been implemented to reduce injury rates. Since 1981, Alaska has allowed communities to choose their level of alcohol availability (10). This is generally referred to as Local Option. Communities may choose to ban the sale, purchase, and possession of alcohol completely (dry); permit the possession but not the sale or purchase of alcohol (damp); or not restrict alcohol sales, purchase, or possession by adults (wet). The Local Option has been implemented primarily in Alaska Native villages and is not generally accepted in villages with a large non-Native population. (11). Although this law is not aimed specifically at preventing injuries, two studies have found that injury mortality rates in dry villages are lower than those in wet villages (11,12). Chiu et al. (13,14) also found the number of alcohol related outpatient visits to be much lower in one rural village of Alaska

during periods when the dry option was in effect versus periods when the village was wet.

Off-road vehicle injuries had the greatest impact in the rural regions of Alaska, particularly northern and western Alaska where these vehicles are the dominant means of transportation. Most rural residents travel by snowmachine in the winter and all-terrain vehicles (ATV) in the summer. The large burden of injuries from off-road vehicles among Alaska Natives, with a high percentage resulting in traumatic brain injury, is troubling and the lack of a state law requiring helmet use may contribute to the problem. About half of Alaska's urban recreational snowmachine users wear helmets (15) but helmets are rarely used daily in rural villages and only sometimes used when traveling longer distances in rural Alaska. Healthy Alaskans 2010 has set the goal of increasing helmet use by snowmachine users to 70% and by ATV users to 45% (statewide baseline 13%) (15).

Some regions have implemented local ordinances requiring helmet use. The Bristol Bay region in southwestern Alaska has had a great deal of success using this method. In the past four years, the Bristol Bay Area Health Corporation (BBAHC) has distributed over 900 snowmachine helmets. The helmet distribution program has recovered 11 helmets that were worn during a crash and saved a youth from head injury. Physicians at the BBAHC region hospital estimate that each of the 11 helmets saved BBAHC a minimum of \$100,000 in medical treatment costs (Ward Jones, Injury Prevention Specialist, BBAHC, personal communication).

Some villages in the Bristol Bay region have requirements for youth to wear helmets, although this is not being enforced in all areas, and some have purchased helmets for all youth in their village. One village requires youth to participate in an ATV safety course. Youth are issued an ATV driver's license upon completion of the course (Ward Jones, personal communication).

The Bristol Bay region has also had success with a program to reduce dog maulings and bites. A well-known Iditarod musher worked with mushers in the region to improve the conditions of their kennels. Significant changes in the risk of dog bites and mauling have been observed since this program was implemented (Ward Jones, personal communication).

Mortality data from Interior Alaska indicated a very high drowning rate among Alaska Natives between 1977 and 1987 (16). In response, the Tanana Chiefs Conference (TCC) in interior Alaska implemented a boating safety program in 1988. TCC provided villages with boating safety training and purchased float coats, which were made available for purchase at cost to interior Alaska residents. The TCC drowning rate dropped from 87 per 100,000 in the three-year period from 1987 to 1989 to 28 per 100,000 in the three-year period from 1993 to 1995 (Mike Keiffer, Commissioned Core Liaison, Public Health Service, unpublished data). Other Tribal Health Corporations, including the Yukon Kuskokwim Health Corporation (YKHC) (17) and the Southeast Alaska Regional Health Corporation (SEARHC) have experienced reductions in their drowning rate as a result of similar programs.

According to the state of Alaska, firearms are the cause of more injury deaths among Alaskan children and adolescents than any other mechanism (18). In response to this problem, the BBAHC conducted a pilot study in 2001 to reduce unauthorized

access to firearms by youth by distributing gun safes and trigger locks (19). This study installed gun safes and trigger locks in 40 homes in one rural Alaska Native community and evaluated their use over time. Unannounced follow-up visits to intervention homes documented that nearly 90% of gun safes and 30% of trigger locks were correctly used three months after installation. The results from this study are being used to design and implement similar projects throughout rural Alaska.

### Future Research and Data Needs

Collection of data from the records of injured persons treated at emergency rooms and village clinics that do not have facilities to hospitalize the injured would capture a much greater proportion of all injuries in Alaska and allow a more comprehensive look at injury patterns. Further, studying patterns of non-fatal injuries compared to fatal injuries may help form ideas for new prevention programs.

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Table 1: Intentional injury hospitalization rates by race and mechanism, Alaska, 1994-1999

Mechanism of Injury	Alaska Native	White	Rate Ratio	95% Confidence Interval
Suicide Attempts	22.0	5.5	4.0	3.7 – 4.3
Firearm	1.5	0.1	12.5	8.4 – 18.5
Poisoning	16.7	4.9	3.4	3.2 – 3.7
All other mechanisms	3.8	0.5	7.8	6.3 – 9.7
Assaults	18.2	2.1	8.7	8.0 – 9.8
Struck by, Against <sup>1</sup>	11.9	1.3	8.8	7.8 – 10.0
Firearm	0.6	0.2	2.6	1.7 – 3.9
All other mechanisms	5.7	0.5	11.5	9.4 – 14.0
<b>Total</b>	<b>40.2</b>	<b>7.6</b>	<b>5.3</b>	<b>5.0 – 5.6</b>

<sup>1</sup>Includes ICD-9 E-codes E 960.0: Unarmed fight or brawl and E 968.2: Striking by blunt or thrown object.

Table 2: Unintentional injury hospitalization rates by race and mechanism, Alaska, 1994 – 1999.

Mechanism of Injury	Alaska Native	White	Rate Ratio	95% Confidence Interval
Falls	35.5	17.6	2.0	1.9 – 2.1
Other Transport	14.1	3.7	3.8	3.4 – 4.1
Off-Road Motor Vehicle	11.8	2.1	5.6	5.1 – 6.3
All other mechanisms	2.3	1.7	1.4	1.2 – 1.7
Motor Vehicle Traffic	12.7	8.1	1.6	1.4 – 1.7
Occupant	8.8	6.0	1.5	1.3 – 1.6
Pedestrian	2.4	0.5	4.4	3.5 – 5.5
Other MV Traffic	1.5	1.5	1.0	0.8 – 1.2
Cut/Pierce	4.9	1.2	4.0	3.4 – 4.6
Struck By, Against	4.6	2.2	2.1	1.8 – 2.4
Other Injury	3.8	1.3	2.9	2.5 – 3.4
Natural/Environmental	3.5	1.0	3.4	2.9 – 4.1
Excessive Cold	2.2	0.4	5.6	4.3 – 7.2
Dog Bite	0.9	0.3	3.3	2.3 – 4.6
Other Nat/Env	0.4	0.4	1.2	0.8 – 1.8
Fire/Burn	3.4	1.1	3.1	2.6 – 3.7
All Other Unintentional	10.8	4.4	2.5	2.2 – 2.7
<b>Total</b>	<b>93.3</b>	<b>40.6</b>	<b>2.3</b>	<b>2.2 – 2.4</b>

Figure Legends:

Figure 1: Map of Tribal Health Corporation Regions, Alaska, 2003

Figure 2: Rates per 10,000 of Non-Fatal Injury Hospitalization by Cause and Age Group, Alaska Natives, 1994-1999

Figure 3: Rates per 10,000 of Non-Fatal Injury Hospitalization by Cause and Age Group, Alaska White Residents, 1994-1999

Figure 4: Percent of Injury Hospitalizations with Alcohol Use Reported on Chart, by Cause and Race, Alaska, 1994-1999

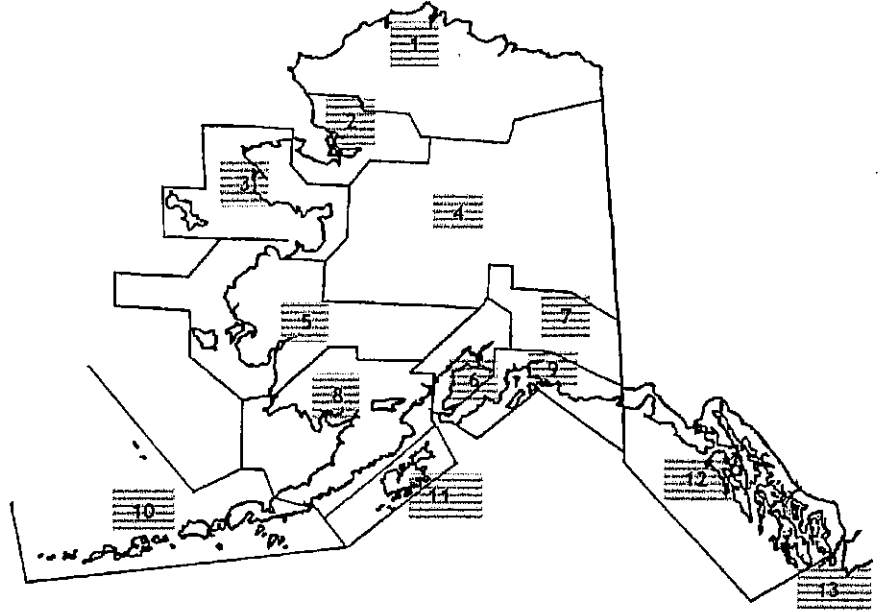
Figure 5: Percent Distribution of Traumatic Brain Injuries by Cause and Race, Alaska, 1994-1999

Figure 6: Percent of Injuries Resulting in Permanent Disability by Cause and Race, Alaska, 1994-1999

Figure 7: Rates per 10,000 of Non-Fatal Injury Hospitalization by Cause and Tribal Health Corporation, Alaska Natives, 1994-1

Figure 1: Map of Tribal Health Corporation Regions, Alaska

- 1 Arctic Slope Native Association
- 2 Maniilaq Association
- 3 Norton Sound Health Corporation
- 4 Tanana Chiefs Conference
- 5 Yukon-Kuskokwim Health Corporation
- 6 SouthCentral Foundation
- \* Native Village of Eklutna
- \* Native Village of Tyonek
- \* Ninilchik Village Traditional Council
- \* Seldovia Village Tribe
- 7 Copper River Native Association
- \* Mt. Sanford Tribal Consortium
- 8 Bristol Bay Area Health Corporation
- 9 Chugachmiut
- \* Valdez Native Tribe
- 10 Aleutian/Pribilof Island Association
- \* Eastern Aleutian Tribes
- 11 Kodiak Area Native Association
- 12 SouthEast Alaska Regional Health Consortium
- \* Ketchikan Indian Community
- 13 Metlakatla Indian Community
- +Alaska Native Tribal Health Consortium



\*Tribal councils not numbered are included among the 22 members of the Alaska Native Health Board and are listed after the nearest Regional Health Corporation.

Figure 2: Rates per 10,000 of Non-Fatal Injury Hospitalization by Cause and Age Group, Alaska Natives, 1994-1999

	0-9 yrs	10-19 yrs	20-29 yrs	30-39 yrs	40-49 yrs	50-59 yrs	60-69 yrs	70-79 yrs	80+ yrs	All ages
<b>All causes</b>	63.1	123.6	186.8	184.3	149.1	130.2	154.1	175.8	376.6	135.1
<b>Top Ten Causes</b>										
1	Unintentional Falls 25.5	Suicide attempt Poisoning 25.2	Suicide attempt Poisoning 33.7	Unintentional Falls 36.3	Unintentional Falls 41.0	Unintentional Falls 52.3	Unintentional Falls 76.9	Unintentional Falls 125.6	Unintentional Falls 350.4	Unintentional Falls 35.5
2	Unintentional Other Specified 7.5	Unintentional Other Transport 19.2	Unintentional Falls 24.9	Suicide attempt Poisoning 27.7	Assault Struck by, Against 22.1	Unintentional Other Transport 14.6	Unintentional Other Transport 18.1	Unintentional M/V Traffic 12.2	Unintentional M/V Traffic 9.9	Suicide attempt Poisoning 16.7
3	Unintentional Fire/Burn 4.7	Unintentional Falls 16.7	Unintentional Other Transport 22.2	Assault Struck by, Against 27.0	Suicide attempt Poisoning 17.7	Unintentional M/V Traffic 13.3	Unintentional M/V Traffic 12.4	Unintentional Other Transport 8.6	Unintentional Fire/Burn 8.3	Unintentional Other Transport 14.1
4	Unintentional M/V Traffic 4.6	Unintentional M/V Traffic 14.0	Assault Struck by, Against 21.0	Unintentional Other Transport 17.6	Unintentional M/V Traffic 14.6	Assault Struck by, Against 9.7	Assault Struck by, Against 7.9	Assault Struck by, Against 2.9	Unintentional Other Transport 6.6	Unintentional M/V Traffic 12.7
5	Unintentional Poisoning 4.3	Unintentional Struck by, Against 6.2	Unintentional M/V Traffic 20.8	Unintentional M/V Traffic 15.3	Unintentional Other Transport 13.4	Suicide attempt Poisoning 8.2	Unintentional Natural/Environmental 4.5	Unintentional Struck by, Against 2.9	Unintentional Struck by, Against 6.6	Assault Struck by, Against 11.9
6	Unintentional Natural/Environmental 3.5	Assault Struck by, Against 5.2	Unintentional Cut/Pierce 8.6	Unintentional Cut/Pierce 8.8	Unintentional Cut/Pierce 5.4	Unintentional Natural/Environmental 4.4	Unintentional Fire/Burn 3.8	Unintentional Fire/Burn 2.9	Unintentional Natural/Environmental 3.3	Unintentional Cut/Pierce 4.9
7	Unintentional Other Transport 3.5	Unintentional Cut/Pierce 4.1	Suicide attempt, Cut/Pierce 8.2	Unintentional Struck by, Against 5.5	Unintentional Struck by, Against 4.2	Unintentional Cut/Pierce 4.1	Unintentional Struck by, Against 3.8	Unintentional Natural/Environmental 2.9	Assault Struck by, Against 1.2	Unintentional Struck by, Against 4.6
8	Pedal Cyclist, Other 2.8	Pedal Cyclist, Other 3.6	Unintentional Struck by, Against 6.7	Unintentional Natural/Environmental 5.3	Unintentional Natural/Environmental 3.2	Unintentional Fire/Burn 3.6	Unintentional Cut/Pierce 3.4	Suicide attempt Poisoning 2.2		Unintentional Other Specified 3.8
9	Unintentional Struck by, Against 2.6	Suicide attempt Cut/Pierce 3.5	Intentional Cut/Pierce 6.7	Suicide attempt Cut/Pierce 4.6	Unintentional Fire/Burn 2.9	Unintentional Other Specified 2.6	Unintentional Other Specified 2.3	Unintentional Other Specified 1.4		Unintentional Natural/Environmental 3.5
10	Unintentional Cut/Pierce 1.7	Unintentional Other Specified 3.5	Suicide attempt Firearm 4.2	Intentional Cut/Pierce 4.3	Unintentional Other Specified 2.1	Unintentional Struck by, Against 1.8	Suicide attempt Poisoning 1.5	Unintentional Cut/Pierce 0.7		Unintentional Fire/Burn 3.4

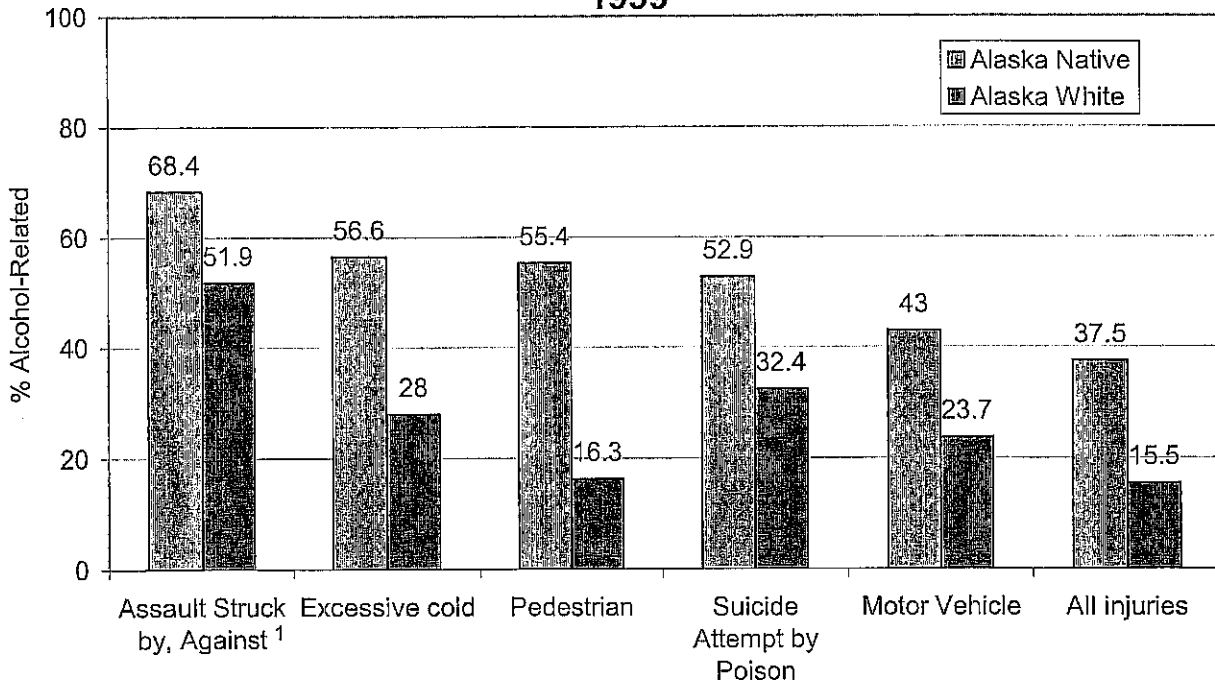
\*Includes ICD-9 E-codes E 960.0: Unarmed fight or brawl and E 968.2: Striking by blunt or thrown object.

Figure 3: Rates per 10,000 of Non-Fatal Injury Hospitalization by Cause and Age Group, Alaska White Residents, 1994-1999

	0-9 yrs	10-19 yrs	20-29 yrs	30-39 yrs	40-49 yrs	50-59 yrs	60-69 yrs	70-79 yrs	80+ yrs	All ages
<b>All causes</b>	21.4	482.5	63.2	45.8	42.1	48.0	64.0	118.5	339.0	48.4
<b>Top Ten Causes</b>										
1	Unintentional Falls 8.4	Unintentional M/V Traffic 11.5	Unintentional M/V Traffic 13.9	Unintentional Falls 10.9	Unintentional Falls 11.5	Unintentional Falls 12.7	Unintentional Falls 18.1	Unintentional Falls 93.0	Unintentional Falls 105.9	Unintentional Falls 17.3
2	Unintentional Poisoning 2.1	Unintentional Falls 10.7	Unintentional Falls 8.1	Unintentional M/V Traffic 8.1	Unintentional M/V Traffic 6.8	Unintentional M/V Traffic 7.3	Unintentional M/V Traffic 9.1	Unintentional M/V Traffic 10.0	Unintentional M/V Traffic 9.4	Unintentional M/V Traffic 0.4
3	Unintentional M/V Traffic 1.8	Suicide attempt Poisoning 6.6	Suicide attempt Poisoning 9.0	Suicide attempt Poisoning 7.2	Suicide attempt Poisoning 5.6	Unintentional Other Transport 4.2	Unintentional Other Transport 3.5	Unintentional Other Transport 3.4	Unintentional Fire/Burn 4.0	Suicide attempt Poisoning 4.9
4	Unintentional Other Specified 1.6	Unintentional Other Transport 4.6	Unintentional Other Transport 6.6	Unintentional Other Transport 4.0	Unintentional Other Transport 3.6	Suicide attempt Poisoning 2.6	Unintentional Machinery 2.2	Unintentional Fire/Burn 2.0	Unintentional Natural/Environmental 3.0	Unintentional Other Transport 3.7
5	Unintentional Struck by, Against 1.3	Unintentional Struck by, Against 2.9	Unintentional Struck by, Against 3.8	Unintentional Struck by, Against 2.5	Unintentional Struck by, Against 1.8	Unintentional Machinery 1.3	Unintentional Fire/Burn 1.8	Unintentional Natural/Environmental 1.6	Suicide attempt Poisoning 2.5	Unintentional Struck by, Against 2.2
6	Unintentional Fire/Burn 1.3	Pedal Cyclist, Other 1.9	Assault Struck by, Against 3.0	Assault Struck by, Against 2.1	Unintentional Overexertion 1.8	Unintentional Struck by, Against 1.2	Unintentional Natural/Environmental 1.7	Unintentional Struck by, Against 1.1	Unintentional Other Transport 2.0	Assault Struck by, Against 1.3
7	Unintentional Natural/Environmental 1.0	Unintentional Other Specified 1.9	Unintentional Cut/Pierce 2.6	Unintentional Cut/Pierce 1.7	Assault Struck by, Against 1.3	Unintentional Cut/Pierce 1.1	Unintentional Struck by, Against 1.3	Unintentional Other Specified 0.8	Unintentional Cut/Pierce 2.0	Unintentional Other Specified 1.3
8	Pedal Cyclist, Other 0.8	Unintentional Cut/Pierce 1.1	Unintentional Overexertion 1.7	Unintentional Other Specified 1.3	Unintentional Other Specified 1.3	Unintentional Natural/Environmental 1.1	Unintentional Overexertion 1.2	Suicide attempt Poisoning 0.6	Unintentional Struck by, Against 1.5	Unintentional Cut/Pierce 1.2
9	Unintentional Other Transport 0.7	Assault Struck by, Against 1.0	Unintentional Machinery 1.5	Unintentional Overexertion 1.1	Unintentional Natural/Environmental 1.0	Assault Struck by, Against 1.1	Unintentional Cut/Pierce 1.0		Unintentional Other Specified 1.0	Unintentional Fire/Burn 1.1
10	Unintentional Cut/Pierce 0.6	Unintentional Poisoning 1.0	Unintentional Other Specified 1.5	Two Tied 1.0	Unintentional Machinery 0.9	Unintentional Overexertion 1.0	Assault Struck by, Against 0.8			Unintentional Natural/Environmental 1.0

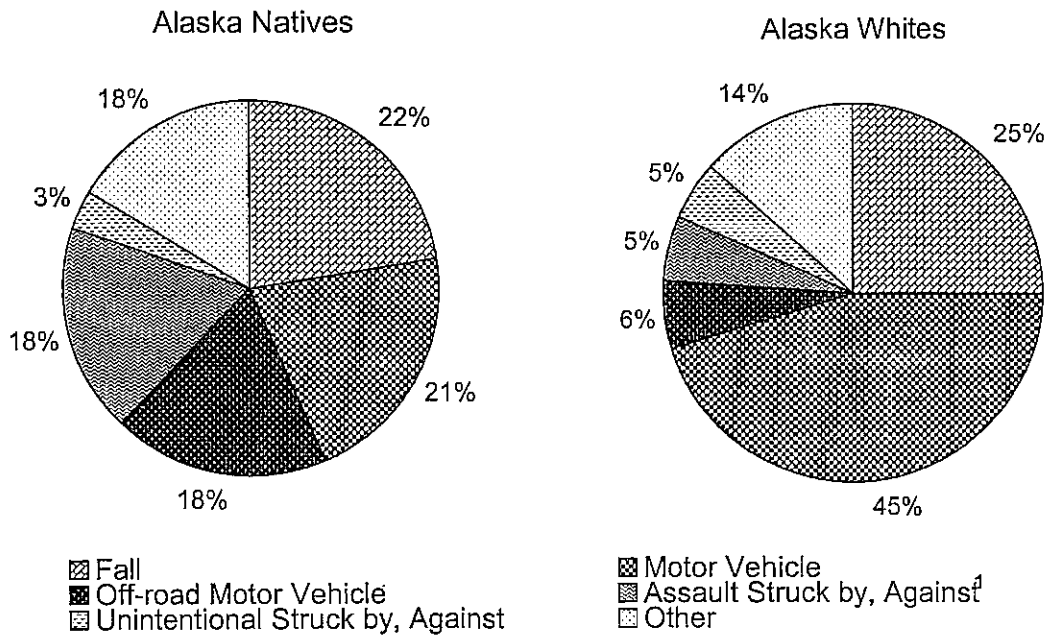
\*Includes ICD-9 E-codes E 960.0: Unarmed fight or brawl and E 968.2: Striking by blunt or thrown object.

**Figure 4: Percent of Injury Hospitalizations with Alcohol Use Reported on Chart, by Cause and Race, Alaska, 1994-1999**



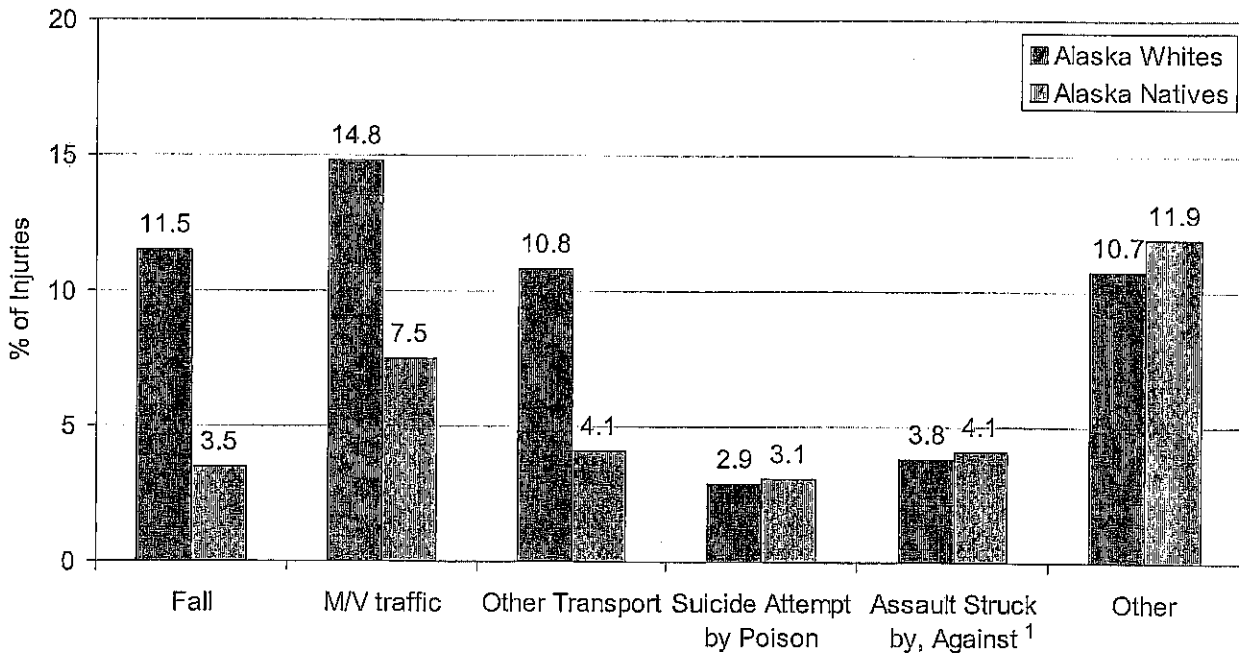
<sup>1</sup>Includes ICD-9 E-codes E 960.0:Unarmed fight or brawl and E 968.2: Striking by blunt or thrown object.

**Figure 5: Percent Distribution Traumatic Brain Injuries by Cause and Race, Alaska, 1994-1999**



<sup>1</sup>Includes ICD-9 E-codes E 960.0:Unarmed fight or brawl and E 968.2: Striking by blunt or thrown object.

**Figure 6: Percent of Injuries Resulting in Permanent Disability by Cause and Race, Alaska, 1994-1999**



<sup>1</sup>Includes ICD-9 E-codes E 960.0:Unarmed fight or brawl and E 968.2: Striking by blunt or thrown object.

**Figure 7: Rates per 10,000 of Non-Fatal Injury Hospitalization by Cause and Tribal Health Corporation, Alaska Natives, 1994-1999**

Tribal Health Corporation								
	Arctic Slope Native Assoc.	Bristol Bay Area Health Corp.	Manillaq Association	Southcentral Foundation <sup>1</sup>	SouthEast Alaska Regional Health Consortium <sup>2</sup>	Tanana Chiefs Conference <sup>2</sup>	Yukon-Kuskokwim Health Corporation	All Alaska Natives
<b>All Causes</b>	141.6	124.6	163.5	81.9	177.5	155.5	123.5	135.1
Top Five Causes								
<b>1</b>	Unintentional Falls 34.9	Unintentional Falls 33.5	Suicide attempt Poisoning 30.2	Unintentional Falls 22.4	Unintentional Falls 25.7	Unintentional Falls 26.8	Unintentional Falls 24.1	Unintentional Falls 25.5
<b>2</b>	Unintentional Other Transport 26.1	Unintentional Other Transport 26.8	Unintentional Falls 23.2	Unintentional M/V Traffic 13.9	Suicide attempt Poisoning 19.4	Suicide attempt Poisoning 29.9	Unintentional Other Transport 18.2	Suicide attempt Poisoning 16.7
<b>3</b>	Unintentional M/V Traffic 11.8	Suicide attempt Poisoning 8.6	Unintentional Other Transport 29.0	Assault Struck by, Against <sup>3</sup> 10.3	Unintentional M/V Traffic 17.2	Assault Struck by, Against <sup>3</sup> 15.9	Suicide attempt Poisoning 14.2	Unintentional Other Transport 14.1
<b>4</b>	Suicide attempt Poisoning 11.4	Unintentional M/V Traffic 7.5	Assault Struck by, Against <sup>3</sup> 11.3	Suicide attempt Poisoning 9.4	Assault Struck by, Against <sup>3</sup> 16.7	Unintentional Other Transport 14.9	Assault Struck by, Against <sup>3</sup> 8.9	Unintentional M/V Traffic 12.7
<b>5</b>	Assault Struck by, Against <sup>3</sup> 10.3	Assault Struck by, Against <sup>3</sup> 6.6	Unintentional Natural/Environ. 9.3	Assault Cut/Pierce 2.7	Unintentional Struck by, Against 11.2	Unintentional Fire/Burn 3.9	2 Tied 5.6	Assault Struck by, Against <sup>3</sup> 11.9

<sup>1</sup>SouthCentral Foundation includes only Anchorage-based Alaska Natives.

<sup>2</sup>SEARHC and TCC include the designated THC Service population and independent tribes using the hospital services.

<sup>3</sup>Includes ICD-9 E-codes E 960.0:Unarmed fight or brawl and E 968.2: Striking by blunt or thrown object.