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TECHNICAL REPORT

Regulating Medical Marijuana Dispensaries

An Overview with Preliminary Evidence of Their Impact on Crime

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Sixteen states and the District of Columbia have passed laws that allow certain individuals to use marijuana for medical purposes. Each year another state takes up this issue, either at the polls or in the legislature: At present, legislatures in more than half a dozen states are set to debate whether to adopt medical marijuana laws.

In this report, we provide an overview of state medical marijuana laws. We discuss current approaches to regulating the supply of medical marijuana, including capping the number of medical marijuana dispensaries, the retail shops that provide marijuana to individuals with a physician's recommendation for the drug, and banning them outright. We then take a closer look at the controversy over retail medical marijuana sales and crime.

To empirically evaluate the connection between medical marijuana dispensaries and crime, we report results from an ongoing analysis in the City of Los Angeles. Since 2005, the number of medical marijuana dispensaries in the city has grown rapidly. At its peak, the number of dispensaries in the city was estimated at 800 and was said to exceed the number of CVS pharmacies or Starbucks locations. In an effort to rein in this growth, Los Angeles ordered the closure of over 70 percent of the 638 dispensaries operating in the city in June 2010. We collected data on the number of crimes (overall and by type) reported per block in the City of Los Angeles and surrounding communities, such as Hollywood, Beverly Hills, and unincorporated areas of Los Angeles County. For this preliminary analysis, we analyzed data for the ten days prior to and ten days following the June 7, 2010, dispensary closures. We combined this with data from the Los Angeles City Attorney's Office on the exact location of dispensaries that were either subject to closure or allowed to remain open.

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Together these data allowed us to analyze crime reports within a few blocks around dispensaries that closed relative to those that remained open. Comparing changes in daily crime reports within areas around dispensaries that closed relative to those that remained open, we found that crime increased in the vicinity of closed dispensaries compared with those allowed to remain open. These results occur within both a 0.3- and 0.6-mile radius of dispensaries but diminish with increasing distance. At 1.5 miles out, there is no perceptible change in crime. The effects are concentrated on crimes, such as breaking and entering and assault, that may be particularly sensitive to the presence of security.

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. We consider the merits of each of these hypotheses and describe ways these might be tested in the future. In ongoing analysis, we are studying crimes for a longer period before and after the 2010 closures and assessing whether these effects vary according to characteristics of the neighborhoods surrounding dispensaries. We will also analyze closures leading up to a pending (but as of yet unscheduled) dispensary license lottery in the City of Los Angeles. Finally, we will analyze the closures directly determined by the lottery.

Recent events promise to bolster the importance of decentralized but locally regulated medical marijuana dispensaries. U.S. Attorneys have sent letters to officials in at least ten states that have been trying to implement centrally regulated supply systems. These letters urge caution, reminding the governors and their legislatures that the federal government will "vigorously" prosecute those involved in the manufacturing and distribution of marijuana, even if they are in compliance with state law. An implication of this federal action is that small-scale privately run

dispensaries, operating in the shadow of federal law, will continue to be the most viable source of medical marijuana. Our work aims to inform the debate on local approaches to regulating this market.

Introduction

In 1996, California voters approved Proposition 215, the Compassionate Use Act, ushering in an era of state medical marijuana laws. Since then, a total of 16 states and the District of Columbia have passed laws allowing marijuana use for medical purposes.[1] In nearly every election cycle, another state contemplates the issue, either at the ballot box or in the legislature. The latest law (passed by Delaware's legislature) became effective on July 1, 2011 (Delaware Code, 2011). In addition, legislatures in ten other states are currently debating whether to join the others.

Medical marijuana laws present states with several unique challenges: (1) how to regulate the supply of marijuana for patients who cannot cultivate the drug themselves, while maintaining its criminal status for nonmedical purposes, and (2) how to reconcile state-sanctioned supply channels (and, to a lesser extent, individual use) with federal prohibition. Until quite recently the dominant approach, particularly in large cities and at the state level, has been benign neglect. Medical marijuana dispensaries, sometimes called pot shops or cannabis clubs, have sprung up through the cracks. Dispensaries typically sell marijuana and edible marijuana products to qualified patients. In some cases, customers/patients consume the marijuana on the premises. The strictness with which the sales of marijuana are limited to those with a bona fide medical need—and how that need is defined—varies widely by state. The enforcement of bona fide medical need also varies by local jurisdiction.

The proliferation of medical marijuana dispensaries in such places as Los Angeles, San Francisco, and Denver has raised the ire of some residents and public officials who believe that the dispensaries attract crime or, at the very least, create a public nuisance (McDonald and Pelisek, 2009; National Public Radio, 2009; Reuteman, 2010). Jurisdictions have responded in a myriad of ways, including capping the number of dispensaries, banning them outright, or, at the other extreme, proposing state-run or regulated dispensaries.

On its face, the claim that dispensaries are associated with crime seems plausible. Illegal drugs have long been associated with crime in the public's consciousness. Many remember the crack cocaine epidemic of the 1980s, when drug dealers battled to control local distribution—often with deadly consequences. In the current setting, the relationship between marijuana sales and crime could occur through several possible causal mechanisms. First, marijuana consumption, which is presumably higher at or near dispensaries, may have direct criminogenic effects on users. These effects are cited in the context of alcohol outlets, where openings (Teh, 2008) and availability (Scribner, MacKinnon, and Dwyer, 1995) in Los Angeles and other jurisdictions (Gorman et al., 1998; Scribner et al., 1999) are associated with increases in crime. While superficially plausible in this setting, some research suggests that 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 users try to finance their drug use by theft or other crime. 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). Finally, dispensaries, which are a direct source of drugs and cash, may offer opportunities to and thus attract criminals. Anecdotal evidence suggests that dispensaries have been subject to break-ins and robberies (e.g., see McDonald and Pelisek, 2009). However, it is unclear whether other types of businesses in the same locations would engender the same kind of crime.

The argument that marijuana use (medical or otherwise) increases crime has proven influential with policymakers: New York City's special narcotics prosecutor used it to prevent the passage of a medical marijuana bill in the state senate (Campanile, 2010), and law enforcement in Oregon raised it to oppose the recent initiative to create a state-run supply system (Measure 74), which was defeated in the November 2010 elections (Burke, 2010). However, the claim that marijuana dispensaries per se attract crime has not been rigorously empirically evaluated. Our work is the first systematic, independent analysis of this claim.[2]

[1] The states are Alaska, Arizona, California, Colorado, Delaware, Hawaii, Maine, Michigan, Montana, Nevada, New Jersey, New Mexico, Oregon, Rhode Island, Vermont, and Washington. While many states have laws that are broadly supportive of medical use—e.g., protecting patients from jail time, as in Maryland—only these 16 remove state penalties for the cultivation, possession, and use of marijuana for approved medical purposes (Marijuana Policy Project, 2008). Pacula et al. (2002) provide an overview of the myriad of state laws on medical marijuana.

[2] The Denver Police Department (Ingold, 2010) and the Colorado Springs Police Department (Rodgers, 2010) each analyzed the number of crimes around dispensaries and compared them with the numbers around banks, pharmacies, and other businesses. Neither found evidence that dispensaries attracted crime.

In this report we provide a brief overview of the history of state medical marijuana laws and current approaches to regulating medical marijuana supply. We then provide a case study of the City of Los Angeles, dubbed "the Wild West of Weed" (Philips, 2009), which has experienced rapid growth in medical marijuana dispensaries since 2005. We clarify the evolving regulatory landscape in the city and use its recent experience ordering the closure of over 70 percent of the 638 dispensaries operating within the city to evaluate the claim that marijuana dispensaries attract or cause crime. Surprisingly, we find that crime increased in the vicinity of the closed dispensaries relative to the vicinity of dispensaries allowed to remain open.

The Los Angeles experience continues to evolve. In January 2011, the city's dispensary closures were invalidated as the result of a legal challenge. In response, the city plans to allocate 100 dispensary licenses by lottery (Hoeffel, 2011c). However, these plans face ongoing legal challenge (Hoeffel, 2011d).

As Los Angeles and other jurisdictions around the nation consider ways to regulate marijuana dispensaries, this study should provide some empirical evidence to guide policymakers. Ultimately any sustained approach to supplying medical marijuana will have to balance a complex mix of legal, regulatory, political, and public safety concerns. Although more work remains to be done, our initial investi-gation suggests that the latter concern—namely, public safety—may not be as important as commonly believed.

The Control of Medical Marijuana: A Brief Overview

Like heroin and LSD, marijuana is classified under federal law as a Schedule I drug, meaning that it has high abuse potential and no accepted medical use (Grinspoon and Bakalar, 1993). It is illegal under federal law to cultivate, possess, or distribute marijuana for any purpose (Mikos, 2009).

Despite this status, the federal government makes marijuana available for medical purposes in a very limited way: through a "Compassionate Use" Investigational New Drug program that once allowed physicians to provide marijuana to approved patients on an experimental basis and through larger-scale research studies that require approvals from the Food and Drug Administration, a special Public Health Service panel, and the Drug Enforcement Administration (Harris, 2010). The Compassionate Use program, which was closed to new patients in 1992, never reached more than 36 patients total (Grinspoon and Bakalar, 1993), and federal approval to study marijuana is notoriously difficult to obtain (Harris, 2010). In both cases, marijuana must be acquired from the University of Mississippi, which runs the only federally approved grow site in the United States (Mikos, 2009).

Like the federal government, all states outlaw marijuana cultivation, possession, and distribution for nonmedical purposes, although some treat minor offenses as a civil rather than a criminal offense (Mikos, 2009). But an increasing number of states—16 and the District of Columbia as of July 2011—make an exception to allow cultivation, possession, and use for approved medical purposes. Most of these laws were passed through voter-approved initiatives (see Table 1).

Medical marijuana use has wide support in principle. Recent polls indicate that over 70 percent of Americans favor state laws allowing marijuana use for prescribed medical purposes (Pew Research Center, 2010). However, 44 percent would be somewhat or very concerned if a "store that sold medical marijuana" opened in their area (Pew Research Center, 2010). Perhaps as a consequence, medical marijuana laws have been remarkably ambiguous about key supply issues, until quite recently. While all allow registered patients to grow their own marijuana or designate somebody as their grower, none provides a mechanism for legally obtaining seeds or cuttings (Harrison, 2010).

Physicians can generally discuss marijuana's benefits and recommend its use to patients, though this practice is controversial in some states (Hoffmann and Weber, 2010).[3] They still cannot legally prescribe, dispense, or even advise patients on how to obtain the drug without violating federal law (Hoffmann and Weber, 2010). Moreover, although the anti-commandeering doctrine prohibits Congress from requiring states to prohibit medical marijuana (Mikos, 2009), a 2005 Supreme Court decision (*Gonzales v Raich*) reaffirmed that individuals who cultivate or possess marijuana legally under state law may be prosecuted under federal law (Hoffmann and Weber, 2010).[4]

[3] In *Conant v Walters*, 309 F.3d 629 (9th Cir. 2002), cert. denied, 540 U.S. 946 (2003), the United States Court of Appeals for the Ninth Circuit ruled that physicians had a First Amendment right to advise patients about marijuana. Judge Kosinski, concurring, argued that the federal government prohibiting doctors from discussing medical marijuana also violated the "commandeering" doctrine of *New York v United States*, 505 U.S. 144 (1992), and *Printz v United States*, 521 U.S. 898 (1997). While the Court of Appeals ruling is technically only binding on the states within the Ninth Circuit (California, Nevada, Washington, Oregon, Montana, Idaho, Arizona, Alaska, and Hawaii), it may prove influential in other jurisdictions.

[4] The U.S. Department of Justice (DOJ), which brought *Gonzales v Raich* to the Supreme Court, exercised this power regularly; it has raided 30 to 40 medical marijuana dispensaries in California since 2005 (Blum, 2009; Alex Johnson, 2009).

Table 1
Summary of State Medical Marijuana Laws

State	Year Passed	Date Effective	Voter Approved?	Maximum Patients per Caregiver	Dispensary Regulations
Alaska	1998	March 4, 1999	Yes	1	
Arizona	2010	November 29, 2010[a]	Yes	5[c]	State regulated
California	1996	November 6, 1996	Yes	None	Licensed through city or county business ordinances
Colorado	2000	June 1, 2001	Yes	5[c]	Authority given to localities
Delaware	2011	July 1, 2011[a]	No	5	State regulated
District of Columbia	2010	July 27, 2010[a]	Yes	1[c]	Will be city regulated
Hawaii	2000	December 28, 2000	No	None	
Maine	1999	December 22, 1999	Yes	5[c]	State regulated
Michigan	2008	December 4, 2008	Yes	5	
Montana	2004	November 2, 2004	Yes	None	Not allowed, but dispensaries are proliferating. The legislature is expected to pass regulations in 2011.
Nevada	2000	October 1, 2001	Yes	1	Not allowed, but several dispensaries are operating
New Jersey	2010	January 2011[a]	No	1	Will be state regulated
New Mexico	2007	July 1, 2007	No	4[c]	State regulated
Oregon	1998	December 3, 1998[b]	Yes	None	
Rhode Island	2006	January 3, 2006	No	5[c]	State regulated; program is on hold as of July 2011
Vermont	2004	July 1, 2004	No	1	
Washington	1998	November 3, 1998	Yes	1	State indicates that dispensaries are "not allowed"

[a] These programs are not yet active, as of August 2011.

[b] Oregonians defeated Measure 74 on the November 2010 ballot, which would have established a state-regulated supply system (Oregon Ballot Measure 74, 2010; "November 2, 2010, General Election Abstracts of Votes, State Measure No. 74," undated).

[c] Limits do not apply to dispensaries.

SOURCES: Arizona Medical Marijuana Act (2009), Council of the District of Columbia (2010), Delaware State Senate (2011), Harrison (2010), Johnson (2010), Maine State Law and Reference Library (2011), Malinowski (2011), O'Connell (2010), ProCon.org (2011a), Southall (2010), Washington State Department of Health (2011), and Whited (2009).

The Emerging Regulatory Framework: California and Beyond

Faced with these legal obstacles to purchasing medical marijuana, patients and buyers banded together to form cooperatives or buyer's clubs, later known as dispensaries. In California, the first cooperatives actually predate the state's medical marijuana law (Cohen, 2000). In October 1996, a month before Proposition 215 passed, the *Los Angeles Times* reported that six dispensaries were operating in the Bay Area and several others were open in Southern California (Curtis and Yates, 1996).[5] These dispensaries, like the first medical marijuana laws themselves, emerged, at least in part, out of AIDS activism (Reiman, 2010); AIDS wasting syndrome is one of the conditions for which the benefits of marijuana are least controversial (Watson, Benson, and Joy, 2000).

[5] The San Francisco Cannabis Buyers Club, which was founded in 1991 by Dennis Peron, a coauthor of Proposition 215, was likely the first dispensary (McCabe, 1996).

More dispensaries opened after Proposition 215 took effect. Their numbers increased rapidly after 2004, when California Senate Bill 420 (2003) established a (voluntary) patient identification card program and recognized a patient's right to cultivate marijuana through nonprofit collectives and cooperatives—i.e., dispensaries.[6] In accordance with Senate Bill 420, the California State Attorney General, Jerry Brown, later issued guidelines to prevent the diversion of medical marijuana (Brown, 2008). Among other things, these guidelines indicated that local jurisdictions had the right to further regulate dispensary operations, which seems to have set in motion a wave of city and county regulations.

As of May 2011, 42 cities and nine counties in California have ordinances regulating dispensary operations (Americans for Safe Access, 2011). While approaches vary, most dispensary regulations deal with the following core issues: licensure, zoning (including district and distance requirements), security systems, storage, on-site consumption, and signage (Salkin and Kansler, 2010). San Francisco, which in 2005 was one of the earliest cities to craft comprehensive dispensary regulations, established zoning and proximity restrictions, as well as ventilation requirements for dispensaries that obtained approval for on-site smoking.[7] Another "early adopter," West Hollywood, caps the number of dispensaries at four, limits business hours, prohibits on-site consumption, and sets zoning and proximity restrictions. It also requires each dispensary to have a neighborhood guard patrol within a two-block radius of a dispensary during business hours and to distribute the name and phone number of a staff person responsible for handling problems to neighbors within 100 feet of a dispensary (City Council of the City of West Hollywood, 2007). Many, primarily smaller, jurisdictions have moratoria on new dispensaries or outlaw them altogether (Americans for Safe Access, 2011).[8] City bans are currently being challenged in the ongoing case of *Qualified Patients Association v City of Anaheim* (see Hoeffel, 2010b; Carpenter, 2011).

While California allows counties and cities to regulate dispensaries, eight states—Arizona, Colorado, Delaware, Maine, New Mexico, New Jersey, Rhode Island, and Vermont—and the District of Columbia regulate medical marijuana dispensaries directly (see Table 2). Many passed regulations in an effort to avoid California's experience—the massive growth in dispensaries (Maas, 2009) and the patchwork of local ordinances that emerged in their wake.

In addition, they reacted to what had until recently been viewed as a softer federal stance on dispensaries. In March 2009, Attorney General Eric Holder announced that federal raids of dispensaries would be restricted to those involved in drug trafficking (Johnston and Lewis, 2009). Holder's announcement was seen as a dramatic change of policy from the Drug Enforcement Administration's dispensary raids during the George W. Bush administration. Headlines such as "A Federal About-Face on Medical Marijuana" (Meyer, 2009) and "Obama Administration to Stop Raids on Medical Marijuana Dispensers" (Johnston and Lewis, 2009) promoted the impression that dispensaries would be allowed to grow unimpeded by federal law enforcement, although DOJ later released a memorandum clarifying that the policy was not a green light for dispensaries (United States Department of Justice, 2009).

Recent efforts to regulate the supply of medical marijuana centralize the licensing and oversight of dispensaries, primarily at the state level. New Mexico, which in 2007 was the first to establish a state system to regulate medical marijuana production and distribution, licenses nonprofit providers and sets limits on the amount of marijuana they can grow and dispense (Holmes, 2010). Rather than capping the number of dispensaries, as is done in most state systems, New Mexico limits the number of patients any dispensary can serve to a total of four. Maine's regulatory system, which was created by a 2009 voter amendment to its 1999 medical marijuana law, licenses and regulates dispensaries as well, but caps their total number at eight.[9]

The specific caps chosen tend to be driven by geography. For example, New Jersey's law establishes six "alternative treatment centers" for medical marijuana, two in each of the northern, central, and southern parts of the state. At the very high end of caps, Arizona limits the number of dispensaries to 124 at the outset, "proportionate to the number of pharmacies in the state" (Lee, 2010). In 2013, Delaware will grant licenses to one state-regulated "compassion center" in each of its three counties based on a scoring system for safety, security, diversion prevention, and record-keeping plans. Three additional licenses will be granted in 2014. With the exception

[6] This right was affirmed in *People v Urziceanu* (2005), which reversed the conviction of a collective owner, Michael Urziceanu, for conspiracy to sell marijuana.

[7] The ordinance specifies, for example, the types of neighborhoods where dispensaries can operate and places a 1,000-foot buffer around schools and recreational facilities. For more detail, see City and County of San Francisco Planning Department (undated).

[8] As of May 2011, 152 cities and 13 counties ban dispensaries, and 96 cities and 15 counties have moratoria in effect.

[9] See Maine State Law and Reference Library (2011).

Table 2
Summary of State Dispensary Regulations

State	Enacted	Nonprofit?	Cap on Numbers?	Zoning Requirements	Quantity Limits?	Security
Arizona	November 29, 2010[a]	Yes	Yes—not to exceed 10% of pharmacies; will start at 124	Devolves to local jurisdictions	Yes	Security alarm system
Colorado	June 7, 2010	No	No, but caps are enacted at the local level	At least 1,000 feet from a school, alcohol or drug treatment facility, or child care facility	Yes	Video and alarm systems
Delaware	May 13, 2011[a]	Yes	1 in each of 3 counties, with 3 more in year 2	500 feet from a school	Yes	Alarm system
District of Columbia	July 27, 2010[a]	No	5	At least 1,000 feet from a school or youth center	Yes	Plan required
Maine	November 3, 2009	Yes	8	At least 500 feet from a school	Yes	Must demonstrate adequate security
New Jersey	January 2011[a]	Yes	6	Devolves to local jurisdictions; cannot be within 1,000 feet of a school	Yes	Plan required
New Mexico	December 15, 2008	Yes	No caps, but suppliers are limited to 4 patients	At least 300 feet from any school, church, or day care center	Yes	Not specified
Rhode Island	June 16, 2009[b]	Yes	3	At least 500 feet from a school	Yes	Security alarm system
Vermont	June 6, 2011[b]	Yes	4	At least 1,000 feet from a school or child care facility	Yes	Security alarm system

[a] These programs are not yet active in their entirety, as of August 2011.

[b] The dispensary system is not yet active, as of August 2011.

SOURCES: Arizona Medical Marijuana Act (2009), California Senate Bill 420 (2003), Delaware State Senate (2011), General Assembly of the State of Colorado (2010), General Assembly of the State of Vermont (2011), Maine Department of Health and Human Services, Division of Licensing and Regulatory Services (2010), New Jersey Register (2010), New Mexico Department of Health (undated), ProCon.org (2011b), and Rhode Island General Assembly (2009).

of Colorado, Maine, and New Mexico, the other state-regulated supply systems exist only on paper and have not yet issued licenses.[10] More states, such as Hawaii and Montana, have been actively contemplating the establishment of systems to regulate the supply of medical marijuana.

Many efforts to plan or implement central supply systems have slowed or ceased in recent months, after U.S. Attorneys in ten states sent letters to governors and other elected officials restating the conflict between state and federal law. The letters warned that those involved in the manufacture or distribution of marijuana risk civil or criminal penalties (see Table 3). In some cases, these letters responded to requests for guidance (seven states), but several others were sent on DOJ's own initiative (three states). Vermont and Hawaii appear to be pressing ahead despite these letters, but the response among other recipients and the likely chilling effect in states considering similar systems suggest that the regulation of medical marijuana supply may remain a local issue.[11]

[10] Colorado's system is in an interim phase. Colorado will not issue licenses until July 1, 2012 (originally 2011), but dispensaries that had filed an application by the August 1, 2010, deadline can continue to operate until that time. See Wyatt (2011) for discussion of the extension.

[11] One letter was sent to the City of Oakland, which had plans to establish four industrial-scale marijuana production facilities (Wholsen, 2010). It has since abandoned this plan. Although it is the rare jurisdiction that contemplates such an approach, local regulations will likely involve far less centralization.

Table 3
Summary of 2011 U.S. Attorney Letters Regarding Medical Marijuana

When	U.S. Attorney	District	To Whom	Letter Solicited?	Comments and Outcome
February 1	Melinda Haag	Northern California	Oakland City Attorney	Yes—guidance on Oakland ordinance	Warns that city's plans to license 4 industrial-scale production facilities could result in civil and criminal penalties. City suspended plans after receipt of letter.
April 12	Florence Nakakuni	Hawaii	Director, Public Safety	Yes—guidance on law to establish at least 1 dispensary	States that disruption and prosecution of drug trafficking is a core priority
April 14	Jenny Durkan, Michael Ormsby	Western and Eastern Washington	Governor	Yes—guidance on program to license growers and dispensaries	States that disruption and prosecution of drug trafficking is a core priority. Governor vetoes bill.
April 20	Michael Cotter	Montana	Several state legislators	Yes—guidance on proposal to license and regulate production and distribution	States that disruption and prosecution of drug trafficking is a core priority. New legislation passed will likely shut down hundreds of dispensaries.
April 26	John Walsh	Colorado	Colorado Attorney General	Yes—guidance on bill to clarify law that licenses marijuana dispensaries	DOJ will consider "appropriate civil and criminal" remedies. Law passes despite letter; extends moratorium on new dispensaries through 2012.
April 29	Peter Neronha	Rhode Island	Governor	No—responds to licensing of 3 "Compassion Centers"	States that prosecution of businesses that "market and sell marijuana" is a "core priority." Governor suspends program to license dispensaries.
May 2	Dennis Burke	Arizona	Director, Department of Health Services	No—responds to rules filed for dispensary licensing and other aspects of program	Governor filed suit against Burke and Attorney General Holder seeking clarification on the legal protections their law affords voters
May 4	Tristram Coffin	Vermont	Information not available	Yes—guidance on bill sought after Rhode Island received an unsolicited letter about proposed compassion centers	Bill passes and receives governor's signature
May 16	Thomas Delahanty II	Maine	Health and Human Services Committee	Yes—guidance on changes to law, such as making patient registration voluntary	DOJ will act "vigorously against individuals and organizations" involved in unlawful manufacturing and distribution
June 3	Dwight Holton	Oregon	Dispensary owners, operators, landlords	No—responds to dispensary growth	Letter signed by many Oregon DAs, sheriffs, and police chiefs. Warns of risk of prosecution, civil action, and asset seizure.

NOTE: DA = district attorney.

SOURCES: For letters from Rhode Island, Colorado, California, Hawaii, Washington, and Montana, see *Reason* (2011). For the Arizona letter, see Burke (2011). For the Oregon letter, see Holton (2011) and Richardson (2011). For details of the Vermont letter, see Hallenbeck (2011).

The Los Angeles Experience

The movement to regulate medical marijuana supply, and in particular to limit and tightly manage dispensary systems, has been fueled in part by the experience in Los Angeles. In this section, we study Los Angeles in order to put the current debate in proper historical context and to shed light on what remains an important issue for local regulations moving forward—the relationship between dispensaries and public safety.

The effort to regulate dispensaries in Los Angeles began in May 2005, when City Council member Dennis Zine requested a study of the city's dispensaries. His goal was to set the stage for drafting comprehensive land use regulations (Doherty, 2010).[12] In its report in July 2005, the Los Angeles Police Department (LAPD) identified four known dispensaries

[12] A description of the motion can be found at LACityClerk Connect (undated[a]).

within city limits, suggested that several others were operating at mobile sites, and claimed that dispensaries generated crime.[13] To substantiate these claims, the LAPD cited several felony narcotics arrests made at these dispensaries. They noted that "no reported non-narcotics related crimes can be attributed to these locations" but indicated that it was highly likely that "crimes such as theft, robbery and assault have occurred and will occur along with the sale of marijuana from these locations" (Bratton, 2005).

To address these concerns, the LAPD report called for restricting dispensaries to commercial areas, if the city chose not to ban them altogether. It further suggested prohibiting dispensaries from residential areas, near schools and colleges, and near both public and private recreational areas and recommended a set of regulations for those already in operation. In 2006, the City Attorney's Office issued its own report laying out various options for regulating dispensaries, including an outright ban based on federal law, an interim moratorium until state law is "further clarified," and a land use ordinance establishing zoning requirements.[14]

As detailed in Table 4, the city opted for an Interim Control Ordinance (ICO), which took effect almost a full year later in September 2007. The ICO placed a temporary moratorium on new dispensaries and required existing dispensaries to register with the city by November 13, 2007. To register, dispensaries had to present a City of Los Angeles Tax Registration Certificate, a State Board of Equalization seller's permit, a lease, proof of insurance, and dispensary membership forms. The broad goal of the ICO was to address concerns of neighborhood activists about the growth of dispensaries while buying the city some time to draft permanent legislation.

The ICO was also a response to the LAPD's fact sheet documenting a massive increase in dispensaries (from four to 98) between July 2005 and November 2006 and attempting to tie these dispensaries to an increase in crime in their reporting districts.[15] This link was summarized in the fact sheet's table of areas with dispensaries, the number of dispensaries, and the percentage change in crimes (robberies, burglaries, aggravated assaults, and burglary from auto) in these areas from July 30, 2005, to October 29, 2005, and from July 30, 2006, to October 28, 2006. No effort was made to isolate the change in crime near dispensaries from broader neighborhood-specific crime patterns or to compare them with the change around other neighborhood establishments, such as liquor stores, coffee shops, or banks.

Although the ICO was intended to halt 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 that were allowed under the ICO (McDonald and Pelisek, 2009).[16] Many entrepreneurs quickly realized that the city would not prosecute these dispensaries until their hardship applications had been reviewed, and the City Council seemed in no hurry to review these applications. Indeed, the City Council did not rule on any applications before June 2009, after more than 500 applications had been submitted (Hoeffel, 2009a). To close this loophole, the city passed an ordinance on June 19, 2009, that amended the ICO to eliminate the hardship exemption.[17]

It was not until January 26, 2010, that the City Council approved final regulations. The new ordinance set the number of dispensaries in the city at 70.[18] Dispensaries that registered and had been operating legally in the city since the ICO were grandfathered, meaning that the number of legal dispensaries could exceed 70 in the short run. However, all dispensaries were subject to new zoning rules, including a 1,000-foot buffer between dispensaries and between dispensaries and "sensitive use" sites, such as schools, parks, and libraries. The ordinance also established a set of operating conditions. Dispensaries were required to have web-based closed-circuit television security systems, maintain security recordings for a minimum of 90 days, and make those recordings available to the police on request. The ordinance prohibited on-site consumption of marijuana, dispensary operation between the hours of 8:00 p.m. and 10:00 a.m., the sale of alcoholic beverages, and the entry of persons under the age of 18 without proof of patient qualification and the presence of a parent, legal guardian, or licensed attending physician.

On June 7, 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.[19] Early reports indicated that most dispensaries ordered to close did so; the City Attorney's Office estimated that 20 to 30 stores were

[13] See Bratton (2005).
[14] See Delgadillo (2006).
[15] See Los Angeles Police Department, Narcotics Division (2006).
[16] The first set of hardship applications requested exemptions because of delays beyond the dispensaries' control, such as receiving a city business tax registration certificate, which prevented them from meeting the November 13, 2007, registration deadline. Later applicants provided a much wider range of justifications, such as that they provided a community service or that they could not officially register in 2007 because of the fear imposed by federal authorities (Hoeffel, 2009a).
[17] See Council of the City of Los Angeles (2009).
[18] See Council of the City of Los Angeles (2010a).
[19] See Romero (2010a) for a sample letter.

Table 4
Timeline of Events Impacting Medical Marijuana Dispensaries in Los Angeles and Beyond

Date	Law/Event	Key Details
November 5, 1996	Proposition 215: The Compassionate Use Act of 1996	California voters approve medical use of marijuana by 56%. Law took effect on November 6, 1996.
September 11, 2003	Senate Bill 420: Medical Marijuana Program Act of 2003	Law took effect on January 1, 2004. Establishes a voluntary ID program for qualified patients and provides some legal cover for medical marijuana dispensaries by validating access through "cooperatives and collectives." Authorizes localities to adopt and enforce laws consistent with the act. Also set possession limits, but they were struck down at the Appeals Court and State Supreme Court levels in 2008 and 2010, respectively.
May 23, 2006	L.A. County Ordinance No. 2006-0032	Law took effect on June 22, 2006. Allows medical marijuana dispensaries to operate in Los Angeles County with a conditional use permit. Limits hours, establishes distance requirements and other rules as part of Title 22.56 of the county's planning and zoning code. The law was replaced in 2010 by a ban on dispensaries.
December 14, 2006	LAPD fact sheet released	Fact sheet details the explosion of medical marijuana dispensaries in the City of Los Angeles, shows statistics to support the view that the dispensaries increase crime, and recommends a moratorium on new dispensaries and detailed regulations for existing dispensaries
September 14, 2007	ICO: L.A. Ordinance 179027	Placed a temporary moratorium on the opening of new medical marijuana dispensaries in the City of Los Angeles. Allows for a hardship exemption.
November 13, 2007	ICO registration deadline	Deadline for dispensary registration under the ICO
August 25, 2008	Brown guidelines released	California State Attorney General Jerry Brown issues guidelines to clarify details of Senate Bill 420
March 18, 2009	Holder announcement	U.S. Attorney General Eric Holder outlines new federal policy on medical marijuana dispensary raids
June 24, 2009	ICO amended via L.A. Ordinance 180749	Eliminates hardship exemption
October 19, 2009	Ogden memo	U.S. Deputy Attorney General David Ogden issues a memo clarifying federal policy on "investigations and prosecutions" in states that allow medical marijuana
January 26, 2010	L.A. Ordinance 181069 to regulate medical marijuana collectives passes	Caps the number of dispensaries in the city at 70. Allows existing dispensaries in excess of 70 to remain operational provided that they comply with the ICO and abide by new requirements. Dispensaries must be geographically distributed across L.A. community plan areas in proportion to the population; must be at least 1,000 feet from "sensitive use" buildings, such as schools and parks; and must not be located on a lot "abutting, across the street or alley from, or having a common corner with a residentially zoned area."
March 14, 2010	L.A. Ordinance 181069 takes effect	Dispensaries that are legally operating have 180 days to meet zoning requirements.
June 7, 2010	L.A. Ordinance 181069, Chapter IV, Article 5.1, takes effect	As part of the ordinance, the city shuts down the more than 400 dispensaries that had not registered by November 13, 2007. Offenders face civil penalties of $2,500 per day and may receive up to six months in jail. The remaining dispensaries have 180 days to comply with the new zoning requirements, which, in many cases, means moving.
August 25, 2010	Villaraigosa memo	City states that 128 of the remaining 169 dispensaries must shut down because they had changes in management, which were precluded under the ICO. City allows these dispensaries to remain open until the courts can rule on the decision's legality.
November 23, 2010	Los Angeles County and Orange County approve bans	Both the Los Angeles County Board of Supervisors and the Orange County Board of Supervisors vote to ban dispensaries in unincorporated parts of their counties.
November 24, 2010	Koretz-Hahn and other amendments to L.A. Ordinance 181069	City Council adopts amendments that clarify and effectively loosen the "same ownership and management" requirements and extend the timeline for full compliance for "qualifying" dispensaries. Mayor has until December 6, 2010, to decide on the amendments.
December 10, 2010	Mohr injunction	Los Angeles County Superior Court Judge Anthony J. Mohr grants an injunction that bars the city from enforcing key aspects of L.A. Ordinance 181069, including closures based on the moratorium
January 25, 2011	L.A. Ordinance 181530 takes effect	Amends L.A. Ordinance 181069 to cap the number of dispensaries at 100 among those continuously operating since September 14, 2007. Allocates permits by lottery.

SOURCES: Brown (2008), California Senate Bill 420 (2003), Compassionate Use Act of 1996, Council of the City of Los Angeles (2007), Council of the City of Los Angeles (2009), Council of the City of Los Angeles (2010a), Council of the City of Los Angeles (2010b), Council of the City of Los Angeles (2011), Hoeffel (2010a), Hoeffel (2011b), Hoeffel (2010d), Hoeffel (2010e), Johnston and Lewis (2009), LACityClerk Connect (undated[b]), Lagmay (2010), Los Angeles County Department of Regional Planning (2009), Los Angeles Police Department, Narcotics Division (2006), and United States Department of Justice (2009).

still open illegally, and the LAPD conducted raids on at least four defiant stores (Rubin and Hoeffel, 2010).[20] Another 186 were deemed in compliance and could apply for permits to remain operational. Of these, 170 dispensaries notified the City Clerk of their intention to register, even though many would have to move to meet the new zoning requirements (Guerrero, 2010). Only 41 were in full compliance with the eligibility requirements of the new ordinance (Hoeffel, 2010c).[21]

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 the many legal challenges to the ordinance were resolved (Hoeffel, 2010c; Lagmay, 2010). Efforts were under way to abolish the continuous management requirement, which would have allowed a total of 180 dispensaries to remain in operation (Romero, 2010b). However, in January 2011, a 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, 2010c). The judge suggested that alternative approaches, including allowing dispensaries to remain open if they could prove they were in operation on the date the moratorium took effect, would be permissible.

To that end, on January 22, 2011, the L.A. City Council amended its ordinance. It now caps the number of dispensaries at 100 among those that can demonstrate continuous operation since September 14, 2007 (Hoeffel, 2011b); 100 permits will be distributed by lottery. According to the City Clerk's Office, 228 dispensaries have applied to participate in the lottery (Hoeffel, 2011c). The date of the lottery has not yet been determined, as of August 2011. The city has begun notifying dispensaries that did not apply to participate in the lottery or cannot demonstrate continuous operation that they must shut down (Hoeffel, 2011c). However, the legality of the lottery is already being challenged (Hoeffel, 2011d).

Evaluating the Dispensary–Crime Connection

One of the principal reasons behind the city's effort (and similar efforts in other jurisdictions) to limit dispensaries is the presumed connection to crime. Residents neighboring dispensaries complain about crime and other quality of life concerns (Romero, 2010c). In Los Angeles, increased crime around dispensaries was explicitly cited as a reason that the City Council decided to restrict dispensaries.[22] Los Angeles County Sheriff Lee Baca has publically stated that dispensaries have been "hijacked" by criminals and have become crime targets (Winton, 2010). Countless media outlets have reported this claim.[23] But despite its plausibility, we know of no systematic evaluation of the claim that dispensaries themselves attract or cause crime.

To fill the gap in our knowledge, we use the first round of dispensary closures in the City of Los Angeles to assess the impact of dispensaries on crime. Figure 1 shows the geographic distribution of medical marijuana dispensaries by closure status. For each dispensary, we collected data on the number of crimes (overall and by type) reported per block in the City of Los Angeles and surrounding communities, such as Hollywood, Beverly Hills, and unincorporated areas of Los Angeles County. Data were extracted from CrimeReports (undated), an online software mapping tool that allows law enforcement agencies to spatially analyze their crime data and share these data with the public.

According to CrimeReports, its software is used by more than 700 law enforcement agencies across North America. During our study period, the LAPD subscribed to this service, allowing us to extract data on crimes by type, day, and city block. The LAPD no longer uses CrimeReports, possibly because it is launching its own mapping system.[24] During our time period, we compared the data from CrimeReports with those publically available through the LAPD's website. The data correspond very closely. However, the data provided by the LAPD are only available for four crime categories (versus 13 categories from CrimeReports) and are not available for jurisdictions that neighbor the City of Los Angeles.

Importantly, the CrimeReports data capture reported offenses or incidents rather than arrests. This distinction is important for several reasons. First, arrests typically undercount crime, since many incidents, even those in which an offender is apprehended, do not result in processed arrests. Second,

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

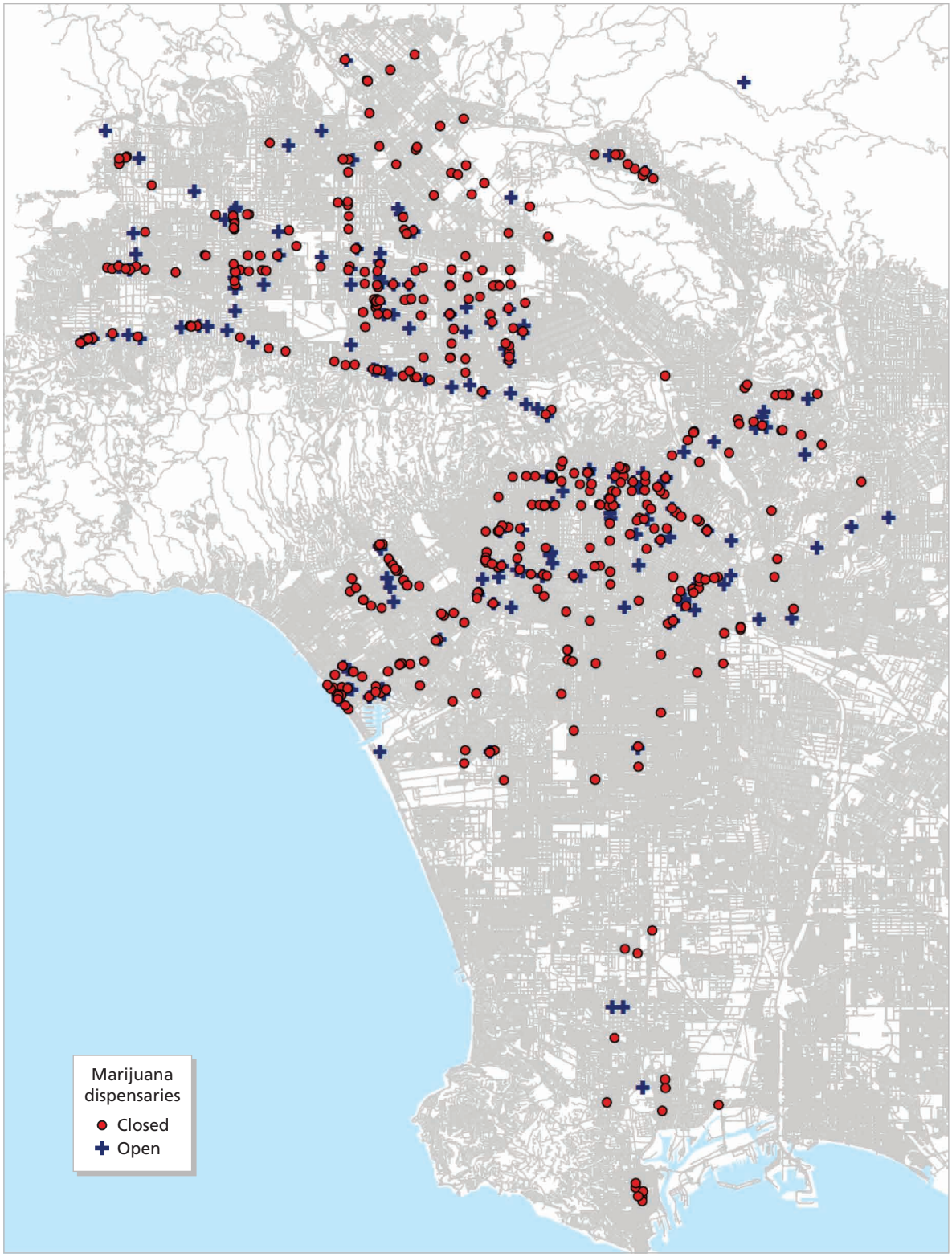
[21] See Los Angeles Municipal Code Section 45.19.6.2.B.2 for the full set of requirements (available at Council of the City of Los Angeles [2010a]).

[22] See the fifth paragraph of Ordinance 181069 (Council of the City of Los Angeles, 2010a).

[23] Examples abound. See Del Barco (2010), which asserts that "[s]ome 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."

[24] See Los Angeles Police Department (2011).

Figure 1
Geographic Distribution of Medical Marijuana Dispensaries in Los Angeles as of June 7, 2010



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 period around the closures. Third, arrest data typically do not contain precise-enough geographic information to link an incident to an exact city block.

For this preliminary analysis, we used crime data for the ten days prior to and ten days following the June 7, 2010, closures of dispensaries. We combined these data with information from the Los Angeles City Attorney's Office on the exact locations of dispensaries that were either subject to closure or allowed to remain open. We analyzed crime reports within 0.3, 0.6, 1.5, and 3 miles of dispensaries that closed relative to those that remained open.[25] In total, our dataset includes 21 days of crime reports for 600 dispensaries; 170 of these dispensaries were allowed to remain open, and 430 were ordered to close.

Table 5 presents basic summary statistics on our main outcomes: total daily crimes reported, as well as thefts, breaking and entering incidents, and assaults. We chose these categories of crimes because they are the most common. In Table A.1 we show the difference in pre-closure crime counts for dispensaries allowed to remain open relative to those ordered to close. In general, with a few exceptions, the differences are small and not statistically distinguishable from zero. This suggests that open dispensaries may serve as a reasonable control group for those ordered to close, although our empirical analysis will rely on comparability in crime trends rather than levels.

Table 5
Summary Statistics: Average Number of Crimes Surrounding Dispensaries per 100 Days

	Radius Around Dispensary			
Crime Type	0.3 Miles	0.6 Miles	1.5 Miles	3 Miles
Total crimes	2.2	7.0	43.5	133
Theft	1.3	3.9	21.9	62.2
Breaking and entering	0.4	1.2	7.5	20.8
Assault	0.2	0.9	6.9	23.7
Observations	12,600	12,600	12,600	12,600

NOTES: Data are from CrimeReports (undated) for May 28, 2010, through June 17, 2010. Data for these 21 days cover the areas surrounding 600 dispensaries, 430 that were subject to closure on June 7, 2010, and 170 that were allowed to remain open. A few (nine) dispensaries are not included because of a lack of coverage by CrimeReports. Theft includes general theft, theft from a vehicle, and theft of a vehicle. Assault includes assault with a deadly weapon. Other crime categories include homicide, robbery, sexual offense, "other," quality of life, and traffic.

We estimated the effect of dispensaries on crime in a simple difference-in-differences framework, comparing changes in daily crime reports within the specified areas around dispensaries that closed relative to those that remained open. More specifically, we run an Ordinary Least Squares (OLS) regression of the following basic form (Equation 1):

$$Crime_{dt} = \alpha_d + \beta 1(date > june7) * 1(closed) + \delta_t + \varepsilon_{dt}, \quad (1)$$

where *Crime* is the number of crimes within a given radius of dispensary d on day t, α_d is a dispensary fixed effect, and δ_t are fixed effects for the exact date. We include an interaction between 1(*date* > *june 7*), an indicator for dates after the June 7, 2010, closures, and 1(*closed*), an indicator for dispensary closure status, as determined by city orders. The main post–June 7, 2010, 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., they 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.[26]

The identifying assumption in the difference-in-differences framework is that crime in the areas around dispensaries subject to closure is similar to that 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 cannot make any claims about the long-term changes associated with dispensary closures.

Our primary results are presented in Table 6. The difference-in-differences estimates indicate that crime actually *increases* in the neighborhood (0.3 to 0.6 of a mile) around dispensaries that closed compared with those that remained open.[27] Specifically, we find that total crime increases by about 60 percent

[25] The radii calculations used here are not corrected for the curvature of the earth. Chang and Jacobson (2011) find very similar results when this correction is made.

[26] Since dispensaries tend to cluster (see Figure 1 and also Figure 2, which zooms into the neighborhood of Venice), a given radius may capture crime around both closed and open dispensaries. This is problematic for the empirical strategy only if the clustering is by closure status. Chang and Jacobson (2011) show that clustering is independent of closure status, meaning that the likelihood that a closed dispensary is near another closed dispensary is the same as the likelihood that an open dispensary is near a closed dispensary. In this case, clustering may reduce power and decrease the precision of our estimates. Assuming that the effect of closure clustering does not have multiplicative effects, it will generate a lower bound estimate of the true effect of closures on crime. This type of power issue should diminish with distance around the dispensary, since the contribution of any cluster to the radius will be reduced.

[27] Table 7 reports the results of Table 5 (including confidence intervals) in percentage terms.

Table 6
Average Increase in Daily Crime Reports Associated with Closures, with Confidence Intervals

Crime Type	Radius Around Dispensary			
	0.3 Miles	0.6 Miles	1.5 Miles	3 Miles
Total crimes	0.013 (0.006) 59% [5.4%, 114%]	0.017 (0.008) 24% [0.4%, 47%]	0.005 (0.020) 1.1% [–8%, 10%]	0.012 (0.034) 0.9% [–4.2%, 6%]
Theft	0.006 (0.006) 46% [–0.01%, 77%]	0.006 (0.006) 15% [–13%, 46%]	0.015 (0.016) 6.8% [–7.7%, 21%]	–0.017 (0.026) –2.7% [–10.7%, 5.4%]
Breaking and entering	0.006 (0.003) 150% [–5%, 275%]	0.007 (0.004) 58% [–5%, 125%]	–0.003 (0.009) –4% [–27%, 18.6%]	0.001 (0.013) 0.4% [–12%, 13%]
Assault	0.003 (0.002) 150% [–7.5%, 400%]	0.008 (0.003) 89% [13%, 166%]	0.004 (0.010) 5.8% [–22%, 34.7%]	0.0001 (0.019) 0.042% [–15%, 16%]
Observations	12,600	12,600	12,600	12,600

NOTES: Data are from CrimeReports (undated) for May 28, 2010, through June 17, 2010, for areas of the specified distance surrounding dispensaries. We have 21 days of data for 600 dispensaries; 430 were ordered to close, and 170 were allowed to remain open. Each cell represents a separate regression. The first entry in each cell is the coefficient on β from Equation 1 and represents the change in crimes post-closure. All regressions include date fixed effects and dispensary fixed effects. Standard errors are clustered at the dispensary level and given in parentheses. We also present the percentage change in crime that this estimate represents, relative to the mean crime count, and the 95-percent confidence intervals expressed as a percentage in brackets.

within 0.3 miles of a closure relative to 0.3 miles around an open dispensary.[28] The effect diminishes with distance: Within 0.6 miles the increase is about 25 percent, and by 1.5 miles out there is no perceptible change in crime. The effects are concentrated on crimes, such as assault and breaking and entering, that may be particularly sensitive to the presence of security. Incidents of breaking and entering increase by about 50 percent within four blocks, and assaults increase by about 90 percent after the dispensaries are closed. While these results are statistically significant and imply very large increases in crime, our confidence intervals are quite wide, so the estimated increase should be interpreted with some caution.[29]

We performed several sensitivity analyses and robustness checks (shown in the appendix). First, to test the sensitivity of our results to specifying crime in levels, we estimated models that analyze the log of crime plus 0.1; we add 0.1 because in small-enough areas or categories, there are no crimes, and thus the log is not defined. Results from this specification (in Table A.2) are qualitatively similar, though they suggest small percentage increases.[30] 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. Results from this "matched" sample (provided in Table A.3) are qualitatively similar, although they are slightly larger and more precisely estimated for both total crime counts and breaking and entering. Finally, we replicated our analysis on the main sample but recode as open those dispensaries that, according to reports from the *Los Angeles Times* and *LA Weekly*, remained open even though they were ordered to close.[31] Accounting for these defiant dis-

[28] The 60 percent figure is calculated by dividing the mean change in total crimes post-closure, 0.013, from Table 5 by the mean of 0.022 total daily crimes within 0.3 miles reported in Table 4.

[29] Although these effects seem large, work on the effects of drug enforcement on crime often finds very large effects. For example, Miron (1999) finds that a 1-percent increase in drug enforcement expenditures or projected expenditures is associated with increases in the homicide rate on the order of 25 to 50 percent, relative to the maximum value of the homicide rate in the sample (rather than the mean, as we use here).

[30] A preferred model for crime counts might be a Poisson or negative binomial regression. However, because of the sparseness of the data at small distances (e.g., 0.3 or 0.6 miles), these models often cannot be solved (i.e., they do not converge). Where they do converge, the percentage change in crime is quite similar to the implied effects from our main specification in Table 6.

[31] Defiant dispensaries were identified based on the following reports: Rubin and Hoeffel (2010) and Wei and Romero (2010).

pensaries yields results (provided in Table A.4) that are again qualitatively similar, although they are slightly larger and/or more precisely estimated for total crime counts, theft, and breaking and entering.

We note that these findings are based on data collected around a relatively small window (ten days) before and after the closing of the dispensaries.

Discussion: Why Would Crime Decrease After Dispensary Closings?

In the previous section, we demonstrated that the closing of marijuana dispensaries in Los Angeles was associated with a rather immediate and sharp increase in total crime and in theft, breaking and entering, and assault. Given the conventional association between drug markets and crime, these findings are surprising. Here we offer a handful of possible explanations and suggestions for future research.

First, marijuana dispensaries in operation may have reduced crime by providing additional on-site security. California regulations require that dispensaries ensure adequate security. As a result of the value of marijuana and the cash necessary to run a dispensary, many dispensaries employ security services, in some cases around the clock. These security services may reduce crime in the immediate neighborhood, particularly such crimes as breaking and entering and robbery, which may respond more to formal and informal observation. Such an effect has been observed in studies of business improvement districts that pay for security services in neighborhoods in Los Angeles (Brooks, 2008; Cook and MacDonald, 2011). Future research might test this hypothesis by determining the extent of security that the various dispensaries employed to see if that had an effect on the reduction.

Second, operating marijuana dispensaries may reduce crime by increasing local foot traffic and "eyes on the street." Many of the marijuana dispensaries operated with extended hours. These extended hours may have brought more foot traffic to the neighborhood, which may, in turn, have deterred the "dark alley" crimes that were associated with a closing of the dispensaries. This may have interacted with the security explanation, if the dispensaries provided guards visible on the street to protect their customers. This hypothesis might be tested by comparing the effect of the dispensary closures with some other category of store closure—perhaps pharmacies, which have somewhat similar issues, or other retail operations. Such a comparison might test whether there is an effect specific to marijuana dispensaries or whether closing any retail establishment increases local crime. On the other hand, such comparisons are imperfect because closures in these cases might result from a declining neighborhood or bad economy—factors that would have an independent effect on crime. An alternative approach we are currently pursuing is to assess whether closure effects differ according to the population or retail density around a dispensary. If the increase in crime is due primarily to reduced traffic, then these effects should be larger in less-trafficked areas.

Third, the effect may 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, this hypothesis may be testable with data on drug arrests or on the source of drug purchases.

Fourth, 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. One could test this hypothesis by obtaining data about LAPD service allocation and arrest records to see if areas with dispensaries were targeted more intensively.

Fifth, the effect might be explained by some other police-related efforts in connection with the efforts to close the clinics. Perhaps the police stepped up local enforcement efforts in order to encourage dispensaries to close. Once the clinics closed, police went elsewhere and crime surged. To test this hypothesis, one could examine crime data during a larger window around the closing of the clinics. This would allow us to see if the estimated effect persists over a longer period. In ongoing work, we are extending the window around the closures to include several weeks before and after June 7, 2010.

Conclusion

The vast majority of Americans favor legalizing marijuana for medical purposes. Activists have harnessed this support to pass medical marijuana laws in 16 states and the District of Columbia, and more states are likely to follow.

Since the first medical marijuana law was passed by California in 1996, states have focused increasingly on how to regulate the supply side of this market. These efforts respond in part to thriving retail medical marijuana dispensaries in such cities as Los

Figure 2
Geographic Distribution of Medical Marijuana Dispensaries in Venice, California, as of June 7, 2010

Angeles and the presumed crime and quality of life problems they bring with them.

However, state efforts to regulate and, in some cases, institutionalize medical marijuana manufacturing and distribution have met with warnings from DOJ. Many have scaled back their efforts or abandoned their efforts altogether.

This recent turn of events suggests that local approaches to regulating marijuana may proliferate nationwide, as they do in California. Localities will consider 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.

As part of the case study, we use Los Angeles's experience ordering the close of hundreds of dispensaries to test the commonly 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 the medical marijuana dispensaries is associated with an increase—rather than the expected decrease—in local crime in a short-term ten-day period. Overall crime increased almost 60 percent in the blocks surrounding closed clinics in the ten days following their closing. We offer a variety of plausible hypotheses to explain this finding. Further research is necessary to determine whether the effect is truly the result of marijuana dispensaries preventing crime in the local neighborhood. 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. ■

Appendix

Table A.1
Pre-Closure Difference in Crime Counts Around Dispensaries Allowed to Remain Open and Ordered to Close

	Radius Around Dispensary			
Ln(Crime Type)	**0.3 Miles**	**0.6 Miles**	**1.5 Miles**	**3 Miles**
Total crimes	0.004 (0.005) [0.026]	–0.005 (0.011) [0.068]	–0.088 (0.032) [0.371]	–0.017 (0.074) [1.35]
Theft	0.001 (0.004) [0.013]	0.001 (0.008) [0.042]	0.021 (0.017) [0.198]	0.035 (0.032) [0.648]
Breaking and entering	0.004 (0.002) [0.08]	0.0001 (0.003) [0.013]	–0.016 (0.008) [0.065]	–0.005 (0.016) [0.220]
Assault	0.0016 (0.0014) [0.004]	–0.002 (0.003) [0.008]	0.016 (0.009) [0.056]	0.021 (0.018) [0.253]
Observations	6,600	6,600	6,600	6,600

NOTES: Data are from CrimeReports (undated) for May 28, 2010, through June 6, 2010, for areas of the specified distance surrounding dispensaries. Each cell represents a separate regression. The first number in each cell is the mean difference for open dispensaries minus closed dispensaries. The standard error on the difference is in parentheses. The mean crime count for dispensaries allowed to remain open is given in brackets.

Table A.2
Sensitivity Analysis: Log Crime Specification and Average Percentage Increase in Daily Crime Reports Associated with Closures

	Radius Around Dispensary			
Ln(Crime Type)	**0.3 Miles**	**0.6 Miles**	**1.5 Miles**	**3 Miles**
Total crimes	2.14 (1.12) [–0.075, 4.35]	2.51 (1.46) [–0.36, 5.39]	1.16 (2.64) [–4.03, 6.35]	0.25 (2.97) [–6.09, 5.58]
Theft	0.32 (0.61) [–0.87, 1.51]	0.41 (0.99) [–1.54, 2.36]	0.49 (2.13) [–3.70, 4.68]	–1.12 (2.60) [–6.23, 3.98]
Breaking and entering	1.19 (0.60) [0.01, 2.36]	1.50 (0.82) [–0.11,0.31]	–0.36 (1.56) [–3.42, 2.71]	3.73 (2.29) [–0.78, 8.24]
Assault	0.82 (0.58) [–0.33, 1.96]	1.11 (0.69) [–0.23, 2.45]	–0.29 (1.50) [–3.23, 2.65]	1.83 (2.23) [–2.56, 6.21]
Observations	12,600	12,600	12,600	12,600

NOTES: Data are from CrimeReports (undated) for May 28, 2010, through June 17, 2010, for areas of the specified distance surrounding dispensaries. Each cell represents a separate regression. The first entry in each cell is the coefficient on β from Equation 1 with log(*crime* + 0.1) as the dependent variable and represents the change in crimes post-closure. All regressions include date fixed effects and dispensary fixed effects. Standard errors are clustered at the dispensary level and given in parentheses; 95-percent confidence intervals are given in brackets.

Table A.3
Sensitivity Analysis of the Average Increase in Daily Crime Associated with Closures: Restricting to Areas with Both Open and Closed Dispensaries

	Radius Around Dispensary			
Crime Type	**0.3 Miles**	**0.6 Miles**	**1.5 Miles**	**3 Miles**
Total crimes	0.015 (0.006) [0.0029, 0.028]	0.020 (0.009) [0.003, 0.037]	0.014 (0.019) [–0.024, 0.052]	0.016 (0.030) [–0.044, 0.076]
Theft	0.005 (0.004) [–0.002, 0.011]	0.009 (0.006) [–0.003, 0.021]	0.014 (0.016) [–0.019, 0.046]	–0.016 (0.026) [–0.067, 0.035]
Breaking and entering	0.007 (0.003) [0.0007, 0.013]	0.011 (0.004) [0.003, 0.019]	0.007 (0.008) [–0.009, 0.024]	0.020 (0.013) [–0.0047, 0.045]
Assault	0.004 (0.003) [–0.0012, 0.0089]	0.003 (0.003) [–0.002, 0.009]	0.011 (0.009) [–0.008, 0.029]	0.005 (0.019) [–0.033, 0.042]
Ln(Total crimes)	2.56 (1.15) [0.30, 4.82]	3.06 (1.45) [0.20, 5.91]	3.27 (2.45) [–1.16, 8.61]	1.98 (3.06) [–4.03, 7.99]
Ln(Theft)	0.32 (0.61) [–0.87, 1.52]	0.98 (1.01) [–1.00, 2.96]	1.00 (1.90) [–2.73, 4.73]	–0.86 (2.63) [–6.01, 4.29]
Ln(Breaking and entering)	1.47 (0.63) [0.22, 2.71]	2.29 (0.85) [0.62, 3.96]	0.85 (1.48) [2.05, 3.75]	5.06 (2.16) [0.82, 9.31]
Ln(Assault)	0.92 (0.62) [–0.30, 2.13]	0.84 (0.68) [–0.50, 2.17]	1.11 (1.44) [–1.71, 3.94]	2.35 (2.20) [–1.96, 6.66]
Observations	11,046	11,046	11,046	11,046

NOTES: Sample is restricted to 526 dispensaries located in zip codes that have both dispensaries that were subject to closure and dispensaries that were allowed to remain open. Data are from CrimeReports (undated) for May 28, 2010, through June 17, 2010, for areas of the specified distance surrounding dispensaries. Each cell represents a separate regression. The first entry in each cell is the coefficient on β from Equation 1 and represents the change in crimes post-closure. All regressions include date fixed effects and dispensary fixed effects. Standard errors are clustered at the dispensary level and given in parentheses. Confidence intervals at the 95-percent level for the estimate are provided in brackets.

Table A.4
The Average Increase in Daily Crime Reports Associated with Closures: Coding Known Defiant Dispensaries as Open

	Radius Around Dispensary			
Crime Type	**0.3 Miles**	**0.6 Miles**	**1.5 Miles**	**3 Miles**
Total crimes	0.014 (0.006) [0.002, 0.025]	0.021 (0.008) [0.005, 0.038]	–0.001 (0.020) [–0.040, 0.038]	0.025 (0.033) [–0.040, 0.090]
Theft	0.006 (0.003) [–0.001, 0.013]	0.010 (0.006) [–0.002, 0.022]	0.016 (0.016) [–0.015, 0.047]	–0.006 (0.026) [–0.056, 0.043]
Breaking and entering	0.005 (0.003) [–0.0003, 0.011]	0.008 (0.004) [0.001, 0.016]	–0.004 (0.009) [–0.021, 0.012]	0.002 (0.013) [–0.023, 0.028]
Assault	0.003 (0.002) [–0.0015, 0.008]	0.008 (0.003) [0.0011, 0.014]	0.001 (0.010) [–0.018, 0.020]	0.004 (0.019) [–0.033, 0.042]
Observations	12,600	12,600	12,600	12,600

NOTES: Data are from CrimeReports (undated) for May 28, 2010, through June 17, 2010, for areas of the specified distance surrounding dispensaries. Each cell represents a separate regression. Four defiant dispensaries were identified from the *Los Angeles Times* report on LAPD raids and another four from an *LA Weekly* report—see Rubin and Hoeffel (2010) and Romero and Wei (2010). The first entry in each cell is the coefficient on β from Equation 1 and represents the change in crimes post-closure. All regressions include date fixed effects and dispensary fixed effects. Standard errors are clustered at the dispensary level and given in parentheses; 95-percent confidence intervals are given in brackets.

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About This Report

This report presents an overview of the medical marijuana landscape nationwide along with preliminary findings on the relationship between closing medical marijuana dispensaries and local crime. The empirical analysis represents a portion of ongoing work by Mireille Jacobson and Tom Chang to more thoroughly understand the relationship between medical marijuana dispensaries and crime. It is also related to a larger project by the authors to understand the relationship between land-use law, the built environment, crime, and public health, funded by the Robert Wood Johnson Foundation's Public Health Law Research program. The report should be of particular interest to agencies and policymakers who are charged with regulating medical marijuana and to those who are interested in the relationship between medical marijuana and crime.

The RAND Safety and Justice Program

This research was conducted in the Safety and Justice Program within RAND Infrastructure, Safety, and Environment (ISE). The mission of RAND Infrastructure, Safety, and Environment is to improve the development, operation, use, and protection of society's essential physical assets and natural resources and to enhance the related social assets of safety and security of individuals in transit and in their workplaces and communities. Safety and Justice Program research addresses all aspects of public safety and the criminal justice system—including violence, policing, corrections, courts and criminal law, substance abuse, occupational safety, and public integrity.

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