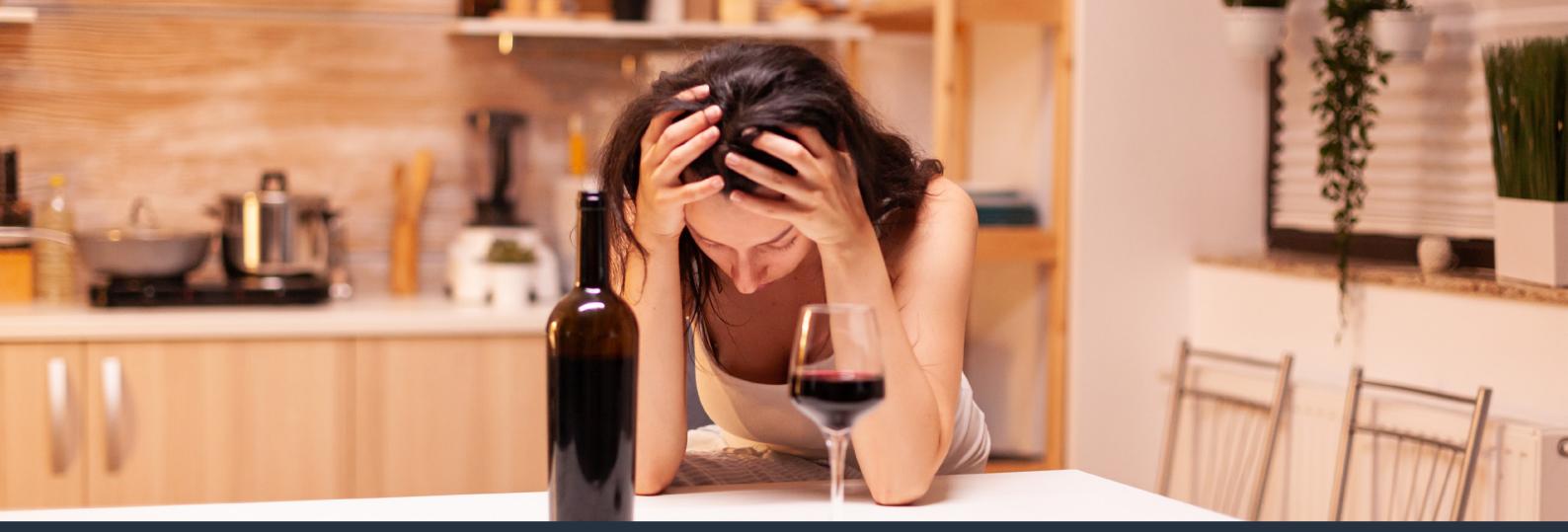




# REGIONAL TRENDS OF ALCOHOL USE AND CONSEQUENCES IN INDIANA





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In the United States, alcoholic beverages are consumed by men and women of varying ages. The legal age to consume alcohol in the United States is 21 years of age; however, the 2019 National Survey on Drug Use and Health (SAMHSA, 2020) found that over 85 percent of adults 18 years and above reported alcohol consumption at some point. In 2019, at least 25.8 percent and 6.3 percent of adults reported engaging in binge drinking and heavy drinking, respectively, in the past month (NIH, 2021). Alcohol misuse is associated with approximately 88,000 deaths per year in the United States (NIH, 2021). According to the NSDUH, nearly 15 million (9 million men and 5.5 million women) people ages 12 and older had Alcohol Use Disorder (AUD) in 2019. An estimate suggests that over 400,000 adolescents had AUD from ages 12 to 17. Current data indicate the prevalence of underage alcohol

use consists of 7 million individuals between 12 to 20 (SAMHSA, 2021). The high use of alcohol in adults accounted for almost \$250 billion in sales in 2019, and these sales have steadily increased every year (Statista, 2021).

This report presents the trend of alcohol use and consequences by regions in Indiana. We use data sources such as the National Survey of Drug Use and Health (NSDUH), County Health Rankings (CHR), Indiana Youth Survey (INYS), and Indiana Department of Education (IDOE). Data from close to three time periods – 2010, 2015, and 2018 (the latest available year for regional data) were used from NSDUH and CHR. In INYS, due to different regional definitions for prior years, 2018 was chosen as the newest year for comparison purposes. For data from IDOE, we use school year 2019-2020 as the latest year.

## ALCOHOL CONSUMPTION

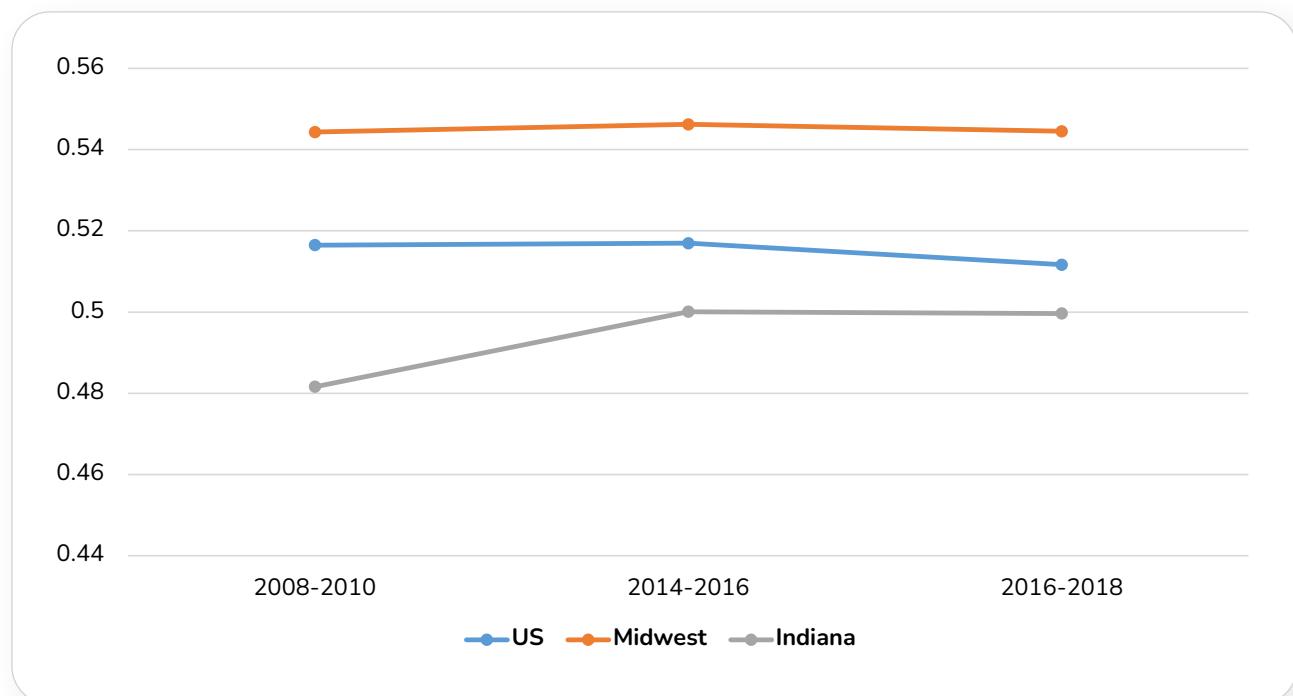
The following sections will present the regional trends of alcohol use and abuse among the general population and youth

### Alcohol use among overall population

While alcohol use in the past month of individuals 12 or older has remained relatively stagnant in the

U.S. and Midwest over time, Indiana experienced an increase of almost two percentage points in monthly alcohol use between 2008 and 2018 (See Figure 1). Although Indiana alcohol use increased the most during this period, the percentage of the population using alcohol in the state was lower than both the U.S. and the Midwest at 49.97 percent.

**Figure 1 Alcohol Use in the Past Month Among Individuals Aged 12 or Older (NSDUH)**



**Table 1 Indiana Alcohol Use in the Past Month among Individuals Aged 12 or Older, by Geographic Area (NSDUH)**

Region	2008-2010	2014-2016	2016-2018	Trends
Indiana	48.16%	50.01%	49.97%	↗
Central	48.51%	52.78%	51.59%	↗
East	39.52%	43.92%	48.60%	↗
North Central	51.48%	48.34%	50.23%	↘
Northeast	49.24%	52.20%	48.26%	↗
Northwest	49.33%	51.07%	51.16%	↗
Southeast	44.98%	46.43%	45.84%	↗
Southwest	43.67%	49.66%	48.37%	↗
West	53.84%	50.75%	52.10%	↘

Note: Regions defined by NSDUH are as follows:

**Central** = Boone, Hamilton, Hancock, Hendricks, Johnson, Marion, Morgan, Shelby.

**East** = Blackford, Delaware, Fayette, Grant, Henry, Jay, Madison, Randolph, Rush, Union, Wayne.

**North Central** = Cass, Elkhart, Fulton, Howard, Kosciusko, La Porte, Marshall, Miami, St. Joseph, Tipton, Wabash.

**Northeast** = Adams, Allen, DeKalb, Huntington, LaGrange, Noble, Steuben, Wells, Whitley.

**Northwest** = Jasper, Lake, Newton, Porter, Pulaski, Starke.

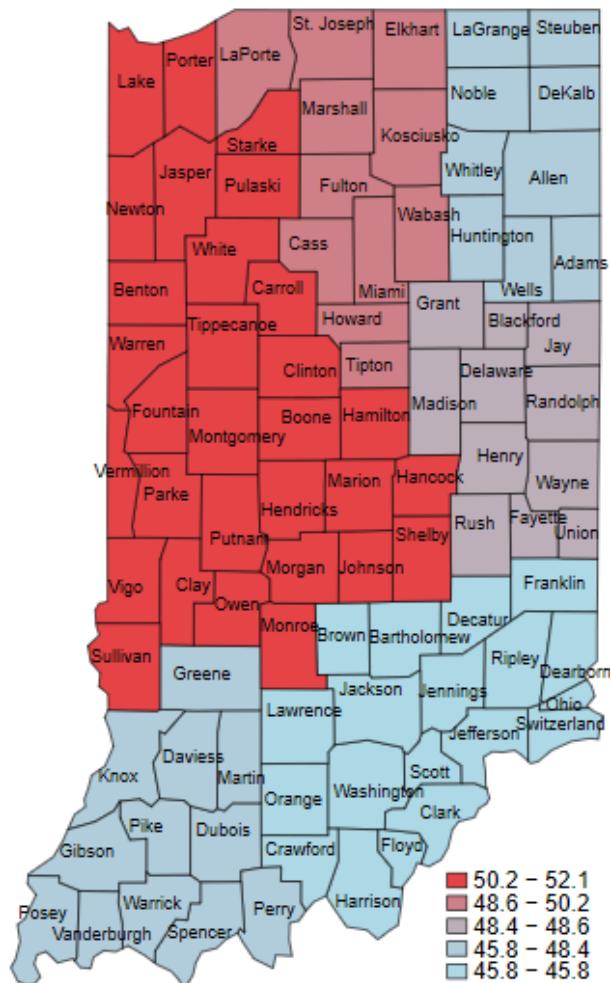
**Southeast** = Bartholomew, Brown, Clark, Crawford, Dearborn, Decatur, Floyd, Franklin, Harrison, Jackson, Jefferson, Jennings, Lawrence, Ohio, Orange, Ripley, Scott, Switzerland, Washington.

**Southwest** = Daviess, Dubois, Gibson, Greene, Knox, Martin, Perry, Pike, Posey, Spencer, Vanderburgh, Warrick.

**West** = Benton, Carroll, Clay, Clinton, Fountain, Monroe, Montgomery, Owen, Parke, Putnam, Sullivan, Tippecanoe, Vermillion, Vigo, Warren, White.

Five out of eight regions in Indiana experienced an increase in monthly alcohol usage between 2008 and 2018 (See Table 1). Despite a boost during the period, the Southeastern region had the lowest percentage of alcohol use at 45.84 percent. The region with the most significant rate of alcohol use was the Western region, even though it experienced a decrease over time. The range between these two regions was 6.26 percent. Map 1 shows the regional distribution of alcohol use in 2018

**Map 1 Indiana Alcohol Use in the Past Month among Individuals Aged 12 or Older (NSDUH)**



## Alcohol Use Disorder Among Overall Population

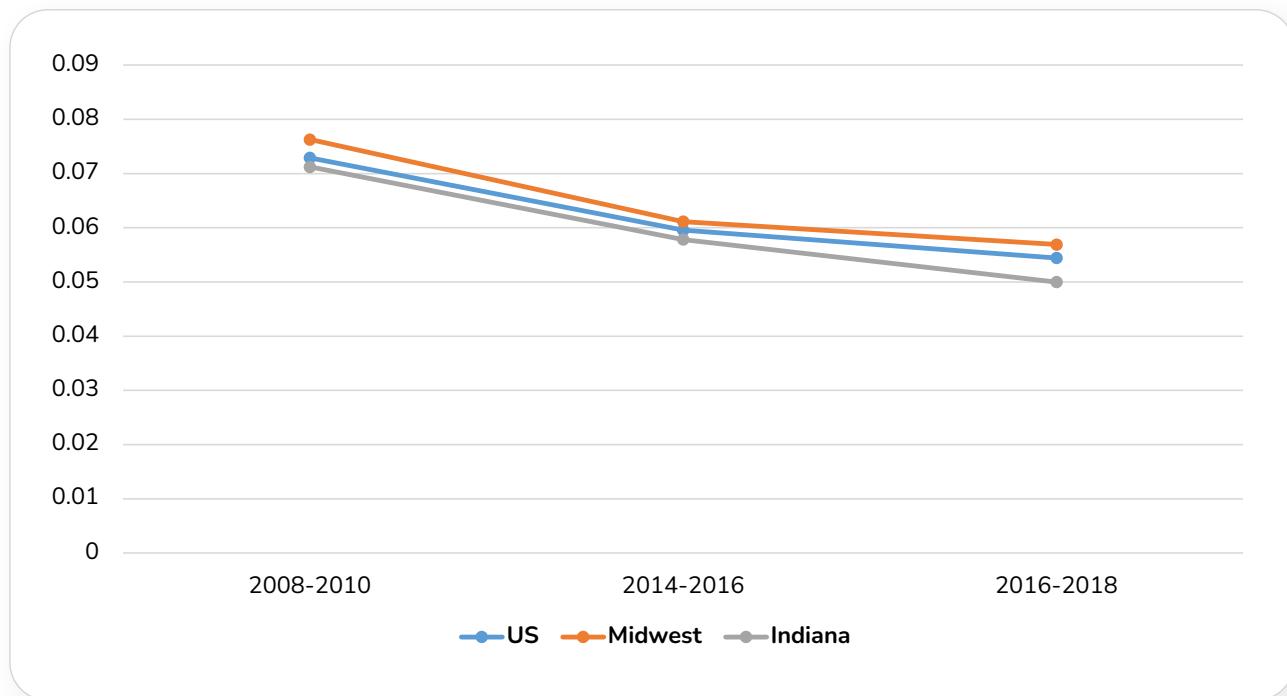
Alcohol abuse varies among adults and the potential factors leading to abuse could include genetics, psychological, physiological, and social factors. The widespread social acceptance of alcohol use has contributed to more accessible access to alcohol. Adult males are more likely to abuse alcohol than female counterparts, and adults aged 18-22 had reported the highest rates of excessive alcohol use (NIAAA, 2022). The risk for alcohol abuse increases with drinking at an early age, family history of alcohol use, and mental health conditions. Individuals with higher impulsivity were also more likely to abuse alcohol and other drugs (Gowin et al., 2017). Economic status and education levels can determine the risk for alcohol abuse, as those with lower financial status and education tend to abuse alcohol more often (Calling et. al., 2019).

A study by Sterling et al. evaluated the association between medical conditions and alcohol

consumption in 2.7 million patients. Results suggest that patients with diabetes (odds ratio [OR], 1.11; 95% CI, 1.08-1.15), chronic obstructive pulmonary disease (COPD; OR, 1.16; 95% CI, 1.10-1.22), and hypertension (OR, 1.22; 95% CI, 1.09-1.13) had higher odds of exceeding daily limits of alcohol consumption. In addition, the patients with COPD, chronic liver disease, and hypertension were more likely to exceed daily and weekly limits (Sterling et. al., 2020). The literature suggests that a positive history of alcoholism in the family strongly correlates with binge drinking. In addition, alcohol consumption has been shown to have a genetic heritability ranging from 0.4 and 0.6 (Agrawal et al., 2008; Courtney and Polich, 2009; Heath et al., 1999; Kendler et al., 2013; Schuckit et al., 2001; Warner et al., 2007)

The following section will present the trends in alcohol use disorder for the Indiana state and region. NSDUH defines alcohol use disorder as a chronic lapsing brain disease and combines alcohol abuse and dependence.

## Figure 2 Alcohol Use Disorder in the Past Year among Individuals Aged 12 or Older, by Geographic Area (NSDUH)



Region	2008-2012	2014-2016	2016-2018
US	7.29%	5.96%	5.44%
Midwest	7.63%	6.11%	5.69%
Indiana	7.12%	5.78%	5.00%

The trends in alcohol use disorder among the U.S., the Midwest, and Indiana are the same (Figure 2). There is an overall decrease in alcohol use disorder in all of these geographic areas in the period from 2008 to 2018, and the decrease is more dramatic in the first half of this period. Relative to the nation

and the rest of the Midwest, Indiana has the lowest population percentage reporting alcohol use disorder in the past month at 5 percent in 2018. This could be as a result of decline in relative alcohol use since 2014 and lower number of individuals reporting alcohol dependence or abuse.

**Table 2 Indiana Alcohol Use Disorder in the Past Year among Individuals Aged 12 or Older, by Geographic Area, NSDUH**

Region	2008-2012	2014-2016	2016-2018	Trends
Indiana	7.12%	5.78%	5.00%	\\
Central	6.84%	5.63%	4.92%	\\
East	6.64%	5.86%	4.85%	\\
North Central	7.20%	5.31%	4.96%	\\
Northeast	7.23%	5.90%	5.10%	\\
Northwest	7.20%	5.52%	4.94%	\\
Southeast	6.64%	5.68%	4.33%	\\
Southwest	6.80%	5.48%	4.69%	\\
West	8.61%	7.13%	6.16%	\\

Between 2008 and 2018, all regions in Indiana saw a decrease in alcohol use disorder (Table 2). The Western region continues to have the highest percentage of alcohol use disorder despite undergoing the largest drop over the period from 8.61 percent in 2008 to 6.16 percent in 2018. The higher incidence in western region could be due to the presence of more rural counties in the region. According to NSDUH, the underage alcohol use and youth binge drinking are higher in non-metro areas relative to metro areas. Further, lack of access to treatment centers may also be contributing to those outcomes. Alcohol use disorder in the Eastern region, on the other hand, decreased only 1.79 percent over time, the least of all areas in Indiana. Map 2 shows the regional distribution of alcohol use disorder in 2018.

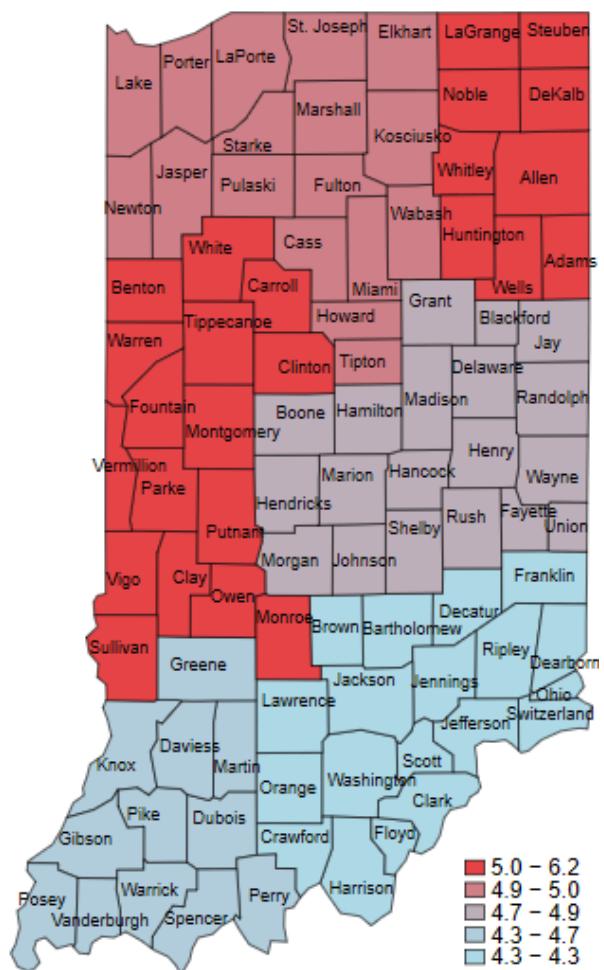
#### **Excessive Drinking Among Overall Population**

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines excessive alcohol

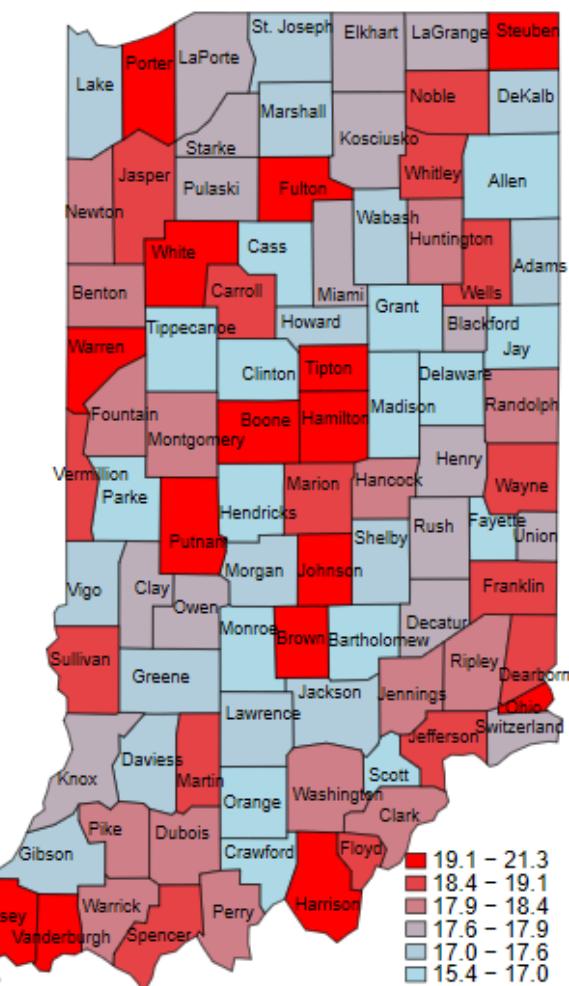
use or heavy drinking as more than four drinks a day or 14 drinks a week for men, and more than three drinks a day or seven drinks per week for women. Daily heavy drinking or binge drinking is defined by the Substance Abuse and Mental Health Services Administration (SAMHSA) as drinking five or more alcoholic drinks for males, or four or more alcoholic drinks for females, at the same time or within a couple of hours of each other at least once in the past month (NIH, 2018). Binge drinking is the most common pattern of excessive alcohol use in the United States and most commonly leads to alcohol dependence (CDC, 2022).

Map 3 shows the county distribution of the share of the population who excessively drink from County Health Rankings (CHR) in 2018. CHR defines excessive drinking as share of adults reporting binge or heavy drinking and estimate county-level using data from CDC's Behavioral Risk Factor Surveillance System (BRFSS).

**Map 2 Indiana Alcohol Use Disorder in the Past Year among Individuals Aged 12 or Older, (NSDUH)**



**Map 3 Percent Excessive Drinking, County Health Rankings**



**Table 3 Percent Excessive Drinking, by Region, (CHR)**

NSDUH Region	2008-2012	2015	2018	Trends
Central	17.37	17.5	18.62	↗
East	11.9	16.09	17.27	↗
North Central	15.2	16.45	17.81	↗
Northeast	16	17.33	17.88	↗
Northwest	19.4	17.16	18.5	↘
Southeast	15.53	16.31	18.05	↗
Southwest	15.90	17	18.16	↗
West	15.53	16.93	18	↗
Indiana	16	17	19	↗

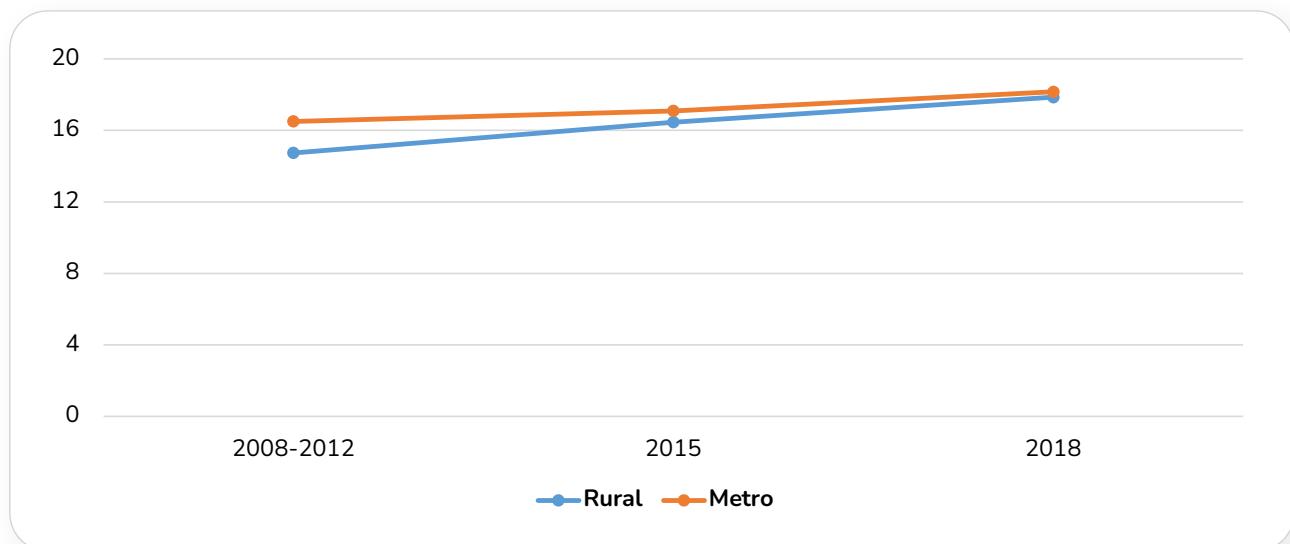
Excessive drinking in Indiana increased by three percentage point between 2008 and 2018. During this ten-year period, excessive drinking only decreased in Northwest region (Table 3). The percent of excessive drinking increased in all other regions of Indiana. East region saw the largest increase in excessive drinking with a growth of 5.2 percentage points.

### Excessive Drinking by Rural vs Urban Locations

Rates of alcohol use and related outcomes vary with geographical location. The prevalence of binge drinking is highest among midwestern and northern areas of the United States, and southern regions reported the lowest prevalence of binge

drinking (CDC, 2022). The data from NSDUH showed that the western United States had the highest 12-month rate of AUD at 8.0 percent, followed by Midwest (7.7 percent), Northeast, and the southern United States (Dixon and Chartier, 2016). California incurred the most costs associated with excessive drinking, while Indiana reported in the middle (CDC, 2022). Population size and density contribute to the overall cost of excessive alcohol; urban/metropolitan area residents reported higher rates of lifetime alcohol use. Metro drinkers were also more likely to report heavy alcohol consumption than rural areas; however, the risk factors leading to alcohol use stayed similar among metro and rural residents in the United States (Dixon and Chartier, 2016).

**Figure 3 Percent Excessive Drinking, Rural versus Metro, CHR**



	2008-2012	2015	2018
Rural	14.74	16.46	17.85
Metro	16.5	17.09	18.16
Indiana	16	17	19

Although the trend in excessive drinking in both rural and metro counties in Indiana is increasing, trends of rural counties are experiencing a steeper change. Between 2008 and 2018, the percentage gap in excessive drinking between rural and metro counties in Indiana decreased from 1.8 percent to 0.3 percent (Figure 3). Despite this, rural counties still have less

excessive drinking on average than metro counties as of 2018.

### Youth Alcohol Use

Underage drinking is classified as persons under the minimum drinking age of 21 years old in the United States (CDC, 2021). Research suggests that heavy alcohol use can affect adolescent

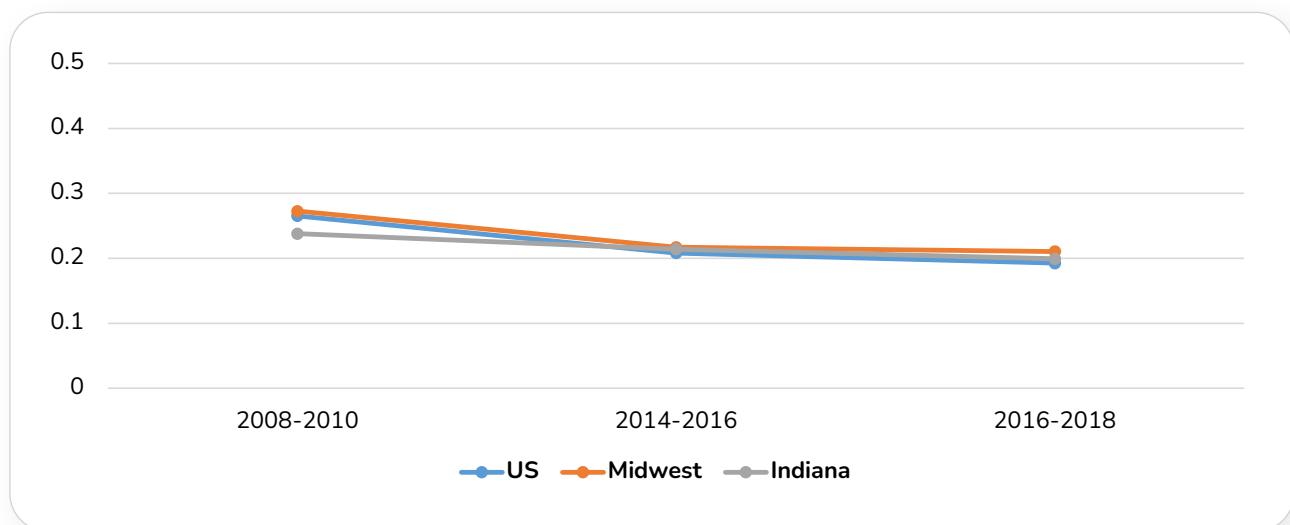
brain development and increase the risk of severe alcohol abuse in adulthood (Bonnie and O'Connell, 2004). In addition, several factors contribute to underage drinking, including peer pressure, increased independence, and access to alcohol in the home (NIH, 2006).

The National Survey on Drug Use and Health (NSDUH) suggests that approximately nine percent of adolescents had at least one drink in the past 30 days. Risk factors contributing to youth drinking can be grouped into internal factors (specific to an individual) and external (dependent on the environment). Genetics continues to be an undeniable link to drinking. A meta-analysis of 145 studies (approximately 8,050 patients) highlighted the role of allelic variations of the serotonin transporter gene (5 HTTLPR) and alcohol dependence. Results suggest an association between alcohol dependence and the presence of at least one short allele (OR, 1.15; 95% CI, 1.01 –

1.30;  $p < 0.05$ ). This correlation was even more vital in patients who were homogenous for the short allele of the serotonin transporter (OR, 1.21; 95% CI, 1.02-1.44;  $p < .05$ )(McHugh et. al., 2010).

Early childhood behaviors can predict alcohol use among adolescents and provide an early opportunity for appropriate intervention. Later in life, behavioral patterns such as restlessness, aggressiveness, impulse control, and antisocial characteristics have been linked to alcohol use. Gender is also a factor leading to alcohol use, as adolescent boys are more likely to abuse alcohol than adolescent girls (SAMHSA, 2021). Parents' education levels and economic status contribute to risk factors for adolescent alcohol use; lower financial status is associated with more alcohol abuse among high school youth (Chaflin and Deza, 2018). The prevalence of alcohol use is higher in White and Hispanic adolescents than in other races (SAMHSA, 2021).

#### **Figure 4 Underage Alcohol Use in the Past Month among Individuals Aged 12 to 20, (NSDUH)**

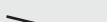


Region	2008-2010	2014-2016	2016-2018
US	26.54%	20.82%	19.27%
Midwest	27.26%	21.71%	21.06%
Indiana	23.80%	21.41%	19.93%

Although underage alcohol use decreased in all three regions during the period, Indiana only experienced a 3.9 percent drop, while underage alcohol use in the U.S. fell by 7.3 percent (Figure 4). Because of this, the gap between Indiana and

the U.S. shrunk over time, and Indiana surpassed the U.S. in underage alcohol use. The Midwest region had the most significant percentage of underage alcohol use at all periods despite a decrease of 6.2 percent from 2008 to 2018.

**Table 4 Indiana Underage Alcohol Use in the Past Month among Individuals Aged 12 to 20, by Geographic Area, (NSDUH)**

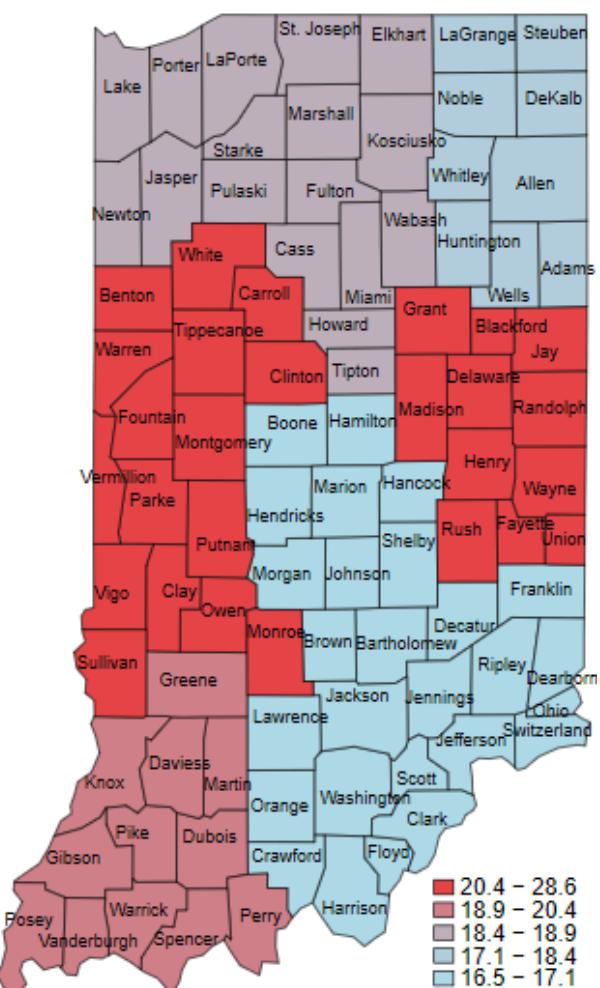
Year	2008-2010	2014-2016	2016-2018	Trends
Indiana	23.80%	21.41%	19.93%	
Central	20.70%	18.73%	16.46%	
East	23.04%	24.15%	26.45%	
North Central	25.41%	20.52%	18.93%	
Northeast	22.62%	21.17%	18.36%	
Northwest	22.81%	18.92%	18.74%	
Southeast	23.02%	19.53%	17.13%	
Southwest	21.84%	22.48%	20.39%	
West	32.78%	29.40%	28.62%	

Only the Eastern region in Indiana saw an increase in underage alcohol use between 2008 and 2018. Underage alcohol use in the Eastern part increased by 3.41 percentage points, while other regions decreased (Table 4). Central Indiana and Western Indiana had the lowest and greatest underage alcohol use respectively in both 2008 and 2018. Map 4 shows the distribution of underage alcohol use across regions in 2018. In addition, map 4 shows the regional distribution of underage alcohol use in the past month from NSDUH survey data.

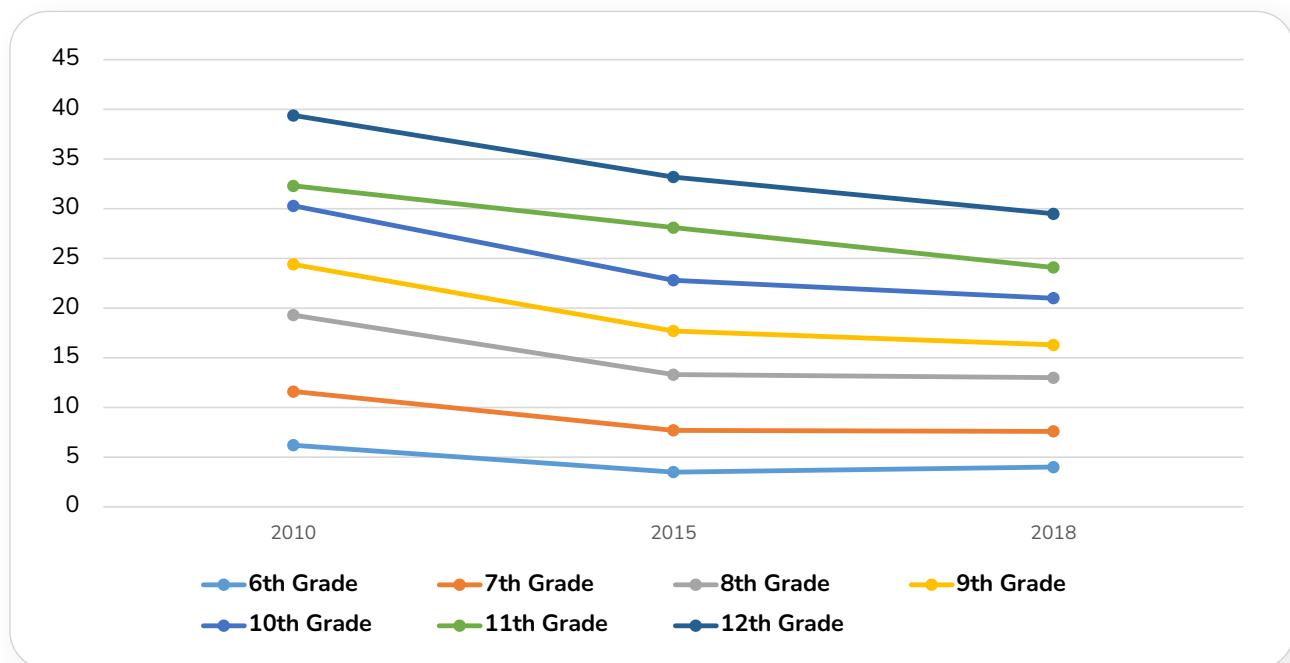
## Youth Alcohol use by Grades

There is variation in alcohol use and abuse among youth by grades; students in higher grades have a higher probability of consuming alcohol than those in lower grades. The trends of alcohol use by grade in Indiana using data obtained from the Indiana Youth Survey are presented in Figure 5. About 30 percent of students in 12th grade have consumed alcohol in the past month, followed by 24.1 percent of 11th graders and 21 percent of 10th graders. Though there were more significant declines from 2010, the levels dropped marginally between 2015 and 2018.

## Map 4 Indiana Underage Alcohol Use in the Past Month among Individuals Aged 12 to 20, NSDUH



**Figure 5 Indiana Percent Monthly Alcohol Use, by Grade, (INYS)**



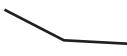
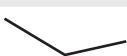
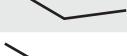
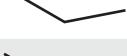
	2010	2015	2018
6th Grade	6.2	3.5	4
7th Grade	11.6	7.7	7.6
8th Grade	19.3	13.3	13
9th Grade	24.4	17.7	16.3
10th Grade	30.3	22.8	21
11th Grade	32.3	28.1	24.1
12th Grade	39.4	33.2	29.5

Trends are also shown by grade based on the regions defined by the Department of Mental Health and Addiction. Tables 5.1 to 5.7 show the regional trends for each region and each grade. Northwest and Southeast regions saw 0.6 percentage points higher use among grade 6 compared to the State average in 2018. Among students in grade 7, the Central and Southeast regions saw 1.7 and 1.5 percentage points higher use than the state average, respectively. Both the Northwest and Northeast regions saw over two percentage points higher use among grade 8 compared to the Indiana average. Students

in grade 9 in the Northwest, Northeast, and Southwest regions saw higher use than the state average. However, the Northeast region is the only one not to see higher use than Indiana total among students in grade 10. Use among students in grades 11 of every region was higher than the state average in 2018. This is also true for students in grade 12 in Indiana's Northwest, Central, Southwest, and Southeast regions.

A heatmap of the regional distributions for 2018 as maps and are provided in the Appendix.

**Tables 5.1-5.7 Percent Alcohol Use in Last Month, by Grade and Geographic Area (INYS)**

Table 5.1 6th Grade Alcohol Use in Last Month				
Region	2010	2015	2018	Trends
Northwest	7.4	4.5	4.6	
North Central	5.3	3.8	3.7	
Northeast	5.3	4.4	2.8	
West	7.6	1.9	3.6	
Central	5.4	3.6	3.9	
East	5.8	4.1	4.1	
Southwest	5.1	2.7	3.2	
Southeast	7.6	3.1	4.6	
Indiana	6.2	3.5	4	

Note: Regions defined by DMHA and used by INYS are as follows:

**Northwest** = Jasper, Lake, Newton, Porter, Pulaski, Starke.

**North Central** = Cass, Elkhart, Fulton, Howard, Kosciusko, LaPorte, Marshall, Miami, St. Joseph, Tipton, Wabash.

**Northeast** = Adams, Allen, DeKalb, Huntington, LaGrange, Noble, Steuben, Wells, Whitley.

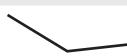
**West** = Benton, Carroll, Clay, Clinton, Fountain, Monroe, Montgomery, Owen, Parke, Putnam, Sullivan, Tippecanoe, Vermillion, Vigo, Warren, White.

**Central** = Boone, Hamilton, Hancock, Hendricks, Johnson, Marion, Morgan, Shelby.

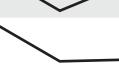
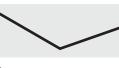
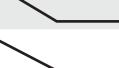
**East** = Blackford, Delaware, Fayette, Grant, Henry, Jay, Madison, Randolph, Rush, Union, Wayne.

**Southwest** = Greene, Knox, Daviess, Martin, Gibson, Pike, Dubois, Posey, Vanderburgh, Warrick, Spencer, Perry.

**Southeast** = Brown, Bartholomew, Decatur, Franklin, Lawrence, Jackson, Jennings, Ripley, Dearborn, Orange, Washington, Scott, Jefferson, Ohio, Switzerland, Crawford, Clark, Harrison, Floyd.

Table 5.2 7th Grade Alcohol Use in Last Month				
Region	2010	2015	2018	Trends
Northwest	15.3	8.8	7.6	
North Central	10.9	8.5	6.6	
Northeast	11.3	8.7	6.1	
West	10.3	6.7	5.8	
Central	9.4	8.2	9.3	
East	13.3	7.4	7.7	
Southwest	10.3	6.3	6.3	
Southeast	15.8	7.6	9.1	
Indiana	11.6	7.7	7.6	

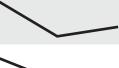
**Table 5.3****8th Grade Alcohol Use in Last Month**

Region	2010	2015	2018	Trends
Northwest	24.8	16.9	15.1	
North Central	19.2	13.9	12.3	
Northeast	16.2	14.6	15.7	
West	18	10	10	
Central	15.7	9.7	13.1	
East	21.8	13.8	12.4	
Southwest	18	12.1	12	
Southeast	22.1	14.8	13.9	
Indiana	19.3	13.3	13	

**Table 5.4****9th Grade Alcohol Use in Last Month**

Region	2010	2015	2018	Trends
Northwest	28.3	19.9	19.1	
North Central	23.8	19	17	
Northeast	22.7	17.8	16.4	
West	23.6	12.9	16.2	
Central	21.8	16.1	12	
East	27	20.7	16	
Southwest	22.6	17.3	16.9	
Southeast	28.6	17.1	15.5	
Indiana	24.4	17.7	16.3	

**Table 5.5****10th Grade Alcohol Use in Last Month**

Region	2010	2015	2018	Trends
Northwest	33.9	26.7	24.2	
North Central	29.5	19.8	17.2	
Northeast	32.1	23.1	18.2	
West	28.1	19.8	20.4	
Central	27	20.6	18.4	
East	31.4	24	20.7	
Southwest	31.5	21.8	23.9	
Southeast	33.7	25.2	21.8	
Indiana	30.3	22.8	21	

**Table 5.6****11th Grade Alcohol Use in Last Month**

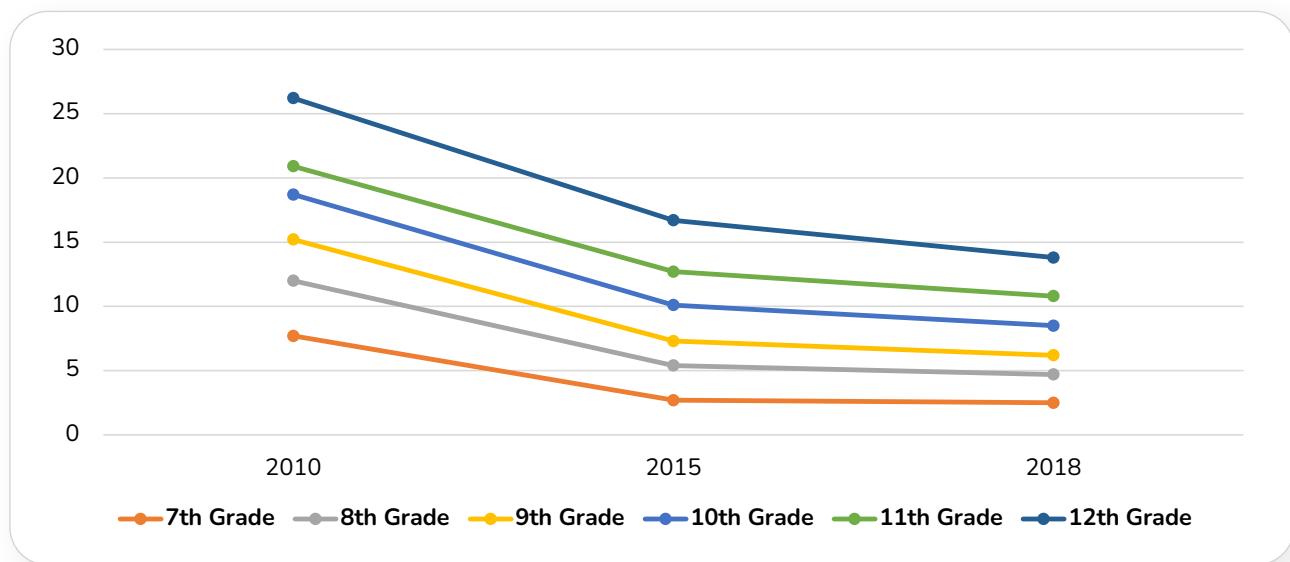
Region	2010	2015	2018	Trends
Northwest	36	28.5	24.7	/\
North Central	28.8	28.9	21.5	/\
Northeast	34.7	29.4	21.3	/\
West	29.3	28.4	24	/\
Central	30.5	26.6	22	/\
East	32.5	27	23.5	/\
Southwest	34.8	28.2	28.3	/\
Southeast	36.8	28.6	24.5	/\
Indiana	32.3	28.1	24.1	/\

**Table 5.7****12th Grade Alcohol Use in Last Month**

Region	2010	2015	2018	Trends
Northwest	41.5	28.4	30.2	/\
North Central	35.5	28.9	24.8	/\
Northeast	37.2	30.9	22.6	/\
West	36.6	28.3	29	/\
Central	38.5	30.4	29.6	/\
East	38.1	32.6	25.5	/\
Southwest	42.5	34.5	33	/\
Southeast	43.8	35.9	33.2	/\
Indiana	39.4	33.2	29.5	/\

A similar analysis by grade was drawn on binge drinking outcomes. Figure 6 shows the overall trends by grade. Again, the levels declined for all grades since 2010, but as of 2018, about 14 percent of students in grade 12 reported binge drinking in the past two weeks. They were followed by 11 percent of grade 11 and 8.5 percent of grade 10.

## Figure 6 Indiana Percent Binge Drinking in Last 2 Weeks, by Grade, INYS



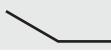
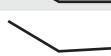
	2010	2015	2018
6th Grade	5.5	-	-
7th Grade	7.7	2.7	2.5
8th Grade	12	5.4	4.7
9th Grade	15.2	7.3	6.2
10th Grade	18.7	10.1	8.5
11th Grade	20.9	12.7	10.8
12th Grade	26.2	16.7	13.8

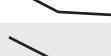
The trends by grade based on the regions defined by the Department of Mental Health and Addiction are shown in Tables 6.1 to 6.7. Central and Southwest regions saw one percentage point higher use among grade 7 students than the state average in 2018. In the same year, the Northeast region saw 1.7 percentage points higher binge drinking among grade 8 students than Indiana. Among students in grade 10, Northwest and Southwest regions saw 1.2 and

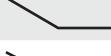
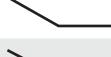
2.4 percentage points higher binge drinking than the state average, respectively. Binge drinking among 11th graders in the Southwest was 4.7 percentage points higher in 2018 than the state average. The Southwest region also saw three percentage points higher binge drinking among students in grade 12 in 2018. West, Central, and Southeast regions saw higher binge drinking among students in grade 12 than the Indiana average.

## Tables 6.1-6.7 Percent Binge Drinking in Last 2 Weeks, by Grade, INYS

Table 6.1 6th Grade Binge Drinking in Last 2 Weeks				
Region	2010	2015	2018	Trends
Northwest	6.7	-	-	-
North Central	5.3	-	-	-
Northeast	6.6	-	-	-
West	6.6	-	-	-
Central	4.8	-	-	-
East	5.8	-	-	-
Southwest	4.1	-	-	-
Southeast	5.9	-	-	-
Indiana	5.5	-	-	-

<b>Table 6.2</b> 7th Grade Binge Drinking in Last 2 Weeks				
Region	2010	2015	2018	Trends
Northwest	10.3	2.9	2.4	
North Central	7.3	2.7	1.9	
Northeast	6.6	3.1	2.1	
West	7	2.2	1.9	
Central	6.3	3.1	3.5	
East	9.3	2.9	2	
Southwest	6.2	1.9	2.1	
Southeast	10.4	2.9	3.5	
Indiana	7.7	2.7	2.5	

<b>Table 6.3</b> 8th Grade Binge Drinking in Last 2 Weeks				
Region	2010	2015	2018	Trends
Northwest	15.4	6	4.8	
North Central	12.7	5.9	4.4	
Northeast	9.3	6.1	6.4	
West	11.9	3.6	3.5	
Central	9.6	4.1	5.2	
East	13.4	5.6	4.7	
Southwest	9.7	5.2	4.5	
Southeast	14	6.3	5.1	
Indiana	12	5.4	4.7	

<b>Table 6.4</b> 9th Grade Binge Drinking in Last 2 Weeks				
Region	2010	2015	2018	Trends
Northwest	18.4	7.9	7	
North Central	14.3	7.9	6.6	
Northeast	14.9	6.1	5.9	
West	14.9	5.4	4.6	
Central	13	6.7	4.7	
East	17.3	8.6	5.6	
Southwest	14.2	8	7.6	
Southeast	17.6	7	6.4	
Indiana	15.2	7.3	6.2	

<b>Table 6.5 10th Grade Binge Drinking in Last 2 Weeks</b>				
<b>Region</b>	<b>2010</b>	<b>2015</b>	<b>2018</b>	<b>Trends</b>
Northwest	21.4	11	9.7	\\ \\
North Central	17.9	9.8	6.7	\\ \\
Northeast	19	9.2	7.2	\\ \\
West	16.4	8.5	8.3	\\ \\
Central	15.7	8.4	8.1	\\ \\
East	19.2	10.5	8	\\ \\
Southwest	21.3	11.2	10.9	\\ \\
Southeast	22	12.2	8.3	\\ \\
Indiana	18.7	10.1	8.5	\\ \\

<b>Table 6.6 11th Grade Binge Drinking in Last 2 Weeks</b>				
<b>Region</b>	<b>2010</b>	<b>2015</b>	<b>2018</b>	<b>Trends</b>
Northwest	24.3	11.3	10.5	\\ \\
North Central	18.9	13.6	8.6	\\ \\
Northeast	24.3	10.9	9.1	\\ \\
West	17.7	11.5	9.9	\\ \\
Central	18.9	12.6	9.4	\\ \\
East	21.5	12.7	9.2	\\ \\
Southwest	23.7	14.4	15.5	\\ \\
Southeast	23.4	12.9	11.6	\\ \\
Indiana	20.9	12.7	10.8	\\ \\

<b>Table 6.7 12th Grade Binge Drinking in Last 2 Weeks</b>				
<b>Region</b>	<b>2010</b>	<b>2015</b>	<b>2018</b>	<b>Trends</b>
Northwest	27.2	19.1	13.8	\\ \\
North Central	23.4	14.1	10.9	\\ \\
Northeast	27.5	14.5	8.4	\\ \\
West	23	14.2	14.6	\\ \\
Central	25.2	15.6	15.1	\\ \\
East	23.7	15.3	10.2	\\ \\
Southwest	29.1	18.2	16.8	\\ \\
Southeast	30.7	18.6	15.9	\\ \\
Indiana	26.2	16.7	13.8	\\ \\

# CONSEQUENCES

Excessive alcohol use can lead to many adverse effects, ranging from health conditions to social problems, and even resulting in death (CDC, 2021). In the United States, at least 25 percent of adults exceed daily alcohol consumption guidelines (Wood et. al., 2018). In addition, several types of cancer have been associated with alcohol consumption; evidence indicates that the more a person drinks, the higher the risk is of that person developing cancer (NIH, 2021). Data highlights the relative risk of developing all types of cancer increases with increased cancer mortality by 5.8 percent.

A recent meta-analysis found that alcohol consumption significantly increases mortality, especially cardiovascular disorders, and reduces life expectancy (Wood et. al., 2018). A separate study concluded that alcohol use raises blood pressure and stroke risk by 15 percent, even if moderate consumption of alcohol is present (Millwood et. al., 2019). There is a positive relationship between alcohol consumption and cardiovascular diseases such as ischemic heart disease (IHD), atrial fibrillation (AF), congestive heart failure (CHF), stroke, and hypertensive heart disease (HHD)(Courtney and Polich, 2009). Alcohol leads to loss of cardiac muscle integrity, facilitating the development of alcoholic cardiomyopathy (ACM). In 2015, alcohol consumption was responsible for almost 26,000 deaths worldwide (Manthey, Probst, and Rehm, 2018; Whitman et. al., 2016). Alcohol consumption is also associated with a variety of respiratory conditions; daily alcohol use can increase the risk of community-acquired pneumonia by 8 percent (Imtiaz et. al., 2017). A meta-analysis reported that 22.3 percent of tuberculosis cases were associated with alcohol consumption, while 2.23 percent of tuberculosis deaths were attributed to alcohol (Imtiaz et. al., 2017).

Many indicators point towards a consistent increase in alcohol-related problems in the United States over the past decade, particularly mortality from alcohol-related liver cirrhosis (Yoon and Chen, 2016). According to The Centers for Disease Control and Prevention (CDC), mortality associated with the alcohol-related liver disease increased by more than 40 percent (CDC, 2017). In 2006 the death rate was 4.1 deaths per 100,000 persons, compared to 5.6 per 100,000 in 2016 (CDC, 2017;

Yoon and Chen, 2016). According to a study by Grucza et al., the meta-analysis showed an increase in alcohol use prevalence by approximately 0.3 percent per year ( $\text{Beta}=0.0030$ ). The most significant increase was women (0.6 percent per year). In contrast, the increase among men was not significant (Grucza et. al., 2018).

Another severe consequence of alcohol use is pancreatitis and chronic kidney disease. Various studies have outlined numerous mechanisms by which alcohol contributes to kidney dysfunction (Varga, Matyas, and Paloczi, 2017).

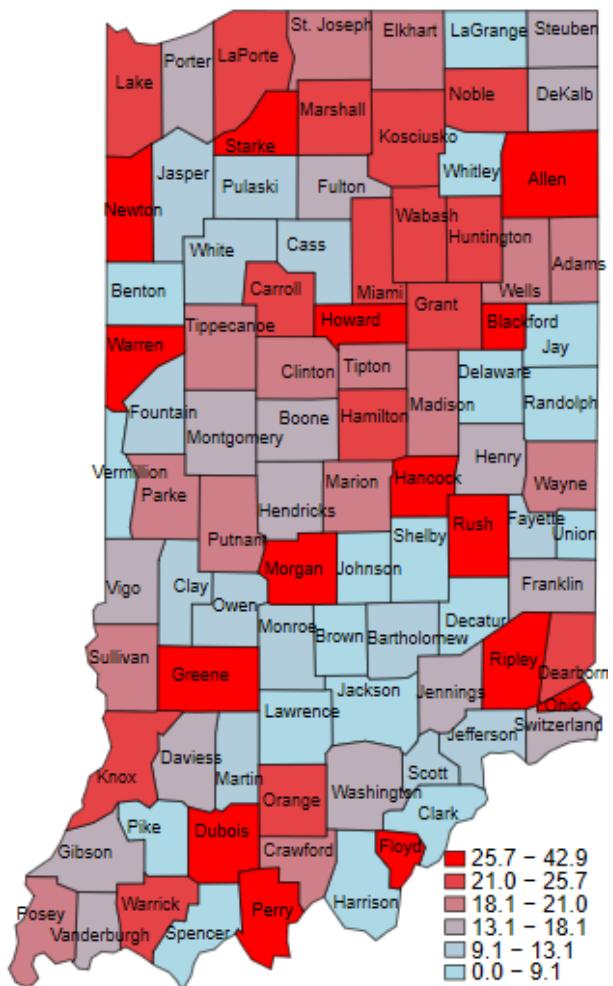
As alcohol is a central nervous system depressant, excessive consumption can lead to symptoms of depression and anxiety in users (NIH Alcoholism and Psychiatric). Alcohol dependence is more prevalent among men, whites, Native Americans, younger individuals, unmarried adults, and the lower-income population (Hasin et. al., 2007).

Death is also another consequence of alcohol abuse and misuse and is noted as the third-leading preventable cause of death in the United States. Alcohol-related causes of death include cancers, liver disease, heart disease, and even death from impaired driving fatalities (CDC, 2021). According to the National Highway Traffic Safety Administration, 28 percent of driving fatalities were attributable to alcohol-impaired driving (NHTSA, 2021).

Although alcohol sales bring in billions of dollars a year, alcohol misuse also leads to an economic burden in the United States. Estimates from 2010 found that excessive drinking cost the United States almost \$250 billion in costs stemming from loss in workplace productivity, healthcare expenses, criminal justice expenses, and motor vehicle crashes (CDC, 2019). Much of the costs of alcohol misuse are attributed to binge drinking, especially from underage drinkers (Bouchery et. al., 2006).

Alcohol exposure during pregnancy results in impaired growth, stillbirth, and Fetal alcohol spectrum disorder (FASDs) are a group of conditions that occur in a newborn. Symptoms of FASD often include an abnormal appearance, low body weight, short height, microcephaly, behavioral and coordination complications, difficulty hearing, poor vision(DeJong, Olyaei, and Lo, 2019).

## Map 5 Percent Alcohol Impaired Driving Deaths, CHR



### Alcohol Impaired Driving Deaths

Map 5 is the county distribution of alcohol-impaired driving deaths using data obtained from County Health Rankings (CHR) in 2018. Between 2008 and 2018, the percentage of driving deaths that were related to alcohol in Indiana decreased from 26 percent to 19 percent (Table 7). This decrease was mimicked in all regions. Of the nine regions that saw a decrease, Northwest underwent the largest change with a decline of 10.1 percentage point over the period.

**Note:** For Tables 7 and 8, regions defined by NSDUH are as follows:

**Central** = Boone, Hamilton, Hancock, Hendricks, Johnson, Marion, Morgan, Shelby.

**East** = Blackford, Delaware, Fayette, Grant, Henry, Jay, Madison, Randolph, Rush, Union, Wayne.

**North Central** = Cass, Elkhart, Fulton, Howard, Kosciusko, La Porte, Marshall, Miami, St. Joseph, Tipton, Wabash.

**Northeast** = Adams, Allen, DeKalb, Huntington, LaGrange, Noble, Steuben, Wells, Whitley.

**Northwest** = Jasper, Lake, Newton, Porter, Pulaski, Starke.

**Southeast** = Bartholomew, Brown, Clark, Crawford, Dearborn, Decatur, Floyd, Franklin, Harrison, Jackson, Jefferson, Jennings, Lawrence, Ohio, Orange, Ripley, Scott, Switzerland, Washington.

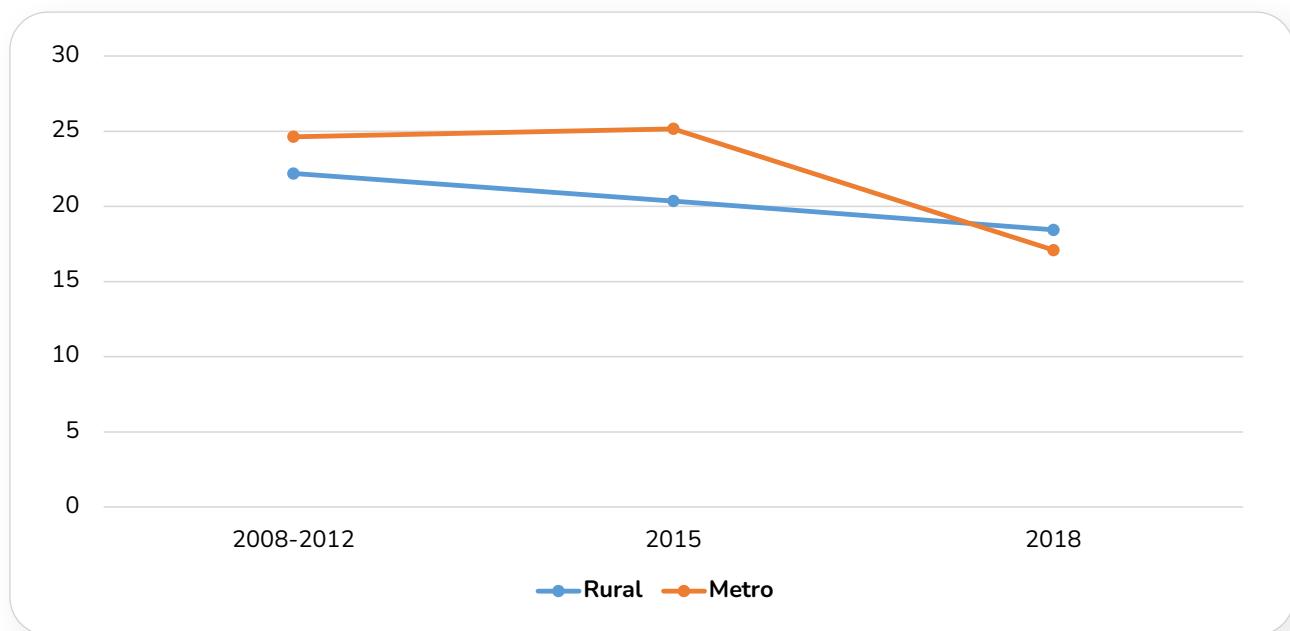
**Southwest** = Daviess, Dubois, Gibson, Greene, Knox, Martin, Perry, Pike, Posey, Spencer, Vanderburgh, Warrick.

**West** = Benton, Carroll, Clay, Clinton, Fountain, Monroe, Montgomery, Owen, Parke, Putnam, Sullivan, Tippecanoe, Vermillion, Vigo, Warren, White.

**Table 7 Average Percent Alcohol Impaired Driving Deaths, by Region, CHR**

Region	2008-2012	2015	2018	Trends
Central	22.25	22	17.75	↘
East	22.45	13.45	17.09	↙ ↘
North Central	24.09	25.90	21.90	↗ ↘
Northeast	23.33	28	18.22	↗ ↘
Northwest	32.66	25.83	22.5	↘
Southeast	25	24.42	15.31	↗ ↘
Southwest	17.16	19.58	19	↗ ↗
West	23.25	23.06	15.5	↗ ↘
Indiana	26	24	19	↘

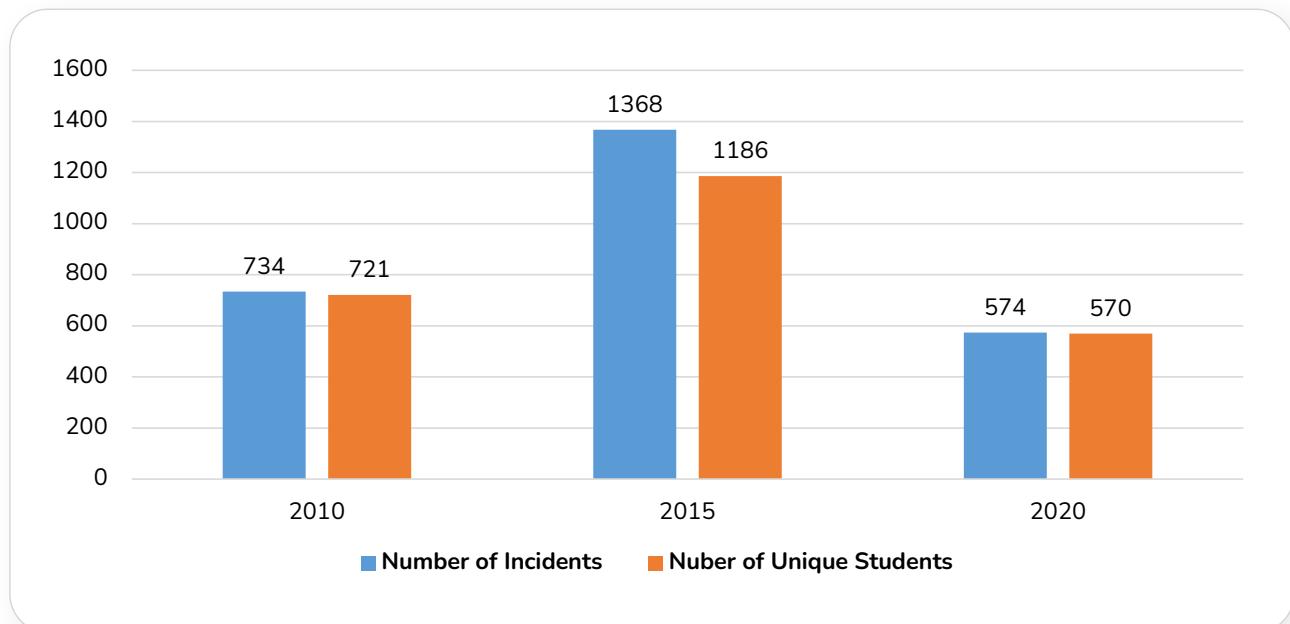
**Figure 7 Average Percent Alcohol Related Driving Deaths, Rural versus Metro, CHR**



	2008-2012	2015	2018
Rural	22.19	20.35	18.44
Metro	24.64	25.16	17.09
Indiana	26	24	19

The average percent of driving deaths related to alcohol decreased in Indiana's rural and metro areas from 2008 to 2018 (Figure 7). However, rural alcohol-related driving deaths only reduced by 3.8 percent over the period, while those in metro areas decreased by 7.5 percent. In 2018, the percent of driving deaths related to alcohol was higher on average in rural areas than in metro areas of Indiana.

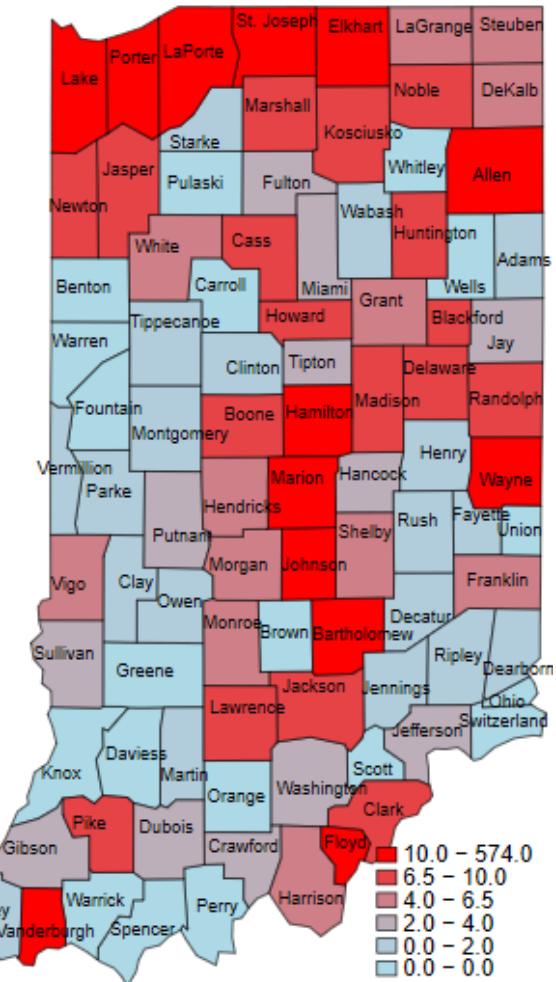
**Figure 8 Indiana Alcohol Related School Suspensions, IDOE**



## Map 6 Indiana Alcohol Related School Suspensions, IDOE

### Alcohol-related Suspensions in Schools

We analyze the regional trends in suspension incidents at schools due to alcohol. We compare incidents in school year 2009-10, school year 2014-15 and school year 2019-20. There were 574 alcohol related school suspension incidents in 2020 in Indiana. Though there were increases in alcohol related school suspensions from 2010 to 2015, possibly due to increase in alcohol consumption in general across Indiana, the numbers decreased from 2015 to 2020. The classes moving online since March to May 2020 during the COVID-19 pandemic may have also contributed to decline suspension incidents as well. Map 6 shows the total number of alcohol-related school suspensions or expulsions in 2020

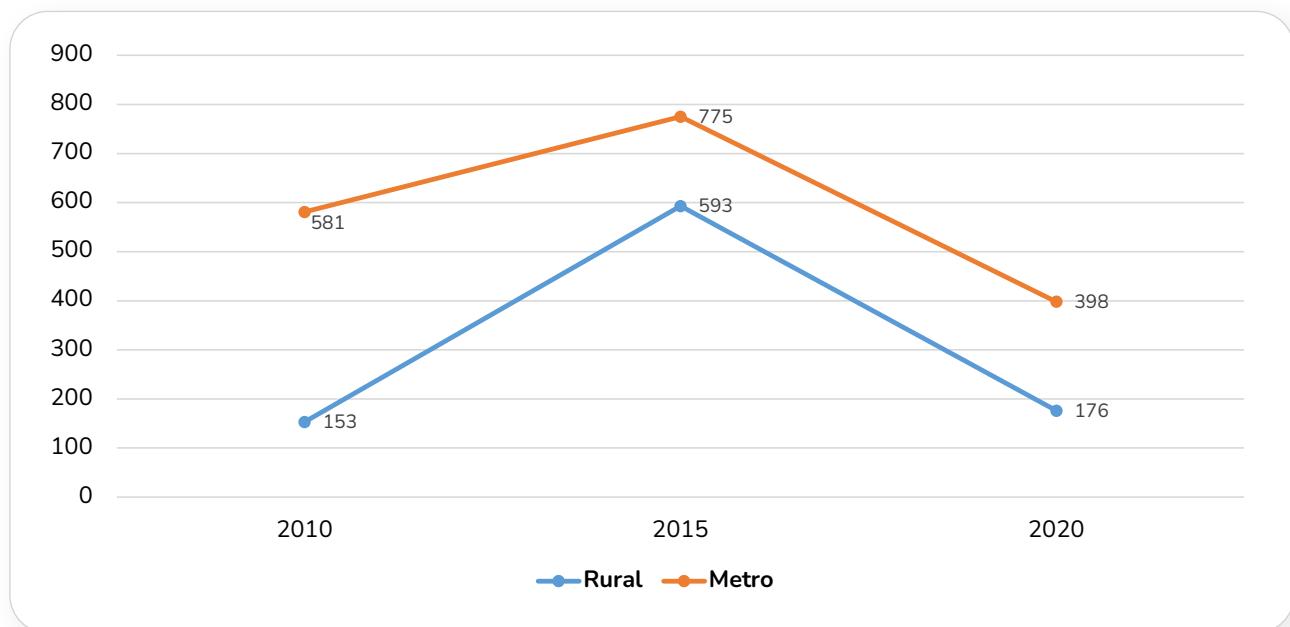


**Table 8 Indiana Alcohol Related School Suspensions, by Region, IDOE**

NSDUH Region	Number of incidents - 2010	Number of incidents - 2015	Number of incidents - 2020	Trends
Central	203	306	115	↗
East	55	48	63	↘
North Central	100	377	93	↗
Northeast	62	98	86	↘
Northwest	104	115	57	↗
Southeast	72	327	92	↗
Southwest	67	39	35	↘
West	71	58	33	↘
Indiana	734	1368	574	↗

The number of alcohol related school suspensions in five of eight NSDUH regions decreased between 2010 and 2020 (Table 8). Of these five regions, West, Northwest and Southwest regions saw largest decline in suspensions ranging from 45 percent to 54 percent drop.

**Figure 9 Indiana Alcohol Related School Suspensions, Rural versus Metro, IDOE**



	2010	2015	2020
Rural	153	593	176
Metro	581	775	398
Indiana	734	1368	574

Both rural and metro counties in Indiana saw increases in alcohol-related school suspensions between 2010 and 2015 before experiencing a decrease in the following five years (Figure 9). While trends in both types of counties were similar, the gap in alcohol-related suspensions between rural and metro counties decreased from 428 to 222 between 2010 and 2020.

## CONCLUSION

Several factors affect the overconsumption of alcohol in the United States. Several of those factors affect children as young as 12 years of age. Factors such as mental illness play a significant part in the consumption of alcohol, and several reports have found that mental illness cases have increased in the past couple of years due to the COVID-19 pandemic. While the prevalence rates of alcohol abuse in Indiana are not as high as the rest of the nation, there is still a cause of concern for the misuse of alcohol in the state. The alcohol misuse and abuse rates are predicted to be much higher based on the COVID-19 pandemic outcomes.

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# APPENDIX A1

## Percent Excessive Drinking, by County, CHR

FIPS	State	County	FSSA Region	NSDUH region	MSA dummy	2008-2012	2015	2018
18000	Indiana					15.90	16.82	18.65
18001	Indiana	Adams	3	Northeast	0	13.50	16.41	17.36
18003	Indiana	Allen	3	Northeast	1	16.80	18.55	15.63
18005	Indiana	Bartholomew	8	Southeast	1	15.80	16.69	16.30
18007	Indiana	Benton	1	West	1		16.18	18.05
18009	Indiana	Blackford	4	East	0	14.30	15.44	17.76
18011	Indiana	Boone	9	Central	1	18.90	18.88	20.87
18013	Indiana	Brown	8	Southeast	1		15.46	19.22
18015	Indiana	Carroll	4	West	1	14.60	16.07	18.47
18017	Indiana	Cass	4	North Central	0	14.40	15.65	16.78
18019	Indiana	Clark	8	Southeast	1	15.60	15.94	18.20
18021	Indiana	Clay	6	West	1		15.60	17.89
18023	Indiana	Clinton	9	West	0	11.50	15.97	16.86
18025	Indiana	Crawford	7	Southeast	0		14.71	16.95
18027	Indiana	Daviess	7	Southwest	0	16.20	16.39	17.22
18029	Indiana	Dearborn	8	Southeast	1	14.40	17.71	18.57
18031	Indiana	Decatur	8	Southeast	0	11.90	16.38	17.89
18033	Indiana	DeKalb	3	Northeast	0	13.50	16.15	17.39
18035	Indiana	Delaware	4	East	1	11.90	15.73	16.03
18037	Indiana	Dubois	7	Southwest	0	22.50	16.86	17.98
18039	Indiana	Elkhart	2	North Central	1	10.30	15.16	17.65
18041	Indiana	Fayette	10	East	0	11.00	14.61	16.89
18043	Indiana	Floyd	8	Southeast	1	14.40	16.49	18.97
18045	Indiana	Fountain	9	West	0	12.90	15.66	18.26
18047	Indiana	Franklin	10	Southeast	0	22.00	16.27	19.13
18049	Indiana	Fulton	2	North Central	0	13.70	16.35	19.27
18051	Indiana	Gibson	7	Southwest	0	10.10	16.41	17.57
18053	Indiana	Grant	4	East	0	12.40	14.76	15.41
18055	Indiana	Greene	7	Southwest	0	12.00	15.74	17.46
18057	Indiana	Hamilton	9	Central	1	19.00	16.93	20.80
18059	Indiana	Hancock	10	Central	1	16.50	17.60	18.09
18061	Indiana	Harrison	8	Southeast	1	18.30	16.83	19.39
18063	Indiana	Hendricks	6	Central	1	15.30	18.49	16.28
18065	Indiana	Henry	10	East	0	8.60	16.05	17.77
18067	Indiana	Howard	4	North Central	1	13.60	15.86	17.07
18069	Indiana	Huntington	3	Northeast	0	22.20	16.56	18.09
18071	Indiana	Jackson	8	Southeast	0	15.10	15.50	17.13
18073	Indiana	Jasper	1	Northwest	1	14.90	17.29	18.67
18075	Indiana	Jay	3	East	0	10.20	15.49	16.82
18077	Indiana	Jefferson	8	Southeast	0	14.00	15.60	18.73
18079	Indiana	Jennings	8	Southeast	0	11.30	16.43	18.26
18081	Indiana	Johnson	5	Central	1	18.90	17.35	19.80
18083	Indiana	Knox	7	Southwest	0	13.60	16.53	17.91
18085	Indiana	Kosciusko	3	North Central	0	11.80	17.52	17.60
18087	Indiana	LaGrange	2	Northeast	0	11.50	16.75	17.73

FIPS	State	County	FSSA Region	NSDUH region	MSA dummy	2008-2012	2015	2018
18089	Indiana	Lake	1	Northwest	1	18.40	15.15	16.97
18091	Indiana	LaPorte	2	North Central	1	19.40	17.14	17.64
18093	Indiana	Lawrence	7	Southeast	0	11.20	15.77	17.17
18095	Indiana	Madison	4	East	1	16.80	15.54	16.41
18097	Indiana	Marion	5	Central	1	15.70	17.61	19.01
18099	Indiana	Marshall	2	North Central	0	11.10	16.10	17.34
18101	Indiana	Martin	7	Southwest	0	14.20	15.86	18.46
18103	Indiana	Miami	4	North Central	0	19.50	15.64	17.58
18105	Indiana	Monroe	5	West	1	17.30	20.19	16.52
18107	Indiana	Montgomery	9	West	0	15.60	16.78	17.95
18109	Indiana	Morgan	5	Central	1	18.20	17.40	17.42
18111	Indiana	Newton	1	Northwest	1	25.40	16.98	18.08
18113	Indiana	Noble	3	Northeast	0	15.60	17.73	18.80
18115	Indiana	Ohio	8	Southeast	1		18.65	19.84
18117	Indiana	Orange	7	Southeast	0	15.10	15.50	16.55
18119	Indiana	Owen	6	West	1	23.00	16.76	17.85
18121	Indiana	Parke	6	West	0	14.80	15.76	16.80
18123	Indiana	Perry	7	Southwest	0	18.70	17.22	18.33
18125	Indiana	Pike	7	Southwest	0		17.06	18.28
18127	Indiana	Porter	1	Northwest	1	18.70	20.31	21.27
18129	Indiana	Posey	7	Southwest	1	18.80	18.14	19.29
18131	Indiana	Pulaski	2	Northwest	0		16.65	17.86
18133	Indiana	Putnam	6	West	1	10.40	18.32	19.38
18135	Indiana	Randolph	4	East	0	16.00	16.85	17.93
18137	Indiana	Ripley	8	Southeast	0	24.40	17.23	18.33
18139	Indiana	Rush	10	East	0	7.80	16.52	17.67
18141	Indiana	St. Joseph	2	North Central	1	19.10	16.73	17.46
18143	Indiana	Scott	8	Southeast	1		15.71	16.75
18145	Indiana	Shelby	10	Central	1	15.60	16.35	17.37
18147	Indiana	Spencer	7	Southwest	0	19.70	17.89	19.08
18149	Indiana	Starke	2	Northwest	0	20.10	16.65	17.69
18151	Indiana	Steuben	3	Northeast	0	20.30	18.06	19.14
18153	Indiana	Sullivan	7	West	1	15.80	17.40	18.52
18155	Indiana	Switzerland	8	Southeast	0	16.80	16.49	17.61
18157	Indiana	Tippecanoe	9	West	1	17.30	15.81	16.55
18159	Indiana	Tipton	4	North Central	0		18.34	19.50
18161	Indiana	Union	10	East	1		16.69	17.79
18163	Indiana	Vanderburgh	7	Southwest	1	14.90	18.67	19.66
18165	Indiana	Vermillion	6	West	1	21.00	17.66	18.83
18167	Indiana	Vigo	6	West	1	16.40	16.13	17.08
18169	Indiana	Wabash	4	North Central	0	19.10	16.49	17.55
18171	Indiana	Warren	9	West	0		18.03	19.25
18173	Indiana	Warrick	7	Southwest	1	13.40	17.37	18.43
18175	Indiana	Washington	8	Southeast	1	13.50	16.89	18.10
18177	Indiana	Wayne	10	East	0	9.80	17.83	18.87
18179	Indiana	Wells	3	Northeast	1	7.80	17.31	18.45
18181	Indiana	White	4	West	0	11.00	18.19	19.27
18183	Indiana	Whitley	3	Northeast	1	21.10	17.72	18.89

## APPENDIX A2

### Percent Alcohol Impaired Driving Deaths, by County, CHR

FIPS	State	County	FSSA Region	MSA dummy	2008-2012	2015	2018
18000	Indiana				26	24	19
18001	Indiana	Adams	3	0	6	13	18
18003	Indiana	Allen	3	1	33	32	35
18005	Indiana	Bartholomew	8	1	23	15	11
18007	Indiana	Benton	1	1	15	0	0
18009	Indiana	Blackford	4	0	10	0	43
18011	Indiana	Boone	9	1	19	8	16
18013	Indiana	Brown	8	1	15	33	0
18015	Indiana	Carroll	4	1	19	25	25
18017	Indiana	Cass	4	0	39	52	13
18019	Indiana	Clark	8	1	21	22	6
18021	Indiana	Clay	6	1	25	33	11
18023	Indiana	Clinton	9	0	22	36	19
18025	Indiana	Crawford	7	0	25	22	20
18027	Indiana	Daviess	7	0	13	6	16
18029	Indiana	Dearborn	8	1	29	35	26
18031	Indiana	Decatur	8	0	39	15	8
18033	Indiana	DeKalb	3	0	24	22	15
18035	Indiana	Delaware	4	1	32	27	9
18037	Indiana	Dubois	7	0	25	30	28
18039	Indiana	Elkhart	2	1	25	21	19
18041	Indiana	Fayette	10	0	31	0	10
18043	Indiana	Floyd	8	1	21	35	29
18045	Indiana	Fountain	9	0	13	0	13
18047	Indiana	Franklin	10	0	35	39	17
18049	Indiana	Fulton	2	0	11	14	16
18051	Indiana	Gibson	7	0	14	13	15
18053	Indiana	Grant	4	0	23	15	23
18055	Indiana	Greene	7	0	19	29	29
18057	Indiana	Hamilton	9	1	32	30	24
18059	Indiana	Hancock	10	1	24	26	28
18061	Indiana	Harrison	8	1	34	22	7
18063	Indiana	Hendricks	6	1	20	25	14
18065	Indiana	Henry	10	0	3	7	18
18067	Indiana	Howard	4	1	30	24	35
18069	Indiana	Huntington	3	0	7	8	22
18071	Indiana	Jackson	8	0	13	12	8
18073	Indiana	Jasper	1	1	28	28	11
18075	Indiana	Jay	3	0	35	32	9
18077	Indiana	Jefferson	8	0	25	23	11
18079	Indiana	Jennings	8	0	27	19	15
18081	Indiana	Johnson	5	1	16	21	6
18083	Indiana	Knox	7	0	23	17	23
18085	Indiana	Kosciusko	3	0	34	31	22
18087	Indiana	LaGrange	2	0	39	27	9

FIPS	State	County	FSSA Region	MSA dummy	2008-2012	2015	2018
18089	Indiana	Lake	1	1	38	32	25
18091	Indiana	LaPorte	2	1	38	34	25
18093	Indiana	Lawrence	7	0	38	34	6
18095	Indiana	Madison	4	1	16	10	19
18097	Indiana	Marion	5	1	30	19	20
18099	Indiana	Marshall	2	0	14	14	23
18101	Indiana	Martin	7	0	10	25	13
18103	Indiana	Miami	4	0	11	19	23
18105	Indiana	Monroe	5	1	29	28	13
18107	Indiana	Montgomery	9	0	19	18	13
18109	Indiana	Morgan	5	1	21	30	30
18111	Indiana	Newton	1	1	23	21	27
18113	Indiana	Noble	3	0	23	13	22
18115	Indiana	Ohio	8	1	25	20	33
18117	Indiana	Orange	7	0	27	42	23
18119	Indiana	Owen	6	1	18	24	10
18121	Indiana	Parke	6	0	40	33	21
18123	Indiana	Perry	7	0	0	18	42
18125	Indiana	Pike	7	0	33	20	0
18127	Indiana	Porter	1	1	31	30	18
18129	Indiana	Posey	7	1	14	30	20
18131	Indiana	Pulaski	2	0	42	22	13
18133	Indiana	Putnam	6	1	22	19	21
18135	Indiana	Randolph	4	0	24	21	6
18137	Indiana	Ripley	8	0	14	19	33
18139	Indiana	Rush	10	0	7	9	33
18141	Indiana	St. Joseph	2	1	32	34	19
18143	Indiana	Scott	8	1	13	13	10
18145	Indiana	Shelby	10	1	16	17	4
18147	Indiana	Spencer	7	0	16	4	3
18149	Indiana	Starke	2	0	34	22	41
18151	Indiana	Steuben	3	0	32	52	14
18153	Indiana	Sullivan	7	1	43	39	20
18155	Indiana	Switzerland	8	0	30	21	13
18157	Indiana	Tippecanoe	9	1	36	31	19
18159	Indiana	Tipton	4	0	7	14	21
18161	Indiana	Union	10	1	33	13	0
18163	Indiana	Vanderburgh	7	1	26	21	14
18165	Indiana	Vermillion	6	1	22	30	9
18167	Indiana	Vigo	6	1	17	20	15
18169	Indiana	Wabash	4	0	24	28	25
18171	Indiana	Warren	9	0	14	15	27
18173	Indiana	Warrick	7	1	13	22	25
18175	Indiana	Washington	8	1	21	23	15
18177	Indiana	Wayne	10	0	33	14	18
18179	Indiana	Wells	3	1	25	60	21
18181	Indiana	White	4	0	18	18	12
18183	Indiana	Whitley	3	1	21	25	8

## APPENDIX A3

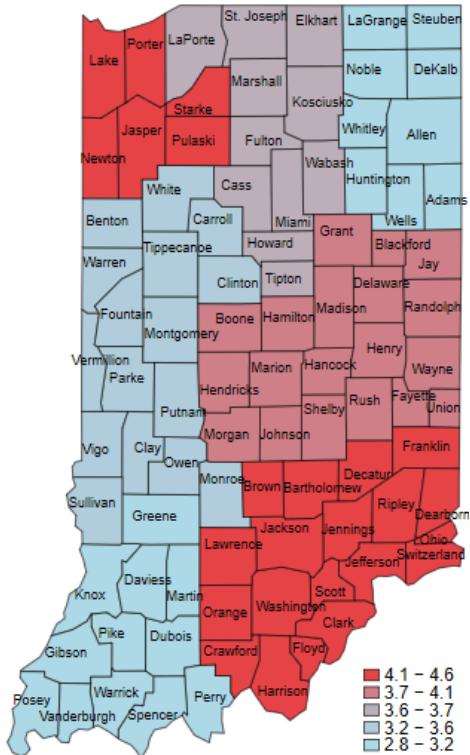
Alcohol related school suspensions or expulsions, by County, IDOE

FIPS	State	County	FSSA Region	MSA Dummy	Number of incidents	Number of incidents	Number of incidents	Number of unique students involved - 2010	Number of unique students involved - 2015	Number of unique students involved - 2020
					- 2010	- 2015	- 2020			
18000	Indiana				734	1368	574	721	1186	570
18001	Indiana	Adams	3	0	3	0	2	3	0	2
18003	Indiana	Allen	3	1	35	75	50	35	74	50
18005	Indiana	Bartholomew	8	1	10	12	28	10	11	28
18007	Indiana	Benton	1	1	0	0	0	0	0	0
18009	Indiana	Blackford	4	0	1	2	9	1	2	9
18011	Indiana	Boone	9	1	10	13	8	10	13	8
18013	Indiana	Brown	8	1	0	25	0	0	24	0
18015	Indiana	Carroll	4	1	7	0	0	7	0	0
18017	Indiana	Cass	4	0	7	7	7	7	7	7
18019	Indiana	Clark	8	1	19	5	9	19	5	9
18021	Indiana	Clay	6	1	0	1	1	0	1	1
18023	Indiana	Clinton	9	0	2	6	2	2	6	2
18025	Indiana	Crawford	7	0	0	3	3	0	3	3
18027	Indiana	Daviess	7	0	5	2	0	5	2	0
18029	Indiana	Dearborn	8	1	0	6	2	0	6	2
18031	Indiana	Decatur	8	0	0	4	1	0	4	1
18033	Indiana	DeKalb	3	0	2	3	6	2	2	5
18035	Indiana	Delaware	4	1	13	7	10	13	6	10
18037	Indiana	Dubois	7	0	9	4	4	9	4	4
18039	Indiana	Elkhart	2	1	27	20	29	27	20	29
18041	Indiana	Fayette	10	0	0	10	2	0	10	2
18043	Indiana	Floyd	8	1	4	18	13	4	18	13
18045	Indiana	Fountain	9	0	0	0	0	0	0	0
18047	Indiana	Franklin	10	0	3	2	5	3	2	5
18049	Indiana	Fulton	2	0	1	3	3	1	3	3
18051	Indiana	Gibson	7	0	5	2	4	5	2	3
18053	Indiana	Grant	4	0	12	8	5	12	8	5
18055	Indiana	Greene	7	0	8	8	0	8	8	0
18057	Indiana	Hamilton	9	1	58	39	13	48	39	13
18059	Indiana	Hancock	10	1	10	9	3	10	9	3
18061	Indiana	Harrison	8	1	3	3	6	3	3	6
18063	Indiana	Hendricks	6	1	28	7	6	28	7	6
18065	Indiana	Henry	10	0	0	4	2	0	4	2
18067	Indiana	Howard	4	1	5	51	7	5	50	7
18069	Indiana	Huntington	3	0	6	5	10	6	5	10
18071	Indiana	Jackson	8	0	3	9	9	3	8	9
18073	Indiana	Jasper	1	1	4	1	9	4	1	9
18075	Indiana	Jay	3	0	0	1	4	0	1	4
18077	Indiana	Jefferson	8	0	3	165	3	3	125	3
18079	Indiana	Jennings	8	0	1	2	2	1	2	2
18081	Indiana	Johnson	5	1	13	8	27	13	8	27
18083	Indiana	Knox	7	0	5	4	0	5	4	0
18085	Indiana	Kosciusko	3	0	5	10	8	5	9	8

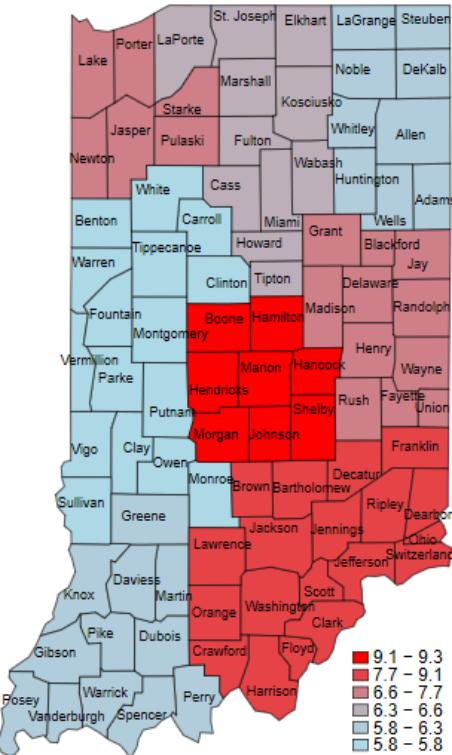
FIPS	State	County	FSSA Region	MSA Dummy	Number of incidents			Number of unique students involved - 2010	Number of unique students involved - 2015	Number of unique students involved - 2020
					- 2010	- 2015	- 2020			
18087	Indiana	LaGrange	2	0	2	1	5	2	1	5
18089	Indiana	Lake	1	1	66	55	21	66	55	21
18091	Indiana	LaPorte	2	1	8	20	12	8	20	12
18093	Indiana	Lawrence	7	0	2	1	7	2	1	7
18095	Indiana	Madison	4	1	15	10	9	14	10	9
18097	Indiana	Marion	5	1	76	197	48	75	185	48
18099	Indiana	Marshall	2	0	2	9	7	2	9	7
18101	Indiana	Martin	7	0	0	5	1	0	5	1
18103	Indiana	Miami	4	0	2	227	4	2	129	4
18105	Indiana	Monroe	5	1	10	23	6	10	22	6
18107	Indiana	Montgomery	9	0	2	0	1	2	0	1
18109	Indiana	Morgan	5	1	8	32	5	8	32	5
18111	Indiana	Newton	1	1	7	6	10	7	6	10
18113	Indiana	Noble	3	0	4	7	8	4	7	8
18115	Indiana	Ohio	8	1	0	0	0	0	0	0
18117	Indiana	Orange	7	0	0	3	0	0	3	0
18119	Indiana	Owen	6	1	16	5	1	16	5	1
18121	Indiana	Parke	6	0	0	0	2	0	0	2
18123	Indiana	Perry	7	0	1	0	0	1	0	0
18125	Indiana	Pike	7	0	3	0	10	3	0	10
18127	Indiana	Porter	1	1	23	52	15	23	50	15
18129	Indiana	Posey	7	1	2	3	2	2	3	2
18131	Indiana	Pulaski	2	0	1	0	0	1	0	0
18133	Indiana	Putnam	6	1	0	3	3	0	3	3
18135	Indiana	Randolph	4	0	5	2	7	5	2	5
18137	Indiana	Ripley	8	0	9	1	1	8	1	1
18139	Indiana	Rush	10	0	4	0	1	4	0	1
18141	Indiana	St. Joseph	2	1	40	18	11	40	18	11
18143	Indiana	Scott	8	1	8	4	0	8	4	0
18145	Indiana	Shelby	10	1	0	1	5	0	1	5
18147	Indiana	Spencer	7	0	6	1	0	6	1	0
18149	Indiana	Starke	2	0	3	1	2	3	1	2
18151	Indiana	Steuben	3	0	7	2	5	7	2	5
18153	Indiana	Sullivan	7	1	0	0	3	0	0	3
18155	Indiana	Switzerland	8	0	5	53	0	5	32	0
18157	Indiana	Tippecanoe	9	1	8	4	2	8	4	2
18159	Indiana	Tipton	4	0	0	6	3	0	6	3
18161	Indiana	Union	10	1	0	0	0	0	0	0
18163	Indiana	Vanderburgh	7	1	11	7	14	11	7	14
18165	Indiana	Vermillion	6	1	7	5	1	7	5	1
18167	Indiana	Vigo	6	1	13	11	6	13	11	6
18169	Indiana	Wabash	4	0	3	6	2	3	6	2
18171	Indiana	Warren	9	0	0	0	0	0	0	0
18173	Indiana	Warrick	7	1	12	3	0	12	3	0
18175	Indiana	Washington	8	1	2	11	3	2	11	3
18177	Indiana	Wayne	10	0	5	4	14	5	4	14
18179	Indiana	Wells	3	1	1	1	0	1	1	0
18181	Indiana	White	4	0	6	0	5	6	0	5
18183	Indiana	Whitley	3	1	2	4	0	2	4	0

# APPENDIX MAPS

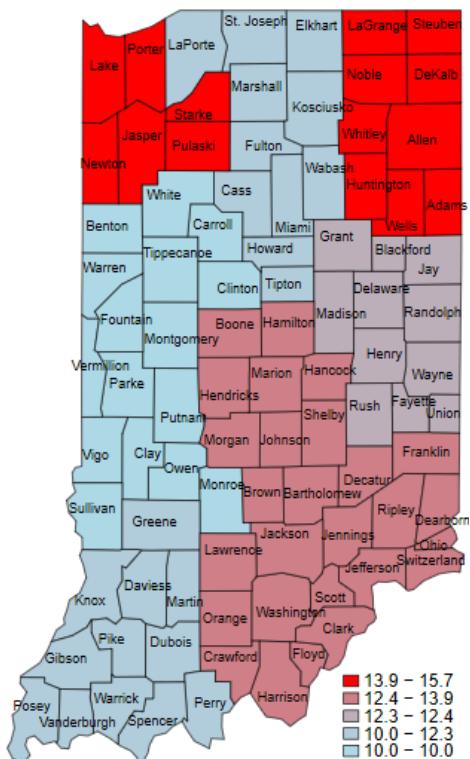
**Appendix Map A 6th Grade Alcohol Use in Last Month, INYS**



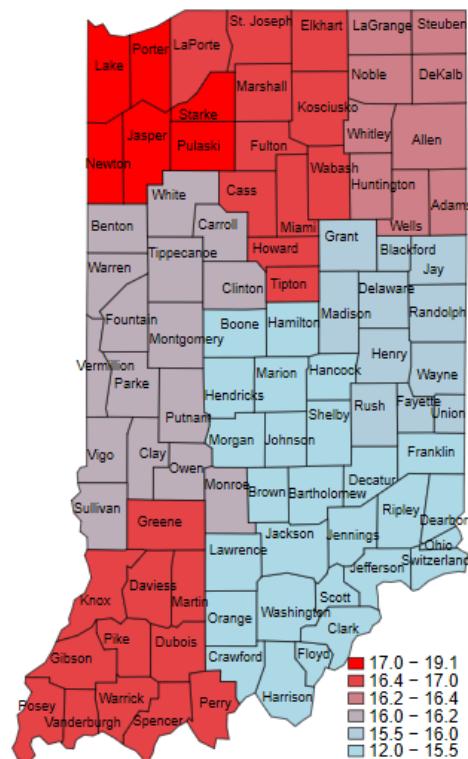
**Appendix Map B 7th Grade Alcohol Use in Last Month, INYS**



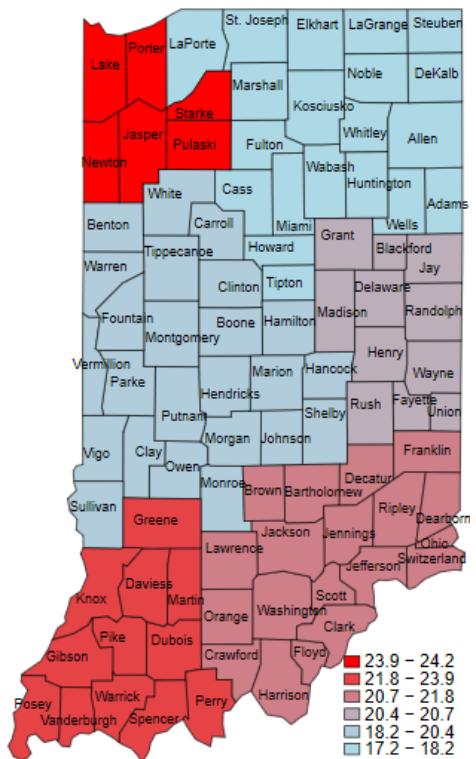
**Appendix Map C 8th Grade Alcohol Use in Last Month, INYS**



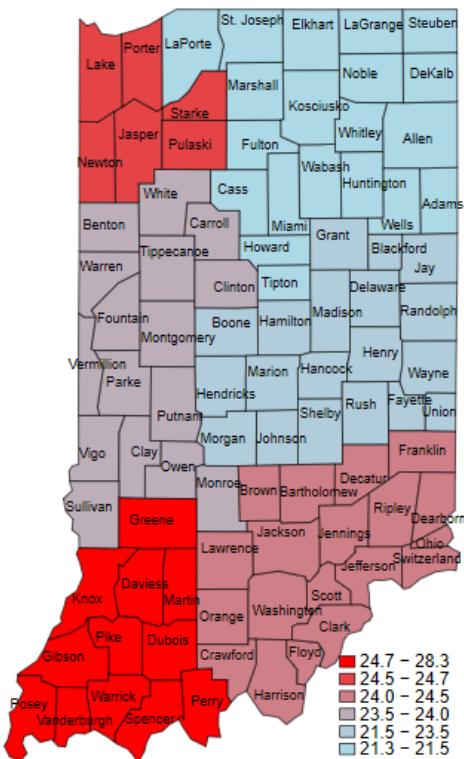
**Appendix Map D 9th Grade Alcohol Use in Last Month, INYS**



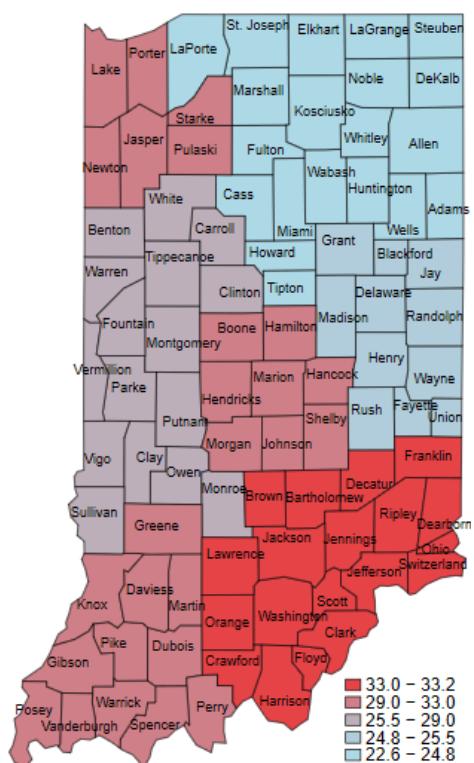
### Appendix Map E 10th Grade Alcohol Use in Last Month, INYS



### Appendix Map F 11th Grade Alcohol Use in Last Month, INYS



### Appendix Map G 12th Grade Alcohol Use in Last Month, INYS





This report was funded by the Indiana State  
Division of Mental Health and Addiction (DMHA).  
The views expressed here do not necessarily reflect  
the views of the DMHA



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