



KEY FACTS

- New cancer cases occur among Silver Bow County residents at the same rate as other Montana residents for all cancers combined and for the most common types of cancer.
- The rate of deaths due to all cancers combined was the same for Silver Bow County residents as for other Montana residents.
- The number of new cases of cancer among residents of census tract 6 (see map in figure 6) was significantly higher than expected from 2013 to 2022.
- The incidence rate of liver and bile duct cancer was significantly higher among residents of Silver Bow County than among residents Montana as a whole.

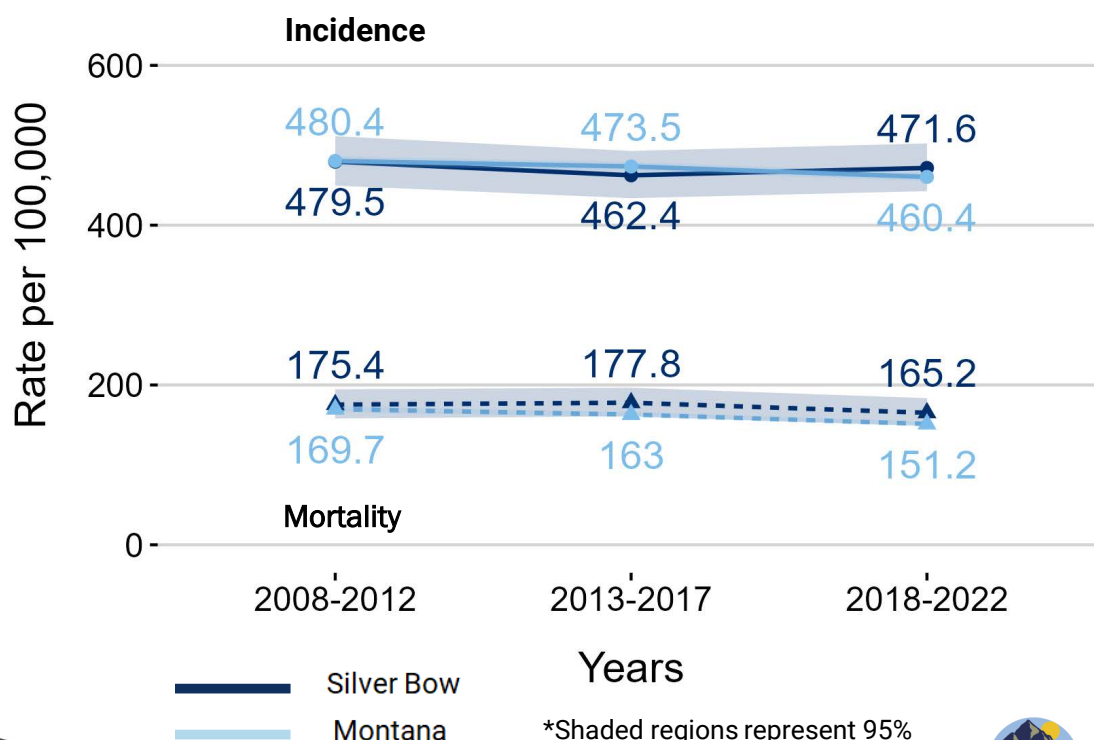
CANCER IN SILVER BOW COUNTY

Cancer is a common disease. Approximately 6,500 Montanans are diagnosed with cancer each year. A person can develop cancer for many reasons: genetics, environmental exposures, diet, and life style behaviors (such as cigarette smoking, drinking alcohol, etc.), or a combination of these factors. Unfortunately, it is often difficult to determine the exact cause for an individual's cancer.

The State of Montana has very complete data on cancer. Cancer incidence, which is the number of newly diagnosed cases each year, is collected by the Montana Central Tumor Registry (MCTR). Since 1979, state law has required every patient diagnosed with cancer or treated in Montana be reported to the MCTR (Montana Code Annotated 50.15.7). The registry is highly complete, with over 95% of all cancer cases included.

Data on cancer mortality in this report is based on the underlying cause of death on the death certificate and was provided by the Montana Office of Vital Statistics. All incidence and mortality rates in this report are age-adjusted to the U.S. Standard Million Population.

Figure 1: New cancer cases and cancer death rates among Silver Bow County residents compared to residents of other Montana counties from 2008–2022.



*Shaded regions represent 95% confidence intervals

Montana Cancer Control
Programs

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[https://dphhs.mt.gov/
publichealth/cancer](https://dphhs.mt.gov/publichealth/cancer)

How often is cancer diagnosed in Silver Bow County residents compared to other Montana residents?

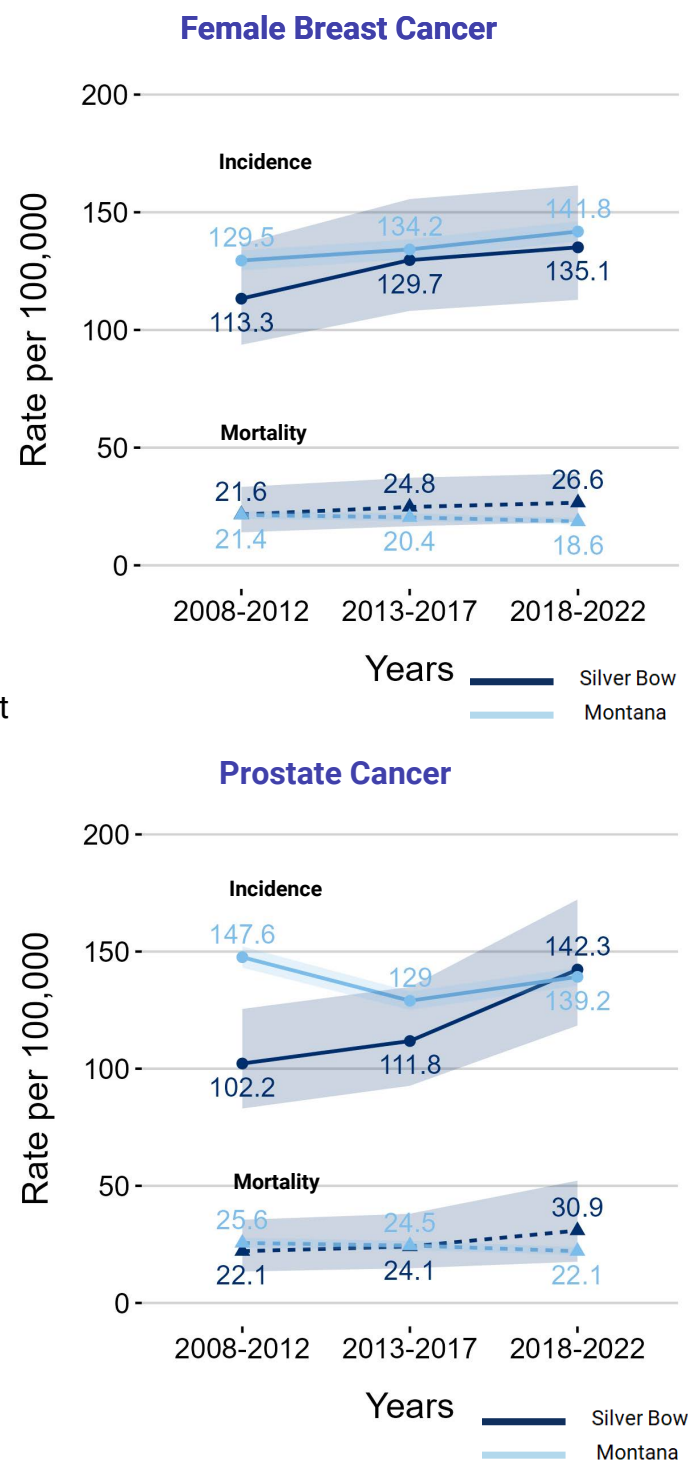
There are about 215 new cases of cancer and 80 cancer deaths among Silver Bow County residents each year. The 5- year incidence rates from 2008 to 2022 of all cancer sites combined were statistically the same among residents of Silver Bow County compared to the residents of other MT counties (Figure 1). The rate of cancer deaths was also statistically the same among Silver Bow County residents as other MT residents for this time period.

Which cancers are most common?

The most common types of cancer in Silver Bow County were also the most common in MT and the U.S. **Female breast cancer** was the most common type of cancer among women in Silver Bow County with about 29 new cases and seven deaths per year on average. There was no statistically detectable difference between the rate of new female breast cancer cases among residents of Silver Bow County and residents of other Montana counties combined from 2008-2022 (Figure 2). The rate of breast cancer deaths was also statistically the same for Silver Bow County residents compared to other MT counties. The most important risk factors for female breast cancer are: older age, pregnancies late in life or never having a full term pregnancy, a family history, physical inactivity, being overweight or obese after menopause, and using combination hormone therapy.

Prostate cancer was the most common type of cancer among men in Silver Bow County with about 30 new cases and 5 deaths per year on average. The rate of new prostate cancer cases was statistically the same in Silver Bow County as in other MT counties combined from 2013 to 2022 (Figure 2). However there were significantly fewer new cases of prostate cancer in Silver Bow County from 2008 to 2012. There was no statistically detectable difference in prostate cancer deaths in Silver Bow County than the other MT counties for any of the 5-year periods between 2008 and 2022 (Figure 2). The most significant risk factors for prostate cancer are: older age, being African-American, and a family history of the disease.

Figure 2: Incidence and mortality rates for Female Breast and Prostate cancers in Silver Bow County compared to other Montana counties, 2008–2022

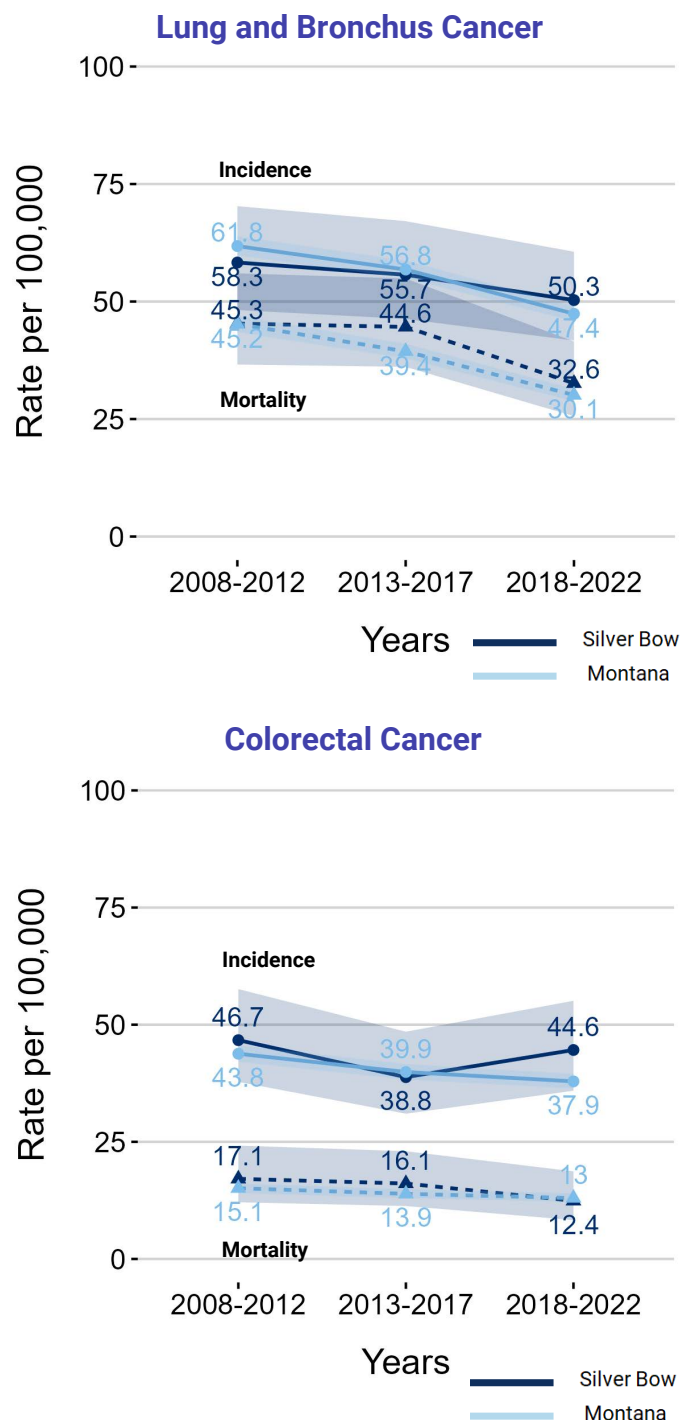


Lung & bronchus cancer was the second most common cancer among both men and women in Silver Bow County with 26 new cases and 18 deaths per year on average. The rate of new lung cancer cases was not statistically different in Silver Bow County as compared to other MT counties from 2008-2022 (Figure 3). The rate of lung cancer deaths was also statistically the same in Silver Bow County. Smoking and exposure to secondhand smoke are the most significant risk factors for lung cancer. It is estimated that 80% to 90% of lung cancer deaths in the United States are linked to cigarette smoking¹. Other risk factors for lung cancer include: exposure to radon or asbestos, workplace exposures (uranium, inhaled chemicals or minerals including arsenic and diesel exhaust), arsenic in drinking water, history of radiation therapy, and family history.

Colorectal cancer was the third most common cancer among both men and women in Silver Bow County with 20 new cases and seven deaths per year on average. The rate of new colorectal cancer cases was statistically the same in Silver Bow County as in other MT counties (Figure 3). The rate of colorectal cancer deaths from 2008 to 2022 was also the same in Silver Bow County. Risk factors for colorectal cancer include: lack of physical activity, low-fiber and high-fat diet, tobacco use, excessive alcohol consumption, and family history.

What cancers are associated with potential heavy metal exposures at the Silver Bow Creek - Butte Area Superfund Site? Assessing cancer risk in humans due to exposure to contaminants in the environment requires the review of multiple scientific studies. These studies assess cancer risk in humans, animals, and in the laboratory. National and international agencies use the results of these studies to classify environmental compounds as to their cancer-causing potential. The International Agency for Research on Cancer (IARC) and the Environmental Protection Agency (EPA) have classified the carcinogenicity of the following heavy metals and chemical of concern in Butte Priority Soils Operable Unit of the Silver Bow Creek Superfund Site:

Figure 3: Incidence and mortality rates for Lung & Bronchus and Colorectal cancers in Silver Bow County compared to residents of Montana as a whole, 2008–2022



*Shaded regions represent 95% confidence intervals

¹Centers for Disease Control and Prevention. "Lung Cancer Risk Factors." Centers for Disease Control and Prevention, U.S. Department of Health & Human Services, 13 Feb. 2025, www.cdc.gov/lung-cancer/risk-factors/index.html.

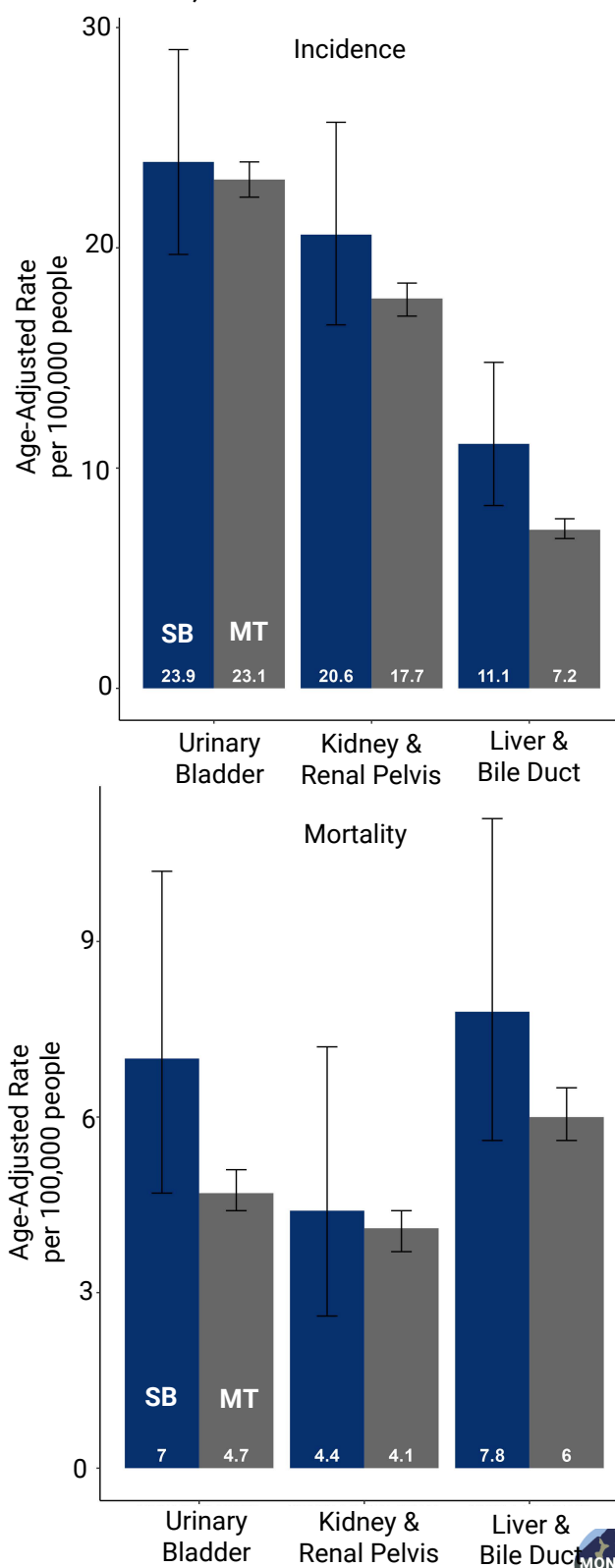
Table 1: Silver Bow Creek -Butte Area
Superfund Site Carcinogen Classifications

Contaminant	Classification	Associated Cancer Sites
Arsenic	Group 1 (Carcinogenic to humans)	Sufficient evidence: Lung, Bladder, Skin (squamous and basal cell) Limited evidence: Kidney, Liver, Prostate
Cadmium	Group 1 (Carcinogenic to humans)	Sufficient evidence: Lung Limited evidence: Prostate, Kidney
Inorganic Lead	Group 2A (Probably carcinogenic to humans)	Limited evidence: Lung, Stomach
Metallic Mercury, Aluminum, Copper, Iron, Silver, and Zinc	Group 3 (Not enough evidence to determine carcinogenicity to humans)	Not sufficient evidence to determine associated cancer sites

Squamous and basal cell carcinoma of the skin is not a reportable cancer by Montana State Law. The MCTR does not have complete data on the incidence of these types of skin cancer, therefore it is not reported here.

Bladder cancer: Over the past ten years (2013–2022) the rate of new bladder cancer cases was statistically the same in Silver Bow County as in other MT counties (Figure 4). The rate of bladder cancer deaths was also statistically the same in Silver Bow County as in other MT counties. From 2013–2022, there were about 12 new cases per year and three deaths per year on average. Bladder cancer risk increases with age and is more common in men and White individuals. Smoking is a primary cause due to harmful chemicals accumulating in the bladder. Other significant risk factors include a family history or specific genetic mutations, occupational exposure to chemicals (paints, dyes, metals, petroleum products), certain medical treatments (pelvic radiation, some chemotherapy drugs), and exposure to Aristolochia fangchi herb. Additionally, risks are associated with high levels of arsenic or chlorinated water and chronic urinary catheter use.

Figure 4: Incidence and mortality rates of selected cancer sites in Silver Bow County compared to other Montana counties, 2013–2022.



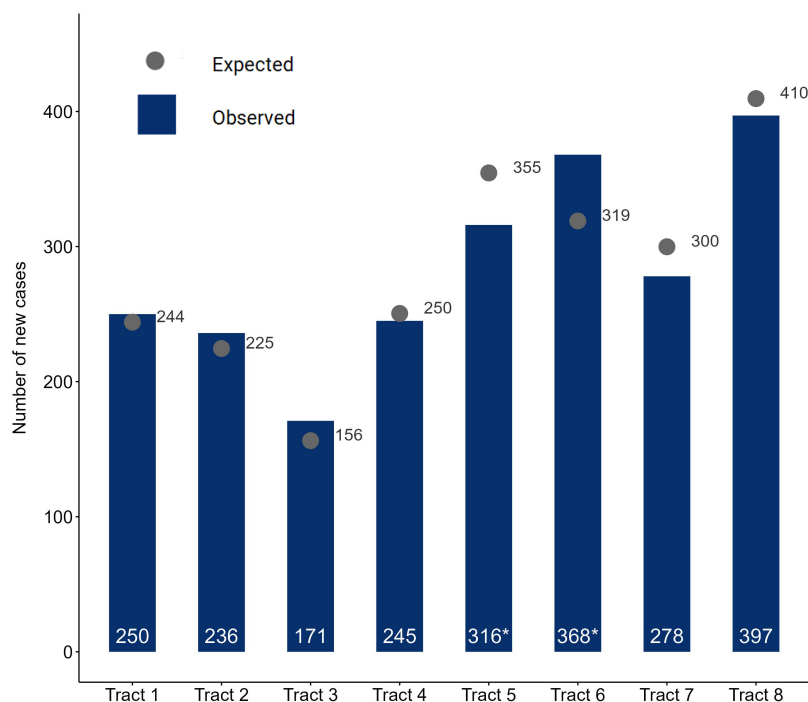
Kidney cancer: Over the past ten years (2013–2022) the rate of new kidney cancer cases in Silver Bow County was statistically the same as other MT counties (Figure 4). There was also no evidence of a difference in kidney cancer mortality rates. In Silver Bow County there were about seven new cases per year and two deaths per year on average. Risk factors for kidney cancer include: smoking, obesity, workplace exposures (such as cadmium, some herbicides, organic solvents like trichloroethylene), and hereditary (family history) risk factors.

Liver cancer: Over the past ten years (2013–2022) the rate of new liver cancer cases was significantly higher among residents of Silver Bow County than the rate observed among residents of other MT counties combined, however the mortality rates were not significantly different over this period (Figure 4). From 2013 to 2022 there were an average of six new cases a year and four deaths due to liver cancer in Silver Bow County. Risk factors for liver cancer include: heavy alcohol use, cirrhosis (which can be caused by hepatitis or alcohol use), obesity, diabetes, and smoking.

How often is cancer diagnosed within different areas of Silver Bow County ?

To determine if there is more cancer than expected within different regions of the county we compared the number of observed cancer cases within each census tract (Figure 6) to the number of cases we would expect. This expected number represents how many cases there would be if the incidence rate in each Silver Bow County census tract were the same as the rate in the whole state of Montana. The expected number of cases was calculated by multiplying the statewide incidence rate within each age group and each year to the number of people living in each census tract in Silver Bow County. Then the expected numbers for

Figure 5: Number of new cancer cases **Observed** vs. **Expected** by 2010 Census Tract[†], Silver Bow County MT, 2013-2022.



[†] Census tracts are areas within a county defined by the US Census Bureau for the purpose of assisting with the decennial census. Each census tract is defined so that it has a population between 1,200 and 8,000 with an optimal population size of 4,000. 2020 Silver Bow County Census Tracts 1.1 and 1.2 were combined in years 2020:2022 so that they may align with Silver Bow County 2010 Census Tract 1 in years 2013:2019.

*Observed cases were significantly different than the expected number of cases

each year and age group were added together to get the total expected number from 2013 to 2022. The observed number of cases is simply a count of new cancer diagnoses among Silver Bow County residents. Significance was calculated based on 95% confidence intervals assuming a Poisson distribution.

We observed significantly higher than expected counts of all site cancer diagnosis than expected in Silver Bow County Census Tract 6. Census Tract 5 had significantly fewer observed cases than expected (Figure 5).

Limitations

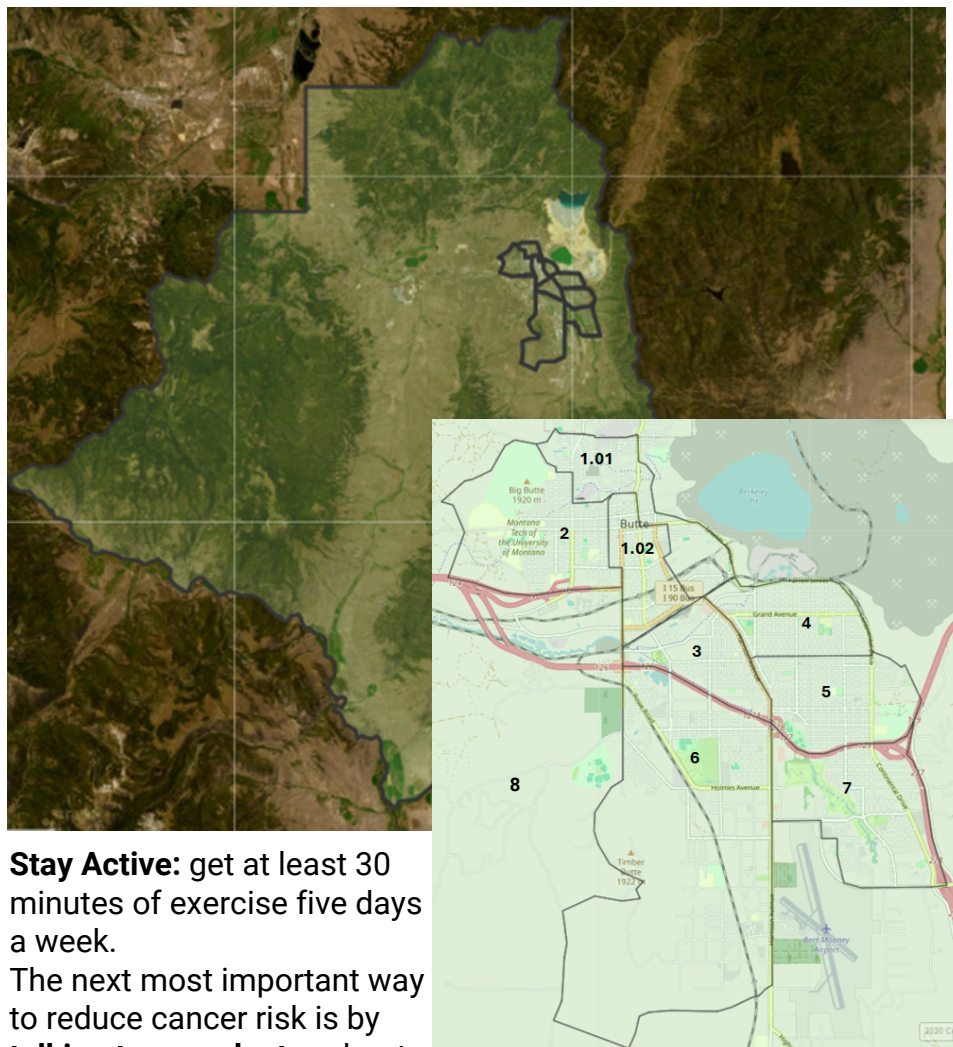
Cases were assigned to census tracts based on the reported address at diagnosis. If the address could not be matched to existing address files and placed in an exact location on the map the case was assigned a location at the center of the zip code area. Likewise, if the address at diagnosis was a PO Box the case was located at the center of the zip code area. For the Butte zip code area the center is located in census tract 6. Thirty-six cases were placed in census tract 6 because the exact location of their address could not be determined. As such the true number of cases observed in census tract 6 may be as low as 332* which is not significantly more than expected. Observed/expected estimates and rate calculations were dependent on American Community Survey (ACS) population estimates, which, as sample-based data, inherently possess associated margins of error and may not precisely reflect true population counts, especially for small geographic areas or specific demographic subgroups.

How can I reduce my risk of cancer?

While there are many cancer risks that cannot be changed there are also many things people can do to reduce their risk of cancer. The most important way to reduce cancer risk is through a healthy lifestyle.

Do not use tobacco products: including cigarettes, cigars, pipes, smokeless tobacco, or e-cigarettes, and avoid exposure to second-hand smoke. **Limit alcohol consumption and eat a healthy diet:** rich in fruits and vegetables, whole grains, and lean meats, fish, beans, and nuts.

Figure 6: Map of 2020 Butte MT Census Tracts



Stay Active: get at least 30 minutes of exercise five days a week.

The next most important way to reduce cancer risk is by **talking to your doctor** about

what cancer screening tests you should have. **Getting screened** for colorectal and cervical cancer can find pre-cancerous cells before they develop into cancer and actually prevent the cancer. Screening for breast and lung cancer can detect the cancer early when treatment will work better and there is a better chance of survival.

Finally, you can reduce your risk of exposure to environmental contaminants by having private well water tested once a year and contacting the Residential Metals Abatement Program at 406-497-6278 to have your house and yard tested for harmful contaminants.

Maps were generated using the mapview R package (Appel, 2020), displaying 2010 and 2020 Census Tracts. The underlying base map layers for visualization included OpenStreetMap data (© OpenStreetMap contributors) and Esri World Imagery (sourced from Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community).

* Lower bound estimate determined by excluding the thirty-six cases which were placed in census tract 6 due to missing address information.