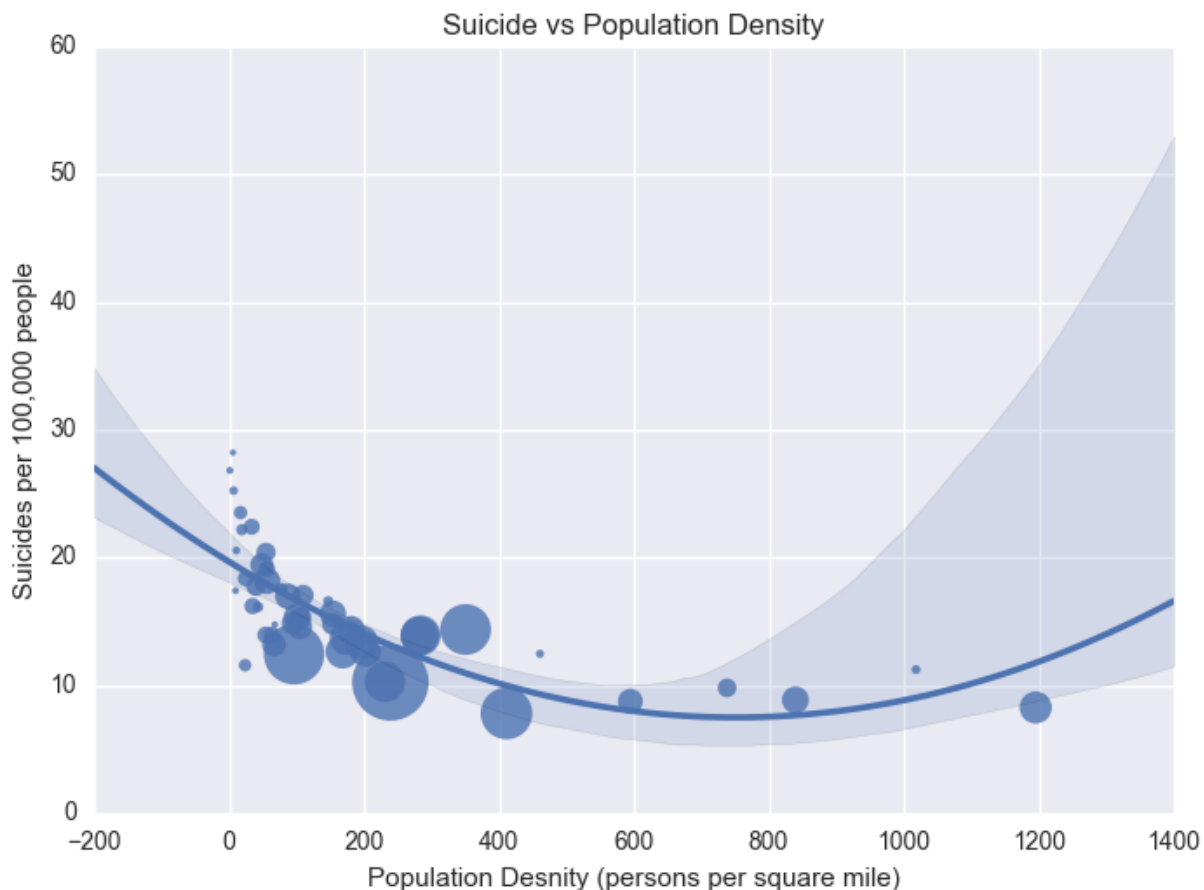# Suicide, The Holidays and Population Density

My mom and I were in a car, on our way to accomplish something that would hopefully make someone's Christmas better. My mother commented, "you know people are actually more likely to commit suicide during the holidays?" Because I have an insatiable need to respond to factoids with more factoids, I retorted "Did you know Utah has the fifth highest suicide rate of any state?" My mother, incredulous that anything bad could happen in a place full of mormons, questioned my claim.
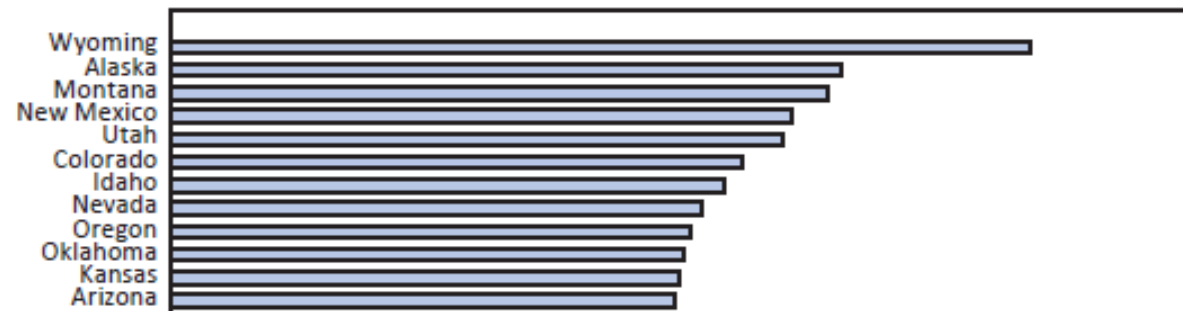
So like any responsible pseudo-scientific know-it-all I checked my sources. The first credible result was from the CDC: in 2012 Utah was 5th in age-adjusted suicides. But that wasn't the most interesting thing on the page. In this happenstantial data analysis I noticed the four above Utah all seemed somehow similar. Wyoming, Alaska, Montana, New Mexico.

State								
Utah	40	36.5	14.1	31	2,995,919	12	82,170	212,819.3
Kansas	41	35.6	13.7	34	2,911,641	13	81,759	211,754.8
Nevada	42	26.3	10.2	35	2,890,845	7	109,781	284,331.5
Nebraska	43	24.7	9.5	37	1,896,190	15	76,824	198,973.2
Idaho	44	20.0	7.7	39	1,654,930	11	82,643	214,044.4
New Mexico	45	17.2	6.6	36	2,085,109	5	121,298	314,160.4
South Dakota	46	11.3	4.4	46	858,469	16	75,811	196,349.6
North Dakota	47	11.0	4.2	47	756,927	17	69,001	178,711.8
Montana	48	7.1	2.7	44	1,032,949	4	145,546	376,962.4
Wyoming	49	6.0	2.3	50	586,107	9	97,093	251,469.7
Alaska	50	1.3	0.5	48	738,432	1	570,641	1,477,953.4

Sure enough, the top three suicide states were the bottom three by population density. At this point I was feeling clever, so I wanted to keep digging. In order to get a better picture I wanted cleaner data. I was able to pull suicide data from the CDC and population density data from the US census. I cleaned up the data, kicked out the District of Columbia (it is a mad outlier in terms of population density) and started putzing around with it. A couple minutes later I had come up with this puppy:

On the horizontal axis we have population density; this is people per square mile. On the vertical axis we have suicide; this is suicides per 100,000 people. Each point represents a state, the size of which is dependent upon the state's population. Example: California's point is huge, because California contains a metric heck-ton of people. The line is a 2nd order line of best fit, and the field around it is a 95% confidence interval (that is to say, if there was a new/ imaginary state that followed the same trend, we could be 95% sure it would fall within that field).

Boom.

On a very basic level, the trend is pretty clear: the denser the population of a state, the lower incidence of suicide it has. Okay, but why?

Now we need to be clear: all this data is entirely observational. We're trying to explain differences in suicide using information we have about population, but we could just as easily do the reverse: try to explain differences population using information about suicide; maybe Wyoming residents are running away because their neighbors are dropping like flies. But it makes some intuitive sense to look at it this way--so lets run with it.

Why do states with higher population densities tend to have a lower rate of suicide? A host of things also correlate well with population density. Densely populated states tend to be more urban and offer more access to healthcare. They also tend to have stricter gun laws. They also tend to be more politically liberal. But that doesn't mean stricter gun laws or liberalism is saving anyone from suicide per se. The same is true of population density. In the words of that one insufferable stats professor we all had at one point: "correlation does not imply causation."

That being said, there is strong theoretical support for the idea that being around other people can increase well being and reduce the risk of suicidal ideation. And hey, the data seems to support that in a non-rigorous way. So let's stay surrounded.

Want to read all the caveats, footnotes, and code that went into this? Check it out at wlifferth.com/

Want to help fight suicide? Check out the American Foundation for Suicide Prevention at afsp.org; If you or someone you know has experienced thoughts of suicide or self harm call or text the Suicide Prevention hotline at 1-800-273-8255.