Health Risk Factors

2022

JUNE 8

GALLATIN COUNTY, KY

THREE RIVERS DISTRICT
HEALTH DEPARTMENT

Introduction

Gallatin County, KY

Health risk factors are the attributes, characteristics or exposures that increase the likelihood of a person developing a disease or health disorder. Risk factors are around us every day in our homes, places of work, schools, and in public. A nearby sneeze or cough may increase your likelihood of catching the flu, COVID-19, or a common cold. Being overweight increases the likelihood you'll develop diabetes and smoking increases your risks for many cancers.

To help understand the risk factors affecting the health of the populations in Gallatin County, we have collected and analyzed a wealth of health information for review and use.

"Gallatin County, where history of yesterday meets today"

This report will explore the health risk factors and pertinent details to help better understand how our populations health is being affected. With use of this information, it is anticipated mitigation measures will be implemented to help improve the overall health of our communities.

Life Expectancy

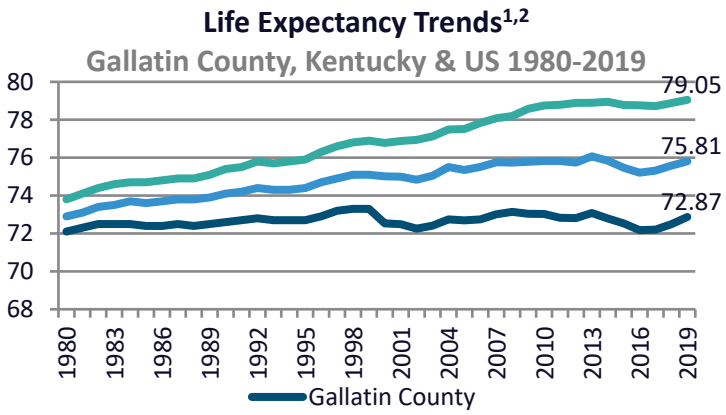
Averages

Life expectancy is the average number of years a person is expected to live. The current U.S. life expectancy for persons born today is 79.05 years[1]. Gallatin County's life expectancy is 72.87 years[1]. Overall rates have remained nearly the same since 1980, increasing only .7 years. Accordingly, the life expectancy in Gallatin County remains considerably lower than the U.S. and state averages.

72.87 years

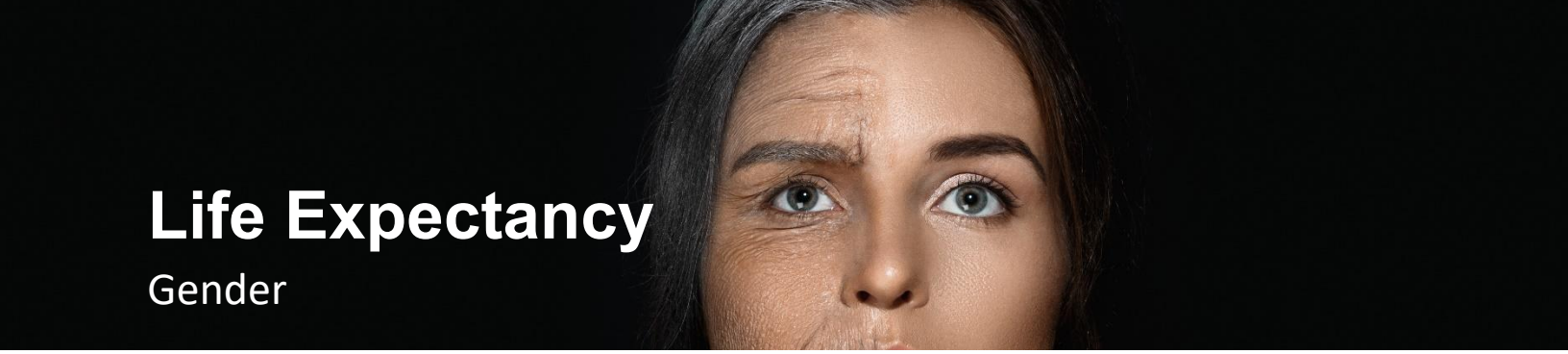
"The average resident dies 6.2 years sooner"

Some of the main factors affecting life expectancy include, but are not limited to, gender, genetics, prenatal and childhood conditions, education, socio-economic status, marital status, ethnicity/migrant status, lifestyle, and access to medical care/technology.



	Gallatin, Kentucky	Lowest Life Expectancy in U.S. Ogala Lakota, SD	Highest Life Expectancy Summit, CO
Life Expectancy[1]	72.87 years	64.5 years	91.72 years
Poverty Rate[3]	14.3%	46.8%	1.93%
Median Household Income[3]	$55,113	$31,423	$80,709
Education Bachelor's degree or higher 25+yrs[4]	9.6%	11.1%	53.6%

Gallatin County comparison to the counties with the highest and lowest life expectancies in the U.S.



Life Expectancy

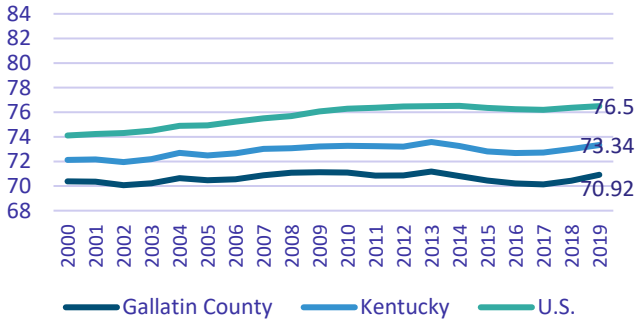
Gender

Like the state and nation overall, men have a lower life expectancy than women in Gallatin County. Men's overall life expectancy is 4.07 years less than women in Gallatin County, as compared to 5 and 5.09 in the Commonwealth and U.S. overall[1]. There are several factors affecting the disparity between males and females. Some of the more obvious include the fact that men tend to take bigger risks than women resulting in higher accident rates. Additionally, men are also more likely to have jobs in riskier occupations such as military combat, firefighting, and working at construction sites where injury and accidents are more prevalent.

"On average, men die 4+ years earlier than women"

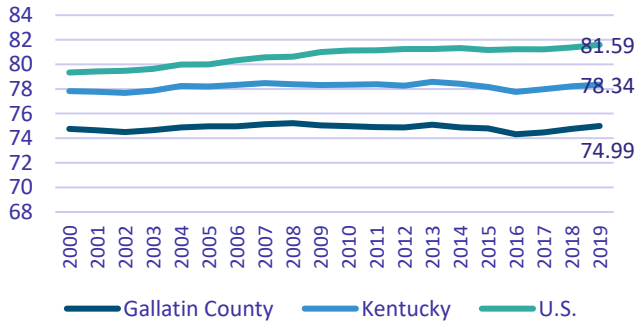
Life Expectancy Trends - Males[1]

Gallatin County, Kentucky, U.S. 2000-2019



Life Expectancy Trends - Females[1]

Gallatin County, Kentucky, U.S. 2000-2019

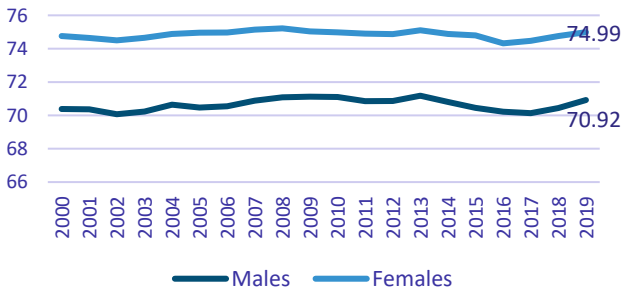


Industry[5]	Males	Females
Agriculture/Forestry	37.3%	62.7%
Mining	100%	0%
Construction	97.5%	2.5%
Utilities	100%	0%
Waste Mngt	67.7%	32.3%

Percentage of male to female workers by industry associated with more dangerous working conditions.

Life Expectancy Trends by Gender[1]

Gallatin County 2000-2019



Causes of Death

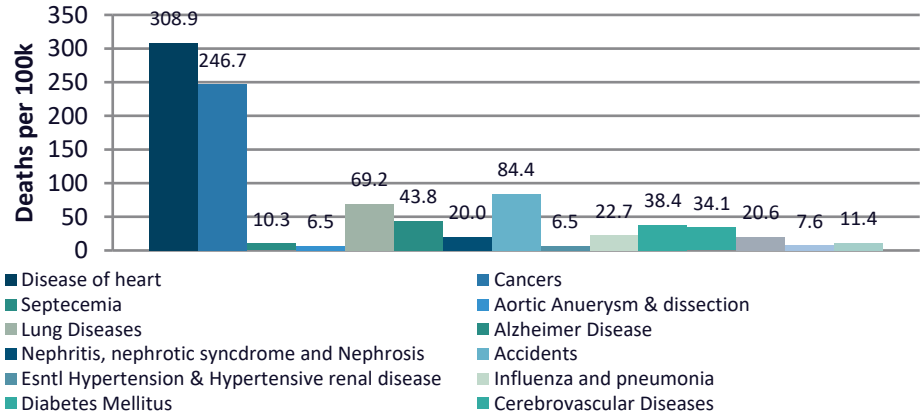
Leading Causes

Deaths are reported and tracked using a diagnosis code, currently the International Statistical Classification of Diseases and Related Health Problems, or (ICD10). These codes help in identifying trends and conducting analysis to identify causes of death in a population.

Since 1921, heart disease has been the leading cause of death in the U.S.[6] In the years between 1900 and 1920 heart disease was second only to deaths caused by influenza/pneumonia and tuberculosis. The great influenza pandemic of 1918 that killed between 20 and 40 million people globally had a material influence on those early rates. However, because of the introduction of antibiotics in the 1930s, the last 100 years has seen tuberculosis fall from a leading cause and influenza/pneumonia drop to the eighth leading cause of death in the U.S[7]. Heart disease, (for ICD10 codes I00-I09, I11, I13, I20-I51), however, continues holding fast in its position as the leading cause of death for Americans[7] resulting in more than 14 million deaths from 1999 to 2020[7], or 4.3% of the total U.S. population today. As an accumulative total in the past 21 years, heart disease is considered a leading cause of death in Gallatin County as well.

Top 10 Leading Causes of Death, Accumulative[7]

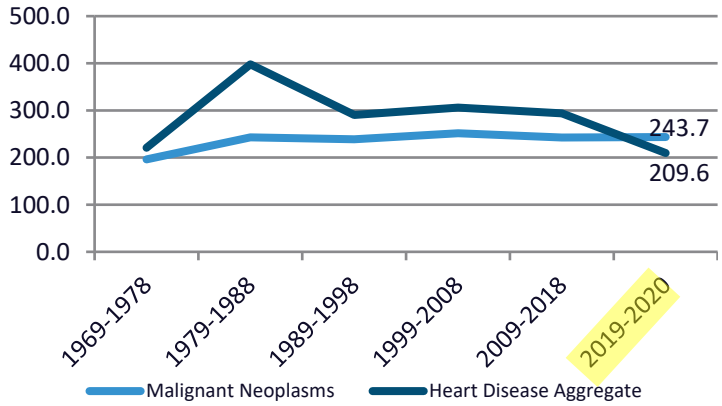
Gallatin County 1999-2020



However, when examining the yearly trends in the leading causes of death, deaths from cancers overtook heart disease as the leading cause of death in 2019 in Gallatin County and continues to hold that position as of 2020[7]. It is worth noting that the cancer related deaths have remained relatively steady since 1969.

Leading Cause of Death Trend over Time[7]

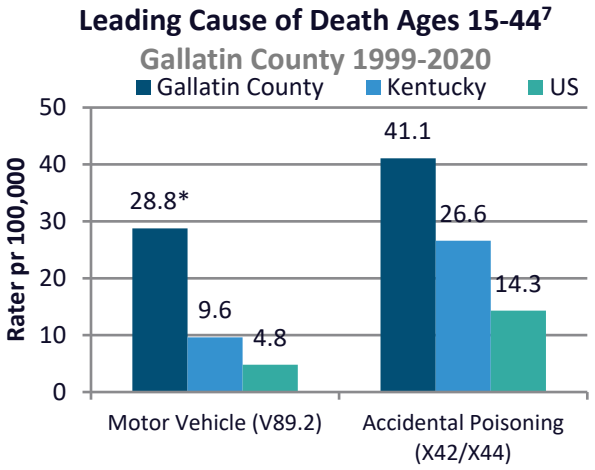
Gallatin County 1969-2020

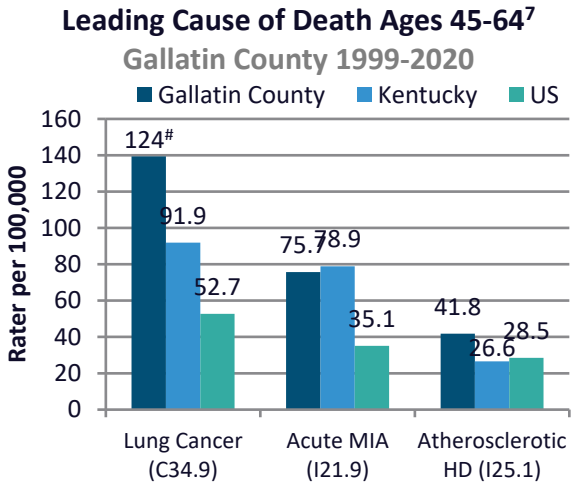


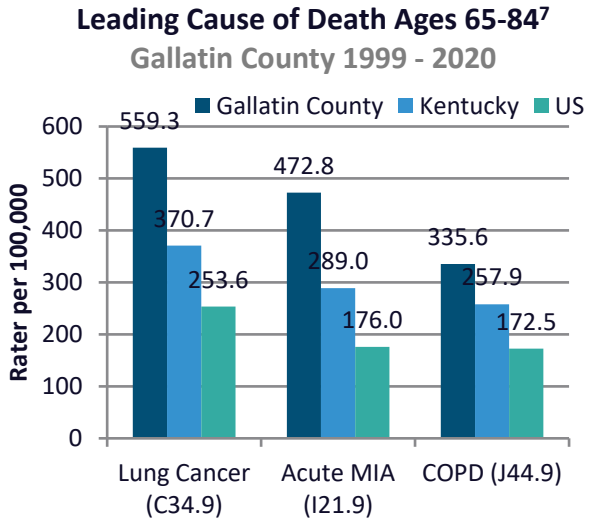
Causes of Death

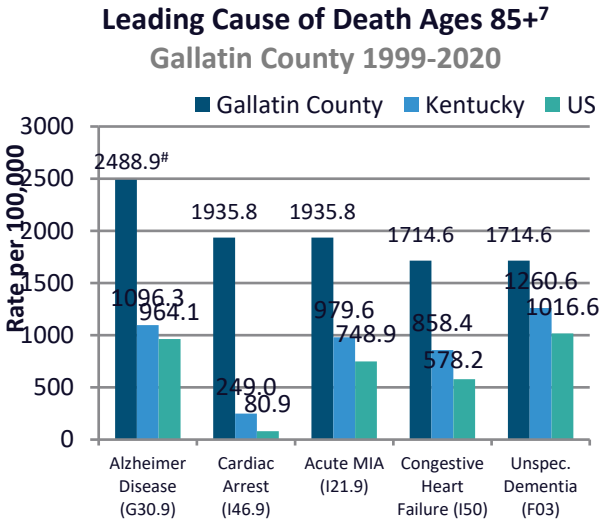
Leading Causes by Age

Evaluating the leading cause of death by age group demonstrates, as expected, that the leading cause of death changes as we age. Persons between 15 and 44 years are more likely to die from primarily preventable causes such as motor vehicle accidents and accidental poisoning by narcotics and psychodysleptics, than any other causes.









*Deaths from motor vehicle accidents disproportionately affect those aged 15-44 in Gallatin County by more than 6 times the national rate. #Lung Cancer kills Gallatin County residents more than twice as frequently for those aged 45-64 and those aged 85+ die of Alzheimer's Disease 2.6 times more frequently than the average American.

Causes of Death

Underlying and Contributing Factors

When evaluating the cause of death, it is important to examine and understand the underlying and contributing factors that result in the diagnoses of specific diseases and causes of death. While genetics and environmental factors have a part, behavior plays a much larger role in the development of specific diseases that result in death than was believed in the past.

In 2009-2010, at least 47% of adults in the U.S. had at least one risk factor for heart disease[8]. According to the Centers for Disease Control and Prevention (CDC), there are three prevailing risk factors contributing to the incidence of heart disease including uncontrolled high blood pressure, uncontrolled high low-density lipoproteins cholesterol (LDL) and smoking. (The first two of which can be exacerbated by behavior and the last being solely a behavior.) Similarly, 90% of all lung cancers are the result of smoking tobacco[9] and 80% of all patients diagnosed with COPD are or were smokers[10].

An examination of the underlying causes of premature death (death before age 75)[7], for Gallatin County residents shows behavioral factors have a significant effect on the lower life expectancy trends as compared with the nation and state overall. Those behaviors including smoking, alcohol use, and drug/alcohol abuse[11].

ICD10	Description	Deaths per 100k[7]	Underlying Contributing Factors/100k		
			Tobacco[11]	Alcohol[11]	Drug/Alcohol Abuse[11]
C34.9	Lung Cancer	76.4	68.8	2.7	
I21.9	Acute Mia	49.3	9.9		
J44.9 & J43.9	COPD & Emphysema	32.3	25.8		
V89.2	Motor Vehicle Accident	22.6		6.3	
I25.1, I25.0	Atherosclerotic HD/Cardiovascular Disease	32.8	6.6		
X44	Accidental Poisoning	17.6			9.5
I46.9	Cardiac Arrest, unspecified	15.9	3.2		
X42	Narcotic Poisoning	13.0			7.1
I50.0	Congestive HF	11.3	3.7		
C18.9	Colon Cancer	10.2		.4	
X74	Suicide	9.6			
J18.9	Pneumonia	8.5			
E14.9	Diabetes w/o complications	7.4			
C25.9	Cancer Pancreas	7.4		.3	
C50.9	Breast Cancer	6.8		1.0	
I64	Stroke	5.7	1.1		

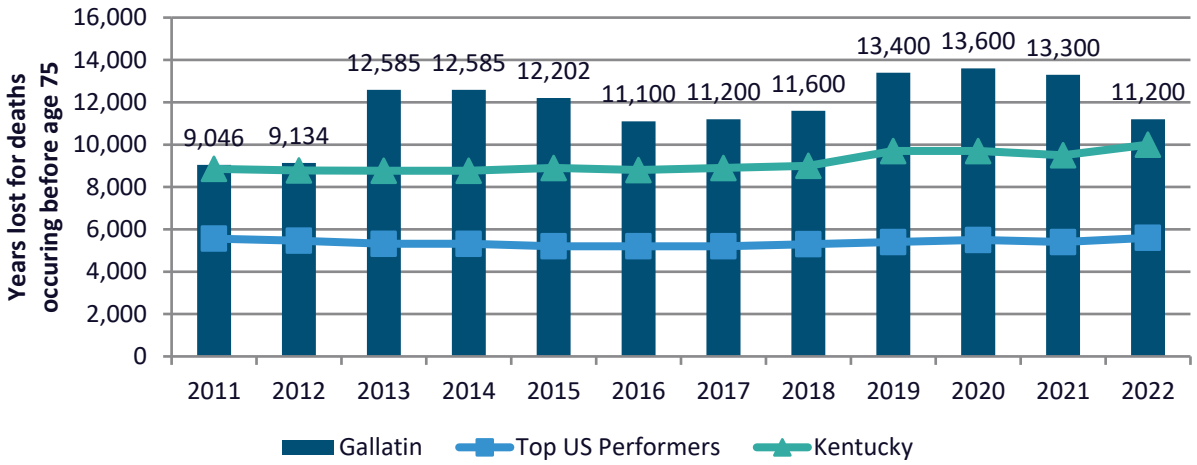
Cause of Death

Years of Potential Life Lost

Years of potential life lost, (YPLL), represent the years of life lost where death occurs before the age of 75, the average annual age of death for Americans. Gallatin County has higher YPLL, as compared with state and top performers in the nation.

Years of Potential Life Lost[12]

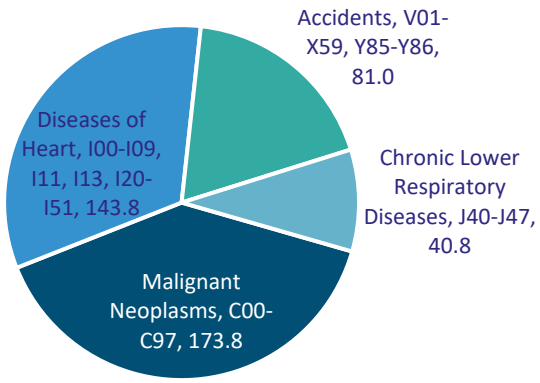
Gallatin County 2022



For those under the age of 75, the leading cause of death remains malignant neoplasms, 173.8 per 100k, followed by heart disease at 143.8 per 100k and accidents at 81 per 100k[7].

Cause of Years of Potential Life Lost[7]

Gallatin County 2022

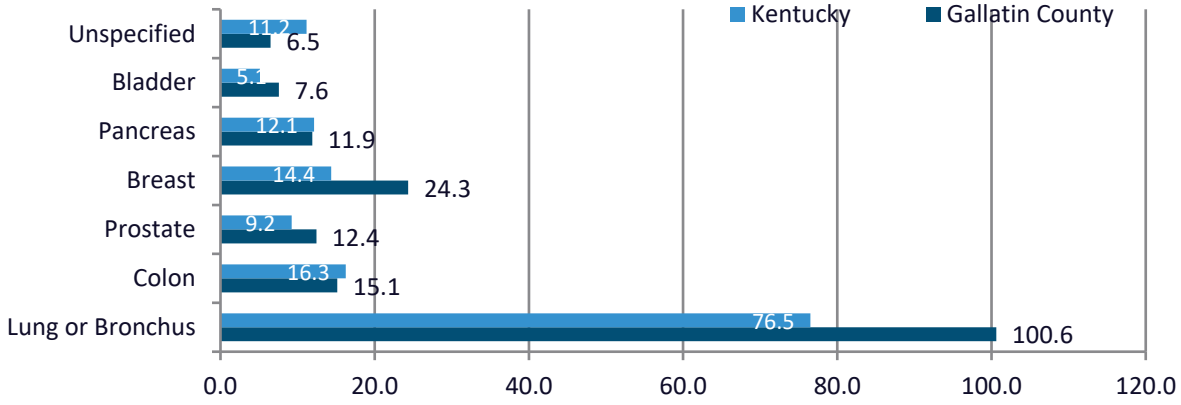


Causes of Death

Cancers

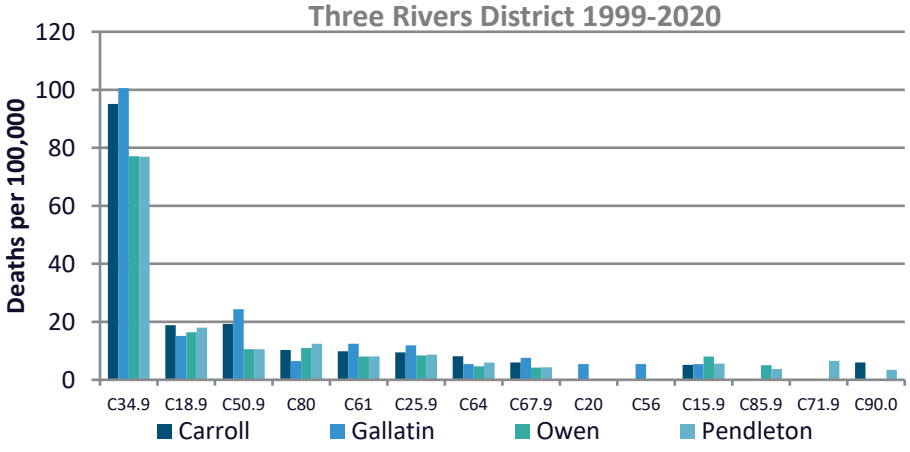
Since the year 1999, cancer of the lungs or bronchus has represented the leading cause of death among persons diagnosed with malignancies in Gallatin County, accounting for 100.6 deaths per 100,000 population[7].

Leading Cancer Cause of Death[7]
Gallatin County 1999-2020



Gallatin County leads the district in cancer related deaths for lung cancers representing half of all cancer related deaths[7]. According to the CDC, smoking can cause cancers almost anywhere in the body including the bladder, blood, cervix, colon, rectum, esophagus, kidney, renal pelvis, liver, lungs, bronchi, trachea, mouth, throat, pancreas, stomach and larynx[13]. Additionally, Lung Cancer has a known association with the inhalation of radon gas. Higher cancer rates in Gallatin County may be the result of either or both underlying contributing factors. See page 19 for details on tobacco rates. See page 24 for details on radon in Gallatin County.

Leading Cancer Cause Death[7]
Three Rivers District 1999-2020



ICD10	Cancer
C34.9	Lung
C18.9	Colon
C50.9	Breast
C80	Unspecified
C61	Prostate
C25.9	Pancreas
C64	Kidney
C67.9	Bladder
C56	Ovarian
C15.9	Esophagus
C85.9	Lymphoma
C71.9	Brain
C90.0	Multiple Myeloma

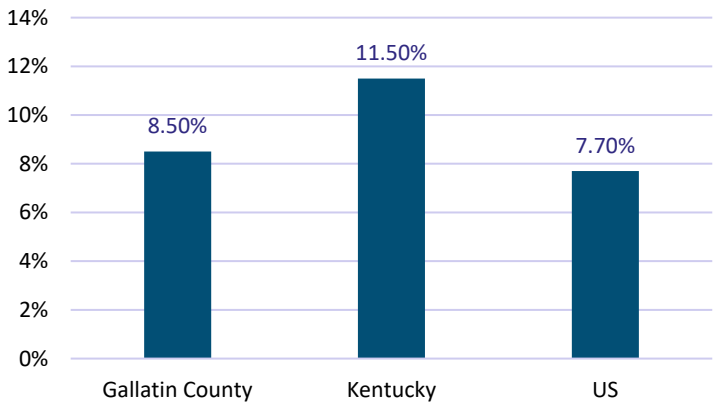
Health Conditions

Asthma

According to the CDC, 1 in 13 persons in the U.S. has asthma[14]. Most people can control their symptoms and prevent asthma attacks by avoiding triggers and using prescribed medication such as inhalants correctly.

Asthma Prevalence[14,15]

Gallatin County, Kentucky, U.S. 2016-2018



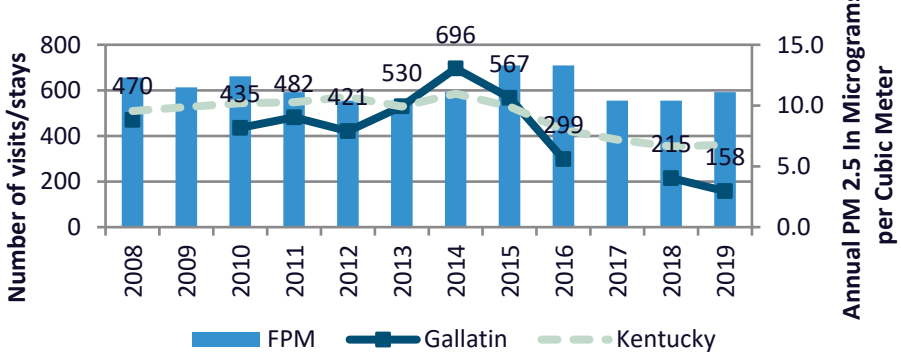
Gallatin County has a higher-than-average prevalence for asthma at 8.5%, or 1 in 12, when compared with national averages at 7.7%, 1 in 13 people, but is lower than the state averages at 1 in 9 or 11.5% of the population[15].

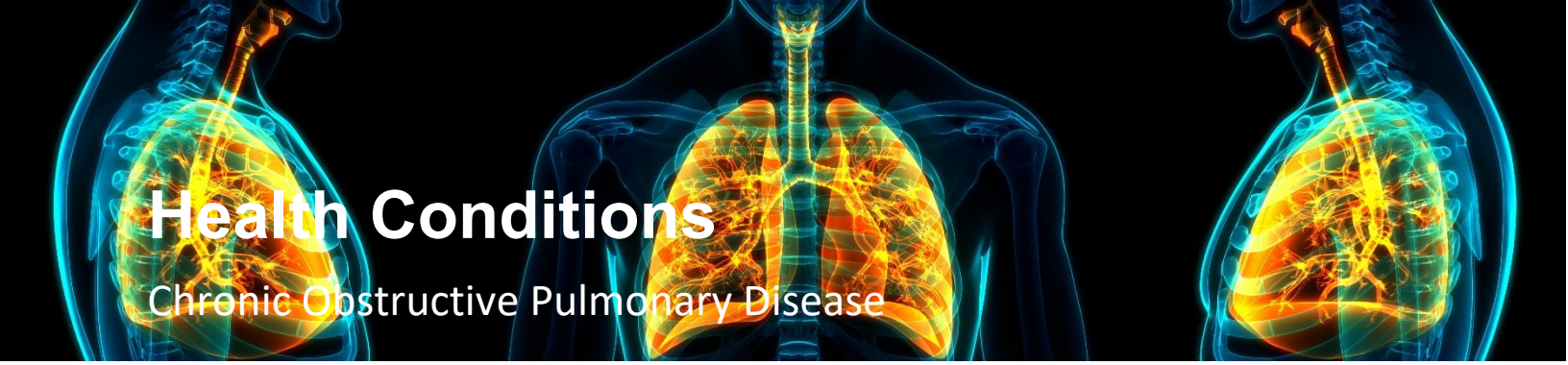
"1 in 12 people in Gallatin County has Asthma"

Asthma induced ER visits in Gallatin County in 2019 represent an equivalent of 1.8% of the total population or 21% of those with Asthma[16].

Asthma induced Emergency Room Visits Age Adjusted Fine Particulate Air Matter (Modeled)[16]

Gallatin County & Kentucky 2008-2019





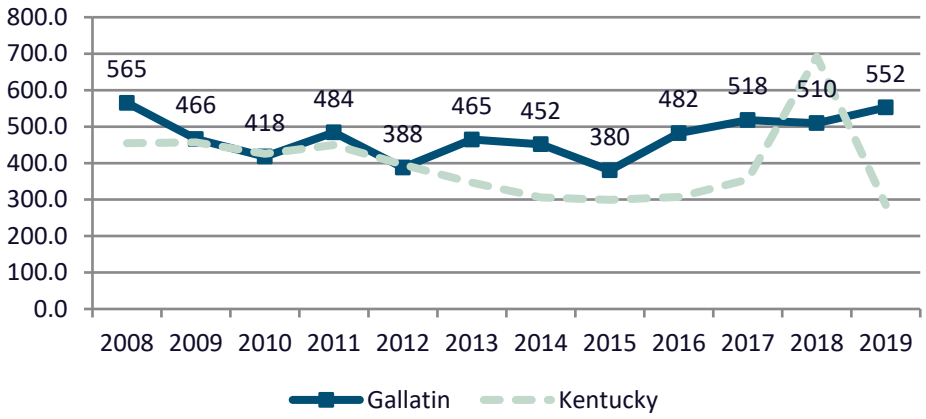
Health Conditions

Chronic Obstructive Pulmonary Disease

Chronic Obstructive Pulmonary Disease, or COPD, is a group of pulmonary disease(s) that restricts airflow within the lungs and includes chronic bronchitis and emphysema. According to the CDC, approximately 18 million Americans have been diagnosed with COPD and millions more suffer with it but have yet to be diagnosed and receive treatment[17]. People aged 65 and over are more likely to be diagnosed with some form of COPD but it can affect persons of any age.

COPD induced Hospitalizations Age Adjusted[16]

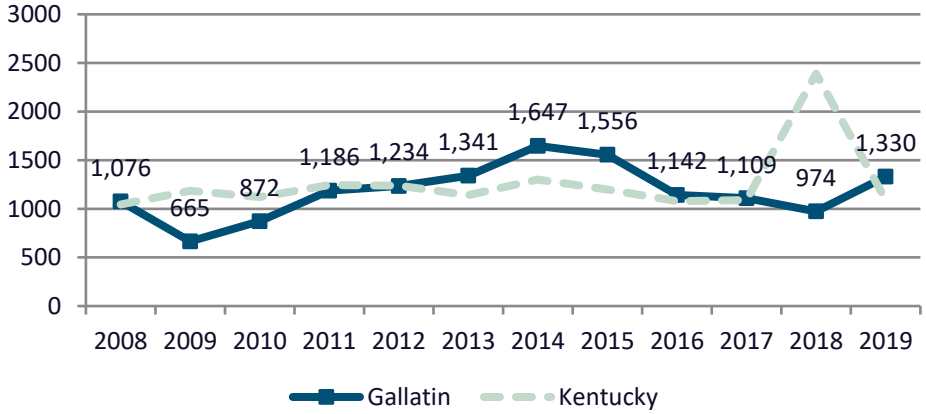
Gallatin County & Kentucky 2008-2019



Nationally, there are 40.4 ER visits per 100 persons and 43.5% of those visits are less than 15 minutes in duration[18]. According to the National Hospital Ambulatory Medical Care Survey: 2018 Emergency Department Summary Tables, COPD accounted for 8.1 million ER visits in 2018 or 6.2% of all ER visits nationwide[18]. Gallatin County has a relatively stable rate of COPD induced ER visits that align with the state overall indicating residents have similar control/ environmental triggers and access to care as compared with the average Kentuckian.

COPD induced Emergency Room Visits Age Adjusted[16]

Gallatin County & Kentucky 2008-2019



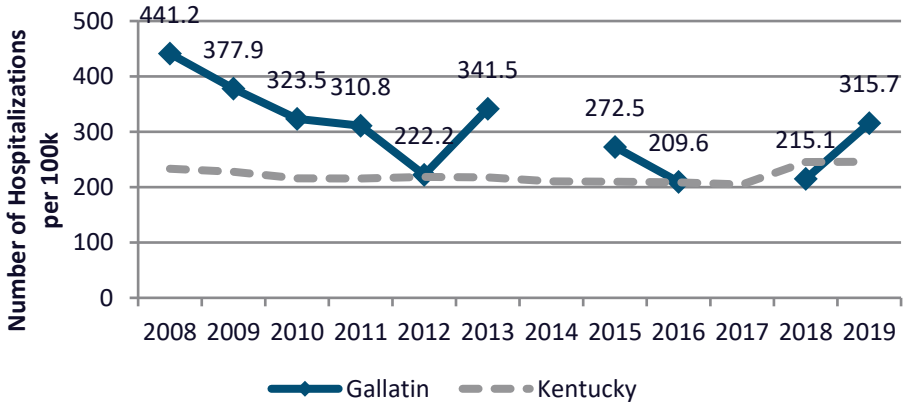
Health Conditions

Heart Attacks

A heart attack or myocardial infarction is a result of reduction or block of blood flow to the heart that results in the damage or death of part of the heart muscle. Coronary Artery Disease (CAD) is the primary cause of myocardial infarction. Coronary Artery Disease is caused by the buildup of plaque and other deposits in the artery(ies) creating narrowing, reducing blood flow and supply to critical body parts/organs.

Heart Attack induced Hospitalizations Age Adjusted[19]

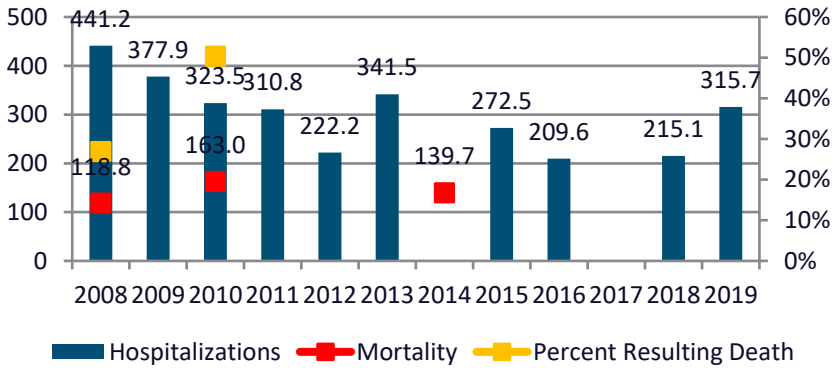
Gallatin County & Kentucky 2008-2019



"Gallatin County has 1.3 times more heart attacks than KY"

Heart Attack induced Hospitalizations & Mortality Age Adjusted

Gallatin County 2008-2019



When overlaying mortality associated with heart attacks in Gallatin County, the percentages of heart attacks resulting in death is low[7].

(Note, years with deaths below a specific threshold are suppressed to protect privacy and are not displayed.)

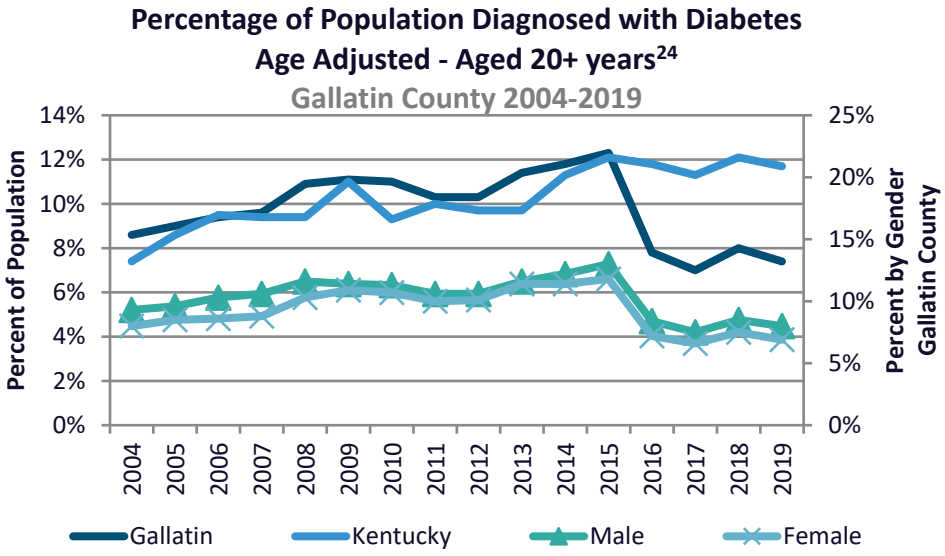
Health Conditions

Diabetes Prevalence

According to the CDC, 37.3 million people have diabetes in the U.S. and 23% are undiagnosed[20]. Diabetes is a chronic life-long disease characterized by high blood sugar resulting in the 7th leading cause of death in the U.S. It is the number one cause of kidney failure, lower-limb amputations and adult blindness[21].

Type 2 diabetes is the most common form of the disease affecting between 90-95% of those diagnosed with diabetes[22]. It may be prevented or delayed with healthy lifestyle changes such as losing weight, eating healthy foods, and being active.

As of 2019, 1 in 14 people in Gallatin County have been diagnosed with diabetes and males have slightly higher rates of diabetes diagnoses than females.



Risks for Pre-Diabetes and type 2 diabetes[23]

- Overweight
- 45 and older
- Parent or sibling with type 2 diabetes
- Physically active less than 3x/week
- Had gestational diabetes
- African American, Hispanic/Latino American, Pacific Islander, American Indian, or Asian American

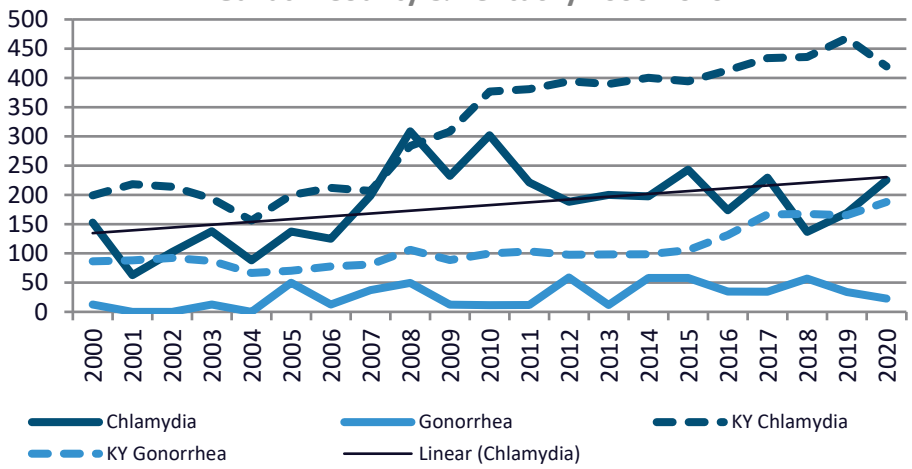
Health Conditions

Sexually Transmitted Infections

Gallatin County has maintained a significantly lower rate of sexually transmitted infections as compared with the state overall. Only in 2008, did the incidence of Chlamydia peak above the state rate. Accordingly, on average Gallatin County is significantly lower, with an eight-year trend of 196.9 as compared to the state average at 376.1 per 100k persons[25]. Gonorrhea incidence also remains significantly lower than the state rate averaging 38.8 cases per 100k[25].

Rate of sexually transmitted infections[25]

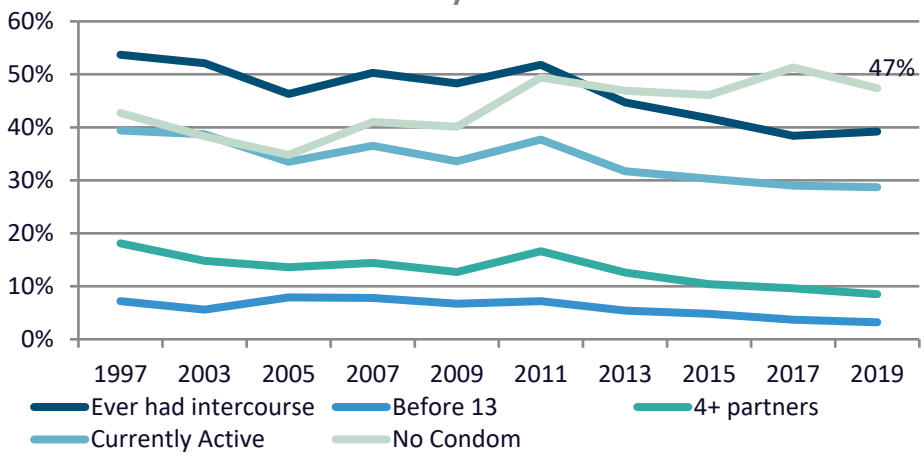
Gallatin County & Kentucky 2000-2020



"47.4% of youths did not use a condom in their last encounter"

Sexually Active High School Youths[26]

Kentucky 1997-2019

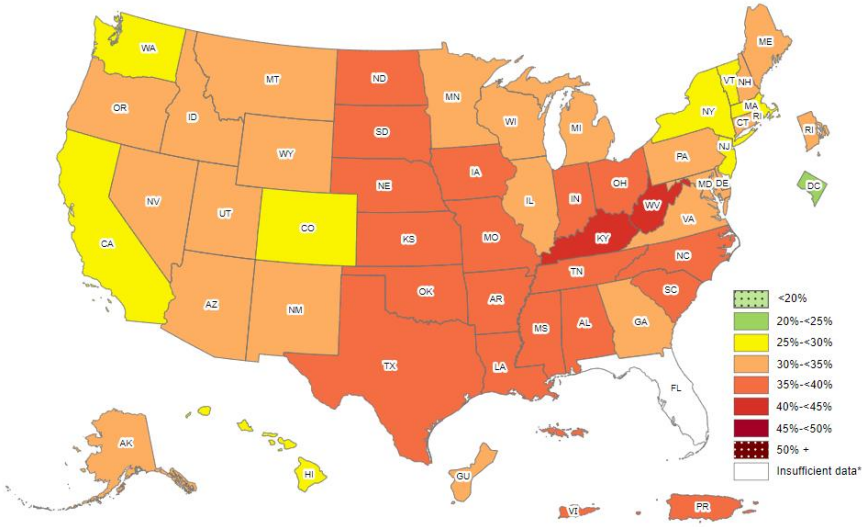


Approximately 40.4% of Kentucky high school students have had at least one sexual encounter[26]. Of those, 7.2% had sexual intercourse with four or more persons and 30.7% are currently sexually active[26].

Health Conditions

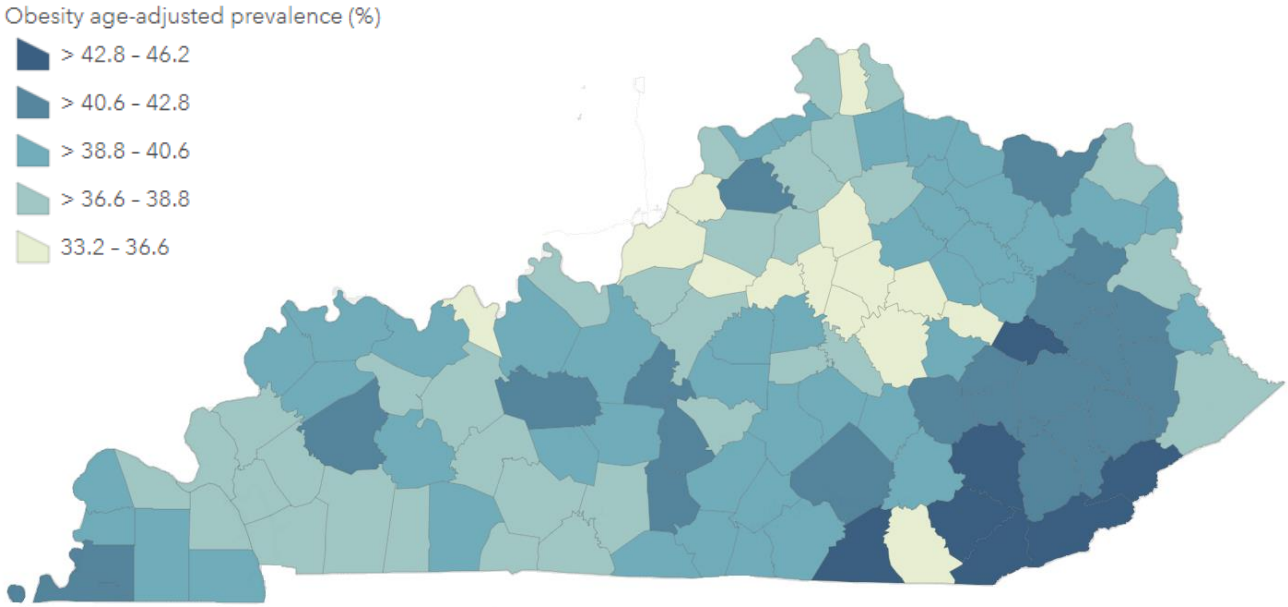
Overweight and Obesity - Adults

Adult obesity is defined as a weight that is higher than what is considered healthy for a person's height. In the years 2021, the adult obesity prevalence was 41.9% of U.S. adults.[27] Kentucky leads the nation in obesity rates with obesity rates averaging 40-45% of the population overall.



"40% of Ky counties have lower obesity rates than Gallatin Co."

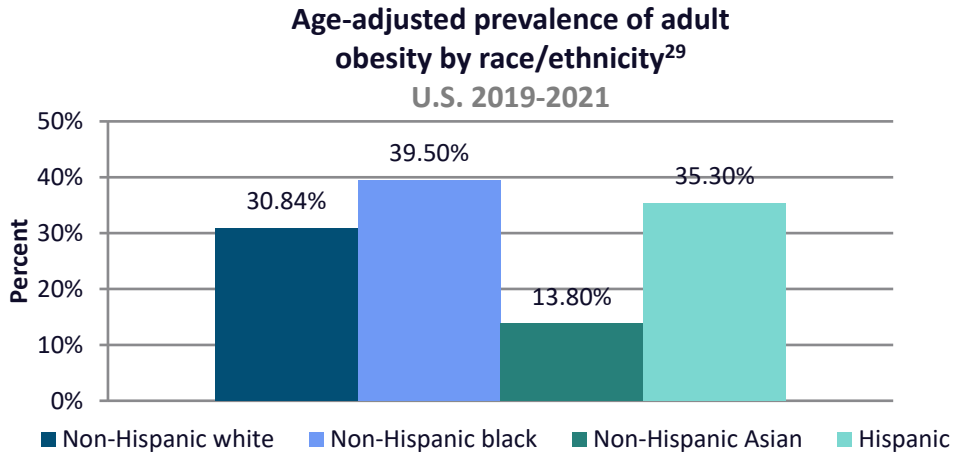
The most recent county level data in Gallatin County reflect obesity rates that align with state prevalence rates at 39.1% of the total population in 2020[28].



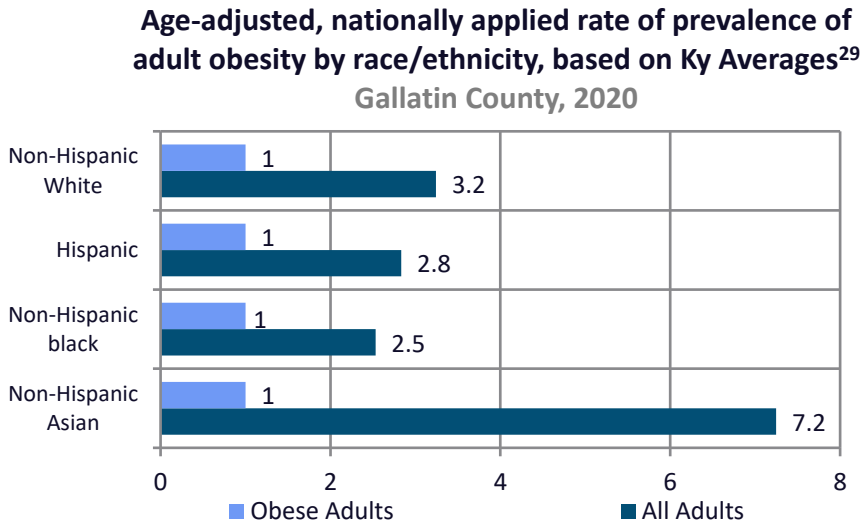
Health Conditions

Overweight and Obesity by Race and Ethnicity

Obesity prevalence affects persons of varying races and ethnicities differently among populations. The prevalence of Self-Reported Obesity, 2019-2021 Behavioral Risk Factor Surveillance System (BRFSS) reflects significant differences in obesity prevalence rates among non-Hispanic, Hispanic, black, white, and Asian populations. Non-Hispanic Asian adults have the lowest obesity prevalence at just 13.8% of the U.S. population as compared with all other races and Hispanic populations[29].



In Gallatin County, 1 in 3.2 White Adults; 1 in 2.8 Hispanic adults; 1 in 2.5 Black adults and 1 in 7.2 Asian adults are obese[29].



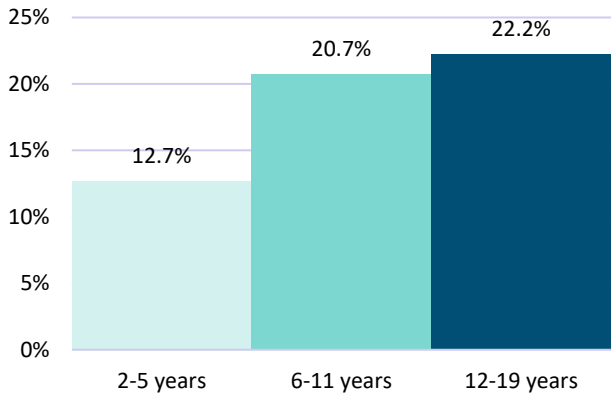
Health Conditions

Childhood Obesity

Childhood overweight is defined as a Body Mass Index (BMI) at or above the 85th percentile and below the 95th percentile for children and teens of the same age and sex. Childhood obesity is defined as a BMI at or above the 95th percentile for children and teens of the same age and sex. The National Health and Nutrition Examination Survey 2017-March 2020 Pre-pandemic, indicates an overall obesity prevalence rate among youth aged 2-19 years of 19.7% in the U.S.[30] The survey also found that obesity rates increased among youth as age increased.

Youth Obesity Rate by Age Group[30]

U.S. 2017-March 2020

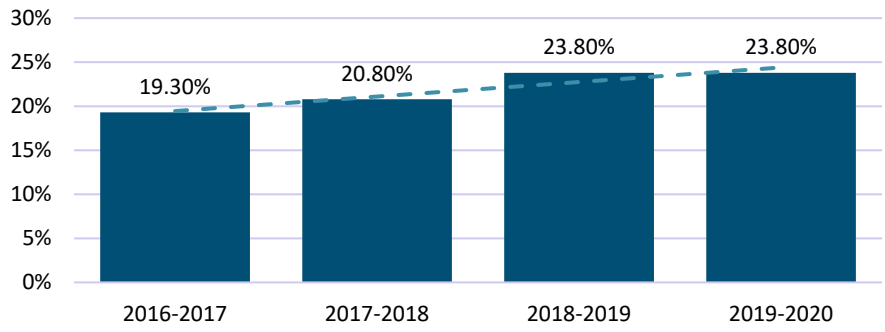


"Recent studies show childhood obesity rates are increasing"

As an attempt to help slow the spread of COVID-19 in Kentucky schools, the last two school years, 2020-2021 and 2021-2022 did not conduct mass health screenings in Kentucky. Therefore, local BMI data for Gallatin County schools is extremely limited and has a very low confidence interval and has not been included in this most recent report. It is worth noting however that the average percent of children considered obese in Kentucky schools for ages 10-17 has increased from 19.3% of the population in the school year 2016-2017 to 23.8% in the school year 2019-2020[31].

Youth Obesity Rate Trends[31]

Kentucky Ages 10-17, 2016-2020

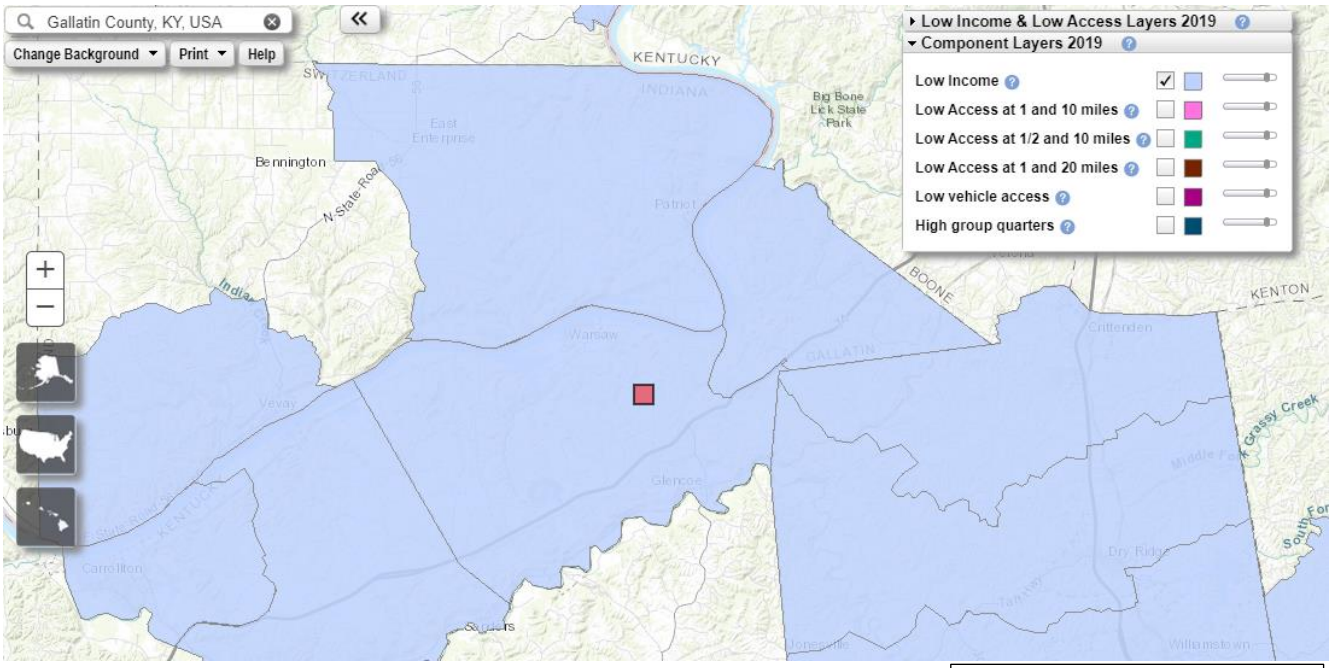


Health Risk Behaviors

Diet

Healthy behaviors such as a healthy diet and regular physical activity contribute to better short term health outcomes, long term health benefits, and the prevention of chronic diseases such as Type 2 diabetes and heart disease.

Factors affecting healthy behaviors related to diet and exercise include access to and availability of healthy foods and opportunities for exercise. Access is limited in populations that are low income, have limited grocery supermarkets, have a high fast-food concentration and lack of access to transportation. The U.S. Department of Agriculture Food Access Research Atlas indicators reveal all of Gallatin County is categorized as low income[32] which can impact access to healthy foods.



Gallatin County is at a significant disadvantage when compared with residents in areas such as Boone, Kenton, Campbell, and Oldham counties that have little to no low-income areas and have much higher rates of grocery stores and full-service restaurants.

Food establishments[33]

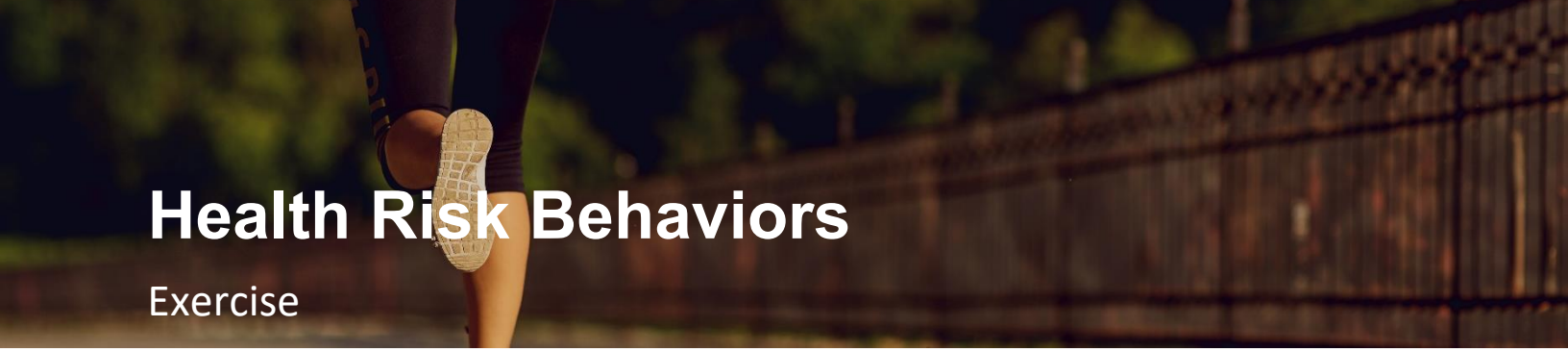
Groceries – 2

Full-Service Restaurant – 4

Fast Food Restaurant – 2

Convenience Stores – 6

Famer's Market – 0



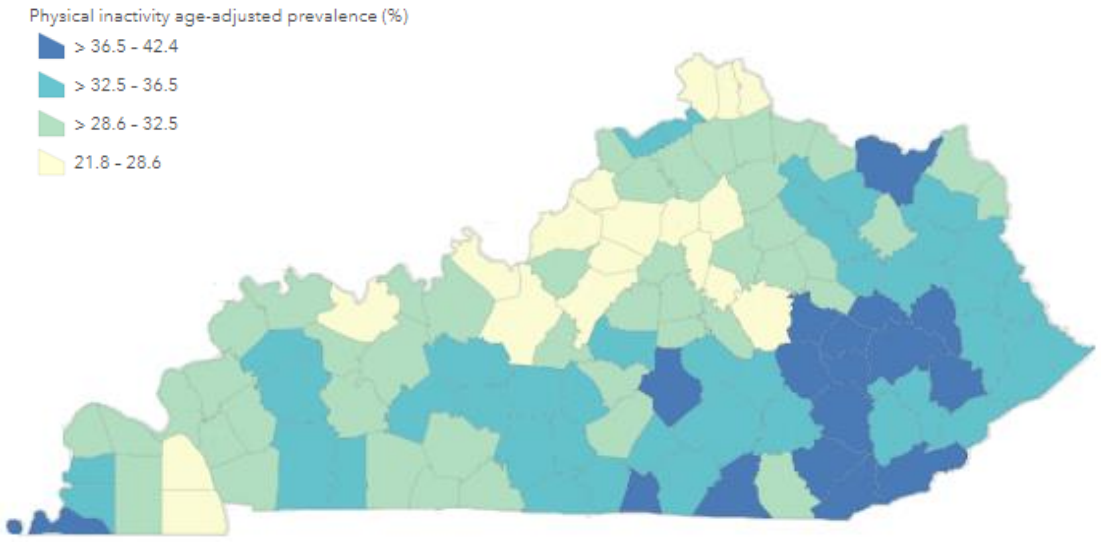
Health Risk Behaviors

Exercise

Physical inactivity is a critical factor in the health status of a population. Exercise has been linked to healthy weight and BMI, reduction in various chronic diseases, normal growth and development, better quality of life, and healthy sleep patterns.

"More than 43% of Gallatin County Residents are inactive"

The CDC U.S. Diabetes Atlas[34] reports Gallatin County has a self-reported "lack of physical activity" that is statistically higher than the state overall indicating they are less physically active than the average Kentuckian. As of 2020, Gallatin County has a physical inactivity rate of 43.3% of the population reporting no leisure time physical activity in the last 30 days[34].



The source of data used in the Atlas includes the BRFSS data which defines physical inactivity as those respondents who answered no to the question "During the past month, other than your job, did you participate in any physical activities or exercises or exercises such as running, calisthenics, golf, gardening, or walking for exercise?"

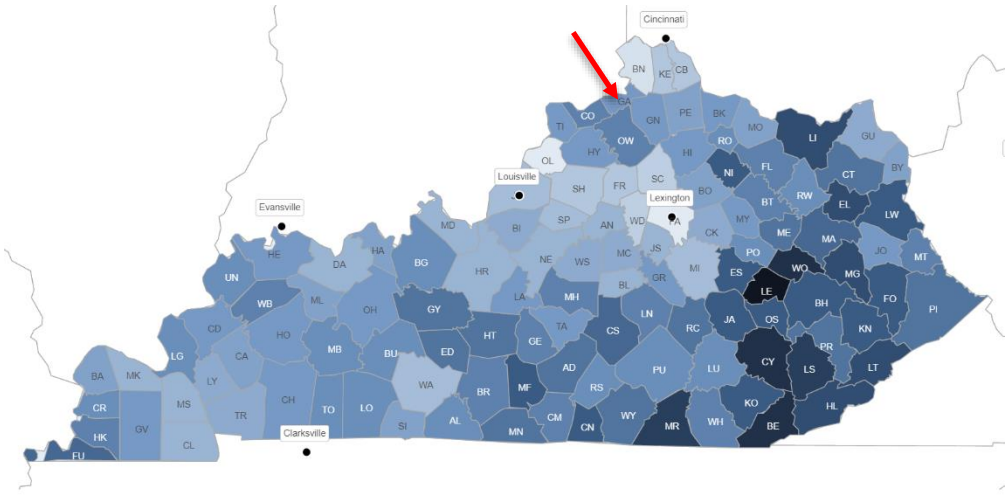
Health Risk Behaviors

Tobacco Use Adults

Smoking remains the single largest leading cause of preventable disease, death, and disability, in the U.S., accounting for more than 480,000 deaths every year, or about 1 in 5 deaths[35]. The Centers for Disease Control and Prevention reports that adult smoking rates have declined in the U.S. from 1 out of nearly every 5[35] adults in 2005 to 1 in 10 as of 2020[36].

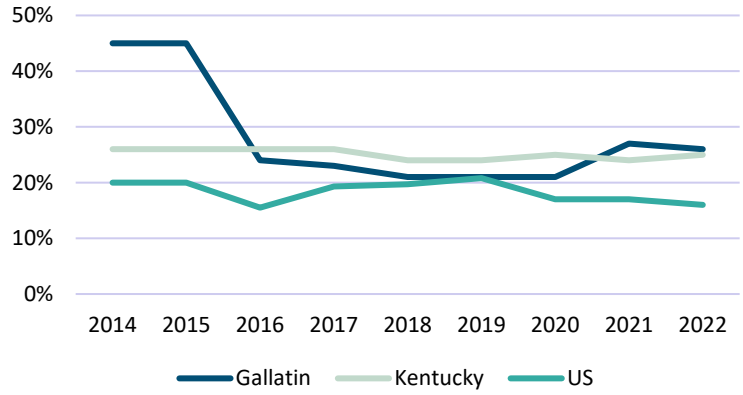
Gallatin County has a significantly higher rate of adults who smoke, with a rate of 26% or 1 in 4 adults[37].

The financial burden of tobacco use is significant, costing the U.S. billions of dollars each year. Comprehensive tobacco policies have demonstrated positive effects on the rates of tobacco use among adults and youth alike, recognizing a 10-15% reduction in smoking prevalence where comprehensive tobacco policies have been in place for eight years. (The Journal of Public Health Management and Practice, The Impact of Implementing Tobacco Control Policies: The 2017 Tobacco Control Policy Scorecard).



Adult Smoking Trends[37]

Gallatin County, Kentucky, Us 2014-2022[22]



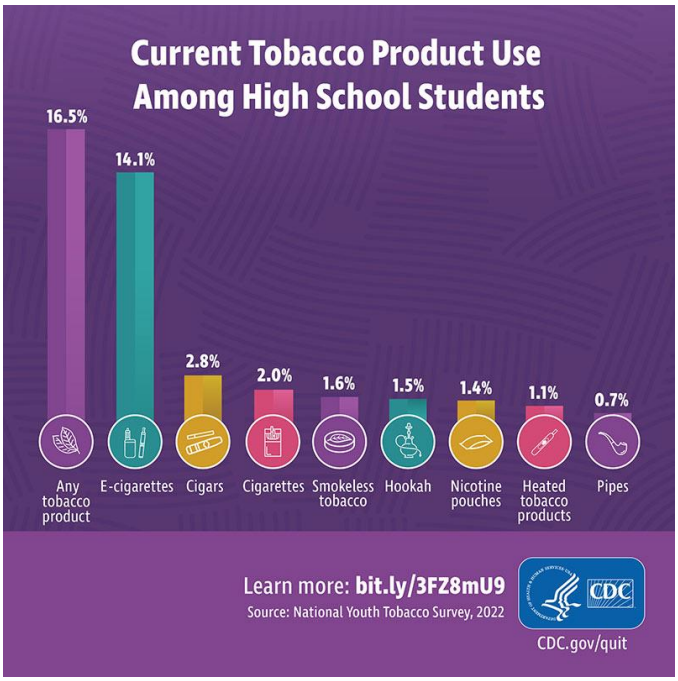
Health Risk Behaviors

Tobacco Use Adolescents

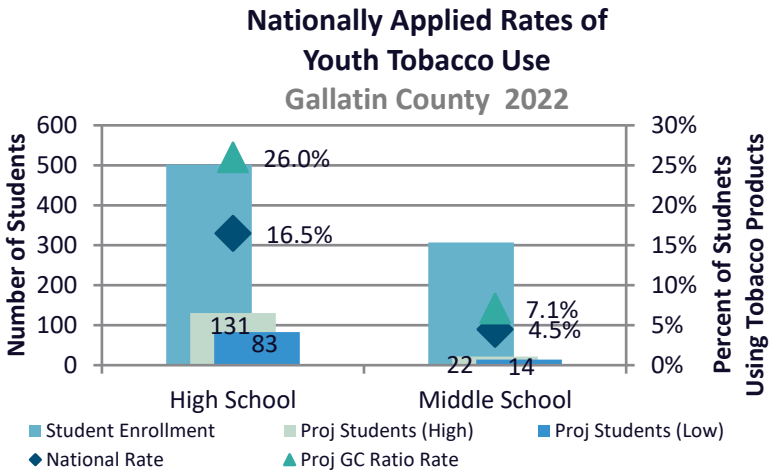
The Centers for Disease Control and Prevention reports that 1 in 4 High School Students used some form of tobacco product in 2022 with the greatest percentage of those using e-cigarettes in the past 30 days at 14.1%[38].

"As many as 1 in 6 HS students report using Tobacco"

Today, girls are more likely to report using of some tobacco product in the last 30 days than boys, a shift since 2018 when more boys reported use than girls, with E-Cigarettes representing 15.4% of tobacco use in girls[38]. The same survey had similar findings in middle school students reporting use of some form of tobacco product with most of these using e-cigarettes (4.1%)[38].



Assuming similar applied ratios of tobacco use in the youth population as compared with national averages, middle and high school use could be as high as 1 in 12 or as low as 1 in 22 for middle school students and as high as 1 in 3 or as low as 1 in 6 for high school students in Gallatin County.



Health Risk Behaviors

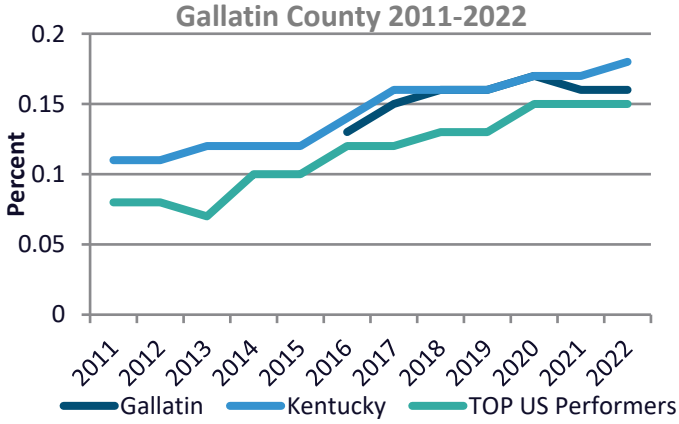
Alcohol Use

In the years 2015-2019 excessive alcohol use was responsible for more than 140,000 deaths in the U.S. each year, or more than 380 deaths per day[39]. In Kentucky, men with alcohol related deaths were nearly four times more likely to have chronic alcohol abuse than women[40].

According to the BRFSS survey results as reported in the 2022 County Health Rankings, Gallatin County has an average number of adults reporting binge or heavy drinking in the last 30 days compared with the state overall[41]. It should be noted that data prior to 2016 is not available for Gallatin County.

Percent of Adult Population Self-Reporting Excessive Drinking[41]

Gallatin County 2011-2022



Excessive or heavy drinking is associated with short and long term health effects including: injuries such as motor vehicle crashes, falls, drownings, and burns; violence including homicide, suicide, sexual assault, and intimate partner violence; alcohol poisoning, risky sexual behaviors including unprotected sex with multiple partners which can result in unwanted pregnancies or sexually transmitted diseases including HIV; and miscarriage or still birth, or fetal alcohol spectrum disorders among pregnant women.

Excessive alcohol use includes binge drinking, heavy drinking, any alcohol use by persons under 21 years and alcohol used by pregnant women.

Binge drinking is defined as 5 or more drinks consumed on a single occasion for men and 4 or more for women, generally within about 2 hours.

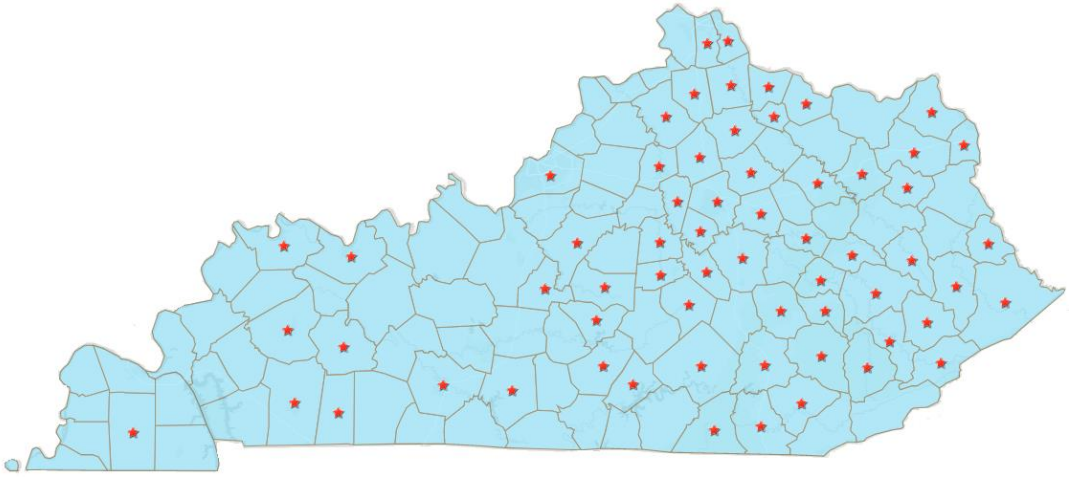
Heavy drinking is defined as men who consume 15 drinks or more per week and women who consume 8 drinks or more per week.

Long term health risks include high blood pressure; heart disease, stroke, liver disease, and digestive problems; cancer of the breast, mouth, throat, esophagus, liver, and colon; learning and memory problems including dementia; mental health problems including depression and anxiety; social problems including lost productivity, family problems and unemployment; alcohol dependence or alcoholism.

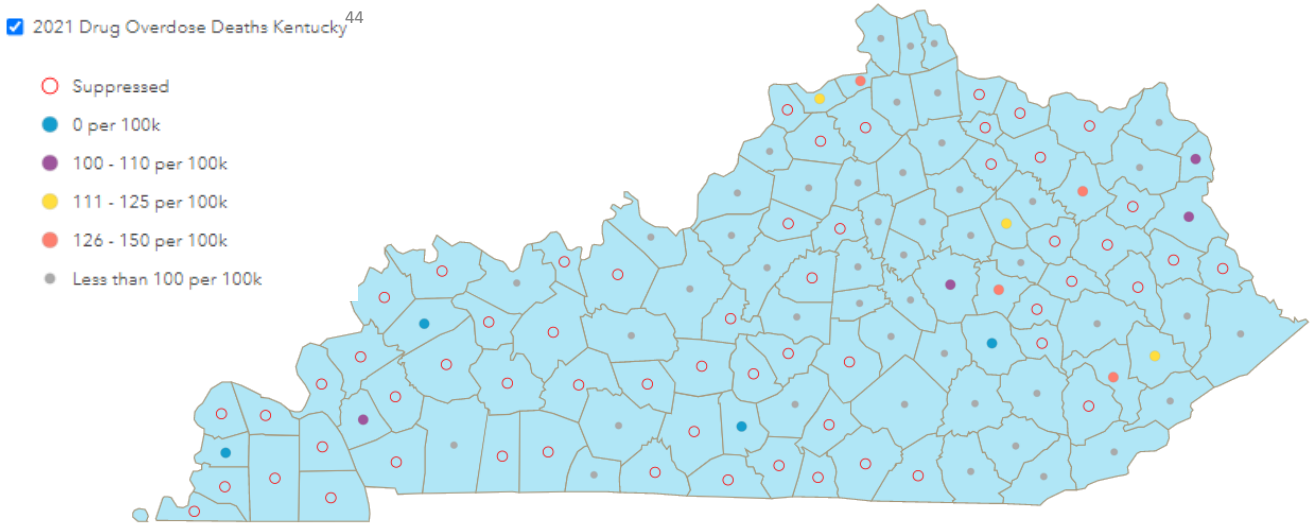
Health Risk Behaviors

Recreational Drug Use/Abuse

Gallatin County has been ranked 108th for the most vulnerable counties in the nation at risk for an outbreak of HIV and/or Hepatitis C (HEP C)[42] among persons who inject drugs. Of the 120 counties in Kentucky, 36 are ranked in the top 100 at risk, and 54, or nearly half, are in the top 220 counties across the nation identified at risk[42]. One of the primary objectives of the Hep C Elimination Plan in Kentucky is to increase and improve equitable access to harm reduction services across social and demographic areas particularly among people who use drugs. Along the I-71 corridor from Northern Kentucky to Jefferson County, there are no Syringe programs until you arrive in the Louisville area[43].



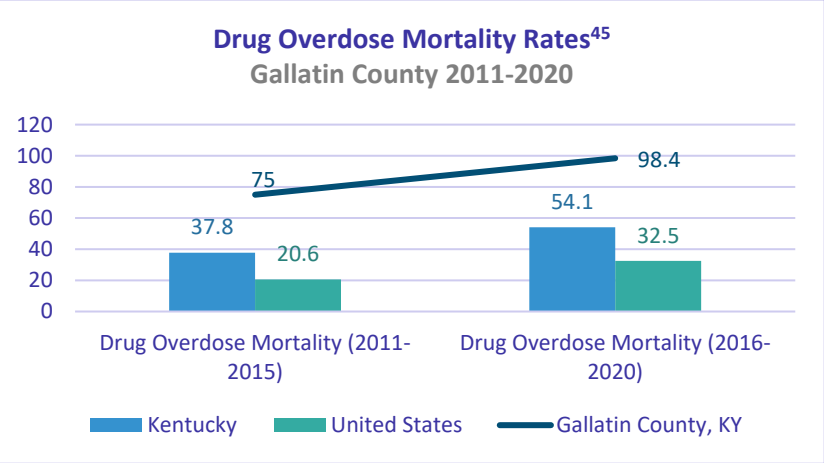
According to the 2021 Kentucky Drug Overdose Deaths Report, Gallatin County had an age adjusted mortality rate of 145.89 per 100,000 persons[44].



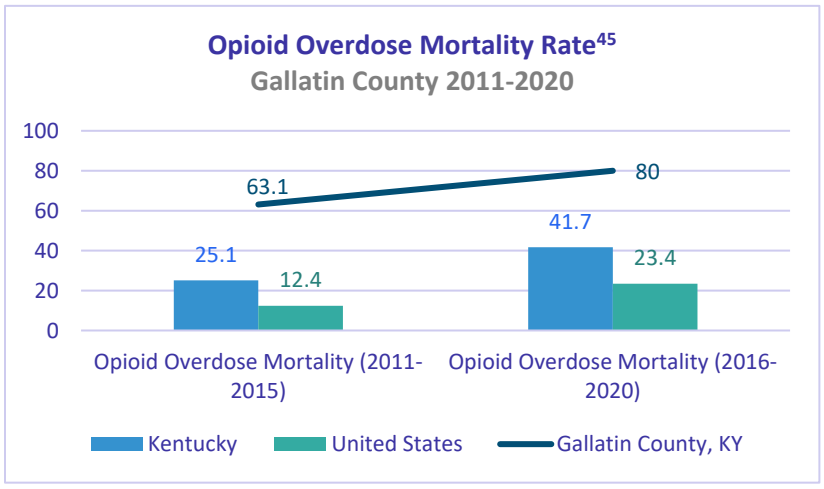
HEALTH RISK FACTORS

Overdose Mortality

In Gallatin County, deaths associated with drug overdose rates increased 31.2% from 75 to 98.4 per 100k, between the 2011-2015 and 2016-2020 time periods[45]. Compared with the Commonwealth and the U.S. Gallatin County mortality from drug overdoses is significantly higher than the Commonwealth and U.S. with the national and Commonwealth rates at 32.5and 54.1 respecrtively[45].



Deaths from opioid specific overdoses also increased significantly, representing a 26.78% increase between the 2011-2015 and 2016-2020 time periods[45]. Concurrently, rates for opioid specific drug overdose deaths in the Commonwealth and U.S. also both increased during the same time period as Gallatin County[45].



Environmental Factors

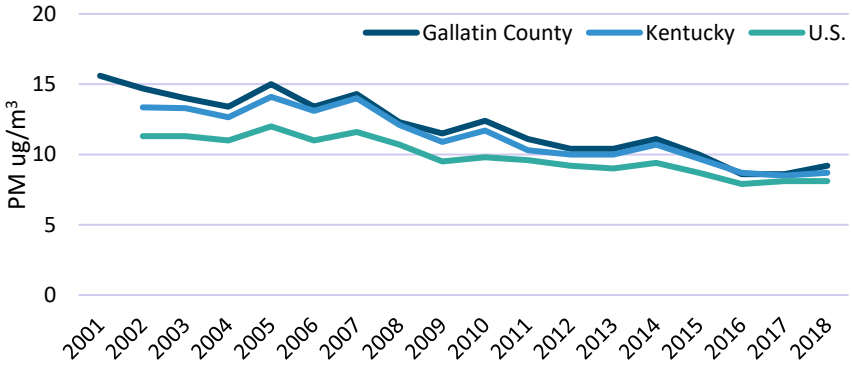
Air Particulate Matter

Per the CDC, Environmental Public Health Tracking Network, air pollution poses a public health threat affecting potentially millions of people throughout the U.S.[46] Pollution such as dust, dirt, soot, and smoke are one kind of air pollution called fine particulate matter (FPM). Sources of FPM include forest fires, power plants, industries, and automobiles. FPM is associated with compromised health and may lead to breathing problems, worsening of asthma symptoms and/or worsening of some heart conditions, as well as increased low birth weight[47].

Decreased lung function, chronic bronchitis, asthma, and adverse pulmonary effects are common in populations exposed to high levels of FPM. Long term exposure is associated with premature death of people aged 65 and older even when exposure is at levels below the National Standards[48]. Since 2001 FPM rates in Gallatin County have decreased by 41% to 9.2 PM ug/M^3 in 2018[49].

Fine Particulate Air Matter[49]

Gallatin County, Kentucky, U.S. 2001-2018

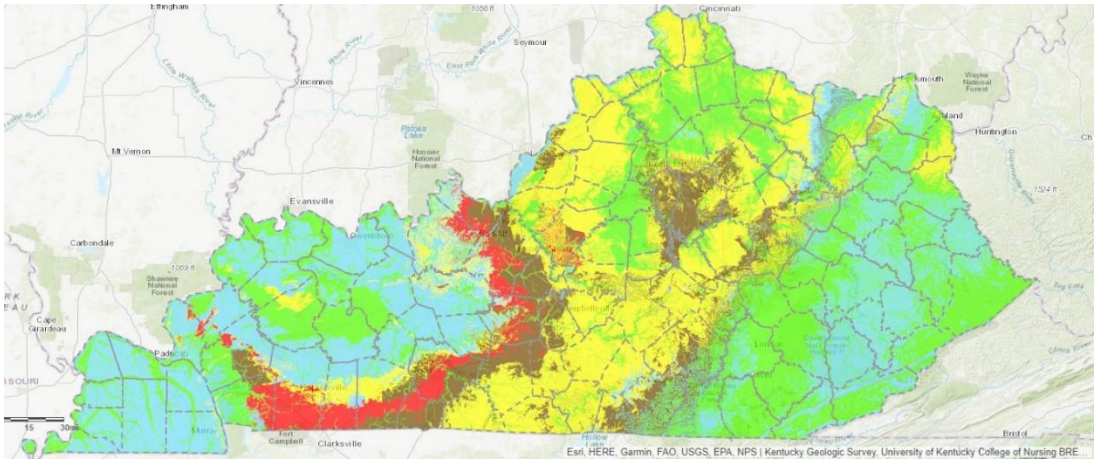


Rates below 12 Ug/m^3 are considered acceptable according to the U.S. Environmental Protection

Environmental Factors

Radon

Radon is a gas formed naturally in the environment with the breakdown of radioactive metals. People are always exposed to radon because it comes from the earth, but some areas have higher concentrations of the gas than others. The gas can enter your home through cracks and gaps. Kentucky has an average radon level of 5.4 picocuries per liter of air (pCi/L)[50]. The Environmental Protection Agency indicates remediation should be taken for levels exceeding 4pCi/L in a home[51]. Higher radon levels are associated with increased risk of lung cancer and is the second leading cause of all lunger cancers in the U.S.

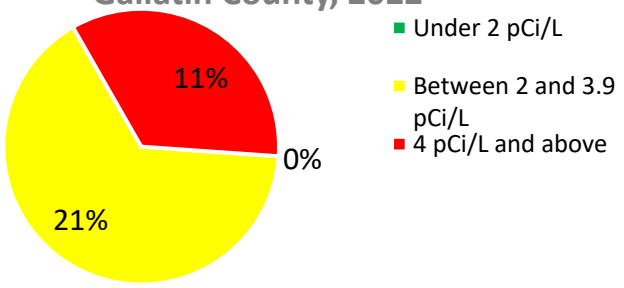


"Gallatin Co. average radon levels for homes tested is 3.9pCi/L"

Of the homes tested, the average indoor radon level is 3.9 pCi/L as compared to 1.3pCi/L nationally[52]. Gallatin County homes have higher indoor radon levels than the nation. Of the homes measured in Gallatin County, 11% have radon levels of 4pCi/L or higher. More than half of the homes in Gallatin County have insufficient data to measure levels[52].

Indoor Radon Levels measured in pCi/L[52]

Gallatin County, 2022



End Notes

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Appendix A

ICD10	Tobacco Association	Alcohol Association
C34.9	https://pubmed.ncbi.nlm.nih.gov/16100660/	https://www.livescience.com/27259-alcohol-causes-cancer-deaths.html
I21.9	https://www.ncbi.nlm.nih.gov/books/NBK53012/	
J44.9	https://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/index.htm	
I25.1	https://www.ncbi.nlm.nih.gov/books/NBK53012/	
I50.0	https://www.ncbi.nlm.nih.gov/books/NBK53012/	
V89.2		https://www.cdc.gov/motorvehiclesafety/impaired_driving/impaired-drv_factsheet.html#statistics
C50.9		https://www.livescience.com/27259-alcohol-causes-cancer-deaths.html
X44		CDC wonder calculated by # of deaths caused by drug and alcohol induced from total poisoning deaths
A41.9		
C18.9		https://www.livescience.com/27259-alcohol-causes-cancer-deaths.html
J18.9		
X70/X74		
X42		CDC wonder calculated by # of deaths caused by drug and alcohol from total poisoning deaths
E14.9		
J44.0	https://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/index.htm	
K70.3		
C80		
J43.9	https://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/index.htm	
I64	https://www.ncbi.nlm.nih.gov/books/NBK53012/	
I11.9	https://www.ncbi.nlm.nih.gov/books/NBK53012/	
C25.9		https://www.livescience.com/27259-alcohol-causes-cancer-deaths.html
C92		
C64	https://www.cancer.net/cancer-types/kidney-cancer/risk-factors-and-prevention#:~:text=Smoking.,Gender.	
I46.9		