

# 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 that county-level overdose rates are not related to preferences over drug policy in the Cooperative Congressional Election Study (CCES). More research is needed to precisely determine the relationship between local opioid overdose death rates and political behavior.

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

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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 will use municipal-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 rehabilitation 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 second 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 marijuana 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.

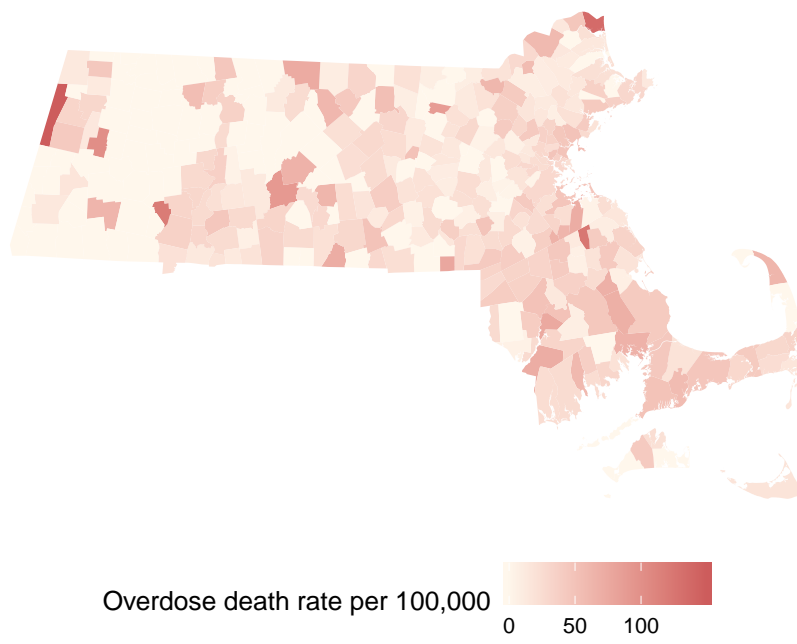
Second, Massachusetts provides overdose data that is specific to opioids, while the CDC aggregate county data is only available for more general drug overdoses. This is useful especially as the salience of the opioid crisis makes this measure appropriate for studying local contextual effects. Additionally, 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 5).<sup>1</sup> 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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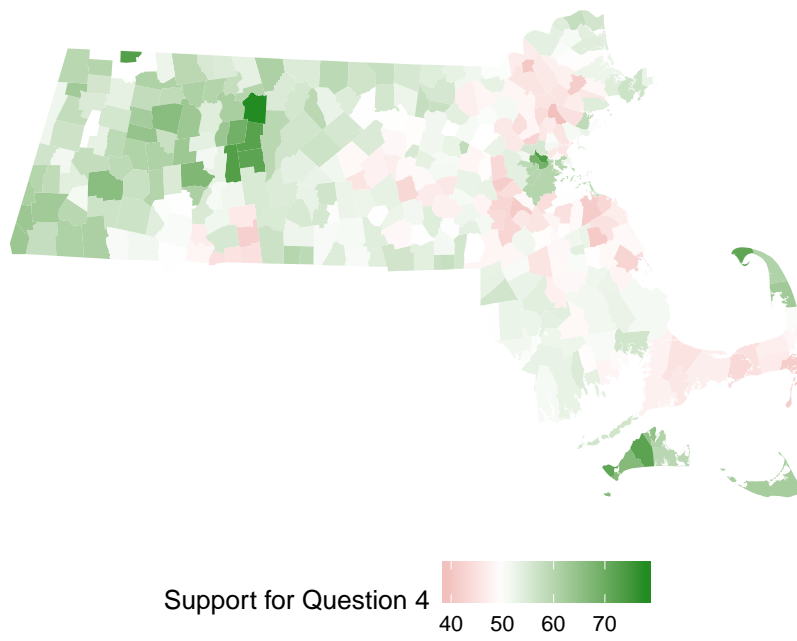
<sup>1</sup>In Table 6, both measures of overdose deaths are used, and residence appears to be more important.



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



**Figure 2:** Support for Massachusetts Question 4, 2016



## 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. 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 the appendix 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 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.<sup>2</sup>

**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*** (0.227)	-1.008*** (0.179)	-0.691*** (0.245)
2012 Democratic presidential vote share		0.356*** (0.029)	0.469*** (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			0.00001 (0.00001)
Population density			0.0002 (0.0003)
Observations	351	351	351
Adjusted R <sup>2</sup>	0.116	0.479	0.759

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

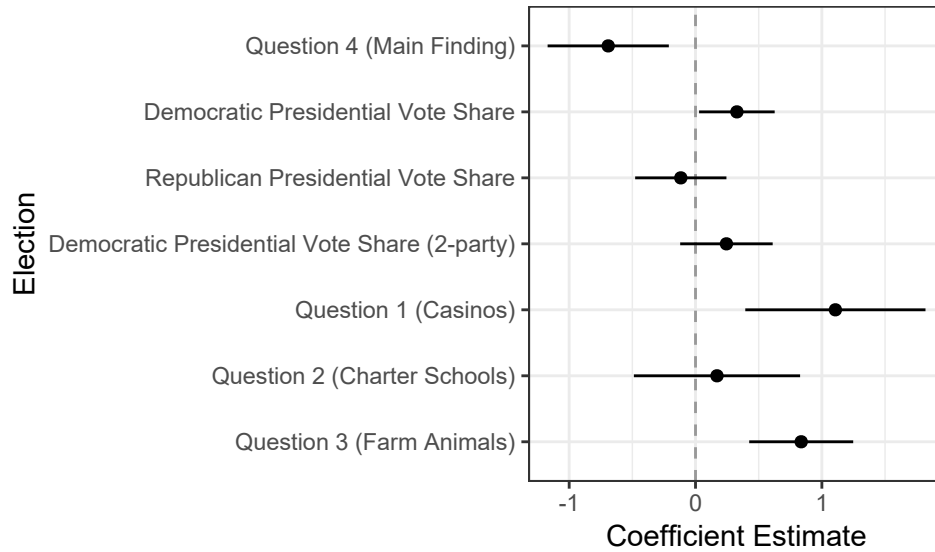
The association between opioid overdose death rates and support for marijuana legal-

<sup>2</sup>This analysis does not control for crime rates, as this measure is likely post-treatment to the measure of opioid overdoses.

ization 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 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

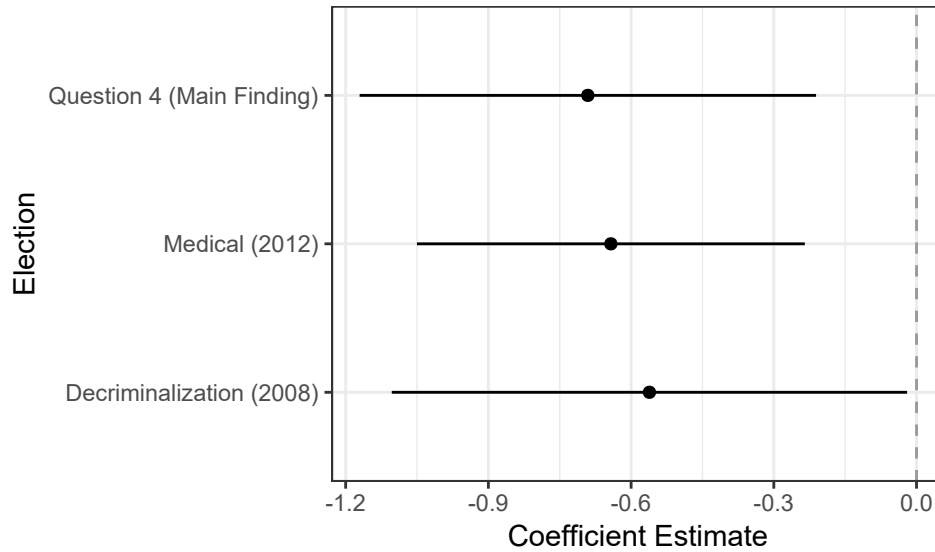
**Figure 3:** Placebo Test 1, Other 2016 Election Outcomes



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 available in Figure 4, which show that this is not the case. 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

**Figure 4:** Placebo Test 2, Prior Year Marijuana Ballot Questions



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 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.

**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*** (0.355)	−0.668*** (0.196)	−0.464** (0.209)	−0.156 (0.250)
2012 Democratic presidential vote share		0.291*** (0.042)	0.232*** (0.054)	−0.378*** (0.081)
Percent black		−0.192*** (0.054)	−0.135** (0.065)	0.124 (0.339)
Percent Latinx		−0.295*** (0.061)	−0.268*** (0.071)	0.331* (0.193)
Percent female		−0.200* (0.106)	−0.166 (0.111)	−0.201 (0.231)
Percent high school or less		−0.334** (0.131)	−0.233* (0.133)	0.086 (0.191)
Percent Bachelor’s or more		−0.097 (0.110)	0.029 (0.106)	−0.128 (0.223)
Percent under 25		−0.237** (0.107)	−0.231** (0.109)	−0.343 (0.238)
Percent 65 or over		−0.616*** (0.078)	−0.607*** (0.095)	−0.573*** (0.198)
Log median household income		−13.618*** (1.973)	−11.336*** (2.207)	−3.619 (6.430)
Unemployment rate		−0.324 (0.203)	−0.219 (0.197)	−0.194 (0.207)
Population		0.00000 (0.00000)	0.00000 (0.00000)	−0.0001 (0.001)
Population density		0.0002 (0.0002)	0.0003* (0.0002)	0.008 (0.005)
2016		−6.710*** (0.698)	−7.248*** (0.719)	−10.583*** (1.421)
Regional dummies			County	Municipality
Observations	702	702	702	702
Adjusted R <sup>2</sup>	0.123	0.762	0.783	0.935

*Note:*

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

## 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.<sup>3</sup> 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-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 5 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 6 shows the relationship between a respondent's county overdose death rate and support for eliminating mandatory minimums.

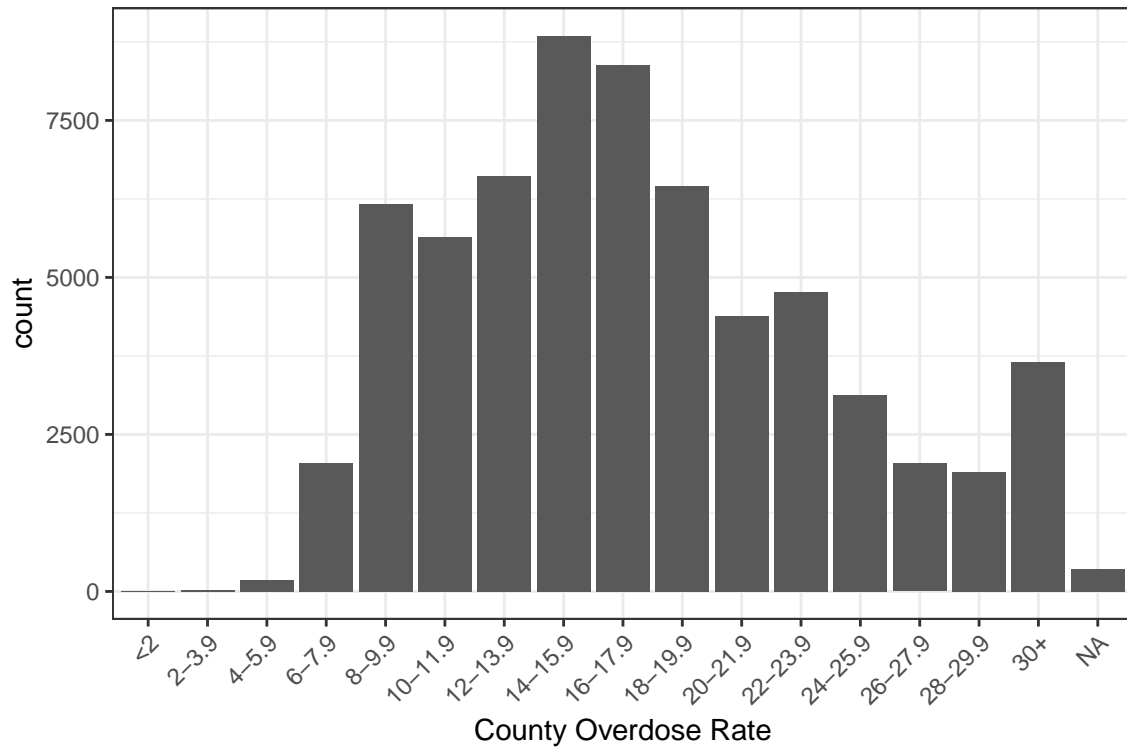
Excluding a few counties with low overdose death rates, as rates increase, there is no change

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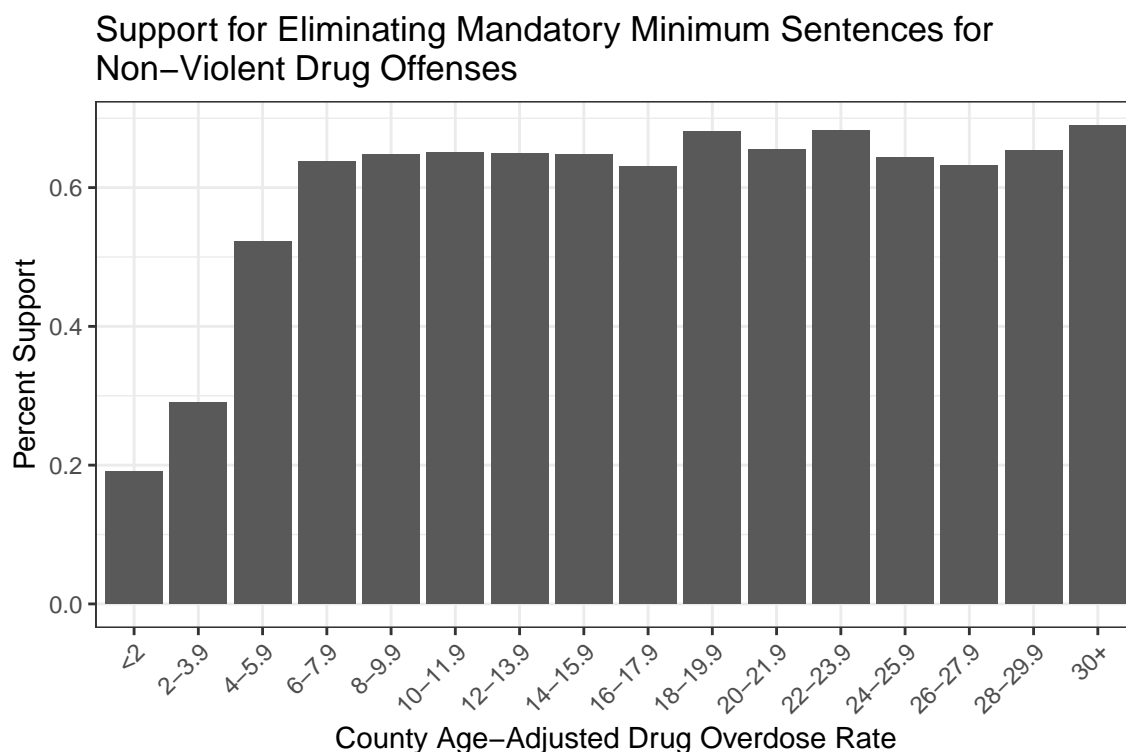
<sup>3</sup>The CDC WONDER database provides more exact overdose death rate data, rather than binned rates. For many counties, however, the number of overdose deaths and/or the county population is too small to obtain an estimate of the overdose death rate, leaving a lot of missing data. For this reason, I use the NCHS binned rates instead.



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 5:** County Overdose Death Rates, 2016, CCES Respondents



**Figure 6:** 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 3. 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.

## 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.

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 4). 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).

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

**Table 3:** Association between County Overdose Death Rates and Support for Eliminating Mandatory Minimums, OLS

	Support for Repealing Mandatory Minimums		
	(1)	(2)	(3)
County overdose death rate	0.001*** (0.0003)	0.001*** (0.0003)	0.001*** (0.0003)
Republican		-0.145*** (0.006)	-0.146*** (0.006)
Political ideology		-0.090*** (0.002)	-0.090*** (0.002)
Female		-0.046*** (0.004)	-0.046*** (0.004)
Birth year		0.002*** (0.0001)	0.002*** (0.0001)
Black		0.048*** (0.007)	0.041*** (0.007)
Hispanic		-0.082*** (0.008)	-0.068*** (0.009)
Asian		-0.100*** (0.011)	-0.096*** (0.011)
Born-Again Christian		0.047*** (0.005)	0.047*** (0.005)
News interest		-0.053*** (0.003)	-0.053*** (0.003)
Log median income			0.014 (0.015)
Percent black			0.053*** (0.019)
Percent Hispanic			-0.061*** (0.017)
Percent Bachelor's degree or more			0.255 (0.379)
Percent under 25			0.087 (0.100)
Percent 65 and over			-0.040 (0.111)
Observations	64,206	58,413	58,413
Adjusted R <sup>2</sup>	0.0003	0.117	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)

is needed to assess how this epidemic has shaped the politics of criminal justice and public health more broadly.

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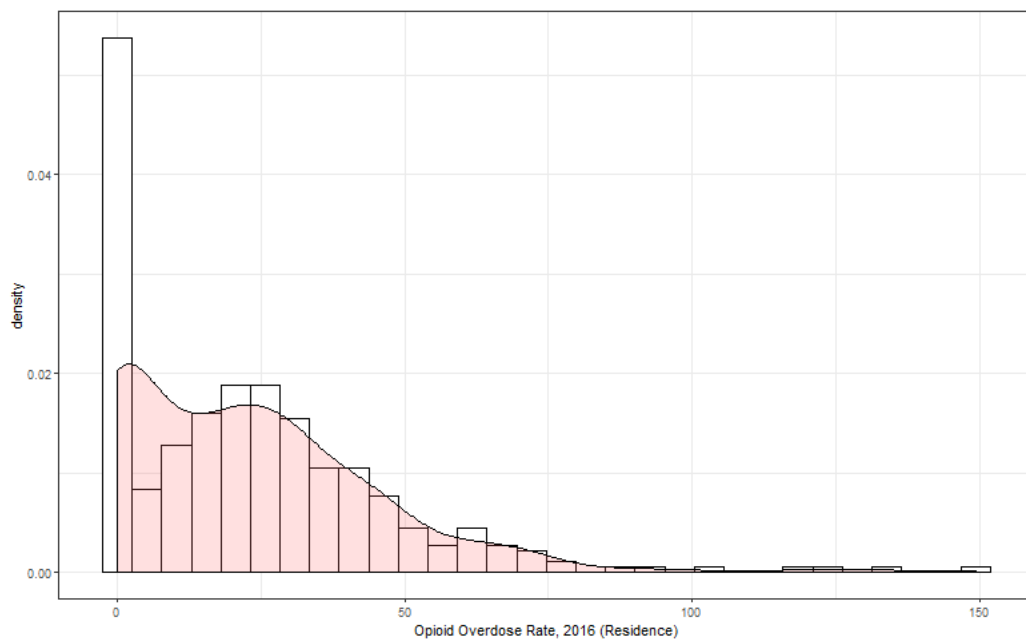


# Appendix

**Table 4:** 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

**Figure 7:** Density Plot, MA Opioid Overdose Death Rate (Residential), 2016



**Table 5:** 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*** (0.224)	−0.848*** (0.176)	−0.482** (0.218)
2012 Democratic presidential vote share		0.377*** (0.028)	0.474*** (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			0.00001 (0.00001)
Population density			0.0002 (0.0003)
Observations	351	351	351
Adjusted R <sup>2</sup>	0.047	0.466	0.758

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

**Table 6:** 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*** (0.325)	−0.805*** (0.241)	−0.500 (0.306)
Log OD deaths per 100,000 (location)	0.355 (0.301)	−0.257 (0.233)	−0.222 (0.275)
2012 Democratic presidential vote share		0.360*** (0.028)	0.469*** (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			0.00001 (0.00001)
Population density			0.0002 (0.0003)
Observations	351	351	351
Adjusted R <sup>2</sup>	0.116	0.479	0.759

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