ALASKA 2019

Injury Facts

Injury & Deaths Related to Falls among Older Adults and Transportation Incidents among All Alaska Residents

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2019

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I. Report Highlights

Fall-related Injury and Deaths among Older Alaska Adults

- Falls are the number one leading cause of serious injury requiring acute care and one of the leading causes of death among Alaska residents age 55 and older (hereafter, older Alaska adults).
- In 2016 alone, the total amount billed to older Alaska adults for acute care received for serious fall-related injuries was approximately $135 million—triple the amount billed in 2012. This financial burden will likely increase even as Alaska's population ages and healthcare costs increase.
- The rate of serious fall-related injury is higher among older women in Alaska compared to older men. The gender disparity in serious fall-related injury among older adults in Alaska may be larger than what is observed in the rest of the country.
- There are substantial disparities in serious fall-related injury among older Alaska adults by race. Serious fall-related injury among older Alaska Native adults is approximately double the rate of older White adults and more than triple the rate of older adults of other races. Corresponding disparities in fall-related injury deaths were not found.
- Data indicate most older Alaska adults are not tested for excessive alcohol use or other substance misuse when they seek treatment for fall-related injuries in acute care settings. Substance misuse and taking multiple prescription medications can increase the risk of falls and related injuries among older adults. Regular drug and alcohol screenings for older fall patients may help health care providers identify and mitigate these behavioral risk factors and prevent future injury.
- Older Alaska adults who report falls and fall-related injury are likely to rate their overall general health as fair or poor (as opposed to good, very good, or excellent); they also report more frequent mental distress and health problems that limit usual activity compared to older adults who do not fall.
- Self-reported falls and fall-related injury are more common among older adults who have diabetes and arthritis, and among those who have experienced recent confusion and memory loss.

Transportation-related Injury and Deaths among all Alaska Residents

- Next to falls, transportation-related incidents are the second leading cause of serious injury requiring acute care among Alaska residents when age is not considered.
- Alaska is a unique state in that many residents live in villages located in remote areas where travel by all-terrain vehicle (ATV) and snow machine are common. Likely due to their place

in everyday Alaskan life, ATVs and snow machines were responsible for over a quarter of all serious transportation-related injuries between 2012 and 2016.

- The total amount billed to Alaska residents for acute care received for serious transportation-related injury was $40 million in 2012 and $91 million in 2016.
- Serious injury and death caused by transportation-related incidents are higher among men compared to women in Alaska.
- The rate of serious transportation-related injury among Alaska Native people is triple the rates of both White Alaska residents and other race Alaska residents. Alaska Native people also have disparate rates of transportation-related death compared to White and other race Alaska residents.
- Alaska Native people may be at greater risk of transportation-related injury and death in that they are less likely than White and other race Alaska residents to regularly use seat belts. Alaska Native people are also less likely to use infant car seats and life jackets with their young children.
- Regular seat belt use is significantly less likely among Alaska adults and adolescents who report recent drinking and driving. Regular seat belt use is also significantly less likely among Alaska adolescents who report driving under the influence of marijuana and riding in a car driven by someone who has been drinking alcohol.
- A larger percentage of Alaska adolescent drivers than Alaska adults report recent driving under the influence of alcohol.
- More Alaska adolescent drivers report driving under the influence of marijuana than driving under the influence of alcohol.
- Driving under the influence of alcohol and marijuana are less frequent among adolescent drivers who report certain protective factors including family support, connectedness, and association with pro-social peers.
- Thirty-nine percent of Alaska adolescent drivers report recent distracted driving—that is, texting, emailing, or talking on a cellphone or smartphone while driving in the past 30 days.
- White adolescents are significantly more likely than Alaska Native and other race adolescents to report distracted driving.
- Unlike driving under the influence of alcohol and marijuana, distracted driving does not appear to be mitigated by the presence of protective factors among adolescents.

II. Introduction

Since 2014, Alaska has ranked within the top 10 states in the country for deaths caused by unintentional injury.[1] In 2014 and 2015, Alaska was ranked 8th among states for unintentional injury, and in 2016 Alaska climbed to 7th place. Serious injury and death are considered preventable in cases where risks can be mitigated through the use of safety devices (e.g., seat belts), education, and policies (e.g., laws requiring seat belts and prohibiting distracted driving). Serious unintentional injury and death are also often associated with measurable factors like demographic and environmental characteristics, which can be used to develop and tailor effective interventions.[2]

A public health approach to injury prevention seeks to improve the health, safety, and wellbeing of a population by addressing individual, social, environmental, and societal determinants of health. This process involves identifying and reducing risk factors while also identifying and leveraging protective factors to advance overall health.[3] The Alaska Statewide Violence and Injury Prevention Partnership recently developed the Alaska Statewide Violence and Injury Prevention Plan[4] wherein they identified shared risk and protective factors for priority areas of injury concern. Building off this work and in an effort to support injury prevention efforts statewide, the current report is a compilation of information related to two of the leading causes of injury and death in Alaska: falls among older Alaska adults and transportation-related incidents among all Alaska residents.

This report presents data on the prevalence of injury and death caused by falls and transportation-related incidents as well as patterns observed by select subgroups (i.e., gender, age, race, and region). Data also include information on behavior, health indicators, and social characteristics related to these two injury categories. Many of the risk and protective factors for falls and transportation-related injury identified in the Alaska Statewide Violence and Injury Prevention Plan are examined here.

A number of data sources on falls among older Alaska adults and transportation-related incidents among all Alaska residents are included in this report but there are many others worth exploring. Several organizations within the state regularly collect and disseminate

[1] US Centers for Disease Control and Prevention (CDC) National Center for Health Statistics. *Accident Mortality by State, 2014, 2015, and 2016.* https://www.cdc.gov/nchs/pressroom/states/alaska/alaska.htm. Updated April 13, 2018. Retrieved June 28, 2018.

[2] Alaska Statewide Violence and Injury Prevention Partnership; Alaska Statewide Violence and Injury Prevention Plan, 2018-2022. http://dhss.alaska.gov/dph/Chronic/Documents/InjuryPrevention/documents/2018-2022_AKStatewide_InjuryAndViolencePreventionPlan.pdf. Retrieved February 20, 2019.

[3] Oregon Public Health Division, Oregon Health Authority, Oregon Injury Community Planning Group; Oregon Injury and Violence Prevention Plan, 2016-2020.

information pertinent to transportation-related injury[5] and death.[6] Those interested in more information are encouraged to access the Alaska Injury Program's webpage (http://dhss.alaska.gov/dph/Chronic/Pages/InjuryPrevention/default.aspx).

Organization of this Report and Methods

This report is organized into two major sections by injury category, with fall-related injury and death among older Alaska adults discussed first then transportation-related injury and death among all Alaska residents. Within each section, data and findings are largely presented by data source.[7]

Subgroup Comparisons and Reporting Statistical Significance

Estimates of injury and death related to falls and transportation incidents are examined overall as well as by subgroup to determine whether certain patterns exist by gender, age, race, and region. The methods used to determine statistically significant differences between subgroups vary somewhat depending on the data source, but primarily involve assessing the overlap of 95% confidence intervals and Chi-square tests when appropriate.

Rates and Confidence Intervals

Confidence intervals refer to the "margin of error" or the "plus or minus" value around a rate. Confidence intervals help to understand the size of uncertainty of the "true value" in a population. The 95% confidence interval provides assurance that there is a 95% chance that the true value of the estimate falls between the upper and lower limits of the interval. The magnitude of confidence intervals is dependent upon the size of the population in question and, specific to this report, the count of reported cases of injury and death. Generally, large populations with a large number of cases result in rates with small confidence intervals (i.e., less uncertainty of the "true value"), and smaller populations with fewer cases tend to have large confidence intervals (i.e., more uncertainty). If the confidence intervals of two different rates overlap, we cannot be certain that there is a true difference between them. If the confidence intervals do not overlap, then we can conclude that the results for the two groups are different.

For data presented in this report on serious fall-related injury, fall-related death, serious transportation-related injury, and transportation-related death, differences between subgroups

[5] For example, the Alaska Injury Prevention Center's annual survey of Alaska drivers: http://alaskainjurypreventioncenter.org/wp-content/uploads/2017/10/AIPC-2017-Transportation-Survey-Final-Report.pdf and observational study of seat belt use: http://alaskainjurypreventioncenter.org/wp-content/uploads/2017/10/2017-AK-OPUS-Report-1.pdf

[6] For example, the National Highway Traffic Safety Administration's Fatality Analysis Reporting System (FARS): http://www.dot.state.ak.us/highwaysafety/fars.shtml

[7] Complete descriptions of each data source used in this report appear in Section V: Data Sources.

are assessed by comparing estimated rates and confidence intervals, displayed as "whiskers" on bar charts. When we state that a particular subgroup's rate is higher or lower than another's rate, it is because there is a statistically significant difference between them as their confidence intervals do not overlap.

Chi-Square Tests

Chi-square tests are tests of association between subgroup and outcome variables (for example, male/female subgroups and reports of one or more falls in the past 12 months). Results are labeled as statistically significant if p-values are less than 0.05, which indicates that a difference seen between percentages is statistically significant at the 95% confidence level. Results that approach significance (i.e., where p-values are less than 0.10) are labeled accordingly. Chi-square tests were performed to assess statistically significant differences between select subgroups for data on self-reported falls, self-reported fall-related injuries, and risk and protective factors for transportation-related injury and death.

Trend Analyses

Throughout this report, data are sometimes presented on injury and death related to falls and transportation incidents over multiple years. Joinpoint regression analysis was used to determine statistically significant changes in these injury and death rates over time. When we report a significant increase or decrease in rates of injury or death over time we also report the average annual percentage change by year. Trend analyses were not performed when one or more rates in a series were calculated from fewer than 30 "events" (i.e., cases of injury or death) due to the increased risk of overestimating the significance of trends. Areas where the data did not support the analysis of trends are labeled accordingly throughout the report.

Median, Mean, and Standard Deviation from the Mean

In a few places throughout this report, the median, mean, and standard deviation from the mean are used to describe data from certain sources. The median is the midpoint of a set of numbers or data points and is a useful statistic to describe a set of data points that ranges widely from the smallest to largest value (e.g., the range of charges billed to patients receiving acute medical care). Since the median is the middle value of the range of data points, it is not influenced by especially small or large values. The mean is the average of a set of data points and is calculated by dividing the sum of all data points by the number of data points (e.g., the sum of all billed charges divided by the number of patients). The standard deviation from the mean is a statistic that describes how much each data point in a set spreads from the mean. A small standard deviation indicates that most data points in the set are similar to the mean, and a large standard deviation indicates a wide range of data points that are different from the mean. The standard deviation provides context for the mean and helps describe the tendencies of the data points in the set.

In this report, the median and mean are used to describe data on medical bills for acute care received for serious fall- and transportation-related injury. The mean and standard deviation from the mean (indicated in the report as *SD*) are used to describe the number of days spent in acute care settings for serious fall- and transportation-related injury.

Reporting by Race Group

Data presented by race group are reported using three categories: Alaska Native, White, and Other. Race categories are determined using different methods depending on the data source.

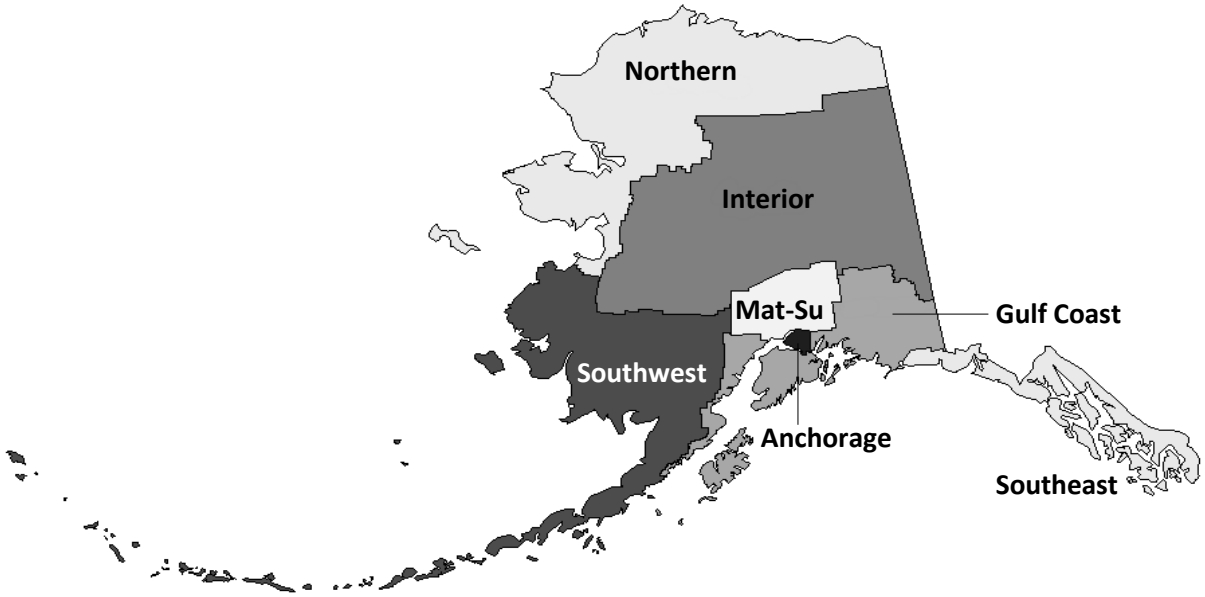
For self-reported information and data on serious injury, "Alaska Native" includes individuals who are classified as or report being Alaska Native/American Indian, alone or in combination with another race. "White" includes all individuals who identify or are classified as White alone, not in combination with another race. "Other" includes those who report other races (e.g., African American, Asian, Hawaiian or Pacific Islander, etc.) or multiple race groups, not including Alaska Native/American Indian.

For death data, race categories are based on "bridged race" codes established by the National Center for Health Statistics (NCHS). NCHS creates bridged race codes by using an algorithm to assign multiple-race individuals to a single-race category. Death data in Alaska are typically reported by four race groups: American Indian or Alaska Native; Asian, Native Hawaiian, or Other Pacific Islander; Black or African American; and White. In this report, the race categories of Black or African American and Asian, Native Hawaiian, or Other Pacific Islander are combined into a single race category of "Other".

Regional Reporting

Data sources used in this report do not provide sufficient representation for reporting by most of the individual boroughs, therefore boroughs were combined to create regions for analysis of patterns by the geographic areas of Alaska. Regions reported here are the Alaska Public Health Regions, which are the same as the Labor Market Regions used by the Alaska Department of Labor and Workforce Development.

Figure 1: Alaska Public Health Regions



Source: State of Alaska, Department of Health and Social Services, Division of Public Health, Center for Health Data and Statistics.

The Alaska Public Health Regions are defined using census area/borough designation as follows:

- Anchorage – Municipality of Anchorage
- Mat-Su – Matanuska-Susitna Borough
- Gulf Coast – Kenai Peninsula Borough, Kodiak Island Borough, and Valdez-Cordova Census Area
- Interior – Denali Borough, Fairbanks North Star Borough, Southeast Fairbanks Census Area, and Yukon-Koyukuk Census Area
- Northern – Nome Census Area, North Slope Borough, and Northwest Arctic Borough
- Southeast – Haines Borough, Hoonah-Angoon Census Area, Juneau City and Borough, Ketchikan Gateway Borough, Petersburg Census Area, Prince of Wale-Hyder Census Area, Sitka City and Borough, Skagway Municipality, Wrangell City and Borough, and Yakutat City and Borough
- Southwest – Aleutians East Borough, Aleutians West Census Area, Bethel Census Area, Bristol Bay Borough, Dillingham Census Area, Lake and Peninsula Borough, and Kusilvak Census Area

Classifying Injury and Deaths

In this report, falls and transportation incidents that cause injury and/or death are defined in a variety of ways depending on the data source. The Alaska Trauma Registry (ATR) and the Health Analytics and Vital Records Section (HAVRS) use International Classification of Disease, Tenth Revision (ICD-10) codes to identify fall- and transportation-related serious injury and death. The Behavioral Risk Factor Surveillance System (BRFSS) collects self-reported information on falls and fall-related injury and risk and protective factors. The Childhood Understanding Behaviors Survey (CUBS), Pregnancy Risk Assessment Monitoring System (PRAMS), Youth Risk Behavior Survey (YRBS), and BRFSS collect self-reported information on risk and protective factors for transportation-related injury and death. Where applicable, we use the terminology from each data source for information presented in charts and tables.

The examination of falls is limited to Alaska residents age 55 and older (Alaska older adults). ICD-10 codes W00 through W19 were used to identify serious fall-related injury and fall-related death in the ATR and HAVRS data. Self-reported information on falls, fall-related injury, and associated risk and protective factors is presented using BRFSS data.

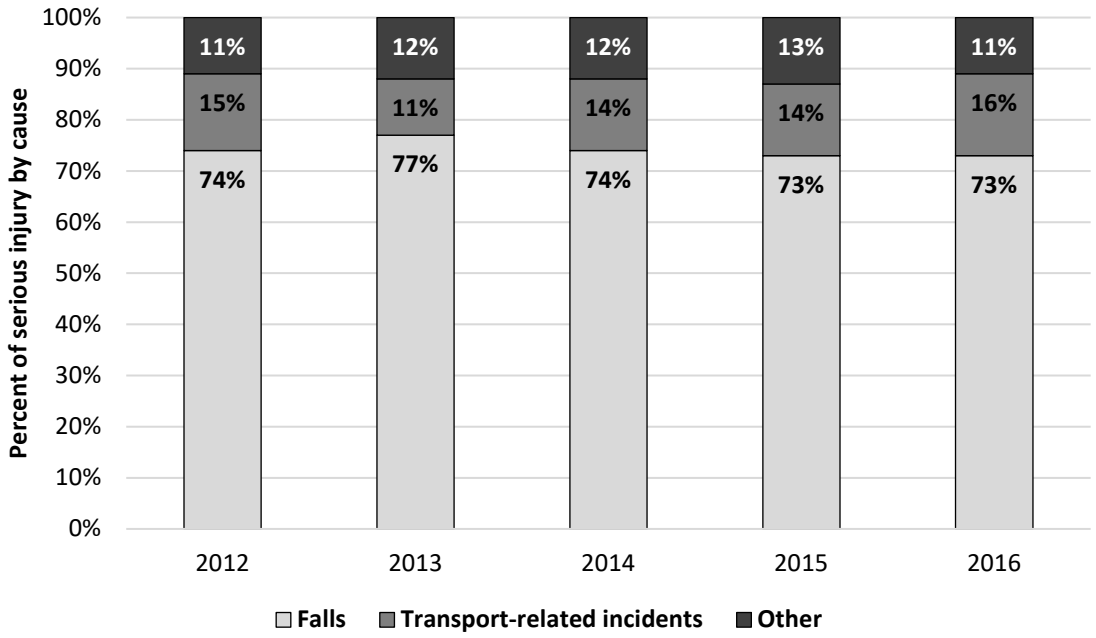
Transportation-related incidents are examined among all Alaska residents and include those involving pedestrians, bicycles, motorcycles, cars, trucks, buses, ATVs and snow machines, water transport, and air transport. ICD-10 codes V00-V99[8] were used to identify serious transportation-related injury and transportation-related death in the ATR and HAVRS data. Self-reported information on risk and protective factors for transportation-related injury and death is presented using BRFSS, CUBS, PRAMS, and YRBS data. Wherever possible, transportation-related injury, death, and associated risk and protective factors are reported by transportation type.

[8] Specifically, V00-V09: Pedestrian injured in transport accident; V10-V19: Pedal cycle rider injured in transport accident; V20-V39: Motorcycle rider injured in transport accident and occupant of three-wheeled motor vehicle injured in transport accident; V40-V85, V87-V89: Occupant of car, truck, van, heavy transport vehicle, bus, and other land transport injured in transport accident; V86: Occupant of special all-terrain or other off-road motor vehicle injured in transport accident; V90-V94: Water transport accidents; V95-V97: Air transport accidents; and V98-V99: Other and unspecified transport accidents.

III. Falls among Older Alaska Adults

Serious Fall-Related Injury

Figure 2: Leading Causes of Serious Injury among Alaska Adults age 55 and older, by year

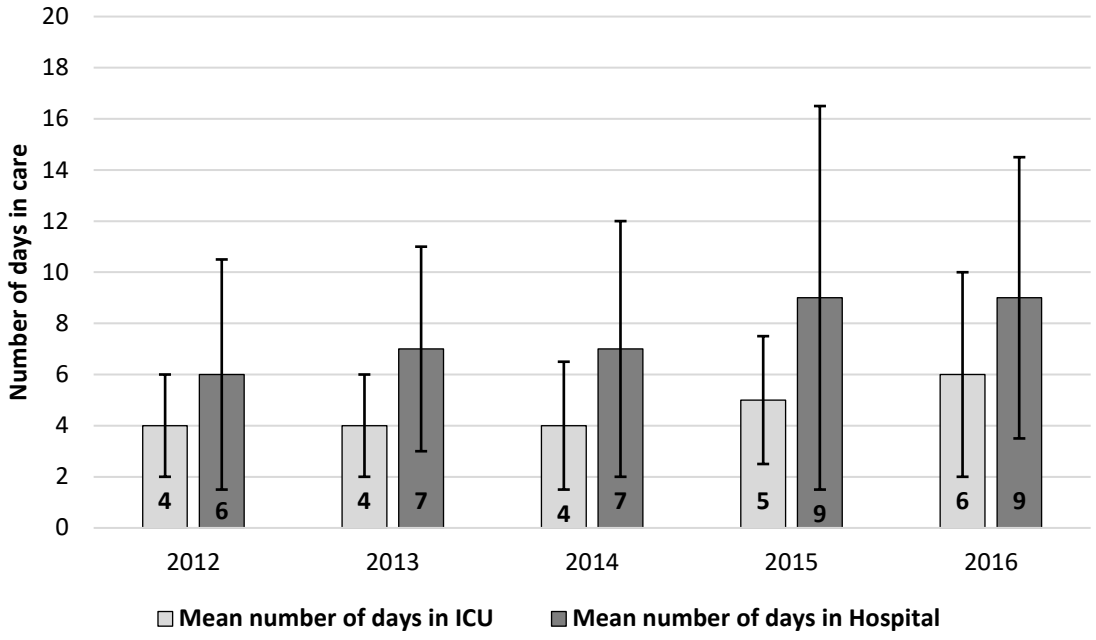


Source: Alaska Trauma Registry, 2012-2016

- Falls are the number one cause of serious injury requiring acute care (i.e., trauma patient care) among Alaska adults age 55 and older (older Alaska adults).
- Between 2012 and 2016, an average of 74% of acute trauma cases for older Alaska patients were related to serious injuries sustained from falls.[9]

[9] Falls have been the leading cause of non-fatal hospitalized injury among Alaska residents aged 55 and older since well before 2012. For information on serious injury from falls dating back to 2005, visit: http://dhss.alaska.gov/dph/Emergency/Pages/trauma/registry.aspx

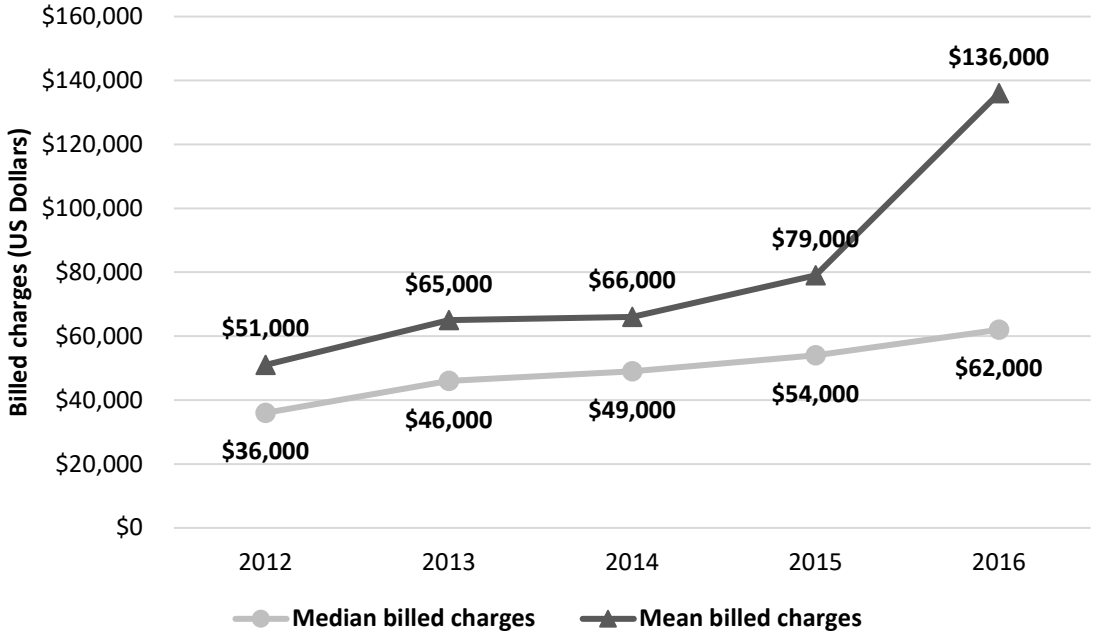
Figure 3: Mean Length of Acute Care Associated with Serious Fall-Related Injury among Older Alaska Adults, by year



Source: Alaska Trauma Registry, 2012-2016

- Older Alaska adults who are seriously injured from falling often require hospitalization, treatment in the Intensive Care Unit (ICU), and emergency medical services.
- Between 2012 and 2016, an average of 10% of older Alaska adults receiving care for serious fall-related injury spent at least one day in the ICU. These patients spent an average (i.e., mean) of 5 days in the ICU (*SD*=5) during these years.
- The mean number of days spent in the hospital for serious fall-related injury between 2012 and 2016 was 8 (*SD*=10) and ranged widely from 1 to 237 days.
- Older Alaska adults who received acute care for serious fall-related injury also spent a mean of 5 hours in the emergency department between 2012 and 2016 (*SD*=2.5 hours, data not shown).

Figure 4: Median and Mean Billed Charges for Acute Care for Serious Fall-Related Injury among Older Alaska Adults, by year



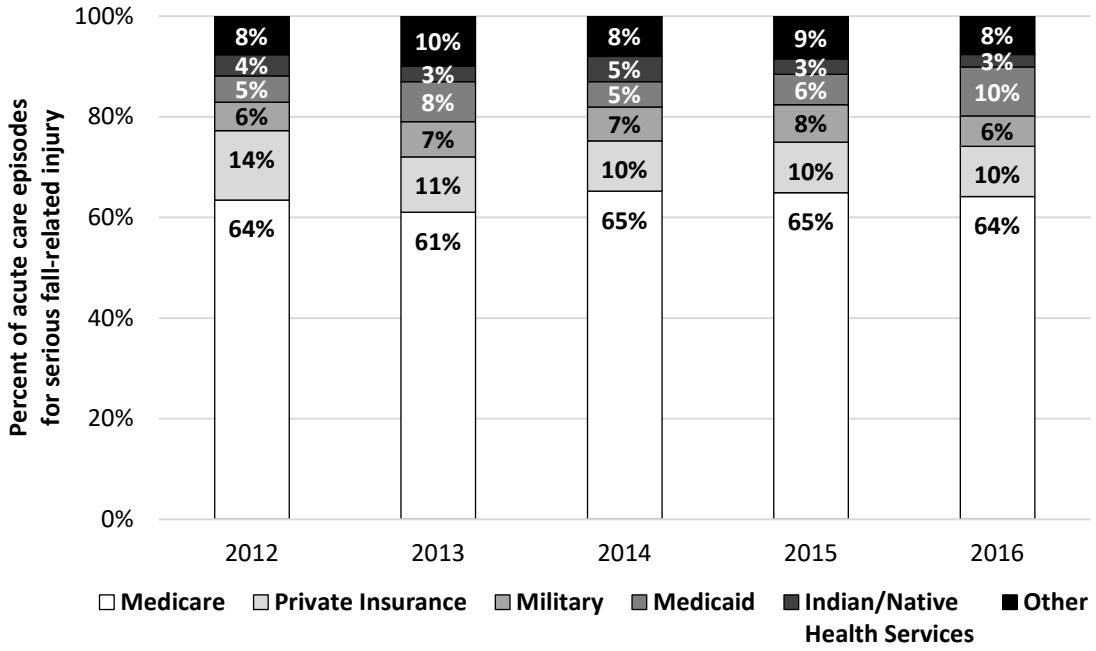
Source: Alaska Trauma Registry, 2012-2016

- Between 2012 and 2016, older Alaska adults who experienced serious fall-related injuries were billed an average of $80,000 per incident for acute care received in emergency departments, ICUs, and hospitals.

- In 2012, the total amount billed to older Alaska adults for acute care received for serious fall-related injuries was approximately $45 million. In 2016, the total charges billed to these patients more than tripled to $135 million.[10]

[10] Billed charges reflect amounts billed by facilities for hospital charges and may differ from amounts ultimately settled on with insurance companies or other payers. These charges also do not include additional amounts that may be billed by physicians.

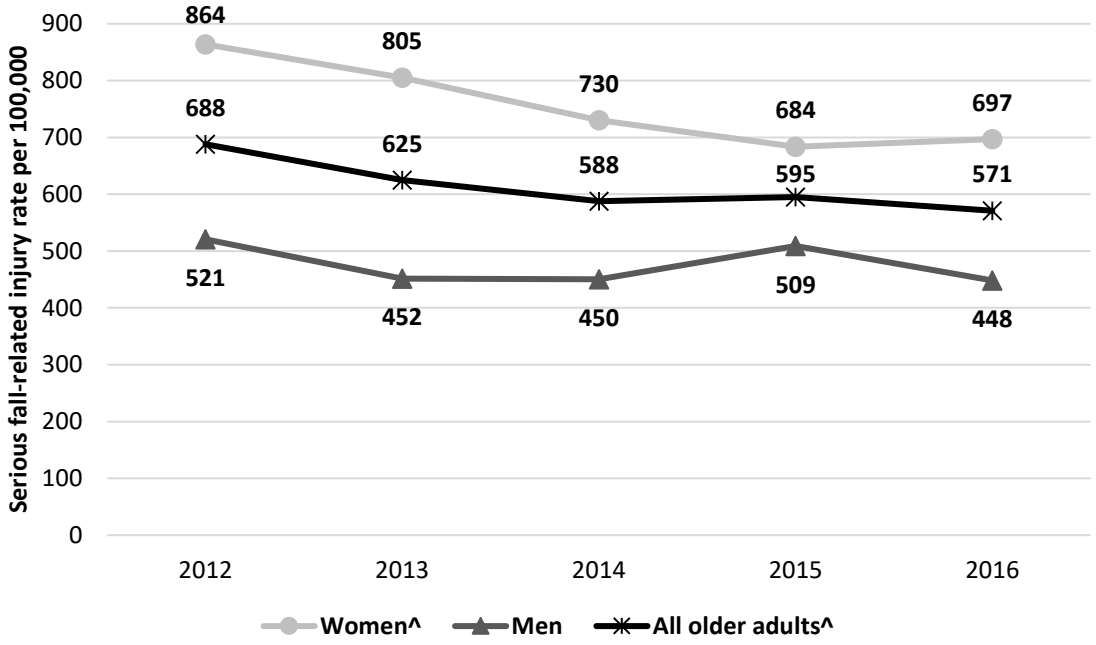
Figure 5: Most Common Primary Payors for Acute Care for Serious Fall-Related Injury among Older Alaska Adults, by year



Source: Alaska Trauma Registry, 2012-2016

- The most common primary payor for older Alaska adults' acute care for serious fall-related injury was Medicare between 2012 and 2016.
- Private or commercial insurance was the next most common payor for acute care older adults received for serious fall-related injury, followed by Medicaid and benefits for active and veteran military personnel and their dependents. Indian Health Services was the primary payor for approximately 3% of acute care received by older adult fall victims.
- Other less common primary payors for serious fall-related injury experienced by older Alaska adults included Blue Cross Blue Shield, self-pay, and workers' compensation.

Figure 6: Serious Fall-Related Injury among Older Alaska Adults by Gender, rate per 100,000



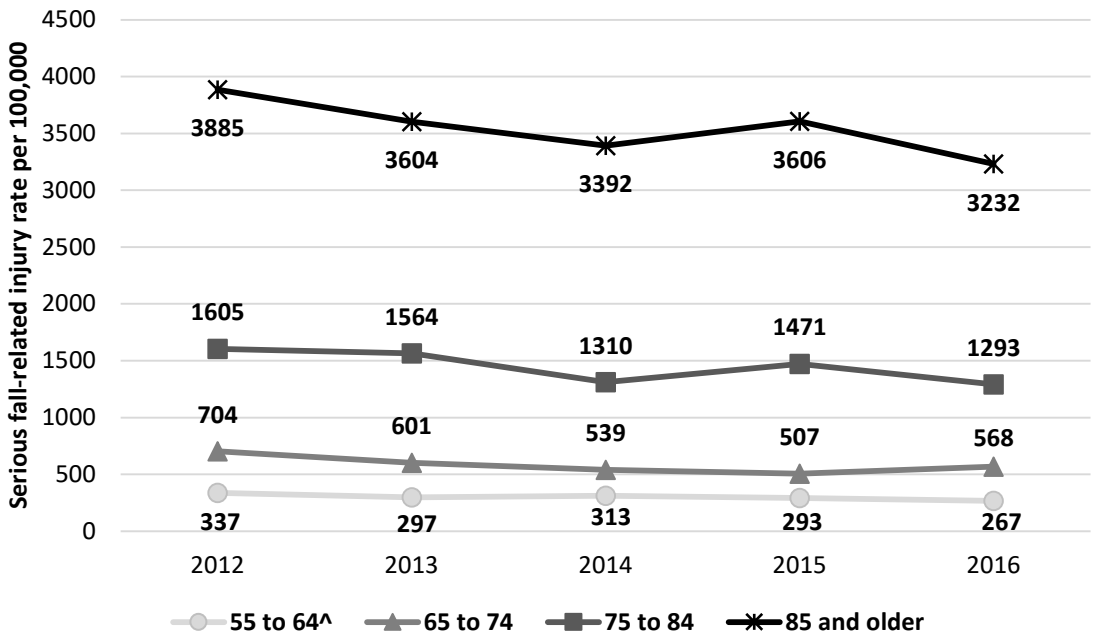
Sources: Alaska Trauma Registry; Alaska Department of Labor and Workforce Development, 2012-2016
Note: Rates are not age-adjusted.
^ Denotes that the Annual Percent Change (APC) since 2012 is significant at the $p \leq 0.05$ level.

- Data indicate the rate of serious-fall related injury among all older adults in Alaska has been declining significantly since 2012, by an average of about 4.2% per year.
- Since 2012, the rate of serious fall-related injury has been significantly higher among older Alaska women compared to men. Between 2012 and 2016, older women experienced serious fall-related injury at an average rate of 753 per 100,000. Over the same years, the average serious fall-related injury rate for older men was 475 per 100,000.
- Higher rates of serious fall-related injury among older women have also been found in previous research, however the rate for older women in Alaska may be higher than rates found in other states and nationally.[11] Evidence suggests the gender disparity in serious fall-related injury may be due to differences in bone mass and physical activity. Bone mass decreases faster among ageing women compared to men, which increases the risk of serious injury such as hip fracture in the event of a fall. Older women also tend to be less active than older men, leading to muscle weakness and loss of lower body strength—both of which increase the risk of falling.[12]

[11] Institute of Medicine (US) Division of Health Promotion and Disease Prevention; Berg RL, Cassells JS, editors. *The Second Fifty Years: Promoting Health and Preventing Disability*. Washington, DC: National Academies Press; 1992.
[12] Stevens JA, Sogolow, ED. Gender differences for non-fatal unintentional fall related injuries among older adults. *Injury Prevention* 2005;11:115-119.

- Although the rate of serious fall-related injury is higher among older Alaska women compared to men, data suggest the rate among women is going down. Since 2012, the rate of serious fall-related injury has declined significantly among women by an average of 5.8% each year. The rate among older Alaska men has remained steady.

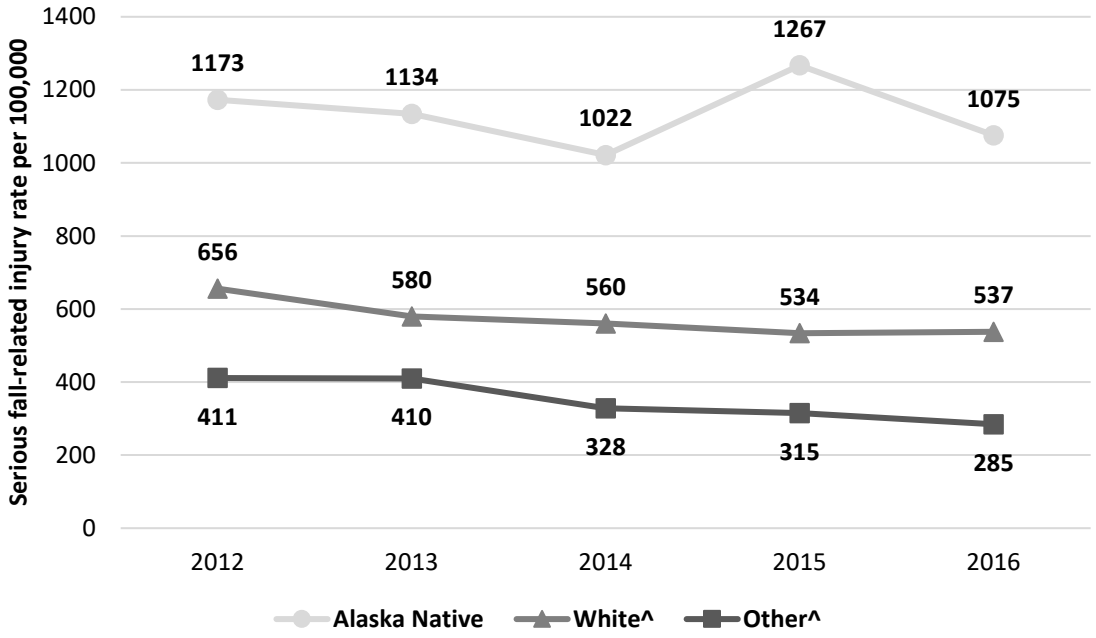
Figure 7: Serious Fall-Related Injury among Older Alaska Adults by Age Group, rate per 100,000



Source: Alaska Trauma Registry; Alaska Department of Labor and Workforce Development, 2012-2016
Note: Rates are not age-adjusted.
^ Denotes that the Annual Percent Change (APC) since 2012 is significant at the $p \leq 0.05$ level.

- Age is a significant factor contributing to serious injury among fall victims.
- From 2012 and 2016, the average rate of serious fall-related injury among adults between the ages of 55 and 64 was 301 per 100,000. The average rate for those between the ages of 65 and 74 was nearly double at 579 per 100,000, and the average rate for adults age 74 to 85 was 1,443 per 100,000. The age group who experienced the highest average rate of serious fall-related injuries between 2012 and 2016 were adults age 85 and older at 3,535 per 100,000. The differences between serious fall-related injury rates for each age group are statistically significant.
- As displayed in the previous chart, the rate of serious fall-related injury has been declining significantly among all older Alaska adults since 2012 at a rate of about 4.2% each year. The data also indicate a decline in serious fall-related injury when adults are divided into specific age groups; however, the current chart shows the only statistically significant decrease was found among adults age 55 to 64. The serious fall-related injury rate within this age group decreased an average of 4.7% per year between 2012 and 2016. None of the decreases found in other age groups reached statistical significance.

Figure 8: Serious Fall-Related Injury among Older Alaska Adults by Race, rate per 100,000



Source: Alaska Trauma Registry; Alaska Department of Labor and Workforce Development, 2012-2016
Note: Rates are not age-adjusted.
^ Denotes that the Annual Percent Change (APC) is significant at the $p \leq 0.05$ level.

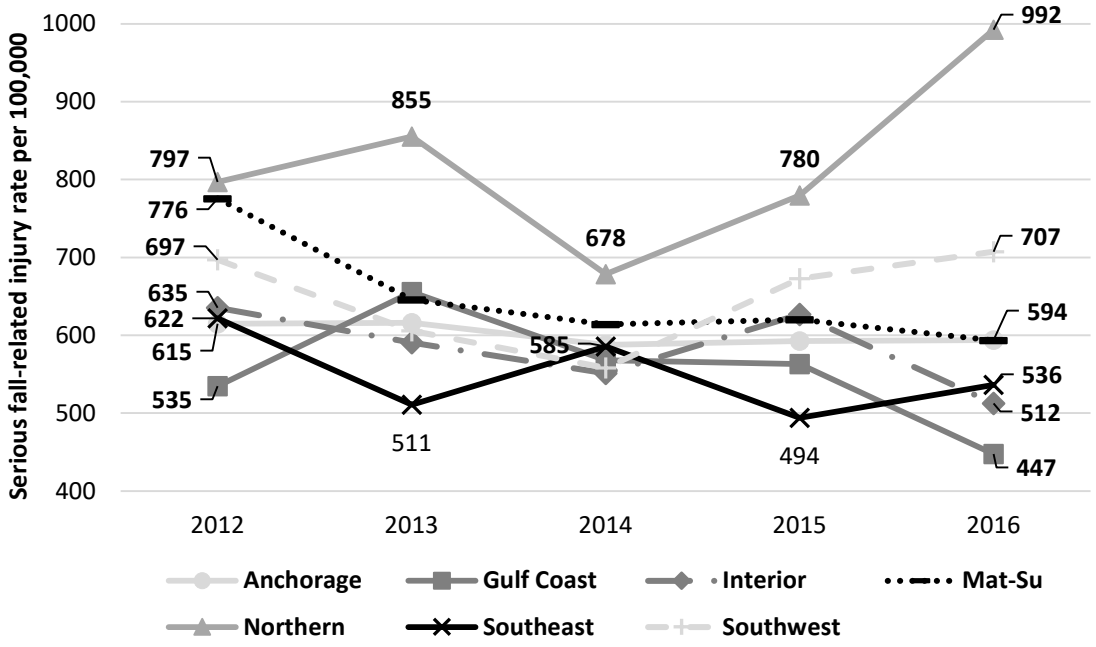
- Data suggests there are significant differences in serious fall-related injury among older Alaska adults by race or ethnicity.
- Compared to older adults in all other race groups, older Alaska Native adults have the highest rate of serious fall-related injury with an average of 1,134 per 100,000 between 2012 and 2016. The serious fall-related injury rate among Alaska Native adults is significantly higher than the average rate among older White adults (572 per 100,000) and older adults of other races[13] (347 per 100,000).
- The rates of serious fall-related injury among older White adults and among other race adults in Alaska have declined significantly since 2012. The rate among older White adults has decreased an average of 4.8% per year and the rate among older other race adults declined an average of 9.5% per year. No statistically significant change in the rate of serious fall-related injury has been observed among older Alaska Native adults since 2012.
- The substantially higher rate of serious fall-related injury among older Alaska Native adults may be related to a number of potential causes including environmental conditions and subsistence living practices. Alaska Native people are more likely than other race groups to live in remote areas where weather conditions (i.e., ice and snow)

[13] Throughout this report, "other" race refers collectively to African American, Asian, and Hawaiian/Pacific Islander.

and a lack of infrastructure (i.e., regular plowing and sanding) increase the likelihood of falls and subsequent injury. Alaska Native people are also more likely than other groups to engage in subsistence living, which involves practices that may increase the risk of serious fall-related injury (e.g., hunting, fishing, homebuilding, wood harvesting and gathering, etc.).[14]

[14] Subsistence in Alaska. Alaska Department of Fish and Game website. http://www.adfg.alaska.gov/index.cfm?adfg=subsistence.main. Accessed June 14, 2018.

Figure 9: Serious Fall-Related Injury among Older Alaska Adults by Region, rate per 100,000



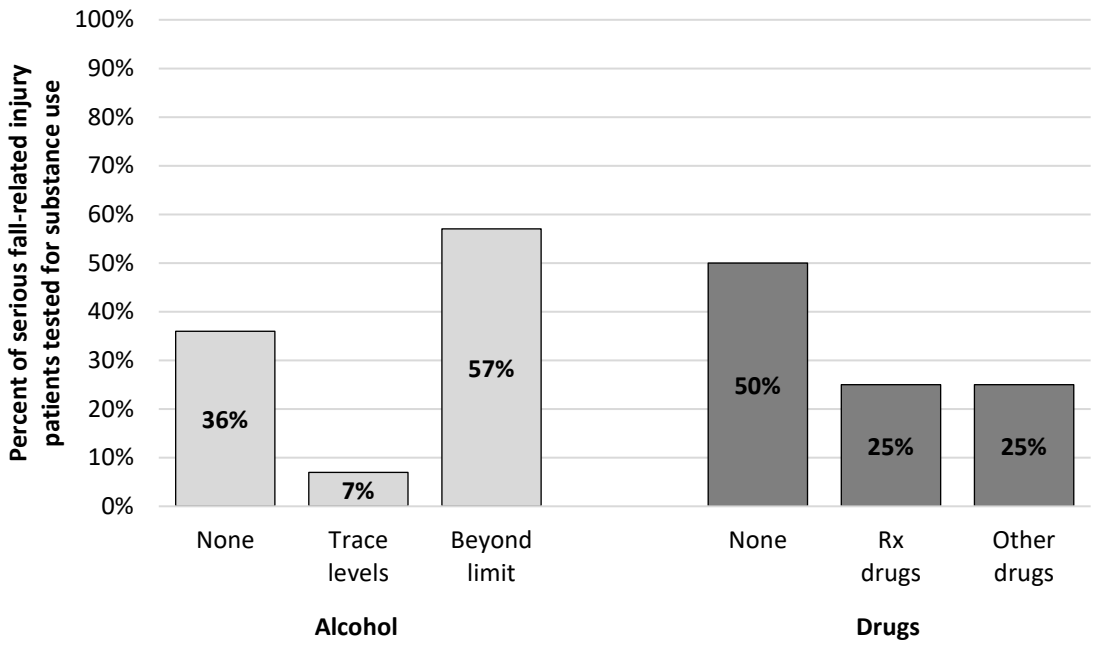
Source: Alaska Trauma Registry; Alaska Department of Labor and Workforce Development, 2012-2016
Note: Rates are not age-adjusted.

- For the most part, data suggests that rates of serious fall-related injury among older Alaska adults have not differed significantly by region since 2012. The only rate that was statistically different from nearly everywhere else was observed in the Northern region, where 992 per 100,000 older adults experienced serious fall-related injury in 2016. This rate was significantly higher than rates from all other regions in 2016 except in the Southwest.

- The relatively higher rate of serious fall-related injury experienced by older adult residents in the Northern region coincides with findings from the preceding page relative to the disproportionately high rates of serious fall-related injury among older Alaska Native adults. Remote and rural areas of the state are home to the largest populations of Alaska Native people, which likely contributes to the higher rate of serious-fall related injury observed in the Northern region. This region also experiences more severe weather conditions (i.e., ice and snow) that may increase the risk of falling and fall-related injury.

- Rates of serious fall-related injury in the other six regions of the state bounced between a high of 776 per 100,000 in the Matanuska-Susitna region in 2012 to a low of 447 per 100,000 in the Gulf Coast in 2016. No significant trends in serious fall-related injury rates were found by region between 2012 and 2016.

Figure 10: Serious Fall-Related Injury and Substance Misuse among Older Alaska Adults



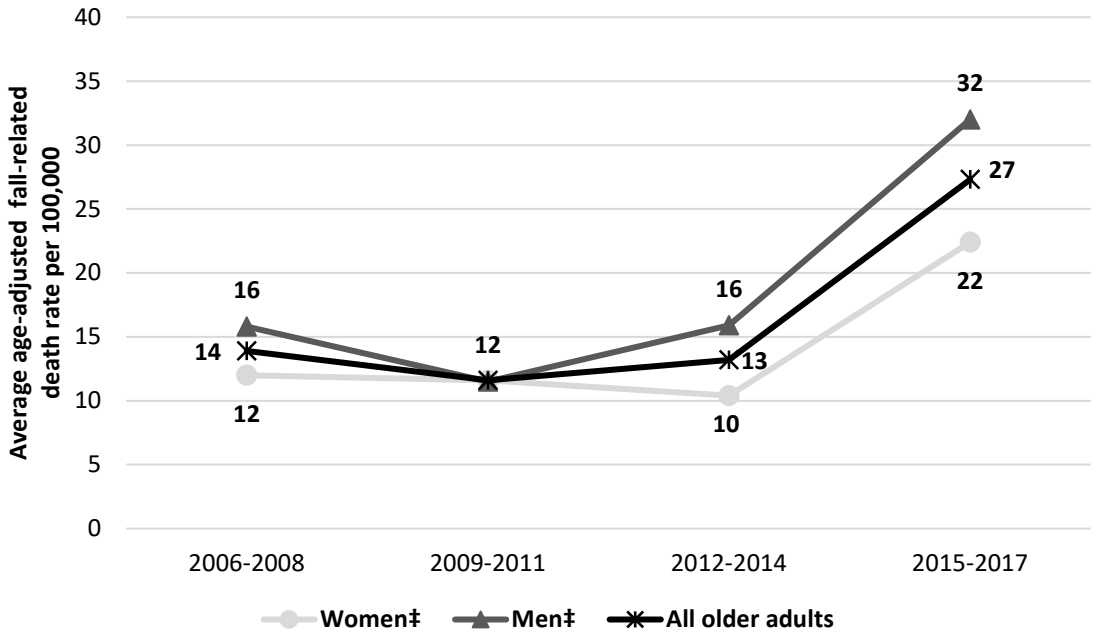
Source: Alaska Trauma Registry, 2012-2016

- Substance misuse including excessive alcohol consumption and illegal drug use are behavioral risk factors that can increase the risk of falls and serious fall-related injury among older adults.[15]
- Data indicate that the overwhelming majority of older Alaska adults with serious fall-related injury are not tested for substance misuse when they seek treatment in acute care settings. Of the 5,162 older Alaska adults who received acute care for serious fall-related injury between 2012 and 2016, 509 (10%) were tested for alcohol use and 245 (5%) were tested for other substance use (including misuse of prescription drugs). This likely indicates that most older adults who are treated in acute care facilities for serious fall-related injury are not suspected of substance misuse and therefore are not tested.
- Among the 509 older fall patients who were tested for alcohol use, 57% had blood alcohol concentrations over 0.08% (the legal limit to operate a car). Seven percent tested positive for trace levels of alcohol, and 36% had no alcohol in their systems.
- Of the 245 older fall patients who were assessed for other substance use, 25% tested positive for misuse of prescription drugs and another 25% tested positive for "other" drugs. Further analysis of the data indicates the majority of those who tested positive for "other" drugs had consumed recreational marijuana, which became legal in Alaska for adult use in February 2015.

[15] World Health Organization. WHO Global Report on Falls Prevention in Older Age. http://www.who.int/ageing/projects/falls_prevention_older_age/en/ . Published 2007. Retrieved June 26, 2018.

Fall-Related Deaths

Figure 11: Fall-Related Deaths among Older Alaska Adults by Gender, rate per 100,000



Source: Alaska Vital Statistics, Mortality data, Health Analytics and Vital Records, 2013-2017
Note: Rates are age-adjusted to the 2000 standard US population.
‡ Indicates one or more rates in the series is calculated from fewer than 30 events, therefore trend analyses were not performed due to increased risk of overestimating the significance of trends.

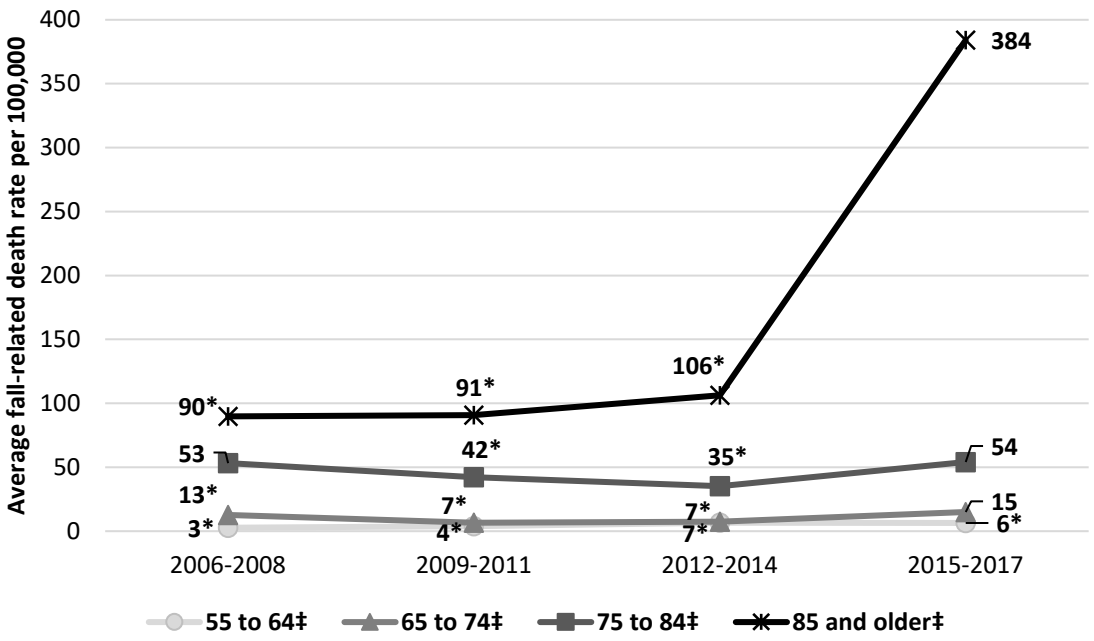
- Falls are one of the leading causes of fatal injury for Alaska residents age 55 and older.[16]
- Data indicate the age-adjusted average rate of fall-related deaths among all older Alaska adults was 14 per 100,000 in 2006-2008, 12 per 100,000 in 2009-2011, 13 per 100,000 in 2012-2014, and 27 per 100,000 in 2015-2017. No statistically significant trend was found in the rate of fall-related deaths among all older Alaska adults during these years.
- The differences in the rates of fall-related deaths among older Alaska men compared to older women did not reach statistical significance. Data could not support trend analysis of fall-related death rates by gender.
- Despite the lack of statistical significance found here, data at the national level do suggest that men are more likely than women to be fatally injured in a fall.[17] This gender

[16] Ten Leading Causes of Fatal Injuries in Alaska by Age Group, 2011-2015. Alaska Trauma Registry webpage. http://dhss.alaska.gov/dph/Emergency/Documents/trauma/Fatal%20Alaska%20Residents%20Injuries%2011-15%20Chart.pdf. Accessed June 15, 2018.
[17] Stevens JA, Ryan G, Kresnow M. Fatalities and injuries from falls among older adults—United States,, 1993-2003 and 2001-2005. MMWR Morb Mortal Wkly Rep 2006;55:1221-1224.

disparity could be attributed to differences in physical activity between men and women, which may influence the circumstances or events that lead to a fatal fall.[18]

[18] Stevens JA, Sogolow, ED. Gender differences for non-fatal unintentional fall related injuries among older adults. *Injury Prevention* 2005;11:115-119.

Figure 12: Fall-Related Deaths among Older Alaska Adults by Age Group, rate per 100,000

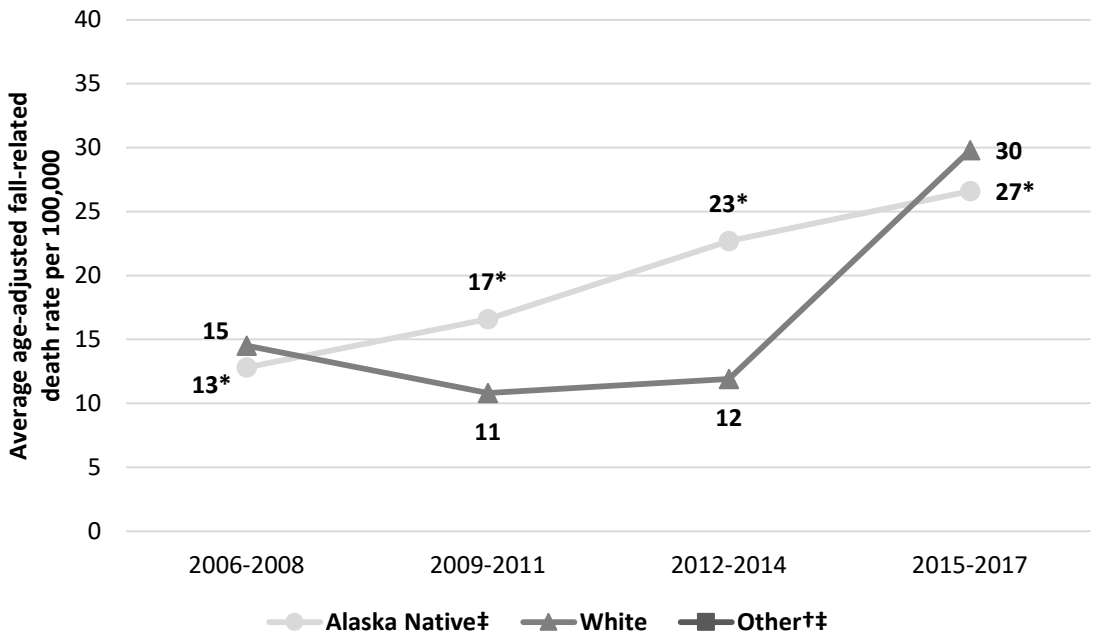


Source: Alaska Vital Statistics, Mortality data, Health Analytics and Vital Records, 2013-2017
* Denotes rates that are based on 20 or fewer events. Interpret with caution.
‡ Indicates one or more rates in the series is calculated from fewer than 30 events, therefore trend analyses were not performed due to increased risk of overestimating the significance of trends.

- Data show there are substantial differences in fall-related death rates for older Alaska adults among certain age groups.
- Between 2006-2008 and 2015-2017, the average fall-related death rates for Alaska adults age 75 and older were significantly higher than rates for adults age 74 and under.
- In 2015-2017, adults age 85 and older experienced fatal falls at an average rate of 384 per 100,000, which is many times the rate of adults in every other age group during the same years. This finding supports other data indicating falls are the number one leading cause of fatal injury for Alaska adults 85 and older.[19]
- Data could not support the analysis of trends in fall-related deaths among older Alaska adults by age group.

[19] Ten Leading Causes of Fatal Injuries in Alaska by Age Group, 2011-2015. Alaska Trauma Registry webpage. http://dhss.alaska.gov/dph/Emergency/Documents/trauma/Fatal%20Alaska%20Residents%20Injuries%2011-15%20Chart.pdf. Accessed June 15, 2018.

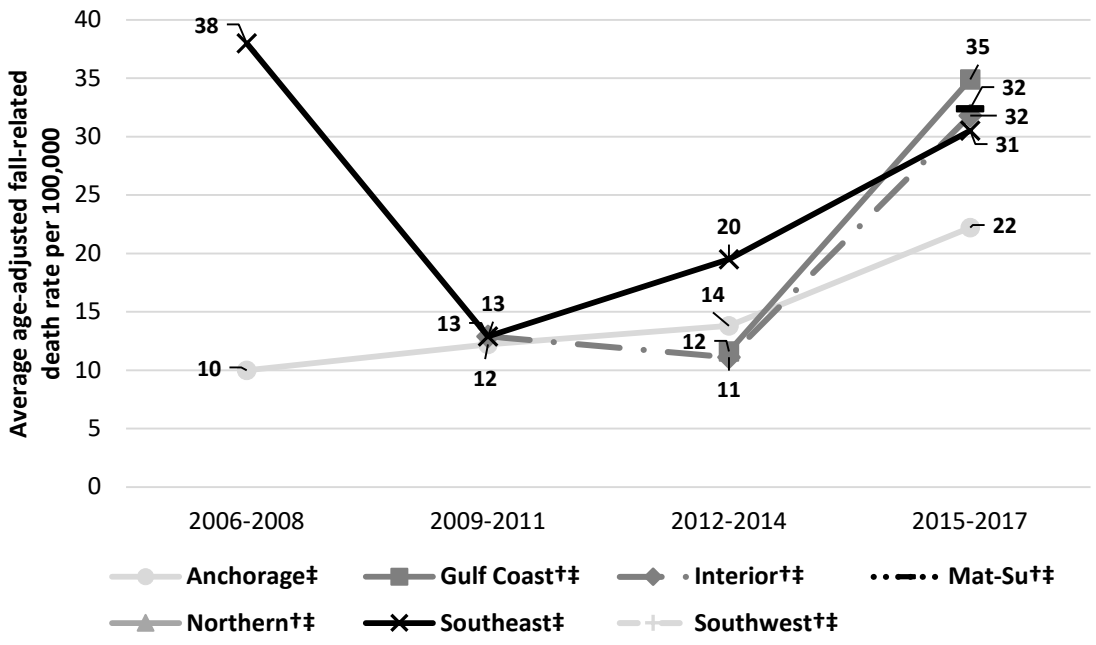
Figure 13: Fall-Related Deaths among Older Alaska Adults by Race, rate per 100,000



Source: Alaska Vital Statistics, Mortality data, Health Analytics and Vital Records, 2013-2017
Note: Rates are age-adjusted to the 2000 standard US population
* Denotes rates that are based on 20 or fewer events. Interpret with caution.
† Rates for less than 6 events are not calculated.
‡ Indicates one or more rates in the series is calculated from fewer than 30 events, therefore trend analyses were not performed due to increased risk of overestimating the significance of trends.

- Data examined earlier in this report indicated that the rate of serious fall-related injury was significantly higher among older Alaska Native adults compared to older White and other race adults. In contrast, there is no statistically significant association between race or ethnic group and fall-related deaths.
- Trend analysis of the fall-related death rate among older Alaska Native adults was not possible due to the small number of fall-related deaths.
- There was no statistically significant trend in the fall-related death rate among older White adults in Alaska during these years.
- Fall-related death rates and trend analyses for older Alaska adults of all other races could not be estimated reliably due to the small number of fall-related deaths in this group.

Figure 14: Fall-Related Deaths among Older Alaska Adults by Region, rate per 100,000



Source: Alaska Vital Statistics, Mortality data, Health Analytics and Vital Records, 2013-2017
Note: Rates are age-adjusted to the 2000 standard US population
* Denotes rates that are based on 20 or fewer events. Interpret with caution.
† Rates for less than 6 events are not calculated.
‡ Indicates one or more rates in the series is calculated from fewer than 30 events, therefore trend analyses were not performed due to increased risk of overestimating the significance of trends.

- For the most part, and similar to rates of serious fall-related injury, fall-related death rates among older Alaska adults have not differed significantly by region since 2006-2008.

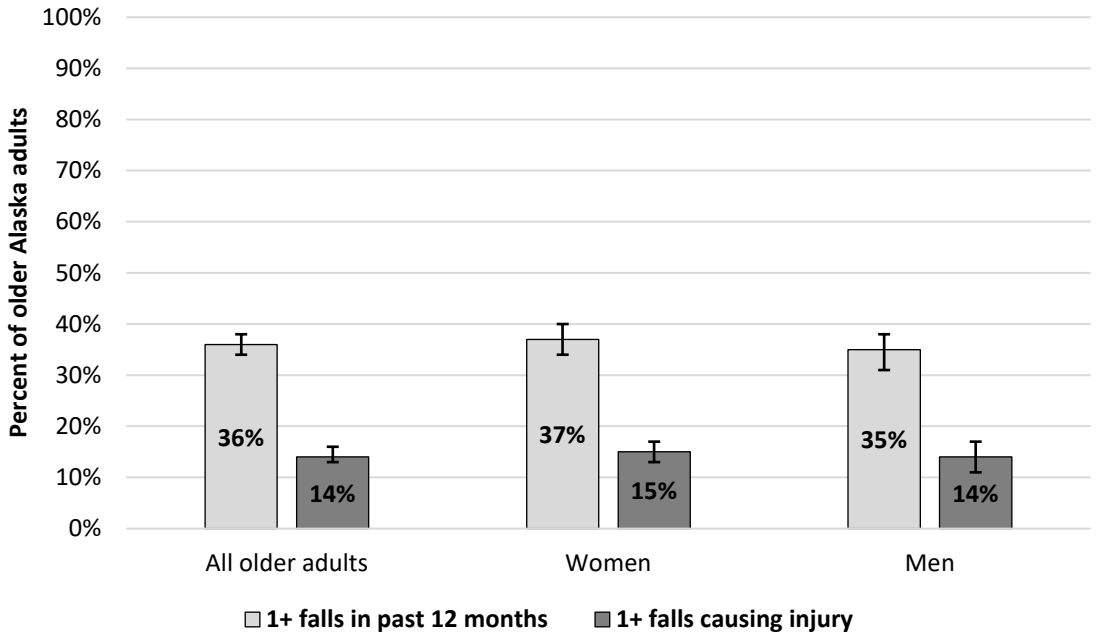
- The only exception was in 2006-2008, where data show a significant difference in fall-related deaths among older adults living in Anchorage and the Southeast region. Over these years, the average age-adjusted fall-related death rate for older adults was 10 per 100,000 in Anchorage and 38 per 100,000 in the Southeast region. Average fall-related death rates in all other regions could not be estimated reliably for 2006-2008, therefore it is unknown whether the rate in the Southeast is significantly higher than anywhere else.

- Fall-related death rates for older Alaska adults living in two rural regions—Northern and Southwest—could not be estimated reliably for any of the years included in the analysis due to the small number of fall-related deaths. Fall-related death rates could also not be estimated reliably for some years in the Gulf Coast, Interior, and Mat-Su regions.

- Analyses of trends in fall-related death rates by region were not possible due to the small number of fall-related deaths.

Self-Reported Falls and Fall-Related Injuries

Figure 15: Self-Reported Falls and Fall-Related Injuries among Older Alaska Adults by Gender

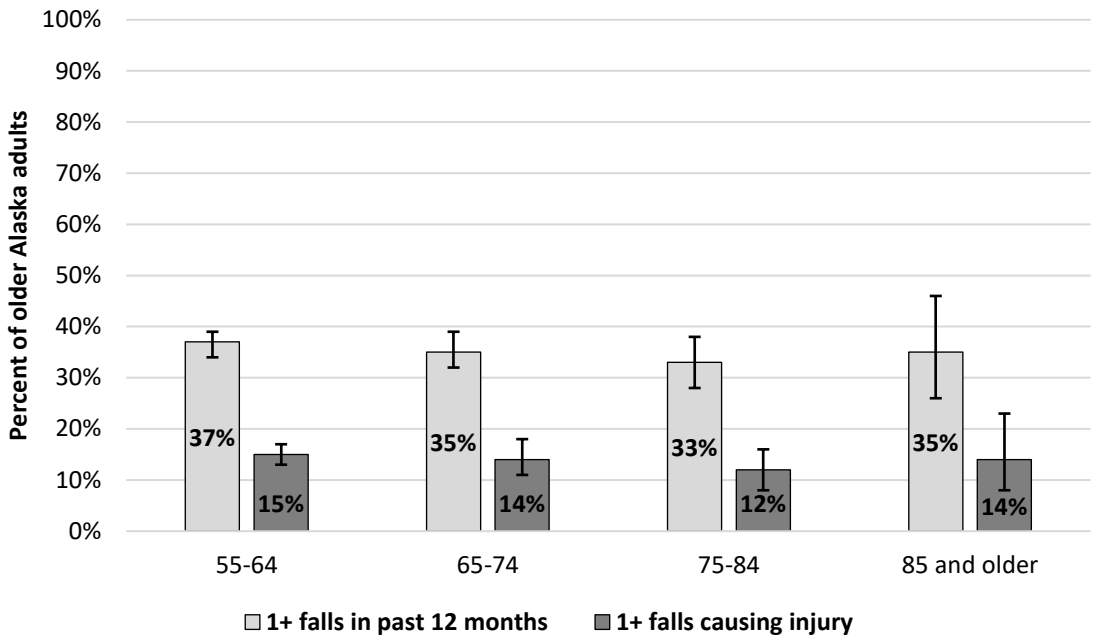


Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined[20]

- Self-reports of falling and fall-related injury among older Alaska adults are collected every other year via the statewide Behavioral Risk Factor Surveillance System (BRFSS).
- All Alaska BRFSS respondents age 45 and older[21] are asked to report the number of times they have fallen and the number of falls that resulted in injury over the previous 12 months.
- Data from survey years 2012, 2014, and 2016 (combined) indicate 36% of Alaska adults age 55 and older reported one or more falls in the previous 12 months. Fourteen percent of older Alaska adults experienced one or more falls that caused injury, or 41% of those who reported one or more falls.
- Self-reported falls and fall-related injury did not differ significantly between older Alaska men and women. These findings differ from similar national data, which show that women self-report more falls and fall-related injury compared to men.[22]

[20] Questions about falls and fall-related injury are asked every other year on the Alaska Standard BRFSS survey.
[21] Data are only reported for respondents age 55 and older in this document.
[22] Bergen G, Stevens MR, Burns ER. Falls and fall injuries among adults aged ≥65 Years—United States, 2014. MMWR Morb Mortal Wkly Rep 2016;65:993-998. DOI: http://dx.doi.org/10.15585/mmwr.mm6537a2

Figure 16: Self-Reported Falls and Fall-Related Injuries among Older Alaska Adults by Age Group

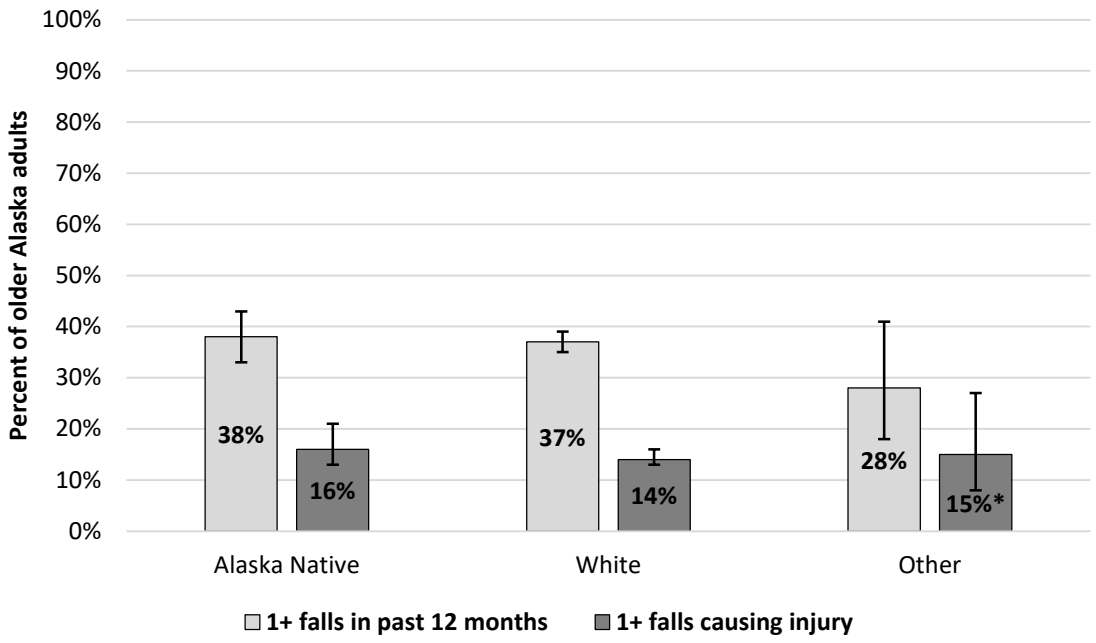


Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined

- Surprisingly, BRFSS data indicate that self-reported falls and fall-related injury do not differ significantly by age group among older Alaska adults.
- Similar to results by gender, results by age group in Alaska are different from what has been reported nationally. A recent analysis indicated the percentage of older adults in the United States who report falls and fall-related injury increases with age. [23]
- Discrepancies between Alaska state and national data on falls and fall-related injury may be due to differences in the profiles of older adults in Alaska versus the rest of the country. For example, a large proportion of older adults move out of Alaska every year,[24] which could bias the results toward older Alaska adults whose characteristics are different than the average person in their age group. Older adults also make up a smaller proportion of the Alaska population relative to the rest of the country,[25] which may limit equitable comparisons between state and national estimates.
- These findings also contrast with data described elsewhere in this report, which suggests the rate of serious fall-related injury increases substantially with age among older Alaska adults.

[23] Bergen G, Stevens MR, Burns ER. Falls and fall injuries among adults aged ≥65 Years—United States, 2014. MMWR Morb Mortal Wkly Rep 2016;65:993-998. DOI: http://dx.doi.org/10.15585/mmwr.mm6537a2
[24] Sandberg, E. Migration in Alaska: How migration has shaped us and how we compare to other states. *Alaska Economic Trends*. 2018:4-22. Available at: http://labor.alaska.gov/trends/mar18.pdf. Accessed January 9, 2019.
[25] U.S. Census Bureau, 2010 Census.

Figure 17: Self-Reported Falls and Fall-Related Injuries among Older Alaska Adults by Race

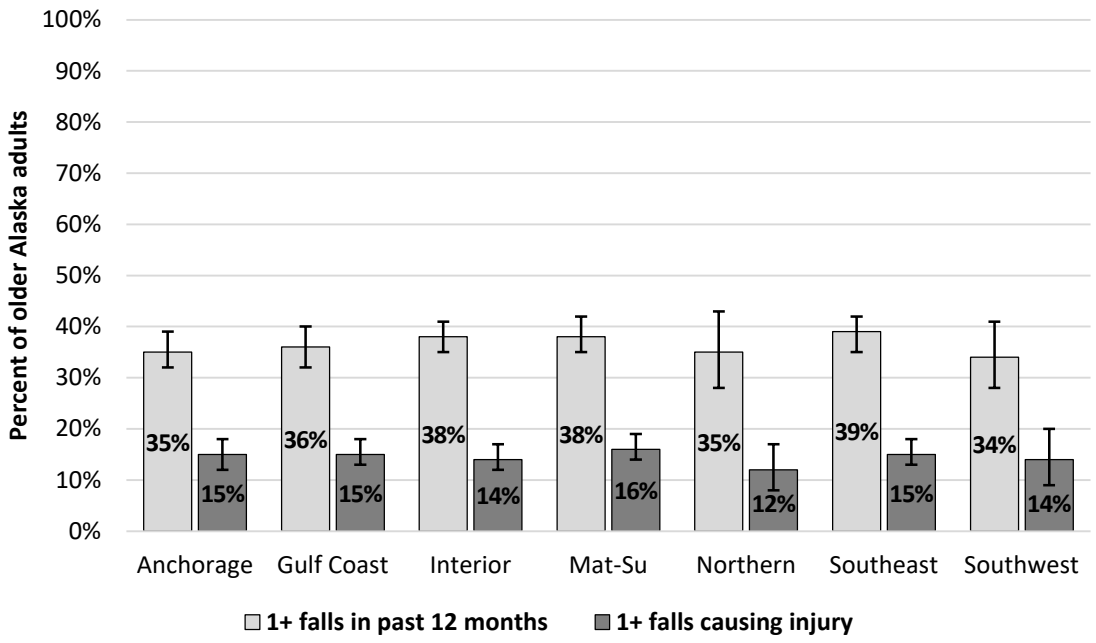


Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined

* This number may be statistically unreliable and should be interpreted with caution.

- Self-reported falls and fall-related injury do not differ significantly among older Alaska adults by race.
- Thirty-eight percent of older Alaska Native adults report one or more falls in the previous 12 months, followed by White (37%) and other race (28%) older adults.
- Sixteen percent of older Alaska Native adults, 14% of older White adults, and 15% of older other race adults report one or more falls that caused injury in the past 12 months.
- The lack of difference between older Alaska Native, White, and other race adults' self-reported falling injury is surprising given that other data in this report indicate higher rates of serious fall-related injury among older Alaska Native adults compared to all other race groups.

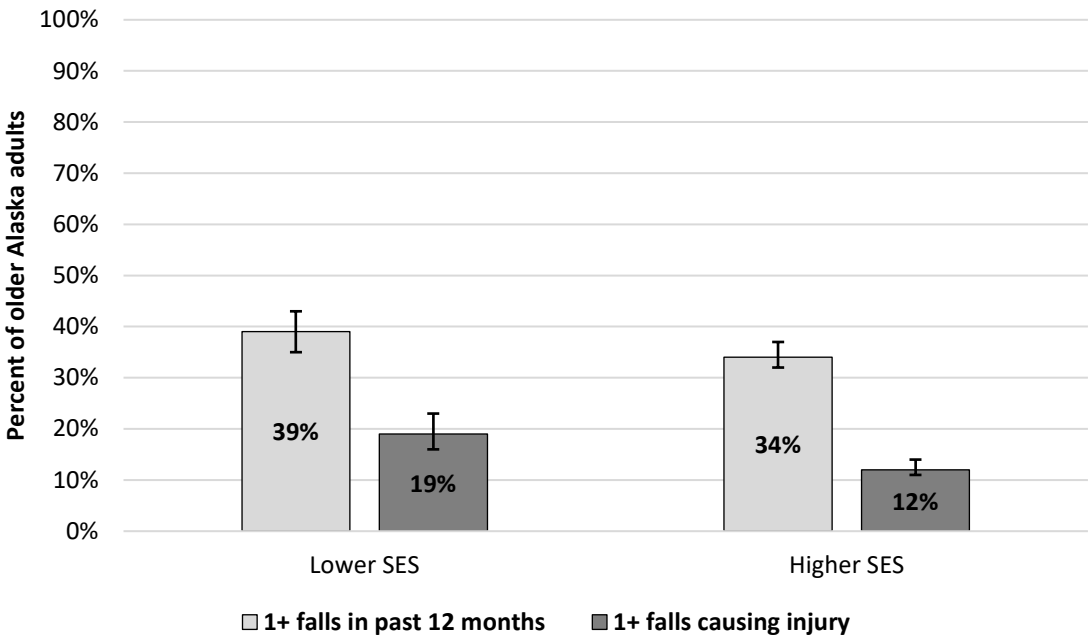
Figure 18: Self-Reported Falls and Fall-Related Injury among Older Alaska Adults by Region



Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined

- Self-reported falls and fall-related injury do not differ significantly among older Alaska adults by region of residence.

Figure 19: Self-Reported Falls and Fall-Related Injury among Older Alaska Adults by Socioeconomic Status

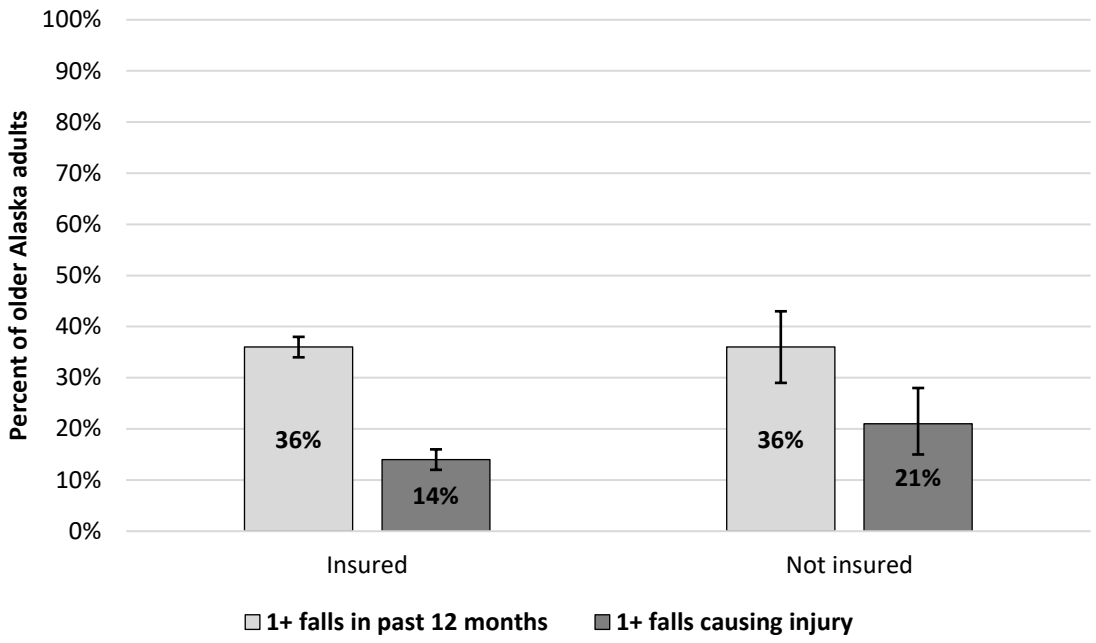


Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined

- Self-reported falls and fall-related injury differ significantly among older Alaska adults by socioeconomic status (SES).[26]
- Compared to older Alaska adults of higher SES, older adults of lower SES are significantly more likely to report one or more falls in the previous 12 months and one or more falls that led to injury.
- Examining factors like SES in the context of falls and fall-related injury is important to the overall picture of health outcomes and costs associated with these preventable occurrences and injuries.

[26] Socioeconomic status is defined in the Alaska BRFSS dataset by examining household income and education level. Respondents with less than a high school education or whose household income is less than or equal to 185% of the federal poverty guideline are categorized into the "lower SES" group.

Figure 20: Self-Reported Falls and Fall-Related Injury among Older Alaska Adults by Health Insurance Status

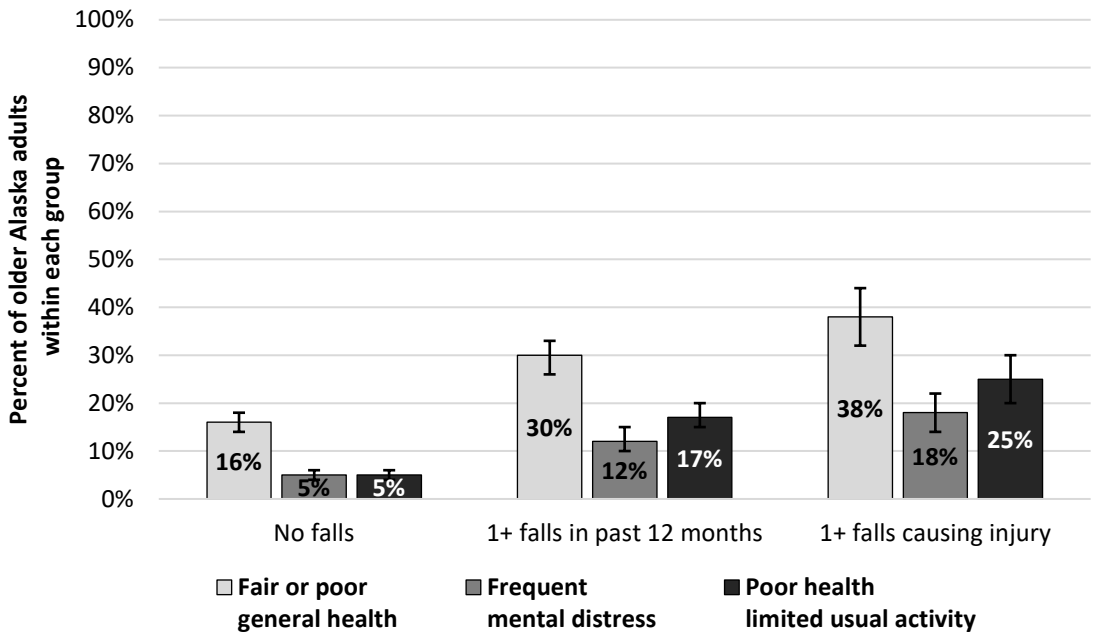


Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined

- The vast majority of older adults in Alaska report having health insurance coverage. Overall, 93% of older Alaska adults are covered by some kind of plan.[27]
- There are no significant differences in falling between older Alaska adults who do and do not have health insurance. Thirty-six percent of older Alaska adults in each group report falling one or more times in the previous 12 months.
- While self-reported falls are the same among older Alaska adults regardless of health insurance status, fall-related injury differs significantly between those who are insured and those who are not insured. Results indicate that 21% of older Alaska adults who are not insured experienced one or more falls that caused injury in the past 12 months compared to 14% of those who are insured.
- It is not possible to know exactly why older Alaska adults without health insurance are more likely to report injury from a fall. However, it is reasonable to imagine that a lack of health insurance could have prevented necessary medical care after a fall, exacerbating the injury and making it more memorable and likely to be reported.
- Regardless of the reason, higher rates of fall-related injury among uninsured older Alaska adults may lead to increased medical costs for individuals and the state in the future.

[27] Most Alaska Native residents (regardless of age) are covered—at least in part—by the Alaska Area Indian Health Service (IHS), a federal health program for American Indian and Alaska Native people.

Figure 21: Selected Health Indicators among Older Alaska Adults by Self-Reported Falls and Fall-Related Injury

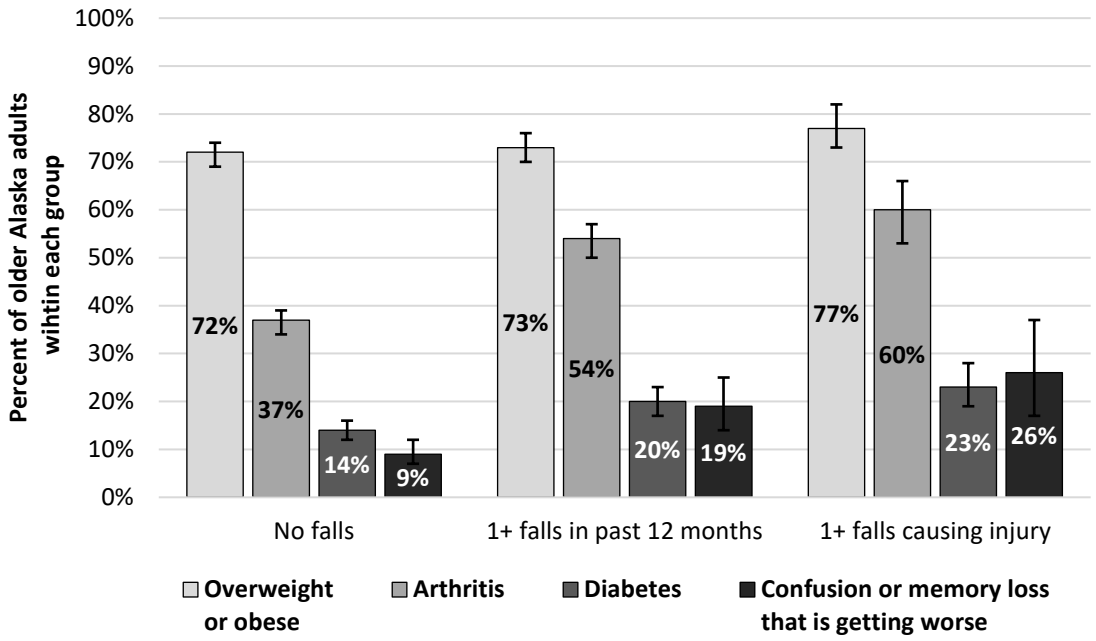


Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined

- Data indicate that older Alaska adults who report falling and being injured from a fall in the previous 12 months differ significantly from older adults who have not fallen with regard to certain indicators of general health.[28]
- Older Alaska adults who have fallen in the previous 12 months are significantly more likely than older adults who have not experienced a fall to rate their overall general health as fair or poor (as opposed to good, very good, or excellent). Older adults who have been injured in a fall are even more likely to report fair or poor general health.
- Frequent mental distress (i.e., 14 or more days in the past 30 when mental health was not good) is also more likely to be reported by older Alaska adults who have fallen and those who have been injured in a fall compared to those who have not fallen in the past 12 months.
- Older Alaska adults who have fallen and who have been injured in a fall are more likely than older adults who have not fallen to report that poor physical health has limited their usual activity for at least 14 out of the previous 30 days. This is concerning in that it confirms other research suggesting isolation and/or a sedentary lifestyle further increase the risk of falling among older adults.[29]

[28] General health questions on the BRFSS are not tied directly to questions about falling and fall-related injury, so it is not possible to know whether falling caused poor health or poor health led to falling.
[29] World Health Organization. WHO Global Report on Falls Prevention in Older Age. http://www.who.int/ageing/projects/falls_prevention_older_age/en/ . Published 2007. Retrieved June 26, 2018.

Figure 22: Selected Health Conditions among Older Alaska Adults by Self-Reported Falls and Fall-Related Injury



Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined

- Reports of falling and fall-related injury among older Alaska adults differ significantly by obesity, diabetes, and arthritis. Falling and fall-related injury also appear to be associated with reports of recent memory loss and confusion.[30]
- The majority of older Alaska adults—regardless of falling history—are overweight or obese (i.e., body mass index greater than 25). Overweight/obesity is not significantly related to falling in general, however older adults who report fall-related injury are significantly more likely to be overweight/obese than those have not fallen and those who fall but are uninjured.
- In terms of chronic conditions, both diabetes and arthritis are more likely to be reported by older Alaska adults who have fallen and those who have been injured in a fall compared to older adults who have not fallen.
- The 2016 BRFSS survey included a new question pertaining to recent memory loss and confusion. Findings indicate that older Alaska adults who have fallen and been injured in a fall are more likely than those who have not fallen to report experiencing confusion and memory loss that has gotten worse over the past 12 months. This confirms other research on the greater risk of falling among older adults experiencing this type of cognitive decline.[31]

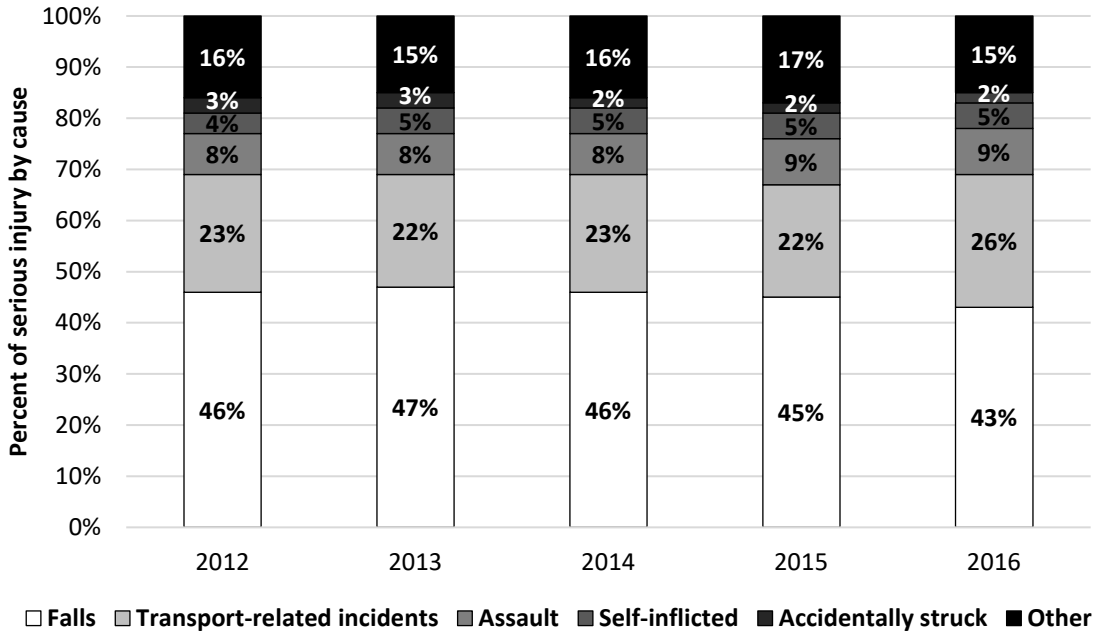
[30]Questions about chronic conditions are not tied to questions about falling and fall-related injury, so it is not possible to know whether falling occurred before or after the development of these conditions.
[31] World Health Organization. WHO Global Report on Falls Prevention in Older Age. http://www.who.int/ageing/projects/falls_prevention_older_age/en/ . Published 2007. Retrieved June 26, 2018.

IV. Transportation-Related Incidents

The previous sections of this report examined falls and fall-related injury among Alaska adults age 55 and older. The following sections are focused on transportation-related incidents and cover resulting injury among Alaska residents of all ages. Analyses conducted within specific age groups (i.e., adults, adolescents, children, and infants) are labeled accordingly.

Serious Transportation-Related Injury

Figure 23: Leading Causes of Serious Injury among Alaska residents, All Ages, by year

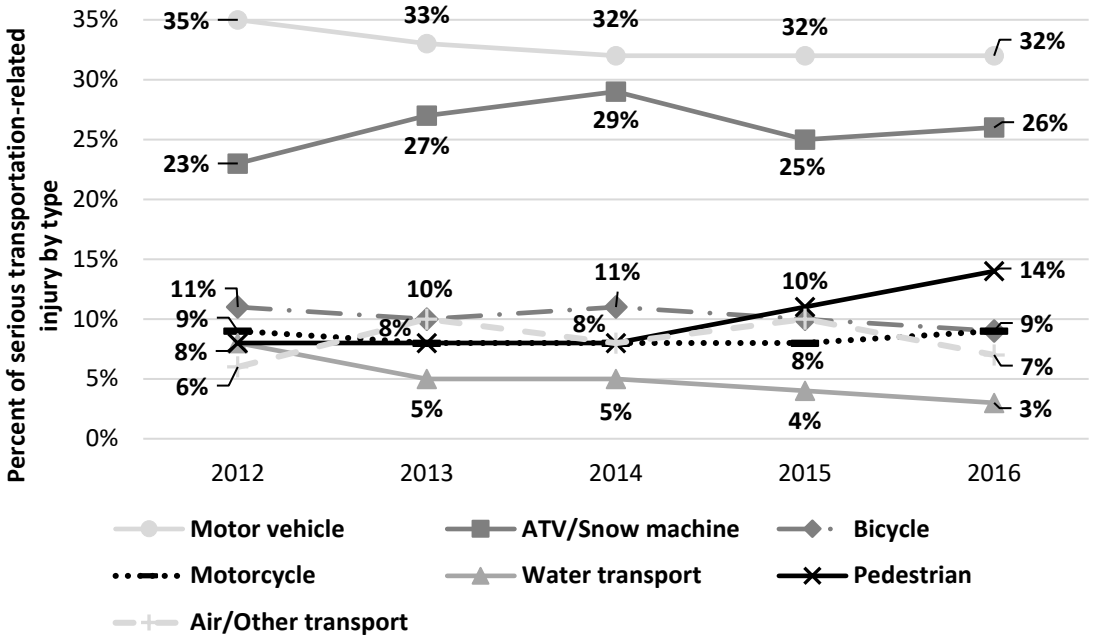


Source: Alaska Trauma Registry, 2012-2016

- Next to falls, transportation-related incidents are the second leading cause of serious injury requiring acute care (i.e., trauma patient care) among Alaska residents across all age groups. In this section, transportation-related serious injury refers to incidents involving motor vehicles, motorcycles, pedestrians, bicycles, ATVs or snowmobiles, water transport, and air transport.
- Between 2012 and 2016, an average of 23% of acute trauma cases for Alaska residents across all ages were related to serious injuries sustained from transportation-related incidents.[32]

[32] For information on non-fatal serious injury from transportation-related incidents dating back to 2005, visit: http://dhss.alaska.gov/dph/Emergency/Pages/trauma/registry.aspx

Figure 24: Serious Transportation-Related Injury among Alaska Residents by Transportation Type and year

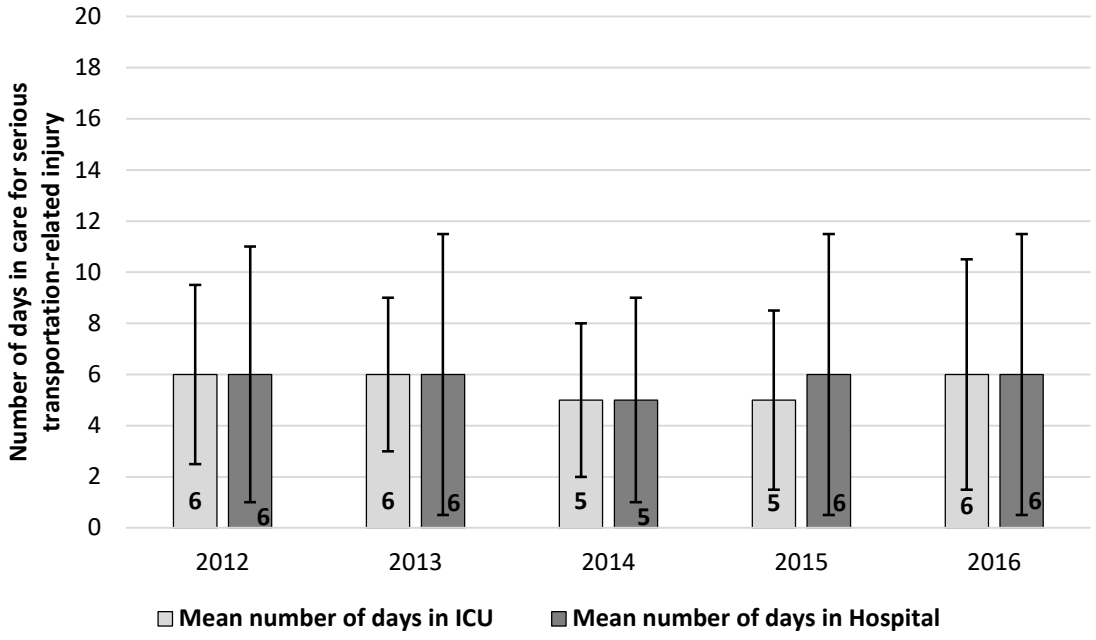


Source: Alaska Trauma Registry, 2012-2016

- Motor vehicles like cars and trucks were responsible for the largest percentage of serious transportation-related injury among Alaska residents across all ages. On average, one third of serious transportation-related injury was caused by incidents involving motor vehicles.
- Alaska is a unique state in that many residents live in villages located in remote areas where travel by ATV and snow machine are common. Likely due in part to their use in everyday Alaskan life, ATVs and snow machines were responsible for 26% of serious transportation-related injuries on average between 2012 and 2016.
- Incidents involving bicycles, motorcycles, and water transport accounted for an average of 10%, 8%, and 5%, respectively, of serious transportation-related injury between 2012 and 2016. Incidents involving air travel and other methods of transport (e.g., railway) were responsible for 8% of serious transportation-related injury during these years.
- Remarkably, the percentage of serious transportation-related injury involving pedestrians nearly doubled from 8% in 2012 to 14% in 2016. Recent increases in serious injury and death among pedestrians have been noted in national studies, which fault the surge in cellphone use (by both drivers and pedestrians) and the legalization of drugs like marijuana.[33] Marijuana became legal for adult use in Alaska in February 2015.

[33] Macaig M. Pedestrian deaths remain near historic high. Retrieved June 19, 2018: http://www.governing.com/topics/transportation-infrastructure/gov-pedestrian-deaths.html

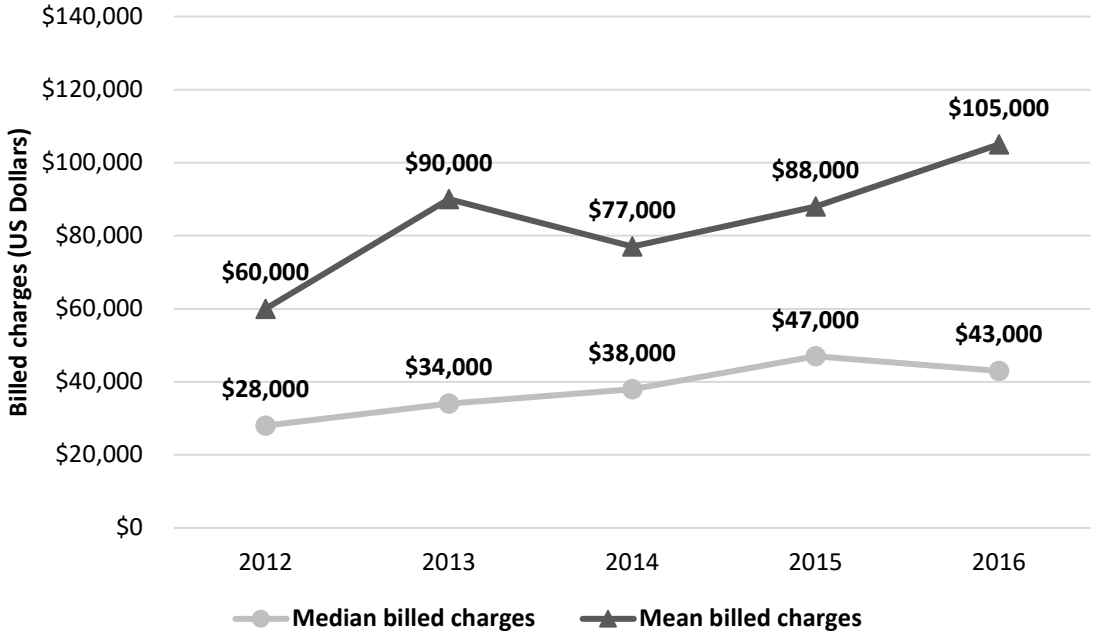
Figure 25: Mean Length of Acute Care Associated with Serious Transportation-Related Injury among Alaska Residents, by year



Source: Alaska Trauma Registry, 2012-2016

- Acute care for serious transportation-related injury often involves hospitalization, treatment in the Intensive Care Unit (ICU), and emergency medical services.
- On average, 23% of Alaska residents who received acute care for serious transportation-related injury spent at least one day in the ICU between 2012 and 2016. The mean length of time these patients spent in the ICU was 6 days (*SD*=7).
- Between 2012 and 2016, patients spent a mean of 6 days (*SD*=10) in the hospital for serious transportation-related injury.
- The mean amount of time patients spent in the emergency department for serious fall-related injury between 2012 and 2016 was 4.5 hours (*SD*=3 hours).
- The amount of time patients spent in the ICU, hospital, and emergency department for serious transportation-related injury stayed relatively flat between 2012 and 2016 (i.e., no large increases or decreases in time during those years).

Figure 26: Median and Mean Billed Charges for Acute Care for Serious Transportation-Related Injury among Alaska Residents, by year



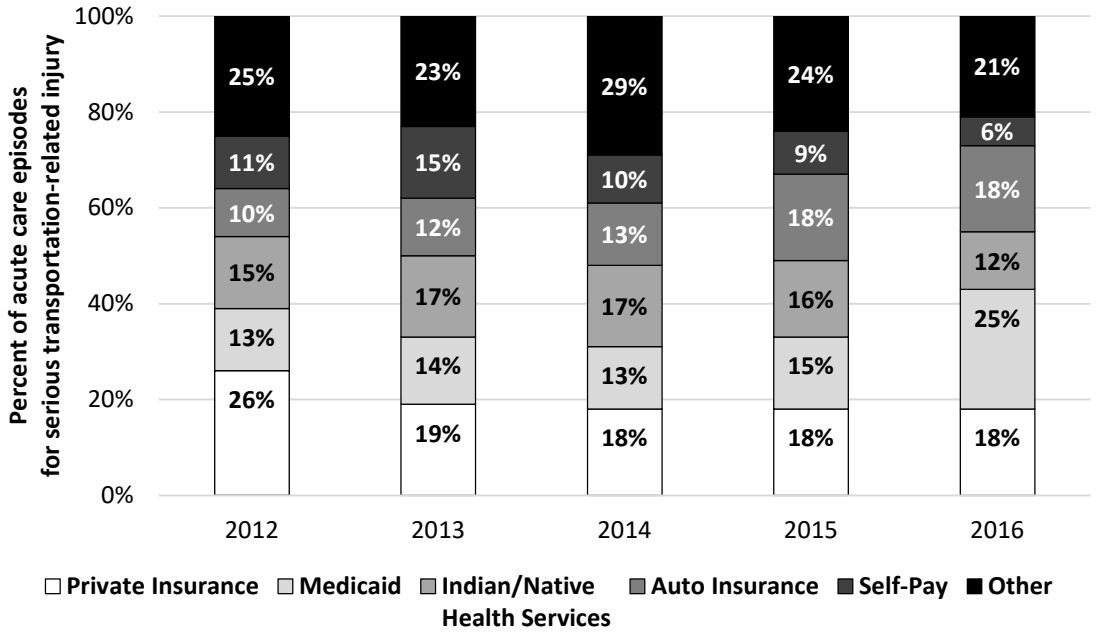
Source: Alaska Trauma Registry, 2012-2016

- Alaska residents who experienced serious transportation-related injuries were billed an average of $84,500 per incident for acute care received in emergency departments, ICUs, and hospitals between 2012 and 2016. The median amount of billed charges per incident over these years was $38,000.

- In 2012, the total amount billed to Alaska residents for acute care received for serious transportation-related injuries was approximately $40 million. In 2016, the total charges billed to these patients more than doubled to $91 million.[34]

[34] Billed charges reflect amounts billed by facilities and may differ from amounts ultimately settled on with insurance companies or other payers. These charges also do not include additional amounts that may be billed by physicians.

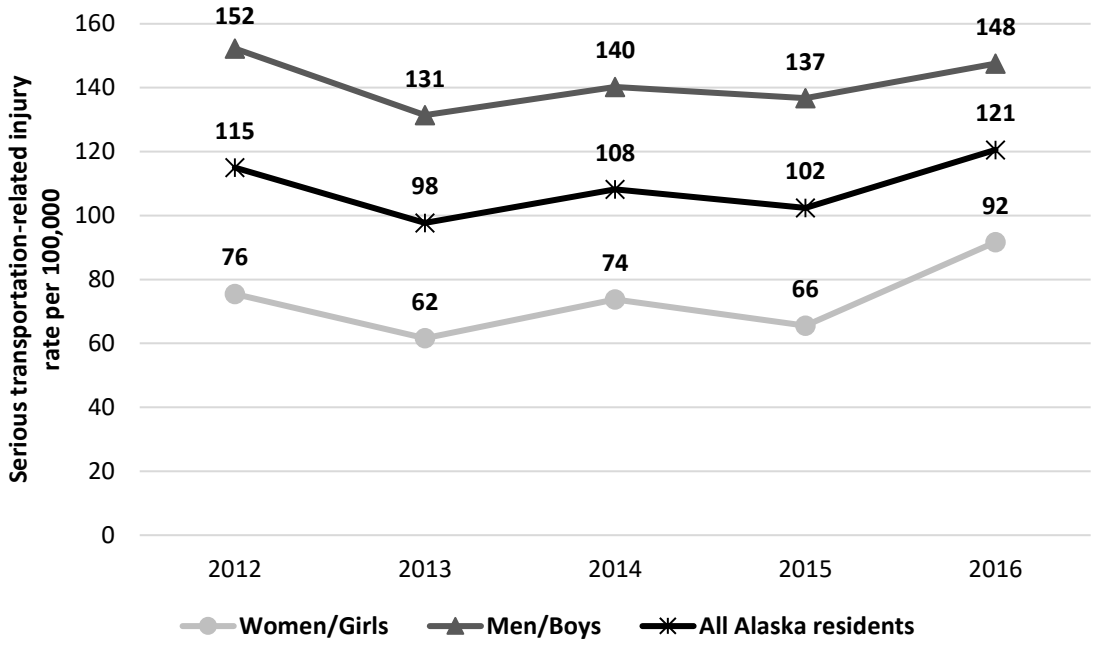
Figure 27: Most Common Primary Payors for Acute Care for Serious Transportation-Related Injury among Alaska Residents, by year



Source: Alaska Trauma Registry, 2012-2016

- From 2012 to 2016, the most common primary payors for Alaska residents' acute care for serious transportation-related injury included private or commercial insurance, Medicaid, Indian/Native Health Services, auto insurance, and Alaska residents themselves (i.e., self-pay).
- The percentage of acute care episodes for serious transportation-related injury with Medicaid as the primary payor remained relatively stable from 2012 to 2015 and then increased sharply in 2016.
- Other primary payors from 2012 to 2016 for serious transportation-related injury claims included Medicare, workers' compensation, Blue Cross/Blue Shield, and benefits for active and veteran military personnel and their dependents.

Figure 28: Serious Transportation-Related Injury among Alaska Residents by Gender, rate per 100,000

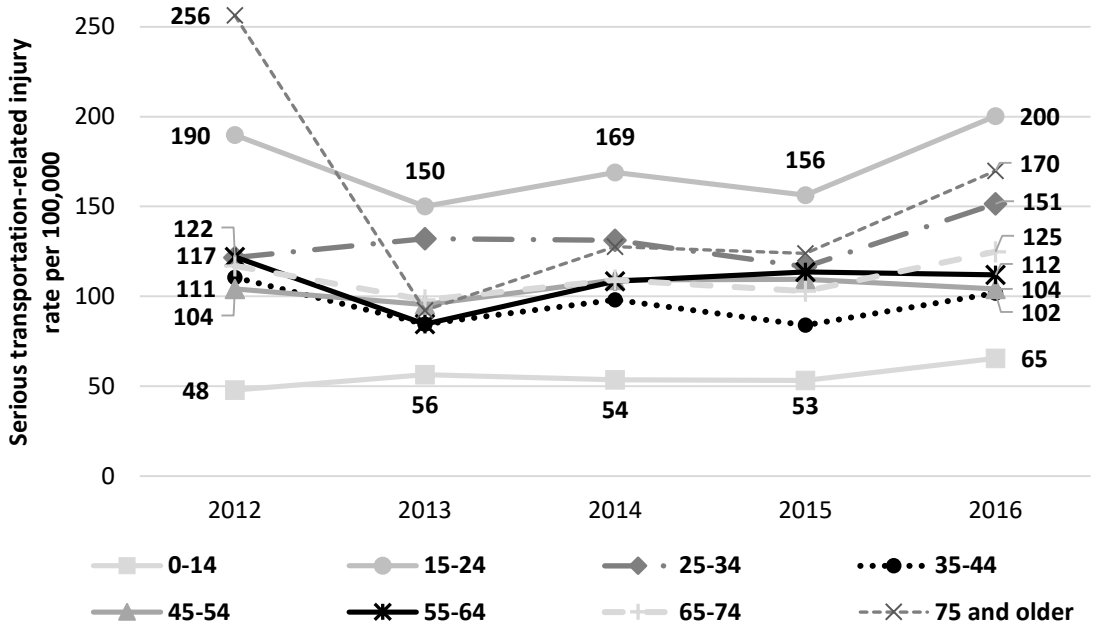


Sources: Alaska Trauma Registry; Alaska Department of Labor and Workforce Development, 2012-2016

- The rate of serious transportation-related injury is significantly higher among male Alaska residents compared to females. The average rate of serious transportation-related injury for men from 2012 to 2016 was 142 per 100,000 and for women it was 74 per 100,000.
- Each year from 2012 to 2015, men in Alaska had approximately double the serious transportation-related injury rate of women in Alaska. In 2016, the rate for men was 148 per 100,000 and the rate for women was 92 per 100,000.
- The higher rate of serious transportation-related injury among Alaska men relative to women mirrors national estimates. Prior evidence suggests men are more likely than women to experience transportation-related injury in part because on average men drive more miles than women. Men are also more likely to engage in behaviors like driving after drinking alcohol and speeding, thus increasing the risk of collision or other incident and injury.[35] Prior analyses also suggest that motor vehicle crashes involving male drivers tend to be more severe and harmful than those involving female drivers.[36]
- There was no statistically significant trend in the overall rate of serious transportation-related injury, nor in the gender-specific rates between 2012 and 2016.

[35] Fatality Facts. Insurance Institute for Highway Safety website. http://www.iihs.org/iihs/topics/t/general-statistics/fatalityfacts/gender. Retrieved June 20, 2018.
[36] Al-Balbissi AH. Role of gender in road accidents. Traffic Injury Prevention. 2003;4(1):64-73.

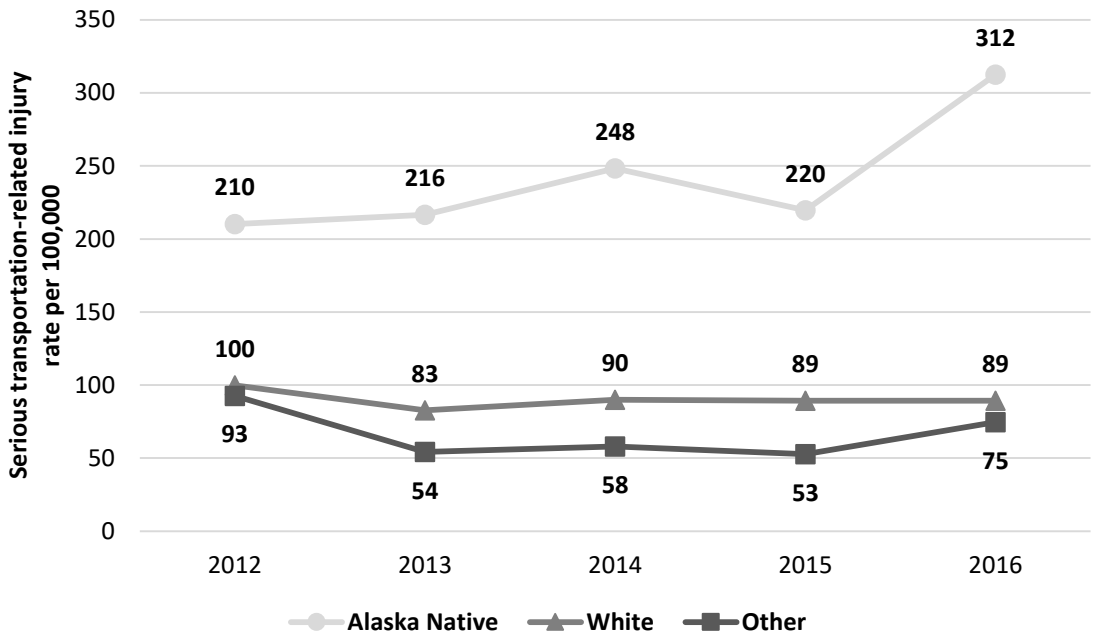
Figure 29: Serious Transportation-Related Injury among Alaska Residents by Age Group, rate per 100,000



Source: Alaska Trauma Registry; Alaska Department of Labor and Workforce Development, 2012-2016

- The rate of serious transportation-related injury varies by age group among Alaska residents.
- For the most part, the rate of serious transportation-related injury among Alaska residents age 14 and under was significantly lower than the rates observed within all other age groups between 2012 and 2016. Children under 14 are not old enough to drive motor vehicles legally, therefore transportation-related injury in this age group is likely sustained while riding as a passenger in a motor vehicle, operating or riding on an ATV or snow machine, or as a pedestrian or bicyclist.
- The rate of serious transportation-related injury among Alaska residents between the ages of 15 and 24 was significantly higher than the rates of all other age groups except those aged 75 and older.
- There were no statistically significant trends in serious transportation-related injury rates by age group between 2012 and 2016.

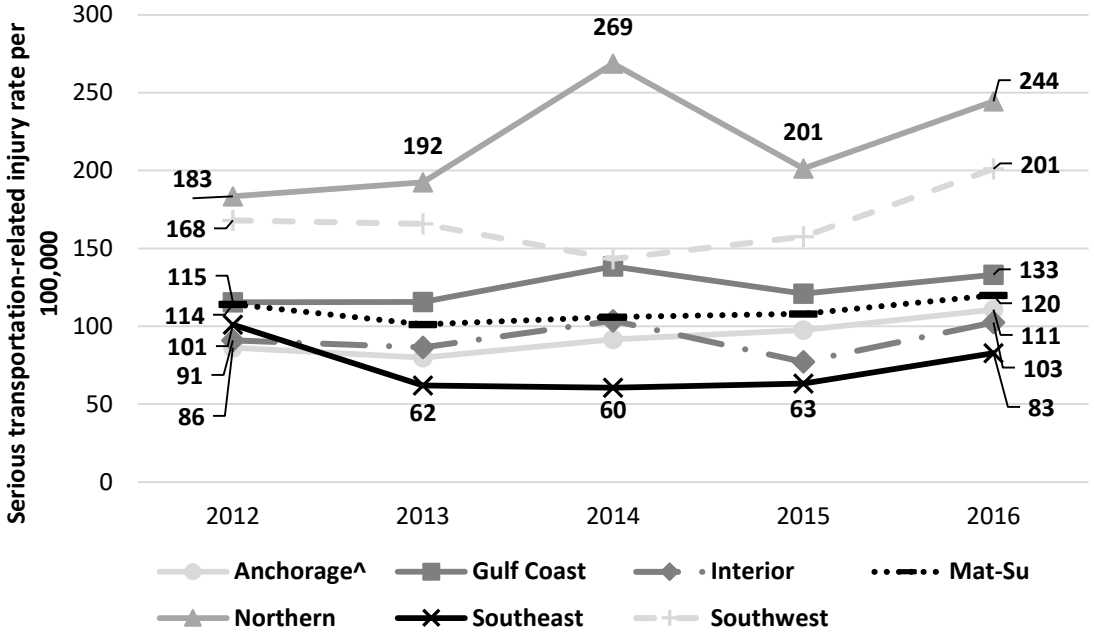
Figure 30: Serious Transportation-Related Injury among Alaska Residents by Race, rate per 100,000



Source: Alaska Trauma Registry; Alaska Department of Labor and Workforce Development, 2012-2016

- Rates of serious transportation-related injury were significantly different among Alaska Native, White, and other race Alaska residents between 2012 and 2016.
- Data indicate that the rate of serious transportation-related injury among Alaska Native people was significantly higher than the rates of White and other race Alaska residents between 2012 and 2016. During these years, Alaska Native people experienced an average rate of 242 serious transportation-related injury incidents per 100,000. The average rate during these years for White Alaska residents was 90 per 100,000, and the average rate for other race Alaska residents was 66 per 100,000.
- In 2013, 2014, and 2015, the rate of serious transportation-related injury was significantly higher among White Alaska residents compared to other race Alaska residents. There were no significant differences in the rates for these groups in 2012 and 2016.
- No significant trends in serious transportation-related injury by race or ethnicity were observed between 2012 and 2016.

Figure 31: Serious Transportation-Related Injury among Alaska Residents by Region, rate per 100,000

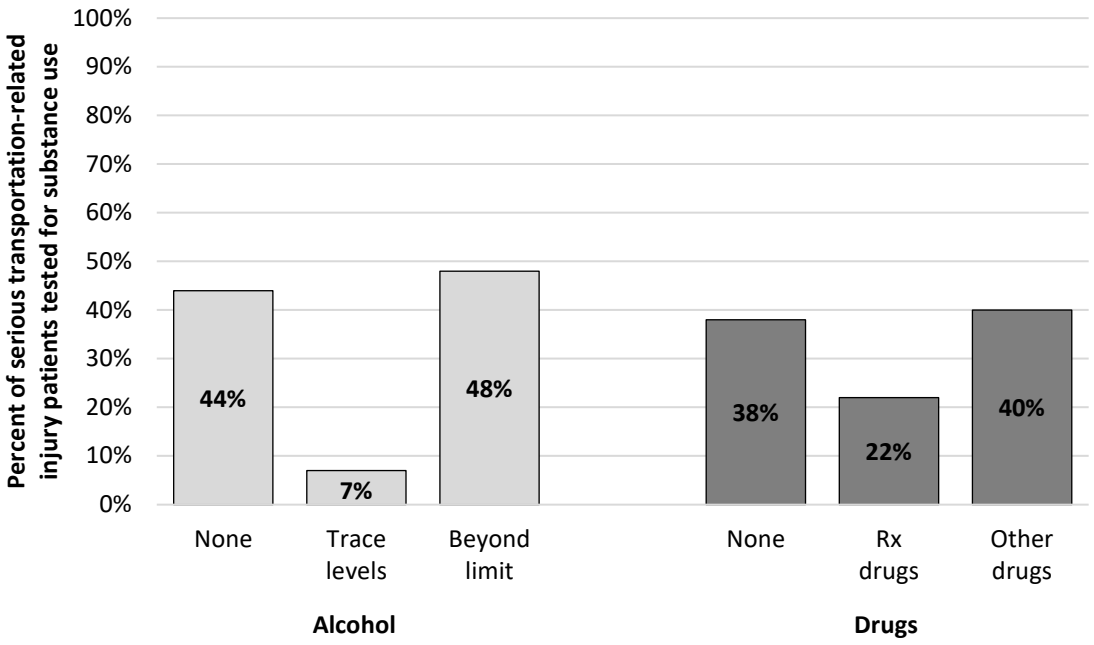


Source: Alaska Trauma Registry; Alaska Department of Labor and Workforce Development, 2012-2016

^ Denotes that the Annual Percent Change (APC) is significant at the $p \leq 0.05$ level.

- Rates of serious transportation-related injury differ based on the region where Alaska residents live. The highest rates of serious transportation-related injury are observed in the some of the more rural areas of the state.
- Between 2012 and 2016, serious transportation-related injury rates were significantly higher in the rural Northern and Southwest regions of the state compared to most other regions. The average rate of serious transportation-related injury during these years was 218 per 100,000 in the Northern region and 167 per 100,000 in the Southwest.
- Rates of serious transportation-related injury varied from 2012 to 2016 across other regions of the state, but not significantly.
- A statistically significant trend in serious transportation-related injury was found in one region—the Anchorage Municipality. Data suggest that the rate of serious transportation-related injury increased in Anchorage an average of 7.3% each year between 2012 and 2016.

Figure 32: Serious Transportation-Related Injury and Substance Misuse among Alaska Residents Age 14 and Older



Source: Alaska Trauma Registry, 2012-2016

- Consuming alcohol or other substances prior to driving a car or other vehicle can increase the risk of serious injury and death.

- A larger percentage of serious transportation-related injury patients are tested for substance misuse than serious fall-related injury patients. Of the 3,563 patients age 14 and older[37] who received acute care for serious transportation-related injury between 2012 and 2016, 1,475 (41%) were tested for alcohol and 1,145 (32%) were tested for use of other substances (including illegal use of prescription drugs).

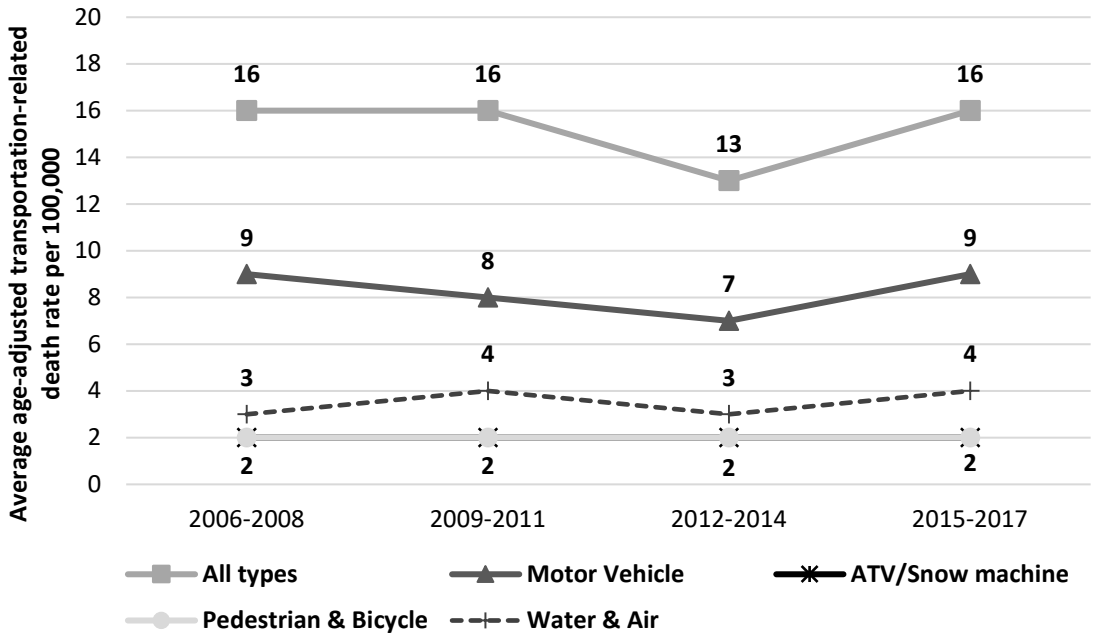
- Nearly half of the 1,475 serious transportation-related injury patients who were tested for alcohol had blood alcohol concentrations beyond the legal limit to operate a car (0.08%). Seven percent had trace levels of alcohol, and 44% had no alcohol in their systems.

- Among those who were assessed for drug use, 38% tested negative for all drugs, 22% tested positive for prescription drugs, and 40% tested positive for other drugs. Further examination of the data indicates those who tested positive for prescription drugs were most likely to have consumed opioids, benzodiazepines, or medical marijuana. Those who tested positive for other drugs were most likely to have consumed recreational marijuana and amphetamines.

[37] Analyses of drug and alcohol consumption among transportation-related injury patients is restricted to those age groups that are most likely to drive a car or other vehicle.

Transportation-Related Deaths

Figure 33: Transportation-Related Deaths among Alaska Residents by Transportation Type, rate per 100,000

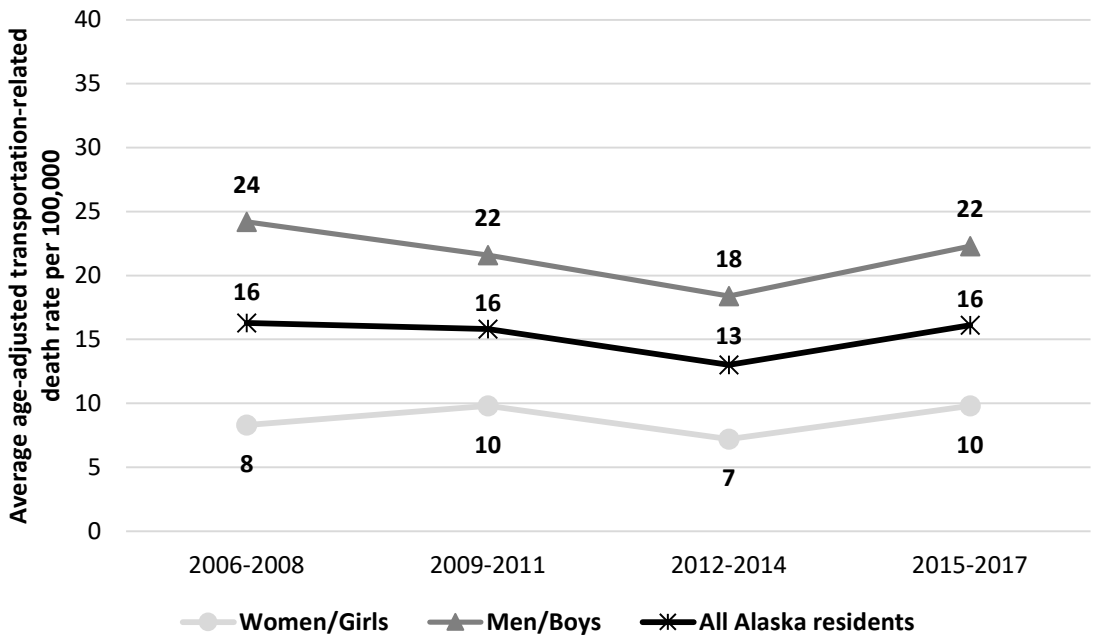


Source: Alaska Vital Statistics, Mortality data, Health Analytics and Vital Records, 2013-2017
Note: Rates are age-adjusted to the 2000 standard US population

- The average age-adjusted rate of deaths caused by transportation-related incidents in Alaska was 16 per 100,000 in 2006-2008 and 2009-2011, 13 per 100,000 in 2012-2014, and 16 per 100,000 in 2015-2017.
- The average age-adjusted death rate for motor vehicle incidents varied between 7 and 9 per 100,000 from 2006-2008 to 2015-2017. Motor vehicle collisions were among the top four leading causes of fatal injury for all Alaska residents age 5 and older.[38]
- The average age-adjusted death rate for incidents involving water and/or air transportation varied between 3 and 4 per 100,000 from 2006-2008 to 2015-2017.
- The age-adjusted death rates for incidents involving pedestrians and/or bicycles has been 2 per 100,000 since 2006-2008.
- Tracking injury and death associated with ATVs and snow machines is unique to Alaska, where these machines are often used for transportation. The average age-adjusted death rate from ATVs and snow machines has been 2 per 100,000 since 2006-2008.
- There were no significant trends in average death rates by transportation type between 2006-2008 and 2015-2017.

[38] Ten Leading Causes of Fatal Injuries in Alaska by Age Group, 2011-2015. Alaska Trauma Registry webpage. http://dhss.alaska.gov/dph/Emergency/Documents/trauma/Fatal%20Alaska%20Residents%20Injuries%2011-15%20Chart.pdf. Accessed June 15, 2018.

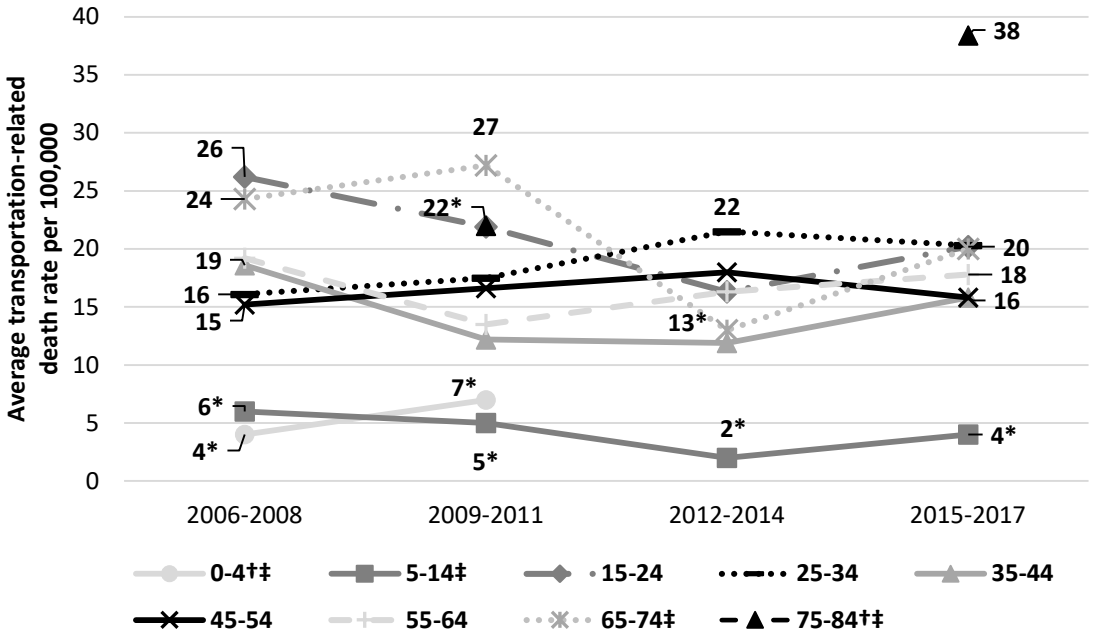
Figure 34: Transportation-Related Deaths among Alaska Residents by Gender, rate per 100,000



Source: Alaska Vital Statistics, Mortality data, Health Analytics and Vital Records, 2013-2017
Note: Rates are age-adjusted to the 2000 standard US population

- The average age-adjusted transportation-related death rate for males in Alaska was consistently and significantly higher than the rate for females since 2006-2008.
- Between 2006-2008 and 2015-2017, the average age-adjusted transportation-related death rate for men varied from a low of 18 to a high of 24 per 100,000. Among women, the rate ranged from a low of 7 per 100,000 in 2012-2014 to a high of 10 per 100,000 in 2009-2011 and 2015-2017.
- The disparity in transportation-related deaths between men and women is in line with gender differences in serious transportation-related injury reported earlier in this document.
- There was no statistically significant trend in the overall transportation-related death rate between 2006-2008 and 2015-2017, nor were there significant trends in the gender-specific rates for these years.

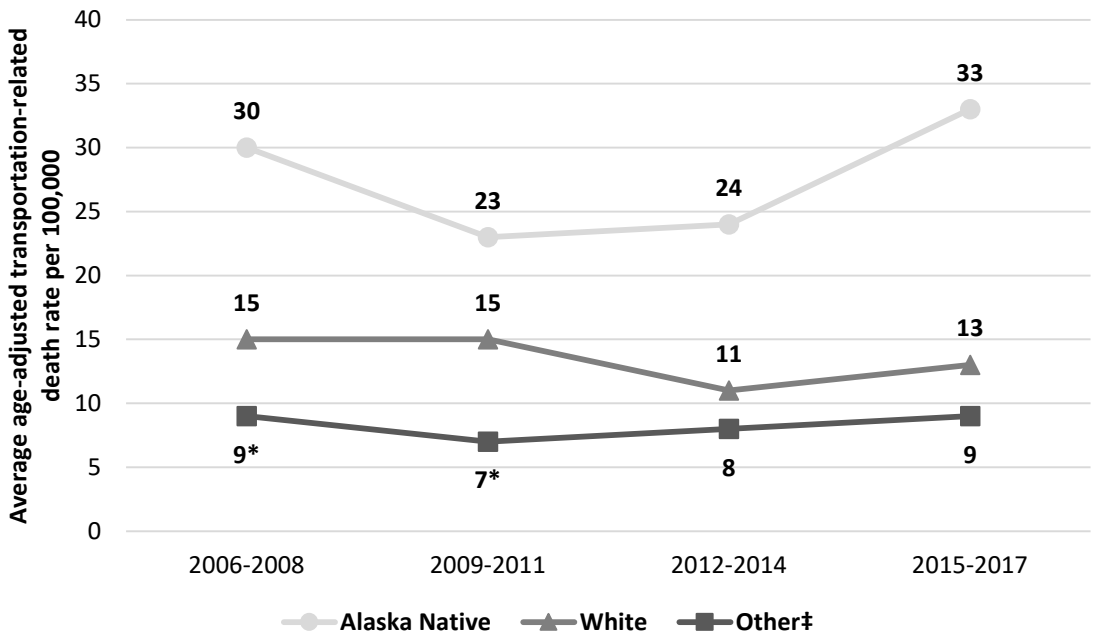
Figure 35: Transportation-Related Deaths among Alaska Residents by Age Group, rate per 100,000



Source: Alaska Vital Statistics, Mortality data, Health Analytics and Vital Records, 2013-2017
* Denotes rates that are based on 20 or fewer events. Interpret with caution.
† Rates for less than 6 events are not calculated.
‡ Indicates one or more rates in the series is calculated from fewer than 30 events, therefore trend analyses were not performed due to increased risk of overestimating the significance of trends.

- Data show there were few significant differences in transportation-related average death rates for Alaska residents depending on age.
- The average transportation-related death rates for children under 15 years old were significantly lower than all other age groups from 2006-2008 to 2015-2017. Average rates for these groups varied between a low of 2 per 100,000 among those between 5 and 14 in 2012-2014 and a high of 7 per 100,000 among those under 5 years old in 2009-2011.
- The highest average rate of transportation-related deaths was observed among those between the ages of 75 and 84 in 2015-2017. The average rate in this age group during these years was 38 per 100,000, significantly higher than nearly every other age group over those years.
- There were no significant trends in transportation-related death rates for any of the age groups during the years examined. Transportation-related death rates and trend analyses for Alaska residents age 85 and older could not be estimated reliably due to the small number of deaths in this group. Trend analyses could also not be performed on transportation-related death rates for those age 0-4, 5-14, 65-74, and 75-84.

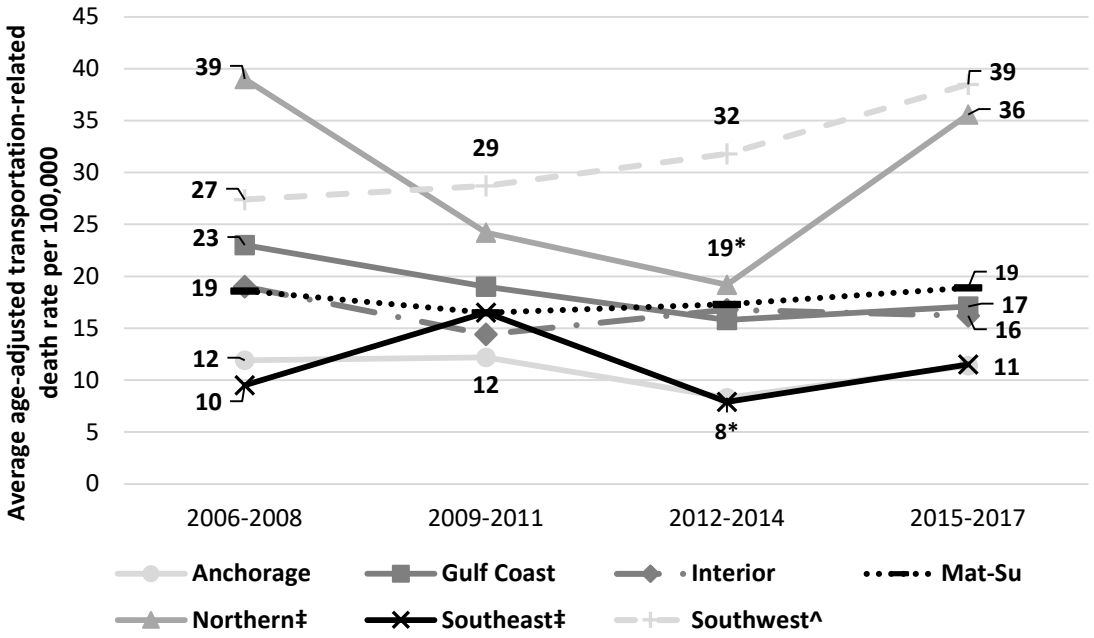
Figure 36: Transportation-Related Deaths among Alaska Residents by Race, rate per 100,000



Source: Alaska Vital Statistics, Mortality data, Health Analytics and Vital Records, 2013-2017
Note: Rates are age-adjusted to the 2000 standard US population
* Denotes rates that are based on 20 or fewer events. Interpret with caution.
‡ Indicates one or more rates in the series is calculated from fewer than 30 events, therefore trend analyses were not performed due to increased risk of overestimating the significance of trends.

- There was a great disparity in deaths caused by transportation-related incidents among Alaska residents of different racial or ethnic backgrounds from 2006 to 2017.
- The average age-adjusted rate of transportation-related death among Alaska Native residents was significantly higher than White and other race residents across all years from 2006-2008 to 2015-2017. The average age-adjusted death rate for transportation-related incidents among Alaska Native people ranged from a low of 23 per 100,000 in 2009-2011 to a high of 33 per 100,000 in 2015-2017.
- White Alaska residents' average transportation-related death rates varied from a low of 11 per 100,000 in 2012-2014 to a high of 15 per 100,000 in 2006-2008 and 2009-2011. Rates among other race Alaska residents ranged from a low of 7 per 100,000 in 2009-2011 to a high of 9 per 100,000 in 2006-2008 and 2015-2017.
- There were no significant trends in transportation-related death rates for Alaska Native or White residents between 2006-2008 and 2015-2017. Data did not support analysis of trends in transportation-related death rates among other race Alaska residents during these years.

Figure 37: Transportation-Related Deaths among Alaska Residents by Region, rate per 100,000



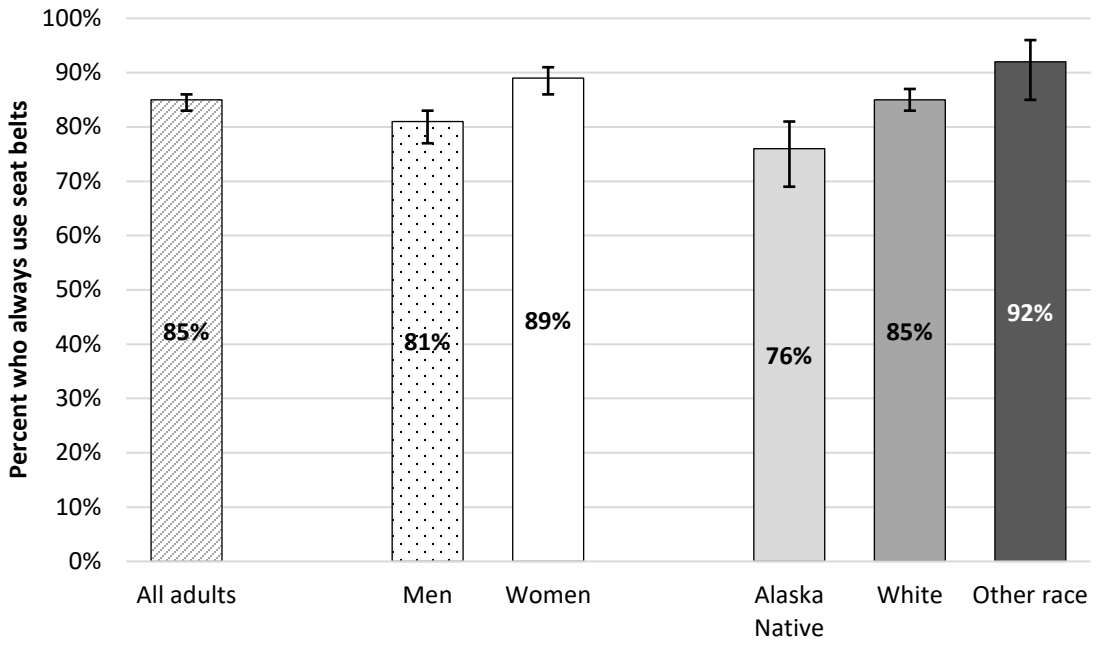
Source: Alaska Vital Statistics, Mortality data, Health Analytics and Vital Records, 2013-2017
Note: Rates are age-adjusted to the 2000 standard US population
* Denotes rates that are based on 20 or fewer events. Interpret with caution.
^ Denotes that the Annual Percent Change (APC) is significant at the $p \leq 0.05$ level.
‡ Indicates one or more rates in the series is calculated from fewer than 30 events, therefore trend analyses were not performed due to increased risk of overestimating the significance of trends.

- There were a few significant differences in average age-adjusted transportation-related death rates based on where Alaska residents live in the state.
- For the most part, the average age-adjusted transportation-related death rates in Anchorage and the Southeast region were significantly lower than the rates observed in other regions between 2006-2008 and 2015-2017. Average rates in Anchorage ranged from a low of 8 per 100,000 in 2012-2014 to a high of 12 per 100,000 in 2006-2008 and 2009-2011. In the Southeast, the lowest average rate was also 8 per 100,000 in 2012-2014 and the highest was 17 per 100,000 in 2009-2011.
- The average age-adjusted transportation-related death rates for the Northern and Southwest regions of the state were significantly higher than most other regions over the same years. In the Northern region, average rates ranged from a low of 19 per 100,000 in 2012-2014 to a high of 39 per 100,000 in 2006-2008. In the Southwest, the lowest rate was 27 per 100,000 in 2006-2008 and the highest was 39 per 100,000 in 2015-2017. This steady increase in the Southwest's transportation-related death rate represents an average annual percent change of less than 1% each year, however the incline was statistically significant.
- No other statistically significant trends were found in other regions.

Risk and Protective Factors for Transportation-Related Injury and Death

Use of Seat Belts and Car Seats

Figure 38: Self-Reported Seat Belt Use among Alaska Adults by Gender and Race

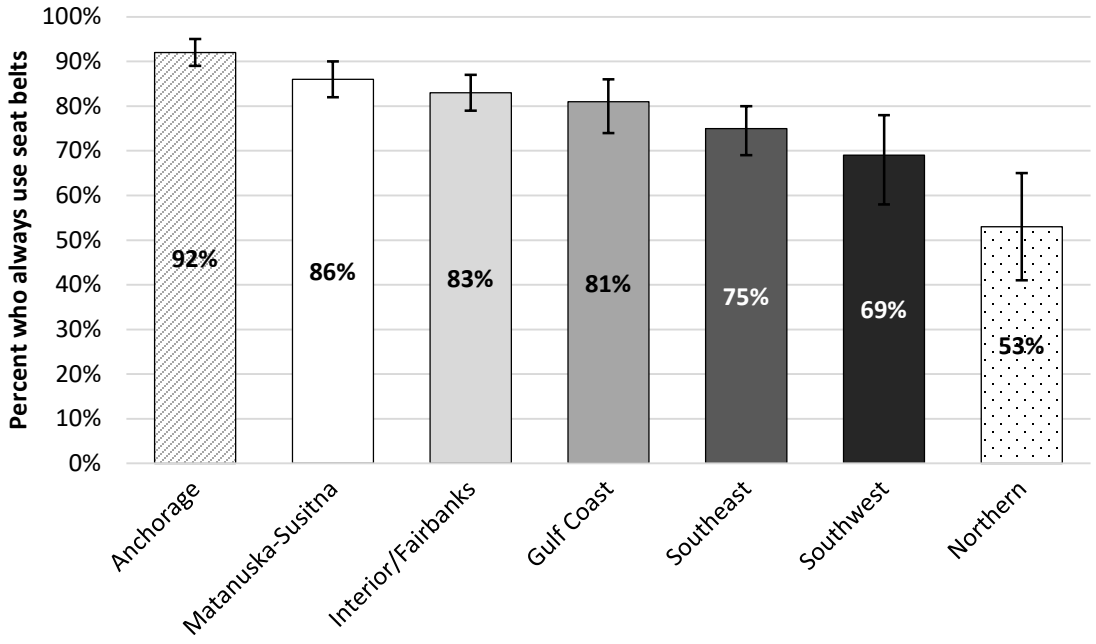


Source: Alaska Standard BRFSS, 2016[39]

- When asked "How often do you use seat belts when you drive or ride in a car," 85% of Alaska adults report "Always." The remaining 15% report nearly always, sometimes, seldom, or never.
- There are differences in seat belt use by gender such that women are significantly more likely than men to report always wearing a seat belt (89% of women vs. 81% of men).
- There are also significant differences in seat belt use by race. Compared to White adults, Alaska Native adults are significantly less likely to report that they always wear a seat belt while driving or riding in a car.
- Results indicate that Alaska adults of other races are significantly more likely than Alaska Native adults to always wear seat belts in cars.
- There are no significant differences in seat belt use among Alaska adults by age group. More than 80% of adults in all age groups report they always wear seat belts in cars (data not shown).

[39] Questions about seat belt use and other risk factors for transportation-related injury are asked on the Alaska Standard BRFSS nearly every year. Results from the most recent year of available data are presented here.

Figure 39: Self-Reported Seat Belt Use among Alaska Adults by Region



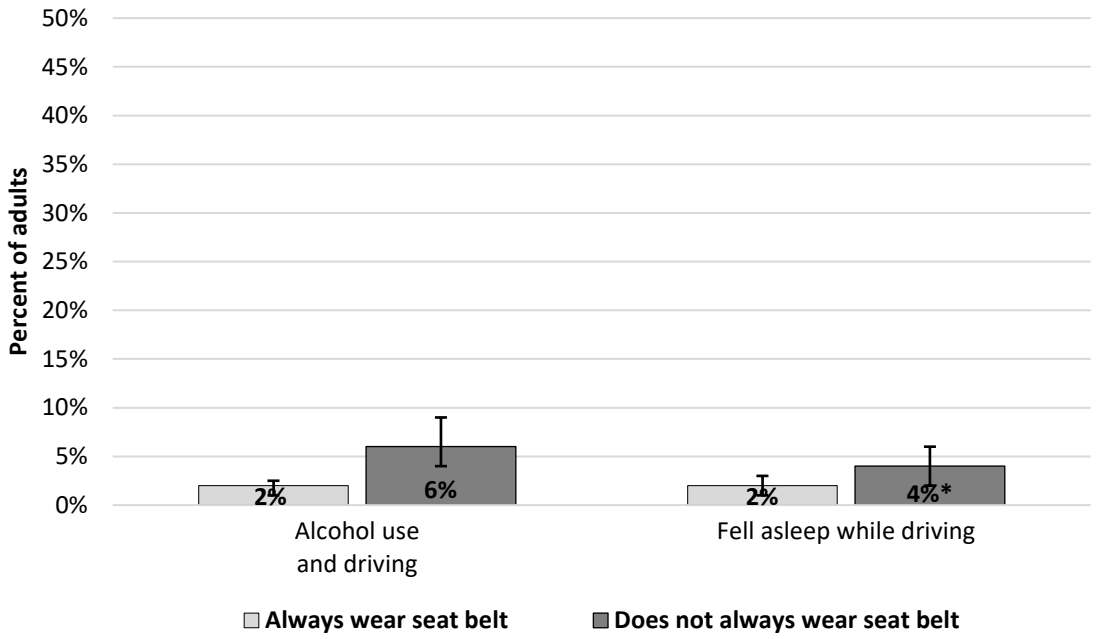
Source: Alaska Standard BRFSS, 2016

- Seat belt use varies significantly based on where Alaska adults reside in the state. Generally, adults who live in densely populated urban regions are more likely to report they always use seat belts in cars compared to adults who live in rural areas.

- The largest percentage of adults who report always wearing a seat belt live in Anchorage (92%), followed by those in Matanuska-Susitna (86%), and residents of the Interior/Fairbanks region (83%). Adults living in the Gulf Coast region are also highly likely to report they always wear seat belts in cars (81%).

- In the more rural areas, 75% of adults in the Southeast report always wearing seat belts, followed by 69% of adults in the Southwest. Only slightly more than half of adults in the Northern region report they always wear seat belts in cars, which is significantly lower than all other regions except the Southwest.

Figure 40: Self-Reported Seat Belt Use and Impaired Driving among Alaska Adults

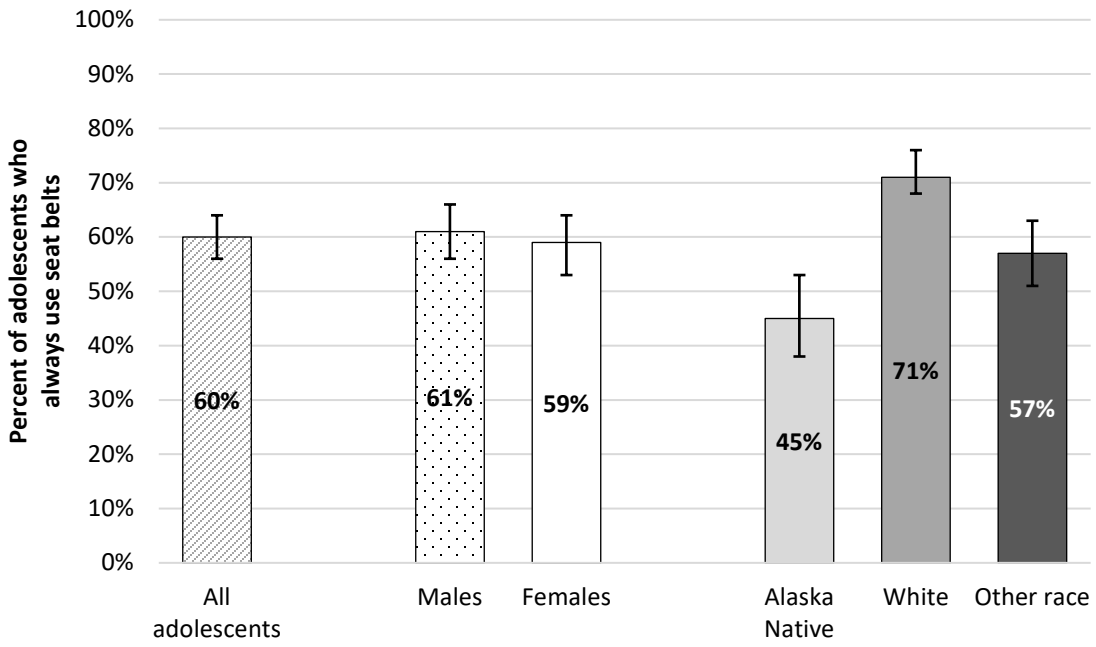


Source: Alaska Standard BRFSS, 2012, 2014, and 2016[40,41]

- Unfortunately, Alaska adults who do not always use a seat belt while driving or riding in a car are also more likely to report impaired driving, therefore increasing the risk of serious injury or death.
- Six percent of adults who do not always use seat belts in cars also report driving in the past 30 days after drinking too much alcohol. Two percent of adults who always use seat belts report drinking and driving in the past 30 days. The difference in drinking and driving by seat belt use is statistically significant.
- Among adults who do not always use seat belts, 4% also report that they have fallen asleep while driving over the past 30 days—significantly more than the 2% who always wear seat belts.

[40] Data collection years 2012, 2014, and 2016 are combined to examine seat belt use among those who drink and drive due to small reporting numbers in single years.
[41] Data collection year 2012 is the only time a question about falling asleep while driving appeared on the BRFSS survey.

Figure 41: Self-Reported Seat Belt Use among Alaska Adolescents by Gender and Race

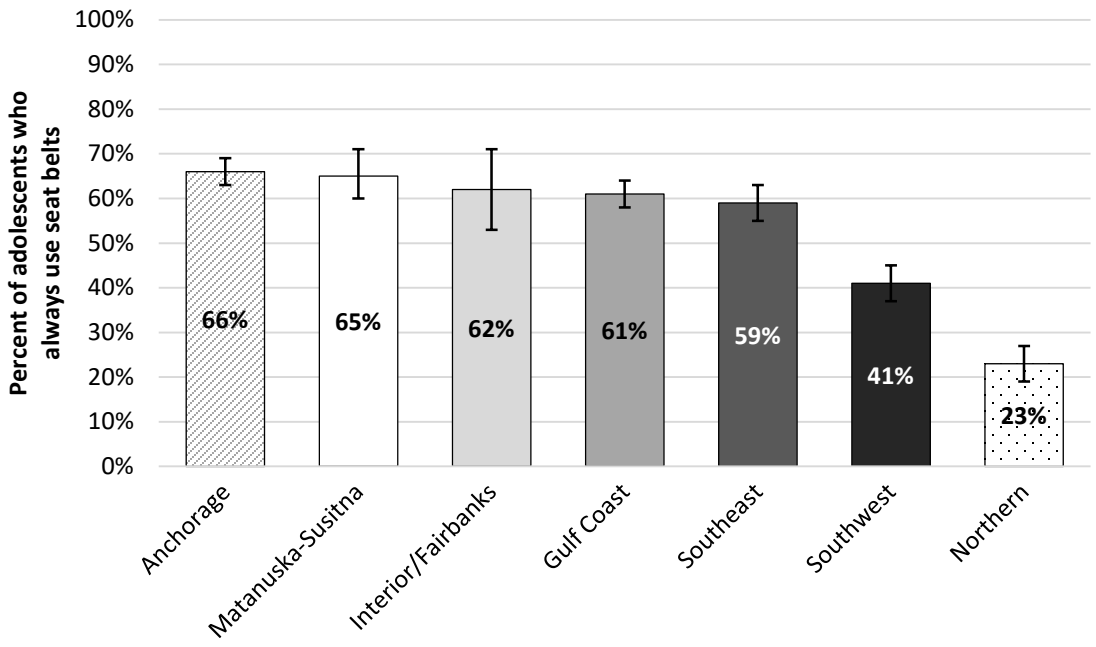


Source: Alaska YRBS, 2017[42]

- When asked "How often do you wear a seat belt when riding in a car driven by someone else?" only 60% of Alaska adolescents report "Always."[43]
- There is no significant difference in seat belt use between adolescent males and females.
- Alaska Native adolescents are significantly less likely than White adolescents to report they always wear seat belts while riding cars. Alaska Native adolescents are also significantly less likely than adolescents of other races to always wear seat belts. Other race adolescents are significantly less likely than White adolescents to always wear seat belts.
- There are no significant differences in seat belt use by age among Alaska adolescents (data not shown).

[42] Questions about seat belt use and other risk factors for transportation-related injury are asked on the Alaska YRBS every year. Results from the most recent year of available data are presented here.
[43] The seat belt question on the YRBS only asks about seat belt use while riding in a car driven by someone else, and does not ask about seat belt use while driving a car or other vehicle.

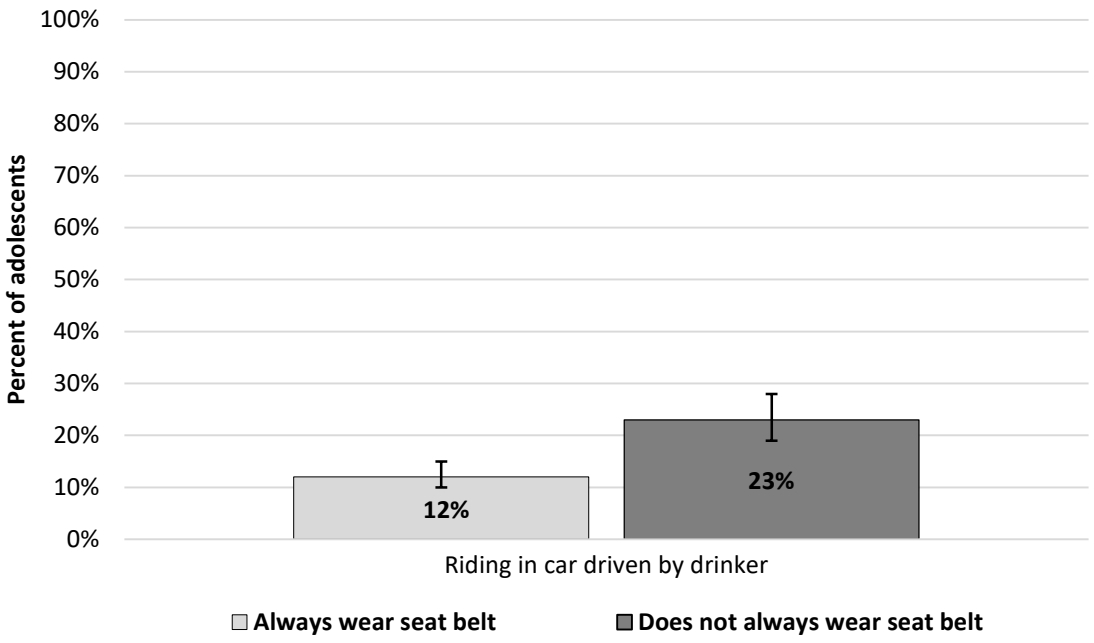
Figure 42: Self-Reported Seat Belt Use among Alaska Adolescents by Region



Source: Alaska Local YRBS, 2017

- Patterns of seat belt use by region of residence are similar between Alaska adolescents and adults.
- Like adults, adolescents living in urban areas including Anchorage, Matanuska-Susitna, and the Interior/Fairbanks region are the most likely to report they always wear seat belts while riding in cars. Adolescents who live in the Gulf Coast region are similarly likely to always wear a seat belt.
- Adolescents living in the Southeast, Southwest, and Northern regions of the state have the lowest likelihood of reporting they always wear a seat belt.
- Less than one quarter of adolescents in the Northern region report they always wear a seat belt while riding in a car driven by someone else. This region is one of the most remote and least populated areas in the state, and travel by car is not as common as travel by ATV, snow machine, boat, or plane. The YRBS survey question related to seat belt use does not include a response option of "I do not typically ride in a car," therefore it is possible that the lower rate of seat belt use in the Northern region is due to the generally limited use of cars for travel.

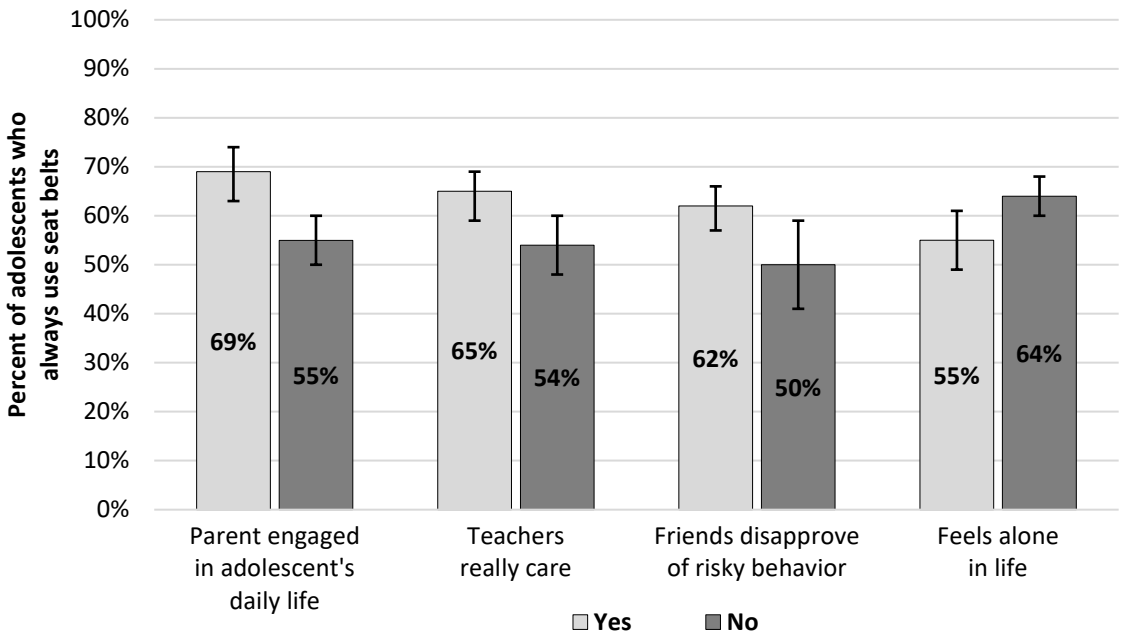
Figure 43: Self-Reported Seat Belt Use among Alaska Adolescents and Riding with Driver who Consumed Alcohol



Source: Alaska YRBS, 2017

- Adolescents who do not always wear a seat belt are significantly more likely than adolescents who always wear a seat belt to report riding in a car in the past 30 days driven by someone who had been drinking alcohol.
- Twenty-three percent of adolescents who do not always wear a seat belt report riding in car driven by a drinker—nearly three times more than the 12% of adolescents who always wear a seat belt.
- Because the Alaska YRBS survey only asks adolescents about seat belt use while riding in a car driven by someone else, it was not possible to examine possible relationships between seat belt use and adolescents' reports of impaired driving.

Figure 44: Selected Protective Factors among Alaska Adolescents by Self-Reported Seat Belt Use



Source: Alaska YRBS 2017

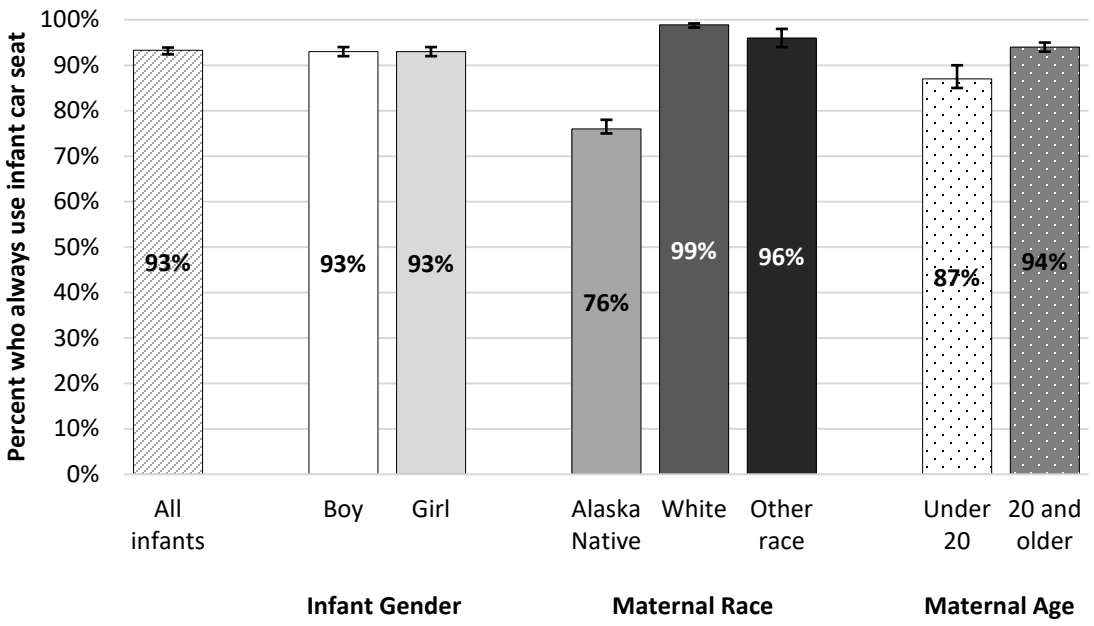
- Family support, connection to school and community, and association with pro-social peers have all been identified as protective factors against risky behaviors that can lead to motor vehicle crashes and injury among adolescents.[44,45] The current findings confirm this notion with regard to regular seat belt use among Alaska adolescents.
- Adolescents who report having a parent who is engaged with their daily lives (i.e., a parent who asks them about school about every day) are significantly more likely to report they always wear seat belts compared to adolescents whose parents are less involved. Adolescents who report feeling their teachers really care about them and encourage them are significantly more likely to report they always wear seat belts relative to adolescents who feel less connected to their teachers. Adolescents who report feeling alone in their lives are significantly less likely to always wear seat belts compared to adolescents who do not feel alone in their lives.
- Friends' feelings about risky behaviors also influence adolescent seat belt use. Adolescents who report their friends generally disapprove of the adolescents engaging in risky behaviors such as drinking alcohol, using marijuana, smoking cigarettes, and misusing pain medication are significantly more likely to always wear seat belts

[44] National Research Council (US), Institute of Medicine (US), and Transportation Research Board (US) Program Committee for a Workshop on Contributions from the Behavioral and Social Sciences in Reducing and Preventing Teen Motor Crashes. *Preventing Teen Motor Crashes: Contributions from the Behavioral and Social Sciences: Workshop Report.* Washington (DC): National Academies Press (US); 2007.

[45] Centers for Disease Control and Prevention. School Connectedness: Strategies for Increasing Protective Factors Among Youth. Atlanta, GA: U.S. Department of Health and Human Services; 2009.

compared to adolescents whose friends approve of such risk-taking behaviors. This finding may suggest a peer-led adolescent safety campaign could be an effective approach to injury prevention among Alaska adolescents.

Figure 45: Infant Car Seat Use by Infant Gender, Maternal Race, and Maternal Age



Source: Alaska PRAMS, 2004-2008

- The vast majority of mothers of newborns in Alaska report that their infant always rides in an infant car seat when riding in a car, truck, or van. There are no significant differences in mothers' reports of car seat use by gender of the infant.

- There is a significant difference in whether an infant always rides in a car seat by maternal race. Only 76% of Alaska Native mothers report their infant always rides in a car seat, which is significantly lower than White mothers (99%) and mothers of other races (96%). This discrepancy has been found in previous years of PRAMS data collection. On a positive note, the 76% figure reported here among Alaska Native mothers is 10% higher than estimates reported in 1996-1999,[46] though this difference could be due to changes in question construct between those years.

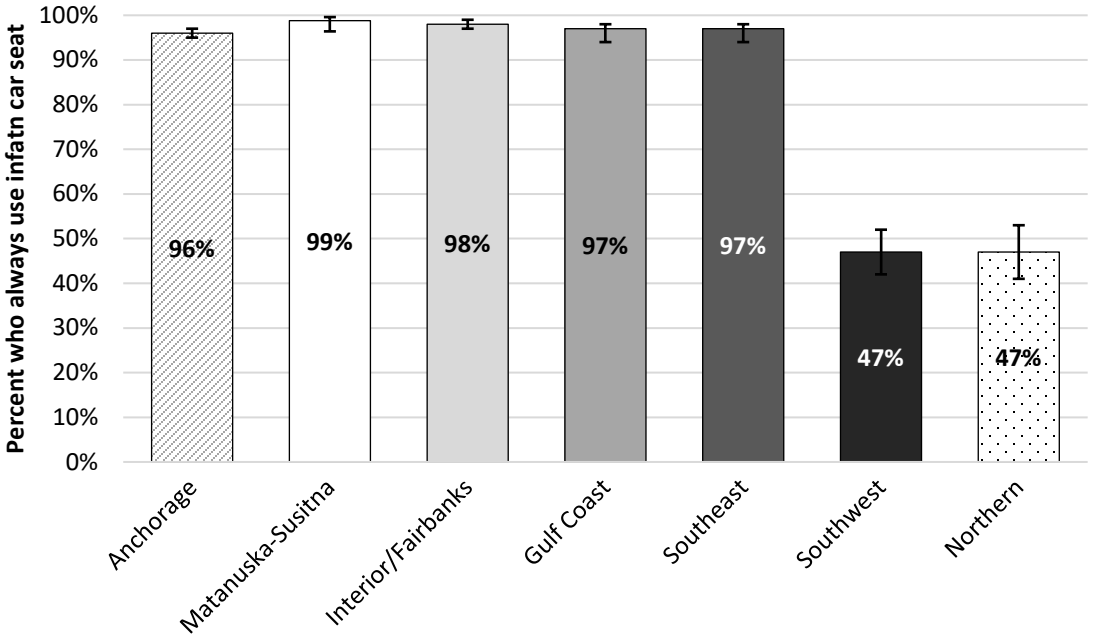
- The discrepancy between Alaska Native and non-Native mothers' reports of infant car seat use may be a reflection of a difference in travel practices. Alaska Native people are more likely than non-Native people to live in rural and remote areas of the state where travel by ATV, snow machine, boat, or plane are more common than car travel. The question related to infant car seat use on the PRAMS survey did not include a response option of "baby does not ride in a car," therefore it is possible that the lower rate of car

[46] Infant Car Seat Use in Alaska, 1996-1999. Alaska MCH Facts. AKDHSS, Alaska Maternal and Child Health Epidemiology Unit; 3:3, March 2004. Available at: http://mch-epibulletins.dhss.alaska.gov/Document/Display?DocumentId=1175. Retrieved June 21, 2018.

seat use among Alaska Native mothers may simply reflect the lower prevalence of car travel in the remote areas where they live.

- There are significant differences in regular infant car seat use by maternal age, such that mothers under 20 years old are less likely than mothers 20 years and older to report their infant always rides in a car seat. The discrepancy in infant car seat use by maternal age has not changed since 1996-1999.

Figure 46: Infant Car Seat Use by Region



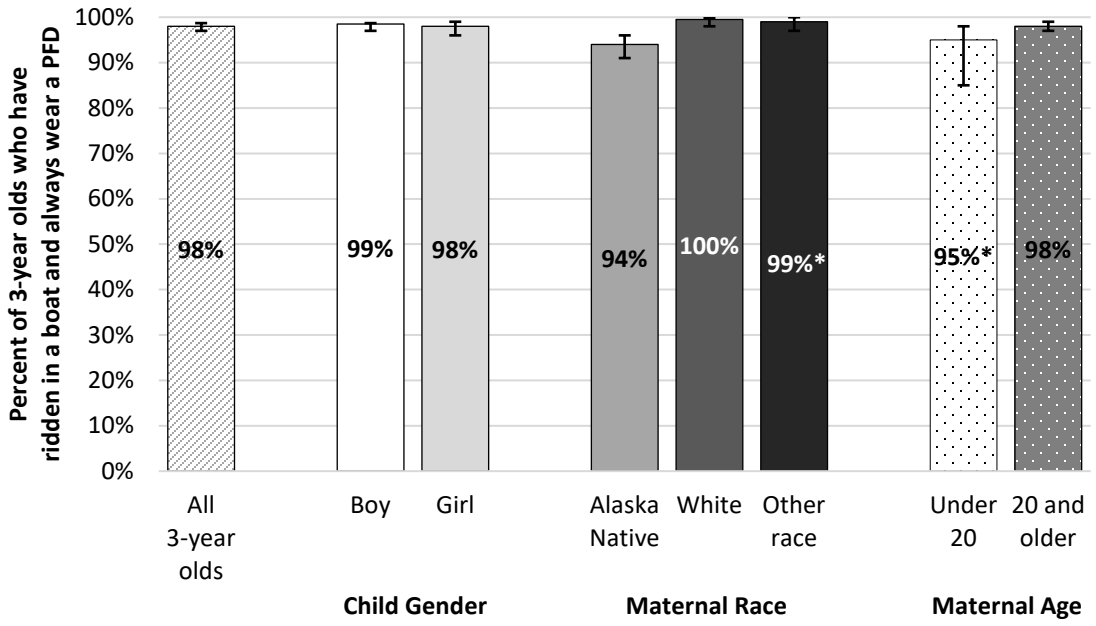
Source: Alaska PRAMS, 2004-2008

- There are large and significant differences in infant car seat use between urban/ populated areas and rural/remote areas.
- Mothers of newborns who live in urban regions of the state have the highest prevalence of always using an infant car seat. Nearly 100% of mothers in Anchorage, Matanuska-Susitna, and the Interior/Fairbanks regions report their baby always rides in an infant car seat.
- Almost all mothers in the Gulf Coast and Southeast regions also report their newborns always ride in infant car seats. These regions are slightly less populated, but they are located right outside the most urban regions of the state.
- In the Southwest and Northern regions of the state, less than half of mothers of newborns report that their baby always rides in an infant car seat while riding in a car, truck, or van. These areas are the most remote and least populated in the state, and travel by car is not as common as travel by ATV, snow machine, boat, or plane.[47] The question related to car seat use on the PRAMS survey did not include a response option of "baby does not ride in a car," therefore it is possible that the lower rate of car seat use in these areas is due to the generally limited use of cars for travel.

[47] Infant Car Seat Use in Alaska, 1996-1999. Alaska MCH Facts. AKDHSS, Alaska Maternal and Child Health Epidemiology Unit; 3:3, March 2004. Available at: http://mch-epibulletins.dhss.alaska.gov/Document/Display?DocumentId=1175. Retrieved June 21, 2018.

Use of Personal Floatation Devices Among Young Children

Figure 47: Use of Personal Floatation Devices among Three-Year Olds by Child Gender, Maternal Race, and Maternal Age



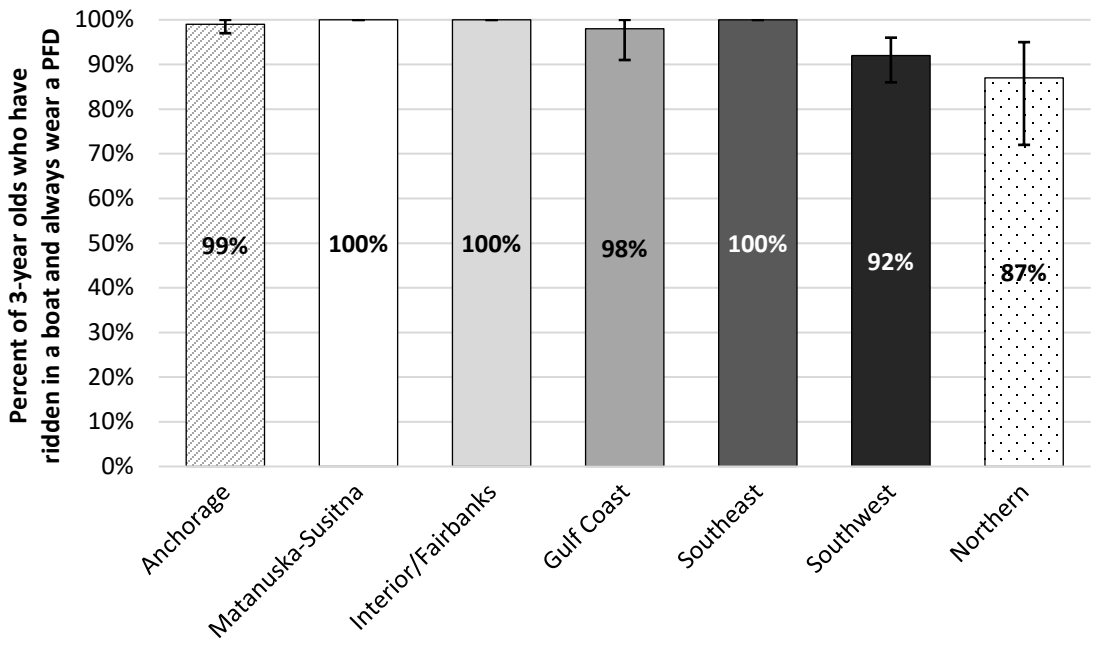
Source: Alaska CUBS, 2013-2014

* May be unreliable. Number of respondents is at least 30 but less than 60. Interpret with caution.

- Due to Alaska's unique terrain and the remote location of some villages, many Alaska residents including young children travel regularly by boat. Serious injury and death caused by boating incidents can be prevented in part using personal floatation devices among young children.[48]
- The regular use of personal floatation devices among young children in Alaska is nearly universal—that is, 98% of mothers of 3-year olds who ride in boats report their child always wear a life jacket. There is no significant difference in mothers' reports of life jacket use by child gender.
- As with infant car seat use, there are significant differences in mothers' reports of life jacket use by maternal race although the disparity is not as large. While 99% of other race and 100% of White mothers report their child always wears a life jacket in boats, 94% of Alaska Native mothers report their child always wears a life jacket.
- There are also significant differences in mothers' reports of life jacket use by maternal age, but again the disparity is not large. Ninety-five percent of young mothers under 20 years old report their child always wears a life jacket in boats compared to 98% of mothers 20 and older.

[48] Adult use of personal floatation devices on boats or near water has not been measured in a statewide survey since the 1993 BRFSS. Data from that year indicate low prevalence of adults using these devices.

Figure 48: Use of Personal Floatation Devices among Three-Year Olds by Region



Source: Alaska CUBS, 2013-2014

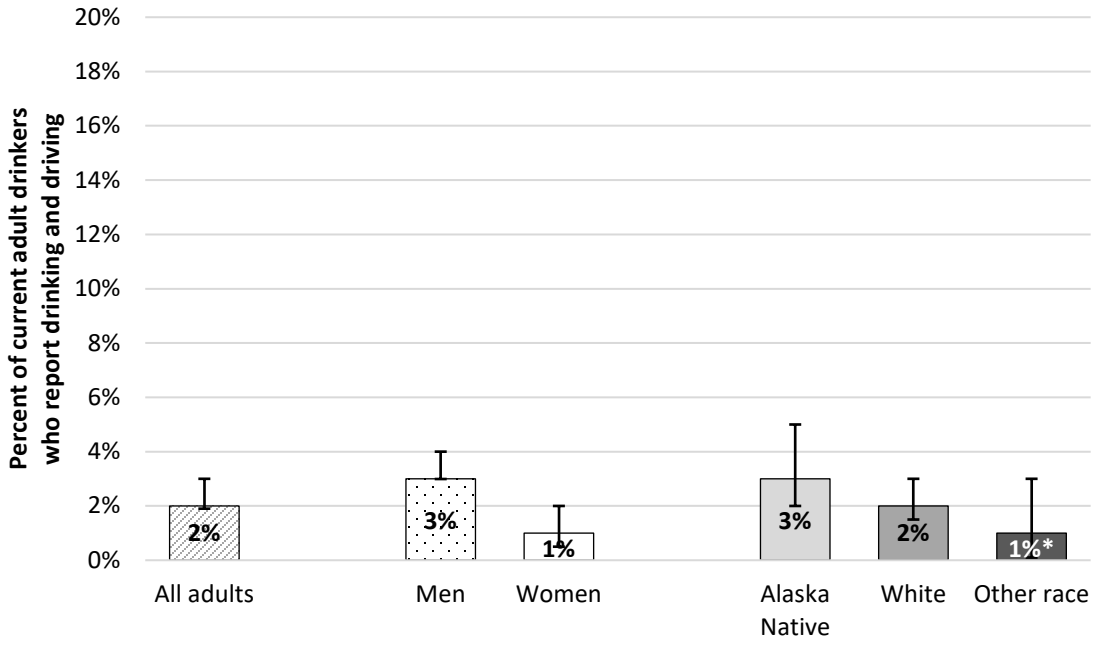
* May be unreliable. Number of respondents is at least 30 but less than 60. Interpret with caution.

- In general, the overwhelming majority of mothers living in all regions report their 3-year-old children always wear life jackets while riding in boats.
- Still, mothers living in the Northern region of the state are significantly less likely than mothers in nearly all other regions to report their 3-year-old children always wear life jackets while riding in boats. The disparity in this region is troubling, given the extensive lakes and wetlands present in this area.[49]

[49] US Fish & Wildlife Service. *National Water Summary on Wetland Resources.* Washington, DC: United States Government Printing Office; 1996. Retrieved June 25, 2018 from: https://pubs.usgs.gov/wsp/2425/report.pdf

Driving Under the Influence of Alcohol and Drugs

Figure 49: Self-Reported Alcohol Use and Driving among Alaska Adults by Gender and Race



Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined[50]

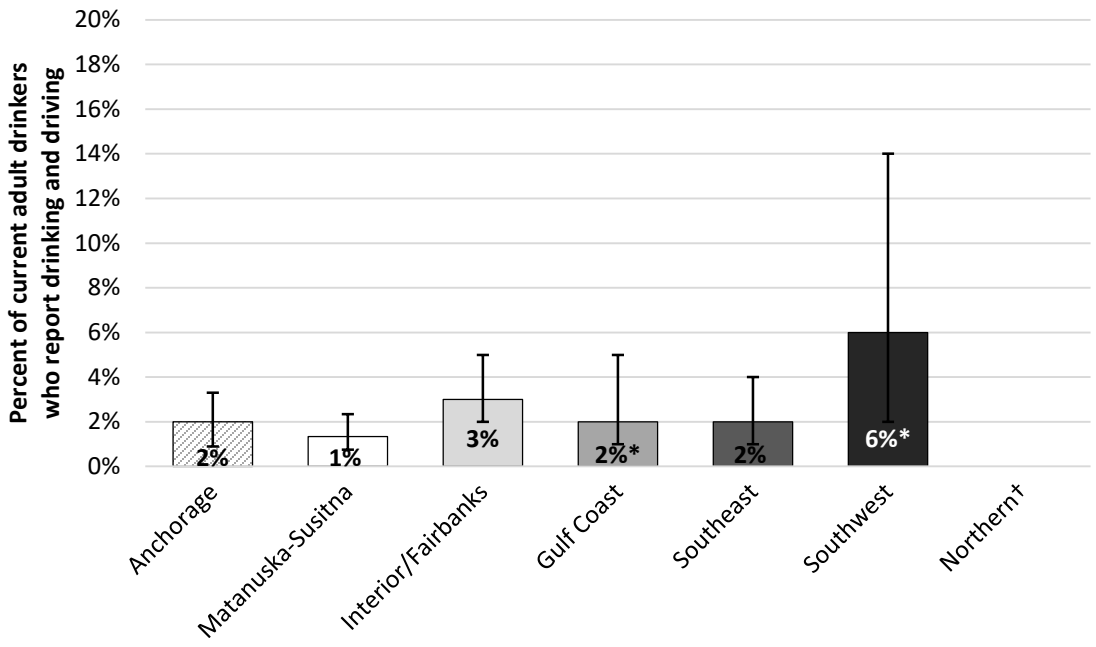
* This number may be statistically unreliable and should be interpreted with caution.

- Two percent of Alaska adults report driving after having too much to drink over the past 30 days.
- Although the estimates are small, men are significantly more likely than women to report driving after drinking too much alcohol.
- Statistically, Alaska Native, White, and other race adults report drinking and driving at the same rate. There are also no significant differences in drinking alcohol and driving by age group (data not shown).
- Other risk factors were also examined among adults who report drinking and driving, including current marijuana use. There is no significant relationship between current marijuana use and drinking and driving (data not shown).[51]

[50] Questions about drinking alcohol and driving are asked every other year on the Alaska Standard BRFSS. To generate reliable estimates, data from 2012, 2014, and 2016 are combined.

[51] In addition to questions about driving a car after drinking too much alcohol, the 1993 BRFSS also included a question about operating an ATV or snow machine after drinking too much alcohol. A quick analysis of these questions indicates that more respondents reported driving an ATV or snow machine under the influence of alcohol than driving a car under the influence of alcohol during that year. This question has not appeared on the BRFSS since then.

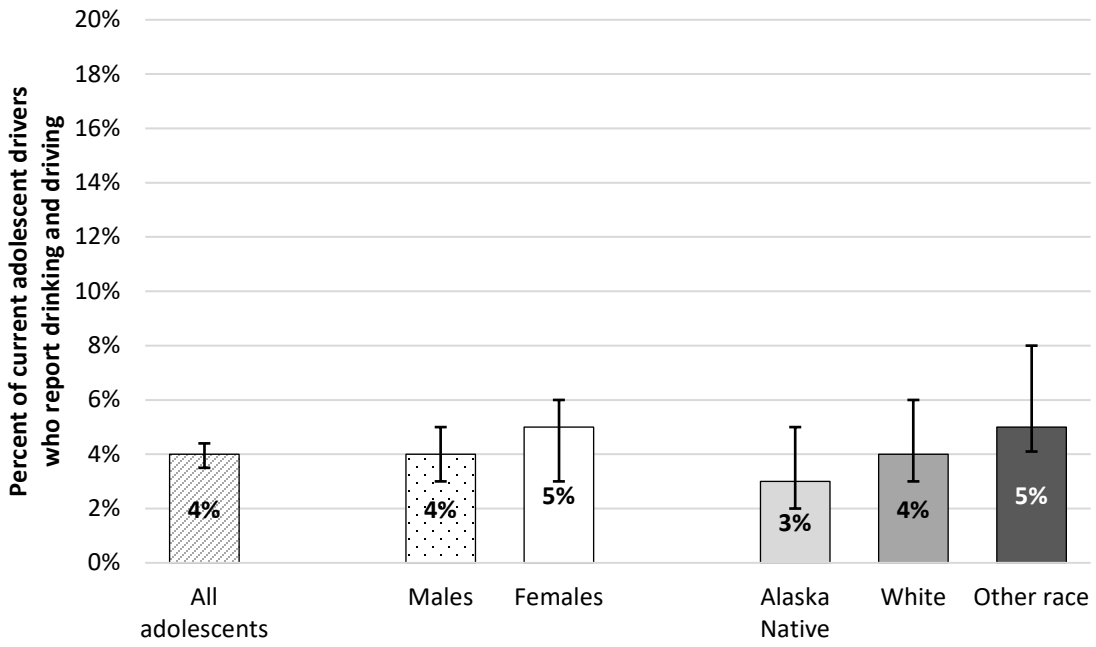
Figure 50: Self-Reported Alcohol Use and Driving among Alaska Adults by Region



Source: Alaska Standard BRFSS, 2012, 2014, and 2016 combined
* This number may be statistically unreliable and should be interpreted with caution.
† This number is suppressed because it is statistically unreliable.

- Self-reports of driving after having too much to drink among current drinkers do not differ significantly by region of residence.
- In the more urban regions of the state, the highest prevalence of self-reported drinking and driving among current drinkers is observed in the Interior/Fairbanks region.
- Adult current drinkers in the Southwest region report the highest rate of drinking and driving among the rural regions and throughout the state. Six percent of current drinkers living in the Southwest report drinking and driving the past 30 days, compared to 1-3% of current drinkers in all other regions. The percentage of adults who drink and drive in the Northern region could not be estimated due to small numbers.

Figure 51: Self-Reported Alcohol Use and Driving among Alaska Adolescents by Gender and Race

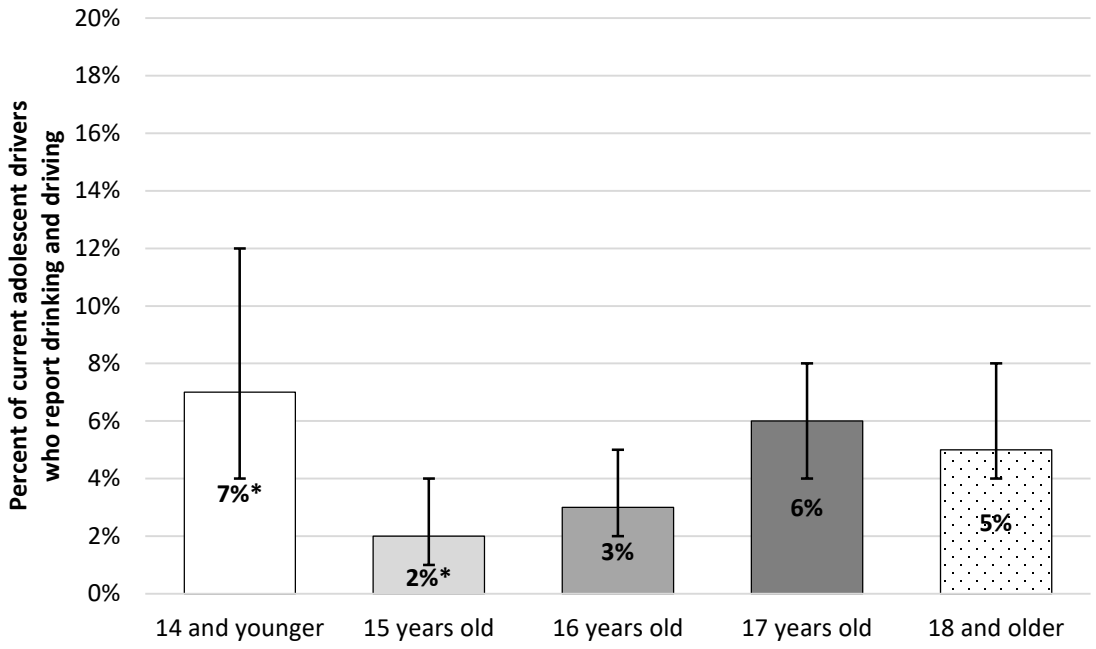


Source: Alaska YRBS, 2013, 2015, and 2017[52]

- About two-thirds of adolescents in Alaska report driving a car or another vehicle in the past 30 days. Among these adolescents, 4% report driving a car or other vehicle when they had been drinking alcohol over the same period.
- Differences in drinking and driving between adolescent male and female drivers are not statistically significant.
- Drinking and driving is also not significantly different among Alaska Native, White, and other race adolescent drivers.

[52] To generate reliable estimates, data from 2013, 2015, and 2017 are combined.

Figure 52: Self-Reported Alcohol Use and Driving among Alaska Adolescents by Age

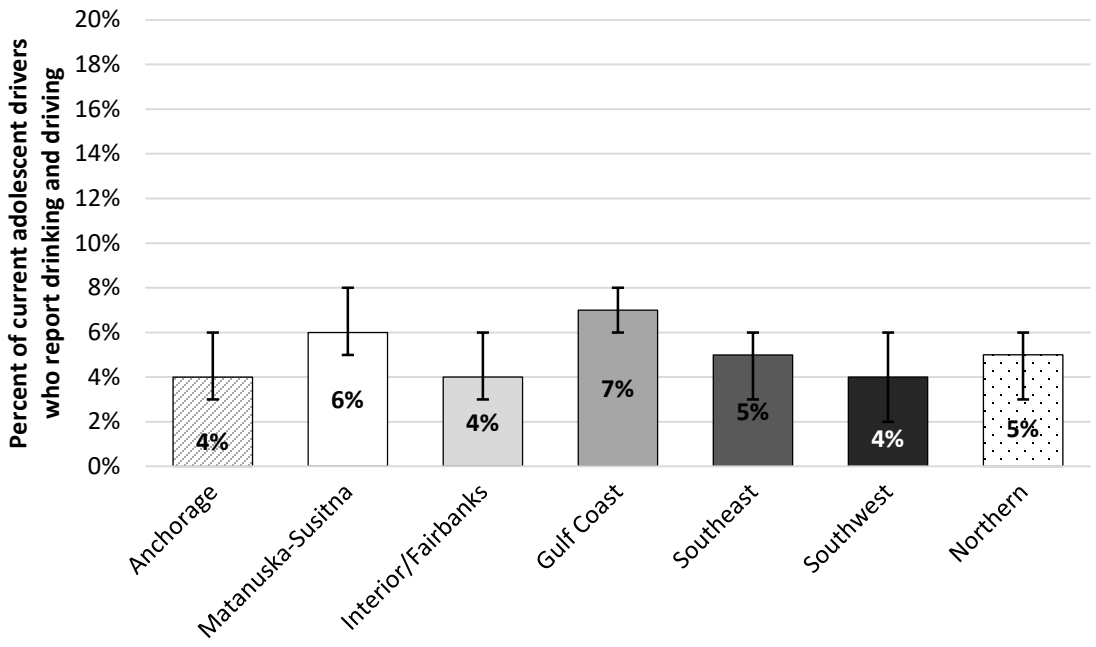


Source: Alaska YRBS, 2013, 2015, and 2017

* This number may be statistically unreliable and should be interpreted with caution.

- Drinking and driving is significantly different among Alaska adolescent drivers by age.
- Adolescent drivers with the highest rate of drinking and driving a car or other vehicle are those who are age 14 and younger. In Alaska, adolescents can obtain an instruction permit at age 14 to begin practicing how to drive under the supervision of a licensed driver over 21. A driver's license is not required in Alaska to operate vehicles other than cars (e.g., ATVs, snow machines, or boats).
- Adolescent drivers who are 17 years old and 18 and older also have high rates of drinking and driving.
- The lowest rate of drinking and driving is observed among 15-year old drivers.

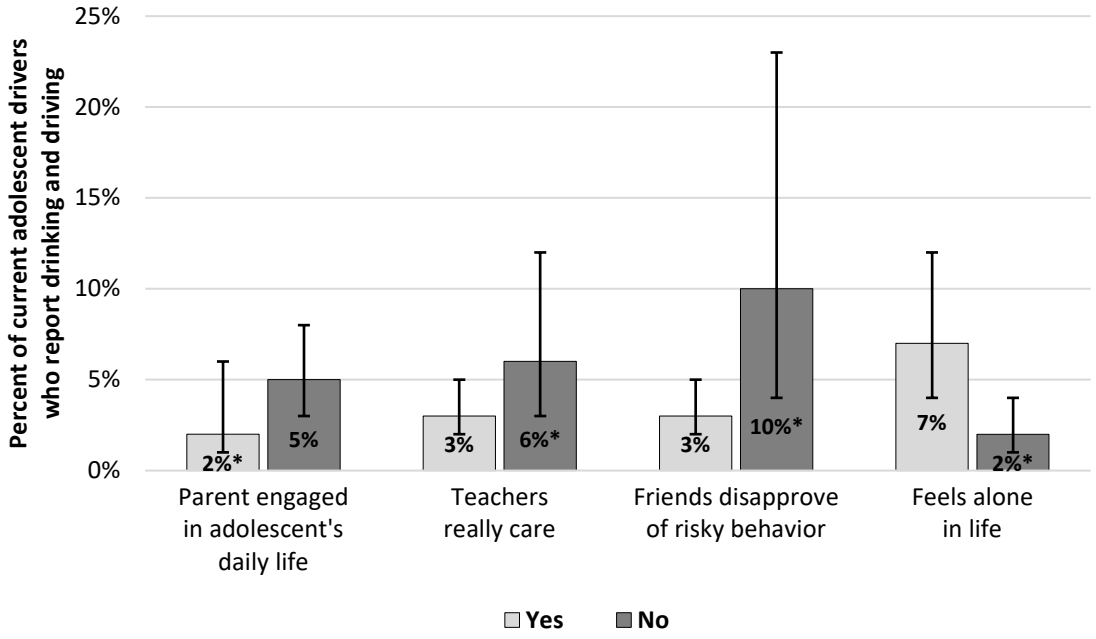
Figure 53: Self-Reported Alcohol Use and Driving among Alaska Adolescents by Region



Source: Alaska Local YRBS, 2013, 2015, and 2017

- There are no statistically significant differences in reports of drinking and driving among adolescent drivers by region of residence.

Figure 54: Selected Protective Factors among Alaska Adolescents by Self-Reported Alcohol Use and Driving



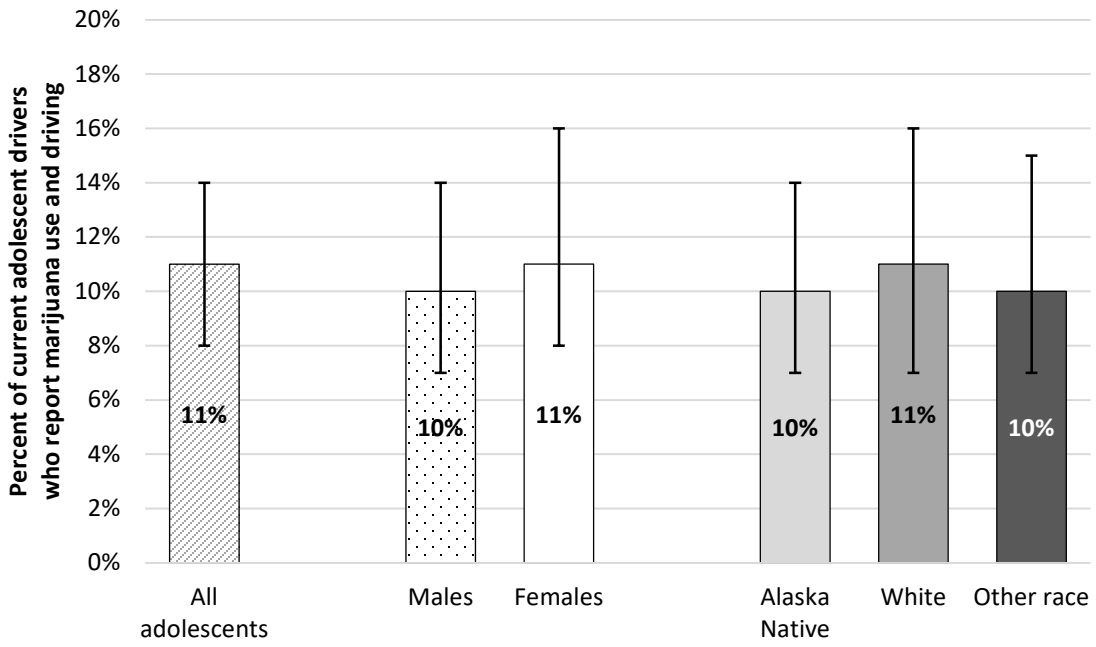
Source: Alaska YRBS 2017[53]

* This number may be statistically unreliable and should be interpreted with caution.

- Similar to seat belt use, drinking and driving among adolescent drivers is also associated with the presence of certain protective factors.
- Adolescent drivers who report their teachers really care about them and encourage them are significantly less likely to report drinking and driving compared to adolescents who feel less connected to their teachers.
- As seen with seat belt use, friends' general disapproval of an adolescent's engaging in risky behaviors is associated with adolescent drivers' reports of drinking and driving. Adolescent drivers who report their friends would disapprove of the adolescent drinking alcohol, using marijuana, smoking cigarettes, or misusing pain medication are significantly less likely to report drinking and driving than adolescents whose friends would approve of such risk-taking behaviors.
- Adolescent drivers who report they feel alone in life are significantly more likely to report drinking and driving than adolescents who feel more connected to others.

[53] Questions about friends' approval of risky behaviors were only asked on the 2017 YRBS. For consistency, drinking and driving by all protective factors are displayed for 2017 only.

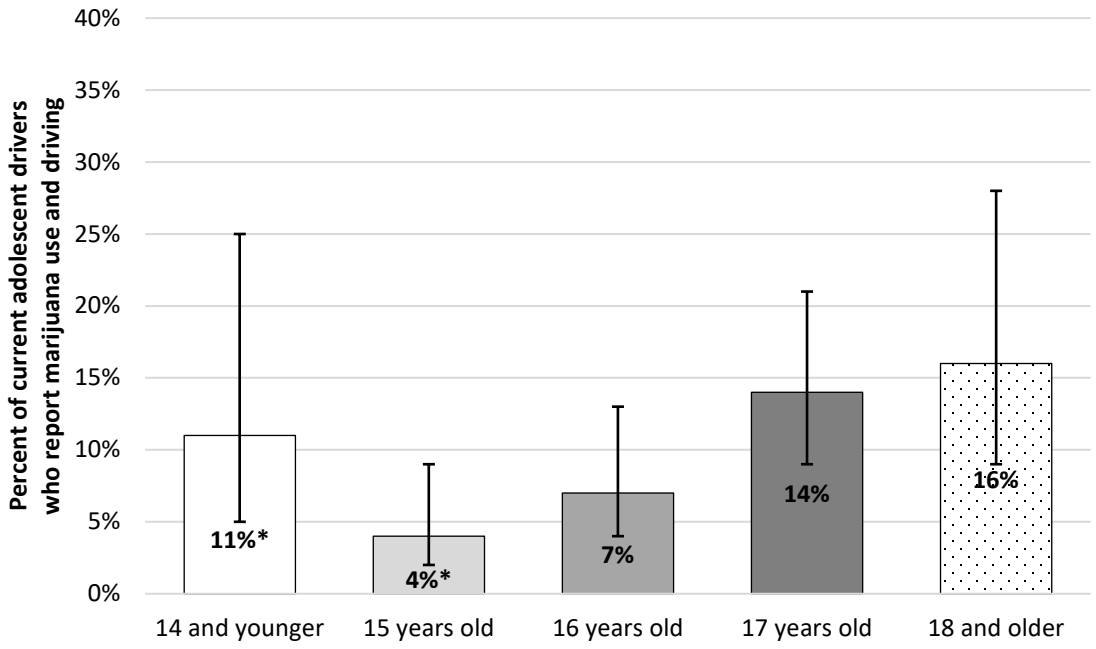
Figure 55: Self-Reported Marijuana Use and Driving among Alaska Adolescents by Gender and Race



Source: Alaska YRBS, 2017

- In 2017, two-thirds of Alaska adolescents reported that they drove a car or other vehicle in the last 30 days. Of these adolescents, 11% also reported that they drove a car or other vehicle after using marijuana over the same period.
- Self-reports of driving after using marijuana do not differ by gender among adolescent drivers.
- There are no significant differences in reports of driving after using marijuana among Alaska Native, White, and other race adolescent drivers.

Figure 56: Self-Reported Marijuana Use and Driving among Alaska Adolescents by Age



Source: Alaska YRBS 2017[54]

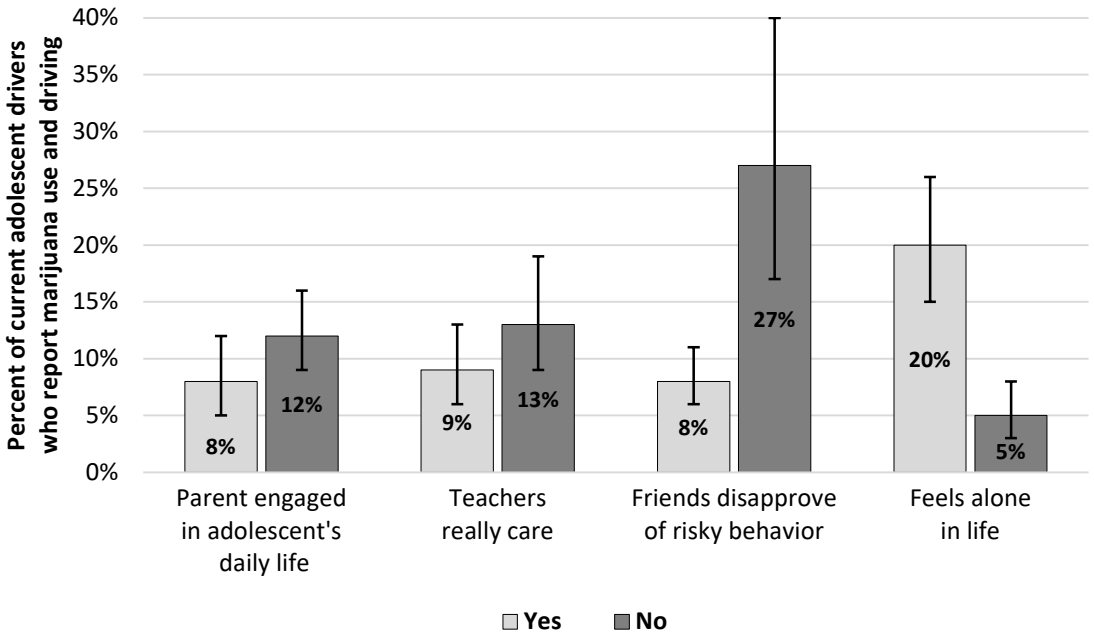
* This number may be statistically unreliable and should be interpreted with caution.

- Younger adolescent drivers in Alaska tend to be more likely to report marijuana use and driving, though the relationship is not significant at the $p < .05$ level. Similar to what was observed in drinking and driving among adolescents of different ages, the highest rates of using marijuana and driving are observed among adolescent drivers who are 18 and older, 17 years old, and 14 and younger.

- There are no significant differences in marijuana use and driving among adolescent drivers living in different regions (data not shown).

[54] The question about marijuana use and driving appeared for the first time on the 2017 YRBS.

Figure 57: Selected Protective Factors among Alaska Adolescents by Self-Reported Marijuana Use and Driving

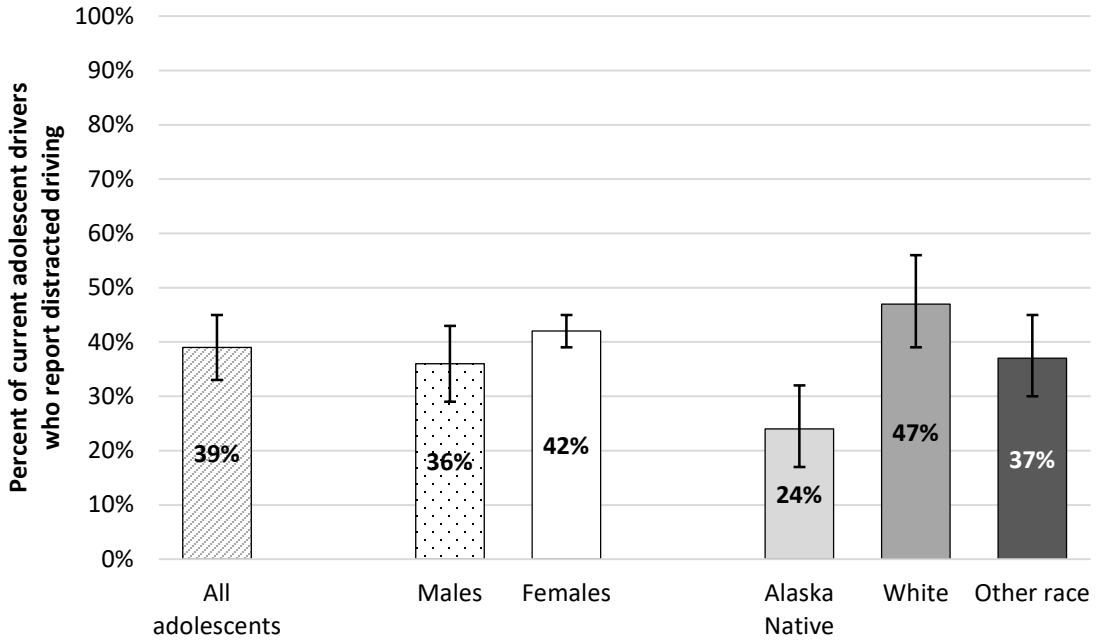


Source: Alaska YRBS 2017

- Like drinking and driving, adolescent drivers' reports of marijuana use and driving are associated with certain protective factors.
- The association between marijuana use and driving and adolescents' reports of parent engagement approaches statistical significance. Adolescent drivers who have a parent who regularly talks with them about school tend to be less likely to report using marijuana and driving compared to adolescents who do not have that interaction with a parent.
- There is no significant association between marijuana use and driving and adolescents' perceptions that teachers really care about them.
- Adolescent drivers whose friends would generally disapprove of the adolescent engaging in risky behaviors are significantly less likely to use marijuana and drive compared to adolescents whose friends are more approving of risk-taking behavior.
- Adolescent drivers who indicate that they feel alone in their lives are significantly more likely to report marijuana use and driving relative to adolescents who feel more connected to others.

Distracted Driving Among Alaska Adolescents

Figure 58: Distracted Driving among Alaska Adolescents by Gender and Age

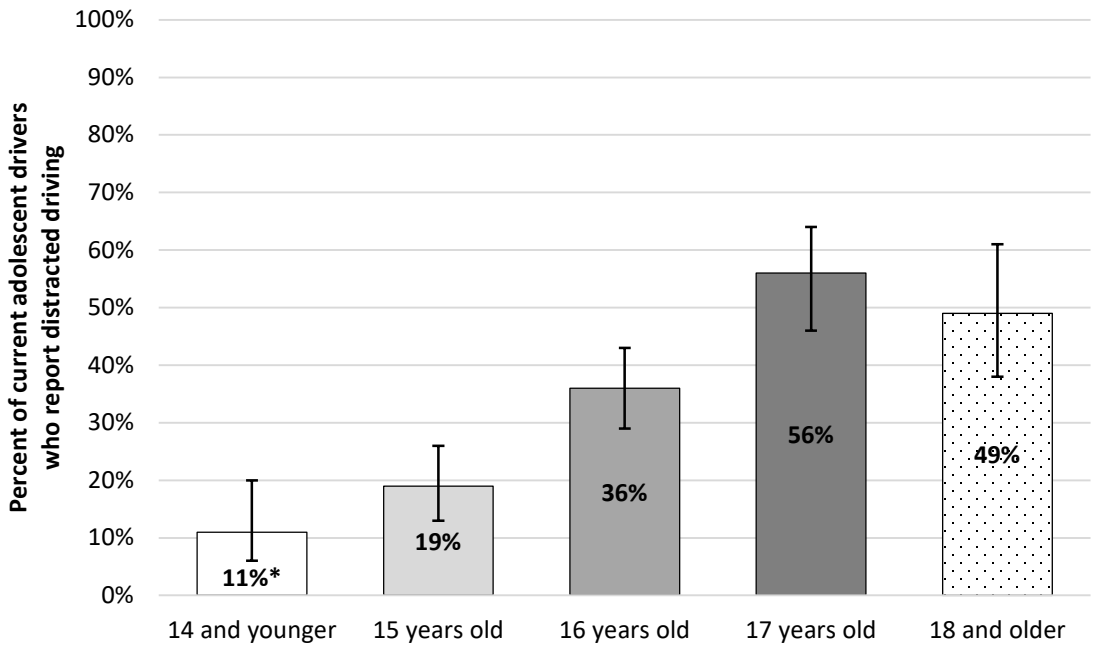


Source: Alaska YRBS 2017

- Thirty-nine percent of Alaska adolescents who drove a car or other vehicle in the past 30 days report that they texted, emailed, or talked on a cell phone while driving.
- There is no significant difference in reports of distracted driving by gender.
- There are differences in reports of distracted driving by race. White adolescent drivers are significantly more likely than Alaska Native and other race adolescent drivers to report distracted driving. Forty-seven percent of White adolescents report distracted driving—nearly double the 24% of Alaska Native adolescents and significantly more than other race adolescents. Alaska Native adolescents are the least likely race group to report distracted driving.
- The Alaska YRBS survey does not ask about smartphone or cell phone ownership; therefore, it is difficult to know whether the observed differences in distracted driving are due to certain adolescents being more or less likely to own these devices. However, there is survey question in 2017 about the amount of "screen time" young people have on an average day, which may shed some light on this issue. Data indicate that 35% of Alaska Native adolescents, 41% of White adolescents, and 46% of other race adolescents report 3 or more hours of screen time on an average day. The difference between Alaska Native adolescents and other race adolescents is statistically significant. This may help explain the difference in distracted driving between Alaska Native and other race adolescents but

does not explain the differences in distracted driving found between White and Alaska Native adolescents and White and other race adolescents.

Figure 59: Distracted Driving among Alaska Adolescents by Age

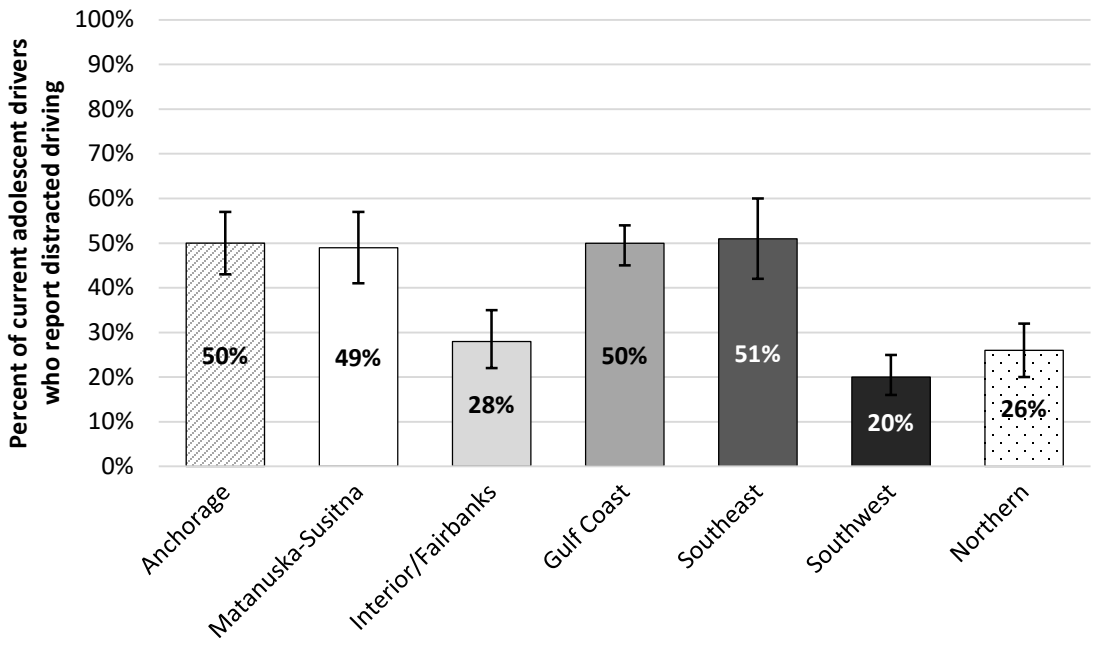


Source: Alaska YRBS 2017

* This number may be statistically unreliable and should be interpreted with caution.

- Data suggest there are significant differences in distracted driving reports by age group among Alaska adolescents.
- Adolescent drivers who are 14 years old and younger are the least likely to report distracted driving at 11%. These findings are interesting, given that this age group showed relatively higher rates of driving a car or other vehicle after drinking alcohol and after using marijuana.
- Reports of distracted driving are highest among adolescent drivers who are 17 years old. More than half of adolescent drivers in this age group report texting, emailing, or talking on a cell phone while driving in the past 30 days.

Figure 60: Distracted Driving among Alaska Adolescents by Region



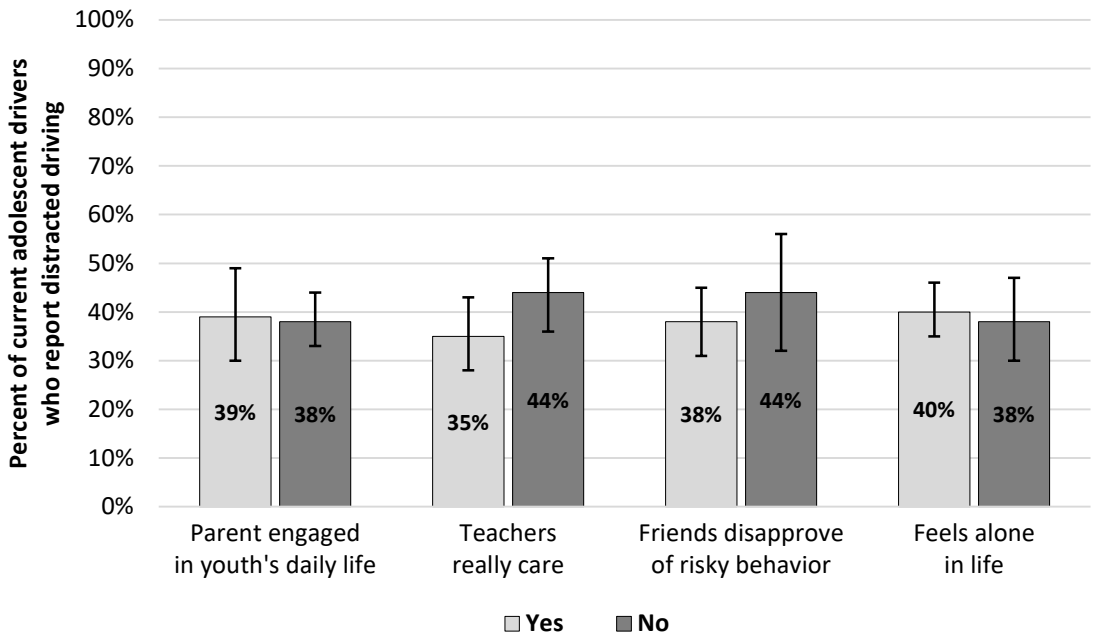
Source: Alaska Local YRBS 2017

- Data indicate that distracted driving—that is, texting, emailing, and/or talking on cell phones while driving—differs significantly among adolescent drivers by region of residence.

- Reports of distracted driving are significantly higher in the Anchorage, Matanuska-Susitna, Gulf Coast, and Southeast regions compared to the Interior/Fairbanks, Southwest, and Northern regions.

- Again, because there is no direct question on the Alaska YRBS survey pertaining to smartphone/cell phone ownership, it is difficult to know whether adolescents in certain regions are more or less likely to own these devices and therefore more or less likely to engage in distracted driving. Additional analyses examining screen time by region show that adolescents living in the Southwest region of the state are significantly less likely than adolescents in all other regions to report 3 or more hours of screen time on an average day. This may explain the finding of significantly fewer distracted driving reports among adolescent drivers living in the Southwest.

Figure 61: Selected Protective Factors among Alaska Adolescents by Distracted Driving



Source: Alaska YRBS 2017

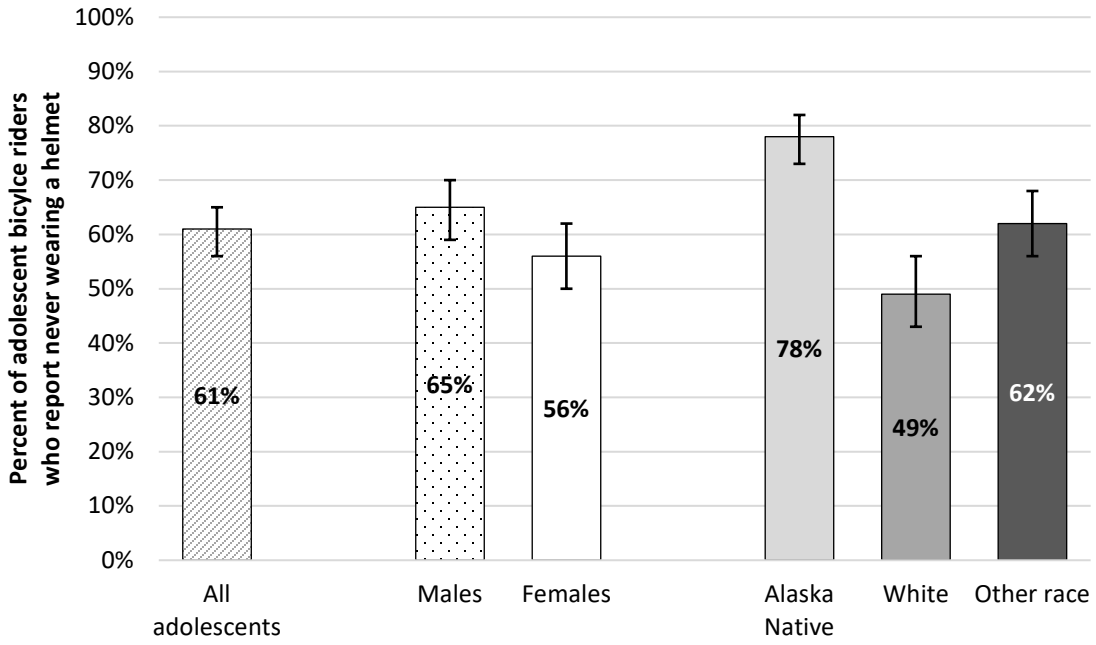
- Remarkably—and unlike the associations observed between protective factors and drinking and driving and marijuana use and driving—there are no statistically significant differences in adolescents' reports of distracted driving by selected protective factors.

- Data indicate that Alaska adolescent drivers who report protective factors like parents who regularly talk with them and teachers who care are not significantly less likely to engage in distracted driving compared to adolescent drivers who do not report these protective factors. Adolescent drivers' reports of distracted driving are also not significantly associated with the presence of friends who disapprove of risky behaviors nor with the perception of feeling alone in life.

- The distinctive patterns observed between protective factors and distracted driving and between protective factors and alcohol/marijuana use and driving suggest that adolescents may perceive the risks associated with each type of impaired driving differently. Adolescents may be more cognizant of the danger associated with driving while drunk or high but not as aware of the risks associated with texting or talking on the phone while driving. This could be related to a variety of factors including poor role-modeling by other drivers (including parents and peers), popular media, or a lack of public health messaging about the risks of distracted driving versus drunk and drug-impaired driving.

Bicycle Helmet Use Among Alaska Adolescents[55]

Figure 62: Bicycle Helmet Use among Alaska Adolescents by Gender and Race



Source: Alaska YRBS, 2017

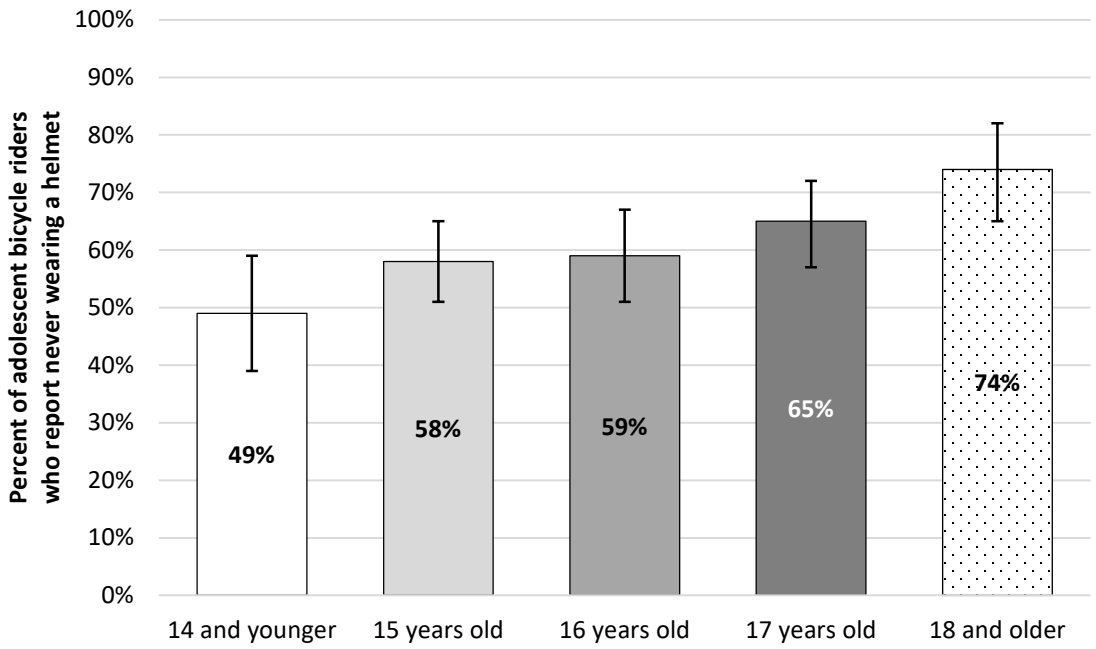
- In response to the question, "When you rode a bicycle during the past 12 months, how often did you wear a helmet," 61% of Alaska adolescent bicycle riders said "never." In other words, the majority of adolescents who ride bicycles in Alaska never wear bike helmets. This is troubling, given the increased risk of serious head injury in the event of a crash when riding a bike without a helmet.

- Significantly more adolescent male compared to female bicycle riders report they never wear a bicycle helmet.

- There are also significant differences in adolescent bicycle helmet use by race. More than three quarters of Alaska Native adolescent bicycle riders report they never wear a bike helmet—significantly more than the 62% of other race adolescents and the 49% of White adolescent bicycle riders.

[55] The 1995 YRBS included a question about helmet use while riding a motorcycle. Data from that year indicates 41% of adolescents reported they never or rarely wore a helmet on a motorcycle. The 1993 BRFSS included questions about helmet use on motorcycles and ATVs/snow machines. Data from that year indicates low prevalence of each.

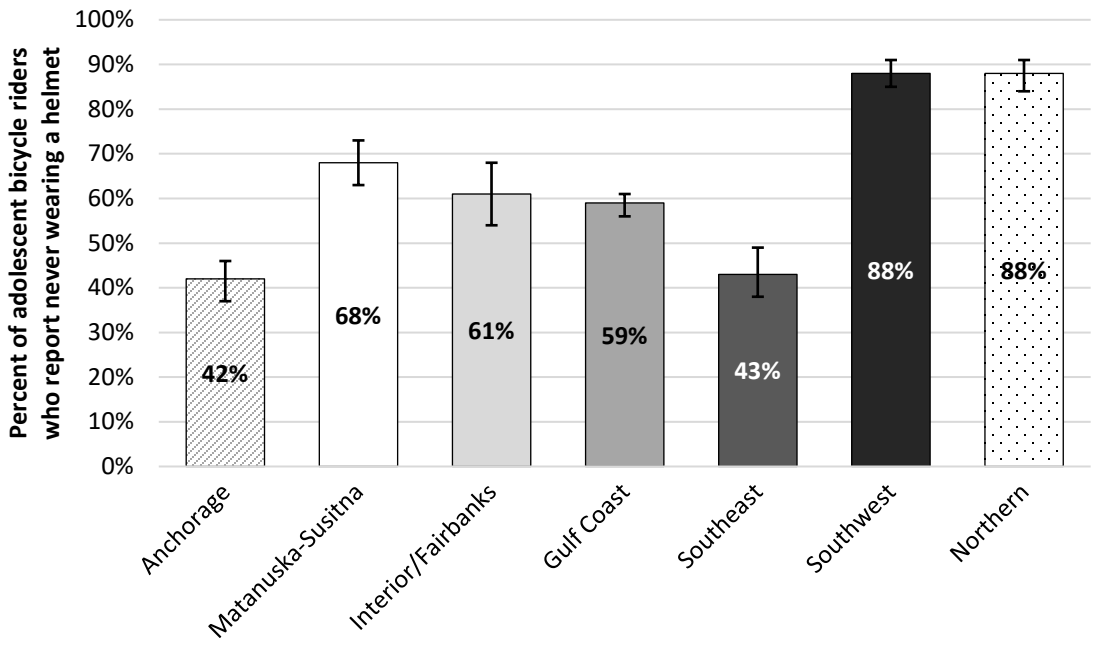
Figure 63: Bicycle Helmet Use among Alaska Adolescents by Age



Source: Alaska YRBS, 2017

- There are significant differences in bicycle helmet use by age among adolescent Alaska bicycle riders.
- As adolescent bicycle riders get older, data indicate they are more likely to report never wearing bicycle helmets. Reports of never wearing a bike helmet are lowest among adolescents 14 and younger, and significantly higher among adolescents 18 and older. That is, adolescent bicycle riders who are 14 and younger are the most likely age group to wear helmets and adolescents who are 18 and older are the least likely age group to wear helmets.

Figure 64: Bicycle Helmet Use among Alaska Adolescents by Region



Source: Alaska Local YRBS, 2017

- Reports of helmet use among adolescent bicycle riders differ significantly by region of residence.

- Adolescent bicycle riders living in the Southwest and Northern regions are significantly less likely than adolescents in all other regions to wear a bicycle helmet. Nearly 90% of adolescents living in both regions indicate they never wore a helmet when riding a bike in the past 12 months.

- Adolescent bicycle riders living in Anchorage and the Southeast region are least likely to report they never wore a helmet while riding a bike in the past 12 months; that is, adolescent bicycle riders in these areas of the state are more likely to wear a helmet. However, over 40% of adolescent bicycle riders in these regions still report they never wear helmets.

- It is worth noting that there is no statewide law in Alaska requiring the use of bicycle helmets. A select few cities—namely, Anchorage, Bethel, Juneau, Kenai, and Sitka—legally require adolescent riders under certain ages to wear bicycle helmets.[56,57] Four of the five cities that have helmet laws are in regions where the data suggest adolescents

[56] Bicycle Helmet Laws. Helmets.org website: https://helmets.org/mandator.htm. Retrieved June 25, 2018.
[57] Bicycle Safety. Municipality of Anchorage Police Department website: https://www.muni.org/Departments/police/ComAffairs/Pages/BicycleSafety.aspx. Retrieved June 24, 2018.

are more likely to wear helmets (i.e., Anchorage/Anchorage, Juneau/Southeast region, Kenai/Gulf Coast region, and Sitka/Southeast region).

V. Data Sources

Alaska Trauma Registry (ATR)

The ATR collects information on the most seriously injured patients in Alaska and the medical care they receive. Since 1991, the ATR has collected records from all 24 acute care hospitals in the state (22 civilian and 2 Department of Defense). Patients are included in the registry if contact with the acute care facility occurs within 30 days of the injury and they are admitted to an Alaska hospital, held for observation, transferred to another acute care facility, declared dead in the emergency department, or left against medical advice after being admitted to the hospital. Injuries included in the registry are related to falls, crashes, burns, adult and child maltreatment, poisoning, suffocation, the effects of reduced temperatures, and other traumatic injuries. In addition to injury and treatment-related data, the ATR collects information about patient demographics, patient transport to the care facility (e.g., by ambulance), and patient outcomes. Data are abstracted from medical records by trained staff at each medical facility. The ATR only includes patients that meet specific criteria and does not contain health records of seriously injured patients who are not admitted to the hospital. Hospital admission data can be found in the Health Facilities Data Reporting (HFDR) Program, described elsewhere.[58] See http://dhss.alaska.gov/dph/Emergency/Pages/trauma/registry.aspx for more information about the ATR.

Alaska Vital Statistics

Alaska Vital Statistics data are maintained by the Alaska Health Analytics and Vital Records Section (HAVRS). Data include all vital events that occur in Alaska (i.e., births, deaths, marriages, divorce, fetal death, Induced Termination of Pregnancy, and the Medical Marijuana Registry). Records of vital events date from the 1800s to present day with varying levels of detail. See http://dhss.alaska.gov/dph/VitalStats/Pages/default.aspx for more information.

Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is an anonymous telephone survey conducted by the Alaska Division of Public Health in cooperation with the Centers for Disease Control (CDC). It aims to estimate the prevalence of behavioral risk factors in the general population that are associated with leading causes of morbidity and mortality in adults. The BRFSS has operated continuously in Alaska since 1991.

[58] A description of HFDR is available in the Alaska Department of Health and Social Services' Data Dictionary: http://dhss.alaska.gov/dph/Epi/injury/Documents/sa/ADPH_Data_Dictionary_2018.pdf

Alaska conducts two BRFSS surveys: the Standard BRFSS and a separately funded Supplemental BRFSS. Both surveys are administered throughout the year, with separate samples drawn using the same methodology. In 2016, approximately 615 Alaska adults were interviewed each month for the two BRFSS surveys combined. The 2016 sample includes 2,369 respondents reached by cell phone and 5,012 respondents reached by their residential landline phone.

Selection of BRFSS Survey Participants

The BRFSS uses a probability (or random) sample in which all Alaska households with landline telephones have a known, nonzero chance of selection. Respondents are randomly selected from among the adult members of each household reached through a series of telephone calls. Those living in institutional housing (i.e., nursing homes and barracks) are not surveyed. The sample is stratified into geographic regions, with roughly equal numbers of interviews conducted in each region. This method deliberately oversamples rural areas of the state. The sample was stratified into six geographic regions beginning in 2011—Anchorage, Mat-Su, Gulf Coast, Southeast, Fairbanks North Star, and Rural. Where possible, the rural region is divided into two regions: Southwest and Northern/Interior.

In addition, the sampling frame has been expanded to include cell phones as well as landline or household phones. This step was important because the proportion of households served only by cell phones has increased rapidly.

Interviews are conducted by trained interviewers during weekdays, evenings, and weekends throughout the year. In addition to injury prevention and related risk factors, the BRFSS questionnaire covers such topics as general health status, health care access, tobacco use, diabetes, alcohol use, women's health, obesity, and HIV/AIDS awareness. There are also questions on the demographic characteristics of respondents.

Data Weighting and Methods

BRFSS data are weighted to adjust the distribution of the sample data so that it reflects the total population of the sampled area, and to compensate for the over-representation or under-representation of persons in various subgroups.

Changes in both the weighting and sampling methods are reflected in the estimates reported in this document. These changes help ensure that the BRFSS can continue to be a valuable source of information for health planning and improvement. The first change is a new weighting method known as iterative proportional fitting, or raking. Raking allows for the inclusion of several key demographic factors in adjusting survey data to the adult population totals. To

provide additional context for interpretation about changes in prevalence estimates over time, raking was applied to data from 2007 forward, and therefore the estimates listed for 2007 through 2010 may be slightly different from estimates reported in earlier publications.

As noted above, starting in 2011 survey participants include people who only have cell phones in addition to those who have a traditional landline phone. Therefore, data from 2011 forward reflects the population of Alaska adults who only have a cell phone as well as those who only have a landline and those who have both. More information about the changes in BRFSS methods can be found in the January 2013 issue of Chronicles: http://dhss.alaska.gov/dph/Chronic/Documents/Publications/assets/ChroniclesV5-1.pdf.

Both the Standard and Supplemental BRFSS are weighted separately for analysis of items that occur only in one version. In addition, a combined dataset (Standard plus Supplemental) is created and weighted for analysis of questions that occur in both versions. In recent years, the combined sample has included more respondents (about 6,100 in 2011), and between 8,000 and 9,000 each year from 2012 to 2016, but prior years included fewer respondents. Between 1996 and 2003 annual sample size ranged from about 1,500 to 2,900 respondents, and from 2004 to 2010, the annual combined sample size averaged about 4,750 respondents. The larger sample sizes allow for more precision in the estimates for fall-related injury among older adults and the estimates of risk for transportation-related injury (e.g., drunk driving and seat belt use).

Reporting by Socioeconomic Status (SES)

Household percent of Federal Poverty Guideline (PGL, as calculated by income and number of people in the household) and education are identified as indicators of socioeconomic status (SES) in the BRFSS data. Formal education status is categorized in four groups—less than high school, high school degree or GED, some college (or less than 4-year program degree) and 4-year college degree or higher.

The poverty guidelines, issued each year in the Federal Register by the Department of Health and Human Services (HHS), are a simplified version of the federal poverty thresholds and are used for administrative purposes — for instance, determining financial eligibility for certain federal programs.[59] The Alaska-specific guideline totals were used to create a cut-point of household incomes at or below the 185% poverty guideline[60] for this report, because this

[59] More information about the poverty guideline can be found here: https://aspe.hhs.gov/poverty-guidelines
[60] For example, in 2018 a family of three in Alaska with a household income of $48,063 would be at 185% of the HHS poverty guideline.

percent corresponds with eligibility criteria for some parts of Medicaid and other public assistance programs.

There are limitations in using income or percent of poverty guideline in the BRFSS. Income information is reported in range categories in the BRFSS, and therefore the correspondence to categories for the percent of poverty guideline is approximate. In 2016, the dollar amounts for 185% poverty level guideline is higher than the income levels BRFSS asks about for households of 6 or more people. Because the highest income category asked is $75,000 or more, we use $85,000 as the estimated income for households of 6 or 7 people who reported incomes of $75,000 or more. We set records to missing for households with 8 or more people and reported income of $75,000 or more. In addition, household income is often missing, as many respondents either decline to respond or report that they do not know their household income level. In 2016, about 6% of Alaska Standard BRFSS respondents were missing information about income and about 4% reported that they did not know. We were unable to calculate household percent of poverty guideline for respondents with missing information about income.

Childhood Understanding Behaviors Survey (CUBS)

Alaska CUBS is a program designed to find out more about the health and early childhood experiences of young children in Alaska. CUBS collects information by conducting a follow-up survey to the Alaska Pregnancy Risk Assessment Monitoring System (PRAMS). PRAMS sends a survey to approximately one of every 6 mothers of newborns in Alaska, and CUBS sends a follow-up survey three years later to all mothers who completed PRAMS and are still living in Alaska. CUBS asks questions about both the mother and her child. About 90 Alaskan mothers are sent a CUBS survey every month.

The purpose of CUBS is to provide information on health conditions, health care utilization, child development and other health related behaviors of young children and to evaluate the association between prenatal and immediate postnatal factors with early childhood health and welfare. Survey responses are weighted so that reported prevalence accurately describes all mothers of 3-year old children born in Alaska in a single calendar year. Both the CUBS and PRAMS data (described below) can be presented regionally, using the same public health regions shown in Figure 1. For more information about CUBS questionnaires and methodology, see http://dhss.alaska.gov/dph/wcfh/Pages/mchepi/cubs/default.aspx.

Pregnancy Risk Assessment Monitoring System (PRAMS)

PRAMS is a population-based survey of Alaska women who have recently delivered a live-born infant. Administered since 1990 by the Alaska Division of Public Health, PRAMS is conducted in

collaboration with the CDC in 47 states to gather information on the health risk behaviors and circumstances of pregnant and postpartum women. A systematic stratified sample is drawn each month from the state's live birth records for infants between 2 and 6 months of age. Sampled mothers receive a series of mailed questionnaires, and since 1997 telephone follow-up has been initiated among those who do not respond to the third mailed request. The PRAMS questionnaire addresses such topics as access to prenatal care, maternal use of alcohol, maternal tobacco use, maternal stress, infant sleep environment, health care provider counseling, and intimate partner violence. Survey responses are weighted so that reported prevalence estimates accurately describe Alaska women delivering a live-born infant during the year of the survey. For more information about PRAMS, see http://dhss.alaska.gov/dph/wcfh/Pages/mchepi/prams/default.aspx.

Youth Risk Behavior Survey (YRBS)

The YRBS is a systematic survey of high school students that assesses behaviors related to the leading causes of mortality, morbidity and social problems among adolescents. The Centers for Disease Control and Prevention sponsors national and state surveys every 2 years, most recently in 2017. Data are currently available through 2017.

Selection of YRBS Survey Participants

The statewide Alaska YRBS is conducted using a two-stage sampling design. Schools are selected first with a probability of inclusion proportional to the size of their enrollment. Once a school is chosen, classes are selected, with each student having an equal opportunity for inclusion. From 2001 through 2017, active parental consent was required for each student participating in the YRBS. On the appointed survey day students completed written questionnaires without any identifying information and returned them in class in unmarked, sealed envelopes.

In addition to the statewide survey, all Alaska school districts have the opportunity to conduct a local survey, which employs the same questionnaire and data analysis methods as the statewide survey. If a district conducts a local survey and one of its classrooms was selected for the statewide survey, additional classrooms will be surveyed as part of the local survey. Districts that conduct a local survey and obtain at least 100 responses receive a district level report based on results of all classrooms surveyed.

Data Weighting and Methods

In a typical YRBS administration, about 1,300 to 1,400 students are surveyed from about 40 to 45 high schools that are scientifically selected to represent all public high schools (excluding boarding schools, alternative schools, correspondence and home study schools, and correctional schools) in Alaska. In spring 2017, 1,332 students from 40 high schools completed the survey. These results are considered to be representative of Alaska's more than 30,000 high school students in grades 9-12 in traditional public high schools. Data are weighted to reflect the true distribution of Alaska high school students by sex within grade level and race-ethnicity, but not by region of the state, since the CDC's sampling method for YRBS does not stratify by region.

Alaska first conducted a statewide YRBS in 1995. Although Alaska participation rates met CDC standards in 1999, this sample did not include Anchorage schools and so the 1999 YRBS data are generally not included in multi-year analyses. To assure statistical validity for weighting, the CDC requires a response rate of at least 60% for the statewide survey. In addition to the 1995 survey, Alaska achieved a representative sample on the statewide survey in 2003, and 2007 through 2017.

School-based surveys do not estimate risk behaviors associated with adolescents who drop out of school or do not attend school. However, for the first time in 2009, about 1,000 students from 15 alternative high schools in Alaska were surveyed to evaluate and address the health risks of this unique population. This process was repeated in subsequent surveys in 2011, 2013, 2015 and 2017. High school-age adolescents in correctional institutions have also been surveyed since 2009. Further information about the Alaska YRBS surveys and health information from those surveys is available at http://dhss.alaska.gov/dph/Chronic/Pages/yrbs/yrbsresults.aspx.

All statewide and regional prevalence estimates derived from YRBS data include only Alaska students in traditional public high schools.

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