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Prenatal Exposure to Marijuana and Infant Health in the US*

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Abstract

This study evaluates the consequences of increased marijuana exposure during pregnancy on infant health in the US. Unlike previous studies on the impacts of marijuana, which rely on state-level variation to identify their effects of interest, I exploit county-specific measures of cannabis prenatal exposure using data on the precise location and opening date of every cannabis dispensary (legal point of sale for marijuana) in the country. Estimations based on state-level measures of increased marijuana access suggest no adverse impact on infant health. In addition, the estimated effects exploiting county-level variation in the opening dates of cannabis dispensaries, suggest that higher prenatal exposure to cannabis is unrelated to changes in infant health, once I control for county fixed effects and state-specific trends. Additional evidence from an event-study analysis with similar controls, corroborates that increased availability of marijuana during pregnancy is not linked to changes in infant health.

Keywords: marijuana, cannabis dispensaries, infant health
JEL Codes: I10, I12, I18

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1 Introduction

The number of state governments that legalized cannabis for medical purposes proliferated over the last decade. By the end of 2018, 33 states and Washington DC had approved medical marijuana laws (MMLs), which aim to provide patients with more treatment options for conditions such as chronic pain, mental health problems and cancer. This rapid expansion in marijuana availability has been accompanied by growing concerns from public health authorities. The public debate on this topic is fierce because both potential benefits and risks of marijuana legalization remain unclear.

In 2016, to inform this debate, the National Academy of Sciences, Engineering and Medicine gathered a panel of experts to start working on a comprehensive report to collect and analyze the available evidence on the health consequences of cannabis. After a year of work, the report was released in 2017 and its main conclusion was that there is insufficient evidence on the benefits and harms of this drug on a wide range of outcomes including cancer, respiratory diseases, cardiovascular risk, mental health, injury and death (National Academy of Sciences, 2017). Furthermore, the report identifies a research gap on the health impacts of cannabis use on pregnant women and infants. These vulnerable groups are of special interest because recent figures suggest that marijuana is the most common drug used during pregnancy (Volkow et al. 2017). To shed light on this issue, I explore whether increased access to marijuana can affect infant health through higher exposure to marijuana coming directly from maternal use or, indirectly, from other family members or close neighbors.

Pregnant women may use marijuana to reduce pain or nausea, two of its allegedly medical benefits. How can this use affect infants' health? It is a fact that the chemical components of marijuana (in particular tetrahydrocannabinol or THC) pass from the mother to the fetus through the placenta. Several observational studies in medicine show that prenatal exposure to cannabis diminishes fetal growth, and this reduction leads to lower birthweight and brain development problems. Based on the available evidence, current health guidelines (e.g. Center for Disease Control and Prevention, the American College of Obstetricians and Gynecologists) recommend pregnant women not to consume medical cannabis and to avoid being close to marijuana smoke. However, as pointed out in two recent systematic reviews (Conner et al. 2016 and Gunn et al. 2016), these correlations should be taken with caution because they could be capturing the effects of other related and harmful behaviors such as tobacco or alcohol use.

To further investigate this open question, I exploit geographic and temporal variation in increases of marijuana availability to estimate the consequences of higher prenatal exposure to cannabis on infant health. First, I combine data on the introduction of MMLs with a restricted version of the birth files from the National Vital Statistics System over 2004-2014. The differential timing of the enactment of MMLs across states allows me to link infant health indicators with increased availability of medical marijuana. The results from this specification suggest that prenatal exposure to legal marijuana has no significant impact on five health indicators (e.g. pre-term birth, respiratory problems at birth, admission to the intensive care unit). The only significant point estimate implies that increased access to marijuana during pregnancy rises the prevalence of low birth-weight (babies born with less than 2500 grams) by 5 percent.

Then, I construct county-specific measures of prenatal exposure to marijuana using novel data on the precise location and opening date of cannabis dispensaries in the US. These dispensaries are the legal point of sale of marijuana for final consumers. The estimated impacts exploiting county-level variation also indicate that increased prenatal exposure to cannabis has no significant effects on any of the six infant health indicators analyzed.

Finally, I estimate changes in infant health outcomes after the opening of cannabis dispensaries using an event-study framework. These estimates, using a restricted sample of births (only those occurring within a narrow window time around the opening date), also show that higher in-utero exposure to cannabis is unrelated to several adverse infant health outcomes. Taken together, these ITT effects suggest that increased marijuana availability during pregnancy is, at best, only weakly related to worse infant health. In nearly all cases, the coefficients are precisely estimated.

The main limitation of this analysis is the lack of a measure on actual (or even self-reported) marijuana use. For this reason, all these coefficients should be interpreted as Intent-To-Treat (ITT) effects. Treatment on the treated (TOT) effects could be quite larger (in absolute terms), depending on the prevalence of cannabis use. Although medical studies coincide on indicating that the prevalence of marijuana use has increased in recent years, there are important differences in the levels they report. National-level estimates show that the prevalence of marijuana use during pregnancy ranges from 2 % to 5% (Volkow et al 2017), but these figures can reach 15-20% among urban, young women (ACOG 2017, Mark et al 2015). Nonetheless, the ITT effects reported here are informative about the consequences of increased marijuana access on the residents of counties where dispensaries have opened.

This paper adds to the small but growing economic literature on the effects of MMLs. A number of recent studies have documented the effects of MMLs on consumption of marijuana, tobacco, alcohol and harder drugs. The emerging evidence suggests that MMLs are related to increases in marijuana and alcohol use, decreases in tobacco consumption, and have no impact on the use of harder drugs (Wen et al. 2014; Choi et al. 2016; Anderson et al. 2014). Powell et al. (2018) also find that MMLs reduce addiction and deaths related to prescription opioid drugs (painkillers). In addition to these health impacts, one of the potential economic benefits of these laws is that, as patients get better treatment for pain conditions, they are also more likely to work. Nicholas and Maclean (2016) show that MMLs increase the labor supply of older adults, suggesting that medical marijuana can be helpful to improve labor market participation among older adults. In short, this growing body of evidence shows both positive and negative impacts of MMLs on the health status of teenagers and adults. To the best of my knowledge, this is the first study analyzing the consequences of increased marijuana availability on infant health using county-level variation from dispensary data.

The rest of the paper proceeds as follows. Section 2 describes the data sources. Section 3 details the empirical framework. Section 4 presents our results and Section 5 offers concluding remarks.

2 Data

The primary data source for the empirical analysis is the National Vital Statistics System. In particular, I use the restricted version of the birth files for the period 2004-2014. These data include rich information on both maternal and infant characteristics for the universe of first-born births occurred in the US. In any given year, first-born babies account for 40 percent of all births in the country.

I consider six measures of adverse infant health. First, we have an indicator for pre-term birth, which is equal to one if the gestational period was less than 37 weeks, and zero otherwise. Second, an indicator for low birthweight, which is equal to one if birthweight is below 2500 grams, and zero otherwise. Third, a dummy variable indicating whether the child had seizures during birth or not. Fourth, an indicator of whether the newborn had a low APGAR score. This score goes from zero to ten and it summarizes the health status of infants based on five dimensions: appearance, pulse, grimace, activity and respiration. Higher scores mean better health at birth. This variable is equal to one if the APGAR score is below seven (as indicated by medical guidelines), and zero otherwise. Fifth, a dummy variable indicating whether the child needed assisted ventilation (due to respiratory problems during the first hours of life) or not. Sixth, we have an indicator variable if the infant was admitted to the neonatal intensive care unit.

As control variables, we have information on a range of socioeconomic and health characteristics. More specifically, I control for prenatal care, indicators for maternal race, educational level, US-born (native or immigrant), marital status, age groups, and delivery method (vaginal or cesarean section) and month of birth. Both outcome and control variables are taken to follow previous medical studies on the health effects of prenatal exposure to marijuana (Conner et al. 2016, Gunn et al. 2016).

On average, the number of observations with non-missing values for both outcome and control variables is 6 million, except for the indicator of admission to the neonatal intensive care unit, which has 2.7 million observations[1].

Marijuana availability steadily increased over the last decade because several states approved its use for medical purposes, as shown in Figure 1. Though this state-level variation is illustrative, the core of the empirical analysis exploits county-level variation in higher access to marijuana.

To construct a novel county-specific measure of marijuana access, I collected data on the precise location and opening date of every cannabis dispensary in the US. These dispensaries, regulated by local governments, represent the primary legal point of sale of cannabis for final consumers[2]. These data were extracted from www.marijuanadoctors.com and www.weedmaps.com between August and November 2018. I first gathered information on the address of every dispensary, and then looked, one-by-one, for the opening date (month and year). In total, 217 dispensaries opened between 2002 and 2018. From these, 128 opened during our study period (one in a different county, implying that there are 128 counties with one cannabis dispensary). The number of dispensaries opened by year is shown in Figure 2. We see that very few dispensaries opened before 2009, but in that year, and afterwards, a growing number of dispensaries opened.

3 Empirical Framework

The question of interest is whether prenatal exposure to increased marijuana access has an impact on infant health. As a starting point, I exploit the timing across states in the introduction of MMLs, linking changes in infant health to differences in the availability of medical marijuana induced by pol-

[1]This variable is not available for all states during the entire study period. Around half of the states began including this measure already in 2004, but some states started later.

[2]Local governments can only authorize the opening of a dispensary after the state has already approved marijuana use.

icy changes. More formally, I estimate the following equation:

$$AH_{ist} = \alpha_s + \alpha_t + \beta MML_{st} + X_i^{'}\Psi + \mu_{ist} \tag{1}$$

where AH_{ist} is a measure of adverse health of child i, in state s in period t. State and year fixed effects are denoted by α_s and α_t, respectively. The variable MML_{st} represents a state-level measure of increased prenatal exposure to cannabis. It indicates that access to medical marijuana was legalized in state s before children were born in year t[3]. The vector X_i includes individual characteristics. The error term is denoted by μ_{ist}, and it is allowed to be correlated within states.

In equation (1), the parameter of interest is β. The identification assumption required for obtaining a consistent estimate of the impact of MMLs is that once I control for unobserved time-invariant characteristics at the state-level, year-specific effects common across all individuals, and individual characteristics, the timing of MMLs across states unrelated to unobserved determinants of infant health. In this setup, the main threat to identification is that there could be state-specific factors that vary over time and correlate with MMLs and infant health. This would imply that β is also capturing the effects of these confounding factors. Another concern, pointed out in previous studies (Hunt et al 2018), is that state-level measures of marijuana access may preclude identification of small effects (in magnitude) or impacts that are local in nature because the estimation ignores within-state variation.

To overcome this limitation, the core of the empirical analysis will be the following regression:

$$AH_{isct} = \lambda_c + \lambda_t + \lambda_s * t + \delta^{DD} dispensary_{ct} + X_i^{'}\Phi + \varepsilon_{isct} \tag{2}$$

where λ_c denotes county fixed-effects, $\lambda_s * t$ represents state-specific time trends, $dispensary_{ct}$ indicates that there is a cannabis dispensary in county c in period t, and the remaining terms are defined as before. In equation (2), the error term is allowed to be correlated within counties. Now, the parameter of interest is δ^{DD}, which captures the change in adverse health indicators following the opening of a cannabis dispensary, controlling for unobserved county-level confounders that are time-invariant, and state-level trends. The medical literature suggests that δ^{DD} should be positive. These adverse health impacts arise for two channels: maternal use of marijuana during pregnancy (direct effect) or prenatal exposure to marijuana smoke (indirect effect or externality).

[3]In practice, the variable is defined using the year of conception (calculated with the month and year of birth) but, for simplicity, I only refer to year t.

The inclusion of both state-level trends and county fixed-effects implies that the coefficient δ^{DD} is estimated using only trend breaks that precisely coincide with the opening of cannabis dispensaries, after removing time-invariant county heterogeneity. This means that once I control for $\lambda_s * T$ and λ_c, the main threat to the estimation of δ^{DD} is that confounding factors, not captured by county fixed-effects, generate deviations from state-specific trends that occur on the opening dates of cannabis dispensaries.

To complement the Differences-in-Differences estimation, I exploit variation in the opening dates of cannabis dispensaries in an event-study framework to estimate the change in infant health following increases in marijuana access. To fix ideas, let us consider the following equation:

$$AH_{isct} = \pi_c + \pi_t + \pi_s * time + \delta^{ES} 1(t > t_c^{OP}) + X_i^{'} \Phi + \nu_{isct} \tag{3}$$

where t_c^{OP} is the date on which the cannabis dispensary opened in county c. In this framework, δ^{ES} captures the change in the outcome following the event (opening of the dispensary). The key assumption behind this specification is that the difference between birth dates and opening dates of cannabis dispensaries is exogenous to infant health, after controlling for county and year fixed effects, state-specific trends, and individual characteristics. To explore the stability of the event-study results, I restrict the sample of births using three different time intervals (in days): $[t - 280; t + 280]$; $[t - 150; t + 150]$, and $[t - 90; t + 90]$[4]. Because I only observe the month and year of the opening date, I assume that all dispensaries opened the first day of the month[5].

4 Results

4.1 Differences-in-Differences (DD) Results

Table 1 presents the DD estimates (ITT effects) of β of equation (1). The estimated coefficients are very small in magnitude and, for all outcomes but one, I cannot reject the null hypothesis of no impact (precisely estimated zero effects). These results suggest that MMLs are not associated with changes in the prevalence of pre-term births (less than 37 weeks), seizures, low APGAR scores, respiratory problems or admissions to the neonatal intensive care unit. I only find a statistically significant effect on the prevalence of low birthweight (below 2,500 gr). The point estimate in column (2) suggests that MML increases the prevalence of low birthweight by 0.39 percentage

[4]These time intervals are chosen to roughly allow for one, two or three trimesters of prenatal exposure to cannabis dispensaries (in reverse order).

[5]Results do not change if I use alternative dates such as the fifteenth day of the month.

points. This impact represents an increase of 5 percent relative to the mean of the low birthweight rate (0.0735). As stated before, we may suspect that these estimates do not capture the full effect of prenatal exposure to cannabis because they ignore county-level variation (within the same state) in access to marijuana.

For this reason, we now turn our attention to the ITT estimates reported in Table 2, which exploit county-specific measures of prenatal exposure to marijuana. In column 1, I report the coefficients of the DD specification controlling for individual characteristics and year fixed effects. In column 2, state-specific trends are included in the model. Finally, in column 3, I control for unobserved county heterogeneity that is time-invariant. The mean of the dependent variable, and the number of observations are shown in the last two columns.

The estimated impacts of higher marijuana access on the occurrence of pre-term births are positive and statistically significant in the first two columns but become insignificant once I include county fixed effects (in column 3). The same pattern (statistically significant in the first two columns but insignificant in the third) is found for the estimated effects on the prevalence of low birthweight and admission to the neonatal intensive care unit. We should note that this loss of statistical significance is not driven by larger standard errors (indeed they are smaller) but by a large reduction in the size of the coefficients. The point estimates associated with the impacts on low APGAR scores and assisted ventilation are insignificant across all specifications. The only effect that is statistically significant in the three models indicates that higher exposure to cannabis is related to increases in the likelihood of seizures. However, there is no clear biological mechanism nor prior evidence for such effect. Overall, it seems important to control for time-invariant county-level characteristics because, after doing so, most ITT effects are precisely estimated zero coefficients.

4.2 Event-Study Results

To complement the DD results, I report the estimates from an event-study framework (equation 3) with three different windows time: 280 days, 150 days and 90 days. Table 3 presents the estimated coefficients for the broadest time window, which allows for 40 weeks of prenatal exposure to cannabis. We see that, again, all point estimates are not statistically different from zero. Thus, these results suggest that there is no discernible change in infant health after the opening of cannabis dispensaries.

In Tables 4 and 5 I further restrict the sample to narrower window times

(150 and 90 days, respectively). In Table 4, we see that most estimated impacts are not statistically significant. Only the point estimates in columns 2 and 5 are significant, suggesting that higher prenatal exposure to cannabis is associated with higher prevalence of low birthweight and fewer newborns needing assisted ventilation. In Table 5, the only estimated coefficient that is significant (column 6) indicates that after the opening of cannabis dispensaries in a given county, there is an increase in the fraction of infants that are admitted to neonatal intensive care unit. In the rest of the columns, the estimated effects suggest that there are no changes in infant health after the opening of cannabis dispensaries.

5 Conclusion

In recent years, marijuana availability has rapidly increased throughout the US. This trend in cannabis legalization has also raised concerns among scholars and policy makers alike. The report made by the National Academy of Sciences, the most comprehensive study on this topic, concludes that much research remains to be done in order to fully understand the health impacts of cannabis.

In this paper, I focus on the consequences of increased prenatal exposure to cannabis on infant health. Similar to previous studies in the economic literature, I first use a differences-in-differences model exploiting state-level changes in prenatal exposure to cannabis generated by the enactment of medical marijuana laws. I find that these state-level policy changes are unrelated to several infant health indicators (precisely estimated zero coefficients).

Then, using the same differences-in-differences framework, I exploit variation in the opening dates of cannabis dispensaries, controlling for state-specific trends and time-invariant county heterogeneity. Without such controls, the estimated effects of increased marijuana availability are large and statistically significant. But after including county fixed effects, most coefficients become insignificant. This loss of significance is driven by smaller point estimates instead of less precision (in fact, standard errors are smaller). Additional evidence from an event-study framework (with three different window times) using only births occurring in counties with cannabis dispensaries also suggests that several infant health indicators are unaffected after the opening of such dispensaries.

Despite the lack of conclusive evidence, most health authorities (e.g. American Medical Association, National Institute of Health, American College of Obstetricians and Gynecologists) recommend against marijuana use during pregnancy pointing out that there is substantial theoretical work on the harmful consequences that cannabis can have on fetal growth and brain development.

Given that experimental studies are not feasible because of ethical reasons, this study represents a first step in providing more credible evidence on the impacts of prenatal cannabis exposure on infant health. In line with two systematic medical reviews, my findings suggest that increased marijuana availability during pregnancy is unrelated to several infant health indicators, once I control for county fixed-effects and state-specific trends. One important drawback in this analysis is that I do not observe maternal marijuana use directly and, therefore, all these estimates are ITT effects, not the impacts on actual cannabis users. As more data on marijuana use become available, future work should explore the health impacts on pregnant women who really consume cannabis.

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Figure 1: Year of Medical Marijuana Legalization by state

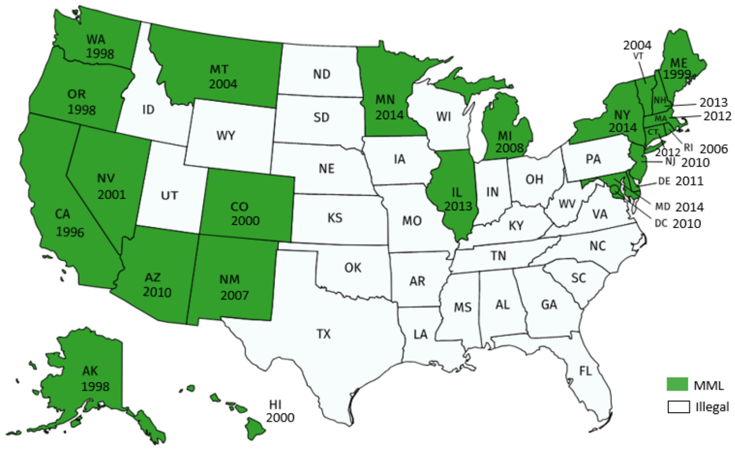

Figure 2: Timing of the opening of cannabis dispensaries: 2004-2014

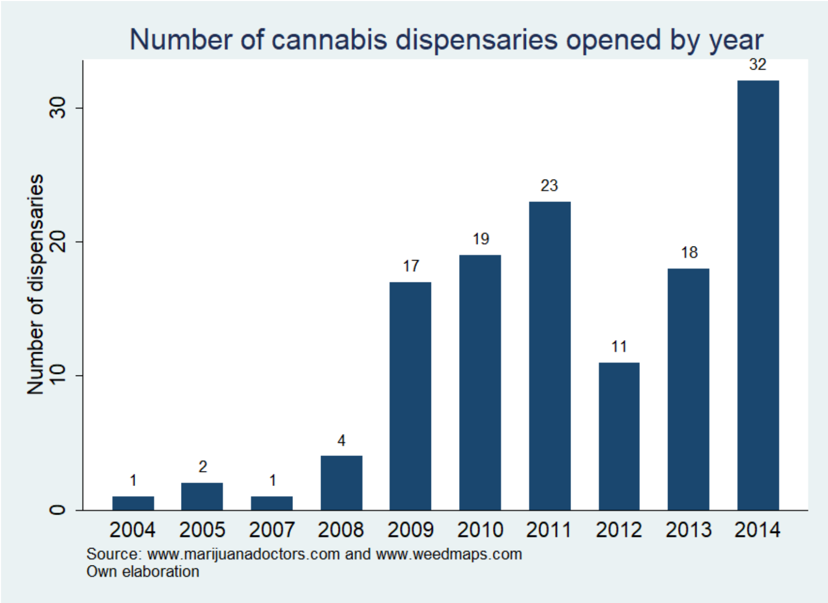

Table 1: DD Estimates of the Impacts of state-level MML on Adverse Infant Health

Dependent variable:	Pre-term Birth (less than 37 wks)	Low Birthweight	Seizures	Low APGAR Score	Assisted Ventilation	Admission to NICU
	(1)	(2)	(3)	(4)	(5)	(6)
Medical marijuana law	0.0019	0.0039***	0.0001	0.0038	-0.0024	-0.0007
	(0.0034)	(0.0015)	(0.0002)	(0.0029)	(0.0044)	(0.0032)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,072,141	6,075,885	6,069,031	5,942,948	6,069,031	2,734,626
R-squared	0.0090	0.0107	0.0005	0.0064	0.0292	0.0172
Mean of dep. variable	0.181	0.0735	0.0002	0.0191	0.0177	0.0801

NOTE: Robust standard errors clustered at the state level are shown in parentheses. Each coefficient comes from a separate regression. All regressions control for individual characteristics, state and year fixed-effects. All dependent variables are discrete. Each outcome is equal to one if the stated adverse condition occurred and zero otherwise (NICU means: Neonatal Intensive Care Unit).

Table 2: DD Estimates of Cannabis Dispensaries on Adverse Infant Health

Dependent Variable:	(1)	(2)	(3)	Mean	N
Pre-term birth	0.0059***	0.0067***	-0.0005	0.181	6,072,141
(less than 37 weeks)	(0.0022)	(0.0023)	(0.0017)		
R-squared	0.0077	0.0078	0.0126		
Low Birthweight	0.0063**	0.0062**	0.0006	0.0735	6,075,885
(below 2500 gr)	(0.0025)	(0.0027)	(0.0011)		
R-squared	0.0088	0.0089	0.0148		
Seizures	0.0003**	0.0003**	0.0002*	0.0002	6,069,031
	(0.0002)	(0.0001)	(0.0001)		
R-squared	0.0005	0.0006	0.0012		
Low APGAR score	0.0017	0.0006	0.0020	0.0191	5,942,948
	(0.0015)	(0.0014)	(0.0015)		
R-squared	0.0058	0.0065	0.0099		
Assisted Ventilation	0.0061	0.0051	0.0080	0.0177	6,069,031
	(0.0044)	(0.0034)	(0.0050)		
R-squared	0.0290	0.0313	0.0432		
Admission to NICU	0.0186***	0.0185***	0.0019	0.0801	2,734,626
	(0.0059)	(0.0060)	(0.0014)		
R-squared	0.0159	0.0160	0.0348		
Individual controls	Yes	Yes	Yes		
Year FE	Yes	Yes	Yes		
State FE	Yes	Yes	No		
State-specific trends	No	Yes	Yes		
County FE	No	No	Yes		

NOTE: Robust standard errors clustered at the county level are shown in parentheses. Each coefficient comes from a separate regression. All dependent variables are discrete. Each outcome is equal to one if the stated adverse condition occurred and zero otherwise (NICU means: Neonatal Intensive Care Unit). The last two columns display the mean of the dependent variable and the number of observations.

Table 3: Event-study Estimates of Cannabis Dispensaries on Adverse Infant Health. Window time: +-280 days

Dependent variable:	Pre-term Birth (less than 37 wks)	Low Birthweight	Seizures	Low APGAR Score	Assisted Ventilation	Admission to NICU
	(1)	(2)	(3)	(4)	(5)	(6)
Change after dispensary has opened	0.0033	0.0031	-0.0001	0.0006	-0.0025	0.0011
	(0.0060)	(0.0027)	(0.0003)	(0.0018)	(0.0027)	(0.0047)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
State-specific trends	Yes	Yes	Yes	Yes	Yes	Yes
Observations	142,673	143,001	142,504	130,710	142,504	111,781
R-squared	0.0098	0.0101	0.0023	0.0082	0.0257	0.0279
Mean of dep. variable	0.159	0.0665	0.0004	0.0200	0.0340	0.0897

NOTE: Robust standard errors clustered at the county level are shown in parentheses. Each coefficient comes from a separate regression. All regressions control for individual characteristics, state and year fixed-effects, and state-specific linear time trends. All dependent variables are discrete. Each outcome is equal to one if the stated adverse condition occurred and zero otherwise. NICU means: Neonatal Intensive Care Unit. The sample only includes counties with cannabis dispensaries and is restricted to births occurring between 280 days before or after the opening of the dispensary.

Table 4: Event-study Estimates of Cannabis Dispensaries on Adverse Infant Health. Window time: +-150 days

Dependent variable:	Pre-term Birth (less than 37 wks) (1)	Low Birthweight (2)	Seizures (3)	Low APGAR Score (4)	Assisted Ventilation (5)	Admission to NICU (6)
Change after dispensary	-0.0005	0.0069*	0.0001	0.0036	-0.0057**	0.0043
has opened	(0.0074)	(0.0040)	(0.0002)	(0.0038)	(0.0026)	(0.0045)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
State-specific trends	Yes	Yes	Yes	Yes	Yes	Yes
Observations	69,134	69,309	69,019	61,718	69,019	52,514
R-squared	0.0105	0.0102	0.0033	0.0082	0.0284	0.0256
Mean of dep. variable	0.160	0.0659	0.0004	0.0206	0.0380	0.0898

NOTE: Robust standard errors clustered at the county level are shown in parentheses. Each coefficient comes from a separate regression. All regressions control for individual characteristics, state and year fixed-effects, and state-specific linear time trends. All dependent variables are discrete. Each outcome is equal to one if the stated adverse condition occurred and zero otherwise (NICU means: Neonatal Intensive Care Unit). The sample only includes counties with cannabis dispensaries and is restricted to births occurring between 150 days before or after the opening of the dispensary.

Table 5: Event-study Estimates of Cannabis Dispensaries on Adverse Infant Health. Window time: +-90 days

Dependent variable:	Pre-term Birth (less than 37 wks)	Low Birthweight	Seizures	Low APGAR Score	Assisted Ventilation	Admission to NICU
	(1)	(2)	(3)	(4)	(5)	(6)
Change after dispensary	-0.0081	0.0093	0.0001	0.0041	-0.0072	0.0127*
has opened	(0.0121)	(0.0057)	(0.0004)	(0.0051)	(0.0061)	(0.0071)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
State-specific trends	Yes	Yes	Yes	Yes	Yes	Yes
Observations	39,383	39,482	39,304	35,151	39,304	28,888
R-squared	0.0104	0.0114	0.0039	0.0103	0.0311	0.0289
Mean of dep. variable	0.160	0.0672	0.0003	0.0205	0.0382	0.0917

NOTE: Robust standard errors clustered at the county level are shown in parentheses. Each coefficient comes from a separate regression. All regressions control for individual characteristics, state and year fixed-effects, and state-specific linear time trends. All dependent variables are discrete. Each outcome is equal to one if the stated adverse condition occurred and zero otherwise (NICU means: Neonatal Intensive Care Unit). The sample only includes counties with cannabis dispensaries and is restricted to births occurring between 90 days before or after the opening of the dispensary.