Alaska Injury Surveillance Report 2011
Injury Deaths and Hospitalizations, 2005-2009

Special Topic: Motor Vehicle Crash Injuries

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Division of Public Health
Alaska Department of Health and Social Services
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Introduction

The subjects of this Alaska injury report are deaths due to injury and non-fatal injuries. These include unintentional injuries, injuries deemed to be intentional (self-harm or suicide, and assault or homicide), and those for which intent was not determined. While much of the data presented relates to Alaska residents, an approach that allows incidence rates to be correctly measured, one focus of this report is to summarize the fatal and non-fatal injuries experienced in Alaska by residents and non-residents, including tourists, seasonal workers, and other visitors.

The Alaska Department of Health and Social Services and the Department of Transportation and Public Facilities both have an interest in injury surveillance and injury prevention. This report is expected to begin an annual series on fatal and non-fatal injuries. It contains a chapter focusing on motor vehicle crash related injuries, in recognition of financial support for the analysis of the data to produce the report.[1] It also provides the context of such injuries in relation to other leading causes of hospitalization and death. Water and air transport related injuries are reported in summary.

Funding for the report has been provided by a grant from the Federal Department of Transportation, National Highway Transportation and Safety Administration (NHTSA), Section 408 grant, through the Alaska Highway Safety Office.

[1] Funding is by grant from the National Highway Transportation Safety Administration (NHTSA) Section 408 funds to Alaska Department of Transportation and Public Facilities, Alaska Highway Safety Office, and reimbursable services agreement to the Alaska Department of Health and Social Services, Division of Public Health, Section of Health Planning and Systems Development

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Part I: Alaska State Summary of Injury Deaths and Hospitalizations

A. Injury Deaths

A1. Injuries as a Leading Cause of Alaska Resident Deaths

Unintentional injuries have been the third leading cause of death (after heart disease and cancer) for the past twenty five years, with suicide and homicide also being consistently among the top twelve during that time. Unintentional injury was Alaska's top leading cause of death for several years during the 1980s (1980, 1983-1985), as infectious diseases including primarily Tuberculosis were finally brought under control,[2] but in 1986 heart disease and cancer each caused more deaths than unintentional injuries. In recent years, cancer and heart disease have continued to rank first and second among the ten leading causes of death in Alaska, as in the U.S. as a whole. Even in 1990-1994, the combination of unintentional injuries, suicides and homicides amounted to 2533 deaths, exceeding the 2456 attributed to diseases of the heart but fewer than deaths attributed to malignant neoplasm. Since then intentional and unintentional injuries have accounted for fewer deaths than either diseases of the heart or malignant neoplasm (cancer), which have become established as the two leading causes of death in Alaska as well as nationally.

Using the five-year average for 2005-2009, unintentional injuries are now the third leading cause, followed by cerebrovascular diseases, chronic lower respiratory diseases, suicide, diabetes, Alzheimer's disease, chronic liver disease and cirrhosis, influenza-pneumonia, and assault.

Figure 1. Leading Causes of Resident Deaths in Alaska, 2005-2009

Leading Cause	Counts	Crude Rate	Age-Adjusted Rate
Malignant neoplasm	4088	120.7	179.3
Diseases of the heart	3191	94.2	155.9
Unintentional injuries	1649	48.7	53.7
Chronic lower respiratory diseases	844	24.9	43.9
Cerebrovascular diseases	838	24.7	45.7
Intentional self-harm (suicide)	715	21.1	21.6
Diabetes mellitus	483	14.3	22.4
Alzheimer's disease	344	10.2	22.8
Chronic liver disease and cirrhosis	317	9.4	10.2
Influenza and pneumonia	239	7.1	12.7
Assault (homicide)	184	5.4	5.5

[2] The leading cause of death in 1950 in Alaska was "infections" (including: TB ICD 9 codes 010-018) at 23% of all deaths. Of the 291 deaths from this cause, 270 were native, 21 non-native. Interestingly heart disease was the second leading cause at 21% and of the 272 cases, 241 were non native, and only 31 were Alaska Natives. *Causes of Death in Alaska*, Section of Epidemiology, Alaska Division of Public Health, 1991. Pp 169-170

Figure 2. Deaths (Counts) by Leading Cause, Alaska Residents, 1990 – 2009 (five year totals)

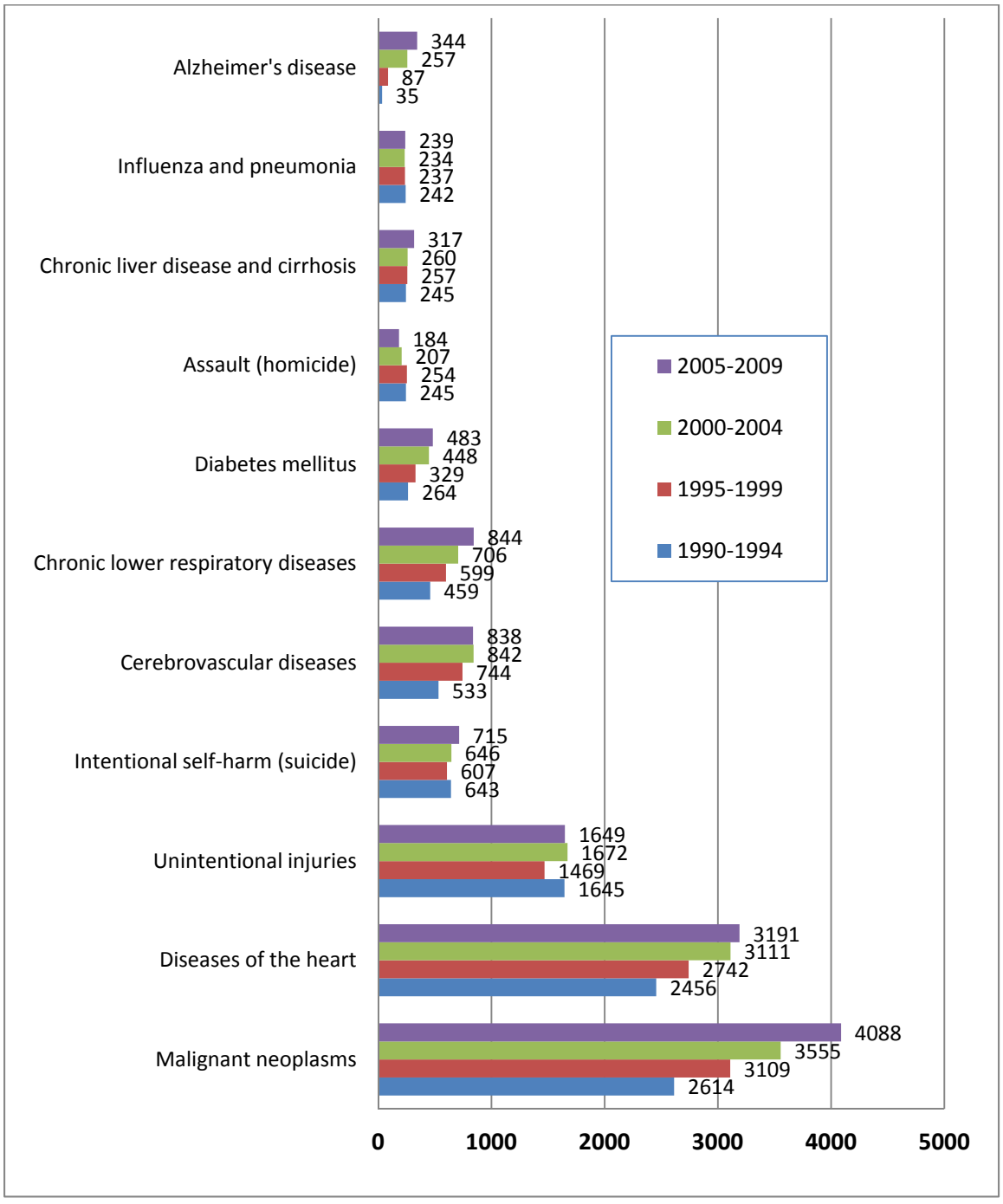
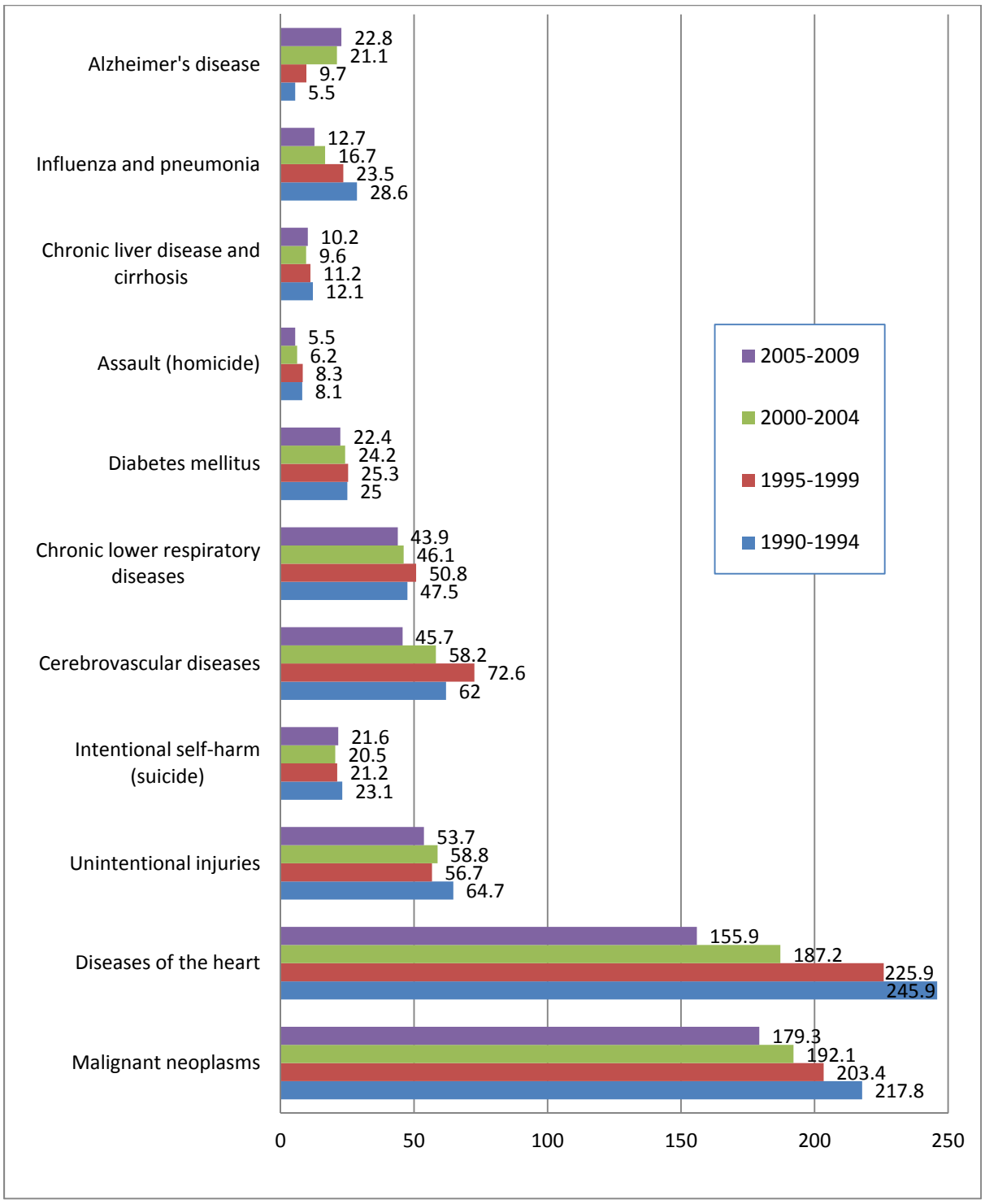


Figure 3. Deaths (Age Adjusted Rates) by Leading Cause, Alaska Residents, 1990-2009 (five year periods, deaths per 100,000 age adjusted)



A2. Injuries as a Leading Cause of Deaths Occurring in Alaska – Regardless of State of Residence

Unintentional injury deaths *occurring* in Alaska are about 5% higher in number than those of Alaska residents only, most likely as a result of the deaths associated with visitors (older tourists, for example), high-risk occupations (fisheries in particular) and high-risk recreational activities, all of which draw non-residents to the state. Non residents' deaths account for over 8% (or about one in twelve) of motor vehicle traffic deaths in the state. Deaths for diseases of the heart occurring in Alaska also exceed the resident deaths, although by a smaller proportion (about 3%) compared with unintentional injuries. These differences will be examined further in relation to details regarding the specific "external causes" of death.

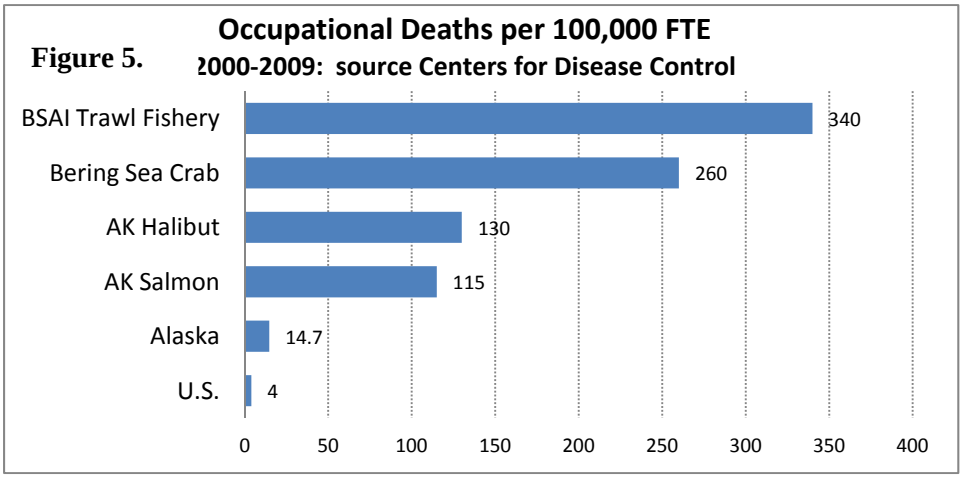
Figure 4. Leading Causes of Death: Occurrences in Alaska, and Alaska Resident Deaths, 2005-2009

Leading Cause Category	Alaska Residents In State Deaths		Alaska Residents Out of State		Non-Residents in Alaska	
Malignant neoplasm	3592	23%	248	29%	59	9%
Diseases of the heart	2931	19%	130	15%	216	33%
Unintentional injuries*	1473	10%	88	10%	178	27%
Chronic lower respiratory diseases	776	5%	34	4%	18	3%
Cerebrovascular diseases	738	5%	50	6%	42	6%
Intentional self-harm (suicide)	687	4%	14	2%	20	3%
Diabetes mellitus	467	3%	8	1%	9	1%
Alzheimer's disease	328	2%	8	1%	2	0%
Chronic liver disease and cirrhosis	295	2%	11	1%	7	1%
Influenza and pneumonia	221	1%	9	1%	9	1%
Other causes	3866	25%	259	30%	97	15%
Total	15374	100%	859	100%	657	100%

* Includes the majority of Motor Vehicle Crash Deaths

One contributing factor to non-resident injury deaths is the large number of non-residents participating in high risk industries. In fact, Alaska along with Montana and Wyoming lead the nation in accidental occupational death rates, usually scoring 10-15 annual deaths per 100,000 FTEs (full time equivalent workers) compared to a national occupational death rate around 4 per 100,000 FTEs. Oil

Figure 5.

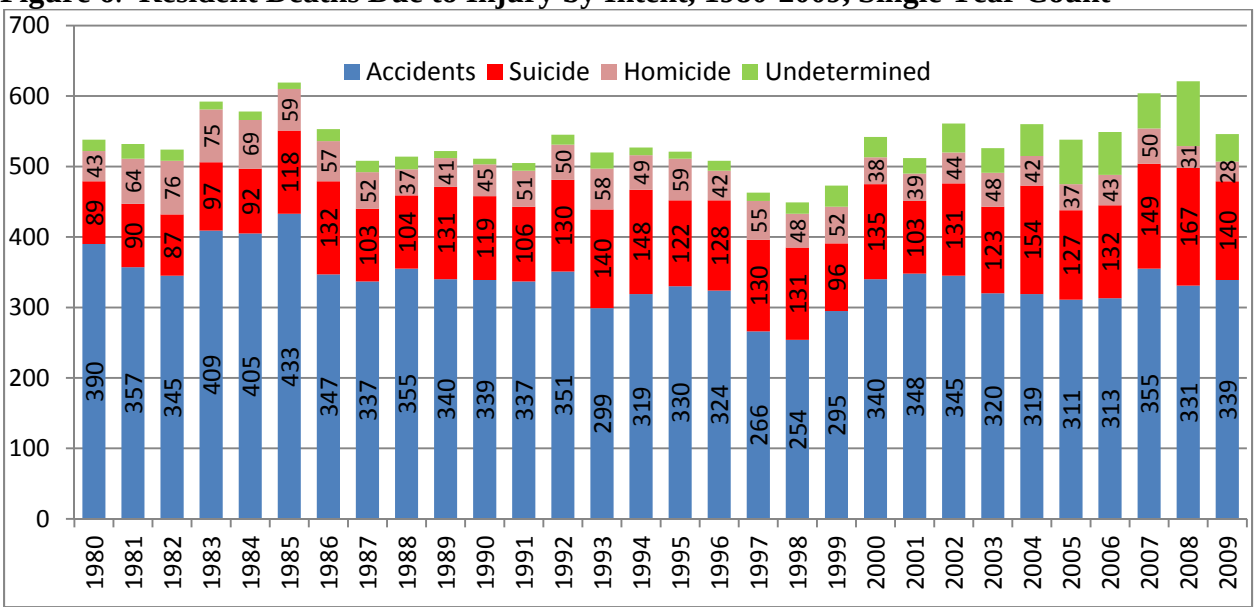


extraction, mining, and construction are all high risk occupations that account for a significant share of employment in these states. Alaska sees a high rate of participation in the fisheries, which has by far the highest fatal injury rate of any occupation in the nation. As shown in Figure 5, the fisheries vary in the degree of danger, with the Bering Sea and Aleutian Islands trawl and crab fisheries competing for the claim of being the "deadliest catch:"

A3. Trends in Injury Deaths in Alaska

Alaska's population has grown from about 420,000 in 1980 to 710,000 in 2010 according to the 2010 census, a 70% increase. However during that time, the count of total injury deaths of Alaska residents has not increased, but has fluctuated around 500 per year, so rates (crude and age adjusted) have declined over the thirty year period.

Figure 6. Resident Deaths Due to Injury by Intent, 1980-2009, Single Year Count



The following figures show the counts of deaths due to injury by "intent" as recorded on the death certificate for 1980-2009, providing counts for (a) Alaska residents and (b) for all deaths *occurring* in Alaska, thus accounting for non-resident workers, tourists, and other visitors to the state.[3]

When we look at each grouping of injury related deaths by intentionality (Figures 7-10), and compare the resident deaths to those occurring in Alaska, we see differences in patterns among the groups, and over time. In-state occurrences in recent years have exceeded residents' deaths by smaller numbers than in the 1980s and early 1990s, perhaps due to reduction in occupational deaths of non-residents.[4]

[3] State vital records registration systems are required to provide death certificates to the registrars for the state of residence of the deceased person so that those deaths can be recorded for all population-based rate calculations.

[4] A major influx of workers during the oil boom of the late 1970s and early 1980s resulted in a large number of individuals working in Alaska while maintaining residency in other states.

As indicated on the following figures, unintentional injury deaths have declined in absolute numbers over the last thirty years, from a high of 470 occurrences in 1985 to about 350 in 2009. The decline is evident in both deaths occurring in Alaska and deaths of Alaska residents.

In contrast, suicides have nearly doubled in the three decades, from 89 in 1980 to a high of 167 in 2008, showing a slight decline in 2009 back to 140. The high rate of suicide in Alaska, which has remained about double the US rate (21.6 per 100,000 compared with 11.3 for the US[5]) has been a concern for decades. Additional information on policies, programs and data can be found at the Alaska Suicide Prevention Council.[6]

Homicides have declined even faster than unintentional injuries, in contrast to the increase in suicides. Homicides reached the lowest number in thirty years in 2009 (28 compared with a peak of 76) in 1982.[7]

The State Medical Examiner Office (SMEO) is responsible for conducting the medical/legal investigative work related to unanticipated, sudden or violent deaths. This includes determining cause and manner of death, providing consultation to law enforcement and the courts, and providing information about non-lethal injuries to children specific to child abuse and neglect. The State Medical Examiner's Office conducts autopsies, provides court testimony when necessary, and assists with the review of all child deaths through the Child Fatality Review Team.

In order to better comprehend circumstances leading up to intentional deaths due to violence, Alaska's Department of Health and Social Services established the Alaska Violent Death Reporting System (AK VDRS), a state-based surveillance system, modeled after the National Violent Death Reporting System (NVDRS) in 2003. The objectives of AKVDRS are to:

- link violent death record data from disparate sources;
- provide timely information through rapid data retrieval;
- describe the circumstantial and environmental factors that contribute to violent deaths; and
- characterize perpetrators, including the relationship to the victim(s).

By providing further assessment of violent death, public health and safety planners, program managers, specialists, and policymakers will have a better understanding of these deaths and will be able to develop targeted services and programs for prevention and control.
As previously noted, non-residents account for a larger percentage of "unintentional injury" deaths occurring in Alaska in the than in any other leading cause of death. Part IV: Motor Vehicle Crash Related Injury Deaths and Hospitalizations will delve into the data about motor

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[5] National Institute of Mental Health, webpage downloaded 11/6/11, http://www.nimh.nih.gov/health/publications/suicide-in-the-us-statistics-and-prevention/index.shtml
[6] Available at: http://www.hss.state.ak.us/suicideprevention/
[7] Alaska Uniform Crime Report. Available at: http://www.dps.alaska.gov/statewide/docs/UCR/UCR_2010.pdf

vehicle related deaths and hospitalizations due to injuries experienced by residents and non-residents.

Figure 7. Unintentional Injury Deaths, Alaska Residents and Alaska Occurrences, by Year and Status, 1980 - 2008

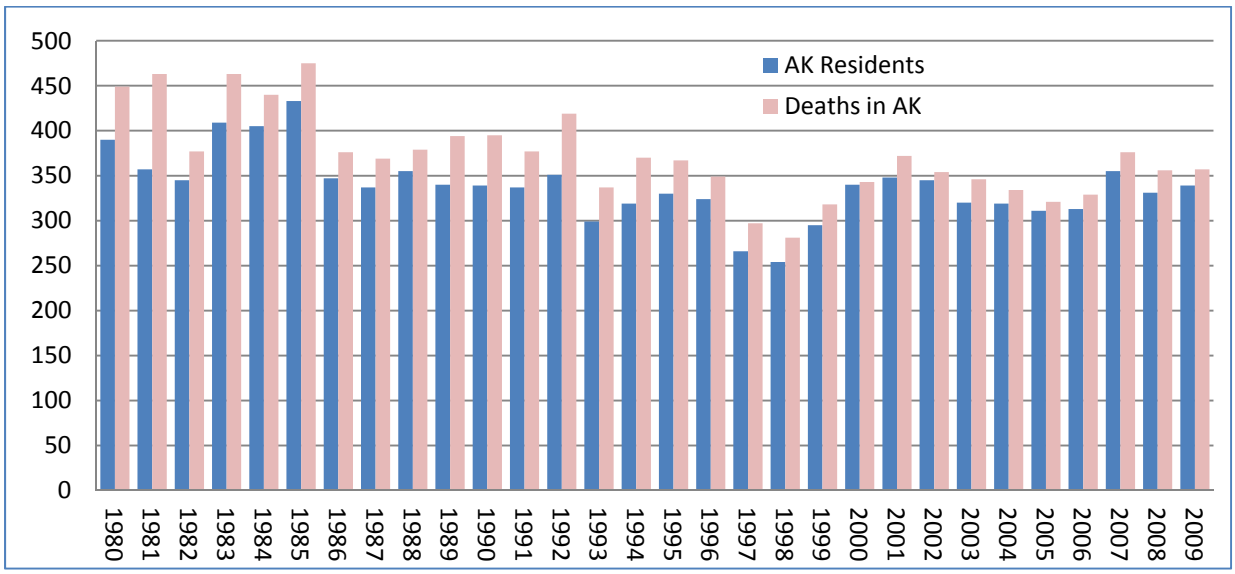


Figure 8. Suicide Deaths, Alaska Residents and Alaska Occurrences, by Year and Status, 1980 - 2009

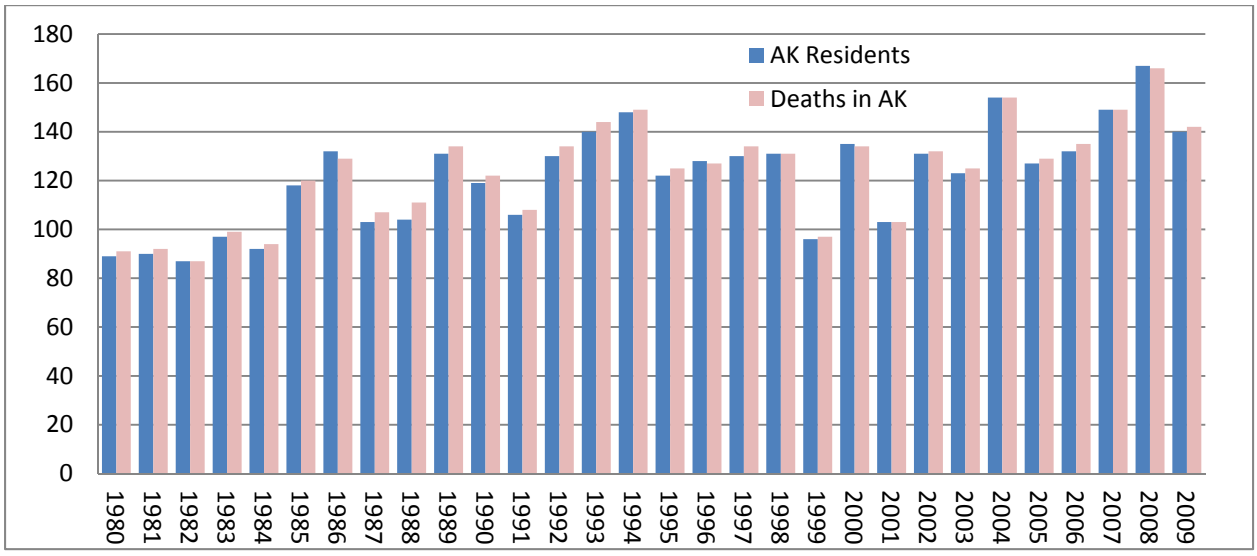


Figure 9. Homicide Deaths, Alaska Residents and Alaska Occurrences, by Year and Status, 1980 - 2009

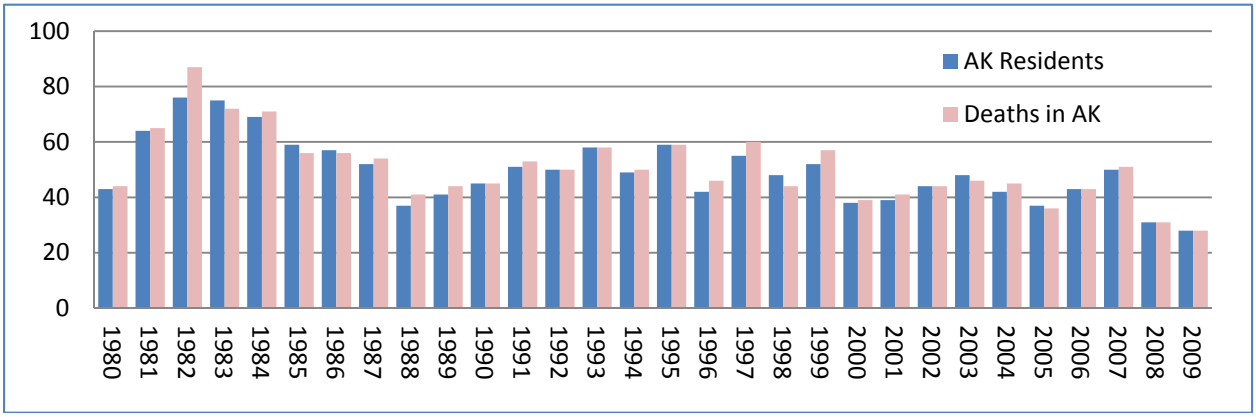
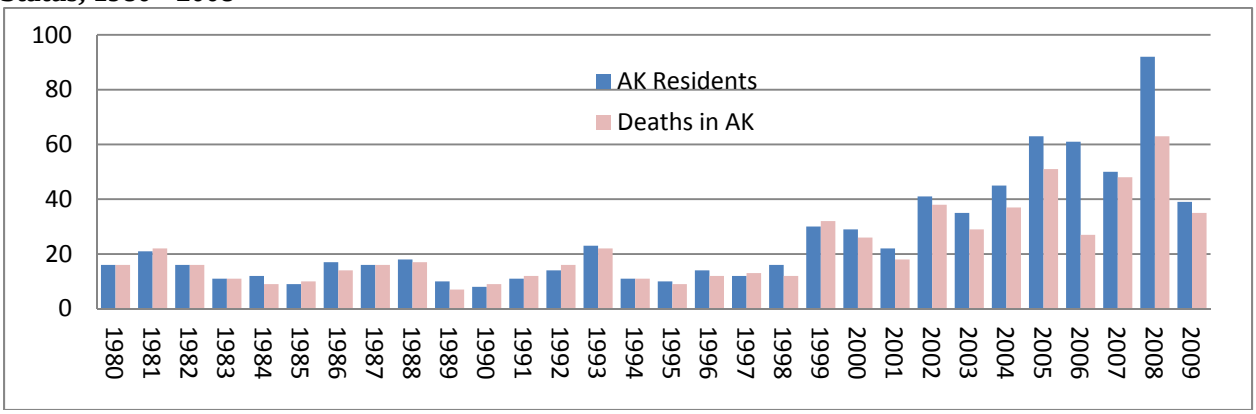
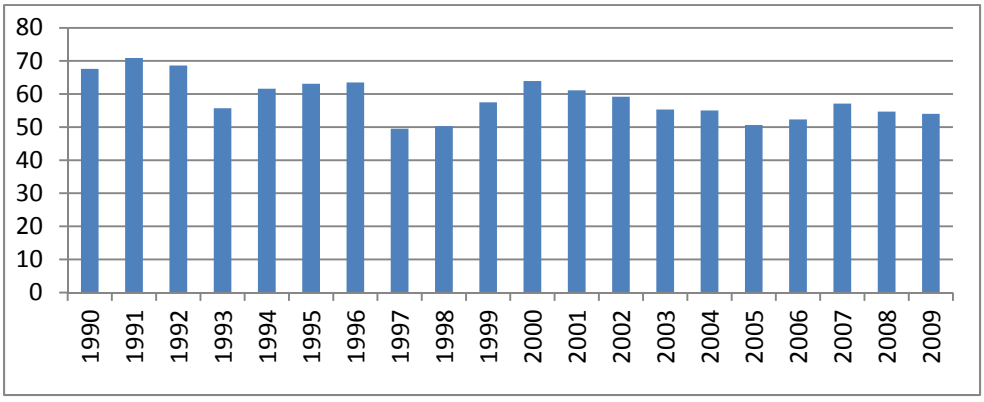


Figure 10. "Undetermined Intent" Deaths, Alaska Residents and Occurrences, by Year and Status, 1980 - 2008



To compare injury rates across time and place, rates were age adjusted using data from the 2000 Census. Thus differences due to aging or age differences in populations, and effects of growth or declines in population size, are removed. Unintentional injury death rates (age adjusted to the U.S. 2000 standard population) have trended downward generally in the last twenty years, as shown on Figure 11 below.

Figure 11. Unintentional Injuries Age Adjusted Death Rate, Alaska Residents, by Year (deaths per 100,000)



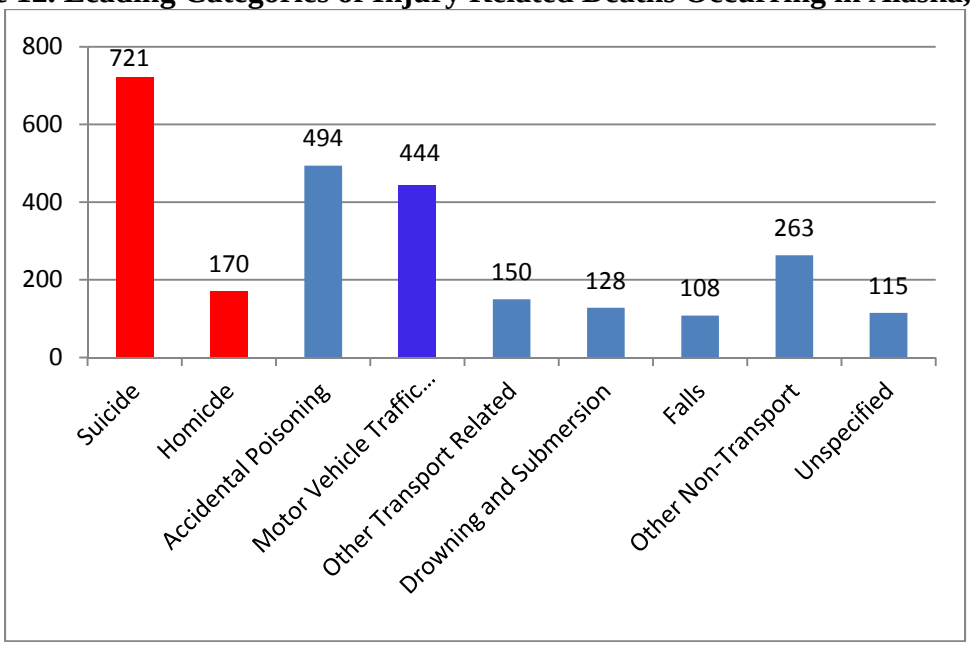
A4. Injury Related Deaths by Category

Definition of terms: The cause of death is an injury or illness that is incompatible with life. A proximate cause is what starts the causal chain; the immediate cause is the final step. The chain may have multiple causes. If you can prove a causal chain with but-for linkage and follow it all the way back, eventually you will find the initiating condition. Usually, we see "due to" or "as a condition of" on the death certificate to denote the sequence of events or medical conditions that result in death. The mechanism of injury is the circumstance or how the injury occurred or sustained. The manner of death is why the cause came to be, as to whether it was natural, due to the unintentional actions of someone (accident), due to the deliberate (intentional) actions of oneself (suicide) or another (homicide), or undetermined.

Classification of external cause of injury and poisoning: Injury is a result of environmental events, circumstances, and conditions outside of the body (e.g., motor vehicle accident, poisoning, drowning). "External causes" have been coded ("e-codes") to classify the cause of injury in the International Classification of Diseases 9th edition (ICD9-CM) used for deaths through 1998, and by hospitals currently. However the ICD10 classification categories (used since 1999 for coding cause on death certificates, and soon to be used for discharges as well) distinguish external cause within the code structure, so that separate e-codes are not required.

Examination of external cause of death shows suicide, accidental poisoning and motor vehicle traffic crashes to be the top three causes for occurrences in Alaska for the period 2005-2009.

Figure 12. Leading Categories of Injury Related Deaths Occurring in Alaska, 2005-2009



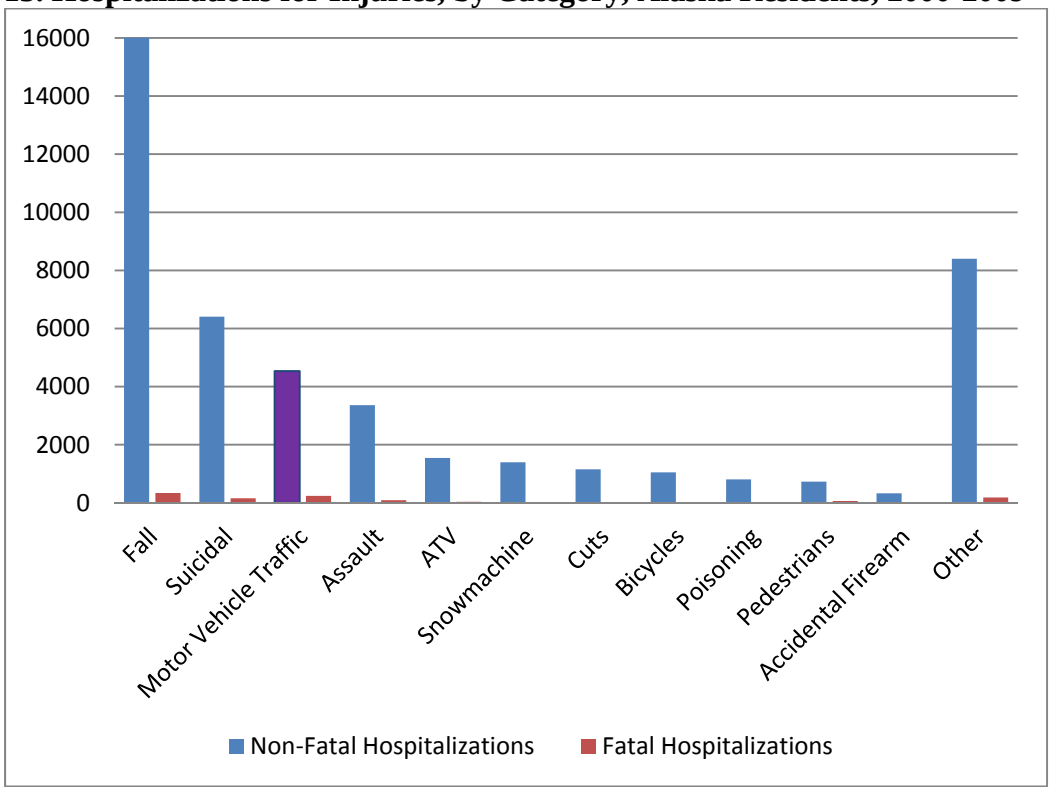
B. Injury Hospitalizations

B1. Injury Hospitalizations -- Leading Causes for Residents

Falls are by far the most common reason for injury-related hospitalizations, 8623 for 2000-2004, 8991 for 2005-2009, although they are one of the top ten leading cause of injury death – there have been on average 22 deaths per year in the last five years due to falls, but over 1600 hospitalizations per year on average.[8] Key findings are:

- In Alaska, self-harm ranks second among all injury related causes of hospitalizations (about 600 per year).
- Motor vehicle traffic crashes rank second as unintentional cause (about 382 per year in the last five years).
- Motor vehicle traffic crashes account for just over a third of all transport-related hospitalizations.
- Off road vehicle related hospitalizations amount to 291 per year on average in the last five years.
- All transport-related hospitalizations in combination amount to an average of 1110 per year.

Figure 13. Hospitalizations for Injuries, by Category, Alaska Residents, 2000-2009



[8] See Appendix C for the full matrix of injury hospitalizations by cause by age group, for 2005-2009. Crosswalks for ICD9 and ICD10 codes , and additional information on injury cause matrices, are available at http://www.cdc.gov/nchs/injury/injury_matrices.htm .

B2. Injury Hospitalizations: Leading Causes for Non-Resident Occurrences in Alaska

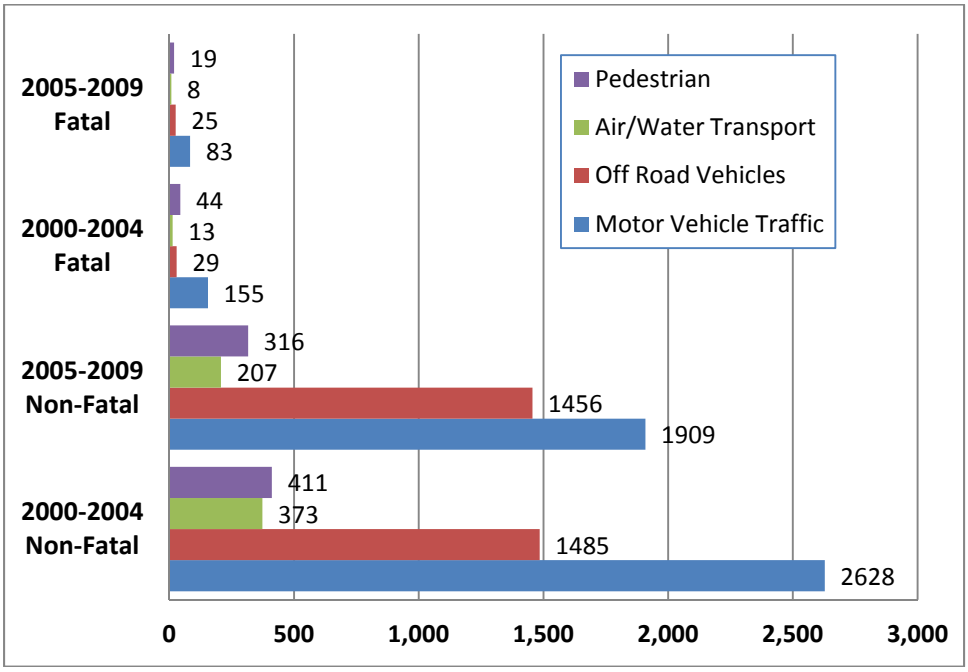
Falls account for 42% (about 103 per year) of injury related hospitalizations for non-residents, while all transport related causes (73 per year on average) account for 29%.

About 39 a year or one third of the transportation-related cases are motor vehicle traffic related.

B3. Trends in Injury Hospitalizations

There have been about 40 injury-related hospitalizations for each death due to injury in the past decade (35,676 compared to 909).

Figure 14. Non-fatal and Fatal Transport-related Hospitalizations in Alaska, 2000-2004 and 2005-2009



Transportation related hospitalizations that were non-fatal have dropped about 20% for the 2005-2009 period compared with the previous five years (Figure 14), while hospitalizations for suicide attempts and self-inflicted injuries increased slightly, approaching 700 per year (Figure 15); hospitalization for assaults have stayed at somewhat over 300 per year (Figure 16). About 30 hospitalizations for injuries each year (including up to six hospitalizations with fatal injuries, see Figure 17) have not had intentionality determined.

Figure 15. Hospitalizations for Suicide Attempts & Self Inflicted Injuries (E-code 800-949.9), Alaska Residents

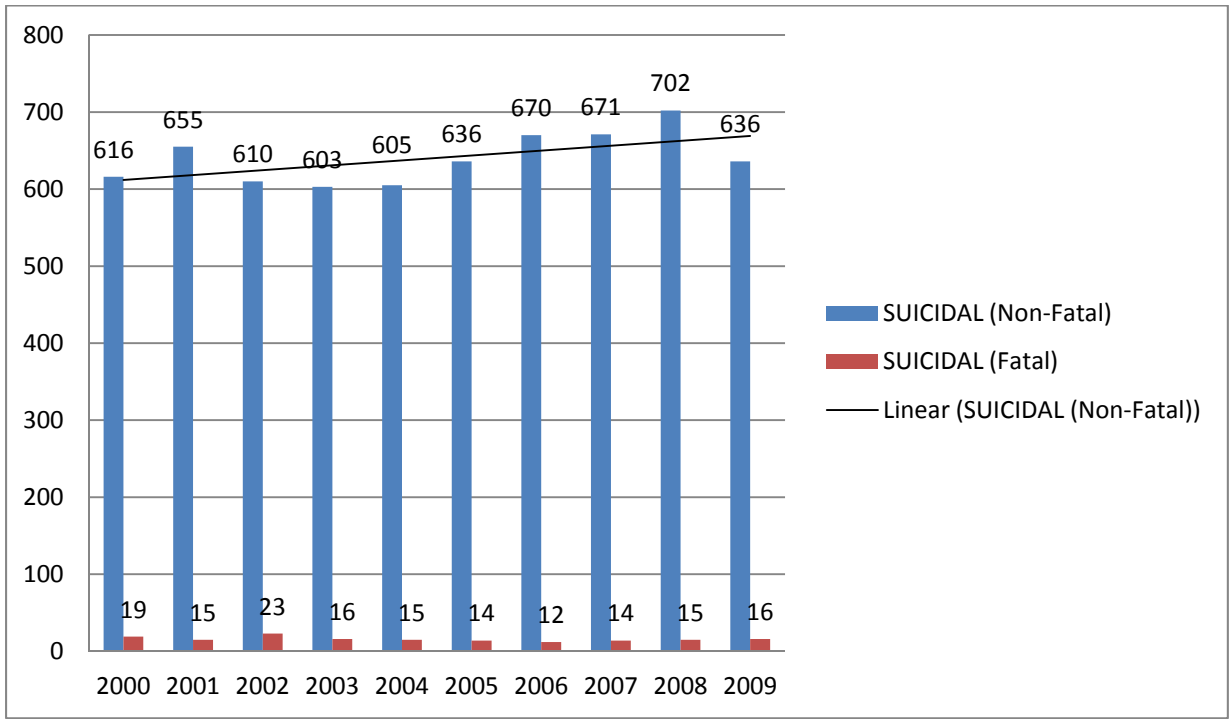


Figure 16. Hospitalizations for (E-code 960-969), Alaska Residents

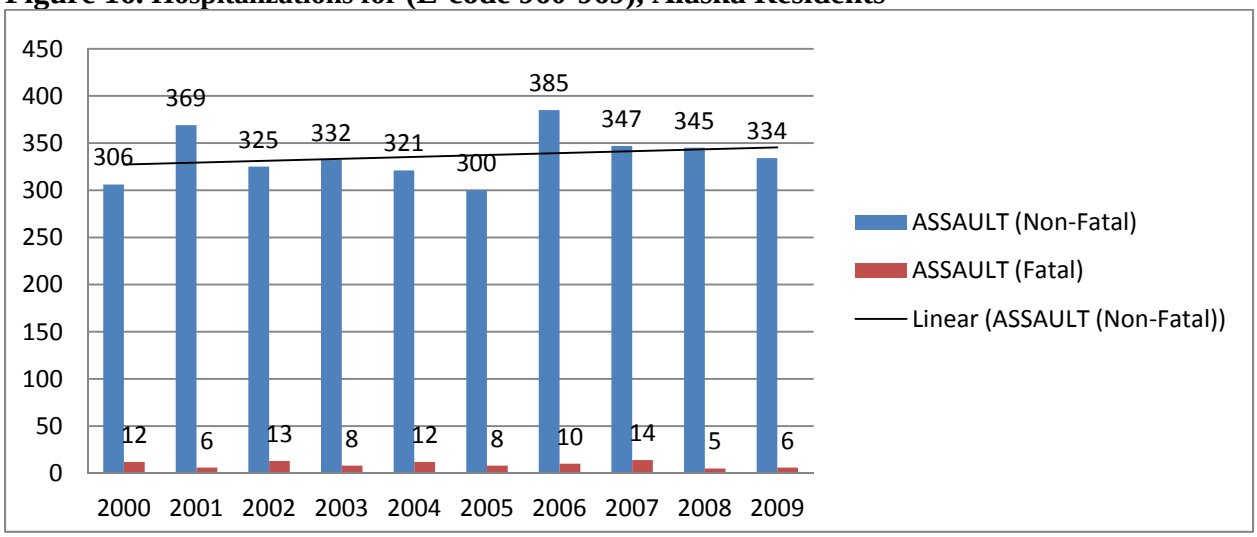
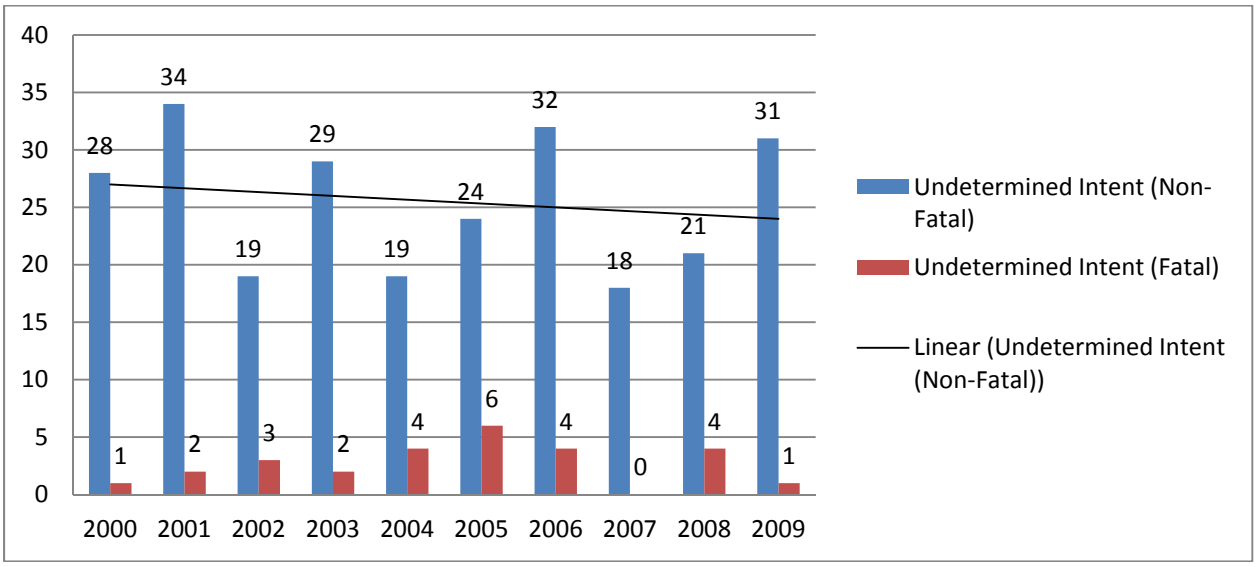


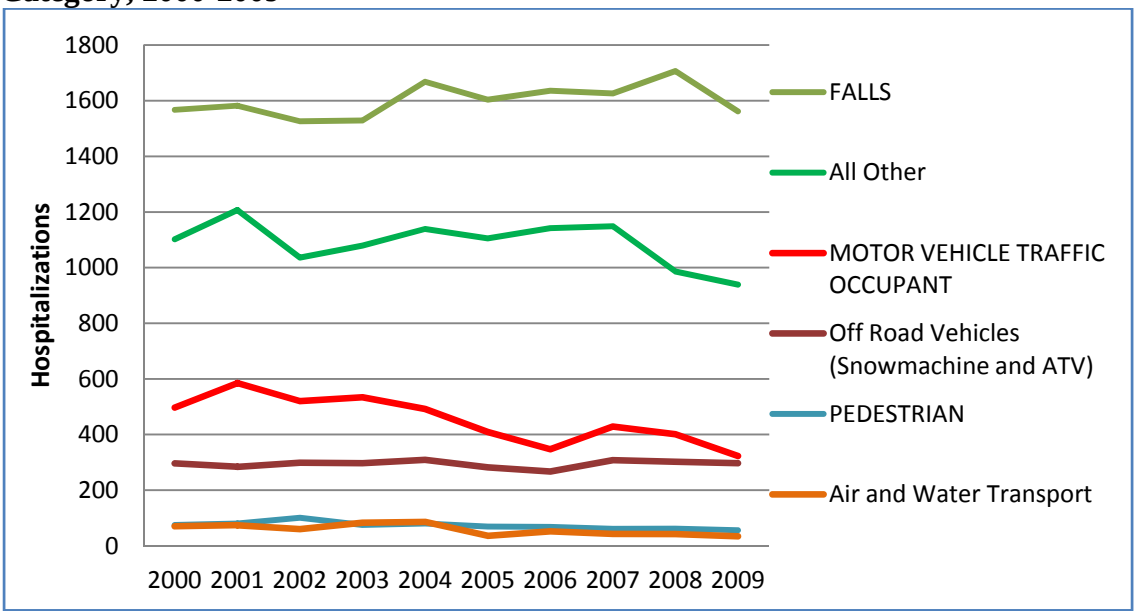
Figure 17. Undetermined Intent Injury Hospitalizations (E-code 980-989), Alaska Residents



B4. Injury Related Hospitalizations by Category

When non-fatal unintentional injury hospitalizations (by cause) are examined for year to year changes (Figure 18), we see that falls have increased in number slightly while motor vehicle traffic injury hospitalizations have declined, and hospitalizations for injuries due to other causes have declined generally, although by small numbers.

Figure 18. Alaska Residents: Non-Fatal Unintentional Injuries by Year and by Major Category, 2000-2009



Part II: Age, Gender and Race
A. Deaths

By race and age, injury deaths are disproportionately Alaska Natives – especially in younger age groups, reflecting both the younger age distribution of the Alaska Natives and higher age specific incidence rates at the younger age groups. By gender, injury deaths are highly disproportionally male – more than two thirds of injury deaths are males. The age/gender/race specific rates show Alaska Natives, both male and female, experience injury deaths at twice the rate of Whites. Numbers for Blacks and Asian and Pacific Islanders are too small to calculate age specific rates.

Figure 19. Injury Deaths Occurring in Alaska by Age Group and Race, 2005-2009

A. Unintentional Deaths only: **B. All Injury Deaths:**

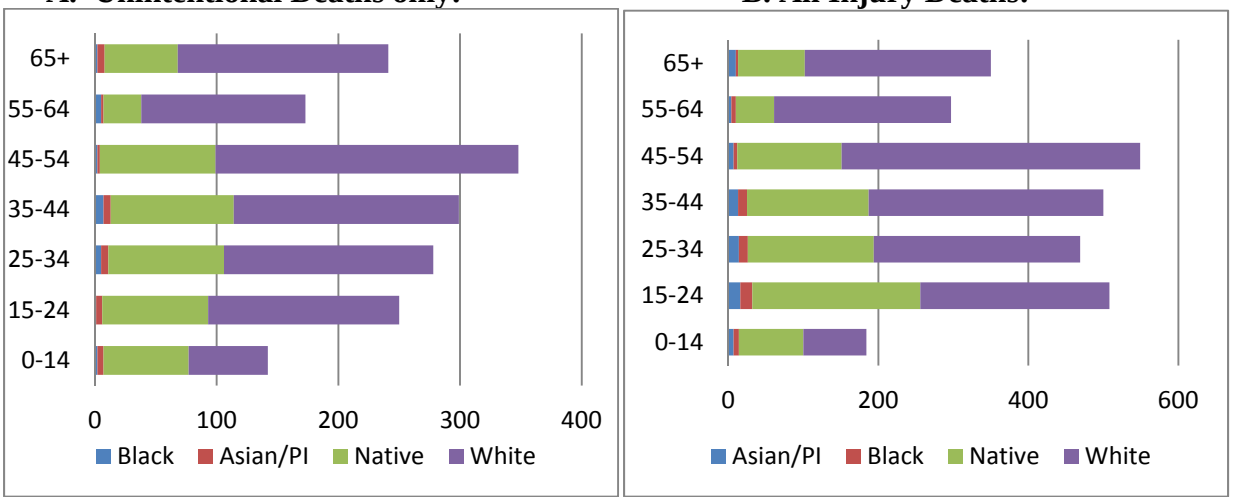


Figure 20. Number of Unintentional Injury Deaths Occurring in Alaska by Age, Gender, and Race, 2005-2009

		Number of Deaths by Age Group							
		0-14	15-24	25-34	35-44	45-54	55-64	65+	All Ages
Female	Asian/PI	1	0	2	1	0	1	3	8
	Black	1	0	0	1	0	1	0	3
	AI/NA	22	21	32	26	32	8	28	169
	White	27	28	34	39	63	27	70	288
	All Races[2]	51	49	68	67	96	37	102	470
Male	Asian/PI	4	5	1	1	3	1	3	18
	Black	1	0	5	4	2	3	2	17
	AI/NA	48	67	63	76	64	24	36	378
	White	39	114	120	122	171	91	99	756
	All Races[2]	93	188	190	205	241	119	141	1,177
Total	Asian/PI	5	5	3	2	3	2	6	26
	Black	2	0	5	5	2	4	2	20
	AI/NA	70	88	95	102	96	32	64	547
	White	66	142	154	161	234	118	169	1,044
	All Races[2]	144	237	258	272	337	156	243	1,647

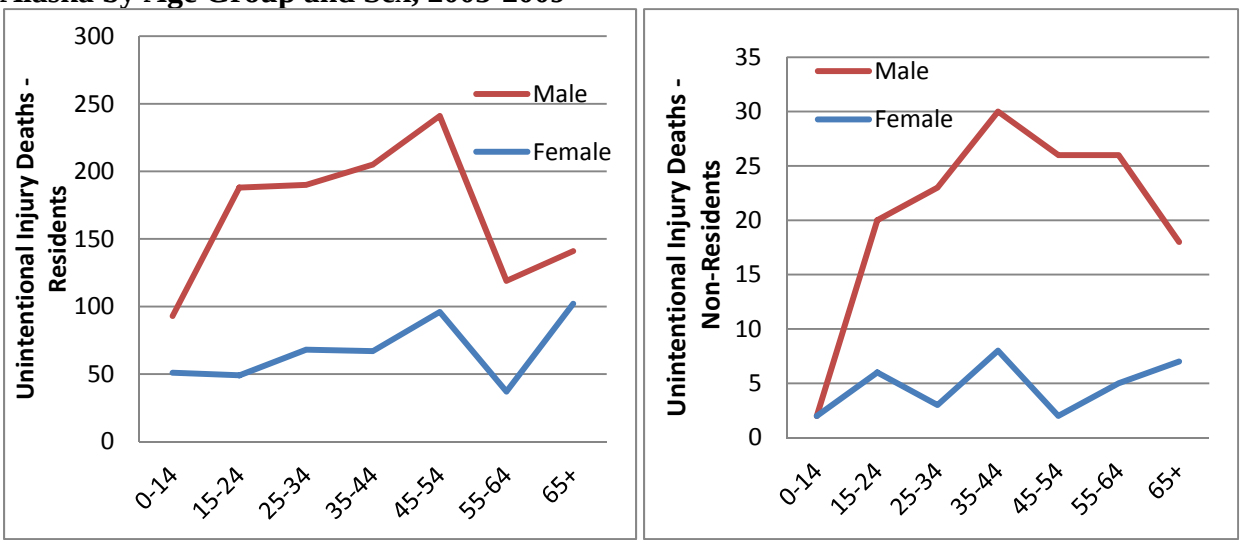
Figure 21. Percent of Unintentional Injury Deaths Occurring in Alaska by Age, Gender, and Race, 2005-2009

		Percent of Deaths by Gender and Race Group							
		0-14	15-24	25-34	35-44	45-54	55-64	65+	All Ages
Female	Asian/PI	13%	0%	25%	13%	0%	13%	38%	100%
	Black	33%	0%	0%	33%	0%	33%	0%	100%
	AI/NA	13%	12%	19%	15%	19%	5%	17%	100%
	White	9%	10%	12%	14%	22%	9%	24%	100%
	All Races[2]	11%	10%	14%	14%	20%	8%	22%	100%
Male	Asian/PI	22%	28%	6%	6%	17%	6%	17%	100%
	Black	6%	0%	29%	24%	12%	18%	12%	100%
	AI/NA	13%	18%	17%	20%	17%	6%	10%	100%
	White	5%	15%	16%	16%	23%	12%	13%	100%
	All Races[2]	8%	16%	16%	17%	20%	10%	12%	100%
Total	Asian/PI	19%	19%	12%	8%	12%	8%	23%	100%
	Black	10%	0%	25%	25%	10%	20%	10%	100%
	AI/NA	13%	16%	17%	19%	18%	6%	12%	100%
	White	6%	14%	15%	15%	22%	11%	16%	100%
	All Races[2]	9%	14%	16%	17%	20%	9%	15%	100%

Source: Alaska Bureau of Vital Statistics, February 2011.

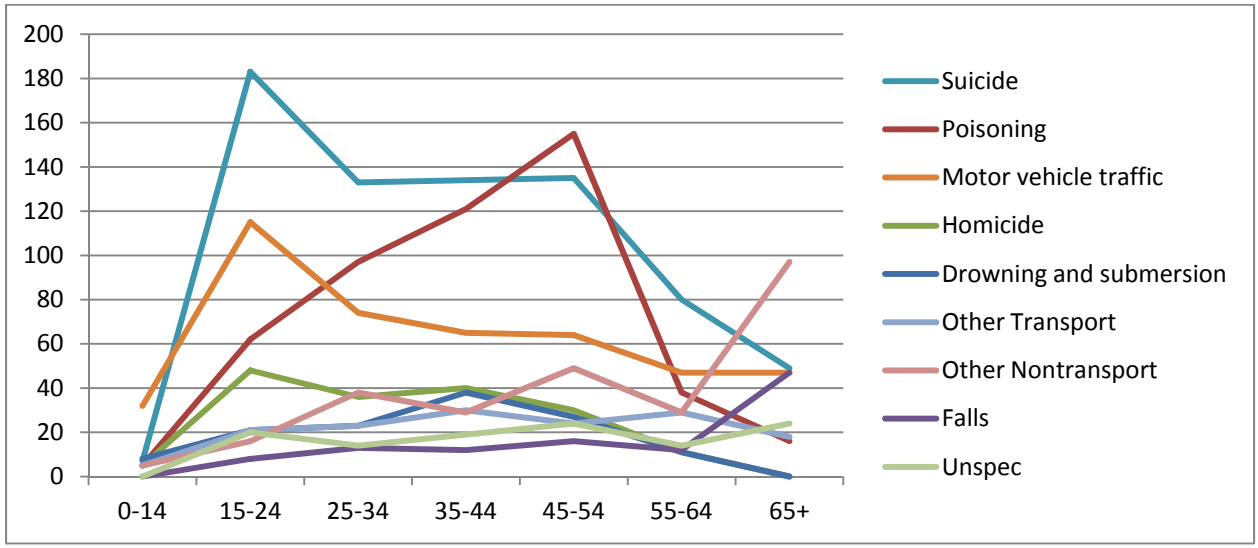
Unintentional injury deaths among residents drop off for the older age groups, while injury deaths among non-residents (occurring in Alaska) are about as high among older adults as for younger age groups. By gender, injury deaths are highly disproportionally male – more than three-fourths of injury deaths are males.

Figure 22. Alaska Resident and Non-Resident Unintentional Injury Deaths Occurring in Alaska by Age Group and Sex, 2005-2009



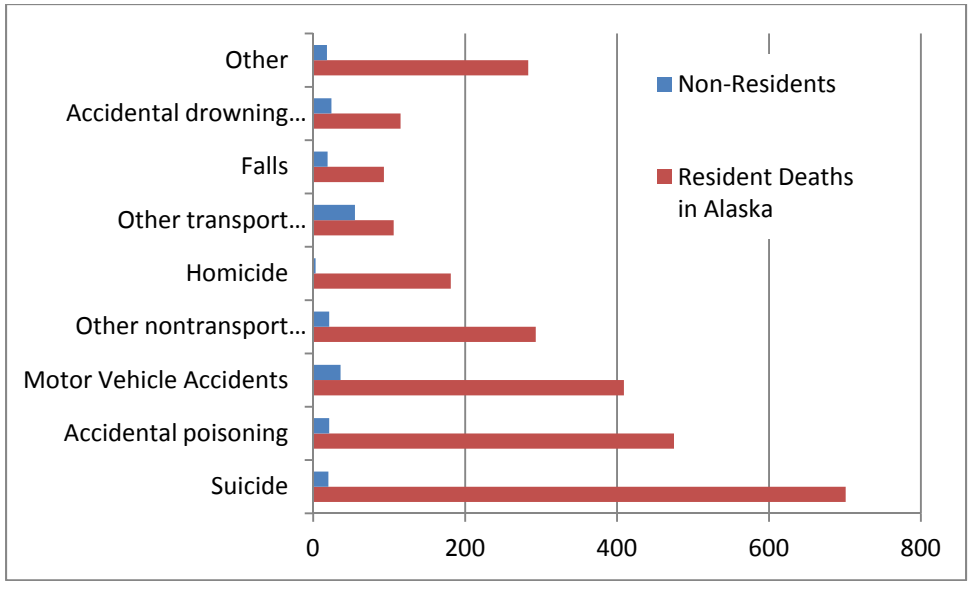
Examination of cause of injury related deaths across age groups shows that both suicides and motor vehicle traffic deaths peak in the teen and young adult age groups (15-24), with poisonings and "other non-transport" being very important causes for older individuals.

Figure 23. Injury Deaths, Occurrences in Alaska, by External Cause Category and Age Group, 2005-2009



To illustrate the differences by cause for resident deaths in Alaska and non-resident deaths in Alaska, the summary by cause is shown in Figure 24. Motor Vehicle Accidents and other transport related deaths are more significant than other types of injury causes.

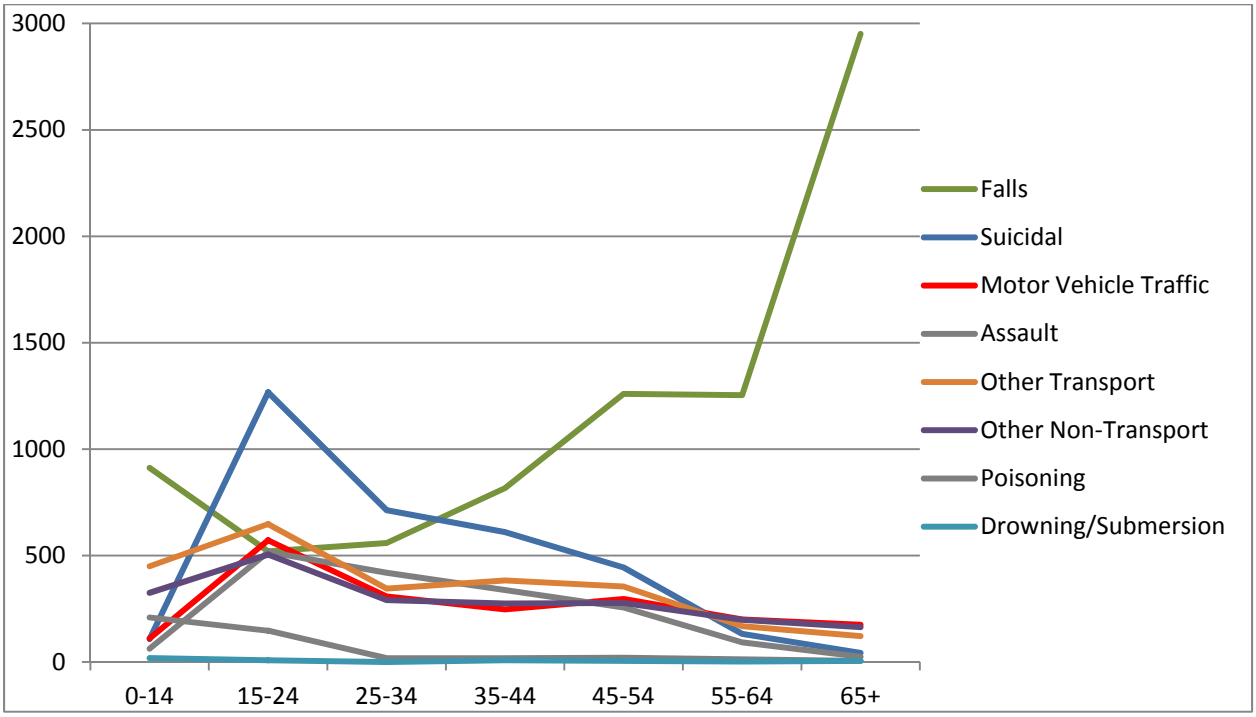
Figure 24. Resident and Non-Resident Injury Related Deaths in Alaska by Cause, 2005-2009.



B. Hospitalizations

Hospitalizations for injuries reflect different patterns across age groups for the major categories of causes since falls (including falls from playground equipment) represent major causes for children (0-14 years of age) and seniors (65 years and older).

Figure 25. Injury Hospitalizations in Alaska (Residents), by External Cause Category and Age Group, 2005-2009

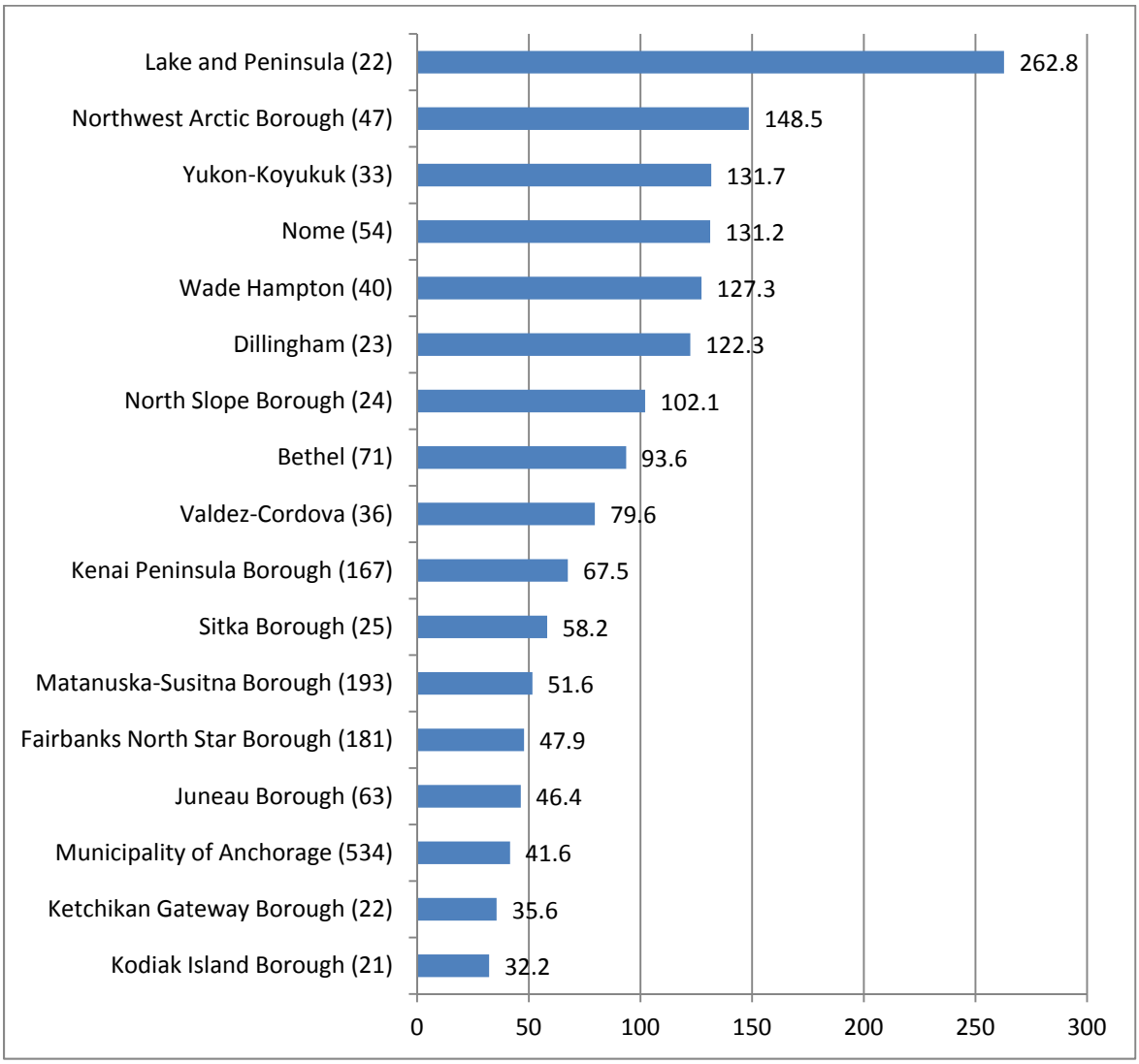


Part III: Geographic Variations

Deaths by Census Area and Borough (Alaska Residents)

Although the three largest cities (Anchorage, Fairbanks and Juneau) accounted for nearly half of injury deaths in Alaska, rates of death were below the state average for the period of about 54 per 100,000 (age adjusted). The highest unintentional injury mortality rates occurred in the west, north and interior – the most rural and frontier areas, where weather conditions, occupations and lifestyle, and great distances to health care all contribute to the risk of death due to injuries.

Figure 26. Unintentional Injury Age-Adjusted Death Rate 2005-2009 for Census Areas and Boroughs (>19 occurrences; deaths per 100,000 residents)



[1] Rates are per 100,000 persons in age groups, age-adjusted to the year 2000 US standard population. Rates based on fewer than 20 events are statistically unreliable and are not included above.
Source: Alaska Bureau of Vital Statistics, February 2011.

Summarizing by labor market area both the deaths due to unintentional injury for residents and non-residents of Alaska permits the observation that non-residents are more likely to die from injury outside of the "railbelt" – in Southwest and Southeast Alaska and along the Gulf Coast, where tourism (including recreational tourism) and the fishing industry involve many non-Alaskans.

Figure 27. Distribution of Accidental Deaths, Alaska Residents and Non-Residents, 2005-2009, by Labor Market Area

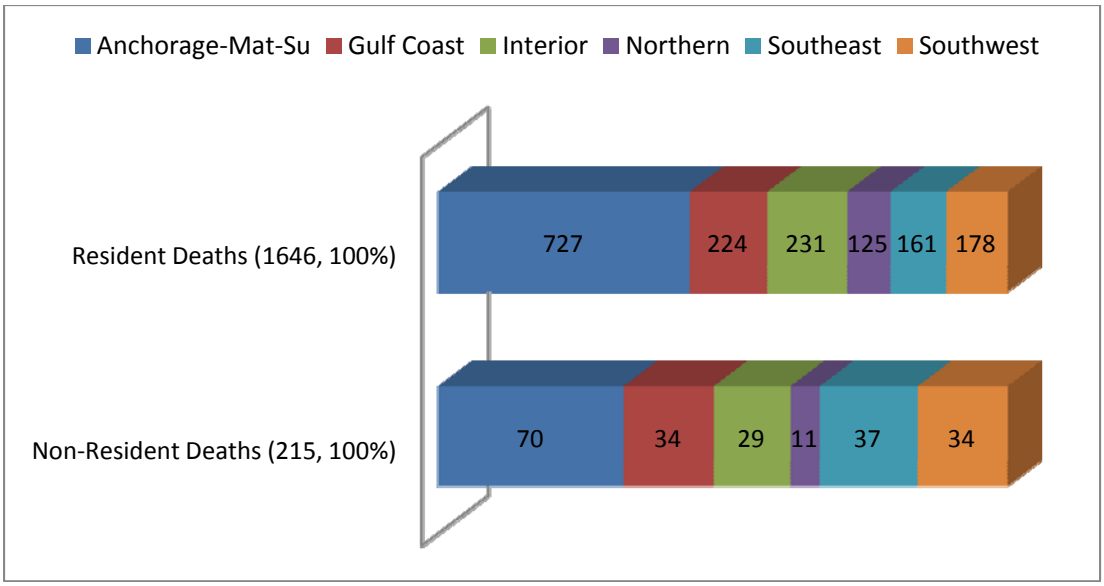


Table: Distribution of Accidental Deaths, Alaska Residents and Non-Residents

Labor Market Area	Resident Deaths	Percent	Non-Resident Deaths	Percent
Anchorage-Mat-Su	727	44%	70	33%
Gulf Coast	224	14%	34	16%
Interior	231	14%	29	13%
Northern	125	8%	11	5%
Southeast	161	10%	37	17%
Southwest	178	11%	34	16%
Grand Total	1646	100%	215	100%

Part IV: Motor Vehicle Crash Related Injury Deaths and Hospitalizations in Alaska

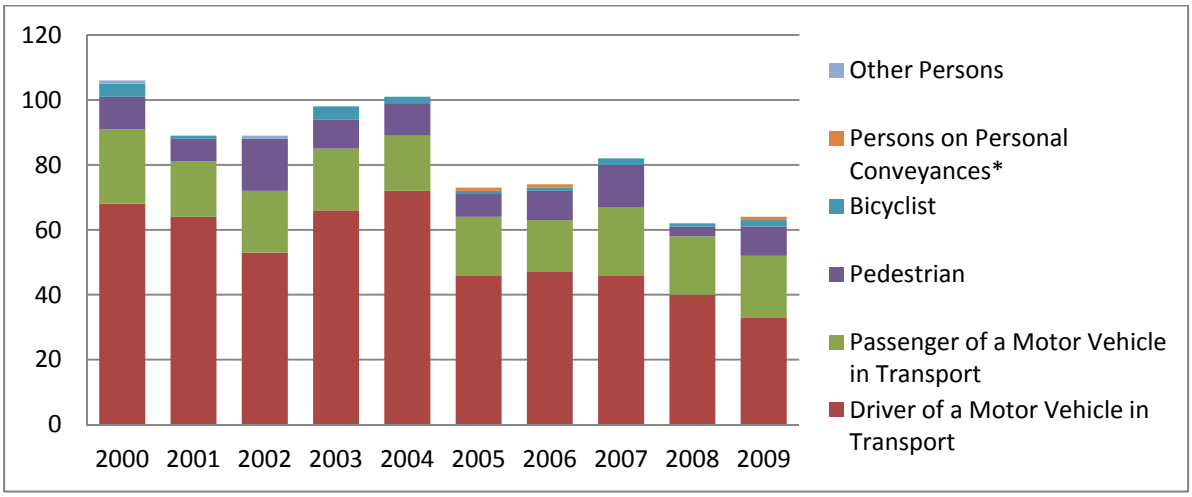
From 2000 to 2009, 4537 non-fatal hospitalizations for motor vehicle crash related injuries occurred in Alaska (average of 454 per year), and in addition there were 238 hospitalizations for motor vehicle crash victims resulting in death (average of 24 per year). From the Fatality Analysis Reporting System (FARS) we see 760 fatalities occurring in Alaska during the same period. Thus only one third of the fatalities were individuals who had survived long enough to be admitted to a hospital in Alaska. Some of the fatalities may have resulted in hospitalization outside of Alaska. The FARS system involves tracking outcomes regardless of place, so victims who have been transported to hospitals outside of Alaska have been included.

Figure 28. Motor Vehicle Accident Deaths by Residency, Age Group and Gender (2005-2009)

Female			Male			Total		
Age Group	Resident Deaths	Non-Resident Deaths	Age Group	Resident Deaths	Non-Resident Deaths	Age Group	Resident Deaths	Non-Resident Deaths
0-14	10	0	0-14	22	1	0-14	32	1
15-24	30	1	15-24	78	6	15-24	108	7
25-34	17	1	25-34	55	1	25-34	72	2
35-44	19	1	35-44	41	4	35-44	60	5
45-54	17	1	45-54	42	4	45-54	59	5
55-64	13	2	55-64	27	5	55-64	40	7
65+	13	2	65+	25	7	65+	38	9
Total	119	8	Total	290	28	Total	409	36

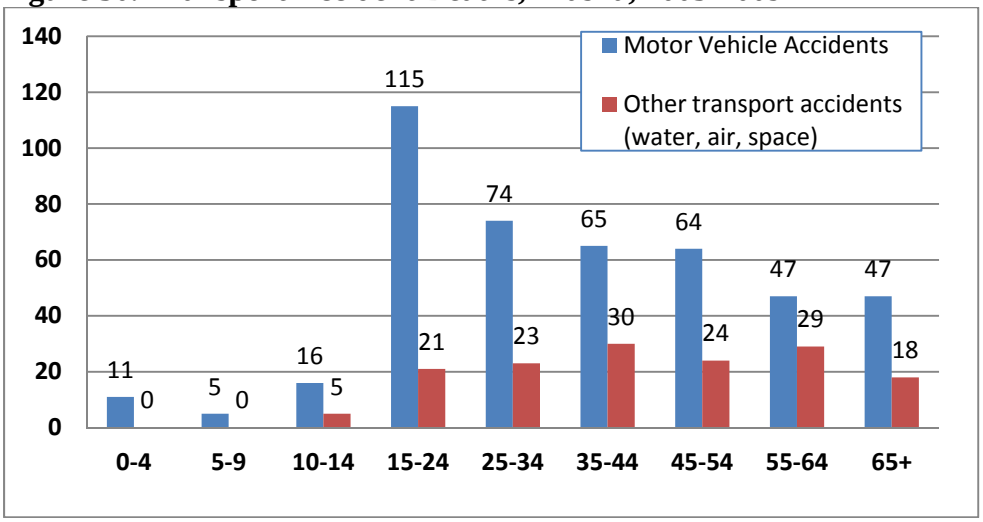
Source: Bureau of Vital Statistics, Alaska Division of Public Health

Figure 29. Motor Vehicle Fatalities by Person Type, 2000-2009 Crash Occurrences in Alaska (FARS)



Examination of deaths due to motor vehicle crashes, compared with other transport related deaths (Figure 30), shows the big difference in age distributions of these groups. Motor vehicle fatalities in Alaska as reported by the vital statistics system indicate that 15-24 year olds have the highest number of deaths, with 115 such deaths between 2005-2009, contrasted with 21 deaths due to other transport-related accidents in that age group. Motor vehicle deaths exceed other transport related deaths for all age groups.

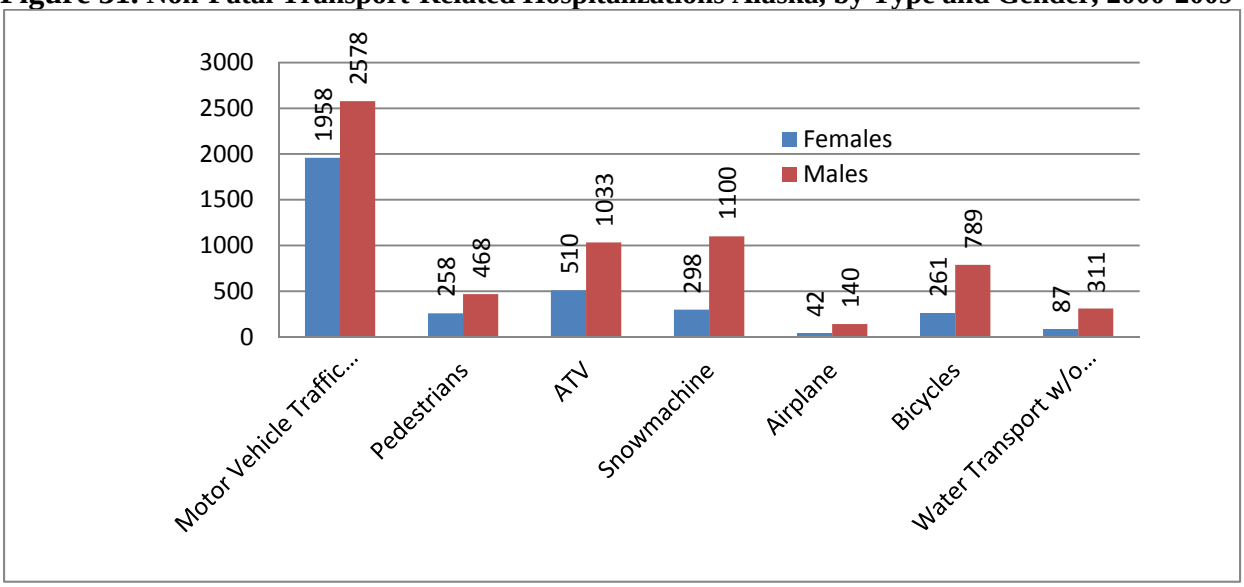
Figure 30. Transport Accident Deaths, Alaska, 2005-2009



Source: Bureau of Vital Statistics, Alaska Division of Public Health

Alaska Trauma Registry data on hospitalizations confirms the importance of motor vehicle traffic injuries as significant cause of hospitalizations. Males account for well over half of the motor vehicle crash related hospitalizations, but for even more of an excess of other transport related hospitalizations, as shown in Figure 31.

Figure 31. Non-Fatal Transport-Related Hospitalizations Alaska, by Type and Gender, 2000-2009



Fatality Analysis Reporting System (FARS) Data on Alcohol Involvement

Alcohol-related motor vehicle deaths have been a significant factor in overall totals but have been declining over time. This may be attributed to a number of campaigns promoting safe driving habits and awareness of enforcement action. The total number of fatal motor vehicle events has steadily declined and the decline in alcohol-related fatal crashes has been even more pronounced. In 2000, 48% of all fatal crashes were alcohol related. By 2009, this figure had declined to 37%. Beginning in 2002, Alaska rate for alcohol-related motor vehicle crashes fell below the national average.

Figure 32. Fatalities Due to Alcohol-Related Motor Vehicle Crashes, Alaska FARS

Year	Total Fatal Crashes	Total Fatalities	Alcohol-Related Fatal Crashes	Fatalities Due to Alcohol-Related Crashes	Percent Alcohol Related Crashes	Percent Alcohol Related Fatalities
2000	93	106	45	56	48%	53%
2001	80	89	42	47	53%	53%
2002	78	89	34	37	44%	41%
2003	87	98	34	37	39%	38%
2004	96	101	30	31	31%	31%
2005	66	73	32	37	48%	50%
2006	71	74	23	23	32%	31%
2007	75	82	31	35	41%	43%
2008	55	62	22	27	40%	44%
2009	59	64	22	26	37%	41%

In the *State Epidemiological Profile of Substance Use, Abuse and Dependency,*[9] unintentional injuries have been shown to have a strong association with alcohol and substance use. Analysis of Alaska Trauma Registry data with examination of any mention of alcohol use indicates that motor vehicle male crash victims are half again as likely as female victims to have alcohol mentioned: 29% compared with 20%. The table below shows even higher association of alcohol with injuries related to falls, assault and suicide for both men and women.

[9] Alaska Department of Health and Social Services, *State Epidemiological Profile of Substance Use, Abuse and Dependency* is available at: http://www.epi.state.ak.us/injury/sa/SEOW-2005-2009.pdf

Figure 33. Top Five Hospitalized Injury and Injury Associated with Alcohol, by Gender, Alaska Trauma Registry, 2005-2009

	Male				Female	
Cause of Injury	Total Count	Count Associated w/ Alcohol (%)		Cause of Injury	Total Count	Count Associated w/ Alcohol (%)
Falls	4,215	783 (18.6%)		Falls	4,635	508 (11.0%)
Assault	1,360	842 (61.9%)		Suicide Attempt	2,214	1,005 (45.4%)
Suicide Attempt	1,283	635 (49.5%)		Motor Vehicle	909	181 (19.1%)
Motor Vehicle	1,217	354 (29.4%)		Assault	433	236 (54.5%)
All-Terrain Vehicle	588	173 (29.4%)		All-Terrain Vehicle	298	62 (20.8%)

Geographically, motor vehicle crashes resulting in death or hospitalization for injuries are concentrated in the parts of the states with the most road miles, the "rail belt" and southeast, but they also occur in rural areas with limited local road systems.

Figure 34.

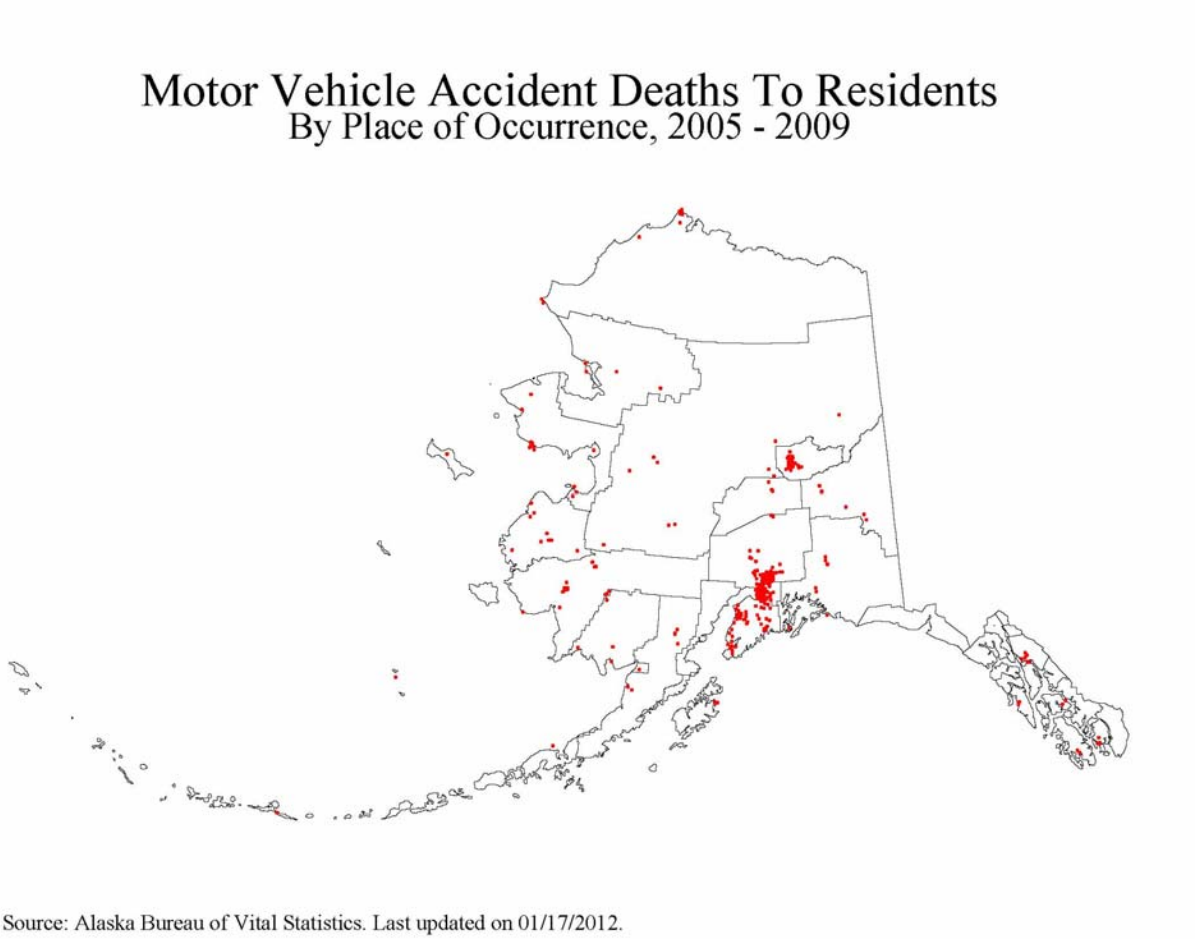


Figure 35.

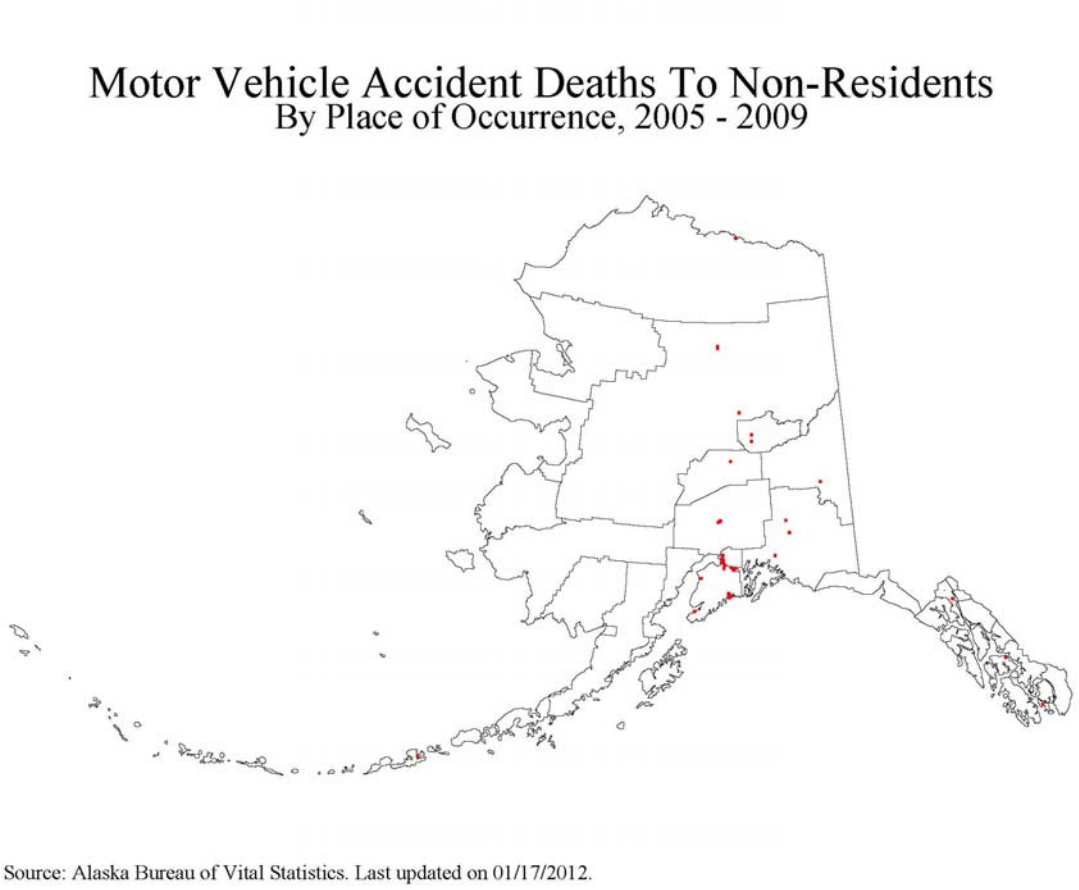
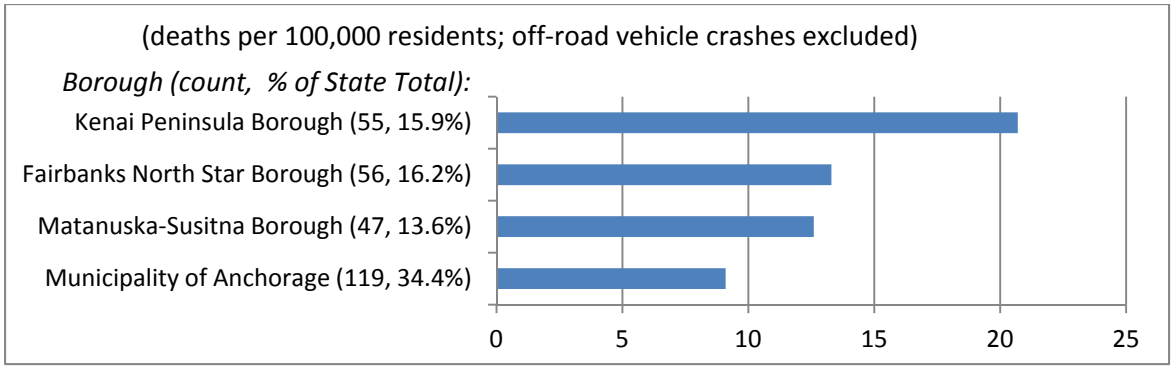


Figure 36. Distribution of Motor Vehicle Crash Deaths – Occurrences (Includes Non-Resident and Resident Deaths), by Census Area and Borough, 2005-2009

Alaska	Occurrences		Resident Deaths	
Borough/Census Area:	Number	Percent	Number	Percent
Kenai Peninsula Borough	63	14.4	55	15.9
Matanuska-Susitna Borough	58	13.2	47	16.2
Fairbanks North Star Borough	66	15.1	56	13.6
Municipality of Anchorage	125	28.5	119	34.4
Balance of State	126	28.8	69	19.9

Figure 37. Alaska Resident Motor Vehicle Death Age-Adjusted Rate for Census Areas and Boroughs with >19 occurrences, 2005-2009



Taking a full ten-year period, it is possible to observe the distribution of motor vehicle mortality rates across a larger number of the census areas and boroughs of Alaska, as shown in Figure 37.

Figure 38. Motor Vehicle Death Age-Adjusted Rate for Census Areas and Boroughs with >19 occurrences, 2000-2009

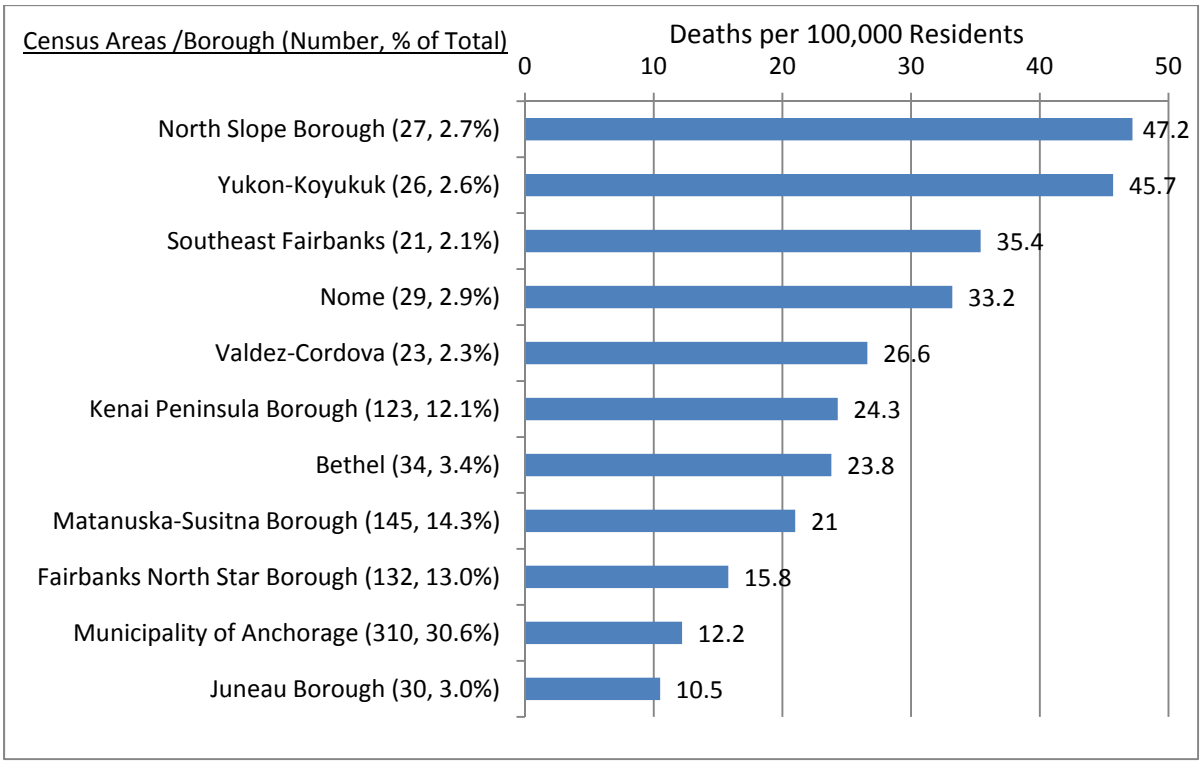


Figure 39. Non-Fatal Hospitalizations for Motor Vehicle Crash Injuries for Alaska Residents and Non-Residents, by Census Area and Borough, 2005-2009

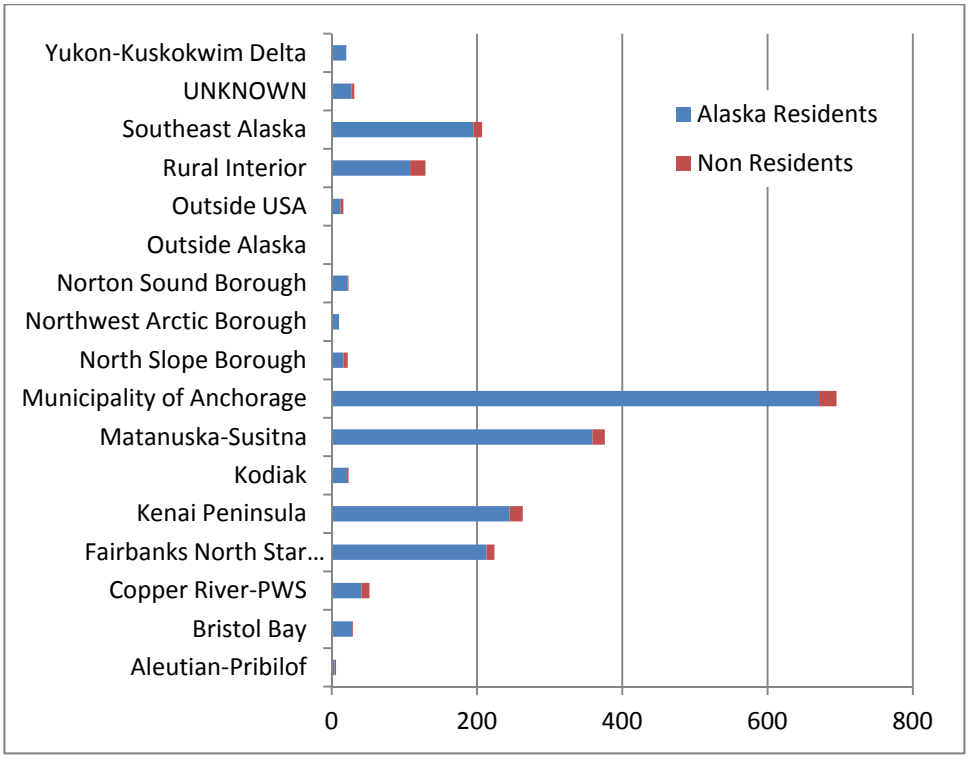


Figure 40. Off-Road Motor Vehicle Death Age-Adjusted Rate, by Census Areas and Boroughs with >19 occurrences, 2000-2009

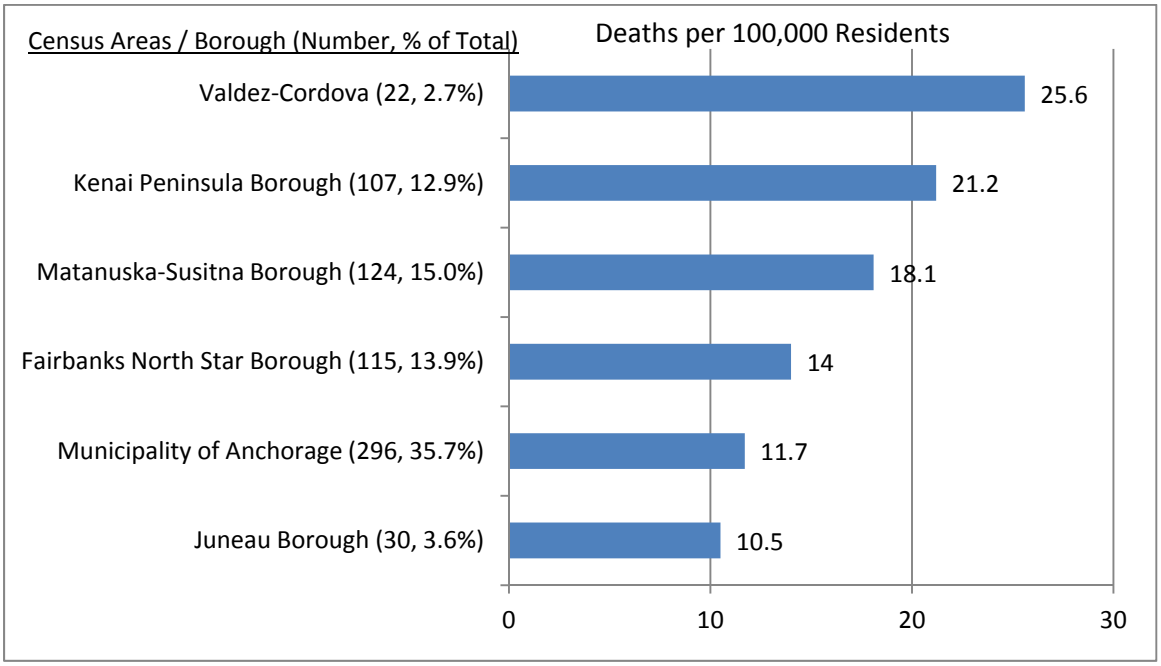
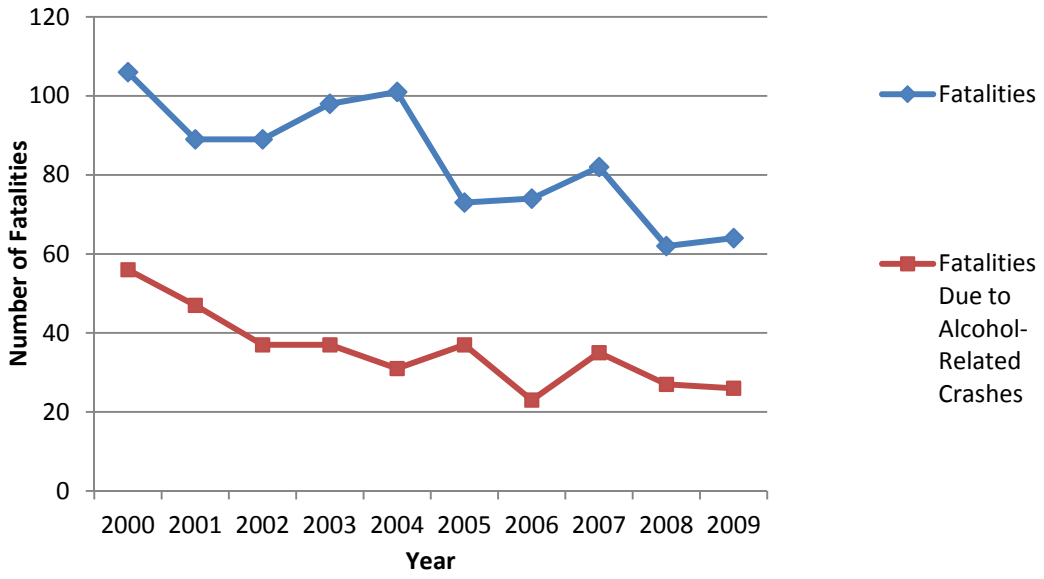
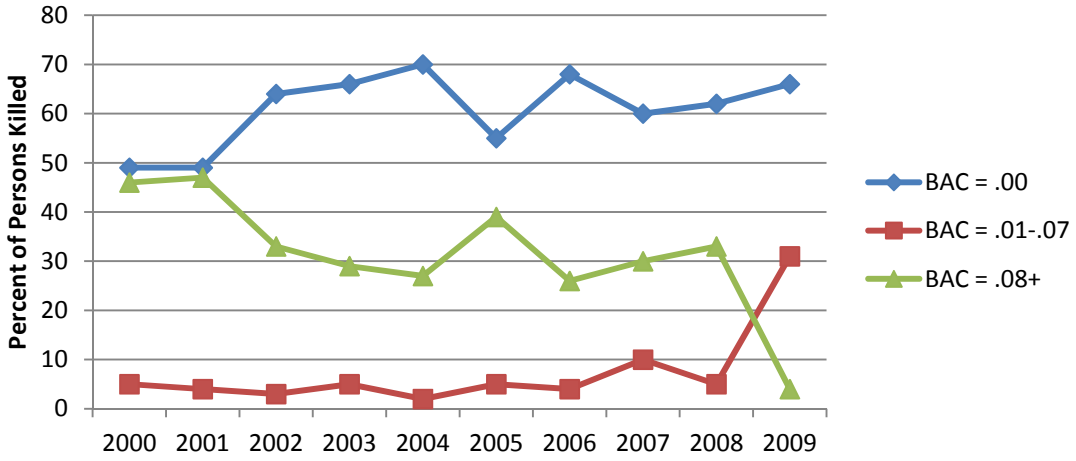


Figure 41. Total Motor Vehicle Crash Fatalities Compared to Alcohol-Related Motor Vehicle Crash Fatalities, Alaska FARS



Between 2000 and 2009, trends in blood alcohol concentrations (BAC) among drivers involved in fatal motor vehicle crashes were a variable that indicates a rise in the percent of drivers with BAC = 0.01-0.07 while the percent of drivers with BAC = 0.08+ continued to decline (Figure 42). This trend was similar among young adults. Of significance was the improved law enforcement surveillance of drivers suspected of driving after drinking.[10]

Figure 42. Percent of Persons Killed, by Highest Driver BAC in Crash, Alaska FARS



[10] Alaska *State Epidemiological Profile of Substance Use, Abuse and Dependency* , p. 61

Figure 43. Trends in Blood Alcohol Concentration (BAC) Collected After Fatal Motor Vehicle Crashes, 2000-2008, FARS

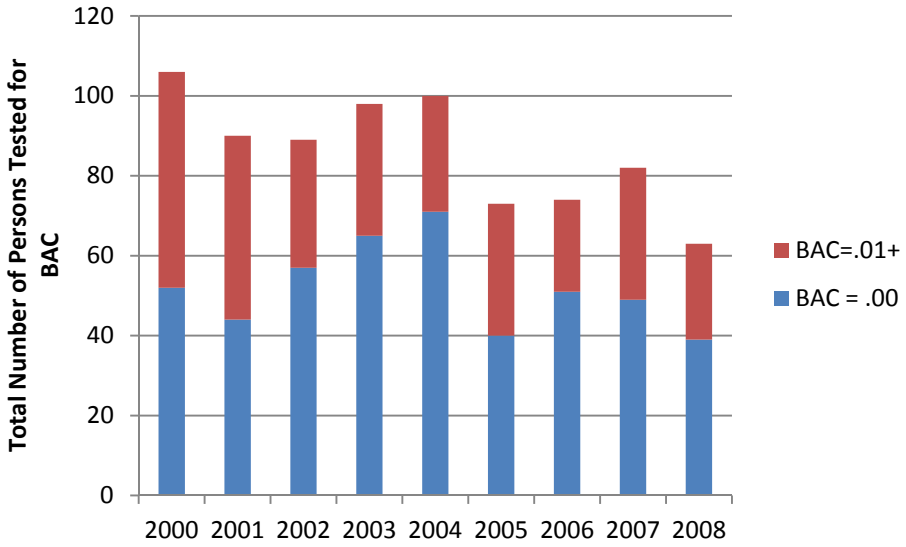


Figure 44. BAC Levels, 15-20 Year Old Drivers Involved in Fatal Motor Vehicle Crashes, 2000-2009 (N=174)

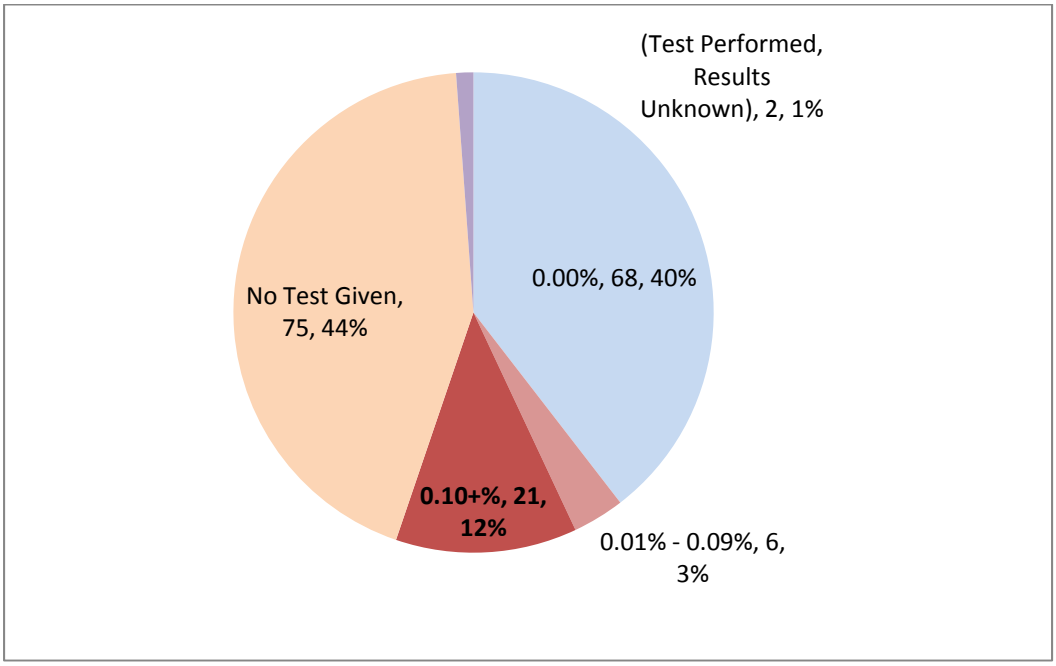


Figure 45. Total 15-20 Year Old Drivers Involved in Fatal Crashes, by BAC, 2000-2009, FARS

Blood Alcohol Content (BAC)										
	0.00%	0.01% - 0.09%	0.10+%	Test Refused	None Given	Test Performed, Results Unknown	PBT Positive Reading with No Actual Value	Unknown	Blank	Total
2000	9	2	7	0	10	0	0	1	0	29
2001	8	2	2	0	4	0	0	0	0	16
2002	3	0	1	0	12	0	0	1	0	17
2003	4	0	1	0	15	0	0	0	0	20
2004	8	0	0	0	7	0	0	0	0	15
2005	4	0	2	0	6	0	0	0	0	12
2006	7	0	2	0	7	1	0	0	0	17
2007	8	1	3	0	9	0	0	0	0	21
2008	12	0	0	0	4	1	0	0	0	17
2009	5	1	3	0	1	0	0	0	0	10
Total	68	6	21	0	75	2	0	2	0	174

Figure 46. Motor Vehicle Fatalities by Person Type, 2000-2009, FARS

Year	Driver of a Motor Vehicle in Transport	Passenger of a Motor Vehicle in Transport	Pedestrian	Bicyclist	Persons on Personal Conveyances*	Other Persons
2000	68	23	10	4	0	1
2001	64	17	7	1	0	0
2002	53	19	16	0	0	1
2003	66	19	9	4	0	0
2004	72	17	10	2	0	0
2005	46	18	7	1	1	0
2006	47	16	9	1	1	0
2007	46	21	13	2	0	0
2008	40	18	3	1	0	0
2009	33	19	9	2	1	0
Total	535	187	93	18	3	2

* Personal conveyances may include roller blades, skateboard, motorized wheelchair, etc.

Other Transport Injury Deaths and Hospitalizations

Air Transportation

Alaska relies on airplanes for moving people and goods due to the long distances and lack of roads and railroads in arctic, subarctic and mountainous areas. This heavy reliance on air transportation shows up in the statistics about crashes and fatalities, as shown in Figure 44.

Figure 47. Commuter and Air Taxi Crashes† 1990-2009

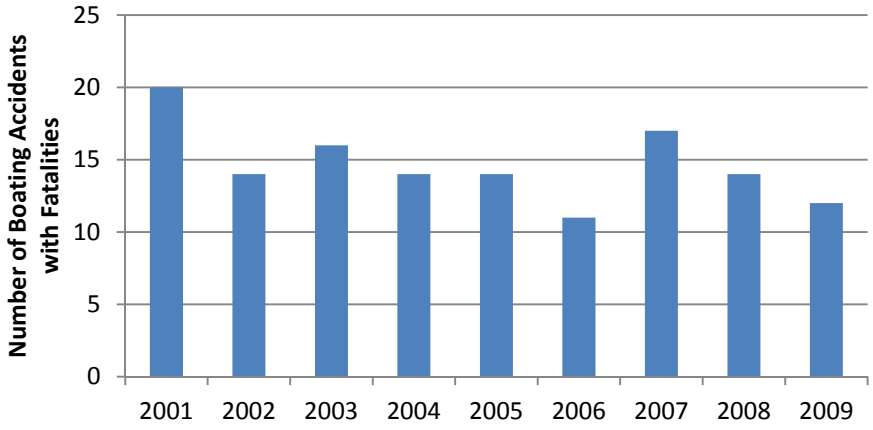
	U.S. Crashes	Alaska Crashes
Number of crashes	1615	568 (35%*)
Number of fatal crashes	407	81 (20%*)
Number of fatalities	1186	238 (20%*)

†Defined as Federal Aviation Regulations Part 135 flights.
** Percent of all U.S. commuter and air taxi crashes.*
Source CDC http://www.cdc.gov/

Drowning and Recreational Boating Fatalities

Boating in Alaska can be the normal form of daily transportation between home, work and other community locations. Key industries include commercial fishing, guiding services, and tourism. Boating is also a common recreational activity among 100-plus communities on approximately 44,000 miles of coastal shoreline and numerous lakes, streams, and rivers. From 2001 to 2009, 200 recreational boating accidents with fatalities were documented (Figure 48).

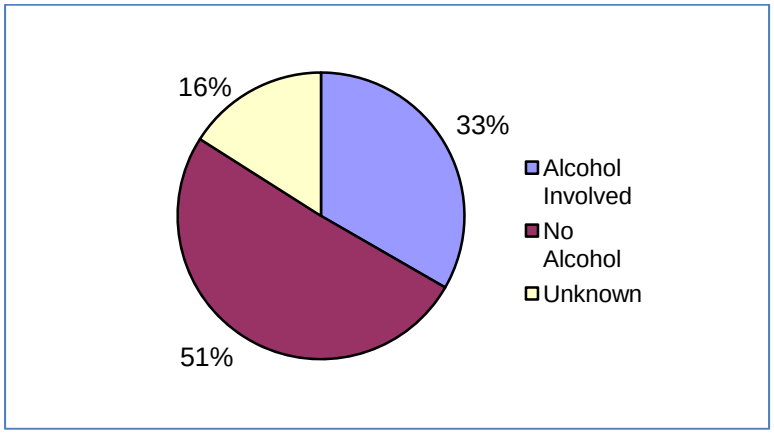
Figure 48. Recreational Boating Fatalities, Alaska, 2001-2009



"Boating Under the Influence" (BUI) is responsible for about 34% of fatal boat events each year in the United States. BUI is very similar to a "Driving Under the Influence" (DUI) offense. Law enforcement officials will look for erratic behavior while operating a boat and will ask to perform a field sobriety test and to take a chemical test. Between 2005 and 2009, 68 recreational

boating events with 75 fatalities occurred in Alaska, of which one-third were associated with known alcohol use (Figure 49). Prevalence was higher among males (88%) and was higher for adults 18-24 years (28%). Of the 2009 events, 5 of the 12 involved canoes.

Figure 49. Recreational Boating Fatalities Associated with Alcohol, Alaska, 2005-2009 (N=75)



Source: Death Certificate and Surveillance databases, Section of Injury Prevention & EMS in cooperation with Alaska Safety Marine Education Association and the United States Coast Guard.

A recent in-depth review of drowning in Alaska by Strayer et al finds that during 2000-2006, 402 unintentional drowning deaths, 108 of them occupational, occurred in Alaska, with an average annual fatality rate of 8.9 deaths per 100,000 Alaskans. The victim population was 86% male and 44% Alaska Native; 40% drowned in the south-west region of Alaska. For non-occupational cases with alcohol use documented, 33% were associated with alcohol consumption, as were 78% of those involved with all-terrain vehicle crashes. Only 17% of non-occupational victims who drowned while boating wore a Personal Floatation Device (PFD).[11]

The drowning rate in Alaska during 2000-2006 (8.9 drowning deaths per 100,000 population) was a decrease from the rate reported in a 1996 study, but the elevated risk for drowning for males and Alaska Natives continued. A substantial portion of fatalities were associated with alcohol consumption. PFD use remains low, and child drowning rates were unchanged from earlier studies. The report concludes that increased data on water temperature and immersion time may help demonstrate the benefits of PFD use to those at risk, and recommends use of social marketing efforts adapted for at-risk populations.[12]

[11] "Drowning in Alaska: progress and persistent problems." Strayer HD, Lucas DL, Hull-Jilly DC, Lincoln JM. Alaska Native Tribal Health Consortium, Division of Community Health Services, Anchorage, AK 55908, USA. hdstrayer@anthc.org

[12] Ibid.

Part V. Conclusion

While unintentional injury remains the third leading of death in Alaska, findings from this report indicate that the rate for unintentional injury deaths has declined 10% over a ten-year period. Injury deaths are disproportionately higher among males, Alaska Natives, and younger age groups. Approximately 5% of these deaths occur among non-residents, who are either visiting or temporarily working in Alaska. Many of the non-resident deaths have been attributed to high risk activities (e.g., mountaineering, aviation) and work-related tasks. The majority of hospitalizations due to an injury are due to a fall followed by transportation-related events.

Motor vehicle traffic events account of nearly 38% of all transportation-related hospitalizations annually. However, analysis of data from 2005-2009 have shown a 20% decrease from the previous 5-year period. Most events occur along Alaska's limited transportation corridors and in population hubs. While injury hospitalizations have a strong association with alcohol and substance use and abuse, motor vehicle crashes and fatalities associated with alcohol continue to diminish.

While data for selected hospitals in the state have not been included in this report, results from the data analyses will permit us to study the frequency of hospitalizations, emergency department visits, mechanisms of injury, and equipment in-place for preventing injury and serious trauma and will include observed vs. expected tables for census areas and boroughs.

Part VI. Recommendations

- Develop an on-going injury data surveillance workgroup and reporting schedule for development and completion of an annual or bi-annual report with interim milestones to include:

    - Submit annual hospital discharge dataset summary on non-fatal injuries occurring in Alaska to the National Center for Injury Prevention and Control;
    - Establish a framework for regular review of current and potential data sources to identify limitations, recommendations for improvement, and analytical approaches to standardize reporting (for example, to accommodate AK and U.S. comparisons using "resident" injuries/deaths, but also occurrences in Alaska regardless of residence; adopt an approach for historical analysis such as a base of 5-year periods' static averages as reference points, with annual counts and rates for the more recent years), depending on available resources;
    - Conduct targeted in-depth analysis for select special topics (e.g., snowmachine/ all-terrain vehicle, violence, falls);
    - Develop baseline metrics to monitor the adoption of electronic data capture to promote timelier submission and quality improvement of injury surveillance system data;
    - Expand on current data assessments (Alaska Epidemiologic Profile on substance Abuse and the NHTSA Traffic Records Assessment) using quantifiable performance measures that encompass timeliness, accuracy, completeness, uniformity, integration, and accessibility.

- Assess the hospital discharge and emergency department data in injury surveillance programs.

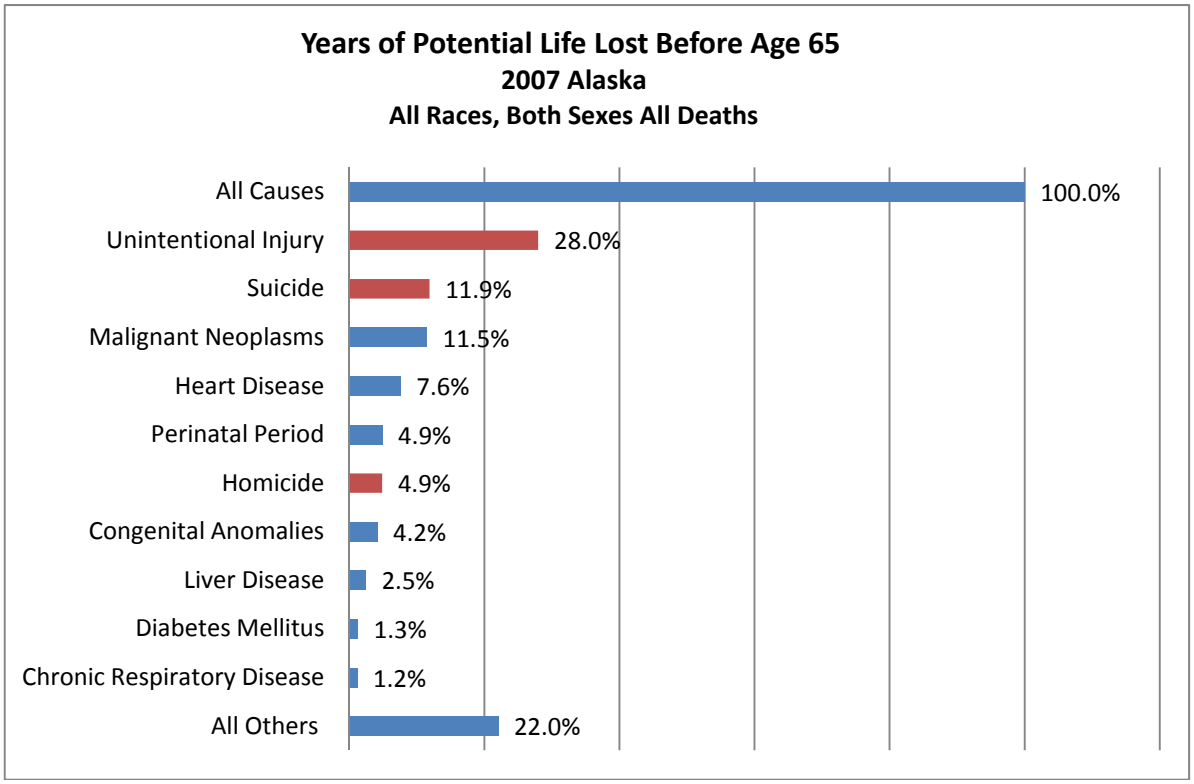
- Prepare white paper on cost, benefits, and risks of linkage projects.

- Pursue the inclusion of each of the injury surveillance components in the Indicator Based Information System (IBIS).

- Develop online query and reporting tools for all injury components for IBIS.

- Monitor implementation of ICD-10 and All Payers Claim database.

- **Appendix A. Years of Potential Life Lost**



WISQARS (CDC)

Unintentional injury accounted for 28% of years of potential life lost before age 65 in Alaska as compared to 20% for the nation (percentage distribution shown in table below).

2007 United States

Cause of Death	YPPL	percent
All Causes	11,795,817	100.0%
Unintentional Injury	2,371,575	20.1%
Malignant Neoplasm	1,858,935	15.8%
Heart Disease	1,395,829	11.8%
Perinatal Period	947,061	8.0%
Suicide	703,199	6.0%
Homicide	605,158	5.1%
Congenital Anomalies	491,957	4.2%
Liver Disease	247,188	2.1%
Cerebrovascular	243,667	2.1%
Diabetes Mellitus	222,303	1.9%
All Others	2,708,945	23.0%

Appendix B. Resource Links

Fatality Analysis Reporting System (FARS):
http://www.dot.state.ak.us/stwdplng/hwysafety/fars.shtml

Highway Safety Statistics http://www.dot.state.ak.us/stwdplng/hwysafety/stats.shtml

State Epidemiological Profile of Substance Use, Abuse and Dependency (Alaska)
http://www.epi.state.ak.us/injury/sa/SEOW-2005-2009.pdf

Alaska Trauma Registry http://www.hss.state.ak.us/dph/ipems/injury_prevention/trauma.htm

Alaska Bureau of Vital Statistics http://hss.alaska.gov/dph/bvs/

Alaska Health Care Data Book: Selected Measures (2007)
http://www.hss.state.ak.us/dph/healthplanning/publications/healthcare/default.htm

Centers for Disease Control and Prevention (CDC) "Web-based Injury Statistics Query and Reporting System" (WISQARS™) http://www.cdc.gov/injury/wisqars/index.html

Centers for Disease Control and Prevention (CDC) "Wide-ranging Online Data for Epidemiologic Research" (WONDER) http://wonder.cdc.gov/

Appendix C. 10 Leading Causes of Non-Fatal Hospitalized Injuries, Alaska Residents, 2005-2009

	Age Group												
Rank	**<1**	**1-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-34**	**35-44**	**45-54**	**55-64**	**65-74**	**75-84**	**85+**
1	Falls 93	Falls 254	Falls 224	Falls 213	Suicide 661	Suicide 606	Suicide 713	Falls 816	Falls 1259	Falls 1253	Falls 998	Falls 1156	Falls 796
2	Assault 27	Poisoning 139	Fall from playground 75	ATV 111	MV Traffic 267	Assault 347	Falls 555	Suicide 610	Suicide 444	MV Traffic 200	MV Traffic 90	MV Traffic 76	MV Traffic 9
3	Burn 18	Burn 53	Bicycle 60	Suicide 95	Falls 245	MV Traffic 305	Assault 419	Assault 338	MV Traffic 296	Suicide 132	Acc. Struck 25	Acc. Struck 24	Acc. Struck 8
4	Swallow Object 13	Acc. Struck 43	ATV 33	Bicycle 90	Assault 170	Falls 272	MV Traffic 308	MV Traffic 247	Assault 256	Assault 92	Suicide 24	ATV 18	Hypothermia/Frostbite 6
5	Suffocation 12 Poisoning 12	Swallow Object 30	Acc. Struck 31	Sports 85	ATV 148	ATV 111	Snow machine 126	ATV 127	ATV 95	Acc. Struck 50	Cut 22	Suicide 16	
6	MV Traffic 7	Pedestrian 26	Pedestrian 29	MV Traffic 65	Poisoning 141	Snow machine 92	Cut 118	Snow machine 115	Acc. Struck 88	Machinery 44	Hypothermia / Frostbite 20	Hypothermia/Frostbite 11	
7	Acc. Struck 5	Dog Bite 24 Suffocation 24	Cut 21 / Dog Bite 21 / MV Traffic 21	Poisoning 44	Sports 130	Cut 79	ATV 107	Cut 95	Snow machine 84 Cut 84	Cut 42	ATV 18 Fire/Flame 18	Assault 10	
8		Fall from playground 22	Sledding 16	Snow machine 39	Snow machine 117	Sports 56	Sports 84	Acc. Struck 74	Bicycle 79	ATV 34 Bicycle 34	Snow machine 17	Fire 6 / Ped. 6 / Spt 6	
9		Assault 19	Sports 15	Acc. Struck 32	Bicycle 74	Acc. Struck 44	Acc. Struck 65	Sports 54	Pedestrian 57	Hypothermia /Frostbite 33 Pedestrian 33	Pedestrian 16		
10		MV Traffic 18	Poisoning 13	Fall from playground 31	Acc. Struck 33	Acc. Firearm 31	Bicycle 44	Bicycle 53	Fire/Flame 52 Machinery 52	Strain 30	Sports 15		

Source: Division of Public Health, Dept. of Health & Social Services, Alaska Trauma Registry: Admitted to the hospital for 24 hours or greater. Occurrences less than 5 not listed. Created January 4, 2011