

Going to Pot: The Impact of Medical Marijuana Dispensaries on Crime

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Abstract

Sixteen states and the District of Columbia have laws that allow marijuana use for medical purposes. In response, a small industry of medical marijuana dispensaries, retail shops that sell marijuana to qualified patients, has developed. Despite widespread public support for medical marijuana laws in principle, many local residents and public officials have acted to regulate the numbers of dispensaries and in some cases ban them altogether. Central to these decisions is the belief that marijuana dispensaries attract crime or, at a minimum, create a public nuisance. To date, no work has credibly assessed this claim. To fill this gap, we study Los Angeles's recent experience closing over 70 percent of the nearly 650 dispensaries operating in the city. Using a simple difference-in-differences framework and detailed data on exact dispensary locations and daily crime reports by city block, we demonstrate that crime increased in the vicinity of shuttered dispensaries relative to those that remained open. The increase is concentrated in crimes such as theft and robbery. These results are robust across a variety of samples and specifications. We provide several possible explanations for this effect.

1 Introduction

In 1996, California voters approved Proposition 215, the Compassionate Use Act, ushering in an era of state medical marijuana laws. Currently, sixteen states and the District of Columbia have such laws on the books.¹ In response, a small industry of medical marijuana dispensaries, retail shops that sell marijuana and edible marijuana products to qualified patients, has developed.

The standards for qualifying as a patient varies widely by state. In California, the setting for this work, qualifying means a doctor has provided a written recommendation for marijuana use. Cities such as San Francisco, Los Angeles, and Denver, where qualification is also relatively easy, dispensary growth have experienced rapid dispensary growth over the past five years and faced criticisms that dispensaries outnumber Starbucks or CVS pharmacies (e.g. see Osher, 2010 and Cote, 2008).

In response to this growth, jurisdictions have acted recently to regulate the number of medical marijuana dispensaries and in some cases ban them altogether. Central to this response is the relatively widespread belief among local residents and public officials that dispensaries increase crime or, at the very least, create a public nuisance (McDonald and Pelisek 2009; NPR 2010a; Reuteman 2010). In New York State, for example, policymakers have appealed to the crime connection to prevent the passage of a medical marijuana bill in the state senate (Campanile 2010) and law enforcement in Oregon raised it to oppose a (defeated) initiative to create a state-run supply system (Burke, 2010).

In principle, dispensaries could affect crime through several channels. First, marijuana consumption, which is likely higher at or near dispensaries, may have direct criminogenic effects on users. These effects have been cited in the context of alcohol outlets, where openings (Teh 2008) and availability (Scribner et al. 1995) in Los Angeles and other jurisdictions (Gorman et al. 1998; Scribner et al. 1999) are associated with increases in crime.

¹The states are Alaska, Arizona, Delaware, California, Colorado, Hawaii, Maine, Michigan, Montana, Nevada, New Jersey, New Mexico, Oregon, Rhode Island, Vermont and Washington. Not all of these states (e.g., New Jersey, Arizona and Delaware) have fully implemented their medical marijuana law as of July 2011. While other states have laws that are broadly supportive of medical marijuana use, e.g. protecting patients from jail time, as in Maryland, only these sixteen remove state penalties for the cultivation, possession and use of marijuana for approved medical purposes (Marijuana Policy Project, 2008). Pacula et al. (2002) provides an overview of the myriad of state laws on medical marijuana.

In contrast to alcohol, however, some research suggests marijuana use does not increase crime commission per se (Pacula and Kilmer, 2003) and may even inhibit aggressive behavior (Myerscough and Taylor, 1985; Hoaken and Stewart, 2003). Second, crime could increase near dispensaries as more individuals try to finance their drug use through theft or other property crime (Grogger and Willis 2000). Third, the quasi-legal status of dispensaries could engender crime if customers, employees or owners resort to violence to resolve disputes (Miron 1999; Resignato, 2000). In this case, we might expect increases in crimes such as aggravated assault, which previous work has found increased in response to the emergence of crack cocaine, for example (Grogger and Willis 2000). Finally, dispensaries, which are a direct source of drugs and cash, may offer opportunities to and thus attract criminals. In this last case, dispensaries may have a larger effect on the spatial distribution of crime rather than increase the overall level. Such a change has clear negative implications for dispensary neighbors, but such spatial redistribution may not have broader societal implications.²

While these channels seem plausible and have captured public attention, dispensaries could decrease crime. First, dispensaries tend to have their own security systems and sometimes security guards to protect their assets and resolve disputes. Recent work on business improvement districts finds that private security spending can have large returns in terms of crime reduction (Cook and MacDonald 2011). Likewise, to the extent that dispensaries increase foot traffic through a neighborhood, they could decrease crime by increasing the perception of “eyes on the street” (Jacobs 1961). Alternatively, by giving the marijuana trade more legitimacy, actors in this market may have felt they could use legitimate channels to resolve disputes. This last possibility seems somewhat less plausible given the ambiguous legality of many aspects of this market, such as large scale distribution.

Ultimately, the relationship between dispensaries and crime is an empirical issue. Recent efforts to regulate medical marijuana dispensaries in the City of Los Angeles provide a unique opportunity to assess the connection to crime. On June 7, 2010, in an attempt

²The impact of geographic redistribution of crime is theoretically ambiguous and depends on such factors as heterogenous effects (e.g., has different costs in some neighborhoods relative to others), multiplicative effects (two crimes in one area imposes higher costs than one crime in each of two areas) and economies of scale (two crimes in one area is less costly than one crime in each of two areas).

to regulate dispensaries, the city shut down over 70 percent of its 638 shops virtually overnight (Hoeffel 2010a). Importantly, the decision to close dispensaries was determined by a registration process that occurred over a one month period almost two years before the closures. Dispensaries that had registered with the city between September 14 and November 13, 2007 were allowed to remain open. Those that did not were forced to close. Consistent with this seeming arbitrariness, we demonstrate below that dispensaries ordered to close and allowed to remain open look remarkably similar on observable dimensions.

To analyze the impact of dispensaries on crime, we combine detailed data on exact dispensary locations from the Los Angeles City Clerk, their closure status as of June 7, 2010 and data on crime reports by city block. Compliance was reported to be very high within days of the June 7, 2010 closure deadline. Where available, we code dispensaries that defied closure orders as open. We use a simple difference-in-differences framework to compare daily crime counts within $1/4$, $1/2$ and a full mile around dispensaries that closed compared to those that remained open. We also perform sensitivity analyses that restrict the sample to dispensaries from zip codes that contained both dispensaries that were allowed to remain open and others that were closed. We do this because neighborhoods around dispensaries that remain open and those that close may differ on unobservable dimensions, even prior to the closures.

Irrespective of the sample, our analyses tell the same basic story: crime increased in the vicinity of shuttered dispensaries relative to those allowed to remain open. These results hold within both a $1/4$ and $1/2$ mile radius of dispensaries. At a mile out, however, there is no perceptible change in crime. The effects are concentrated on crimes, such as theft and robbery, which may be more commonly committed in low-traffic areas. We provide several hypotheses for what might drive these results, including the loss of on-site security and surveillance, a reduction in foot-traffic, a resurgence in outdoor drug activity, and a change in police efforts.

In the work that follows, we first clarify the rapidly evolving medical marijuana dispensary landscape in the city of Los Angeles. We then discuss our data and analytic approach, our results and conclusions.

2 Background: Medical Marijuana Dispensaries in Los Angeles

In California, patients began forming medical marijuana buyers clubs before the enactment of the state’s medical marijuana law (Reiman 2007). In October 1996, a month before voters approved Proposition 215, The Los Angeles Times reported that six marijuana buyers clubs were operating in the Bay Area and several others were open in Southern California (Curtis and Yates 1996). These clubs, precursors to today’s dispensaries, emerged largely out of AIDS activism (Reiman 2007) - AIDS Wasting Syndrome is one of the conditions for which the benefits of marijuana are least controversial (Watson et al. 2000) - and local measures, such as Proposition P in San Francisco, that lowered the priority of marijuana arrests (Feldman and Mandel 1998).

More dispensaries opened shortly after the medical marijuana law passed. The number of dispensaries increased particularly rapidly after the 2004 passage of SB 420, a bill meant to clarify many aspects of the medical marijuana law. Among other things, SB 420 established a (voluntary) patient identification card program and recognized a patient’s right to cultivate marijuana through nonprofit collectives and cooperatives.³ The State Attorney General, Jerry Brown, later issued guidelines to prevent diversion from these clubs and indicated that local jurisdictions had the right to further regulate their operations (Brown 2008).

Consistent with the California experience, the City of Los Angeles saw rapid growth in medical marijuana dispensaries beginning in 2005. At its peak, the number of dispensaries in the city was estimated at 800 (McDonald and Pelisek 2009). Many dispensaries are concentrated in wealthier neighborhoods, such as Westwood and the West Valley, or tourist areas such as Hollywood, Venice and Melrose ((McDonald and Pelisek 2009). Perhaps not surprisingly, not all residents viewed these stores as welcome additions to the neighborhood. Since at least 2007, Los Angeles has been publically grappling with whether and how to regulate this burgeoning retail medical marijuana industry (Hoeffel 2009a).

³This right was affirmed in *People v. Urziceanu*, which reversed the conviction of a collective owner, Michael Urziceneau, for conspiracy to sell marijuana. See <http://caselaw.lp.findlaw.com/data2/californiastatecases/C045276.PDF>

The official regulatory history in Los Angeles begins in May 2005, when City Council member Dennis Zine requested a study to set the stage for drafting comprehensive land use regulations (Doherty 2010).⁴ This request came in part at the behest of residents of Eagle Rock, a neighborhood in Los Angeles that was experiencing much of the new growth. The Los Angeles Police Department (LAPD) was also monitoring dispensary growth in the city. In a July 2005 report, the LAPD identified four known dispensaries within the city limits, suggested several others were operating at mobile sites, and posited that dispensaries increase crime.⁵ A review of this report, suggests that the evidence for this connection was circumstantial, at best. The LAPD's argument relied largely on several felony narcotics arrests made at these dispensaries and speculation that "crimes such as theft, robbery and assault have occurred and will occur along with the sale of marijuana from these locations."

The LAPD report also called for restricting dispensaries to commercial areas, if the city chose not to ban them altogether, and recommended a set of regulations for those already in operation. In 2006, the City Attorney's Office issued its own report, laying out the options for dispensary regulation. These options included an outright ban based on federal law, an interim moratorium until state law is "further clarified," and a land use ordinance establishing zoning requirements.⁶ Almost a full year later, in September 2007, the city released its initial response: an "Interim Control Ordinance" (ICO), which placed a temporary moratorium on new dispensaries and required existing dispensaries register with the city by Nov. 13, 2007.⁷

The ICO aimed to pacify neighborhood activists concerned about the growth of dispensaries while the city worked to draft permanent legislation. It also responded to the Los Angeles Police Department "fact sheet" that documented a massive increase in dispensaries (from 4 to 98) between July 2005 and November 2006 and attempted to tie the dispensaries to an increase in crimes in their reporting districts.⁸

⁴See: http://clkrep.lacity.org/onlinedocs/2005/05-0872-S1_mot_9-22-06.pdf

⁵see http://clkrep.lacity.org/onlinedocs/2005/05-0872_rpt_lapd_7-27-05.pdf

⁶see http://clkrep.lacity.org/onlinedocs/2005/05-0872_rpt_atty_10-19-06.pdf

⁷The County of Los Angeles County passed regulations which apply to unincorporated parts of the county, much earlier. Ordinance No. 2006-0032, which took effect on June 22, 2006, allowed medical marijuana dispensaries to operate with a conditional use permit, limited hours, established distance requirements and set other rules as part of title 22.56 of the County's Planning and Zoning code.

⁸See http://www.californiapolicechiefs.org/nav_files/marijuana_files/files/fact_sheet.pdf

Although the ICO was intended to put a stop to the growth in dispensaries, it actually had the opposite effect. Hundreds of dispensaries opened subsequent to the moratorium after filing applications for “hardship exemption,” requests allowed under the ICO (McDonald and Pelisek, 2009).⁹ Many entrepreneurs quickly realized that the city would not prosecute dispensaries requesting exemptions until their hardship applications had been reviewed. And the City Council appeared in no hurry to review the applications. Indeed, the City Council did not rule on any applications before June 2009, after over 500 applications had been submitted (Hoeffel, 2009b). On June 19, 2009, the city passed an ordinance amending the ICO to eliminate the hardship exemption.¹⁰

While the ICO was meant to serve as a stop-gap measure while it drafted permanent legislation, it took a year and half before that occurred. On January 26, 2010 the city council approved final legislation, which set the number of dispensaries in the city at 70.¹¹ Dispensaries that registered and have been operating legally in the city since the ICO are grandfathered, meaning that the number of legal dispensaries could exceed 70 in the short-run. However, all dispensaries are subject to new zoning rules, including a 1000 foot buffer between dispensaries and between dispensaries and “sensitive use” sites, such as schools, parks and libraries.

On June 7th 2010, dispensaries that were not operating legally were to cease operations. The city sent “courtesy notices” to the 439 dispensaries that were being ordered to shut their doors.¹² Early reports indicate that many dispensaries ordered to close did so: the City Attorney’s office estimated that 20-30 stores were still open illegally and the LAPD conducted raids on a few such defiant stores (Rubin and Hoeffel 2010).¹³ Another 186 were deemed in compliance and could apply for permits to remain operational. Of these, 170 dispensaries notified the City Clerk of the intention to register, even though many would

⁹The first set of hardship applications requested exemptions because of delays beyond their control, such as receiving a city business tax registration certificate, which prevented them from meeting the November 13th, 2007 registration deadline. Later applicants provided a much wider range of justifications such as that they provide a community service or they could not officially register in 2007 because of the fear imposed by federal authorities (Hoeffel 2009b).

¹⁰http://clkrep.lacity.org/onlinedocs/2009/09-0964_ord_180749.pdf

¹¹See http://clkrep.lacity.org/onlinedocs/2008/08-0923_ord_181069.pdf

¹²For a sample letter, see http://blogs.laweekly.com/informer/2010/05/pot_shops_warned_to_close.php

¹³Some stores simply removed their inventory, awaiting legal challenges. See Guerrero (2010) for details.

have to move to meet the new zoning requirements (Guerrero, 2010). However, only 41 were in full compliance with the eligibility requirements of the new ordinance (Hoeffel, 2010b).¹⁴

Most of the other dispensaries failed to meet a requirement that they have the same ownership and management as identified in their ICO registration (Banks 2010). The City Attorney's Office released the list of the dispensaries deemed eligible and ineligible but said that it would not close any dispensaries until a host of legal challenges to the ordinance are resolved (Hoeffel, 2010b).¹⁵ Efforts were underway to abolish the continuous management requirement, which would have allowed a total of 180 dispensaries to remain in operation (Romero, 2010a).

However, in January 2011, the city's dispensary closures were invalidated. More specifically, Los Angeles County Superior Court Judge issued an injunction barring the city from enforcing many aspects of the medical marijuana ordinance, including dispensary closures based on registration (or lack thereof) at the time of the moratorium (Hoeffel 2010a). The judge indicated that alternative approaches, such as determining the right to operate based on proof of continued operation since the date the moratorium took effect, would be permissible.

The Los Angeles experience continues to evolve. On January 22, 2011 the LA City Council amended its ordinance. The city now plans to allocate 100 dispensary licenses by lottery (Hoeffel 2011b). Participation in the lottery requires proof of continuous operation since September 14, 2007 (Hoeffel 2011a). According to the LA City Clerks' office, 228 dispensaries have applied to participate in the lottery (Hoeffel 2011b). The date of the lottery has yet to be determined. The city has begun notifying dispensaries that did not apply to participate in the lottery or cannot provide continuous operation that they must shut down (Hoeffel 2011b). However, the legality of the lottery is already being challenged (Hoeffel 2011c).

¹⁴See Los Angeles Municipal Code Section 45.19.6.2.B.2 for the full set of requirements. Available here http://clkrep.lacity.org/onlinedocs/2008/08-0923_ord_181069.pdf

¹⁵<http://cityclerk.lacity.org/cps/pdf/preliminaryResults08-25-10.pdf>

3 Data and Empirical Strategy

Increased crime around medical marijuana dispensaries was cited as a key reason the L.A. City Council decided to restrict dispensaries.¹⁶ Residents neighboring dispensaries complained about crime and other quality of life concerns (Romero, 2010b). And, Los Angeles County Sheriff Lee Baca criticized the clinics, stating they had been “hijacked” by criminals and become crime targets (Winton, 2010). Numerous media outlets picked up on this claim.¹⁷ But despite the presumed connection between dispensaries and crimes, we know of no systematic evaluation of the claim.

To fill this gap, we use the first round of dispensary closures in the City of Los Angeles to assess the impact of dispensaries on crime. Because the closures occurred at one point in time, a key empirical challenge is to control for other factors, such as general crime patterns, policing or other factors, that may coincide with the event. To handle this issue, we use a difference-in-differences framework that compares changes in daily crime reports before and after the closures in the vicinity around closed dispensaries relative to the vicinity around dispensaries that were allowed to remain open.

Since most crime data are reported at relatively large geographical areas, we collected data on the number of crimes (overall and by type) reported by block and date in Los Angeles and surrounding communities, such as Hollywood, Beverly Hills, and unincorporated areas of Los Angeles County. Data were extracted from CrimeReports.com, an online software tool used by over 700 law enforcement agencies across North America that allows these agencies to spatially analyze their crime data and share these data with the public. Online visitors can use a mapping tool to display crimes by type in the neighborhood of their choosing. Not all law enforcement agencies use CrimeReports.com. During our time period, the LAPD used this service.¹⁸ They have since discontinued their subscription, in all likelihood because they are launching their own mapping system.¹⁹

¹⁶See the fifth paragraph of Ordinance 181069 http://clkrep.lacity.org/onlinedocs/2008/08-0923_ord_181069.pdf

¹⁷As just one example, see NPR (2010b), which asserts that “Some of the city’s marijuana dispensaries have become magnets for criminals wanting cash and pot, and even the site of murders, including a recent triple homicide.”

¹⁸see http://www.lapdonline.org/crime_prevention/content_basic_view/42390

¹⁹The CrimeReports.com data correspond closely to data available through the LAPD’s website. Unlike the public LAPD data, however, these data are available for a wider range of crimes (13 categories versus 4 for

Importantly, CrimeReports data capture reported offenses or incidents rather than arrests. This distinction is important for several reasons. First, arrests may undercount crime since many incidents do not result in processed arrests, even if a suspect is apprehended. Second, the potential lag between the commission of a crime and an arrest means that a long time horizon is required to link arrests back to the dates around the June 2010 closures. Third, as mentioned above, most crime and arrest data typically do not contain precise enough geographic information to link an incident to an exact city block. The smallest unit of geographic observation for LAPD arrest data, for example, is typically a reporting district, which were created to correspond roughly to neighborhoods (see discussion on p. 450 in Cook and MacDonald (2011)).

We used crime data for the two weeks prior to and two weeks following the June 7th dispensary closures. We combined these data with information for the Los Angeles City Attorney’s Office on the exact location of dispensaries that were either subject to closure or allowed to remain open. We analyzed crime reports within 0.25, 0.5 and 1 mile are dispensaries that closed relative to those that remained open. As described above, the city reported that nearly all shops complied with their orders to close. However there were a small number of dispensaries that were supposed to close, but were later raided by the LAPD (see Rubin and Hoeffel 2010) or reported to be operating by report by the LA Week, (see Romero and Wei 2010). In those case we code the dispensary as open.²⁰

In total our dataset includes 29 days of crime report for 609 dispensaries; 185 that remained open and 424 forced to close. Figure 1 shows the geographic distribution of dispensaries by closure status. One important takeaway from this figure is that dispensaries tend to cluster. Some neighborhoods of Los Angeles, such as Venice, Hollywood or Melrose, have many dispensaries while others, such as South Los Angeles have relatively few. Consequently, a given radius around a dispensary may capture crime around both open and closed dispensaries. This is problematic for the empirical strategy only if dispensaries are clustered by closure status. In Table II, Panel A we demonstrate that on the contrary, the

LAPD) and for jurisdictions that neighbor the City of Los Angeles (and subscribed to CrimeReports.com).

²⁰Since we don’t know precisely when the raids occurred, we’ve tried dropping the raided dispensaries. Results are virtually identical with this restriction. Estimates are also virtually identical if we ignore the information about raided or defiant dispensaries and code dispensaries based on the City’s intent. Relative to both approaches, we gain a little precision when we code the defiant dispensaries as open.

likelihood that a closed dispensary’s nearest neighbor is open is similar to the likelihood that an open dispensary’s nearest neighbor is open. Both probabilities are about a third and are statistically indistinguishable from each other.²¹

To estimate the effect of closures on crime, we estimate a regression of the following basic form:

$$C_{dt} = \alpha_d + \beta 1(date \geq June7) * 1(closed) + \delta_t + \epsilon_{dt} \quad (1)$$

where C_{dt} is the number of crimes within a given radius of dispensary d on day t , α_d is a dispensary fixed effect, δ_t is a date fixed effect. We include an interaction between $1(date \geq June7)$, an indicator for dates after and including the June 7th closures, and $1(closed)$, an indicator for dispensary closure status, as determined by city orders and, in a few cases, reports of defying these orders. The main post June 7th and closure indicators are subsumed in the dispensary and date fixed effects. All standard errors allow for serial correlation of an arbitrary structure (i.e. are clustered) at the dispensary level. Our main coefficient of interest is β , which captures the change in crime around dispensaries that closed relative to those that remained open.

In our main specification, we estimate simple OLS models. A preferred model for crime counts is a Poisson or negative binomial regression. However, because of the sparseness of the data at small distances (e.g., 0.25 or 0.5 miles), i.e. the many zeros across all days in the neighborhood of a dispensary, these models often do not converge. In sensitivity checks, however, we estimate count models that include zip code rather than dispensary fixed effects. These models exploit both variation in crime within and across the zip code area of a dispensary. As will be discussed below, the estimated percentage change in crime from these models is quite similar to the implied effects from our main OLS.

The identifying assumption in the difference-in-differences framework is that crime and other factors that impact crime in the areas around dispensaries subject to closure are similar to those in the areas around dispensaries allowed to remain open. Because we are focusing on such a small time window around the city’s closure deadline, this assumption may not be unreasonable. However, the narrow window comes with the drawback that we

²¹This type of clustering is likely to reduce power and decrease the precision of our estimates.

cannot make any claims about the long-term changes associated with dispensary closures.

We have looked at several characteristics to demonstrate the similarities across open and closed dispensaries. First, we considered walk scores, a walkability measure that rates an address based on a weighted function of walking distance to amenities in 9 different categories, such as grocery, restaurants, and entertainment. (Walk Score 2011). Scores, which are on a scale of 0 to 100, are adjusted for pedestrian-friendliness, such as block connectivity. Dispensaries in Los Angeles tend to be in very walkable areas (scores of 70-89 are considered walkable) and this does not appear to vary by closure status. Likewise, the total number of crimes within 1, 0.5 and 0.25 miles of a dispensary are quite similar prior to the closures. In Panel B of Table II, we show that zip code characteristics of dispensaries, based on the 2000 census, are also invariant across closure status. Dispensaries tend to locate in zip codes of about 40,000 people, with a median household income of \$40,000, about 20% of residents living below the federal poverty line, a median age of 33 and about 60% native born. These descriptive statistics suggest that open dispensaries may serve as good controls for closed dispensaries and lend some credence to the proposed difference in differences framework.

Panel C shows the general crime trends in the city of Los Angeles in pre versus post closure period. They indicate that crime was falling over the period, although in no case are the means different across the two periods. Importantly, in our regression specification, we include date fixed effects to control for common trends in crime. Thus, our estimates should be net of any citywide decline in crime.

4 Results

Our main results are presented in Table III. The difference-in-differences estimates indicate that crime increased in close proximity (0.25 to 0.5 miles) of dispensaries that closed compared to those that remained open. Specifically, we find that total crime increases by about 0.008 crimes or about 60% relative to the mean within 0.25 miles of a closure relative to 0.25 miles around an open dispensary. The effect diminishes with distance: within 0.5 miles the increase is about 40% relative to the mean and by 1 mile out there is no perceptible change in crime. The effects are generally imprecise across crime categories,

except in the case of theft and robbery (Panel B). This category of crime, which accounts for the majority of crimes in our data, increases by about 40 to 75%. While these results are statistically significant and imply large increases in crime, our confidence intervals are wide so the estimated increase should be interpreted with some caution. At a minimum, they provide pretty clear evidence that crime did not decrease as a result of closures.

We have performed several sensitivity analyses. First, we have experimented with dropping the June 7th closure date, since activity around dispensaries may have been abnormal on this day. Likewise, we have tried recoding the closed indicator to be one only after June 7th. Neither change has much effect on the results. Second, because neighborhoods around dispensaries that remain open and those that close may differ even prior to the closures, we replicated our analysis on the sample of dispensaries from zip codes in which some dispensaries were allowed to remain open and others were subject to closure. We make this restriction because neighborhoods around dispensaries that remain open and those that close may differ even prior to the closures. In practice, however, most dispensaries (545/609) are in zip codes with both open and closed dispensaries. Consequently, the results from this matched sample (in Table IV) are qualitatively similar, although somewhat less precisely estimated than our main results.

We have also tested the sensitivity of our estimates to the use of a count model. Because many dispensaries have no reported crimes in their vicinity, these models do not converge with dispensary fixed effects. Consequently, we estimate these models with zip code fixed effects. Dispensaries in a few zip codes with no variation in crime or closure status are dropped. We present results in Table V from a negative binomial model, which, unlike a Poisson model, does not restrict the mean and variance of crimes to be the same. However, results are similar when we use a poisson model. Since these models do not converge at 0.25 miles, we present results for 0.5 and 1 mile. For comparison we also add results for 2 and 4 miles. The estimated effect at 0.5 miles is quite similar to that from our OLS models: relative to open dispensaries, crime increases by about 50%. At larger distances, the effect is indistinguishable from zero. In panel B of Table V, we also test for displacement of crime. Specifically, we estimate the effect of closures on crime within 1/2 to 1 mile, 1 to 2 miles and 2 to 4 miles out. Although the estimates are fairly imprecise, they suggest that there

may be some amount of crime displacement. That is the increase in crime within a 1/2 mile of the closed dispensary is offsetting a decline between 1/2 to 1 mile out.

Why might crime, and specifically theft and robbery, increase around closed relative to open dispensaries?. California regulations require that dispensaries ensure adequate security. As a result of the value of marijuana and the cash on hand, many dispensaries employ security services, in some cases around the clock. Thus, one possibility is that as a result of these security services, open dispensaries reduce crime in the immediate neighborhood, particularly crimes like theft and robbery, which may respond more to formal and informal observation. Such an effect has been observed in studies of business improvement districts that fund pay for security services in neighborhoods in LA (Brooks, 2008; Cook and MacDonald, 2011).

A related possibility is that operating marijuana dispensaries reduce crime by increasing local foot traffic and eyes on the street. Many of the marijuana dispensaries operated extended hours, which may have brought more foot traffic to the neighborhood. This may have interacted with the security explanation if the dispensaries provided guards visible on the street. The could also be tied to the drug trade. Closing dispensaries does not eliminate the demand for marijuana. To the extent that illicit suppliers try to move in to fill the new void, this could generate other crime. Our data cover reported crimes and not arrests and, since drug crimes are vastly underreported, we cannot observe a change in illicit drug sales in our data. However, we are currently trying to obtain arrest data that would enable us to test this hypothesis.

Alternatively, the effect may be explained by police presence. If police anticipated higher crime connected with marijuana dispensaries, they may have patrolled the areas around dispensaries more intensively, thereby reducing street crime. Once the dispensaries were closed, they may have reduced police presence and crime may have returned to pre-dispensary levels. In this case, the real causal factor is the effect that dispensaries have on police practices, rather than any effect of the dispensaries per se.

In Table 6, we provide some evidence to support the “eyes on the street” hypothesis. Specifically, we supplement our main OLS regression with an interaction between the closure indicator and a demeaned walk score. Higher walk scores mean that the area is more

amenable to foot traffic. Perhaps not surprisingly, we find that closed dispensaries that were in more walkable locations than the average dispensary, which are reasonably pedestrian-friendly to begin with, were less likely to experience an increase in crime. Said differently, it is the less pedestrian-friendly areas where a dispensary closure is associated with an increase in crime. Table 7 shows results from the negative binomial regression with walk score interactions. Because these models include zip code rather than dispensary fixed effects, they also include the main walkability effect. As in Table 6, these models indicate that the increase in crime is larger in less pedestrian-friendly neighborhoods.

5 Conclusions

The vast majority of Americans favor legalizing marijuana for medical purposes. Activists have harnessed this support to pass medical marijuana laws in sixteen states and the District of Columbia. And more states are likely to follow. As of yet, however, no state has been able to furnish a means for qualified patients to reliably obtain marijuana.

To fill this void, quasi-legal retail marijuana businesses or medical marijuana dispensaries have sprouted up in many of these states. Increasingly, as neighbors begin to complain about these businesses, localities are considering whether to ban dispensaries and, if not, whether and how to control their numbers. This project provides some empirical evidence to guide policymakers by presenting a case study of the City of Los Angeles and its effort to control the distribution of medical marijuana.

Specifically, we use Los Angeles experience ordering the close of hundreds of dispensaries to test the widely held belief that medical marijuana dispensaries increase local crime. Contrary to conventional wisdom, press accounts, and some statements by law enforcement, our analysis suggests that the closing of medical marijuana dispensaries is associated with an increase rather than the expected decrease in local crime in the short-term. Overall crime increased 40 to 60% in the $1/4$ to $1/2$ mile surrounding closed dispensaries in the 2 weeks days following their closing relative to the 2 weeks before. Some, if not all, of this increase may, come from a displacement effect: crime that would have occurred about $1/2$ mile passed a closed dispensary now occurs within $1/2$ mile of the closure. We offer a variety of plausible hypotheses to explain this finding, including the loss of security and “eyes on

the street.” Although the current study cannot offer a definitive answer as to why crime increased around closed dispensaries, it should give jurisdictions reason to question the commonly held view that dispensaries attract and even cause crime in their neighborhoods.

References

- Campanile, Carl 2010. "Prosecutor Whacks Weed," The New York Post, June 17, 2010. http://www.nypost.com/p/news/local/prosecutor_whacks_weed_pqjmrqhSmybvhc01Y02prN
- Cook, Philip J. and John MacDonald, 2011. "Public Safety Through Private Action: An Economic Assessment of BIDS," *The Economic Journal*, 121(May): 445-462.
- Cote, John, 2008. "Marijuana hotspots vs. Starbucks – who wins?" City Insider, sfgate.com, posted on November 17, 2008 http://www.sfgate.com/cgi-bin/blogs/cityinsider/detail?entry_id=32650
- Curtis, Mary and Nona Yates, 1996. "Cannabus Buyer's Club Founder Arrested," *Los Angeles Times*, October 12, 1996. http://articles.latimes.com/1996-10-12/news/mn-53188_1_cannabis-buyers-club/
- Doherty, Brian, 2010. "L.A.'s Pot Revolution," *Reason*, May 2010. <http://reason.com/archives/2010/04/12/las-pot-revolution>
- Feldman, Harvey W and R. Jerry Mandel, "Providing Medical Marijuana: The Importance of Cannabis Clubs," *Journal of Psychoactive Drugs*, 30(2): 179-186.
- Fryer, Roland, Paul Heaton, Steven Levitt and Kevin Murphy, "Measuring Crack Cocaine and Its Impact," *Economic Inquiry*, forthcoming.
- Gorman, Dennis M. Paul W. Speer, Erich W. Labouvie et al. 1998. "Risk of Assaultive Violence and Alcohol Availability in New Jersey," *American Journal of Public Health*, 88(1): 97-100.
- Grogger, J. and Michael Willis. 2000. "The Emergence of Crack Cocaine and the Rise in Urban Crime Rates." *Review of Economics and Statistics*, 82(4): 519-529.
- Hoeffel, John 2009a. "West Hollywood's Medical Marijuana Success Story," Los Angeles Times, November 15, 2009. <http://articles.latimes.com/2009/nov/16/local/me-weho-marijuana16>
- Hoeffel, John 2009b. "LA's Medical Pot Moratorium Led to a Boom Instead," Los Angeles Times, June 3, 2009. <http://articles.latimes.com/2009/jun/03/local/me-medical-marijuana3>
- Hoeffel, John 2010a. "Move it, Bud, Pot Outlets are Told," Los Angeles Times, June 7, 2010. <http://articles.latimes.com/2010/jun/07/local/la-me-pot-shutdown-20100607>
- Hoeffel, John 2010b. "L.A. Finds Only a Quarter of Registered Pot Dispensaries Eligible to Stay Open," Los Angeles Times, August 26, 2010. <http://articles.latimes.com/2010/aug/26/local/la-me-0826-pot-dispensaries-20100826>
- Hoeffel, John 2010c. "Judge Issues Injunction Against L.A.'s Medical Marijuana Law" Los Angeles Times, December 11, 2010. <http://www.latimes.com/news/local/la-me-1211-marijuana-dispensaries-20101211>

- Hoeffel, John 2011a. "L.A. Council Amends Medical Marijuana Ordinance," Los Angeles Times, January 22, 2011. <http://www.latimes.com/news/local/la-me-marijuana-20110122,0,7969981.story>
- Hoeffel, John 2011b. "L.A. officials release list of 141 medical marijuana dispensaries ordered to close immediately," Los Angeles Times , L.A. Now. March 9, 2011.
- Hoeffel, John 2011c. "Two lawsuits challenge Los Angeles' lottery plan for medical marijuana dispensaries," Los Angeles Times , April 21, 2011. <http://www.latimes.com/news/local/la-me-0421-pot-lawsuit-20110421,0,389691.story>
- Hoaken, Peter N.S. and Sherry H. Stewart. 2003. "Drugs of Abuse and the Elicitation of Human Aggressive Behavior," *Addictive Behaviors*, 28: 1533-1554.
- McDonald, Patrick Range and Christine Pelisek 2009. "L.A.'s Medical Weed Wars," *LA Weekly*, posted on November 23, 2009. <http://www.laweekly.com/2009-11-26/news/l-a-39-s-medical-weed-wars/>
- Marijuana Policy Project, 2008. State-by-State Medical Marijuana Laws: How to Remove the Threat of Arrest. <http://www.mpp.org/legislation/state-by-state-medical-marijuana-laws.html>
- Miron, Jeffrey A.1999. "Violence and the US Prohibitions of Drugs and Alcohol." *American Law and Economics Review*, 1(1), 78.
- Myerscough, Rodney and Stuart P. Taylor. 1985. "The Effects of Marijuana on Human Physical Aggression." *Journal of Personality and Social Psychology*, 49(6): 1541-1546,
- Osher, Christopher N. 2010 "As Dispensaries Pop Up, Denver may be Pot Capital, U.S.A.," *The Denver Post*, posted January 3, 2010. http://www.denverpost.com/ci_14112792
- National Public Radio, 2010a. "In California, Marijuana Dispensaries Outnumber Starbucks," Tell Me More, October 15, 2009. <http://www.npr.org/templates/story/story.php?storyId=113822156>
- National Public Radio, 2010b. "How Many L.A. Pot Clinics Will Survive Crackdown?," All Things Considered, September 28, 2010. <http://www.npr.org/templates/story/story.php?storyId=130186398>
- Pacula, Rosalie Liccardo, Jamie F. Chriqui, Deborah A. Reichmann and Yvonne M. Terry-McElrath, 2002. "State Medical Marijuana Laws: Understanding the Laws and Their Limitations," *Journal of Public Health Policy*, 23(4); 413-439.
- Pacula, Rosalie Liccardo and Beau Kilmer, 2003. "Marijuana and Crime: Is there a Connection Beyond Prohibition," NBER Working Paper No. 10046.
- Reiman, Amanda, 2010. Medical Cannabis Facilities, Saarbucken, Germany: VDM Verlag.
- Resignato, A.J. 2000. "Violent Crime:A Function of Drug Use or Drug Enforcement?" *Applied Economics*, 32(6), 681.
- Reuteman, Michael, 2010. "Medical Marijuana Business is on Fire," *USA Today*, posted

April 20, 2010.

http://www.usatoday.com/money/industries/health/2010-04-20-medical-marijuana_N.htm

Romero, Dennis, 2010a. "New L.A. City Rule Would Allow 180 Pot Shops To Stay Open," LA Weekly, November 10, 2010. http://blogs.laweekly.com/informer/2010/11/marijuana_dispensaries_angeles.php

Romero, Dennis, 2010b. "L.A. City's Attempts To Regulate Pot Shops Drags On For Years As Residents Complain About Related Crime," LA Weekly, November 16, 2010. http://blogs.laweekly.com/informer/2010/11/marijuana_dispensary_crime.php

Scribner, Richard A., Deborah Cohen, Stephen Kaplan et al. 1999. "Alcohol Availability and Homicide in New Orleans: Conceptual Considerations for Small Area Analysis of the Effect of Alcohol Outlet Density." *Journal of Studies on Alcohol*, 60: 310-316.

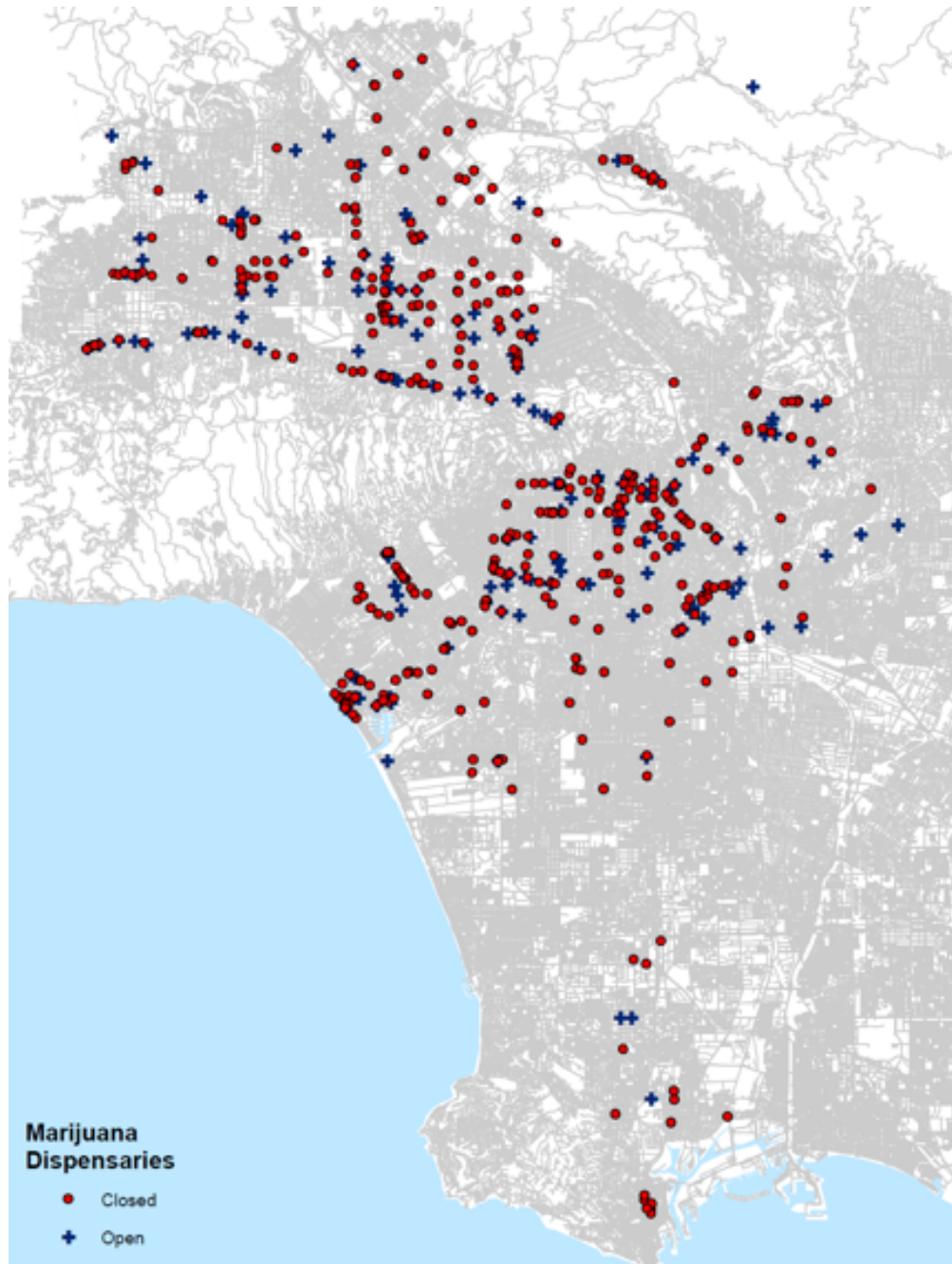
Scribner, Richard A, David P. MacKinnon and James H. Dwyer 1995. "The Risk of Assaultive Violence and Alcohol Availability in Los Angeles County," *American Journal of Public Health*, 85(3): 335-340.

Teh, Bing-Ru, 2008. "Do Liquor Stores Increase Crime and Urban Decay? Evidence from Los Angeles," Unpublished Manuscript.

Walk Score, 2011. Walk Score Methodology. Available at www2.walkscore.com/pdf/WalkScoreMethodology.pdf

Watson, Stanley J. John A. Benson and Janet E. Joy, "Marijuana and Medicine: Assessing the Science Base: A Summary of the 1999 Institute of Medicine Report," *Archives of General Psychiatry*, 57(6): 547-552.

Figure 1: Medical Marijuana Dispensaries in the City of Los Angeles



Source: Los Angeles City Council

Figure 2: Average # of crimes within a half-mile of each Dispensaries

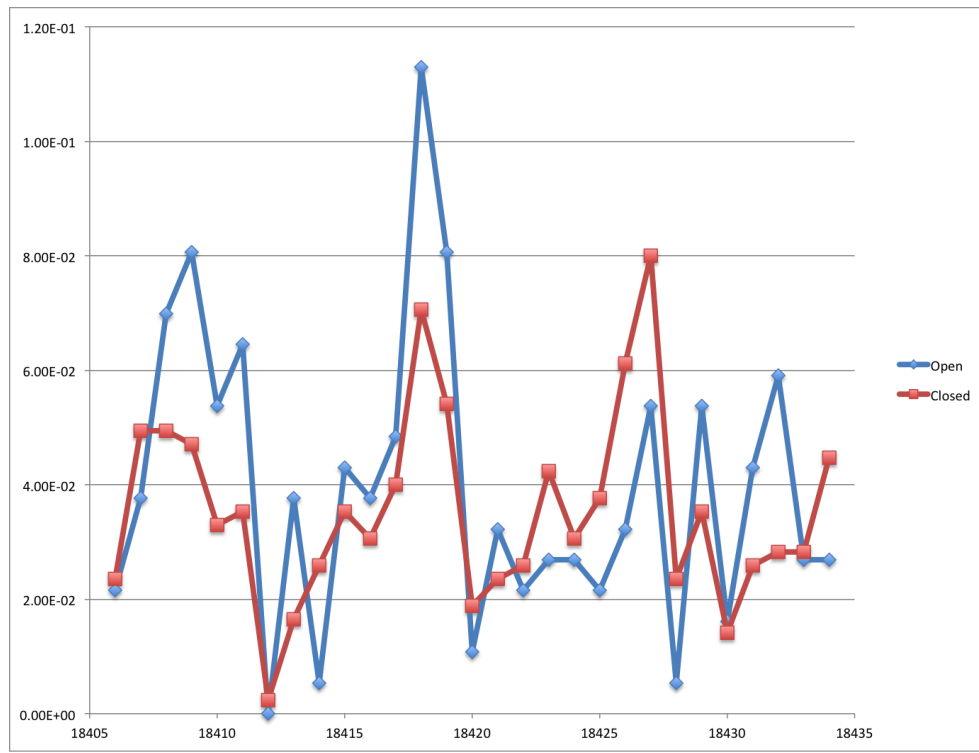


Figure 3: Average # of crimes within a mile of each Dispensaries

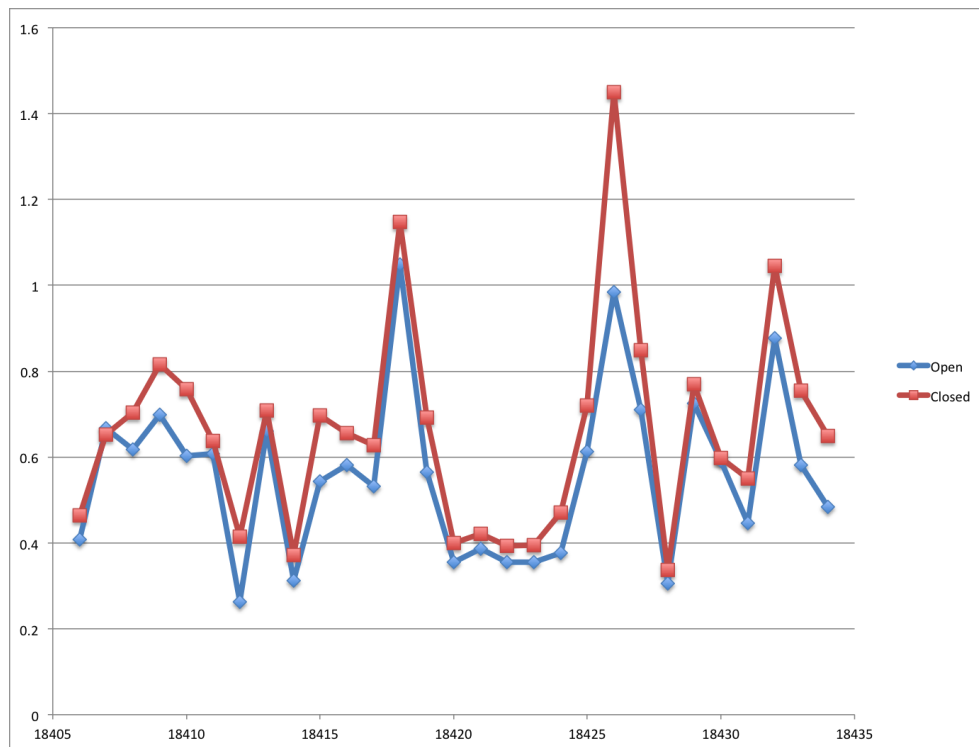


Table I
Timeline of Events Impacting Dispensaries in the City of Los Angeles ^a

<i>Date</i>	<i>Event</i>	<i>Key Details</i>
Nov 5, 1996	Proposition 215: Compassionate Use Act	CA voters approve medical marijuana law by 56%. Law takes effect the next day.
Sept 11, 2003	SB 420: Medical Marijuana Program Act of 2003	CA law effective Jan 2004. Sanctions access through “cooperatives and collectives.” Authorizes localities to adopt and enforce regulations.
May 3, 2005	City Councilmember Zine issues motion to study dispensaries	LAPD and City Attorney asked to report on complaints and criminal activity and recommend regulatory approach.
July 27, 2005	LAPD issues report to City Council	States high probability theft, robbery and assault occurs “along with sales of marijuana obtained at these locations.”
Oct 19, 2006	City Attorney issues report:	Reviews legal issues; lays out options for regulating dispensaries, including bans and zoning ordinances.
Jan 18, 2007	LAPD Recommendations	Tries to tie dispensaries to increases in crime. Recommends moratorium on new dispensaries and strict regulations for existing ones.
Sept 14, 2007	Interim Control Ordinance (ICO) LA Ordinance No. 179027	Places a temporary moratorium on new dispensaries in the city. Allows for hardship exemption.
Nov 13, 2007	ICO Registration deadline	Deadline for dispensaries to register with the city.
Aug 25, 2008	State guidelines issued	State Attorney General Brown issues guidelines to clarify details of SB 420.
June 24, 2009	LA Ordinance No. 180749	Amends ICO to eliminate hardship exemption.
Jan 26, 2010	LA Ordinance No. 181069 to regulate Medical Marijuana Collectives	Caps the number of dispensaries at 70. Allows existing dispensaries in excess of 70 to remain operational provided they complied with the ICO and abide by new zoning requirements.
Mar 14, 2010	LA Ordinance No. 181069	Dispensaries that are legally operating have 180 days to meet zoning requirements.
June 7, 2010	Article 5.1 of Chapter IV of LA Ordinance No. 181069	City shuts down the more than 400 dispensaries not registered by Nov 13, 2007. Offenders face civil penalties of \$2,500 a day and up to six months in jail.
Aug 25, 2010	Villaraigosa memo	States that 128 of the remaining 169 dispensaries must shut down because they had changes in management which violated the ICO. City allows these dispensaries to remain open pending legal challenge.
Nov 24, 2010	Koretz-Hahn Amendments	City council adopts amendment to LA Ordinance 181069 to clarify management requirements and extend timeline for zoning regulation compliance.
Dec 10, 2010	Mohr Injunction	LA County Superior Court Judge Mohr grants injunction barring the city from enforcing key aspects of Ordinance 181069, including closures based on the ICO.
Jan 25, 2011	LA Ordinance No. 181530	Amends Ordinance 181069 to cap dispensaries at 100 among those continuously operating since Sept 14, 2007. Calls to allocate permits by lottery.

^aSources:

1. Hoeffel (2010a), Hoeffel (2010c) and Hoeffel (2011a).
2. http://clkrep.lacity.org/onlinedocs/2005/05-0872-s1_ord_179027.pdf
3. http://clkrep.lacity.org/onlinedocs/2005/05-0872-rpt_atty_10-19-06.pdf
4. http://clkrep.lacity.org/onlinedocs/2005/05-0872-rpt_lapd_7-27-05.pdf
5. http://clkrep.lacity.org/onlinedocs/2005/05-0872-rpt_lapd_1-18-07.pdf
6. http://clkrep.lacity.org/onlinedocs/2009/09-0964_ord_180749.pdf
7. http://clkrep.lacity.org/onlinedocs/2008/08-0923_ord_181069.pdf
8. <http://cityclerk.lacity.org/cps/pdf/preliminaryResults08-25-10.pdf>
9. http://clkrep.lacity.org/onlinedocs/2008/08-0923-s7_ord_181530.pdf

Table II
Descriptive Statistics by Closure Status^a

<i>Panel A</i>	<i>Dispensary Level</i>				
	<i>Closed MMDs</i>		<i>Open MMDs</i>		p-value
	<i>Mean</i>	<i>Std. Dev.</i>	<i>Mean</i>	<i>Std. Dev.</i>	
Pr(Nearest MMD = Open)	0.341	0.475	0.300	0.459	0.309
Walkscore	75.88	13.36	77.14	12.40	0.279
Crimes < 1 mile	0.702	1.762	0.615	1.534	0.463
Crimes < 0.5 miles	0.202	0.787	0.167	0.706	0.451
Crimes < 0.25 miles	0.041	0.274	0.046	0.327	0.837
N	425		184		

<i>Panel B</i>	<i>Zip Code Characteristics, 2000</i>				
	<i>Closed MMDs</i>		<i>Open MMDs</i>		p-value
	<i>Mean</i>	<i>Std. Dev.</i>	<i>Mean</i>	<i>Std. Dev.</i>	
Total Population	41737	19217	39705	17406	0.216
Median HH Income	39505	13323	40099	14946	0.626
Share Below FPL	0.193	0.097	0.187	0.097	0.555
Share Above 200% FPL	0.579	0.166	0.575	0.183	0.709
Median Age	33.1	4.40	33.5	4.68	0.293
Share Native	0.599	0.126	0.604	0.133	0.691
N	423		184		

<i>Panel C</i>	<i>LA county daily crime counts</i>				
	<i>Pre-closure</i>		<i>Post-closure</i>		p-value
	<i>Mean</i>	<i>Std. Dev.</i>	<i>Mean</i>	<i>Std. Dev.</i>	
All Crimes	1121	92.3	1081	92.9	0.25
Assault	95.3	11.6	90.7	21.2	0.48
Breaking and entering	88.3	21.5	85.9	30.0	0.72
Homicide	0.60	0.82	0.57	0.94	0.93
Thefts and Robberies	271	30.0	255	19.9	0.12

^aNotes:

1. Panel A compares the characteristics of dispensaries that closed and those that remain open. The crime data in Panel A are reported for the pre-closure period.
2. Crime data reported in Panels A and C are from CrimeReports.com. The City of LA no longer subscribes to this service.
3. Panel B compares the zip code characteristics of dispensaries that closed and those that remain open. Data are from the 2000 Census.
4. In the last column of each panel, we give the p-value for a test of the difference in means.

Table III
OLS: Crime Within 2 Weeks of Closures^a

<i>Panel A</i>	<i>Crimes per day</i>		
Miles from MMD	$< \frac{1}{4}$	$< \frac{1}{2}$	< 1
<i>Closed dummy</i>	0.0076 (0.0044)+	0.017 (0.0077)*	0.006 (0.010)
Pre-closure mean	0.012	0.040	0.166
Adj. R-squared	0.299	0.361	0.570
N	17661	17661	17661
<i>Panel B</i>	<i>Theft or Robbery per day</i>		
Miles from MMD	$< \frac{1}{4}$	$< \frac{1}{2}$	< 1
<i>Closed dummy</i>	0.0063 (0.0038)+	0.011 (0.0048)*	0.003 (.008)
Pre-closure mean	0.0079	0.025	0.094
Adj. R-squared	0.187	0.279	0.517
N	17661	17661	17661

^aNotes:

1. + Significant at 10%; * Significant at 5%; ** Significant at 1%
2. Each entry (row and column) shows the coefficient and standard errors (in parenthesis) from a separate regression.
3. All regressions include date and dispensary fixed effects.
4. Data are for 609 dispensaries over 29 days.
5. Standard errors are clustered at the MMD level.

Table IV
Dispensaries in Mixed Zip Codes^a

<i>Panel A</i>	<i>Crimes per day</i>		
Miles from MMD	$< \frac{1}{4}$	$< \frac{1}{2}$	< 1
<i>Closed dummy</i>	0.0049 (0.0032)	0.016 (0.007)*	0.007 (.0009)
Pre-closure mean	0.010	0.037	0.168
Adj. R-squared	0.350	0.376	0.576
N	15805	15805	15805
<i>Panel B</i>	<i>Theft or Robbery per day</i>		
Miles from MMD	$< \frac{1}{4}$	$< \frac{1}{2}$	< 1
<i>Closed dummy</i>	0.0026 (0.0018)	0.008 (0.0036)*	0.001 (.007)
Pre-closure mean	0.0062	0.023	0.097
Adj. R-squared	0.219	0.291	0.521
N	15805	15805	15805

^aNotes:

1. + Significant at 10%; * Significant at 5%; ** Significant at 1%
2. Mixed means there are both open and closed dispensaries in the zip code.
3. Each entry shows the coefficient and standard error (in parenthesis) from a separate regression.
4. All regressions include date and dispensary fixed effects.
5. Data are for 545 dispensaries over 29 days.
6. Standard errors are clustered at the MMD level.

Table V
Negative Binomial Regression^a

<i>Panel A</i>		<i>Crimes per day</i>			
Miles from MMD	$< \frac{1}{2}$	< 1	< 2	< 4	
<i>Closed dummy</i>	0.397 (0.184)*	0.024 0.062	0.059 0.039	0.009 0.017	
Pre-closure mean	0.025	0.094	0.371	1.20	
R-squared	0.28	0.32	0.27	0.23	
N	17632	17632	17632	17632	

<i>Panel B</i>		<i>Crimes per day</i>			
Miles from MMD	$[0, \frac{1}{2})$	$[\frac{1}{2}, 1)$	$[1, < 2)$	$(2, < 4]$	
<i>Closed dummy</i>	0.397 (0.184)*	-0.124 (0.077)+	0.053 0.045	-0.007 0.024	
Pre-closure mean	0.025	0.069	0.277	0.830	
R-squared	0.28	0.069	0.28	0.21	
N	17632	17632	17632	17632	

^aNotes:

1. + Significant at 10%; * Significant at 5%; ** Significant at 1%
2. All regressions include date and zipcode fixed effects.
3. Robust standard errors are clustered at the MMD level.
4. Pseudo R-squares reported for non-linear estimates.

Table VI
OLS with Walk Score Interactions^a

<i>Panel A</i>		<i>Crimes per day</i>		
Miles from MMD		$< \frac{1}{4}$	$< \frac{1}{2}$	< 1
<i>Closed dummy</i>		0.0074 (0.0044)+	0.017 (0.0078)*	0.006 (.010)
<i>Closed * Walkscore</i>		- 0.0002 (0.0001)*	-0.0004 (0.003)	- 0.00003 (0.0005)
Pre-closure mean		0.012	0.040	0.166
Adj. R-squared		0.299	0.361	0.570
N		17661	17661	17661
<i>Panel B</i>		<i>Theft or Robbery per day</i>		
Miles from MMD		$< \frac{1}{4}$	$< \frac{1}{2}$	< 1
<i>Closed dummy</i>		0.0061 (0.0038)+	0.011 (0.0048)*	0.003 (.008)
<i>Closed * Walkscore</i>		-0.0002 (0.0001)+	-0.0003 (0.0002)	-0.0003 (0.0004)
Pre-closure mean		0.0079	0.025	0.094
Adj. R-squared		0.187	0.279	0.517
N		17661	17661	17661

^aNotes:

1. + Significant at 10%; * Significant at 5%; ** Significant at 1%
2. Each entry (row and column) shows the coefficient and standard errors (in parenthesis) from a separate regression.
3. The Walk Score has been demeaned.
4. All regressions include date and dispensary fixed effects.
5. Data are for 609 dispensaries over 29 days.
6. Standard errors are clustered at the MMD level.

Table VII
Negative Binomial Regression^a

	<i>Crimes per day</i>				
	$< \frac{1}{2}$	< 1	< 2	$[\frac{1}{2}, 1)$	$[1, 2)$
Miles from MMD					
<i>Closed dummy</i>	0.478 (0.160)**	0.047 0.075	0.059 0.039	-0.146 (0.083)+	0.061 0.050
<i>Closed*Walkscore</i>	-0.020 (0.009)*	-0.003 0.003	-0.005 (0.002)+	0.003 0.004	-0.006 (0.003)*
<i>Walkscore</i>	0.028 0.023	0.036 (0.019)+	0.022 (0.006)**	0.035 0.021	0.020 (0.007)**
Pre-closure mean	0.025	0.094	0.371	0.277	0.830
R-squared	0.34	0.28	0.33	0.31	0.35
N	17632	17632	17632	17632	17632

^aNotes:

1. + Significant at 10%; * Significant at 5%; ** Significant at 1%
2. All regressions include date and zipcode fixed effects.
3. Robust standard errors are clustered at the MMD level.
4. Pseudo R-squares reported for non-linear estimates.