

Burden of Chronic Disease and Unintentional Injury in Montana

Chronic diseases, such as cardiovascular disease, cancer, and diabetes, are among the most important public health concerns in the United States. Chronic diseases account for seven out of the ten leading causes of death across the country.¹ Furthermore, over 75% of total health care costs in the U.S. are due to chronic diseases.¹ Montanans have not fared any better than the rest of country. Fifty eight percent of Montana adults have at least one chronic condition and 33% have two or more. Hypertension and high cholesterol are the most common high risk conditions and arthritis is the most common chronic disease in Montana. While cancer, cardiovascular diseases, and diabetes are not as prevalent as arthritis these diseases account for a majority of chronic disease hospitalizations and deaths.

Unintentional injuries are also a major cause of morbidity and mortality across the United States. They are the fifth leading cause of death among all Americans and the leading cause of death for people ages 1 to 44 years.² Moreover, for every injury death there are approximately 163 more people seen in an emergency department for an injury and 16 more admitted to a hospital.³ Unfortunately, Montanans are even more affected by injury than the rest of the nation. Unintentional injury death rates are much higher in Montana (age-adjusted rate of 61 deaths per 100,000 residents) compared to the total U.S. (37 deaths per 100,000 residents) and the gap between Montana and the U.S. has been widening in recent years.

Together chronic diseases and unintentional injuries account for a significant proportion of Montana's health care burden and deaths.

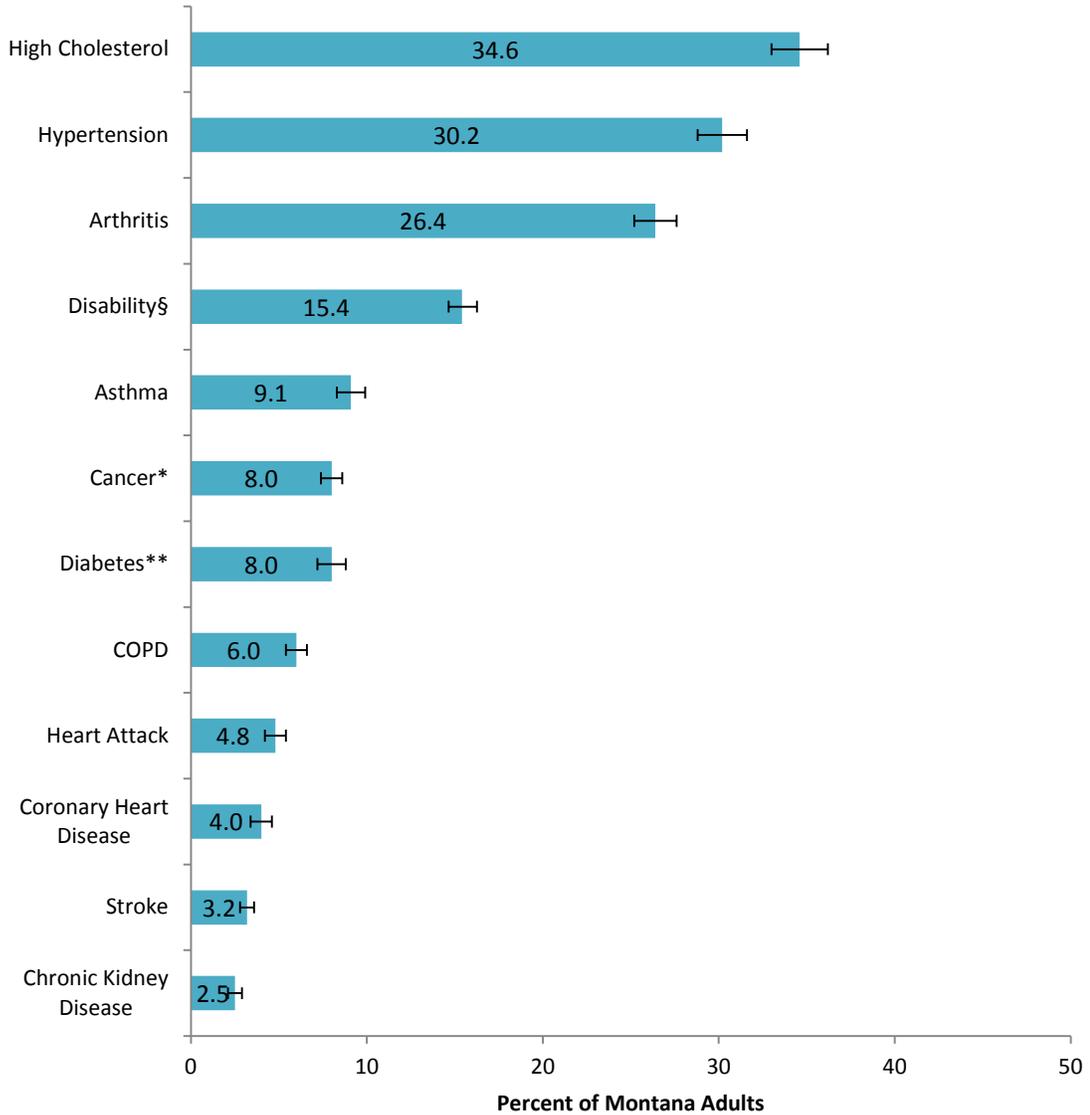
Chronic Disease Prevalence

Disease prevalence data is collected by the Behavioral Risk Factor Surveillance System (BRFSS), a random digit dialing telephone survey of Montana's non-institutionalized adult population.⁴ Selected adults are interviewed and asked to report on various behavioral risk factors as well as diagnosis of 11 chronic diseases. These data are weighted to be generalizable to the total adult population. Disability information is collected by the American Community Survey, a survey conducted by the US Census Bureau that collects detailed information on housing and population characteristics across the country.⁵

- During 2011, 58% (95% CI: 56.2%-59.1%) of Montana adults reported having at least one and 33% (95% CI: 32.1%-34.7%) reported having at least two of the following diseases or related risk factors:
 - Stroke
 - Heart attack
 - Coronary heart disease
 - Diabetes
 - Chronic Obstructive Pulmonary Disease (COPD)
 - Chronic kidney disease
 - Asthma
 - Cancer (excluding skin cancer)

- Arthritis
- Hypertension
- High cholesterol

Figure 1. Prevalence of Selected Chronic Diseases, Chronic Disease Risk Factors, and Disability, BRFSS, Montana, 2011



§ Data source: American Community Survey 2010 1-year estimates

* Excludes diagnosis of skin cancer

** Excludes women who were only diagnosed with gestational diabetes

- Among Montana adults that have ever had their blood cholesterol checked, more than one third (35%) have been told by a health care provider that their cholesterol was high (Figure1).
- Hypertension is also quite common, affecting 30% of Montana adults.
- Arthritis is the most common chronic disease, with 26% of Montana adults reporting being diagnosed with some form of arthritis.
- 9% of Montana adults have asthma and 6% of adults report having Chronic Obstructive Pulmonary Disease (COPD).

- 7% (95% CI: 5.4%-8.2%) of Montana children have asthma (data not shown).
- 8% of Montana adults report ever being diagnosed with cancer.
- 8% of Montana adults report having diabetes.
- Cardiovascular diseases (heart attack, stroke, and coronary heart disease) were among the least prevalent chronic diseases effecting 5%, 4% and 3% of Montana adults, respectively.
- 15% of Montana adults report having a disability, defined as having serious difficulty in at least one of the following areas:
 - Hearing
 - Vision
 - Cognition
 - Walking or climbing stairs
 - Self-care
 - Independent living

Cancer Incidence

Cancer incidence data are collected by the Montana Central Tumor Registry. Montana statute mandates that cancers diagnosed or treated in Montana be reported to the registry. The registry also collects data on Montana residents who are diagnosed or treated in other states. Site specific incidence rates include only invasive cancers and are calculated as an average over five years to account for random variation in rates over time. The incidence rate for all sites combined is reported as an annual rate as well as a five year aggregate rate. All cancer incidence rates are age-adjusted to the 2000 standard million population because cancer is highly associated with age.

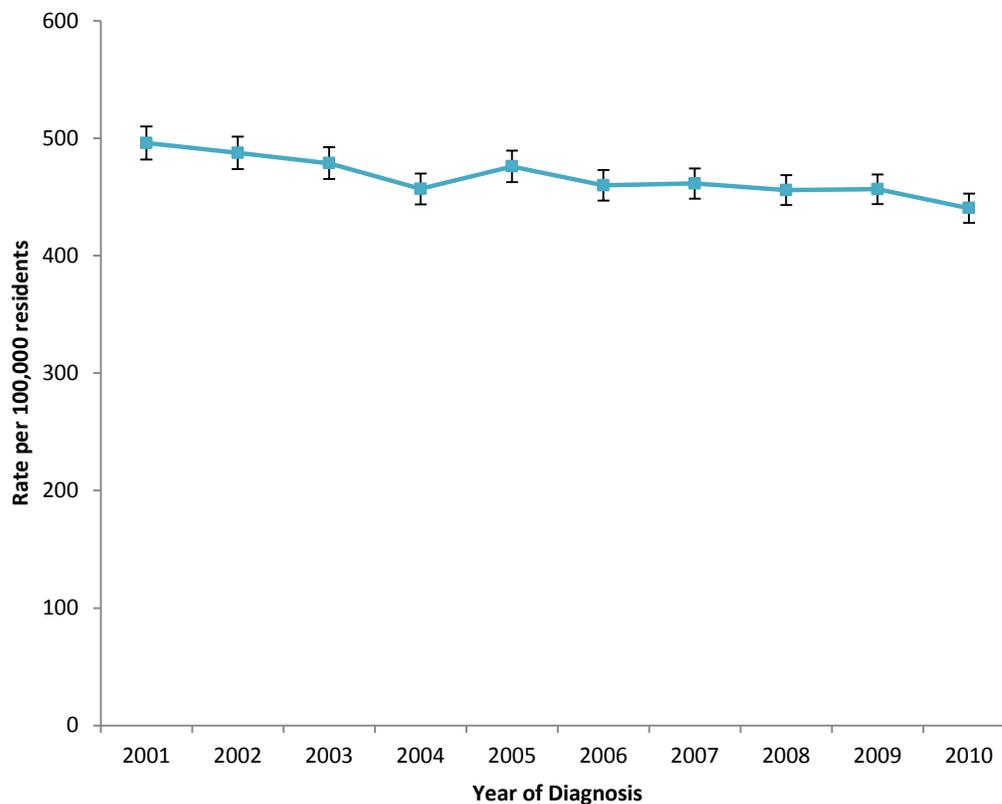
- Approximately 5,000 Montana residents are newly diagnosed with invasive cancer each year (data not shown).
- The most common cancer sites are prostate, breast (female), lung and bronchus, and colon and rectum (Table 1).

Table 1: Age-Adjusted Cancer Incidence by Site, Montana, 2006-2010

	Rate per 100,000 residents	95% CI	
All Sites Combined	452.6	446.9	458.2
Prostate	157.7	153.0	162.5
Breast (female)	124.5	120.3	128.6
Lung and Bronchus	61.7	59.6	63.8
Colon and Rectum	44.7	43.0	46.5

All-site cancer incidence rates in Montana have decreased significantly in the past ten years, going from an age adjusted rate of 496 new cases per 100,000 residents in 2001 to 441 new cases per 100,000 residents in 2010 (Figure 2).

Figure 2. Age-Adjusted All Site Cancer Incidence,[§] Montana, 2001-2010



[§] Data Source: Montana Central Tumor Registry

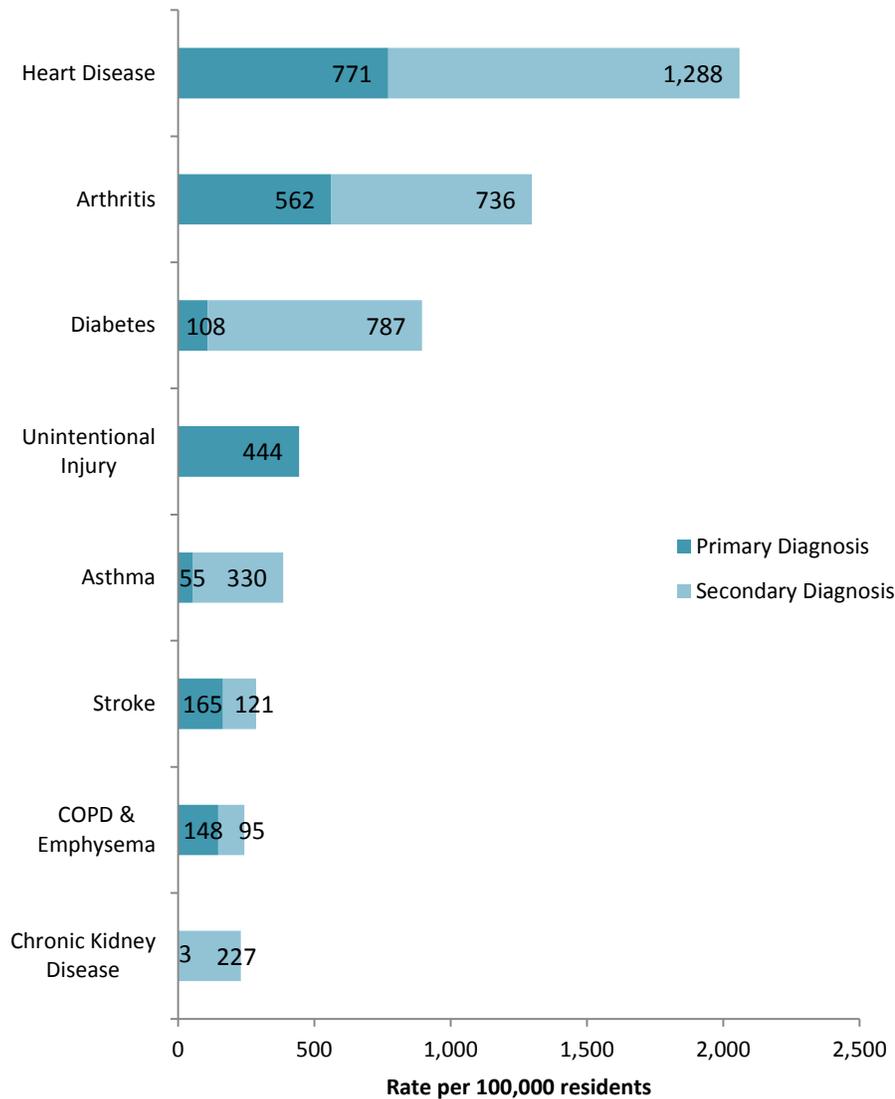
Hospitalization Rates

Hospitalization data are collected by the Montana Hospital Discharge Data System (MHDDS). The majority of Montana hospitals submit de-identified billing data on a voluntary basis to the Montana Hospital Association (MHA); the MHA then shares the aggregate data with MHDDS. Billing information includes ICD-9 codes for both the primary diagnosis, which is the main reason for admission, and up to eight secondary diagnoses, which are conditions that have contributed to the overall hospitalization but were not the most immediate or severe reason for admission. MHDDS data may include multiple hospitalizations for a single person in any given year. Hospitalization rates are calculated as hospitalizations per 100,000 Montana residents.

- Among chronic diseases, heart disease, arthritis, and diabetes accounted for the most hospitalizations during 2010 (Figure 3).
- 444 hospitalizations for every 100,000 Montanans were primarily due to an unintentional injury.
- Asthma was the primary reason for 55 hospitalizations for every 100,000 Montanans and a contributing factor for the hospitalizations of an additional 330 per 100,000 Montanans.

- Hospitalization rates for stroke, COPD and emphysema, and chronic kidney disease were lower and each accounted for less than 300 hospitalizations for every 100,000 Montanans.

Figure 3. Rate of Hospitalizations with any Diagnosis of Selected Chronic Diseases and Injury,[§] Montana, 2010



[§] Data Source: Montana Hospital Discharge Data System

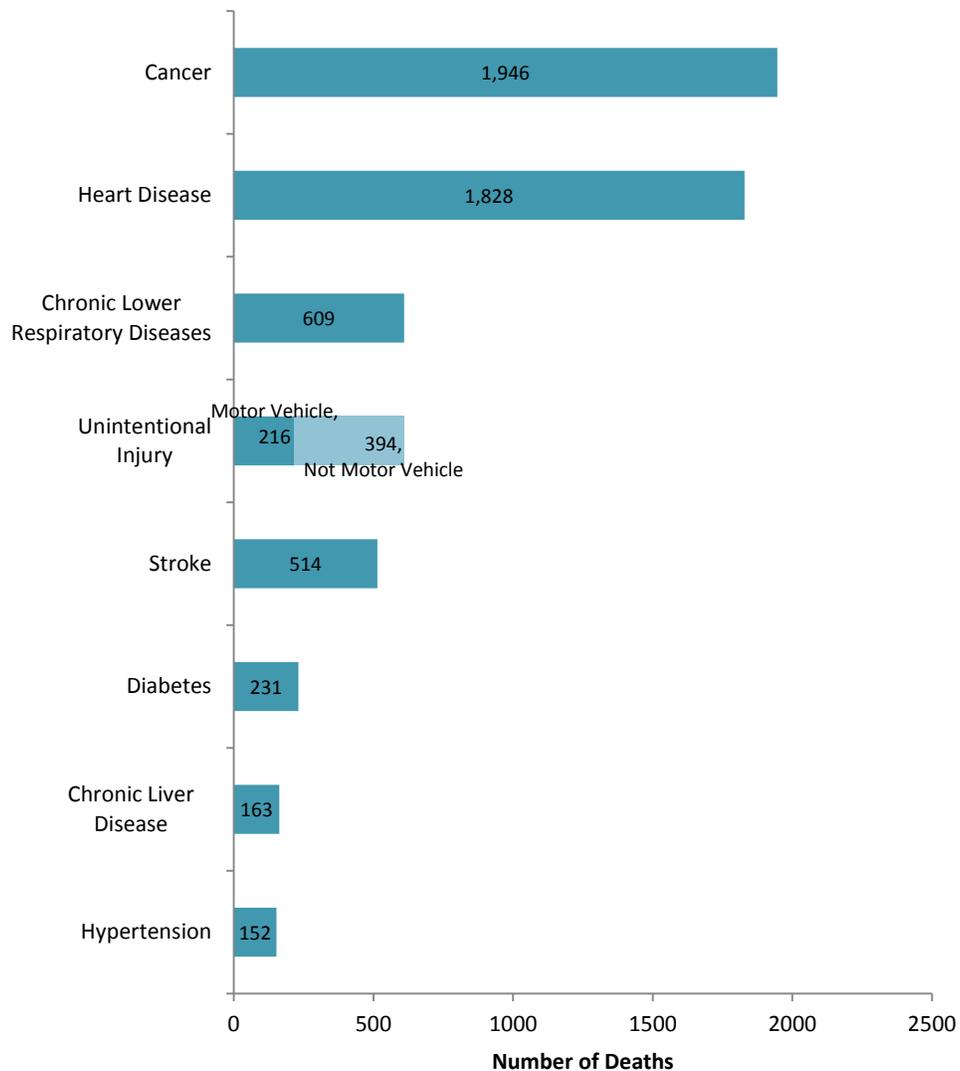
Mortality Rates

Mortality data are collected by the Montana Office of Vital Statistics. The numbers of deaths from selected causes among Montana residents are presented as a measure of the most frequent causes of death. The total years of potential life lost (YPLL) is also presented as a measure of which causes are responsible for the most premature deaths. Age-adjusted death rates were calculated using the 2000

standard million population in order to compare the rates of death due to unintentional injury among Montanans to the entire nation and over time.

- During 2010, cancer was the leading cause of death among Montanans, causing almost 2,000 deaths.
- Heart disease caused nearly as many deaths as cancer in 2010.
- Chronic lower respiratory diseases, including COPD, asthma, and emphysema, caused more than 600 deaths among Montana residents during 2010.
- Unintentional injuries also caused more than 600 deaths among Montanans and over a third of those deaths were associated with motor vehicle crashes.

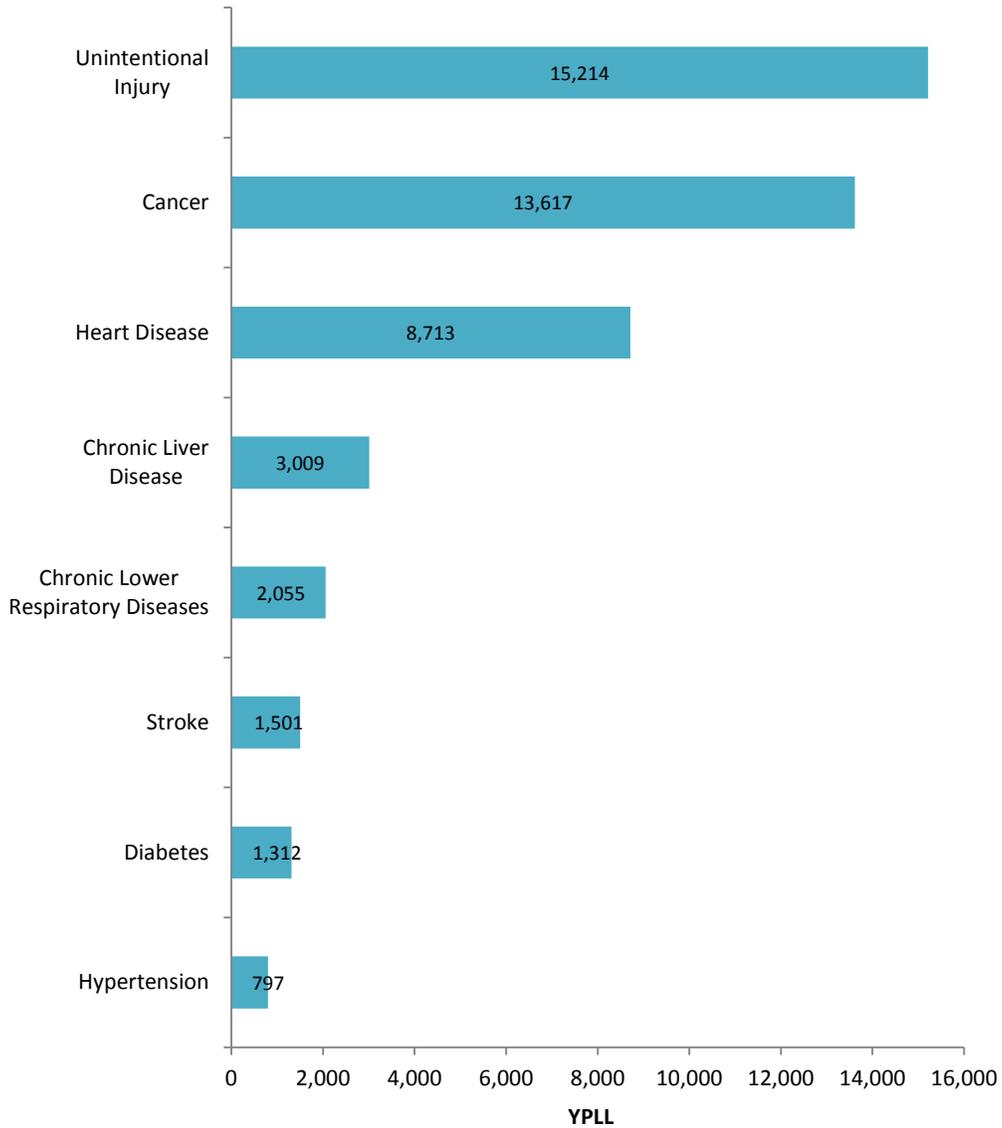
Figure 4. Number of Deaths due to Selected Chronic Conditions and Injury,[§] Montana Residents, 2010



[§] Data Source: Montana Office of Vital Statistics

- Unintentional injuries caused the greatest loss of years of potential life. In 2010, over 15,000 years of Montanans' lives were lost due to unintentional injury (Figure 5).
- Cancer, heart disease, and chronic liver disease were the next largest causes of lost years.

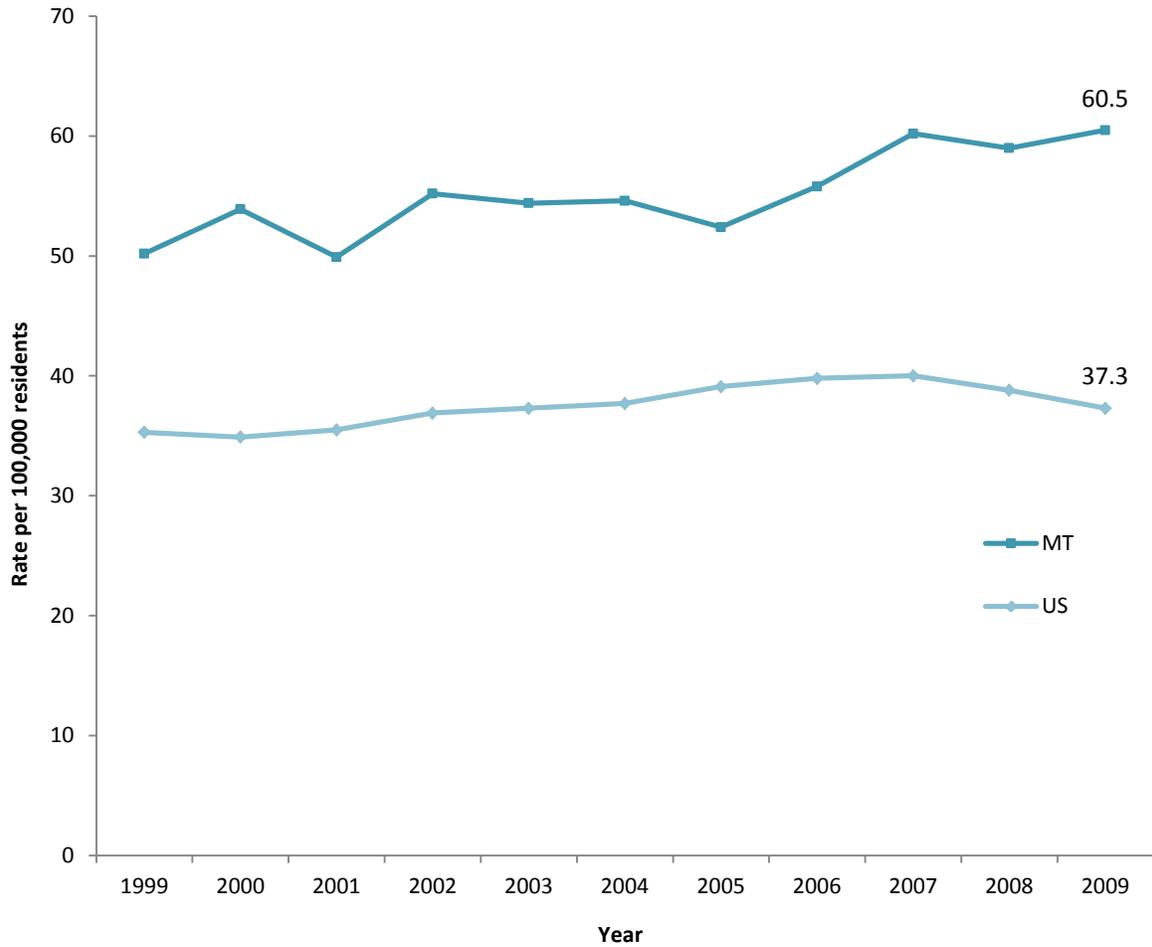
Figure 5. Years of Potential Life Lost (YPLL) due to Selected Chronic Conditions and Injury,[§] Montana Residents, 2010



[§] Data Source: Montana Office of Vital Statistics

- In 2009, the unintentional injury death rate in Montana was over 60% higher than the national unintentional injury death rate (Figure 6).
- Unintentional death rates in Montana have been rising in recent years.

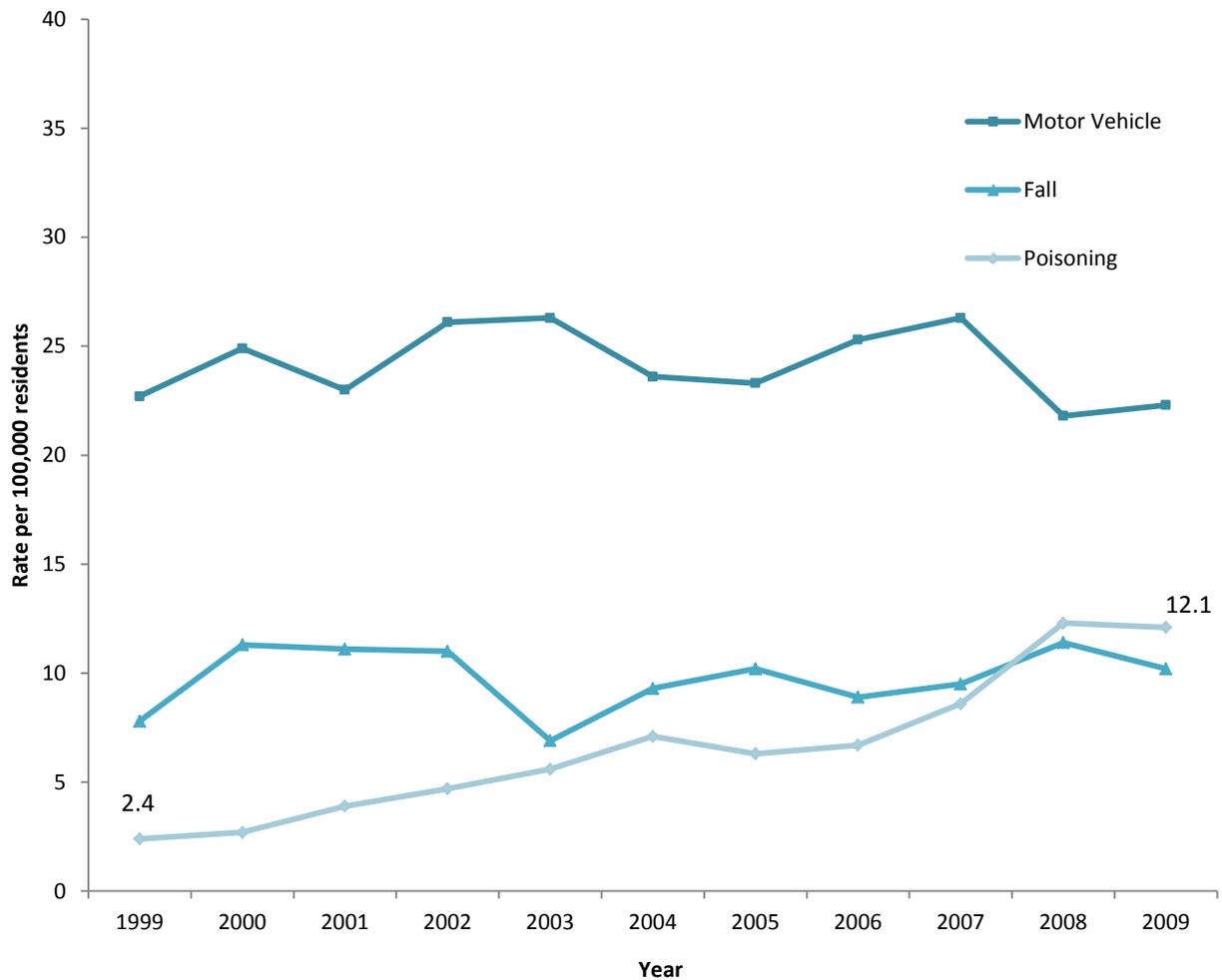
Figure 6. Age-Adjusted Unintentional Injury Death Rates,[§] U.S. & Montana, 1999 -2009



[§] Data Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2009 on CDC WONDER Online Database, released 2012.

- The three most common mechanisms for unintentional injury deaths in Montana are motor vehicle crashes, falls, and poisonings (Figure 7).
- The rates of death due to motor vehicle crashes (ranging from 22 to 26 deaths per 100,000 residents) and falls (ranging from 7 to 11 deaths per 100,000 residents) have not changed significantly since 1999.
- Poisoning death rates have risen substantially in the past ten years. The rate in 2009, 12.1 deaths per 100,000 residents, was almost 6 times higher than the rate in 1999, 2.4 deaths per 100,000 residents.

Figure 7. Age-Adjusted Unintentional Injury Death Rates by Mechanism,[§] Montana, 1999-2009



[§] Data Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2009 on CDC WONDER Online Database, released 2012.

Behavioral Risk Factors for Chronic Disease and Unintentional Injury

Chronic diseases and injuries are largely preventable. Relatively few behavioral risk factors (tobacco use, excessive alcohol use, lack of physical activity, overweight and obesity, lack of seat belt use, and impaired driving) are responsible for the majority of the illness, disability, and death related to chronic disease and injury.

Table 2. Matrix of leading behavioral risk factors and the health conditions they are associated with.

	Tobacco Use	Excessive Alcohol Use	Insufficient Physical Activity	Overweight or Obesity
Cardiovascular Disease*	X	X	X	X
High Cholesterol			X	X
Diabetes			X	X
Cancer	X	X	X	X
COPD, Emphysema	X			
Asthma	X			X
Arthritis			X	X
Unintentional Injury		X		

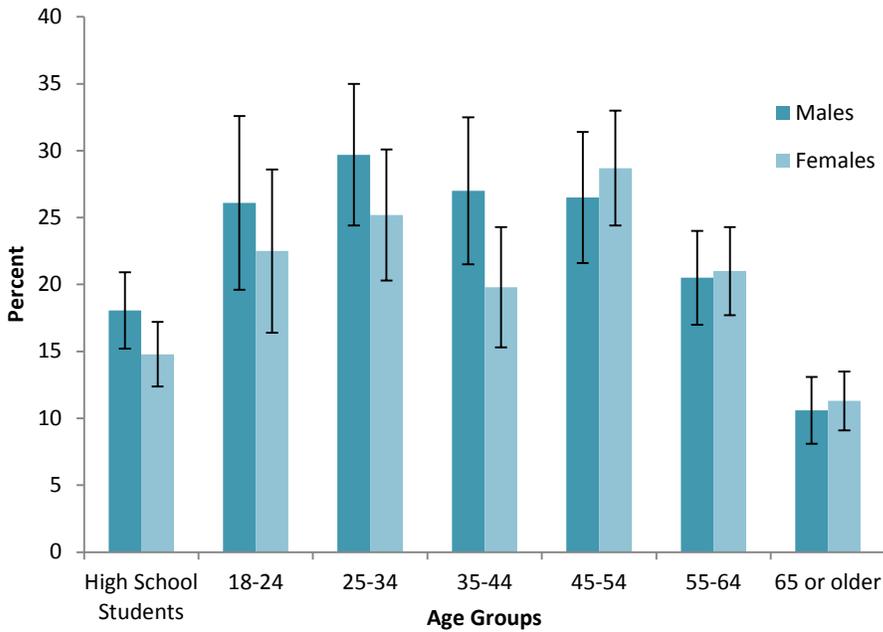
*Cardiovascular diseases include coronary heart disease, heart attack, stroke, and hypertension

Behavioral risk factor data for adults is collected by the Behavioral Risk Factor Surveillance System (BRFSS), a random digit dialing telephone survey of Montana’s non-institutionalized adult population.⁴ Selected adults are interviewed about various behavioral risk factors. The Youth Risk Behavior Survey (YRBS) collects behavioral risk factor data from high school students.⁶ Every odd year, a random sample of Montana high schools is selected for participation in YRBS. For those schools, a sample of students from all grade levels is selected to complete the survey during class time. Data from BRFSS and YRBS are weighted to be generalizable to the total adult and high school populations, respectively.

Tobacco Use

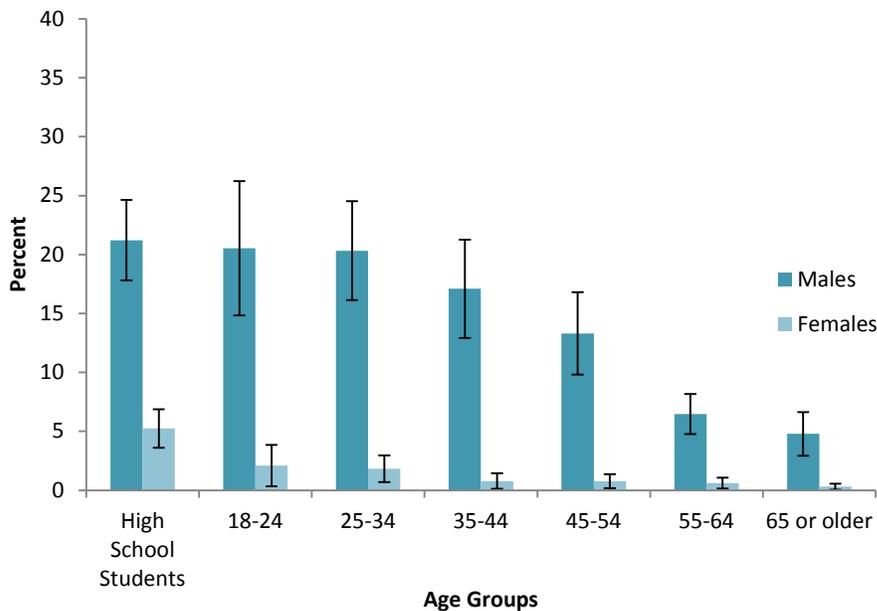
Tobacco use greatly increases the risk of cardiovascular disease, cancer, and respiratory disease.⁷ Tobacco use is the leading cause of preventable deaths in the United States. Each year, approximately 443,000 Americans die prematurely due to smoking or exposure to secondhand smoke.⁸ Another 8.6 million Americans live with a serious illness caused by tobacco use.⁸ In Montana, an estimated 1,400 deaths are due to tobacco use every year.⁹

Figure 8. Prevalence of Current Smoking by Age and Sex, BRFSS and YRBS, Montana, 2011



- Cigarette smoking is common among Montana high school students with 18% of male students and 15% of female students reporting smoking at least one cigarette in the past 30 days (Figure 8).
- Smoking prevalence is also common among adults aged 18 to 54 years. However, significantly fewer adults aged 65 years or older reported current smoking.

Figure 9. Prevalence of Current Smokeless Tobacco Use by Age and Sex, BRFSS and YRBS, Montana, 2011



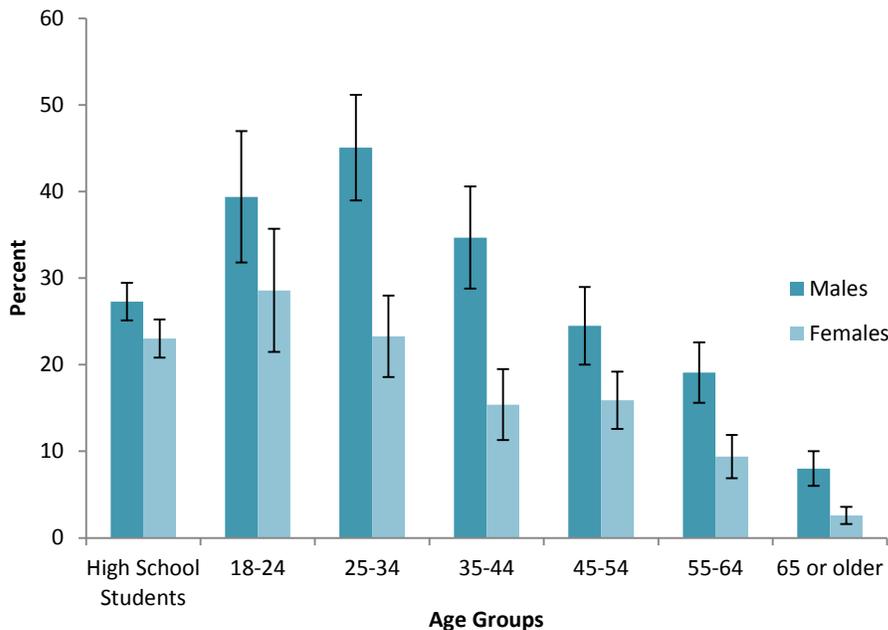
- Smokeless tobacco use is far more common in males of all ages compared to females (Figure 9).

- 5% of high school girls reported smokeless tobacco use in the past 30 days, significantly more than women aged 25 years or older.
- More than 20% of male high school students and men aged 18 to 34 years reported currently using smokeless tobacco.

Excessive Alcohol Use

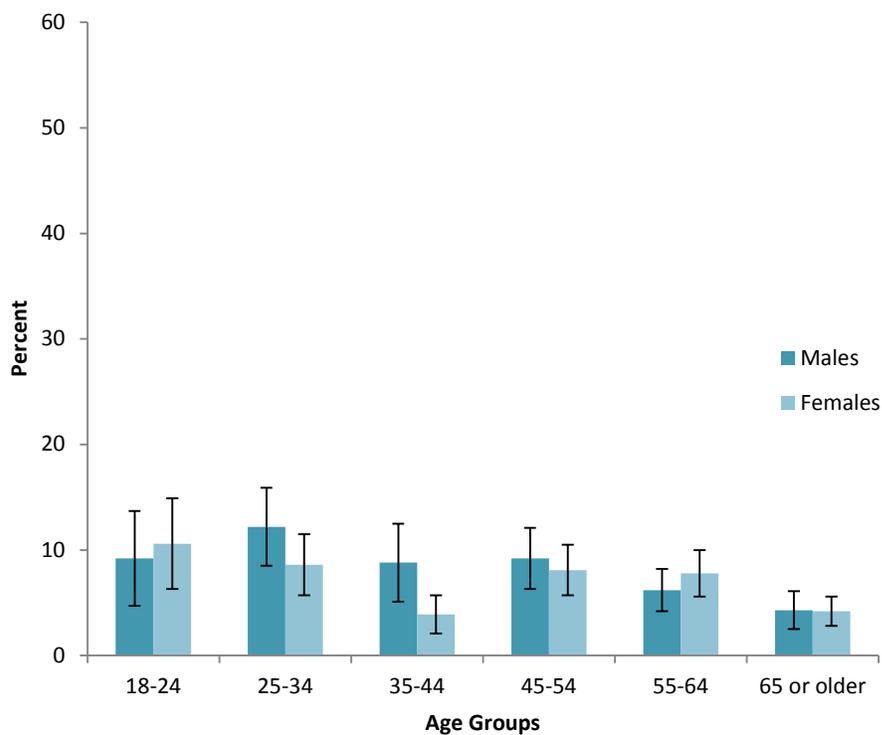
Excessive alcohol use includes heavy drinking, binge drinking, or both. For women, binge drinking is defined as having four or more drinks during a single occasion and heavy drinking is having more than one drink per day on average.¹⁰ For men, binge drinking is defined as having five or more drinks during a single occasion and heavy drinking is having more than two drinks per day on average.¹⁰ Any alcohol use among youth is problematic. However, since underage drinkers primarily binge drink this is the only measure of alcohol use among high school students assessed here. For high school students, binge drinking is defined as five or more drinks during a single occasion regardless of gender.¹¹ Binge drinking is a major risk factor for unintentional injuries including motor vehicle crashes, falls, drowning, burns, and unintentional firearm injuries.¹⁰ Long-term excessive alcohol use contributes to the development of cardiovascular disease, cancer, and liver disease.¹⁰ Approximately 79,000 deaths are attributable to excessive alcohol use each year in the U.S.¹⁰

Figure 10. Prevalence of Binge Drinking in the Past 30 Days by Age and Sex, BRFSS and YRBS, Montana, 2011



- Significantly more Montana males reported binge drinking in the past 30 days compared to females in all age groups except adults aged 18 to 24 years (Figure 10).
- Youth and adults aged 18 to 34 years reported binge drinking more frequently than adults aged 45 years or older.

Figure 11. Prevalence of Heavy Alcohol Use in the Past 30 Days by Age and Sex, BRFSS, Montana, 2011

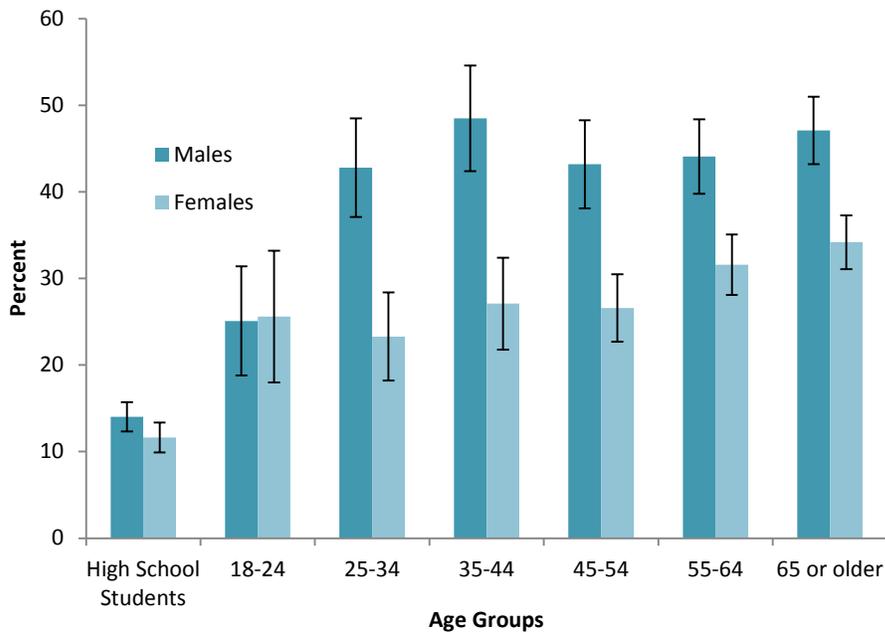


- About 8% of Montana adults aged 18 to 64 years reported heavy drinking in 2011 (Figure 11).
- There was little variation in the rate of heavy drinking by age and sex. Only men and women ages 65 years and older reported heavy drinking significantly less often than younger adults.

Overweight and Obesity

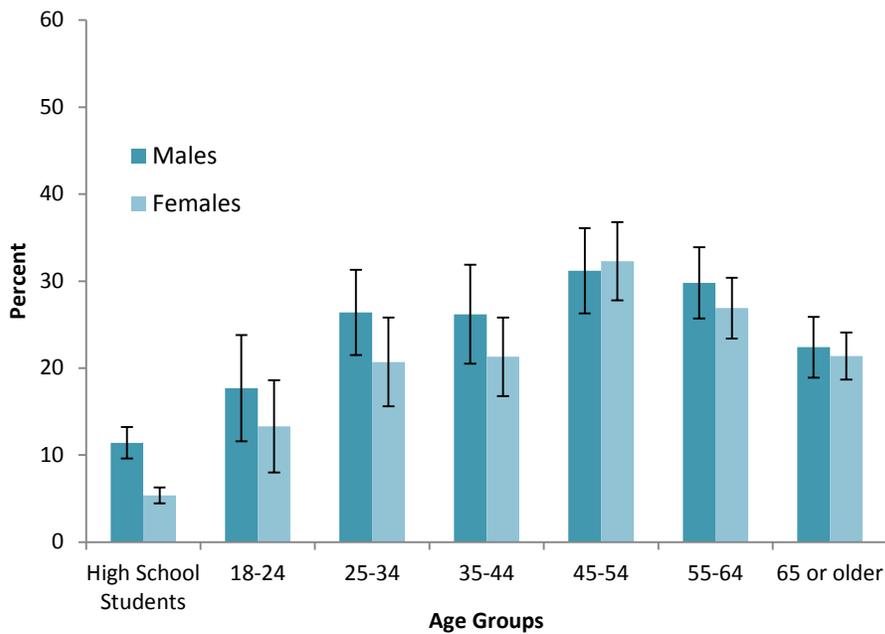
Being overweight (BMI between 25.0 and 29.9) or obese (BMI of 30.0 or more) increases the risk of developing cardiovascular disease, type 2 diabetes, cancer, hypertension, high cholesterol, liver and gallbladder diseases, and osteoarthritis.¹² In 2008, the total cost of medical care due to obesity in the United States was about \$147 billion.¹³ More than one-third of U.S. adults (36%) are obese.¹² Although Montana adults have significantly lower rates of obesity (24% of all Montana adults) compared to the total United States, unhealthy weight is still quite common.¹⁴

Figure 12. Prevalence of Overweight by Age and Sex, BRFSS and YRBS, Montana, 2011



- 14% of high school boys and 12% of high school girls were overweight in 2011 (Figure 12).
- Men ages 25 years or older had significantly higher prevalence of overweight compared to females in the same age groups. More than 40% of men compared to more than 20% of women were overweight.

Figure 13. Prevalence of Obesity by Age and Sex, BRFSS and YRBS, Montana, 2011



- 11% of high school boys were obese, significantly more than the 5% among high school girls (Figure 13).

- Montana adults aged 45 to 54 years had the highest prevalence of obesity (31% of both men and women).

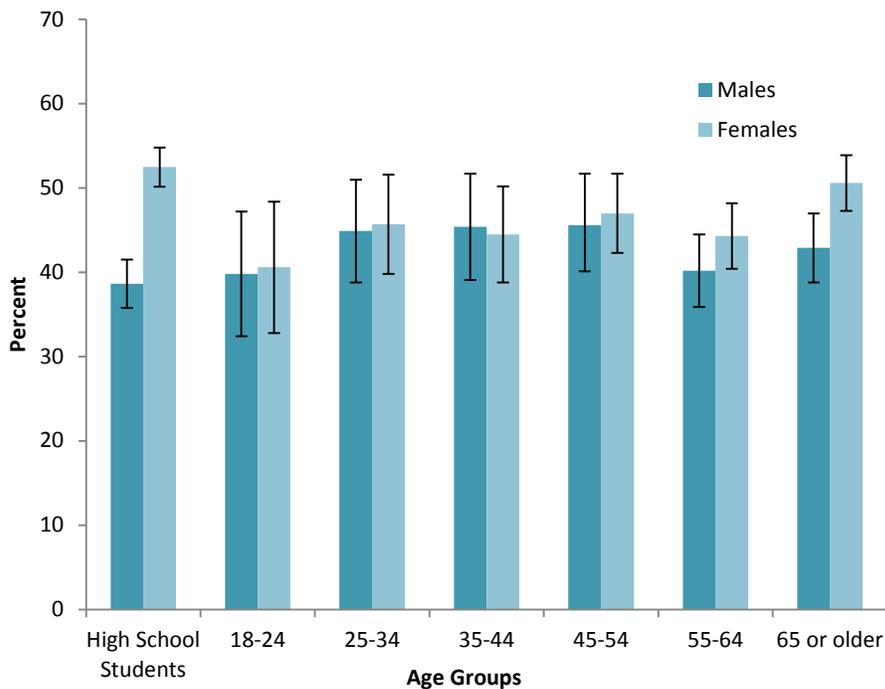
Physical Activity

Being physically active is important for maintaining a healthy weight and it offers other important health benefits. Regular moderate physical activity reduces the risk of premature death in general and reduces the risk of coronary heart disease, hypertension, colon cancer, and diabetes.¹⁵ Physical activity is also essential to overall muscle, bone, and joint health.¹⁵ People suffering from arthritis can experience significant relief from pain and stiffness and increased joint function with regular physical activity. Current physical activity recommendations for adults and children are outlined in Table 3. Many Montana adults and youth do not meet these recommendations.

Table 3. Minimum Physical Activity Recommendations for Adults and Children¹⁶

Children	60 minutes of either moderate or vigorous intensity aerobic activity every day	AND	Muscle strengthening activity on 3 days per week
Adults	2 hours and 30 minutes of moderate intensity aerobic activity every week OR 1 hour and 15 minutes of vigorous intensity aerobic activity every week	AND	Muscle strengthening activity on 2 days per week

Figure 14. Prevalence of Insufficient Physical Activity by Age and Sex, BRFSS and YRBS, Montana, 2011



- Over half (52%) of high school girls in Montana do not get enough physical activity, significantly more than the 39% among high school boys (Figure 14).

- Between 41% and 50% of Montana adults did not get the recommended level of physical activity, with little variation by age and sex.

Ensuring Health Equity in Montana

Racial minorities and people with low socio-economic status often experience health disparities. American Indians are Montana's largest minority group with 7.5% of the population identifying as American Indian alone or in combination with another race.¹⁷ Other racial minorities such as African American or Asian make up 2.5% of Montana's population, and only 2.8% of Montana's residents are of Hispanic ethnicity.¹⁷ Montana is one of the poorest states in the U.S., ranking 45th in 2010 with a median household income of \$41,467, 16% less than the national median.¹⁸ Additionally, 15% of all Montanans and 20% of Montana children were living in poverty during 2010.¹⁹ These segments of Montana's population have higher rates of risk behaviors, chronic diseases, and unintentional injury.

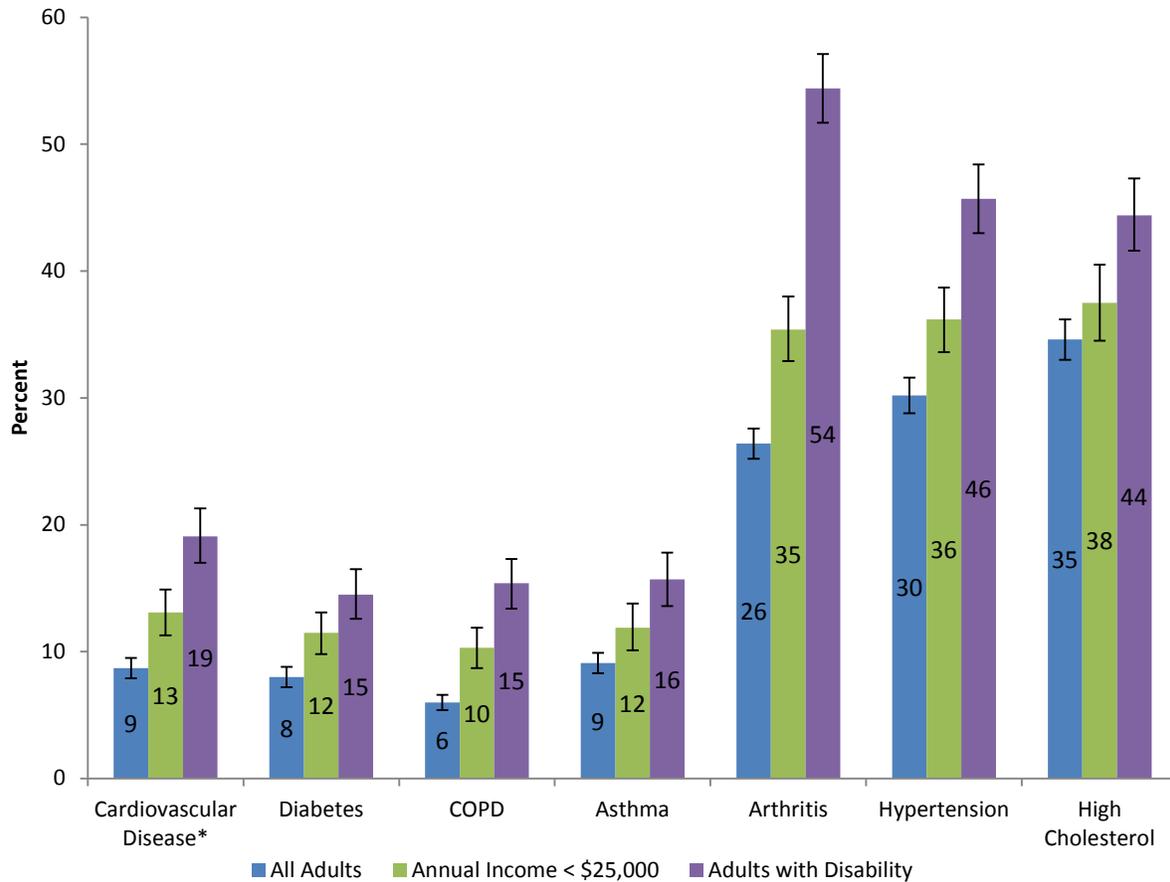
Health disparities also exist between people with and without disability. There are many different ways to measure the prevalence of disability.²⁰ However, BRFSS is the only source of Montana specific estimates of disability as well as other chronic conditions and behavioral risk factors. BRFSS uses a very broad definition for disability. Adults that report either 'being limited in any way in any activity' or 'requiring special equipment because of a physical, mental or emotional problem' are said to have a disability. Using this definition, 29% of Montana adults reported having a disability in 2011. Even with this broad definition, Montanans with a disability reported having chronic conditions and many behavioral risk factors significantly more frequently than all Montana adults.

Disease Burden Disparities

Low Household Income and Adults with Disability

- Montana adults with an annual household income of less than \$25,000 reported significantly higher prevalence of cardiovascular disease, diabetes, COPD, asthma, arthritis, and hypertension compared to all Montana adults (Figure 15).
- Montana adults with disability reported cardiovascular disease, diabetes, COPD, asthma, arthritis, hypertension, and high cholesterol significantly more frequently than all Montana adults (Figure 15).
- More than two times as many adults with disability reported cardiovascular disease, COPD, and arthritis compared to all Montana adults.

Figure 15. Prevalence of Chronic Diseases Among Groups with Health Disparities, BRFSS, Montana, 2011

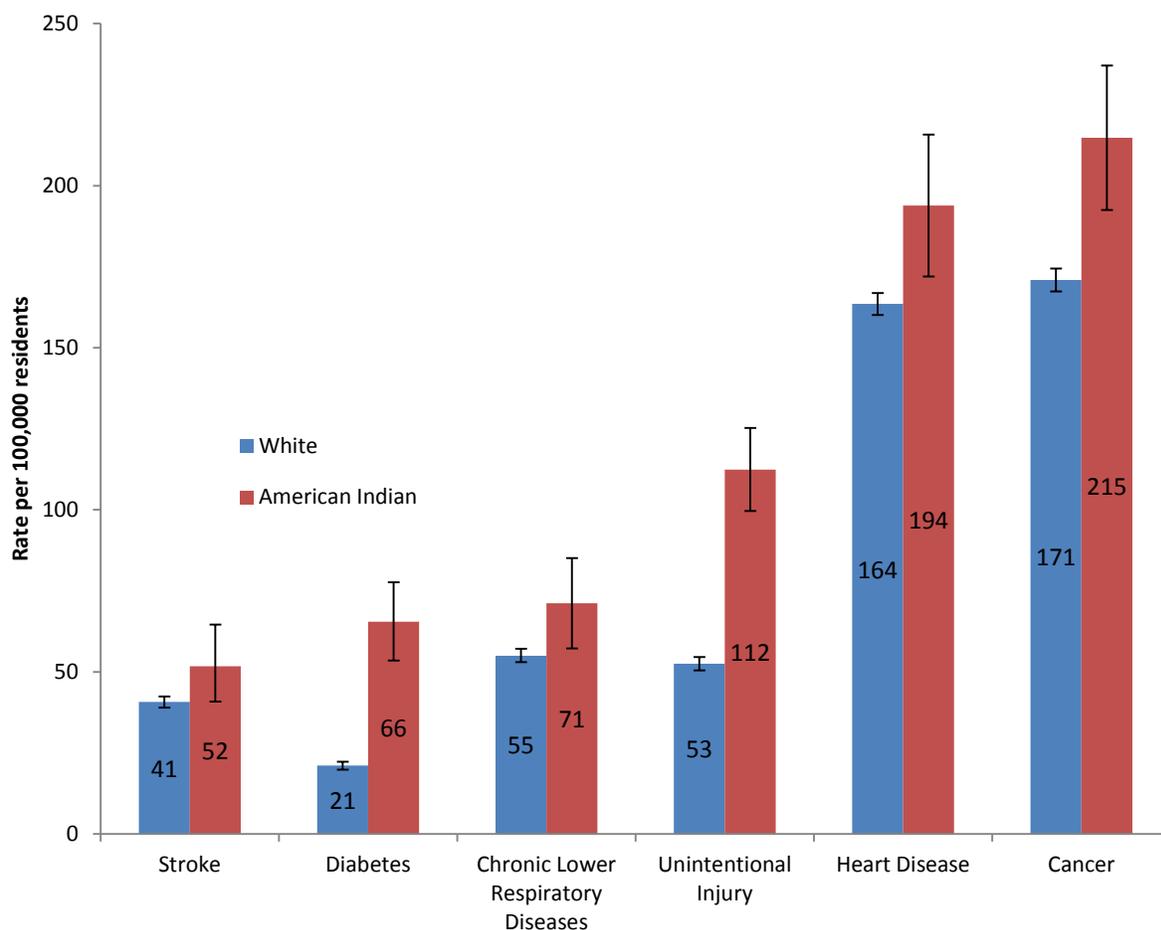


*Cardiovascular disease includes a diagnosis of heart attack, coronary heart disease, or stroke

American Indians

- American Indians in Montana experience higher rates of death due to cancer, heart disease, chronic lower respiratory disease, diabetes, and unintentional injury than are experienced by White Montanans (Figure 16).
- Age-adjusted death rates for diabetes are three times higher among American Indians than among Whites.
- Age-adjusted death rates for unintentional injury are two times higher among American Indians than among Whites.

Figure 16. Age-Adjusted Death Rates by Cause and Race[§], Montana, 2005-2009

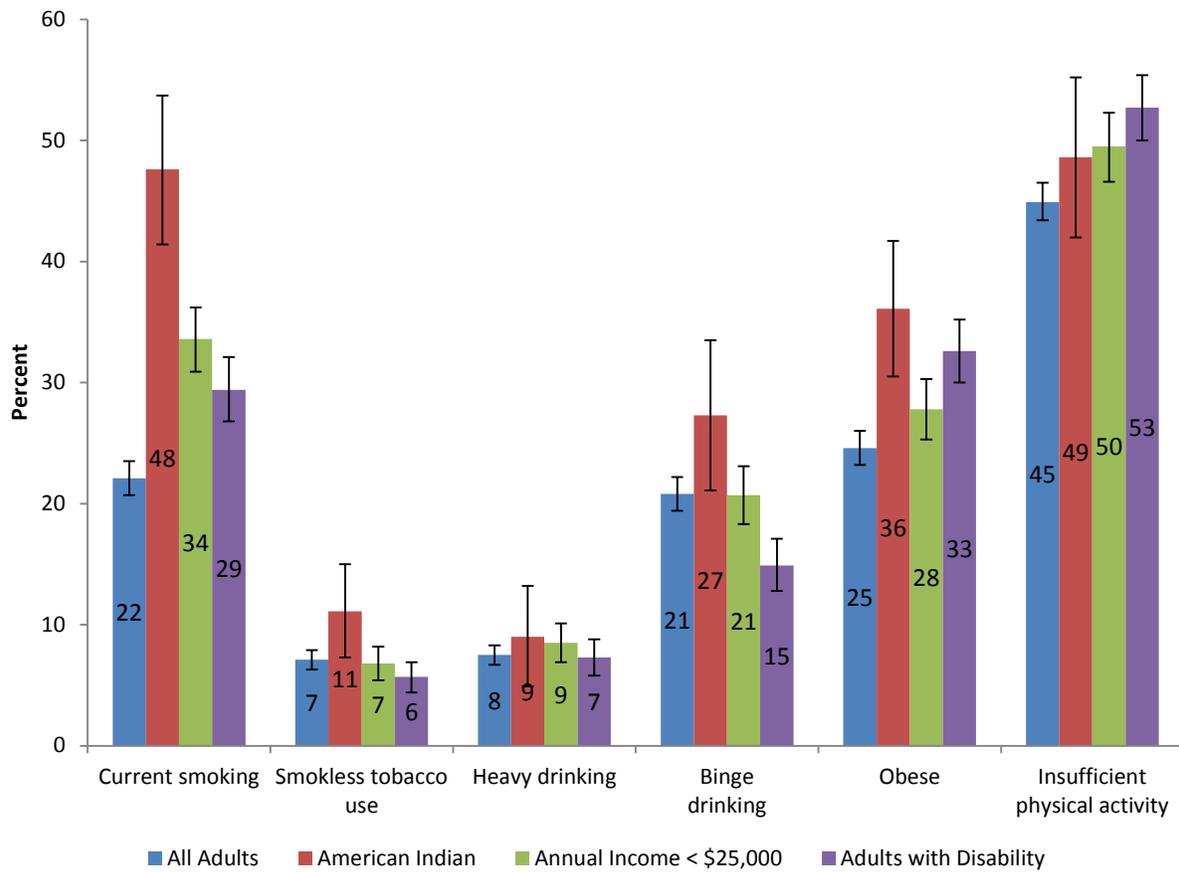


§ Data Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 2005-2009 on CDC WONDER Online Database, released 2012.

Behavioral Risk Disparities

- Prevalence of current cigarette smoking is more than twice as high among American Indians compared to all Montana Adults (Figure 17).
- Prevalence of current cigarette smoking is also significantly higher among adults with low income and adults with a disability.
- American Indians and adults with disability have significantly higher rates of obesity compared to all Montana adults.
- Montana adults with low household income and adults with disability reported insufficient physical activity more often than all Montana adults.

Figure 17. Prevalence of Behavioral Risk Factors Among Groups with Health Disparities, BRFSS, Montana, 2011



Strategies to Address Disparities

Addressing health equity is working to ensure that everyone has an equal opportunity to prosper and achieve full health. The Montana Chronic Disease Plan outlines strategies to address chronic disease and unintentional injury in a comprehensive and coordinated approach. These strategies will reduce the burden of chronic disease for the general population as well as specific sub-populations such as people with low household income and people of American Indian descent. Targeting identified sub-populations will require tailoring the outreach and delivery of the evidence-based strategies to fit the specific population. Every effort will be made to assure that intervention outreach and delivery will be culturally appropriate, accessible to people of all abilities, address education levels of sub-populations, are age appropriate, and are available in both urban and rural communities. The CDPHP Bureau programs have and will continue to work with partners across the state to implement targeted interventions based on the need identified by surveillance data. Examples of past interventions include tobacco cessation interventions targeted to people enrolled in Medicaid and targeted cancer screening outreach and education to American Indian people.

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