The Opioid Crisis and Drug Policy: Does Local Context Shape Public Opinion?

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Abstract

How does exposure to the opioid crisis affect public opinion about criminal justice policy? Hopkins (2018) proposes that local conditions only become relevant for public opinion when the corresponding political issue is salient nationally. Following this "politicized places" framework, I argue that the opioid crisis in 2016 is a sufficiently salient national issue with high geographic variation, and I test how exposure to the opioid crisis is related to two criminal justice policy questions: mandatory minimum sentences for drug offenses and marijuana legalization. First, I find that increased exposure to the opioid crisis is associated with opposition to marijuana legalization in Massachusetts, but this relationship is likely confounded. Next, I find a positive relationship between support for marijuana legalization and overdose deaths at the county level in severla states, though this result tends to not hold up within states. Finally, I find that county-level overdose rates are not related to preferences over drug policy in the Cooperative Congressional Election Study (CCES).

In 2017, nearly 50,000 Americans died from an overdose involving some kind of opioid, over four times the number who died in 2002 (NIH, 2018). The total number of drug overdose deaths has reached 70,000, higher than the number of deaths from car crashes or firearms

(Katz, 2017). The scale of the opioid crisis raises the question: how has the opioid crisis affected American politics? More specifically, does being exposed to an area suffering from overdose deaths shape public opinion in this policy domain? In this paper, I use municipal and county-level election data and survey results to test this question of whether and how local exposure to the opioid crisis influences public opinion regarding drug policy.

Literature Review/Theory

Local Context and Political Behavior

The opioid crisis has had a disproportionate impact in particular geographic regions: Appalachia, the Northeast, and increasingly the Midwest and Southwest (CDC, 2018). It has also hit certain communities within these regions particularly hard. For example, the opioid overdose death rate in Ware, Massachusetts surpassed 90 per 100,000 in 2016. This suggests that one way to understand the relationship between exposure to the opioid crisis and public opinion is to focus on the local level.

A large body of literature has studied the question of whether local context affects political behavior, generally finding mixed results. In the context of economics, some research shows that voters are more attuned to the national economy than personal economic indicators (Kinder and Kiewiet, 1981). Other studies, however, demonstrate the ways in which varying levels of local economic conditions shape political behavior. Ansolabehere, Meredith, and Snowberg (2014) find that noisy economic signals from daily life, such as gas prices, as well as group-based economic measures, predict vote choice. Charles and Stephens (2013)

argue that higher local wages and employment lead to lower turnout for non-presidential elections.Burden and Wichowsky (2014) argue for an opposite effect, that higher county and state unemployment rates lead to higher turnout and a higher rate of punishment for Republican incumbent governors.

Hopkins (2018) provides a useful framework for understanding what kinds of issues are likely to show the impact of local context by proposing the hypothesis of "politicized places." This hypothesis claims that local conditions only become relevant for public opinion when the corresponding political issue is salient nationally. Individuals receive too many different kinds of stimuli for most of them to make a difference, so, in most cases, local context does not affect political behavior. When issues become nationally important, however, then individuals can connect their local experiences to broader political ideas and begin to form opinions.

Following this framework, there are several reasons why the opioid crisis should be considered to be a nationally salient issue in 2016. For example, according to a STAT-Harvard poll fielded in March 2016, 51% of Americans "say the abuse of strong prescription painkillers such as Percocet, OxyContin or Vicodin are an extremely or very serious problem in the state where they live." A similar proportion (53%) identify heroin as an extremely or very serious problem in their state (STAT-Harvard, 2016). Additionally, a Pew poll from October 2017 found that 76% of Americans view prescription drug abuse as a serious public health problem, up from 63% in November 2013 (Oliphant, 2017). Similarly, a WMUR New Hampshire poll fielded in July 2016 found that 43% of respondents view drug abuse as the most important issue, compared to only 21% saying jobs and the economy (DiStaso, 2016).

Further, some research has suggest that the opioid crisis has impacted presidential election

returns. Monnat (2016) asserts that areas that saw increased support for Trump in 2016 had disproportionately high levels of "deaths of despair," which includes drug overdose deaths, alcohol-related deaths, and suicides. Similarly, Goodwin et al. (2018) argue, that cultural indicators associated with opioid use predicted Trump support in 2016.

Public Opinion and Drug Policy

Policy responses to real or perceived public health crises draw support not just from local context but also from prejudice in politics. 19th-century laws against opium use and the initial criminalization of marijuana in the 20th century were targeted at Chinese and Mexican immigrants, respectively (Meier, 1994; Bonnie and Whitebread, 1999). Support for Prohibition was also partially driven by anti-Irish, anti-German, and anti-black sentiment (Andrews and Seguin, 2015; Provine, 2011). Much of the literature on contemporary drug policy focuses on the role of racial, ethnic and religious prejudice in preferences for drug policy, and numerous studies have shown how anti-black prejudice is a major contributor to attitudes toward crime, prisons and policing in the contemporary context (Hutchings, 2015; Green, Staerklé, and Sears, 2006; Provine, 2011; Alexander, 2012). Evidence also exists that individuals support treatment for opioid addiction, but do not want these treatment options to be located near them (de Benedictis-Kessner and Hankinson, 2018).

Other studies find that the link between racial prejudice and drug policy support is less consistent, however. Hurwitz and Peffley (1997) show that, for whites, negative stereotypes toward African Americans increase support for punitive policies that would increase levels of incarceration, but prejudice does not reduce support for government-funded drug rehabil-

itation programs. Bobo and Johnson (2004) find that racial attitudes are somewhat more flexible when it comes to drug policy, compared with the death penalty. While racial attitudes may be a dominant predictor of attitudes toward drug policy, there is still room for other factors and local conditions to come into play. Meier (1994), for example, finds that increased drug usage in a state is correlated with stronger implementation of strict drug laws, while alcohol usage is not linked to alcohol-related arrest rates.

Exposure to Opioid Overdoses and Drug Policy Preferences

As discussed in the above section, the opioid crisis is a nationally salient phenomenon with sufficient local variation to lead us to expect that it may have a localized impact on public opinion. What arenas of public opinion are likely to be affected by exposure to the opioid crisis? In this section, I argue that marijuana legalization is at least a plausible outcome. First, marijuana policy is broadly related to one of the main concepts at stake in debates over policy responses to the opioid crisis: a discrepancy between criminal and public health approaches to drugs (Meier, 1994). Marijuana legalization serves as a useful case to test whether the opioid crisis is related to policy preferences that fall along a spectrum from treatment to criminalization. There are two main reasons why legalization is a useful test: the availability of data and the ability to make cross-state comparisons. Twelve states have held referendum elections on marijuana legalization since 2012, and these policies are mostly similar across states, unlike other potential policies such as changing the classification of drug crimes.

Which way would marijuana opinion be shifted by exposure to the opioid crisis? There are

plausible arguments for a shift in either direction. First, local exposure to opioid overdoses could reduce support for marijuana legalization. Opioid overdoses may create a kind of risk aversion, where individuals fear anything that may create an environment with more freely accessible substances that were formerly illicit. On the other hand, local exposure to opioid overdoses could increase support for marijuana legalization. The opioid crisis, perhaps partly because of its racial associations, has a reputation for garnering a public health-focused response (Netherland and Hansen, 2016). Local exposure to the opioid epidemic might then increase support for non-punitive responses to drug abuse, including marijuana legalization.

Additionally, certain interest groups and politicians make a connection between the opioid crisis and marijuana legalization. In Massachusetts, the campaign to oppose marijuana legalization argued in campaign material that legalization "ignores the deadly opioid epidemic" (Galvin, 2016). Similarly, legalization opponents in Arizona argued, "Arizona does not need more substance abuse problems–our hands are full enough with the legal and dangerous products already available" (Reagan, 2016). This argument has featured in political reticence to support marijuana legalization, most notably in New Hampshire (Taylor, 2019). Part of the purpose of this paper, then, is to interrogate whether the perception among certain political elites about the links between marijuana and opioids also exists in the broader voting public.

In the final section of the paper, the CCES asks respondents whether they would support repealing mandatory minimum sentencing laws for non-violent drug offenses. This question more directly tests public opinion along a spectrum of treatment to criminalization. Compared to marijuana legalization, it is also more aimed at criminal punishment for illicit drug use, rather than at which kinds of substances should be legal. This measure and the mari-

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juana legalization question provide two related but distinct ways of measuring drug policy opinion.

Opioid Overdoses and MA Marijuana Legalization

Due to its national salience and localized impact, there is reason to think that exposure to the opioid crisis may have an effect on public opinion. It is less clear at the outset, however, which direction such an effect might have. Marijuana legalization provides an opportunity to study whether such exposure could shift public opinion broadly toward stricter enforcement or a public health approach.

In this section, I focus on how opioid overdoses affect support for marijuana legalization, using the 2016 marijuana legalization initiative in Massachusetts (Question 4) as a case. There are several reasons why this section specifically focuses on marijuana legalization Massachusetts. First, the Massachusetts Department of Health provides overdose death data at the municipal level. For many states, the only data available is from the CDC, which is gathered at the county level, or other kinds of public health districts that do not easily map onto geographical units used for election returns. (See the next section for more information about the county-level CDC data.) Municipal-level data provides the benefits of increased statistical power; Massachusetts has 351 municipalities and only 14 counties. This level of data also enables greater precision when describing local context.

Second, Massachusetts provides overdose data that is specific to opioids, while the CDC aggregate county data is only available for more general drug overdoses. This is useful especially as the salience of the opioid crisis makes this measure appropriate for studying

Figure 1: Opioid Overdose Deaths per 100,000, 2016

Overdose death rate per 100,000
0   50   100
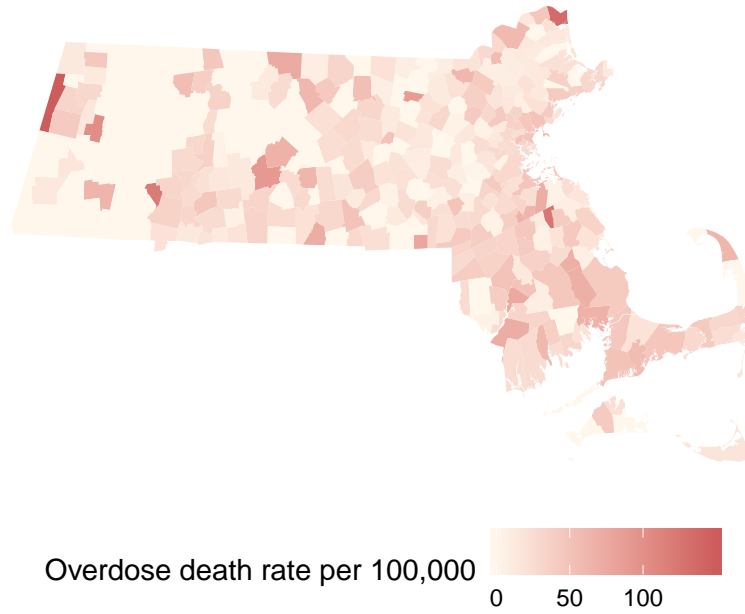
local contextual effects. Additionally, Massachusetts uses two different kinds of overdose data: overdose deaths by residents of a municipality, and overdose deaths that occur within a municipality. This could provide some evidence as to whether an effect is due to local social networks or geographic proximity. These measures are highly correlated but are not identical, with a correlation of 0.74. The paper will focus on the first measure using residents of a municipality; results using the second measure are in the appendix (Table A2).[1] Figure 1 shows a map of the descriptive data for overdose deaths per 100,000 by municipality, and Figure 2 shows a map of the election results for Question 4.

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[1] In Table A3, both measures of overdose deaths are used, and residence appears to be more important.

Figure 2: Support for Massachusetts Question 4, 2016

Support for Question 4
40   50   60   70
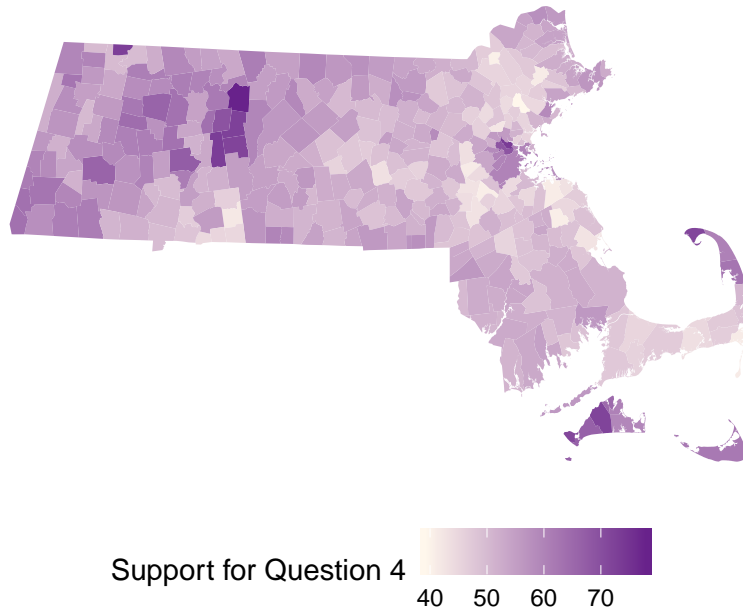
Analysis: MA Question 4 (2016)

To study the relationship between opioid overdoses and support for marijuana legalization, I conduct several OLS regressions of municipal-level election results on overdose deaths, with robust standard errors, followed by placebo tests on other election outcomes.[2]. Table Because the data is skewed toward zero but also has a number of units with high values, I use the logged measure of overdose deaths in the main specification (See Appendix Figure A1 for a plot of the distribution of opioid overdoses by municipality.) Table 1 shows the results from a regression of vote share for MA Question 4 on logged overdose deaths per 100,000, by municipality. In this model, overdose rates are statistically significant and negatively associated with support for Question 4. Column 2 shows this result controlling for Democratic presidential vote share in 2012, with the overdose death rate decreasing in size but remaining

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[2]I also test the relationship between overdose death rates and roll-off in Appendix Table A6, finding no relationship. Overdose death rates are associated with a decline in turnout, shown in Appendix Table A7.

statistically significant.

Column 3 shows this result controlling for other local factors: percent black, percent Latinx, percent female, percent with a high school education or less, logged median income, unemployment rate. With these controls added, the overdose rate is still negative and significant, with a coefficient of -0.691. Substantively, this implies that increasing overdose deaths rates from the 1st to 3rd quartile (0 to 34 per 100,000) is associated with about a three percentage point decrease in support for Question 4. For other controls, it is immediately notable that partisanship is a key factor: Democratic vote share in 2012 is a strong predictor of vote for Question 4. Municipalities with larger populations of black and Latinx residents are negatively associated with support for Question 4.[3]

The association between opioid overdose death rates and support for marijuana legalization cannot be considered a causal estimate, due to the possibility for omitted variable bias. The next section presents two strategies that could provide suggestive evidence against this possibility of confounding. First, to test that the relationship between vote share and overdose rates is unique to Question 4, I conducted placebo tests, replicating Column 3 of Table 1 by regressing vote share for the three other ballot initiatives in 2016 (casino expansion, charter school cap expansion, and regulations on farm animal care). The results of these regressions are displayed in Figure 3. If the effect of overdose deaths is specific to marijuana legalization, the placebo test should show that this variable is not correlated with other electoral outcomes. The results only partially confirm this expectation, however. Overdose death rates are not significantly related to the charter school question and are only

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[3]This analysis does not control for crime rates, as this measure is likely post-treatment to the measure of opioid overdoses.

Table 1: Regression of MA Question 4 on Residential Overdose Rates

	Question 4 "Yes" Vote Share		
	(1)	(2)	(3)
Log OD deaths per 100,000 (residence)	−1.466***	−1.008***	−0.691***
	(0.227)	(0.179)	(0.245)
2012 Democratic presidential vote share		0.356***	0.469***
		(0.029)	(0.053)
Percent black			−0.276***
			(0.066)
Percent Latinx			−0.287***
			(0.084)
Percent female			−0.299**
			(0.130)
Percent high school or less			−0.662***
			(0.173)
Percent Bachelor's or more			−0.462***
			(0.141)
Percent under 25			−0.455***
			(0.144)
Percent 65 or over			−0.608***
			(0.099)
Log median household income			−8.738***
			(3.034)
Unemployment rate			−0.317
			(0.292)
Population per 10,000			0.070
			(0.118)
Population density per 10,000			2.291
			(2.676)
Observations	351	351	351
Adjusted R^2	0.116	0.479	0.759

Note: Robust standard errors reported. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (two-tailed test)

Figure 3: Placebo Test 1, Other 2016 Election Outcomes
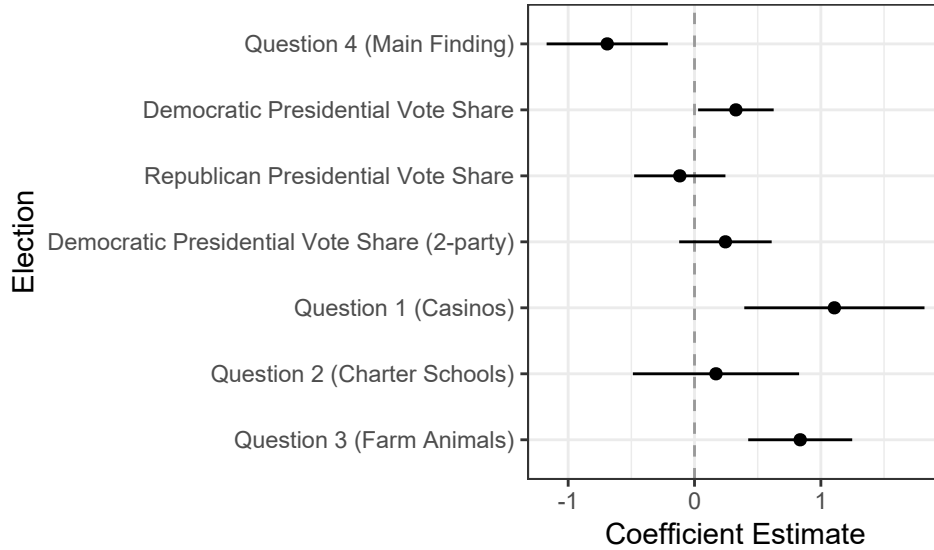
slightly related to two-party Democratic presidential vote share and the casino question. More worrying, however, is the strong, significant positive relationship between overdose rates and support for Question 3 (farm animal regulations). This result suggests that there may be omitted differences between municipalities that explain a general voting preference that includes both marijuana legalization and agricultural preferences. While it is not entirely clear what this alternative explanation may be, this finding sheds at least some doubt on the initial finding about opioid overdoses and marijuana legalization.

A second placebo test provides even more reason to doubt that the relationship between opioid overdoses and marijuana legalization is a causal estimate. Here, I use two prior initiative elections dealing with marijuana issues in Massachusetts: medical marijuana in 2012 and marijuana decriminalization in 2008. In this analysis, I use the same OLS models from above to test whether the overdose rate in 2016 is associated with these prior votes. If the relationship between legalization and overdose rates is causal, we would expect the regressions using past results as a placebo outcome to display null results. The results are

Figure 4: Placebo Test 2, Prior Year Marijuana Ballot Questions
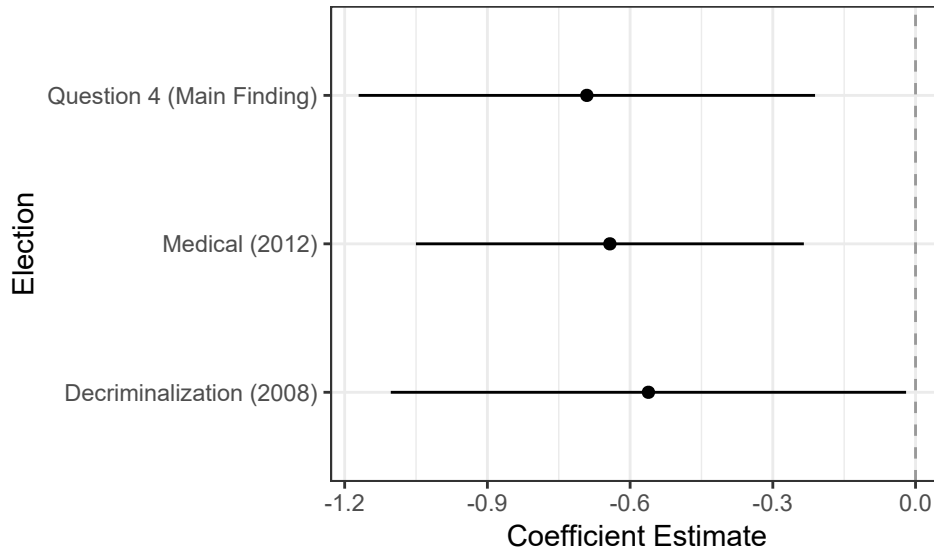
summarized in Figure 4, which show that this is not the case[4]. Opioid overdose rates in 2016 are significant and negative for predicting 2012 and 2008 marijuana voting preferences. Strikingly, the coefficients for each of these years are of similar magnitudes to the 2016 finding. These placebo results provide further evidence that there is likely a null relationship or at least a non-causal relationship between local exposure to opioid overdose deaths and support for marijuana legalization. Rather, political and demographic factors, including partisanship, race and ethnicity, education, and age, are more consistent predictors of legalization voting behavior.

Another way to test this relationship is to use a fixed-effects model. To do this, I treat the medical marijuana vote in 2012 and the marijuana legalization vote as the same dependent variable. I then include dummies first for county and then for municipality. The results are in Table 2. Column 1, the pooled bivariate relationship between overdose deaths and vote for the marijuana questions, shows a strong negative relationship. This relationship

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[4]See Appendix Tables A4 and A5 for detailed regression tables

remains significant but decreases in magnitude when adding controls in Column 2 and county dummies in Column 3. Importantly, Column 4 adds in municipal-level fixed effects. When these are added in, the result remains negative, but loses statistical significance. Of course, this could be due to statistical noise from only having two time periods. As before, I argue that these results show some evidence of a weak negative relationship between opioid overdose death rates and marijuana question vote share, but it is difficult to show evidence of a robust causal relationship.

EMS Incidents as a Measure

In this section, I use opioid-related emergency services (EMS) incidents as a measure of exposure to the opioid crisis. As with the overdose death data, this data is provided by the Massachusetts Department of Health and is collected at the municipal level. This measure is a different way to capture how much a municipality is impacted by drug overdoses, as it captures non-fatal incidents, which are much more frequent.[5] Table 3 shows the results of the main specification, substituting EMS incidents for overdose deaths. Here, opioid-related EMS incidents are negatively related to support for marijuana legalization, but the result is not statistically significant.

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[5]Appendix Figure A3 compares the distribution of overdose deaths to EMS incidents. EMS incidents are much less skewed and less likely to have a zero value.

Table 2: Fixed-Effects Regression of Marijuana Votes on Residential Overdose Rates

	Marijuana Questions "Yes" Vote Share			
	(1)	(2)	(3)	(4)
Log OD deaths per 100,000 (residence)	−2.321***	−0.668***	−0.464**	−0.156
	(0.355)	(0.196)	(0.209)	(0.250)
2012 Democratic presidential vote share		0.291***	0.232***	−0.378***
		(0.042)	(0.054)	(0.081)
Percent black		−0.192***	−0.135**	0.124
		(0.054)	(0.065)	(0.339)
Percent Latinx		−0.295***	−0.268***	0.331*
		(0.061)	(0.071)	(0.193)
Percent female		−0.200*	−0.166	−0.201
		(0.106)	(0.111)	(0.231)
Percent high school or less		−0.334**	−0.233*	0.086
		(0.131)	(0.133)	(0.191)
Percent Bachelor's or more		−0.097	0.029	−0.128
		(0.110)	(0.106)	(0.223)
Percent under 25		−0.237**	−0.231**	−0.343
		(0.107)	(0.109)	(0.238)
Percent 65 or over		−0.616***	−0.607***	−0.573***
		(0.078)	(0.095)	(0.198)
Log median household income		−13.618***	−11.336***	−3.619
		(1.973)	(2.207)	(6.430)
Unemployment rate		−0.324	−0.219	−0.194
		(0.203)	(0.197)	(0.207)
Population per 10,000		0.044	0.014	−0.653
		(0.027)	(0.042)	(10.570)
Population density per 10,000		1.648	3.129*	77.293
		(1.546)	(1.655)	(51.620)
2016		−6.710***	−7.248***	−10.583***
		(0.698)	(0.719)	(1.421)
Regional dummies			County	Municipality
Observations	702	702	702	702
Adjusted R^2	0.123	0.762	0.783	0.935

Note: *p<0.1; **p<0.05; ***p<0.01

Table 3: Regression of MA Question 4 on EMS Incident Rates

	Question 4 "Yes" Vote Share		
	(1)	(2)	(3)
Log opioid-related EMS incidents per 100,000	0.937**	0.081	−0.139
	(0.400)	(0.364)	(0.588)
2012 Democratic presidential vote share		0.346***	0.490***
		(0.035)	(0.057)
Percent black			−0.282***
			(0.070)
Percent Latinx			−0.289***
			(0.086)
Percent female			−0.320**
			(0.137)
Percent high school or less			−0.675***
			(0.187)
Percent Bachelor's or more			−0.478***
			(0.151)
Percent under 25			−0.446***
			(0.156)
Percent 65 or over			−0.618***
			(0.103)
Log median household income			−8.175***
			(3.111)
Unemployment rate			−0.379
			(0.308)
Population per 10,000			0.074
			(0.150)
Population density per 10,000			1.949
			(2.755)
Observations	298	298	298
Adjusted R^2	0.012	0.382	0.759

Note: Robust standard errors reported. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (two-tailed test)

Analysis: Marijuana Legalization Referenda, County-Level

In this section, I use county-level data to further explore the relationship between opioid overdose rates and support for marijuana legalization. Data on overdoses comes from the CDC and is composed of county-level drug overdose deaths. This data is provided in ranges of rates, where the range is equivalent to 2 units per 100,000 population. The rate ranges are 0-1.9, 2-3.9, and so on, up to 30+. For this analysis, I code the overdose death rate variable to be the midpoint of these ranges. Unlike Massachusetts, this variable is close to a normal distribution and is not logged (See Appendix Figure A4). Marijuana legalization referenda were collected from state election websites. A summary of the states included is presented in Table 4. This analysis excludes the 2014 Ohio legalization referendum due to the unique monopoly provisions written into the proposed law that led many marijuana advocates to oppose the measure (Sullum, 2015). Alaska in 2014 is also not included because of problems with the state's election website, and Washington, D.C. is excluded because it contains only one county. Presidential election data comes from the MIT Election Lab (MIT Election Data and Science Lab, 2018). Census data for the appropriate election year is used for controls.

Table 5, Model 1 shows the results from a regression of county-level marijuana legalization vote share on overdose death rates and controls. Model 2 adds dummy variables for states, and Model 3 adds dummy variables for election year.[6] Figure 5 visualizes these results. Unlike the Massachusetts analysis, the results in all 3 models show a positive and

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[6]These variables cannot be included together because each state only has a single election year, so the variables are colinear.

State	Election Year	Counties	Vote for Legalization
Colorado	2012	64	0.55
Washington	2012	39	0.56
Oregon	2014	36	0.56
Arizona	2016	15	0.49
California	2016	58	0.57
Massachusetts	2016	14	0.54
Maine	2016	16	0.50
Nevada	2016	17	0.54
Michigan	2018	83	0.56
North Dakota	2018	53	0.41

Table 4: State and County Data for Marijuana Legalization Referenda

significant relationship between overdose death rates and support for marijuana legalization. A one-unit increase in the overdose death rate is associated with a 0.33 percentage point increase in support for marijuana legalization. As expected, Democratic presidential vote share is positive and strongly associated with support for marijuana legalization. Demographic variables depend on the model, but a notable similarity to the Massachusetts model is the negative and significant relationship between percent black in a county and support for marijuana legalization in Model 2.

Next, I run the model for each state separately. Results for the main variable of interest, overdose death rates, are visualized in Figure 6. Separated out in this way, most states display no statistically significant relationship between overdose death rates and support for marijuana legalization. The only exceptions are Michigan and North Dakota, both of which yield positive coefficients. Interestingly, both of these results occur in 2018, the most recent year in the data, which could suggest that this relationship has grown over time with increased attention paid to the opioid crisis. Alternatively, these states have many more counties than most other states in the sample, making it more possible to test for a

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Table 5: Regression of Marijuana Legalization on Overdose Rates, County-Level

	Dependent variable:		
	Marijuana Legalization Vote Share		
	(1)	(2)	(3)
OD deaths per 100,000	0.226***	0.213***	0.325***
	(0.045)	(0.053)	(0.052)
Prior election Democratic presidential vote share	0.502***	0.549***	0.544***
	(0.028)	(0.029)	(0.027)
Percent black	0.018	−0.223***	−0.151**
	(0.090)	(0.044)	(0.075)
Percent Hispanic	−0.124***	−0.124***	−0.050
	(0.024)	(0.034)	(0.031)
Percent female	−0.085	−0.057	−0.048
	(0.141)	(0.114)	(0.159)
Percent high school or less	0.554***	0.480***	0.727***
	(0.149)	(0.147)	(0.176)
Median age	−0.577***	−0.550***	−0.675***
	(0.150)	(0.146)	(0.170)
Log median household income	2.089	3.810**	4.165**
	(1.650)	(1.717)	(1.782)
Unemployment rate	0.895***	0.370	1.266***
	(0.241)	(0.286)	(0.265)
Population density	−0.001	−0.0005**	−0.001
	(0.001)	(0.0002)	(0.0004)
Percent urban	−0.004	−0.005	0.003
	(0.013)	(0.013)	(0.012)
Constant	−9.931	−28.943	−47.739**
	(19.853)	(21.676)	(21.729)
State dummies		✓	
Year dummies			✓
Observations	391	391	391
Adjusted R^2	0.755	0.867	0.795

Note: *p<0.1; **p<0.05; ***p<0.01

**Figure 5:** County-Level Regression Results
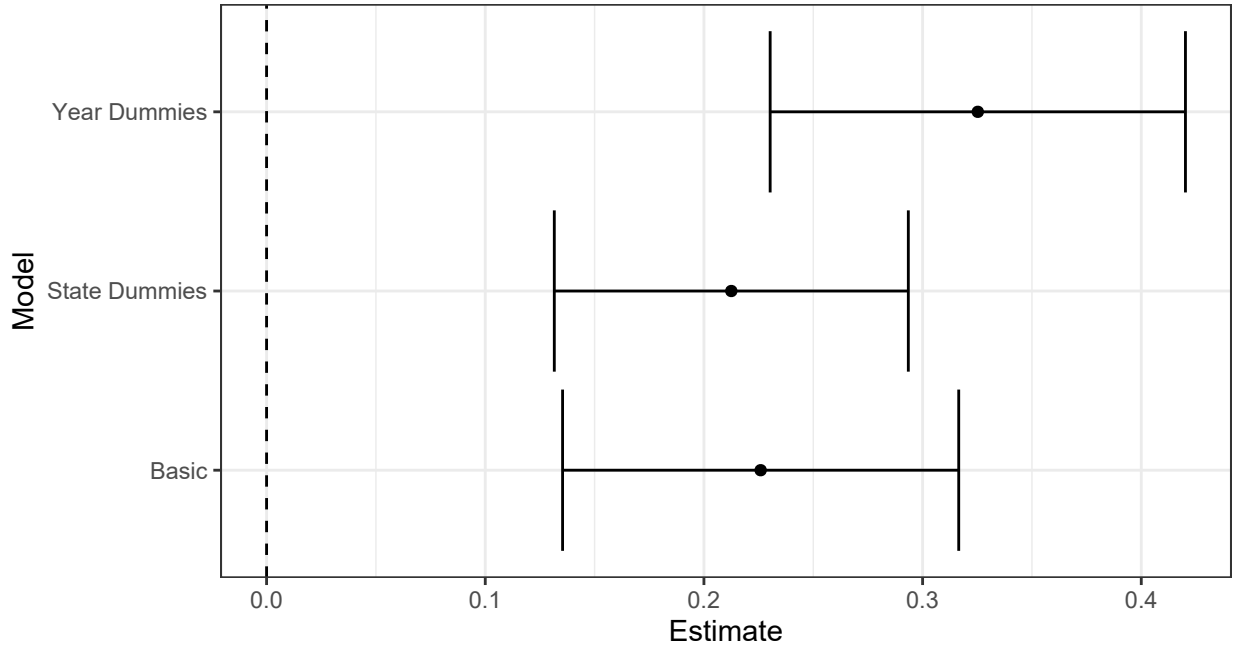
relationship.

Analysis: Individual-Level, CCES

Next, I move to individual-level survey analysis, first using the CCES. To measure exposure to the opioid crisis, I use 2016 county-level age-adjusted overdose death rates from the National Center for Health Statistics. This data is provided in ranges of rates, where the range is equivalent to 2 units per 100,000 population.[7] The rate ranges are 0-1.9, 2-3.9, and so on, up to 30+. For this analysis, I code the overdose death rate variable to be the midpoint of these ranges. Unlike Massachusetts, this variable is close to a normal distribution and is not logged. Overdose death rates include the following CDC WONDER UCD drug/alcohol-

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[7]The CDC WONDER database provides more exact overdose death rate data, rather than binned rates. For many counties, however, the number of overdose deaths and/or the county population is too small to obtain an estimate of the overdose death rate, leaving a lot of missing data. For this reason, I use the NCHS binned rates instead.

Figure 6: State-by-State County-Level Regression Results
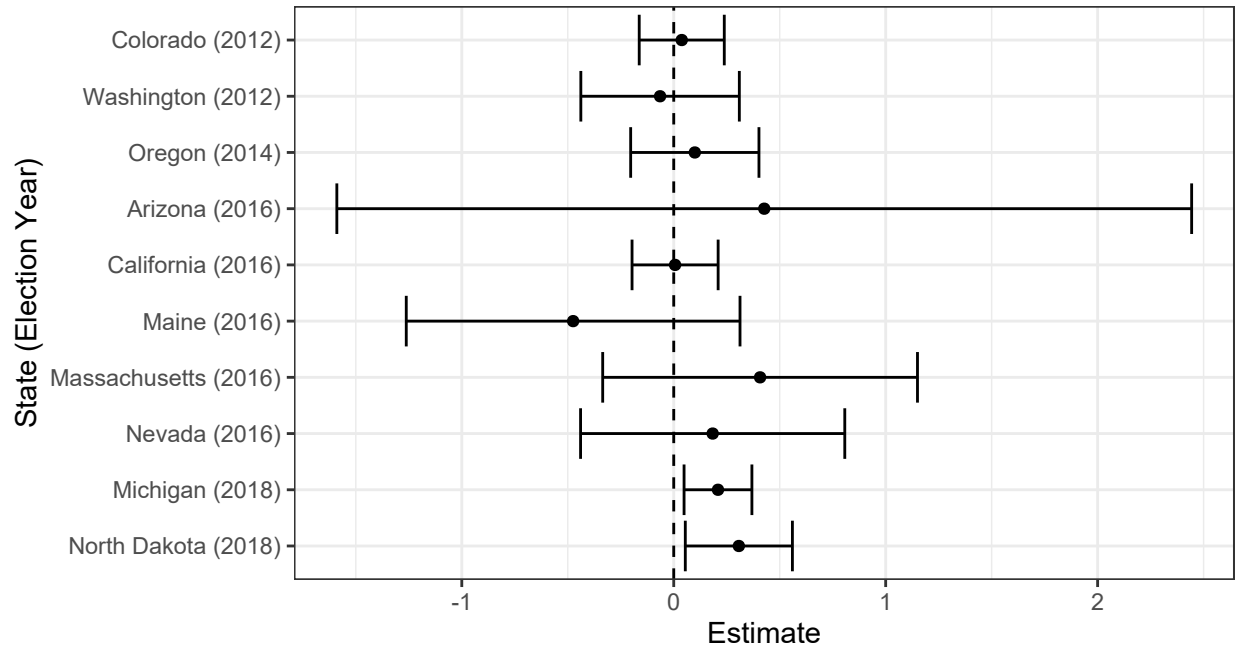
induced deaths codes: X40-44 (Drug poisonings, overdose, unintentional), X60-X64 (Drug poisonings, overdose, suicide), and Y10-14 (Drug poisonings, overdose, undetermined).

I then match individuals in the 2016 CCES to their county's overdose death rate. Figure 7 shows the distribution of these county-level overdose death rates in the 2016 CCES. Next, to measure attitudes about drug policy, I use a question that asks respondents whether they support eliminating mandatory minimum sentences for non-violent drug offenders. First, I simply explore the descriptive relationship between overdose death rates and support for mandatory minimums. Next, I use regression with controls for respondent and contextual characteristics to further specify the relationship. Figure 8 shows the relationship between a respondent's county overdose death rate and support for eliminating mandatory minimums. Excluding a few counties with low overdose death rates, as rates increase, there is no change in support for eliminating mandatory minimum sentences. These descriptive results suggest

that there is no relationship between a respondent's county drug overdose death rate and support for eliminating mandatory minimum sentences.
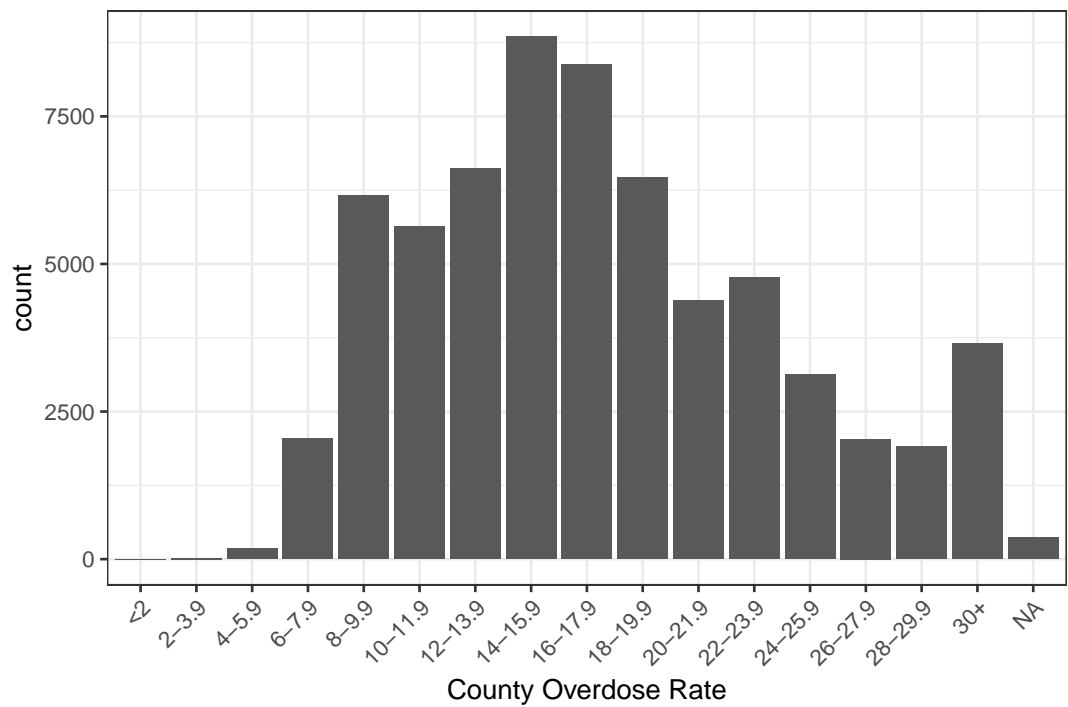

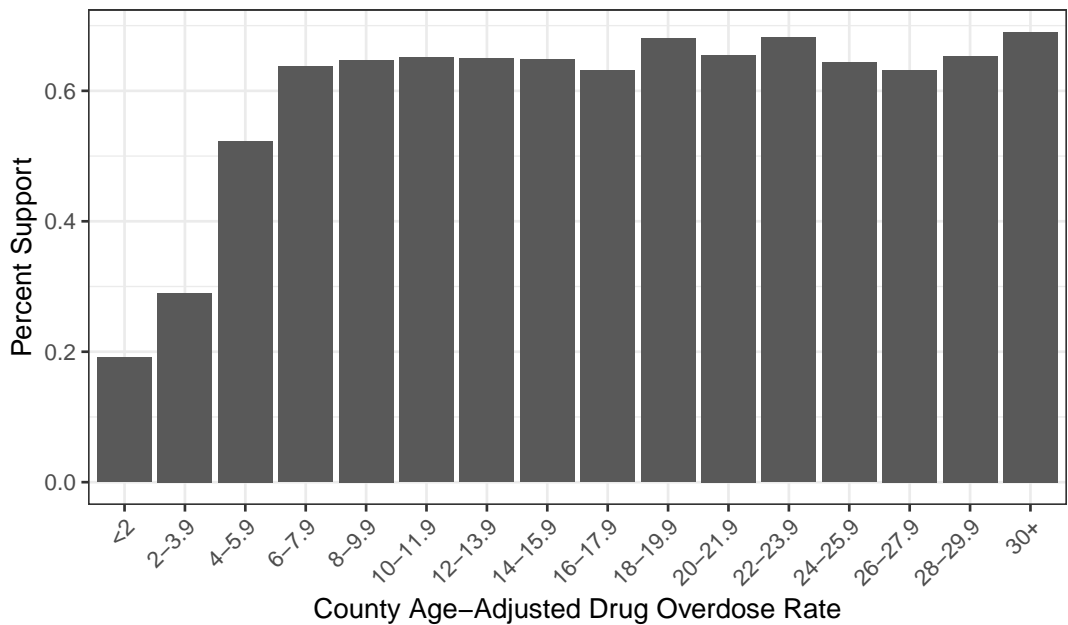**Figure 7:** County Overdose Death Rates, 2016, CCES Respondents

Figure 8: Support for Eliminating Mandatory Minimums by County Overdose Death Rates

Next, I conduct a simple OLS regression of support for eliminating mandatory minimums on an individual's county overdose death rate, using survey weights. The lack of a relationship in the descriptive data is confirmed in this regression analysis in Table 6. Column 1 shows the simple bivariate relationship. Column 2 adds individual controls, including party ID, ideology, gender, age, education, race, religion, and news interest. Column 3 adds contextual controls at the county level, including percent black, percent Latinx, percent under 25, percent over 64, and log median income In each specification, opioid overdose rates are negatively associated with support for eliminating mandatory minimums, but the effect size is so small as to indicate no effect. In Column 3, going from the smallest to highest overdose death rate is associated with only a 1.6 percentage point decline in support for eliminating mandatory minimums. Columns 4 and 5 show that this relationship is not moderated by political party or by news interest.

Discussion and Conclusion

The results from the above models show that opioid overdose death rates have a relatively small but significant association with decreased support for marijuana legalization. Of course, this relationship is not causally identified. There may be omitted characteristics of municipalities that predict both higher overdose levels and lower support for marijuana legalization. The placebo results provide some suggestive evidence that an important causal variable is likely omitted, casting doubt on the importance of local context in this case. Similarly, the lack of a significant finding using the EMS data further suggests that the evidence to address this question is mixed.

Table 6: Association between County Overdose Death Rates and Support for Eliminating Mandatory Minimums, OLS

	Support for Repealing Mandatory Minimums				
	(1)	(2)	(3)	(4)	(5)
County overdose death rate	0.001***	0.001***	0.001***	0.002***	0.001**
	(0.0003)	(0.0003)	(0.0003)	(0.001)	(0.001)
Republican		−0.145***	−0.146***	−0.146***	−0.148***
		(0.006)	(0.006)	(0.006)	(0.015)
Political ideology		−0.090***	−0.090***	−0.090***	−0.090***
		(0.002)	(0.002)	(0.002)	(0.002)
Female		−0.046***	−0.046***	−0.046***	−0.046***
		(0.004)	(0.004)	(0.004)	(0.004)
Birth year		0.002***	0.002***	0.002***	0.002***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Black		0.048***	0.041***	0.041***	0.042***
		(0.007)	(0.007)	(0.007)	(0.007)
Hispanic		−0.082***	−0.068***	−0.068***	−0.067***
		(0.008)	(0.009)	(0.009)	(0.009)
Asian		−0.100***	−0.096***	−0.096***	−0.096***
		(0.011)	(0.011)	(0.011)	(0.011)
Born-Again Christian		0.047***	0.047***	0.047***	0.047***
		(0.005)	(0.005)	(0.005)	(0.005)
News interest		−0.053***	−0.053***	−0.045***	−0.053***
		(0.003)	(0.003)	(0.007)	(0.003)
Log median income			0.014	0.014	0.014
			(0.015)	(0.015)	(0.015)
County percent black			0.053***	0.053***	0.053***
			(0.019)	(0.019)	(0.019)
County percent Hispanic			−0.061***	−0.062***	−0.060***
			(0.017)	(0.017)	(0.017)
County percent Bachelor's degree or more			0.255	0.253	0.262
			(0.379)	(0.379)	(0.379)
County percent under 25			0.087	0.087	0.086
			(0.100)	(0.100)	(0.100)
County percent 65 and over			−0.040	−0.041	−0.040
			(0.111)	(0.111)	(0.111)
County OD death rate × News interest				−0.0004	
				(0.0004)	
County OD death rate × Republican					0.0002
					(0.001)
Observations	64,206	58,413	58,413	58,413	58,413
Adjusted R^2	0.0003	0.117	0.118	0.118	0.118

Note: Additional controls: Independent/other/not sure party ID, education, Native American, mixed race, Middle Eastern, other race/ethnicity. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$ (two-tailed test)

Another consistent result is the negative relationship between a municipality's relative black and Latinx population and support for Question 4. This could be due to lower support among these groups, or to a racial context effect. In four polls on Question 4 leading up to the election, there is little evidence of a pronounced racial difference in voting (see Appendix, Table A1). This suggests the possibility for the role of racial threat. Municipalities with higher median age and income are also negatively associated with support for Question 4. The age finding fits with polling data on marijuana legalization, which shows that younger individuals are much more supportive of legalization than older individuals (Hartig and Geiger, 2018).

The county-level analysis provides a different set of results that suggest a potential positive relationship between the opioid crisis and support for marijuana legalization. While these results hold in aggregate data, however, state-by-state analyses limit the effect to only two states.

Finally, for the individual analysis, an individual's local exposure to the opioid crisis, measured through county overdose death rate, is not related to support for mandatory minimums for illicit drug use. In sum, the opioid crisis appears to be one more facet of local experience that is not relevant for public opinion formation, at least in position-taking. More research is needed to assess how this epidemic has shaped the politics of criminal justice and public health more broadly.

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Appendix

Table A1: Selection of Surveys, Massachusetts Question 4

Survey	Date	White Yes	White No	Non-White Yes	Non-White No
SUPRC	5/10/16	41	49	51	29
WBUR/MassINC	9/13/16	50	46	52	45
WBUR/MassINC	10/19/16	55	39	52	47
SUPRC	10/27/16	50	42	47	38

Massachusetts Ballot Questions Text Summaries

2016

Question 1, Expanded Slot-Machine Gambling: Do you approve of a law summarized below, on which no vote was taken by the Senate or the House of Representatives on or before May 3, 2016?

This proposed law would allow the state Gaming Commission to issue one additional category 2 license, which would permit operation of a gaming establishment with no table games and not more than 1,250 slot machines.

The proposed law would authorize the Commission to request applications for the additional license to be granted to a gaming establishment located on property that is (i) at least four acres in size; (ii) adjacent to and within 1,500 feet of a race track, including the track's additional facilities, such as the track, grounds, paddocks, barns, auditorium, amphitheatre, and bleachers; (iii) where a horse racing meeting may physically be held; (iv) where a horse racing meeting shall have been hosted; and (v) not separated from the race track by a highway or railway.

Question 2, Charter School Expansion: Do you approve of a law summarized below, on which no vote was taken by the Senate or the House of Representatives on or before May 3, 2016?

This proposed law would allow the state Board of Elementary and Secondary Education to approve up to 12 new charter schools or enrollment expansions in existing charter schools each year. Approvals under this law could expand statewide charter school enrollment by up to 1% of the total statewide public school enrollment each year. New charters and enrollment expansions approved under this law would be exempt from existing limits on the number of charter schools, the number of students enrolled in them, and the amount of local school districts' spending allocated to them.

If the Board received more than 12 applications in a single year from qualified applicants, then the proposed law would require it to give priority to proposed charter schools or enrollment expansions in districts where student performance on statewide assessments is in the bottom 25% of all districts in the previous two years and where demonstrated parent demand for additional public school options is greatest.

New charter schools and enrollment expansions approved under this proposed law would be subject to the same approval standards as other charter schools, and to recruitment, retention, and multilingual outreach requirements that currently apply to some charter schools. Schools authorized under this law would be subject to annual performance reviews according to standards established by the Board.

The proposed law would take effect on January 1, 2017.

Question 3, Conditions for Farm Animals: Do you approve of a law summarized below, on which no vote was taken by the Senate or the House of Representatives on or before May 3, 2016?

This proposed law would prohibit any farm owner or operator from knowingly confining any breeding pig, calf raised for veal, or egg-laying hen in a way that prevents the animal from lying down, standing up, fully extending its limbs, or turning around freely. The proposed law would also prohibit any business owner or operator in Massachusetts from selling whole eggs intended for human consumption or any uncooked cut of veal or pork if the business owner or operator knows or should know that the hen, breeding pig, or veal calf that produced these products was confined in a manner prohibited by the proposed law. The proposed law would exempt sales of food products that combine veal or pork with other products, including soups, sandwiches, pizzas, hotdogs, or similar processed or prepared food items.

The proposed law's confinement prohibitions would not apply during transportation; state and county fair exhibitions; 4-H programs; slaughter in compliance with applicable laws and regulations; medical research; veterinary exams, testing, treatment and operation if performed under the direct supervision of a licensed veterinarian; five days prior to a pregnant pig's expected date of giving birth; any day that pig is nursing piglets; and for temporary periods for animal husbandry purposes not to exceed six hours in any twenty-four hour period.

The proposed law would create a civil penalty of up to $1,000 for each violation and would give the Attorney General the exclusive authority to enforce the law, and to issue regulations to implement it. As a defense to enforcement proceedings, the proposed law would allow a business owner or operator to rely in good faith upon a written certification or guarantee of compliance by a supplier.

The proposed law would be in addition to any other animal welfare laws and would not prohibit stricter local laws.

The proposed law would take effect on January 1, 2022. The proposed law states that if any of its parts were declared invalid, the other parts would stay in effect.

Question 4, Legalization, Regulation, and Taxation of Marijuana: Do you approve of a law summarized below, on which no vote was taken by the Senate or the House of Representatives on or before May 3, 2016?

The proposed law would permit the possession, use, distribution, and cultivation of marijuana in limited amounts by persons age 21 and older and would remove criminal penalties for such activities. It would provide for the regulation of commerce in marijuana, marijuana accessories, and marijuana products and for the taxation of proceeds from sales of these items.

The proposed law would authorize persons at least 21 years old to possess up to one ounce of marijuana outside of their residences; possess up to ten ounces of marijuana inside their residences; grow up to six marijuana plants in their residences; give one ounce or less of marijuana to a person at least 21 years old without payment; possess, produce or transfer hemp; or make or transfer items related to marijuana use, storage, cultivation, or processing.

The measure would create a Cannabis Control Commission of three members appointed by the state Treasurer which would generally administer the law governing marijuana use and distribution, promulgate regulations, and be responsible for the licensing of marijuana commercial establishments. The proposed law would also create a Cannabis Advisory Board of fifteen members appointed by the Governor. The Cannabis Control Commission would adopt regulations governing licensing qualifications; security; record keeping; health and safety standards; packaging and labeling; testing; advertising and displays; required inspections; and such other matters as the Commission considers appropriate. The records of the Commission would be public records.

The proposed law would authorize cities and towns to adopt reasonable restrictions on the time, place, and manner of operating marijuana businesses and to limit the number of marijuana establishments in their communities. A city or town could hold a local vote to determine whether to permit the selling of marijuana and marijuana products for consumption on the premises at commercial establishments.

The proceeds of retail sales of marijuana and marijuana products would be subject to the state sales tax and an additional excise tax of 3.75%. A city or town could impose a separate tax of up to 2%. Revenue received from the additional state excise tax or from license application fees and civil penalties for violations of this law would be deposited in a Marijuana Regulation Fund and would be used subject to appropriation for administration of the proposed law.

Marijuana-related activities authorized under this proposed law could not be a basis for adverse orders in child welfare cases absent clear and convincing evidence that such activities had created an unreasonable danger to the safety of a minor child.

The proposed law would not affect existing law regarding medical marijuana treatment centers or the operation of motor vehicles while under the influence. It would permit property owners to prohibit the use, sale, or production of marijuana on their premises (with an exception that landlords cannot prohibit consumption by tenants of marijuana by means other than by smoking); and would permit employers to prohibit the consumption of marijuana by employees in the workplace. State and local governments could continue to restrict uses in public buildings or at or near schools. Supplying marijuana to persons under age 21 would be unlawful.

The proposed law would take effect on December 15, 2016.

2012

Question 3, Medical Use of Marijuana: Do you approve of a law summarized below, on which no vote was taken by the Senate or the House of Representatives on or before May 1, 2012?

This proposed law would eliminate state criminal and civil penalties for the medical use of marijuana by qualifying patients. To qualify, a patient must have been diagnosed with

a debilitating medical condition, such as cancer, glaucoma, HIV-positive status or AIDS, hepatitis C, Crohn's disease, Parkinson's disease, ALS, or multiple sclerosis. The patient would also have to obtain a written certification, from a physician with whom the patient has a bona fide physician-patient relationship, that the patient has a specific debilitating medical condition and would likely obtain a net benefit from medical use of marijuana.

The proposed law would allow patients to possess up to a 60-day supply of marijuana for their personal medical use. The state Department of Public Health (DPH) would decide what amount would be a 60-day supply. A patient could designate a personal caregiver, at least 21 years old, who could assist with the patient's medical use of marijuana but would be prohibited from consuming that marijuana. Patients and caregivers would have to register with DPH by submitting the physician's certification.

The proposed law would allow for non-profit medical marijuana treatment centers to grow, process and provide marijuana to patients or their caregivers. A treatment center would have to apply for a DPH registration by (1) paying a fee to offset DPH's administrative costs; (2) identifying its location and one additional location, if any, where marijuana would be grown; and (3) submitting operating procedures, consistent with rules to be issued by DPH, including cultivation and storage of marijuana only in enclosed, locked facilities.

A treatment center's personnel would have to register with DPH before working or volunteering at the center, be at least 21 years old, and have no felony drug convictions. In 2013, there could be no more than 35 treatment centers, with at least one but not more than five centers in each county. In later years, DPH could modify the number of centers.

The proposed law would require DPH to issue a cultivation registration to a qualifying patient whose access to a treatment center is limited by financial hardship, physical inability to access reasonable transportation, or distance. This would allow the patient or caregiver to grow only enough plants, in a closed, locked facility, for a 60-day supply of marijuana for the patient's own use.

DPH could revoke any registration for a willful violation of the proposed law. Fraudulent use of a DPH registration could be punished by up to six months in a house of correction or a fine of up to $500, and fraudulent use of a registration for the sale, distribution, or trafficking of marijuana for non-medical use for profit could be punished by up to five years in state prison or by two and one-half years in a house of correction.

The proposed law would (1) not give immunity under federal law or obstruct federal enforcement of federal law; (2) not supersede Massachusetts laws prohibiting possession, cultivation, or sale of marijuana for nonmedical purposes; (3) not allow the operation of a motor vehicle, boat, or aircraft while under the influence of marijuana; (4) not require any health insurer or government entity to reimburse for the costs of the medical use of marijuana; (5) not require any health care professional to authorize the medical use of marijuana; (6) not require any accommodation of the medical use of marijuana in any workplace, school bus or grounds, youth center, or correctional facility; and (7) not require any accommodation of smoking marijuana in any public place.

The proposed law would take effect January 1, 2013, and states that if any of its part were declared invalid, the other parts would stay in effect.

2008

Question 2, Possession of Marijuana: Do you approve of a law summarized below, on which no vote was taken by the Senate or the House of Representatives before May 6, 2008?

This proposed law would replace the criminal penalties for possession of one ounce or less of marijuana with a new system of civil penalties, to be enforced by issuing citations, and would exclude information regarding this civil offense from the state's criminal record information system. Offenders age 18 or older would be subject to forfeiture of the marijuana plus a civil penalty of $100. Offenders under the age of 18 would be subject to the same forfeiture and, if they complete a drug awareness program within one year of the offense, the same $100 penalty.

Offenders under 18 and their parents or legal guardian would be notified of the offense and the option for the offender to complete a drug awareness program developed by the state Department of Youth Services. Such programs would include ten hours of community service and at least four hours of instruction or group discussion concerning the use and abuse of marijuana and other drugs and emphasizing early detection and prevention of substance abuse.

The penalty for offenders under 18 who fail to complete such a program within one year could be increased to as much as $1,000, unless the offender showed an inability to pay, an inability to participate in such a program, or the unavailability of such a program. Such an offender's parents could also be held liable for the increased penalty. Failure by an offender under 17 to complete such a program could also be a basis for a delinquency proceeding.

The proposed law would define possession of one ounce or less of marijuana as including possession of one ounce or less of tetrahydrocannibinol ("THC"), or having metabolized products of marijuana or THC in one's body.

Under the proposed law, possessing an ounce or less of marijuana could not be grounds for state or local government entities imposing any other penalty, sanction, or disqualification, such as denying student financial aid, public housing, public financial assistance including unemployment benefits, the right to operate a motor vehicle, or the opportunity to serve as a foster or adoptive parent. The proposed law would allow local ordinances or bylaws that prohibit the public use of marijuana, and would not affect existing laws, practices, or policies concerning operating a motor vehicle or taking other actions while under the influence of marijuana, unlawful possession of prescription forms of marijuana, or selling, manufacturing, or trafficking in marijuana.

The money received from the new civil penalties would go to the city or town where the offense occurred.

Table A2: Regression of MA Question 4 on Overdose Death Rates by Location

	Question 4 "Yes" Vote Share		
	(1)	(2)	(3)
Log OD deaths per 100,000 (location)	−0.928***	−0.848***	−0.482**
	(0.224)	(0.176)	(0.218)
2012 Democratic presidential vote share		0.377***	0.474***
		(0.028)	(0.053)
Percent black			−0.270***
			(0.065)
Percent Latinx			−0.286***
			(0.085)
Percent female			−0.301**
			(0.132)
Percent high school or less			−0.650***
			(0.175)
Percent Bachelor's or more			−0.440***
			(0.141)
Percent under 25			−0.436***
			(0.142)
Percent 65 or over			−0.616***
			(0.099)
Log median household income			−9.084***
			(3.049)
Unemployment rate			−0.329
			(0.293)
Population per 10,000			0.071
			(0.113)
Population density per 10,000			2.090
			(2.677)
Observations	351	351	351
Adjusted R^2	0.047	0.466	0.758

Note: Robust standard errors reported. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (two-tailed test)

Table A3: Regression of MA Question 4 on Overdose Death Rates by Residence and Location

	Question 4 "Yes" Vote Share		
	(1)	(2)	(3)
Log OD deaths per 100,000 (residence)	−1.739***	−0.805***	−0.500
	(0.325)	(0.241)	(0.306)
Log OD deaths per 100,000 (location)	0.355	−0.257	−0.222
	(0.301)	(0.233)	(0.275)
2012 Democratic presidential vote share		0.360***	0.469***
		(0.028)	(0.053)
Percent black			−0.273***
			(0.065)
Percent Latinx			−0.287***
			(0.084)
Percent female			−0.294**
			(0.131)
Percent high school or less			−0.657***
			(0.174)
Percent Bachelor's or more			−0.454***
			(0.141)
Percent under 25			−0.450***
			(0.142)
Percent 65 or over			−0.613***
			(0.099)
Log median household income			−8.990***
			(3.015)
Unemployment rate			−0.315
			(0.292)
Population per 10,000			0.070
			(0.110)
Population density per 10,000			2.286
			(2.687)
Observations	351	351	351
Adjusted R^2	0.116	0.479	0.759

Note: Robust standard errors reported. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (two-tailed test)

Table A4: Regression of MA Presidential Vote Share on Residential Overdose Rates

	2016 Presidential Vote Share:		
	Dem Pct	Rep Pct	Dem 2-Party Pct
	(1)	(2)	(3)
Log OD deaths per 100,000 (residence)	0.327**	−0.116	0.245
	(0.153)	(0.184)	(0.187)
2012 Democratic presidential vote share	0.752***	−0.723***	0.793***
	(0.032)	(0.035)	(0.037)
Percent black	0.280***	−0.220***	0.257***
	(0.036)	(0.040)	(0.041)
Percent Latinx	0.173***	−0.144***	0.162***
	(0.043)	(0.043)	(0.046)
Percent female	0.016	0.063	−0.042
	(0.106)	(0.109)	(0.120)
Percent high school or less	0.114	−0.016	0.064
	(0.128)	(0.134)	(0.143)
Percent Bachelor's or more	0.588***	−0.562***	0.623***
	(0.090)	(0.094)	(0.098)
Percent under 25	0.316***	−0.272**	0.323**
	(0.119)	(0.118)	(0.133)
Percent 65 or over	0.094	0.035	0.021
	(0.068)	(0.066)	(0.072)
Log median household income	0.563	1.912	−1.237
	(1.727)	(1.826)	(1.913)
Unemployment rate	−0.024	0.111	−0.105
	(0.135)	(0.155)	(0.154)
Population per 10,000	−0.034	0.020	−0.028
	(0.024)	(0.072)	(0.044)
Population density per 10,000	0.681	0.666	−0.377
	(1.489)	(1.478)	(1.651)
Observations	351	351	351
Adjusted R^2	0.978	0.971	0.974

Note: Robust standard errors reported. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (two-tailed test)

Table A5: Regression of MA Questions 1-3 on Residential Overdose Rates

	Question "Yes" Vote Share:		
	Gambling	Charter Schools	Farm Animals
	(1)	(2)	(3)
Log OD deaths per 100,000 (residence)	1.107***	0.170	0.836***
	(0.364)	(0.336)	(0.210)
2012 Democratic presidential vote share	−0.197***	−0.184***	−0.012
	(0.063)	(0.067)	(0.046)
Percent black	−0.075	0.160**	0.014
	(0.090)	(0.082)	(0.074)
Percent Latinx	−0.049	0.201**	−0.045
	(0.063)	(0.080)	(0.075)
Percent female	0.273	0.053	0.049
	(0.176)	(0.218)	(0.102)
Percent high school or less	0.474*	0.627**	−0.075
	(0.243)	(0.282)	(0.134)
Percent Bachelor's or more	−0.307	0.554***	0.099
	(0.212)	(0.213)	(0.117)
Percent under 25	−0.120	0.468*	0.097
	(0.189)	(0.265)	(0.125)
Percent 65 or over	−0.522***	0.518***	0.146**
	(0.121)	(0.146)	(0.073)
Log median household income	3.483	6.091	−1.639
	(3.903)	(3.850)	(2.443)
Unemployment rate	0.386	0.694**	−0.232
	(0.332)	(0.322)	(0.265)
Population per 10,000	0.061	0.022	0.007
	(0.337)	(0.270)	(0.101)
Population density per 10,000	−2.235	−1.466	3.664***
	(1.930)	(2.237)	(0.914)
Observations	351	351	351
Adjusted R^2	0.765	0.301	0.414

Note: Robust standard errors reported. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (two-tailed test)

Table A6: Regression of MA 2016 Roll-Off on Residential Overdose Rates

	Pres	Q1	Q2	Q3	Q4
	(1)	(2)	(3)	(4)	(5)
Log OD deaths per 100,000 (residence)	0.026	0.249**	0.076	0.091	−0.062
	(0.042)	(0.119)	(0.074)	(0.076)	(0.069)
2012 Democratic presidential vote share	−0.015	0.038*	0.030**	0.025**	0.039***
	(0.010)	(0.020)	(0.012)	(0.012)	(0.010)
Percent black	−0.012	0.103***	0.015	0.033	0.037
	(0.013)	(0.037)	(0.021)	(0.024)	(0.030)
Percent Latinx	0.011	0.055**	0.039**	0.054**	−0.013
	(0.018)	(0.027)	(0.015)	(0.022)	(0.027)
Percent female	0.014	0.047	−0.008	0.011	0.024
	(0.020)	(0.063)	(0.034)	(0.040)	(0.032)
Percent high school or less	0.064	0.250*	0.191***	0.251***	0.200***
	(0.042)	(0.131)	(0.057)	(0.083)	(0.077)
Percent Bachelor's or more	0.041	0.122	0.087*	0.119*	0.076
	(0.034)	(0.099)	(0.050)	(0.061)	(0.053)
Percent under 25	0.029	0.134*	0.133***	0.159***	0.112**
	(0.025)	(0.081)	(0.042)	(0.053)	(0.046)
Percent 65 or over	0.004	0.044	0.074***	0.080***	0.054*
	(0.023)	(0.040)	(0.025)	(0.029)	(0.031)
Log median household income	0.399	0.245	0.995	1.190	0.950
	(0.670)	(1.165)	(0.947)	(0.842)	(0.831)
Unemployment rate	0.018	0.230	0.074	0.154	0.007
	(0.072)	(0.157)	(0.073)	(0.109)	(0.117)
Population per 10,000	−0.003	0.028	−0.013	−0.006	−0.011
	(0.019)	(0.096)	(0.061)	(0.051)	(0.040)
Population density per 10,000	−0.077	−0.102	1.143**	1.068	0.850
	(0.358)	(0.784)	(0.571)	(0.707)	(0.655)
Observations	351	351	351	351	351
Adjusted R^2	0.144	0.833	0.760	0.844	0.649

Note: Robust standard errors reported. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (two-tailed test)

Table A7: Regression of MA 2016 Turnout on Residential Overdose Rates

	elec16_turnout		
	(1)	(2)	(3)
Log OD deaths per 100,000 (residence)	−1.960***	−2.265***	−0.947**
	(0.376)	(0.418)	(0.463)
2012 Democratic presidential vote share		−0.236***	−0.075
		(0.061)	(0.067)
Percent black			−0.041
			(0.162)
Percent Latinx			0.123**
			(0.057)
Percent female			0.200
			(0.183)
Percent high school or less			−1.273***
			(0.248)
Percent Bachelor's or more			−0.655**
			(0.264)
Percent under 25			−1.120***
			(0.203)
Percent 65 or over			0.378***
			(0.137)
Log median household income			15.874***
			(5.215)
Unemployment rate			0.262
			(0.296)
Population per 10,000			0.009
			(0.486)
Population density per 10,000			−5.236**
			(2.179)
Observations	351	351	351
Adjusted R^2	0.072	0.126	0.880

Note: Robust standard errors reported. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (two-tailed test)

Table A8: Regression of MA Question 4 on 3-Year Average Residential Overdose Rates

	Question 4 "Yes" Vote Share		
	(1)	(2)	(3)
3-Year log OD deaths per 100,000 (residence)	−1.284***	−0.867***	−0.813**
	(0.305)	(0.241)	(0.379)
2012 Democratic presidential vote share		0.368***	0.466***
		(0.030)	(0.053)
Percent black			−0.272***
			(0.066)
Percent Latinx			−0.289***
			(0.084)
Percent female			−0.310**
			(0.130)
Percent high school or less			−0.658***
			(0.174)
Percent Bachelor's or more			−0.459***
			(0.143)
Percent under 25			−0.462***
			(0.146)
Percent 65 or over			−0.620***
			(0.099)
Log median household income			−8.949***
			(3.042)
Unemployment rate			−0.324
			(0.292)
Population per 10,000			0.068
			(0.126)
Population density per 10,000			2.225
			(2.665)
Observations	351	351	351
Adjusted R^2	0.056	0.451	0.757

Note: Robust standard errors reported. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$ (two-tailed test)

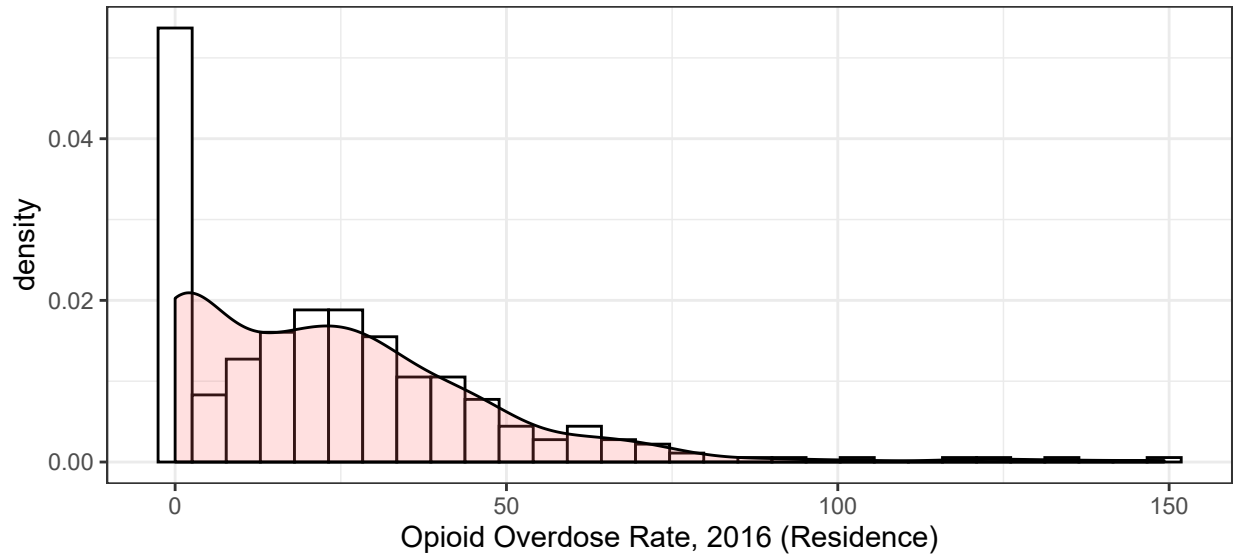**Figure A1:** Density Plot, MA Opioid Overdose Death Rate (Residential), 2016

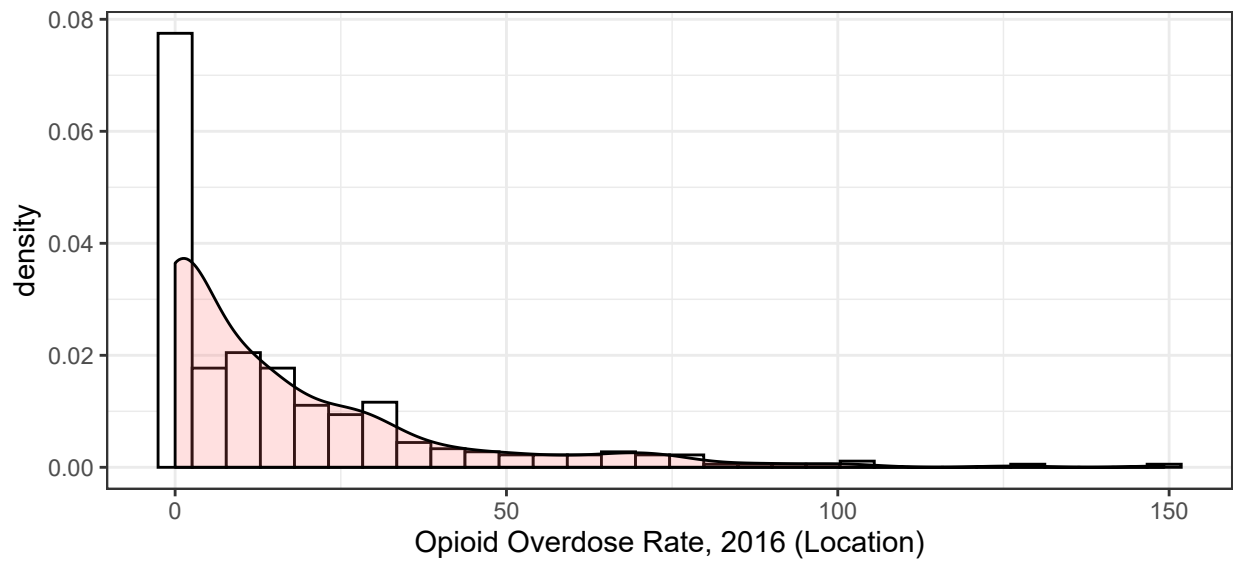**Figure A2:** Density Plot, MA Opioid Overdose Death Rate (Locational), 2016

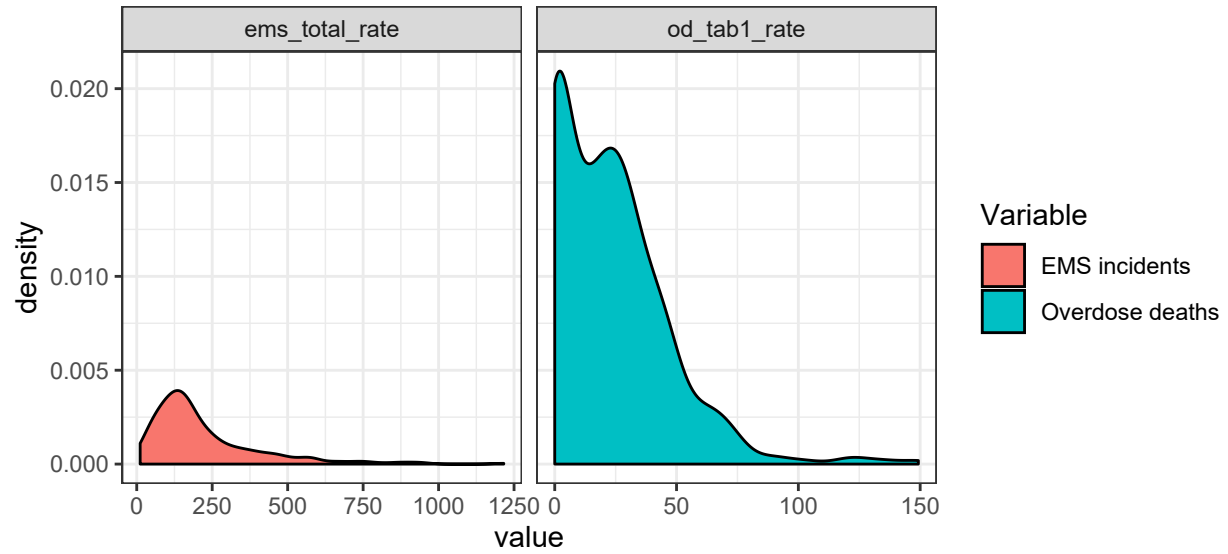**Figure A3:** Density Plot, Comparing EMS to OD Death Rate (MA, 2016)

Figure A4: Overdose Death Rates, County-Level Analysis