

# Examining Deadly Overdoses in “Landscapes of Despair”: Fading Economies and the Social Significance of Place for the Opioid Epidemic

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## Context

The Centers for Disease Control (CDC) reports that drug overdose deaths nearly tripled between 1999 and 2014. More than 63 percent (n = 33,091) of drug-induced deaths in 2015 involved an opioid (Rudd et al. 2016). Between 2010 and 2015, the drug-induced death rate increased significantly: from 12.3 deaths per 100,000 to 16.3. Data indicates that Appalachia and the Northeast are particularly vulnerable.

## Study Objectives

The research questions motivating this project regard place: Do the counties most affected by drug-induced mortality share certain macroeconomic characteristics that increase vulnerability to overdose fatalities? Do these counties share demographic characteristics associated with higher drug-induced death rates? I compiled a dataset using three sources of county-level data to investigate these questions: (1) the CDC’s detailed mortality files, (2) the U.S. Census Bureau’s American Fact Finder, and (3) the U.S. Department of Agriculture’s Economic Research Services (ERS) data products.

## Data

This study uses CDC’s “Detailed mortality files.” WONDER database returns were limited to “drug-induced causes.” To capture drug-induced mortality during the “opioid crisis,” I gathered data from 2013 to 2016. The dependent variable for the present study is the four-year average for drug-induced mortality (i.e. CDC’s “drug-induced causes”); alcohol-induced deaths are not included). Table 1 (below) shows the ten states (and the District of Columbia) most affected by drug-induced mortality:

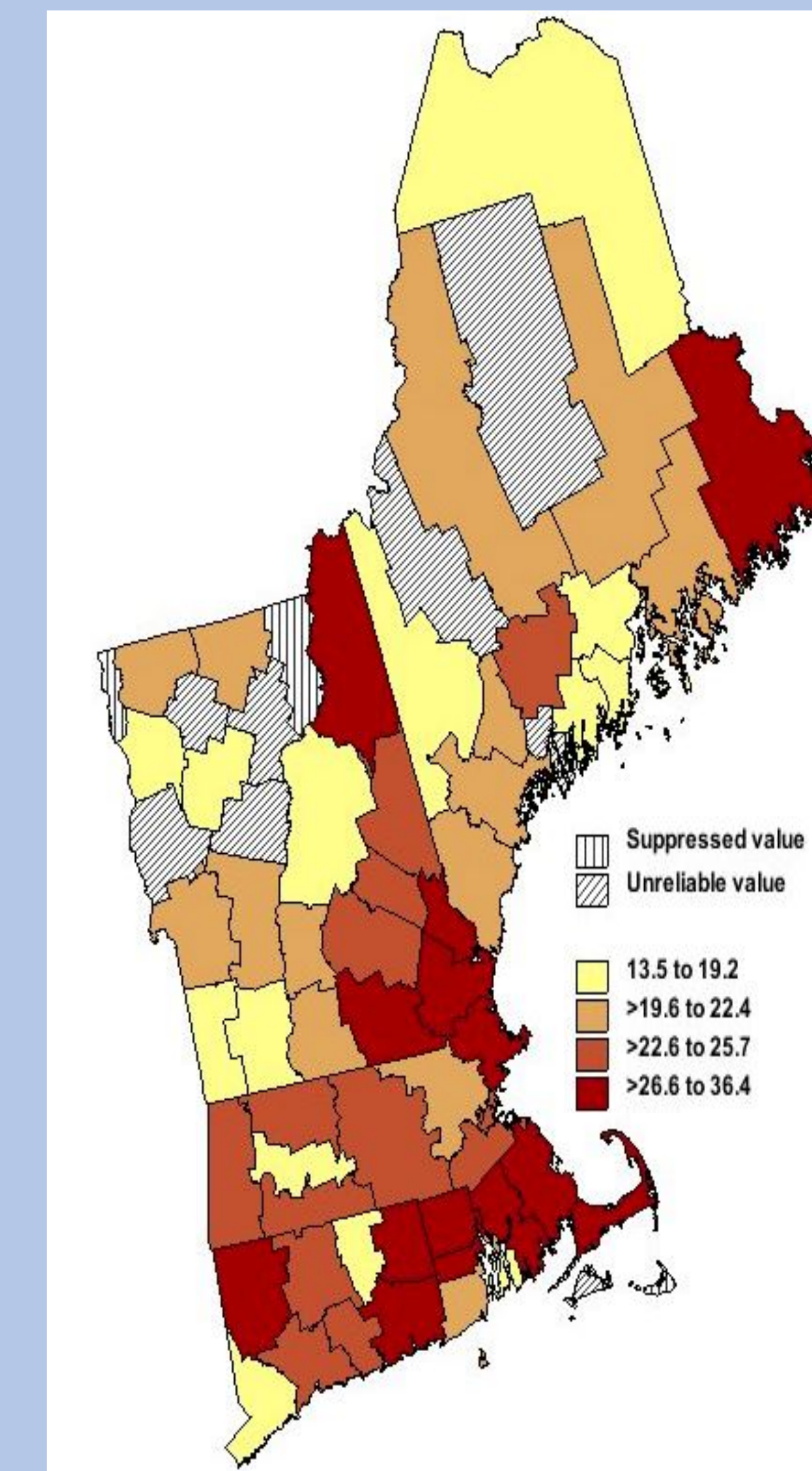
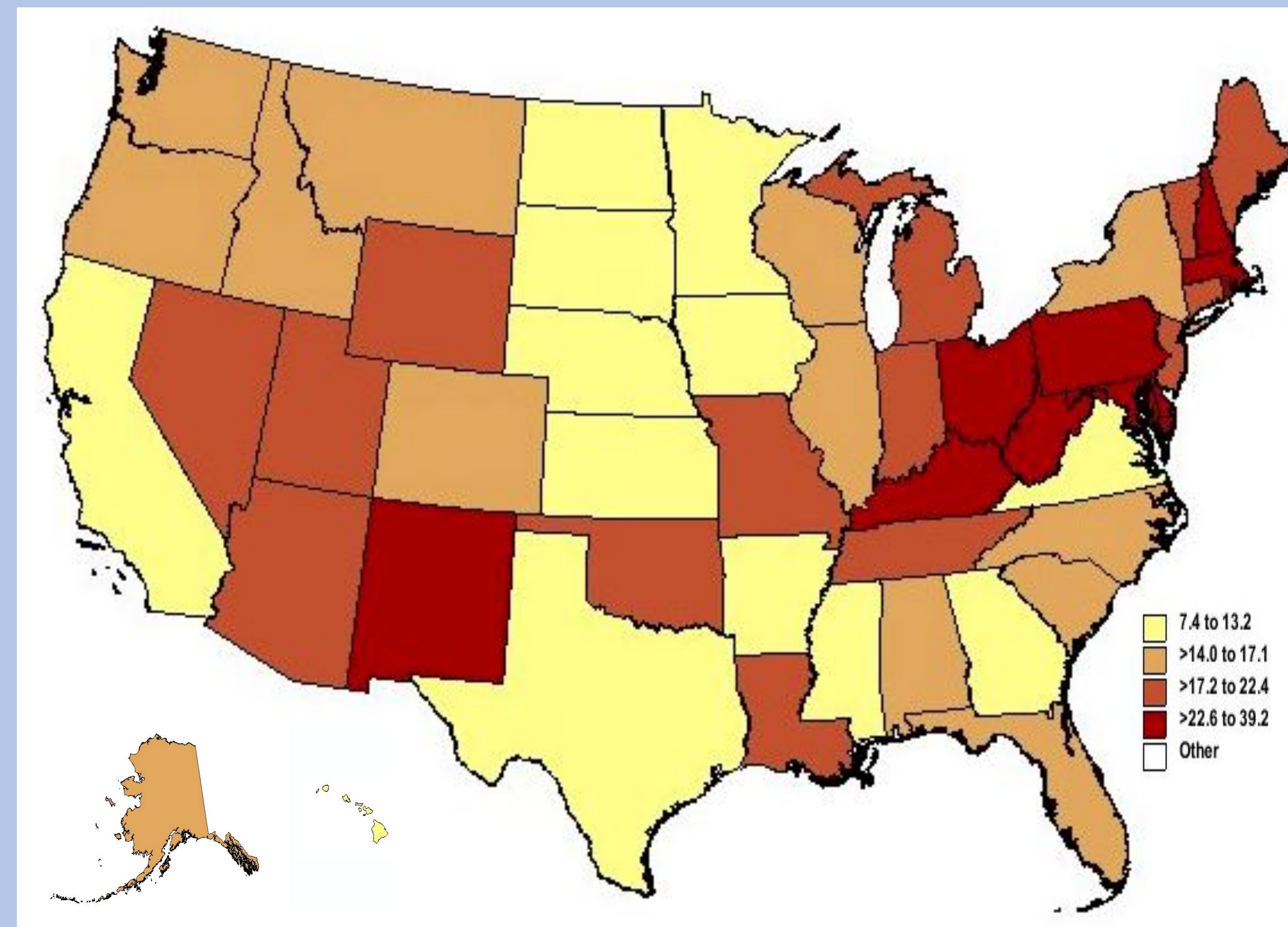
**Table 1: Drug-Induced Mortality and the “Opioid Crisis”**

State	2013-2016 Crude Rate	State	2016 Crude Rate
West Virginia	39.2	West Virginia	49.8
Kentucky	28.5	Washington D.C.	40.5
Ohio	28.4	Ohio	38.5
New Hampshire	28.1	Pennsylvania	37.2
Rhode Island	27.3	New Hampshire	37.1
Pennsylvania	26.4	Massachusetts	34.9
Massachusetts	25.3	Maryland	34.7
New Mexico	24.8	Kentucky	34.4
Washington D.C.	23.5	Rhode Island	31.2
Delaware	23.1	Delaware	30.3
Maryland	22.6	Connecticut	27.9

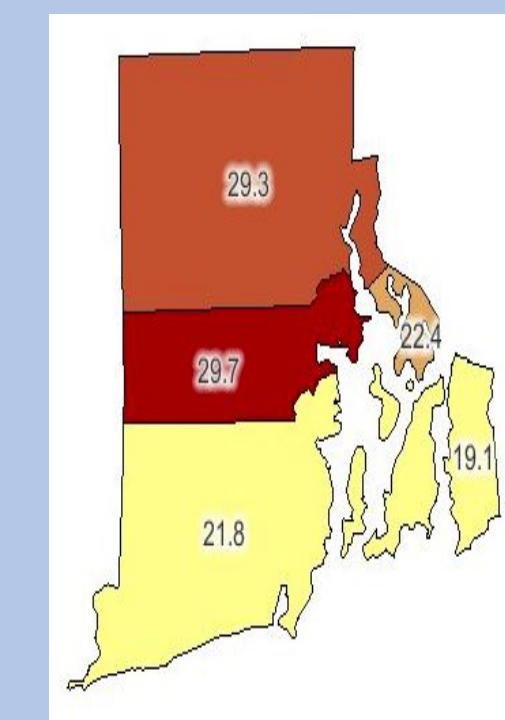
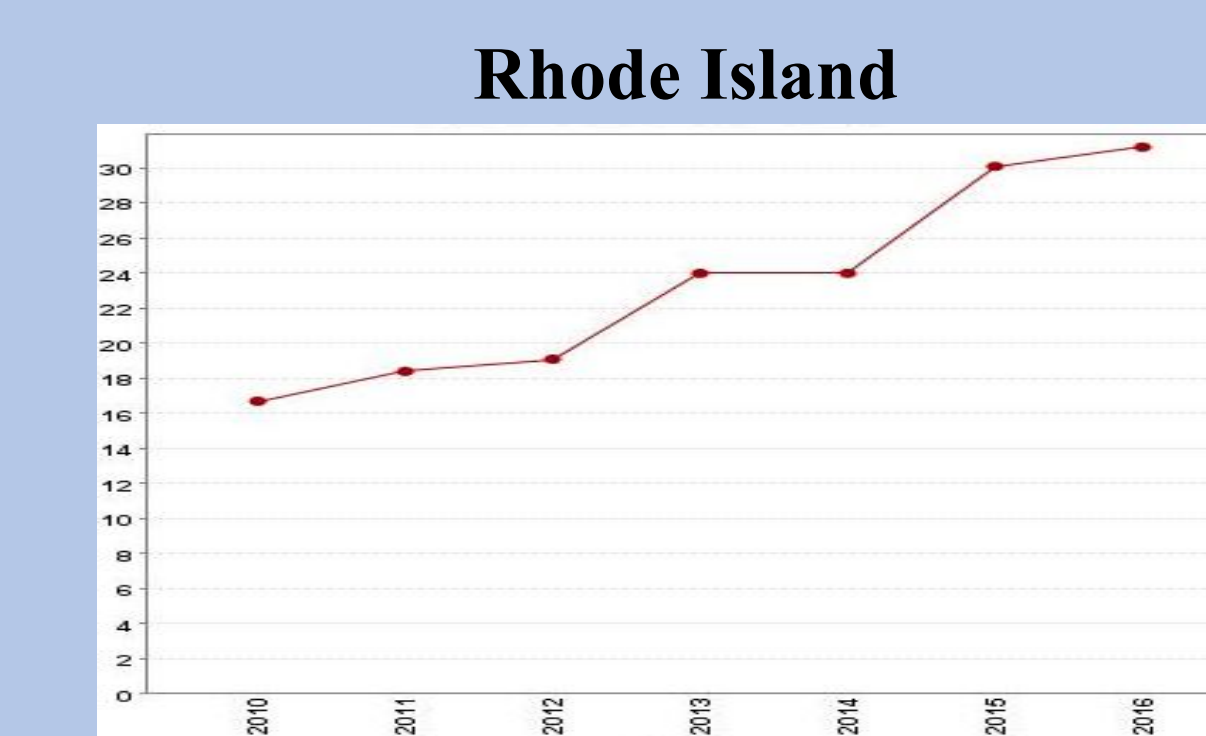
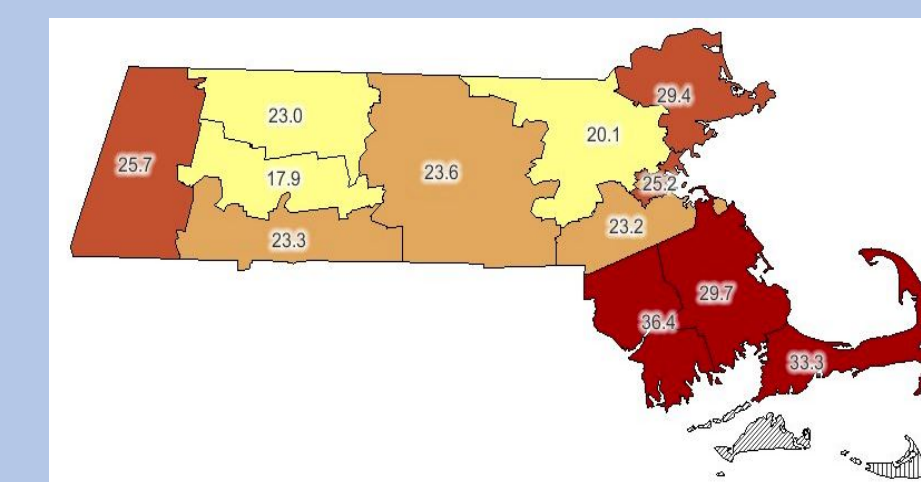
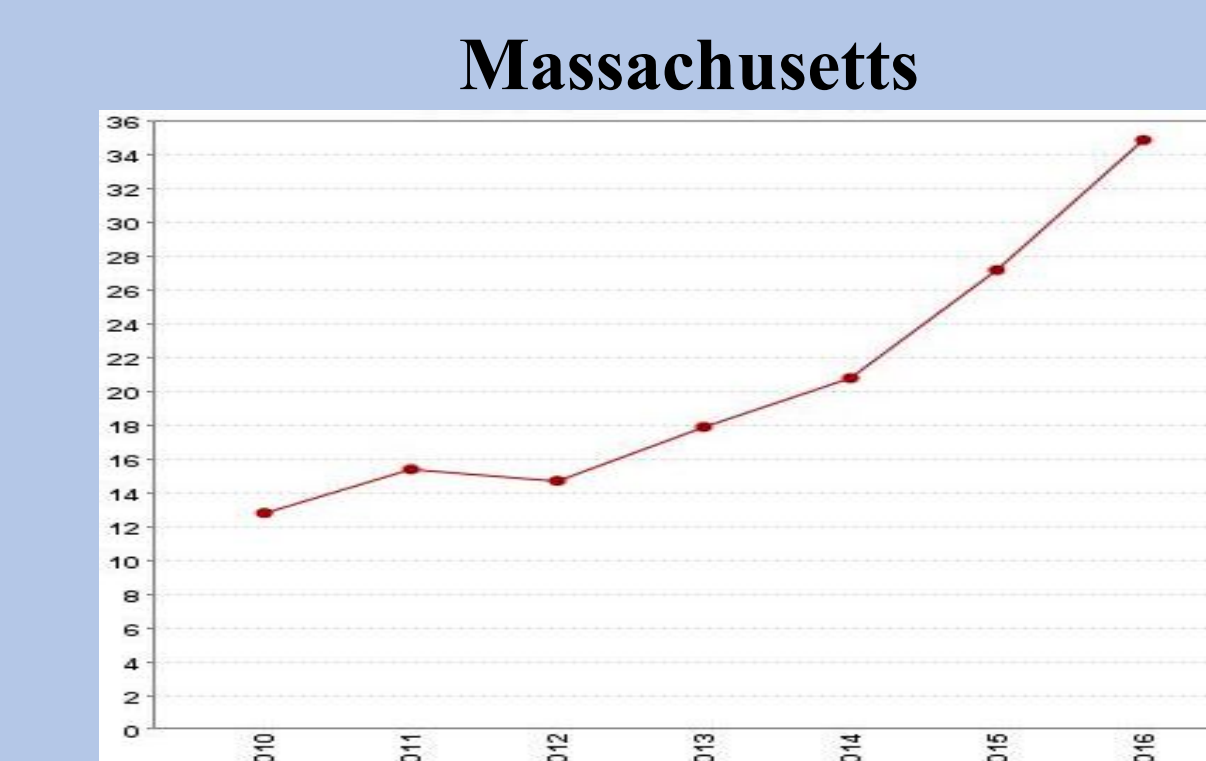
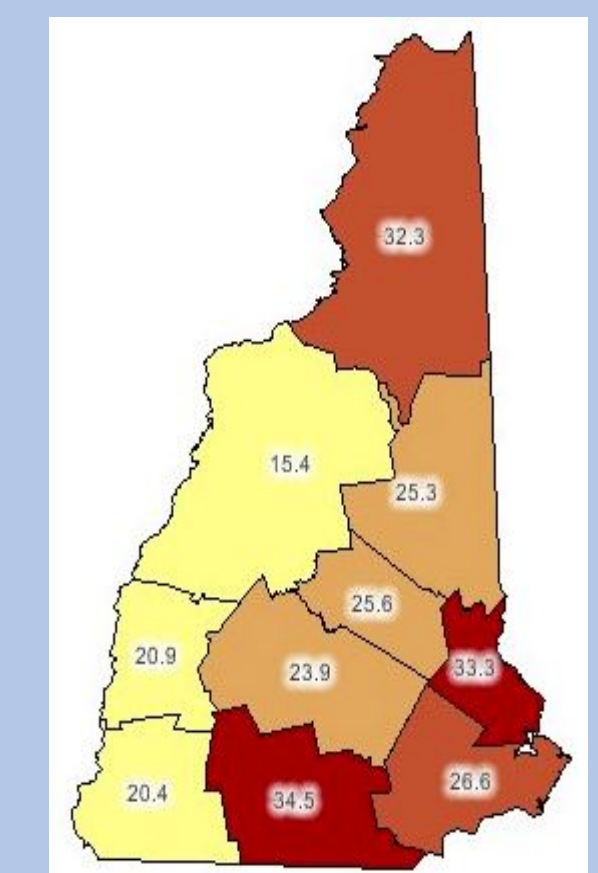
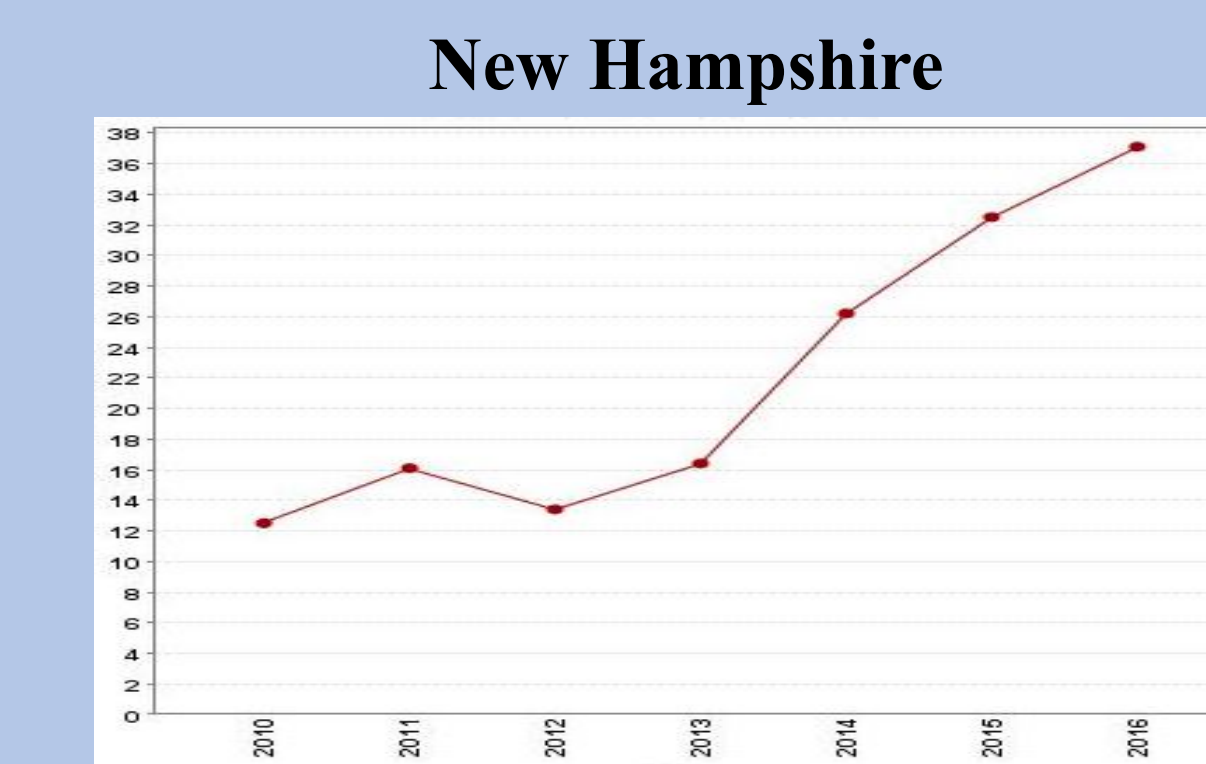
Source: CDC Wonder, Multiple Cause of Death Files, 1999-2016  
Note: U.S. state average is 17.1 for 2013-2016

The unit of analysis for this study is counties. Those with an average crude death rate of 22 or greater (plus Washington, D.C.)—the CDC cutoff point for those places most severely impacted by rising drug overdose—are included in the dataset. Though these states contain 421 counties, my dataset was reduced in size (n = 363) due to suppressed CDC data. Future research will supplement and expand the dataset.

## Drug-Induced Mortality Rates, 2013-2016



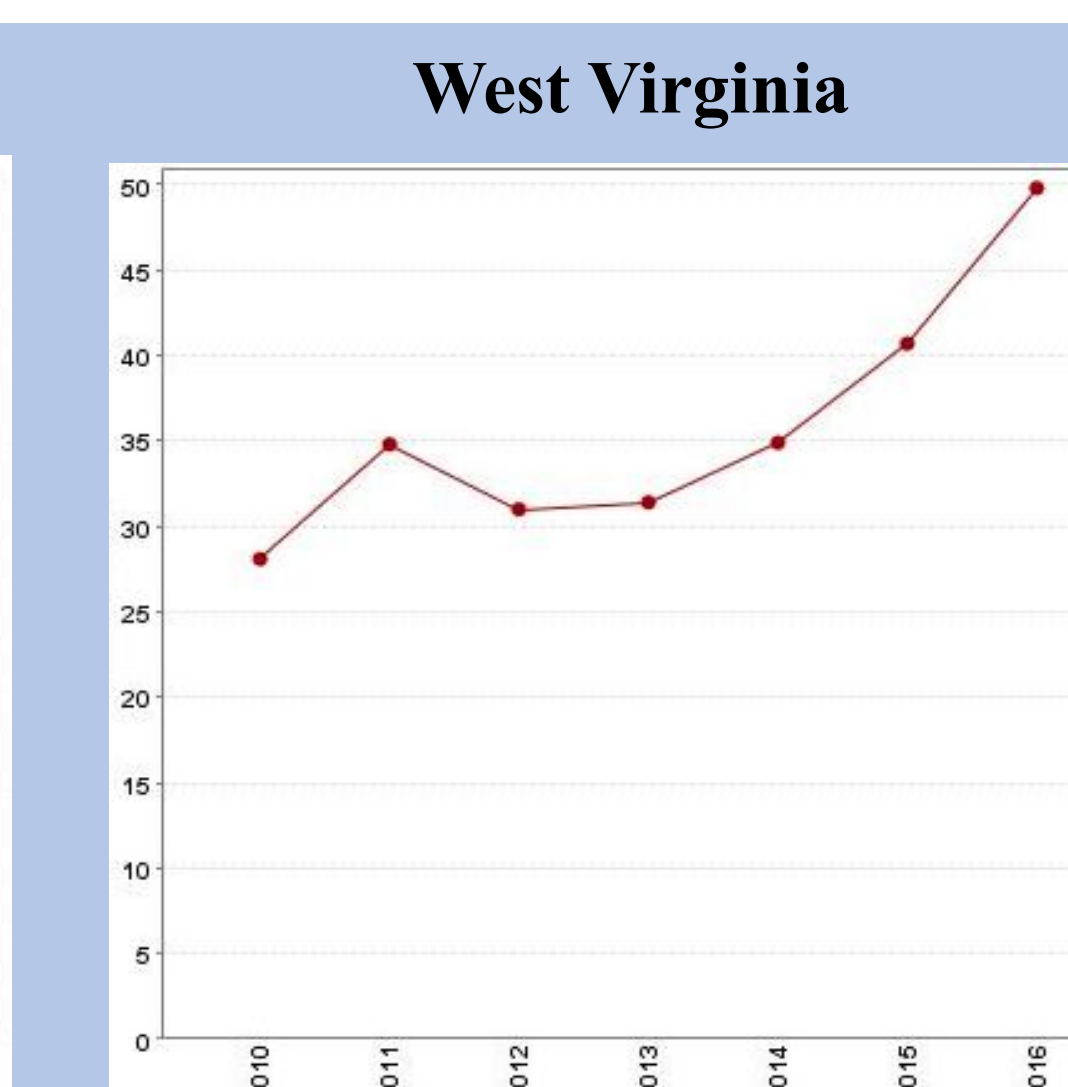
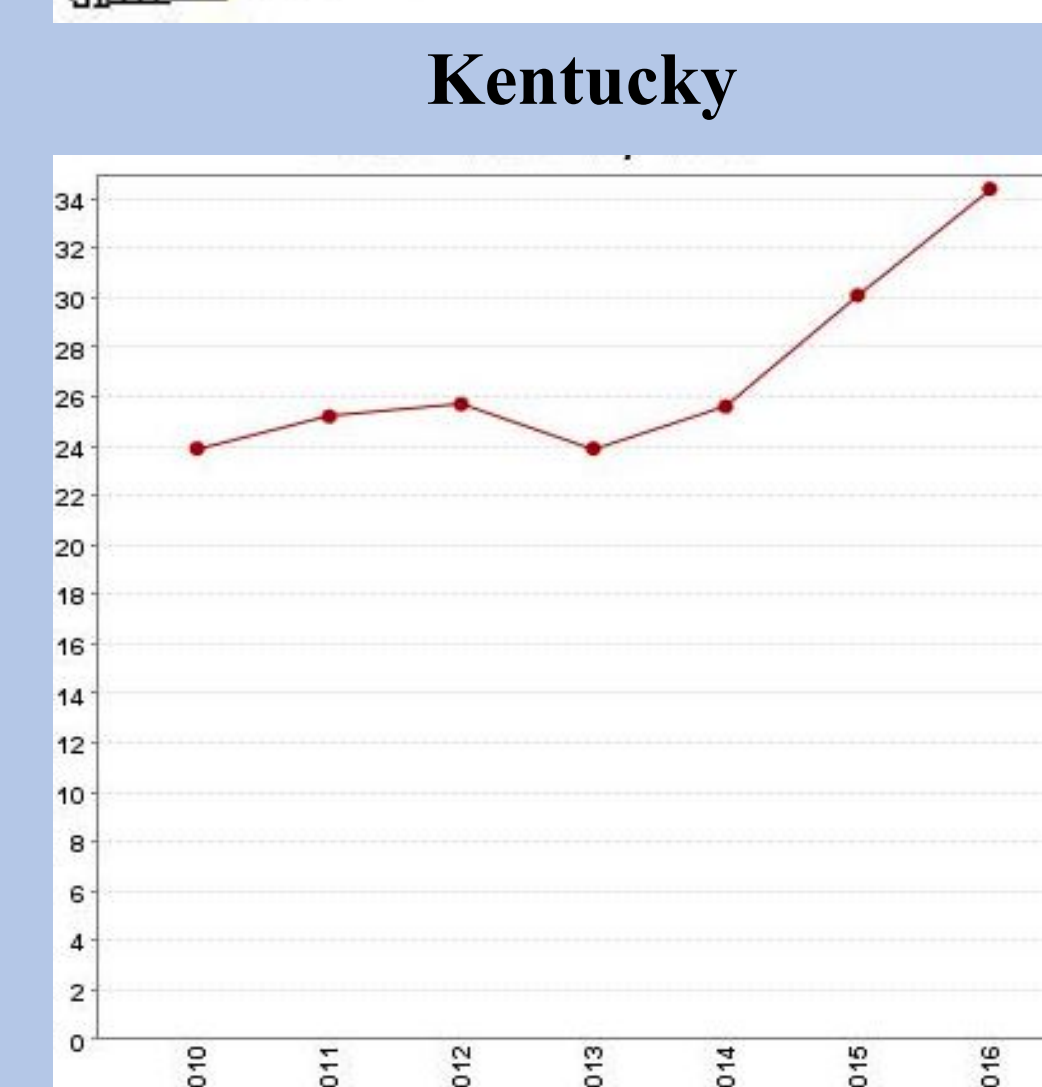
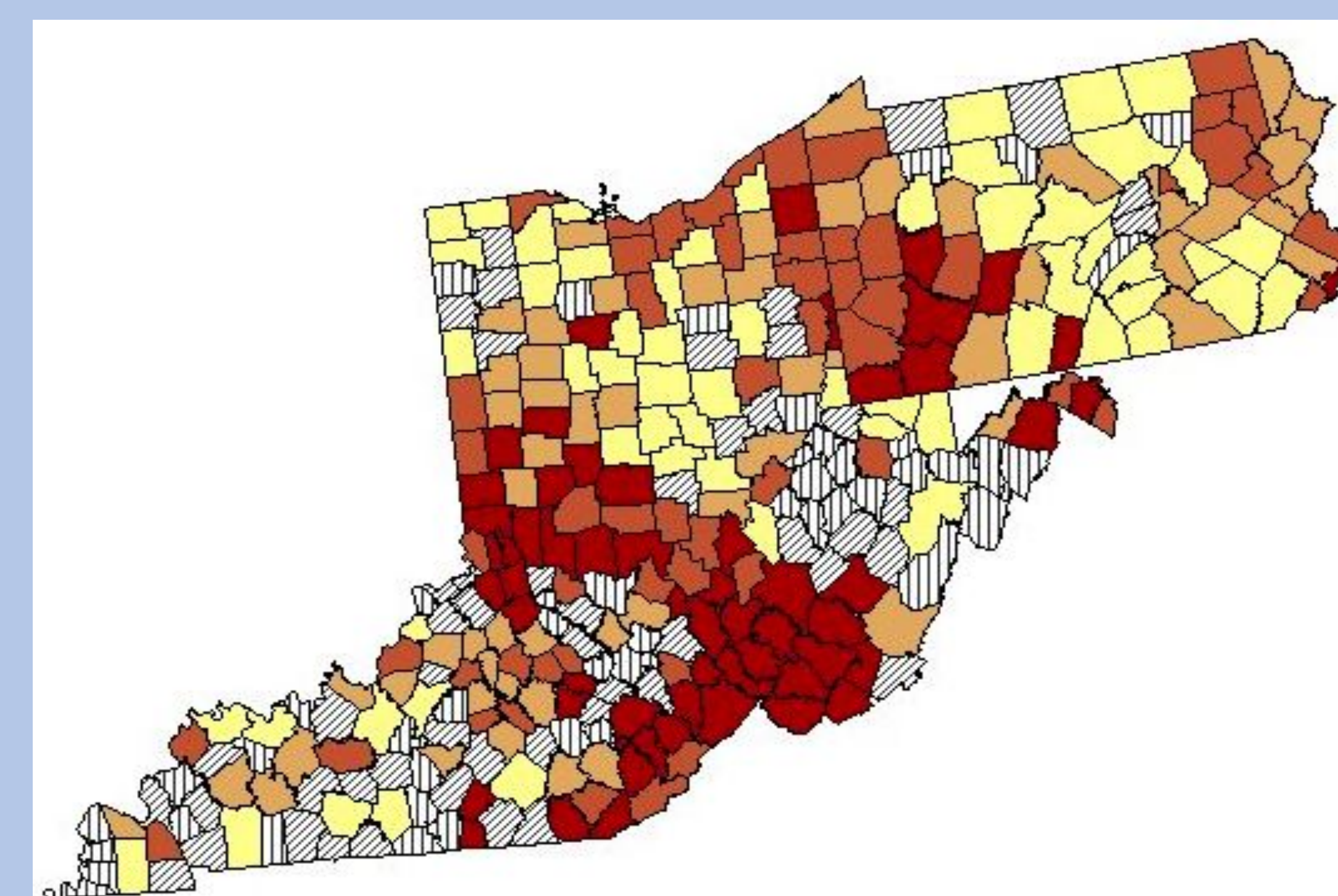
## Landscapes of Despair: New England



## Findings

- In the counties of states most affected by the “opioid crisis” (n = 363), the mean drug-induced mortality rate is 27.8. Drug-induced mortality ranges from a low of 6.8 to a high of 89.7 in these counties. Using only economic and demographic indicators, I am able to explain nearly **35% percent** of the variance in overdose fatality rates (R-squared = .35; Adjusted R-squared = .34). Future research will include health indicators, among other variables, in an attempt to explain a larger portion of the variance.
- Mining counties** are those most severely impacted by rising drug-induced mortality (p < .01); in fact, the model indicates classification as a mining county increases the drug-induced mortality rate by 5.5 deaths per 100,000. According to the USDA, to be classified as a mining county, mining must account for more than 13% of the county’s earnings or 8% of the employment average.
- The **percent below poverty** variable, as measured using U.S. Census data, is highly significant in the multivariate model (p < .001). Its standardized coefficient is .86, indicating that for each one percent increase in the percent below poverty, drug-induced mortality increases by nearly one death (.86) per 100,000.
- The USDA’s **Rural-Urban Continuum Codes (RUCC)** variable is highly significant in the multivariate model (p < .001). This variable distinguishes metropolitan counties by the population size of their metro area. Metropolitan counties are subdivided into three categories. The RUCC distinguishes nonmetropolitan counties by degree of urbanization and adjacency to a metro area; nonmetropolitan counties are subdivided into six categories. The RUCC mean (4.5) indicates the average county in my dataset is nonmetropolitan.
- Population loss** is also highly significant (p < .001) in the multivariate model. According to the USDA, a county is classified as “population loss” if the number of residents declined between 1990 and 2000 censuses and also between the 2000 and 2010 censuses. According to the multivariate model, classification as a “Pop loss county” increases the drug-induced mortality rate by 5.1 deaths per 100,000.
- The county’s **age structure** is also important. Three age categories are significant in explaining drug-induced mortality: age 35 to 44 (p < .001), age 54 to 59 (p < .001), and age 60 to 64 (p < .001). A one percentage increase in the population of adults age 35 to 44 produces a 2.5 increase in drug-induced mortality; the same is true for adults age 55 to 59. A one percentage increase in the population of adults age 60 to 64 increases drug-induced mortality by 3.8 deaths.

## Landscapes of Despair: Appalachia



**Table 2: Most Affected U.S. Counties**

County	State	Drug-Induced Mortality	Unemployment Rate	Percent Below Poverty	Economic Type
McDowell County	WV	89.7	12.7	37.6	Mining
Rio Arriba County	NM	84.1	9.5	23.4	Non-specialized
Wyoming County	WV	80.4	12.1	20.1	Mining
Mingo County	WV	74.8	15.8	26	Mining
Cabell County	WV	72.6	6.6	21.8	Non-specialized
Boone County	WV	72.2	9.6	26	Mining
Bell County	KY	67.2	10.6	36.6	Mining
Leslie County	KY	64.8	17	32.5	Mining
Harrison County	KY	64.4	6.9	19	Manufacturing
Mercer County	WV	63.2	6.2	21.1	Non-specialized
Logan County	WV	60.1	12.3	20.2	Mining
Raleigh County	WV	58.8	7.7	17.7	Mining
Powell County	KY	58.6	7.4	26	Non-specialized
Gallatin County	KY	55.4	6	13.6	Manufacturing
Wayne County	WV	54.9	9.5	20.9	Government
Baltimore City	MD	53.8	11.4	23.1	Government
Kenton County	KY	53.3	6.5	13.6	Non-specialized
Campbell County	KY	52.6	5.8	14.9	Government
Clinton County	KY	51.6	8.9	22.4	Manufacturing
Berkeley County	WV	51.5	9	13.2	Government
Montgomery Co.	OH	51.0	8.7	18.5	Non-specialized
Hancock County	WV	50.9	6.6	14.5	Manufacturing
Russell County	KY	50.8	10.6	26.5	Manufacturing
Martin County	KY	50.5	18.6	32.4	Mining
Kanawha County	WV	50.4	6.4	16	Government
Floyd County	KY	49.4	11.2	30.7	Mining
Nicholas County	WV	48.7	7.7	17.6	Mining
Lincoln County	WV	47.8	7	25.2	Mining
Butler County	OH	47.7	6.1	13.6	Non-specialized
Grant County	KY	46.3	6.2	20.2	Non-specialized
Clermont County	OH	45.9	5	10.5	Non-specialized
Brown County	OH	45.5	8	16.7	Non-specialized
Estill County	KY	45.1	13.7	30.3	Non-specialized
Wolfe County	KY	45.0	10.2	40.8	Non-specialized
Cambria County	PA	44.8	8.3	15.6	Non-specialized
Owen County	KY	44.5	8.5	17.7	Farming
<b>MEAN</b>		<b>56.9</b>	<b>9.3</b>	<b>22.1</b>	