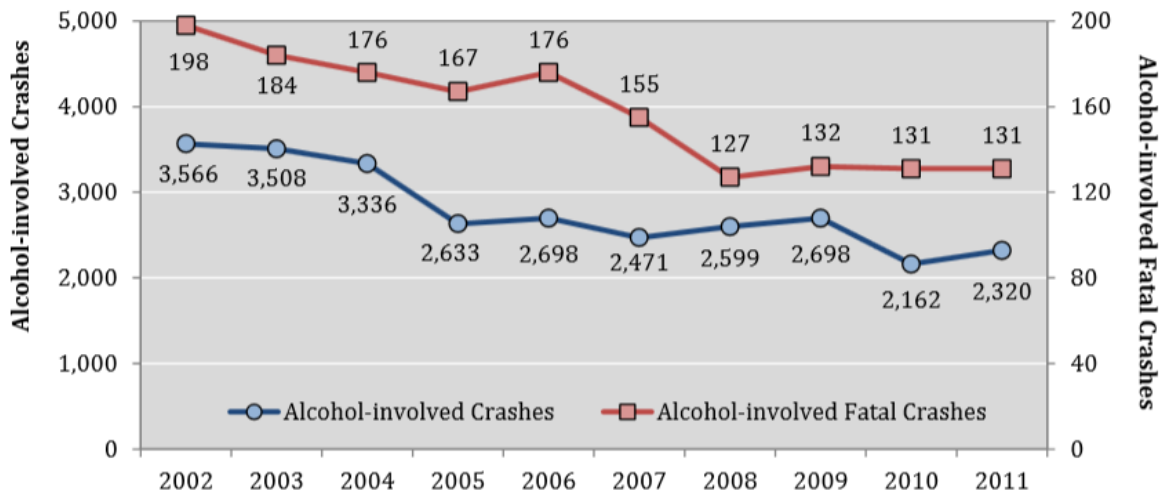


Effect of Income on Drunk-Driving Cycles

Background

New Mexico has a long-running problem with drunk driving. Figures from the U.S. Census Quick Facts and the U.S. Department of Transportation Traffic Safety Facts 2011 were used to derive the rate of people killed by drunk drivers in 2011. The rate for New Mexico was 5.00 per 100,000 residents. The rate for the United States was 3.10 per 100,000 residents. According to the New Mexico DWI Report 2011, produced by the Traffic Research Unit at the University of New Mexico, the number of alcohol-involved fatal crashes in the state steadily declined for many years. But the number plateaued from 2008 to 2011, the latest year for which data is available. The number of all alcohol-involved crashes in the state is also at an apparent plateau after having declined.

Figure 1: Alcohol-involved crashes in alcohol-involved fatal crashes in New Mexico, 2002 - 2011



Source: New Mexico DWI Report, 2011, Traffic Research Unit, University of New Mexico

If law enforcement agencies had a better idea of when and where alcohol-related crashes occur, they could better target efforts to identify and apprehend drunk drivers. This research project examines whether alcohol-related crashes are more likely to occur in the first week of the month than the last week of the month. It also examines whether that difference exists in both a low-income county

Drunk Driving in New Mexico Counties, 2011

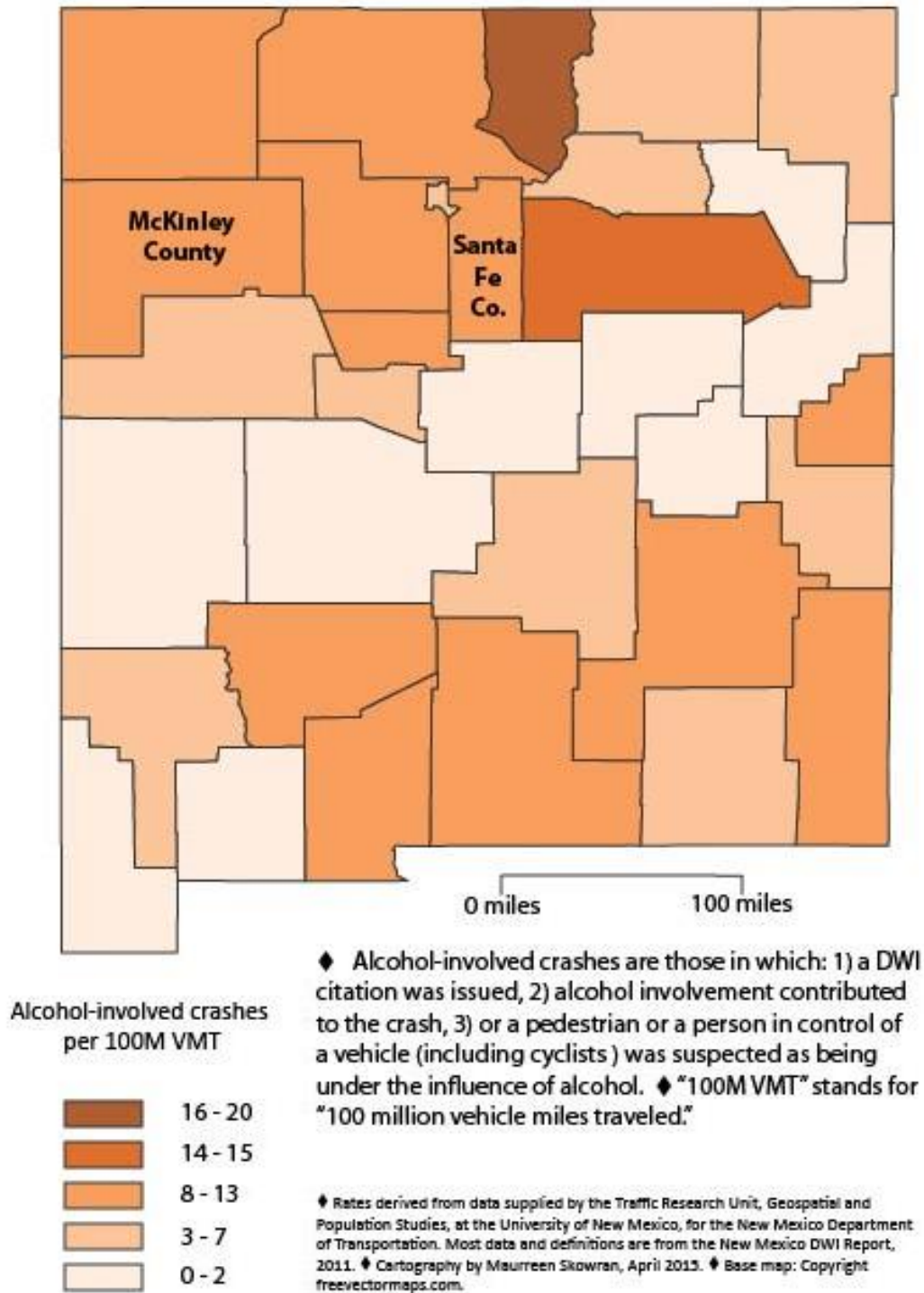


Figure 2: Alcohol-Involved crashes in New Mexico Counties, 2011

and a high-income county. If there are more alcohol-related crashes in the first week of the month, that may be because people have more income at that time. If the difference exists in a low-income county but not a high-income county, that may be because people in the low-income county are using government assistance to buy alcohol, while people in the high-income county have money all month-long to buy alcohol.

McKinley County and Santa Fe County were compared. They have a similar rate of alcohol-involved crashes in 2011. McKinley County had 9.99 alcohol-involved crashes per 100 million vehicle miles traveled. Santa Fe County had 11.69 alcohol-involved crashes per 100 million vehicle miles traveled. McKinley County has the 10th-highest rate in the state, and Santa Fe County has the state’s seventh-highest rate. But the counties are different in socio-economic aspects. McKinley County has about twice the rate of people below the poverty line. It has 35 percent of people in poverty, compared to 17 percent in Santa Fe County, according to the U.S. Census Factfinder.

Table 1: Comparison of McKinley and Santa Fe Counties

	McKinley	Santa Fe
Alcohol-Involved Crashes, per 100M VMT	9.99	11.69
High School Graduates	73%	87%
Median Household Income	\$30, 458	\$52,917
Population Below Poverty Level	35.0%	17%
Unemployment	9.6%	5.3%

Source: U.S. Census Factfinder

Methodology

Data was obtained from the Traffic Research Unit. A record was obtained for each crash, for the years 2008 through 2011. Using Excel, a count was obtained of the number of alcohol-related crashes for the first week of each month and the last week of each month for those years for McKinley County and Santa Fe County. The last week of December and the first week of January were not used, because the winter holidays could skew results. This made a total of 44 pairs for each of the two counties.

A paired-sample t-test was conducted using SPSS. For each pair, the last week of one month was compared with the first week of the next month. The paired sample t-test compares the means between the “before” and “after” group. That is, before and after the first of the month, when low-income people might have more money from government assistance. The paired sample test is used because the observations in the two groups have a one-to-one relationship.

Results

Results showed the mean for the number of crashes in the last week of the month and the first week of the month was very slightly different. However, the difference was not significant. The significance was 0.931 for McKinley County, and 0.613 for Santa Fe County.

McKinley County Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Week4	2.79	29	1.719	.319
	Week1	2.83	29	1.537	.285

McKinley County Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Week4 - Week1	-.034	2.113	.392	-.838	.769	-.088	28	.931

Santa Fe County Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Week4	3.86	29	1.903	.353
	Week1	4.07	29	1.646	.306

Santa Fe County Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Week4 - Week1	-.207	2.177	.404	-1.035	.621	-.512	28	.613

Conclusion

No significant difference was found between the number of alcohol-involved crashes in the last week of the month and the first week of the month, in either a low-income county or a high-income county. This differed from my hypothesis in that I had expected to see a significant difference between the last week of the month and the first week of the month in the low-income county. There appears to be no link between government assistance at the first of the month and alcohol-related crashes.

Complicating factors include the low population density in New Mexico and the fact that not all government benefits pay out on the first of the month. Potential follow-up research could be done by a similar study on a more populous area, such as the whole state, or an area known to be more dependent on receiving money at certain times, such as around a military base.

Another challenge pointed out to me during my presentation in class is that Santa Fe County had both many rich people and many poor people. Results might have been different if I had chosen a county with fewer very rich people but that was more homogenous with respect to income.