

The Demographics of Child Abuse

A study was performed relating the number of cases of child abuse to various demographic indicators. The study was performed at the state level using data obtained from References 1 through 3.

Figure 1 shows the number of cases of child abuse per 100,000 residents for each of the continental United States. The states with the highest level child abuse (shown in red) are Kentucky, the District of Columbia, New York, Rhode Island, Iowa, Michigan, Maine, Massachusetts, and Indiana.

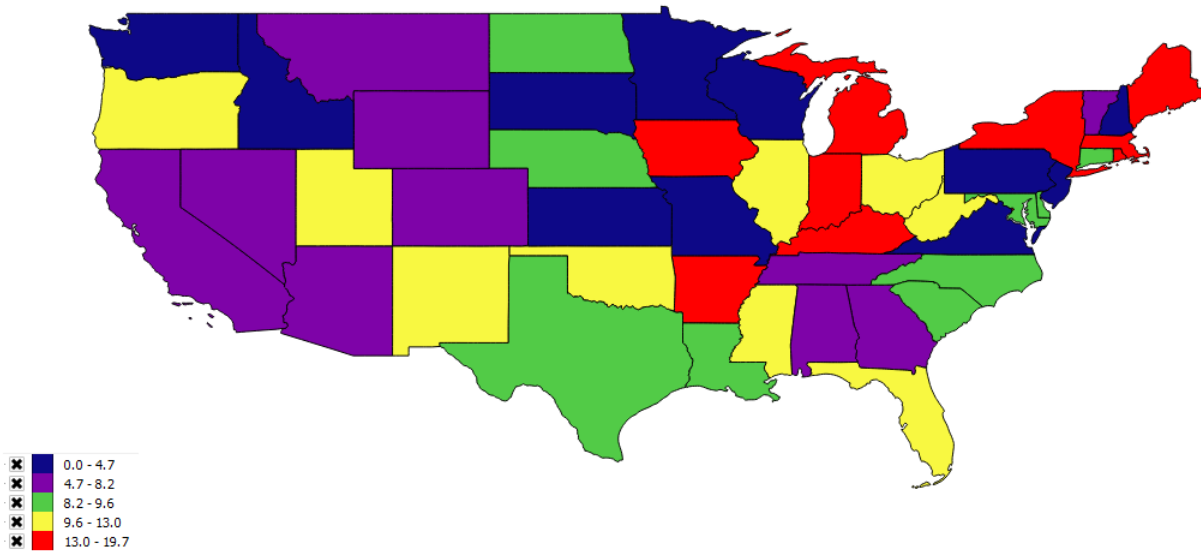


Figure 1. Child Abuse Cases per 100,000 Residents

The demographic indicators that were readily available for each state and relevant to predicting the number of child abuse cases were

1. Drug Overdose Deaths Value
2. Uninsured adults Value
3. Median household income Value
4. Children eligible for free and reduced lunch value
5. Homicide rate Value
6. Unemployment Value
7. Unemployment Redundant Value
8. Child mortality Value
9. Frequent physical distress Value
10. Diabetes Value
11. HIV prevalence rate Value
12. Percent of population that is non-Hispanic African American
13. Percent of population that is American Indian or Alaskan Native
14. Percent of population that is Asian
15. Percent of population that is Native Hawaiian or Other Pacific Islander
16. Percent of population that is Hispanic
17. Percent of population that is non-Hispanic White

Table 1 shows the mean and standard deviations for the various demographic indicators used in this study. In addition, the table provides the correlation between an individual demographic indicator and the number of child abuse cases. The first set of three columns contain this data when all states are considered when computing the mean, standard deviation, and correlations. When viewing the various graphs, some states were seen to be “outliers” for specific demographic indicators. Thus the mean, standard deviation, and correlations were re-computed with these outlier states removed from consideration. This gives the rightmost three columns in Table 1. Footnotes for the table indicate the state that was removed from consideration. The red cells show the demographic indicators with the highest correlation between its value and the number of child abuse cases in a given state.

Table 1. Demographic Value Effects on Child Abuses

Row	All States			Removing One Outlier		
	Correlation	Mean	StDev	Correlation	Mean	StDev
1	0.239	16.02	5.49	0.239	16.02	5.49
2	-0.049	0.15	0.05	-0.049	0.15	0.05
3	-0.149	56385	9409	-0.149	56385	9409
4	0.391	0.49	0.11	0.276 ¹	0.48	0.09
5	0.289	4.96	2.85	0.144 ²	4.72	2.29
6	0.341	0.05	0.01	0.341	0.05	0.01
7	0.341	0.05	0.01	0.341	0.05	0.01
8	0.227	53	11	0.227	53	11
9	0.311	0.11	0.02	0.311	0.11	0.02
10	0.181	0.10	0.02	0.181	0.10	0.02
11	0.31	299	380	0.109 ³	252	164
12	0.184	0.11	0.11	0.050 ⁴	0.10	0.09
13	0.053	0.02	0.03	-0.027 ⁵	0.02	0.02
14	-0.164	0.04	0.05	-0.062 ⁶	0.04	0.03
15	-0.14	0.00	0.01	0.059 ⁷	0.00	0.00
16	0.059	0.12	0.10	0.059	0.12	0.10
17	-0.083	0.69	0.16	-0.083	0.69	0.16

¹ Removing the District of Columbia as an outlier

² Removing the District of Columbia as an outlier

³ Removing the District of Columbia as an outlier

⁴ Removing the District of Columbia as an outlier

⁵ Removing the state of Alaska as an outlier

⁶ Removing the state of Hawaii as an outlier

⁷ Removing the state of Hawaii as an outlier

From Table 1 you can see that the indicators with the highest absolute value of correlation of child abuse (either plus or minus) highlighted in red are:

1. Children eligible for free and reduced lunch value
2. The unemployment rate of the state
3. The frequency physical distress value
4. The drug overdose death rate

Table 1 has also highlighted the LEAST correlated demographic indicator with child abuse rate as shown in green as the number of uninsured adults. (In this case, least correlated meaning the lowest absolute correlation value rather than the most negative correlation value.)

We should address the elephant in the room before we go further. Child abuse is not strongly or even moderately correlated with median household income. Figure 2 shows the statistical correlation between child abuse and income. The correlation is -0.149 which is a fairly low value. Four distinct states are highlighted in Figure 2. Two states, Kentucky and Missouri, have very low median household incomes and strongly disparate levels of child abuse. Two other states, New Hampshire and the District of Columbia, have very high levels of median household income and widely varying levels of child abuse.

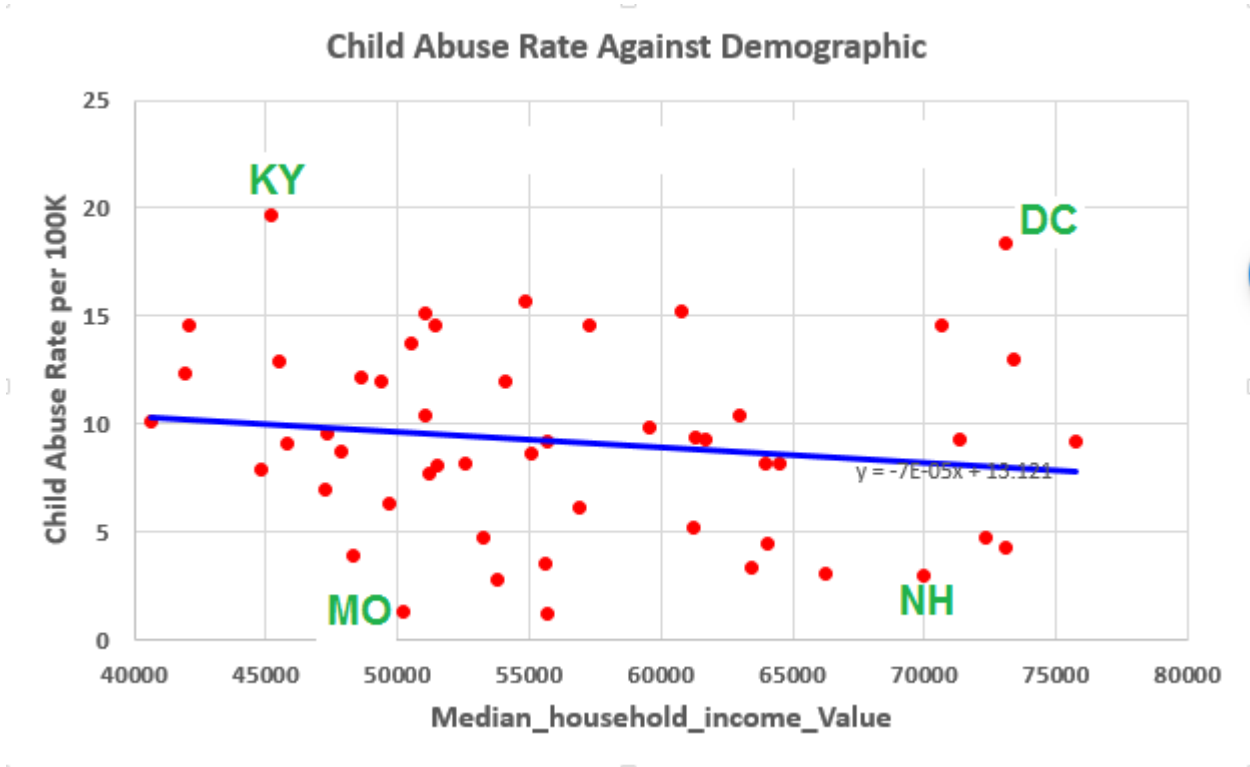


Figure 2. Statistical Correlation Between Child Abuse and Household Income

Figure 4 shows the geographical distribution of children eligible for free/reduced lunches. There is no obvious strong correlation between the geographical distribution of child abuse rates (Figure 1) and percent of children receiving free lunches (Figure 4). Really only Arkansas lights up red in both maps. All of the other states with high child abuse rates show up in green for reduced rate lunches indicating that they are near the national average. Kentucky does show red in child abuse rates and shows yellow in free lunch rates.

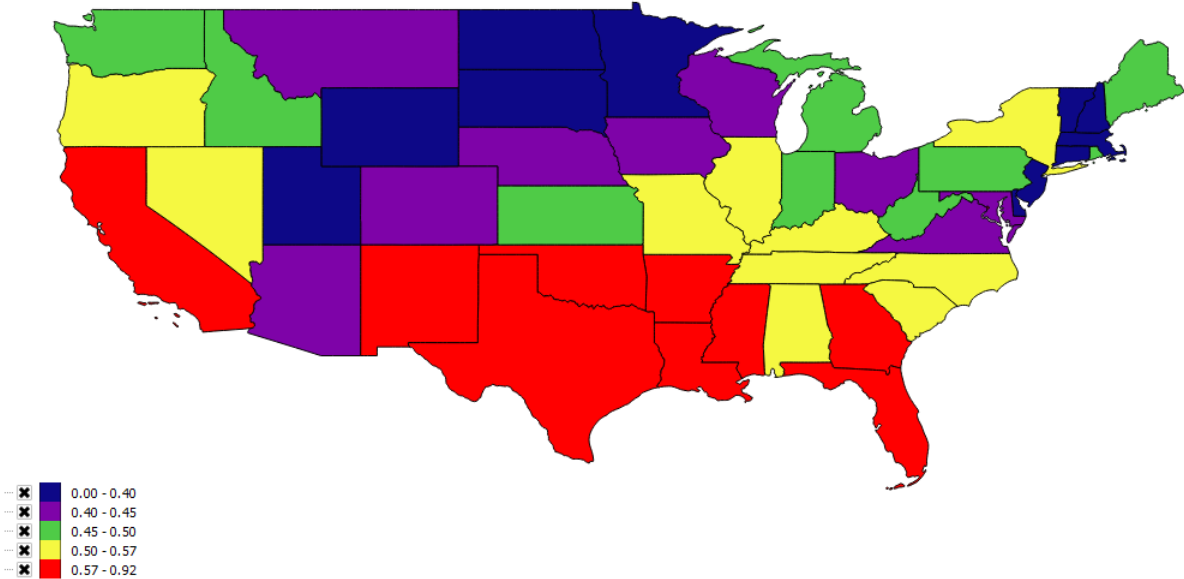


Figure 4. Distribution of Free/Reduced Lunch Rate Children

Figure 5 shows the statistical distribution of child abuse rate against percent of children eligible for free or reduced rate lunches. Even with the “outlier” District of Columbia present in the data, the correlation coefficient is 0.39 (and with DC removed it drops down to 0.27). Certainly there is a trend (with or without DC included), but there is no strong correlation between child abuse rates and the percent of children receiving free lunches when viewed from the state level. A more granular view, for example at the county level, might show something different if that data were available.

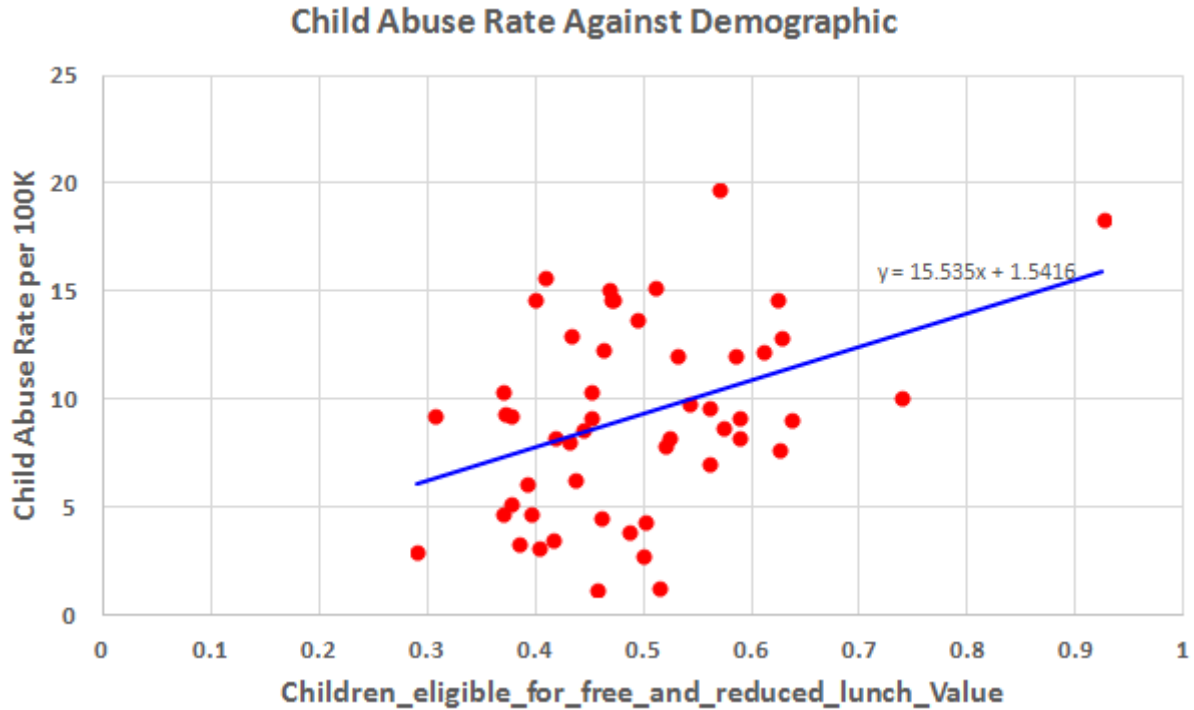


Figure 5. Statistical Correlation Between Child Abuse and Free Lunch Rate

Figure 6 shows the geographical distribution of unemployment levels. Again the states with the highest rates of child abuse (from Figure 1) do not stand out in Figure 6 related to unemployment levels. This is a very different story than the rates of opioid overdoses. In that scenario, the states with the highest overdose death rates are fairly strongly correlated with the states with the highest unemployment levels (as well as other factors such as frequent physical distress). Perhaps a county-level analysis would give a different picture for the correlation between child abuse rates and unemployment rates.

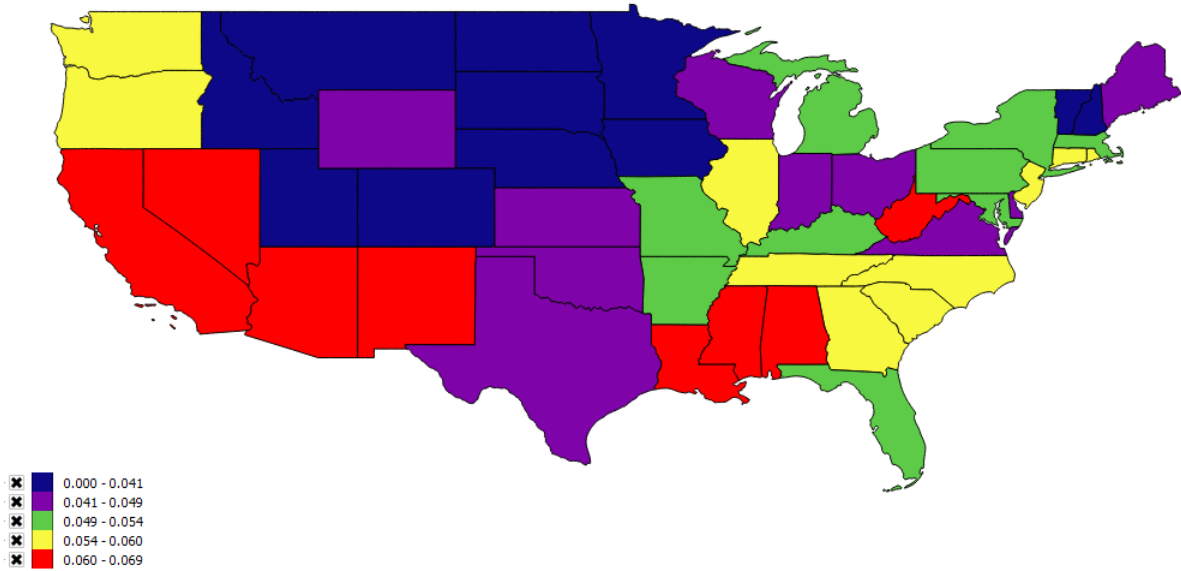


Figure 6. Distribution of Unemployment Levels

Figure 7 shows the geographical distribution of rates of frequent physical distress. Frequent physical distress is defined by the CDC as

The Frequent Physical Distress Value is the percentage of adults who reported ≥ 14 days in response to the question, "Thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?"

The statistical correlation between child abuse rates and frequency physical distress is 0.311 which is a small to moderate level of correlation, yet the geographical distribution does not show it. Only Arkansas and Kentucky show red for both child abuse rates and the frequency of physical distress. Again a county-level analysis might show different results since a few counties could be dominating the number of child abuse cases and/or the frequency of physical distress rates.

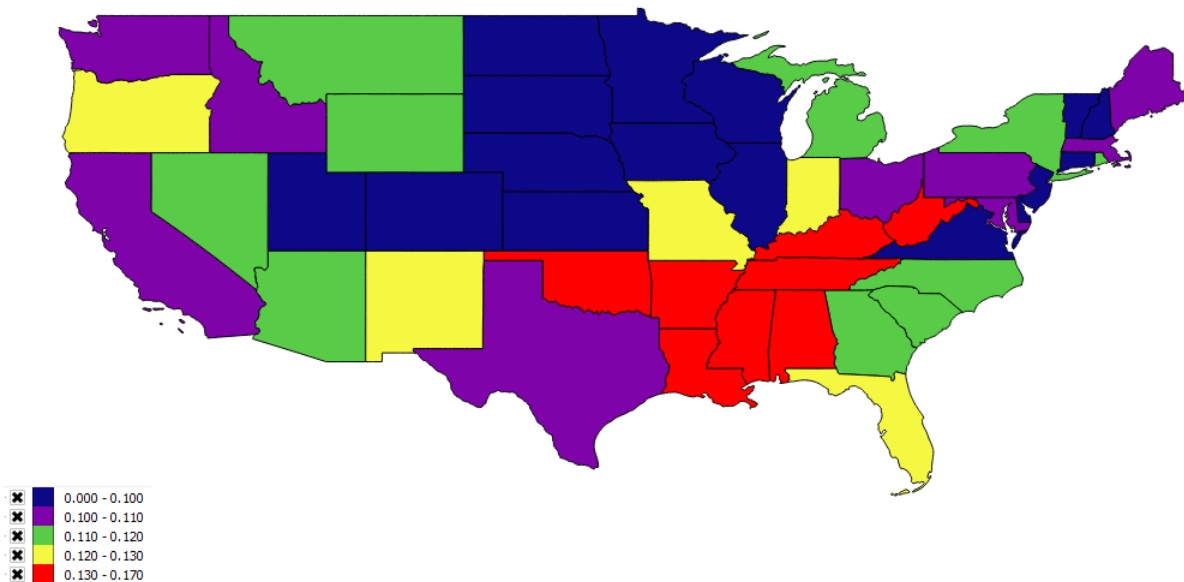


Figure 7. Distribution of Frequent Physical Distress Values

The geographical distribution of homicide rate is shown in Figure 8. It should be noted that the District of Columbia is an “outlier” in this case since its homicide rate is nearly four times the national average. With DC included, the correlation between child abuse rates and homicide rates is 0.289 and drops all the way down to 0.144 when DC is excluded from the correlation analysis. But again Arkansas shows up as red indicating high levels of homicide rates (along with its high level of child abuse rates).

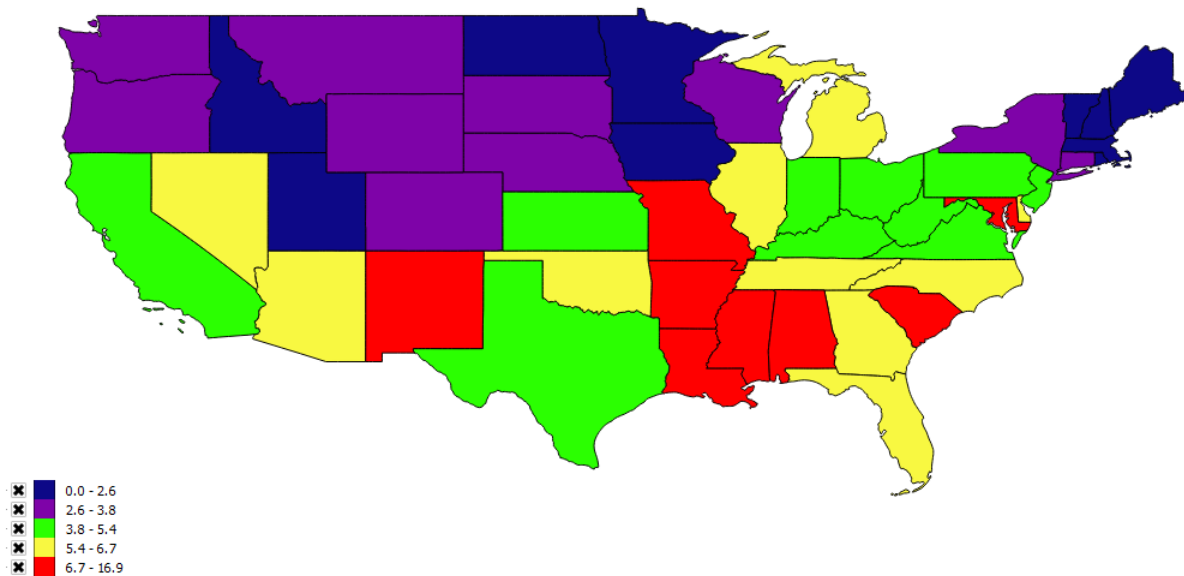


Figure 8. Distribution of Homicide Rate

Is there a good correlation between drug overdose death rates and child abuse? It's a weak to moderate correlation. The numerical correlation value is 0.239 and the geographical distribution is shown in Figure 9. Only Kentucky and Massachusetts show red (i.e., highest quintile) for both child abuse rates and homicide rates. Though it should be noted that West Virginia, Ohio, New Mexico and Colorado show high drug overdose death rates and near-high child abuse rates (i.e., 2nd highest quintile).

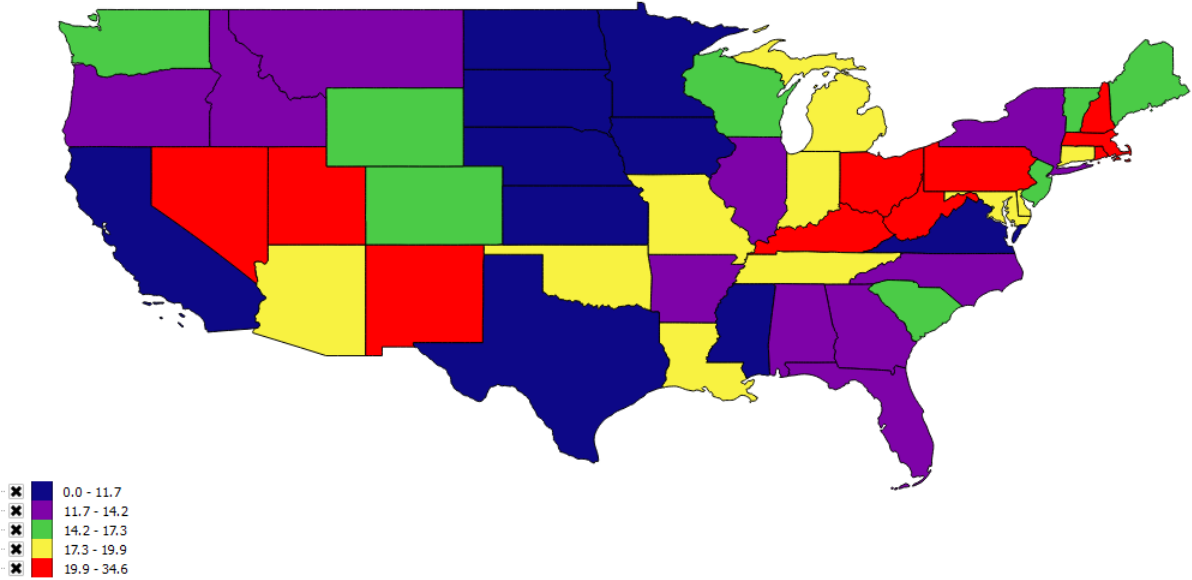


Figure 9. Distribution of Drug Overdose Levels

Finally we look at the rate of uninsured adults. Figure 10 shows the geographic distribution of the rate of uninsured adults in the continental United States. This indicator was chosen for its low correlation with child abuse rates of -0.049. There were no outliers in the data and there is no correlation of significance between the number of uninsured adults and the child abuse rate. This is visually seen by comparing Figure 10 with Figure 1 and seeing that there are no states in the highest quintile of child abuse rates (i.e., red in Figure 1) that are also red in Figure 10.

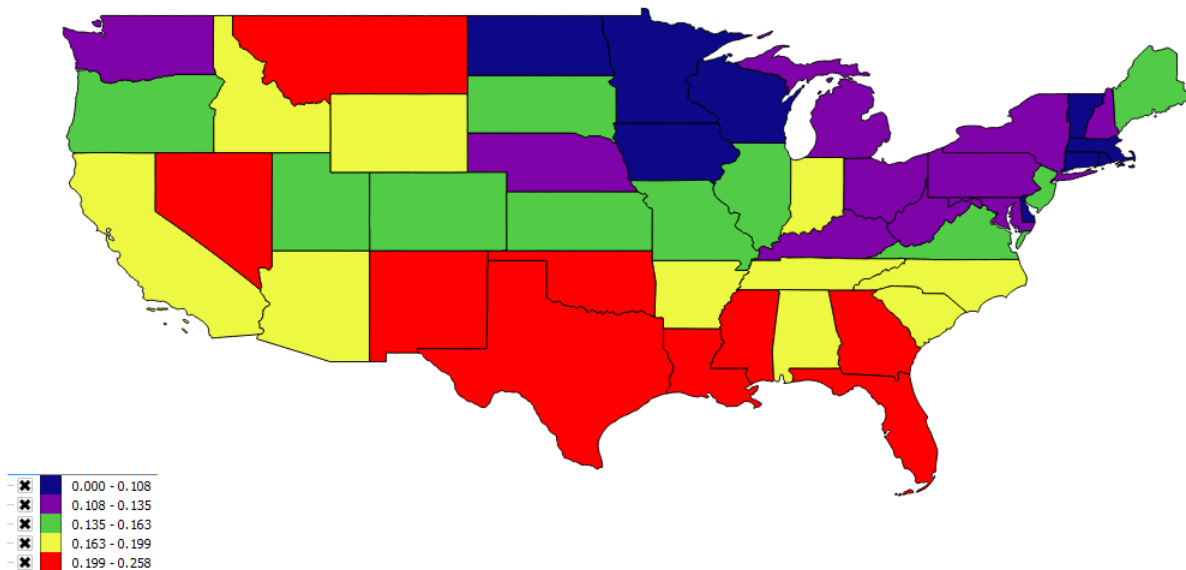


Figure 10. Distribution of Uninsured Adult Rates

Unlike opioid and drug overdose deaths, child abuse rates are harder to pin down in terms of root cause and the demographics of child abuse. Whereas drug overdose deaths are typically driven by unemployment frequent physical distress, the lack of “attractive alternatives”, and despair, child abuse rates defy classification and categorization. Perhaps county-level data would tell a different story. We’re going to continue investigating.

References

“USA state shape files”, https://www.census.gov/geo/maps-data/data/cbf/cbf_state.html.
“USA demographic data”, <https://wonder.cdc.gov/>.

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