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Regulating Marijuana in California



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SUMMARY

CONTENTS

Introduction	5
How Did We Get Here?	6
California’s Evolving Marijuana Law	6
Regulation and Trade-offs	9
Cultivation and Production	10
Sales, Use, and Consumption	13
Taxes and Finance	15
Public Safety and Public Health	17
Governance and Accountability	23
Conclusion	26
References	27
About the Authors	30
Acknowledgements	30

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California led the nation in 1996 when it declared that marijuana use for medical purposes would no longer be a crime. Twenty years later, four states and the District of Columbia have legalized recreational marijuana use. In November 2016, Californians will be asked whether the state should follow suit.

This report does not consider the wisdom of marijuana legalization. Instead, it takes the view that, if recreational marijuana use becomes legally sanctioned, then the debate must turn to how to design regulations that reconcile important, but differing policy goals. These include, among others, limiting the impact of the illegal marijuana market, reducing harm to public health and safety, and raising revenue for the state.

The report explores the approach Washington and Colorado have taken to regulating recreational marijuana markets. These two states have histories of legal recreational marijuana that, though brief, are the longest in the nation.

What lessons can be gleaned from these experiments? Both states have designed mechanisms to track legal cultivation and production, thereby reducing the diversion of marijuana to the illegal market. They also tax marijuana transactions, collecting tens of millions of dollars in revenue. And it appears that neither overall use nor use by young people has risen dramatically. However, as in California, levels of use were already higher in those states than in the rest of the country.

To limit the impact on public safety, both Washington and Colorado established legal definitions of drugged driving. Since then, in both states, greater numbers of people have been charged with driving under the influence. Nonetheless, it is impossible to determine whether those increases mean drugged driving has become more prevalent or that law enforcement is more vigorous. In addition, the change in marijuana’s legal status challenges drug abuse prevention specialists to develop effective messages.

The short experience with legal recreational marijuana in Colorado and Washington and the lack of data on California’s marijuana market make it difficult to derive policy recommendations. However, from a governance perspective, it is possible to draw some general lessons for California. Three in particular stand out: (1) Both Colorado and Washington significantly adjusted marijuana regulation shortly after legalization. We suggest that California approach legalization with an eye toward flexibility. The regulatory process should be designed to facilitate needed changes. (2) Such an adaptable regulatory model will require a mechanism for collecting data on the marijuana market and evaluating the consequences of use. A strong and transparent reporting system will help ensure that future changes are based on solid research and analysis. (3) Finally, this is a venture into uncharted territory, and marijuana

remains illegal under federal law. These considerations suggest that California should err on the side of caution and adopt a relatively restrictive regulatory model for both the recreational and medical markets. A tight, single market will make marijuana laws easier to enforce and to reduce diversion to other states and underage users. To be sure, a highly regulated legal market will undoubtedly be accompanied by a robust illegal market. From a political perspective though, it will be easier to loosen a tight market than to tighten a loose one.

Introduction

Amid changing perceptions about the danger of marijuana, states across the nation have relaxed and, in some cases, effectively eliminated legal restrictions against marijuana use. California was a leader in this shift 20 years ago when it passed Proposition 215, becoming the first state to allow possession of small amounts of marijuana for medical use. Since then, 23 other states plus the District of Columbia, representing about half the nation's population, have enacted laws permitting medicinal marijuana use. Four of these states plus the District of Columbia, accounting for almost 6 percent of the U.S. population, have gone a step further by legalizing recreational use.

A range of factors is driving these changes. These include the perception that the nation's so-called war on drugs has failed, the disproportionate impact of drug enforcement on low-income and minority communities, and a broader criminal justice reform agenda. Whatever the reason, the public's attitude toward legalization is changing. Today, 58 percent of Americans believe that marijuana should be legal, compared with about 20 percent two decades ago.¹ In California, 55 percent of likely voters support legal recreational marijuana, an increase of 6 percentage points over five years (Baldassare, Bonner, and Lopes 2015). These shifting attitudes could lead as many as 12 states to put proposals before voters to legalize recreational marijuana use. In California, a legalization initiative similar to the proposed Control, Regulate and Tax Adult Use of Marijuana Act (AUMA) is likely to appear on the November 2016 ballot. If all 12 states vote to eliminate marijuana prohibitions, almost 60 percent of Americans will live in places where recreational use is permitted (see [Technical Appendix A](#)). This major policy shift raises an important challenge: How should we regulate an industry that used to be illegal under state law and remains illegal under federal law?

This report does not address the wisdom of marijuana legalization. Instead it asks, if legalization is to become a fact of life, then how should marijuana be regulated? And what are the trade-offs inherent in different approaches to legalization? These questions have arisen before. In 2010, the last time recreational marijuana use was on the California ballot, the RAND Corporation analyzed the potential impact on consumption and public budgets (Kilmer et al. 2010).² In March 2015, the Blue Ribbon Commission on Marijuana Policy, led by the lieutenant governor and the ACLU of California, performed an in-depth investigation of legalizing recreational use. The commission identified youth education and protection, public safety, and taxes as key areas of concern (Newsom et al. 2015). This report builds on those works by outlining some of the regulatory and public policy questions raised by legalization.

We begin by reviewing the evolution of California's approach to regulating marijuana and the complicated relationship between state and federal law. The report then considers what kind of framework and regulatory system would best achieve the varying goals of marijuana regulation. In particular, this report examines the trade-offs associated with different regulatory regimes based on the examples of Washington and Colorado, the two states with the most experience implementing recreational marijuana laws. We find that the potential effects of legalizing recreational marijuana are less predictable across many dimensions than other changes in public policy. If California makes this change, policymakers should establish an outcome-oriented regulatory regime that identifies specific objectives. Such an approach, combined with a monitoring capacity to measure social and economic effects, will allow policymakers to implement constructive regulatory changes.

¹ This level ties Gallup's high point in its 46-year history of polling on this subject. See [Gallup Analytics from October 2015](#).

² RAND more recently published an analysis of the key policy questions surrounding legalizing marijuana in Vermont. While Vermont is in many ways a different state than California, much of the analysis and many of the issues they raised are common to all states (Caulkins et al. 2015).

How Did We Get Here?

In 1996, California enacted Proposition 215, becoming the first state to legalize medical marijuana. Two decades later, the state has large, well-established groups of growers, processors, and retailers. After California legalized marijuana for medical use, 23 other states and the District of Columbia followed suit. Subsequent moves by

Marijuana Legalization in the US after 2016?

Twenty-four states and the District of Columbia have laws permitting medical use of marijuana.

As of 2015, Alaska; Colorado; Oregon; Washington; the District of Columbia; and Guam; plus Portland and South Portland, Maine; and Detroit, Ferndale, Flint, Jackson, and Lansing, Michigan; have legalized recreational marijuana use. That picture could change dramatically after the 2016 elections. Legalization referendums are seeking ballot access in another 11 states.

- 154 million people, 48.3% of the US population, currently live in jurisdictions with legalized medical marijuana use.
- 18 million people, 5.6% of the population, live in jurisdictions where marijuana is legal for both recreational and medical purposes.
- After 2016, another 100 million people, 31.4% of the population, could live in states permitting recreational marijuana use.
- In total, 185 million people, 58% of the population, could live in jurisdictions with legal medical and/or recreational marijuana use by the end of 2016.

Colorado and Washington to permit recreational use of marijuana were viewed as experiments that authorities in the US and other nations could learn from. However, what were originally deemed isolated experiments appear to have been supplanted by a national movement for marijuana legalization. If all the jurisdictions currently considering legalizing recreational marijuana do so, then, by the end of 2016, almost 60 percent of the US population will live in places where medical use, recreational use, or both are permitted ([Technical Appendix A](#)). Even if legal recreational use is still considered an experiment, no one can deny its scale. This puts the question of how best to regulate this new industry at the forefront of the policy agenda. And it raises the issue of whether the federal government should combat the movement or respect the wishes of the states and their constituents.

Regardless of what the federal government does, Californians are weighing whether to move marijuana on the regulatory spectrum by voting on the question of legalizing marijuana for recreational use.

California's Evolving Marijuana Law

Marijuana law has been evolving for more than one hundred years. California first passed legislation restricting its use in 1913.³ Since then, the state has made several changes to its marijuana laws, sometimes increasing, and at other times relaxing, restrictions ([Technical Appendix B](#)). In 1996, California became the nation's first state to legalize medicinal use of marijuana.⁴ Since then, the state has taken additional steps to reduce penalties for unauthorized marijuana possession despite voter rejection in 2010 of a measure to legalize recreational use.⁵

Recent changes have had significant consequences. Arrests for marijuana possession in California dropped by more than 80 percent in 2011, the year after passage of SB 1449, which made unauthorized possession of less than one ounce of marijuana similar to a traffic violation. In 2011, public safety realignment (AB 109) shifted responsibility for supervising many low-level offenders from state prisons to county jails in an attempt to reduce

³ Amendment to the state's Poison Law. For further reading see Gieringer 2006.

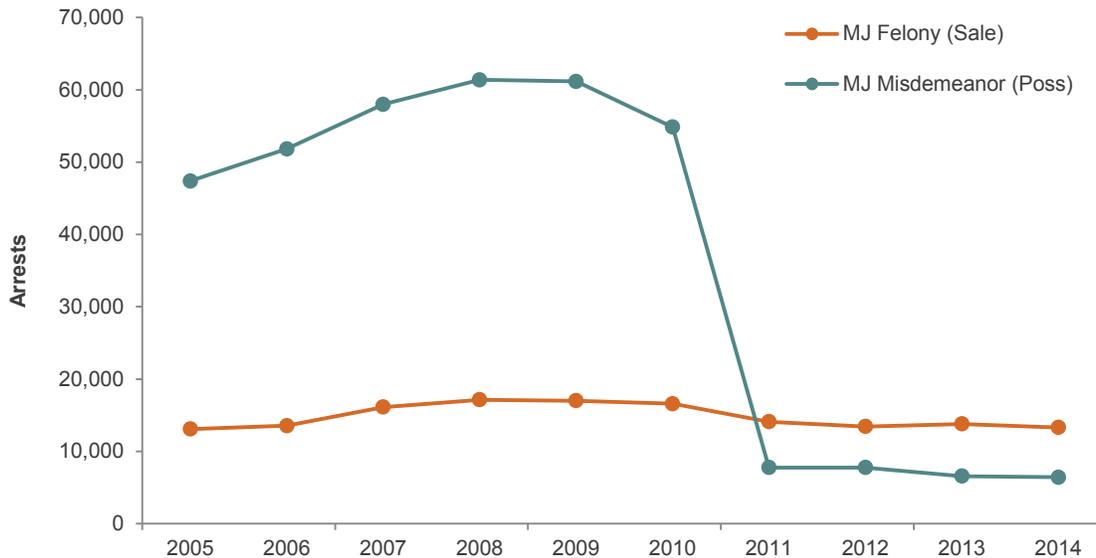
⁴ California Proposition 215 passed in 1996 with 55.6 percent of the vote.

⁵ Proposition 19 garnered 46.5% of the vote in the fall 2010 election.

prison overcrowding. One consequence was that about 18,000 non-serious, non-violent offenders were redirected from incarceration, including many serving drug sentences. In 2014, Proposition 47 reclassified a number of felonies as misdemeanors, including drug possession. The law was applied retroactively, reducing county jail populations by 10,000 in the first few months, including many drug offenders (Lofstrom and Martin 2015).

FIGURE 1

Marijuana misdemeanor arrests dropped dramatically after decriminalizing possession of marijuana



SOURCE: State of California Department of Justice.

In 2015, California passed three bills to regulate the medical marijuana industry: SB 643, AB 266, and AB 243, known collectively as the Medical Marijuana Regulation and Safety Act (MMRSA). Coming 20 years after passage of Proposition 215, the laws established a new Bureau of Medical Marijuana Regulation under the Department of Consumer Affairs and laid out requirements for tracking medical marijuana distribution. The legislation also assigned other departments responsibility for product testing and ensuring that marijuana cultivation is subject to environmental protection.⁶ MMRSA envisioned two marijuana markets in California—one recreational and one medical. In Colorado, dual markets have complicated legalization, while, in Washington, merging recreational and medical markets has proven difficult.

While the states have moved steadily toward a less-restrictive approach to marijuana in recent years, the federal story is muddled. Marijuana is illegal under the US Controlled Substances Act of 1970 (CSA) and is classified as a Schedule I drug with no medical use.⁷ The CSA bans marijuana-related businesses; the possession, cultivation, and production of marijuana-infused products; and the distribution of marijuana and products derived from it.

⁶ Different provisions establish responsibilities for the Departments of Food and Agriculture, Public Health, Pesticide Regulation, Fish and Wildlife, and the State Water Board.

⁷ Other schedule I drugs are heroin and LSD. Cocaine, oxycodone, and methamphetamines are schedule II drugs under the CSA as they have some medical applications.

Moreover, on two separate occasions the US Supreme Court ruled that the CSA trumps state law.⁸ That means that the federal government has the option of enforcing US drug laws, creating a climate of legal uncertainty.⁹

Although the CSA's basic prohibition remains in force, the Obama administration's Justice Department has issued memoranda characterizing enforcement of federal marijuana prohibitions as low priority and instructing federal prosecutors not to take action against individuals complying with state medical marijuana laws. Congress has inserted similar language in budget bills (see [Technical Appendix B](#)). In essence, the federal government has decided to take a hands-off approach and not enforce anti-marijuana laws under some circumstances. However, the administration's policy does not carry force of law. Future administrations could shift policy, leaving the question of federal prosecution unresolved.

⁸ In the 2001 case, *United States v. Oakland Buyers Cooperative* (532 U.S. 483), the court unanimously rejected the notion that medical need was a defense for violating the Controlled Substances Act by selling marijuana, regardless of its status under state law. Four years later, in *Gonzales v. Raich* (previously *Ashcroft v. Raich* 545 U.S. 1 2005), the Court ruled 6-3 that an individual could not legally grow marijuana for medical use regardless of its status under state law.

⁹ States' rights proponents argue that states have the authority to diverge from federal law regarding regulation and control of marijuana for reasons of public health. See www.kcba.org/druglaw/pdf/summary_sr.pdf.

Regulation and Trade-offs

With the looming possibility that Californians will vote to permit recreational marijuana, the challenge facing policymakers will be to design a regulatory regime. Marijuana regulations will cut across many policy and program areas, including health, public safety, agriculture, environment, revenue collection, parks and recreation, education, and workplace rules. In designing marijuana regulations, authorities must define a set of objectives aligned with the public's desire for reform.

California, like the states that have acted before it, can pursue several objectives in regulating recreational marijuana (Pacula et al. 2014). But how can the value of different objectives be measured? And what if pursuing one objective works at cross-purposes with another? The ideal approach in comparing different regulatory models is to systematically weigh costs and benefits.

Unfortunately, little is known about how either the medical marijuana market or the illicit market are functioning in California and other states. It is impossible to say with certainty what the impact of key regulatory elements would be, which makes performing a net cost/benefit analysis exceptionally difficult.¹⁰ To be sure, MMRSA passage last year means California will not be starting from scratch. But the law's provisions haven't been fully implemented, so assessment is not yet possible.

In this report, we identify elements incorporated in most regulatory efforts to date and analyze them according to specific objectives. For the sake of simplicity, we group regulatory objectives in five general policy areas:¹¹

- **Cultivation, production, and processing.** This area focuses on turning marijuana plants into finished products and the sale of those products to consumers.
- **Sale, consumption, and possession.** This area concerns how the state should regulate consumer use. For example, if recreational marijuana is legalized, what rules will apply when consumers possess more than the legal limit?
- **Taxes and finance.** How should marijuana be taxed? Will taxes be based on price, weight, potency, or other factors? How will taxes be collected?
- **Public health and safety.** This area concerns minimizing harm to users by limiting abuse. It also covers preventing harm to others from drugged driving or workplace use, for example.
- **Governance.** What is the role of state government in setting policy and enforcing regulations? How can performance assessment and scientific research guide policy?

¹⁰ One recent report attempts to identify the complexities facing employers who are confronted with legal medical or recreational marijuana. The findings are qualitative, based on an expert panel's conclusion that legalization will increase employer costs. (See Rusche and Sabet 2015).

¹¹ Our categorization is not perfect and their boundaries overlap.

TABLE 1

A simple framework for structuring a regulatory model

Regulatory area	Goals	Regulatory Examples
Cultivation, production, and processing	Manage cultivation, limit supply, product standardization, quality control, eliminate diversion, protect the environment	Licensure, canopy limits, location (e.g., distance from schools), plant tracking, use of pesticides, employee age and criminal history, flower/trim tracking, concentrates/extracts standards, waste management, THC/CBD restrictions, packaging, employee age and criminal history, owner/employee residency requirements, product labeling, warning labels
Sale, consumption, and possession	Limit access by youth, reduce arrests, eliminate diversion	Age restrictions, product sale limits, inventory control, age of seller and employee restrictions, outlet types and density restrictions, product pricing, advertising, nonresident sale/use, hours of operation, advertising, gifting, home grows, use in public, personal possession of amounts above state limits
Taxes/finance	Limit abuse and dependence, raise revenue, limit illegal markets, prevent diversion	Excise taxes; licensure fees; use of proceeds, i.e., general fund and/or earmarking of marijuana tax revenue for prevention, treatment, regulatory enforcement, and research
Public health/public safety	Limit abuse and dependence, quality control, prevent impaired driving	Use and driving, workplace use, prevention and treatment programs, use/consequences monitoring and evaluation
Governance	Oversee and ensure compliance, mount public information campaign focused on legalization costs and benefits	State regulatory oversight, regulatory enforcement, marijuana policy outcome monitoring, regulatory flexibility

NOTES: Table 1 is intended to provide examples. See [Technical Appendix C](#) for a more detailed description of the framework.

We discuss below each of these areas in greater detail, drawing from the experiences of Washington and Colorado—the two states with the longest histories of regulating recreational marijuana. We examine the regulatory options available to California based on the principle that marijuana rules should be simple and transparent while allowing for future modification. In each of the five areas, we identify an approach consistent with a tightly regulated market that limits the scale of operations and participation. If regulations based on this standard prove too tight, they can be loosened at some future point.

Cultivation and Production

The federal government does not want marijuana grown and sold legally in California to go to other states. In addition, both federal and state officials want to prevent criminal enterprises from benefiting from legally produced marijuana. Governments at all levels also want to limit access to marijuana by minors.¹² Consequently, California would benefit from robust regulation of the entire supply chain, including cultivators, producers, wholesalers, and retailers, as well as regulation of product transportation along the supply chain.

A significant and relatively unique challenge facing California is the size of its marijuana market. Currently, marijuana is legally grown and processed solely for the medical marijuana market. But California is also a large supplier to the illegal market outside the state (Drug Enforcement Administration 2014). Therefore, incentives must be created to draw participants into the legally licensed supply chain. In addition, to mitigate concerns about diversion, a “seed-to-sale” tracking system is needed to monitor the quantity of marijuana supplied to Californians for medical and recreational purposes.

Colorado implemented its Marijuana Inventory Tracking System (metrc™) to track supply and prevent diversion. Washington State uses BioTrackTHC™ to track legal marijuana cultivation, production, testing, transportation, destruction, and retail sale. If California creates robust licensing and tracking systems, it will be putting its best

¹² Four of the eight guidelines in a 2013 federal memorandum, known as the “Cole Memo,” involve preventing the: 1) distribution of marijuana to minors; 2) revenue from the sale of marijuana going to criminal enterprises; 3) diversion of marijuana from states where it is legal to other states; and 4) state-authorized marijuana activity from being used to cover trafficking of illegal drugs or other illegal activity. The remaining guidelines apply to marijuana possession or growth on federal lands; drugged driving; and preventing violence and use of firearms in cultivation and distribution of marijuana.

foot forward in following federal guidance. Of course, stiff penalties to suppress the illegal market are essential for California's legal market to succeed.¹³

Licensing is a complicated question. How the market is licensed should depend on how much control and oversight California wants to exercise. The first issue is how to structure the marijuana industry. Should licensing encourage a vertically integrated market in which businesses operate throughout the supply chain, from cultivation, production, and processing to retail sale? Or should the industry be horizontally integrated, with businesses licensed in only one part of the supply chain? Vertical integration allows businesses to manage access to inputs throughout the production chain, enabling better cost control and more efficient delivery of products to consumers. But if the regulatory objective is to encourage wider participation in the marijuana industry, horizontal integration may be preferable. A horizontally structured industry could be designed to favor small businesses, while a vertically integrated industry might result in fewer businesses controlling the industry.

Washington has opted for horizontal integration. It offers separate marijuana licenses for cultivation, production, and retail sale, and market participants cannot hold all three licenses¹⁴. In contrast, Colorado encourages vertical integration, issuing marijuana licenses for cultivation, manufacturing, testing, and retail sale. A single individual or organization can own more than one license. In California, MMRSA appears to favor horizontal integration.¹⁵ As a starting point, this model may make sense for recreational marijuana too. As the market evolves, the state could reconsider how the market is integrated.

California must also consider the US Department of Justice desire to limit the number of participants in the legal marijuana industry. A strong licensing system that restricts participation would be easier to oversee than a more competitive market with numerous participants.¹⁶ Unlimited licensing could strain regulatory enforcement. However, limiting the number of licenses might jeopardize efforts to bring participants in the illegal industry into the legal fold. Colorado has not limited the number of licenses, but the application process is demanding. Washington initially limited recreational marijuana sales licenses to 334 based on estimated consumption levels. It later increased the limit to 556, citing a need to provide marijuana to medical patients.¹⁷

California also must set limits on the scale and location of production operations. These include canopy limits—limits on the area under cultivation and/or the number of plants—as well as cultivation rules in densely populated areas, such as not allowing marijuana facilities within 1,000 feet of a property line or near schools, recreational facilities, and the like. One approach would be to target total production for the legal market, determine a canopy limit, and calculate the number of licensed grows needed to meet that level of production. Placing limits on the number of production licenses an individual or organization can own would make it easier for small businesses to operate in the market.

Production regulations might include residency requirements. Limiting out-of-state investment could reduce criminal involvement and strengthen the state's economy by allowing California residents to benefit more from the marijuana industry's economic opportunities. However, short-term residency requirements might lead to an influx of new residents. Length-of-residency requirements affect who participates in the industry and when they do so. Colorado requires two-year residency to obtain a license. Washington has a six-month residency requirement for license applicants and financiers, that is, any entity giving money, gifts, or loans.

¹³ There is a perception that legalization carries a dividend in the form of reduced need for enforcement. This is an empirical question. It is conceivable that enforcement costs could increase because of the additional expense of regulating legal marijuana while suppressing the illegal industry.

¹⁴ Washington Initiative Measure No. 502 (I-502); appeared on the November 2012 ballot.

¹⁵ MMRSA changed medical marijuana licensing to allow for-profit businesses. The number of licenses available to entrepreneurs are not restricted.

¹⁶ MMRSA does contain a clause that permits marijuana businesses that have already integrated vertically to continue to operate in that manner until January 1, 2026.

¹⁷ From [Washington State Liquor and Cannabis Board Press Release, December 2015](#).

California is unique in the extent of environmental protection required to grow marijuana. Neither Colorado nor Washington included specific environmental protections in their legalization laws. By contrast, California’s medical marijuana regulations require mitigation of the “individual and cumulative effects of water diversion and discharge...[with regard to] instream flows needed for fish spawning, migration, and rearing.”¹⁸ In crafting future regulations, protections can require that marijuana waste be made unusable without harming the environment.

The discussion thus far assumes the market structure that is most commonly expected to prevail in the marijuana industry: a commercial style, competitive market that allows cultivation, production, and final sale to the private for-profit sector. This market would be regulated in accordance with an alcohol-style regime that has age restrictions regarding use, restriction on how and where use occurs, and other things such as product labeling. There are alternative market structures that might be considered, such as government monopolies, nonprofit corporations, and for-benefit organizations. The benefits and costs of these alternative structures would have to be carefully delineated (Caulkins et al. 2015).¹⁹ States that have legalized thus far use a commercial, competitive, but regulated market structure modeled after the alcohol industry; California’s medical marijuana industry is also structured this way. If policymakers seek to move quickly to allow recreational marijuana, they might choose to maintain this market structure.

One critical regulatory question concerns product testing. This requires labs qualified to test for mold, pesticides, tetrahydrocannabinol (THC) potency, and other variables.²⁰ THC potency data informs consumers about dosage and may be used to set taxes. In addition, regulations might place restrictions on potency itself. Increased demand for marijuana for legal recreational use may require more labs to ensure that testing delays don’t choke off supply. If legal supply falls too low because of testing bottlenecks, the illegal market might fill the gap with untested products. Increasing testing capacity sooner rather than later is the logical course for protecting product quality and consumer safety while suppressing the illegal market.

Marijuana-infused products—marijuana edibles—present additional challenges. Edibles can pose health risks to consumers unfamiliar with their delayed effects. After high-profile media stories raised concerns about marijuana edibles, Colorado created a task force to write regulations covering amounts that can be purchased, plus labeling and lab testing for potency. Meanwhile, Washington issued emergency regulations requiring that the Washington State Liquor and Cannabis Board approve product packages and labels. Washington also requires that labels prominently display serving-size information. The state also requires edible processors to follow available-for-inspection recipes ensuring serving-size consistency. Such standards reduce overdose risks and protect public health.²¹

Regulation of the production chain involves a range of related, but distinct issues designed to achieve different objectives. In order to protect the environment, structure the market, and prevent diversion to other states and minors, we recommend a regulatory structure that tightly documents and controls cultivation, production, processing, and sale of legal marijuana. A tight approach would limit the number of licenses and the scale of production, and impose strict testing requirements. Such a regime would help satisfy US Department of Justice guidelines now, but can be modified in the future. To be sure, a tightly regulated market has problems. It could create incentives to operate illegally, which would present risks to

¹⁸ California AB 266.

¹⁹ See table 4.1 of the RAND report for a review of the strengths and weaknesses of each alternative market structure.

²⁰ MMRSA task its Departments of Pesticide Regulation and Food and Agriculture with determine standards for pesticide usage in cultivating marijuana.

²¹ In Colorado and Washington, an individual serving cannot have more than 10 milligrams of THC and when sold as part of a group or bundle, that bundle cannot exceed 100 milligrams of THC. Washington further restricts the production processes of edibles to ensure consistency.

the environment and encourage diversion to minors and other states. Still, in our view, the advantages outweigh the disadvantages.

Sales, Use, and Consumption

Since recreational marijuana is currently against the law in California, legalizing it requires reforming the criminal code. Regulating legal access has two goals: revising the definition of criminal behavior while minimizing use by young people. Indeed, advocates say that decriminalizing use and distribution of marijuana is one of the greatest benefits of reform, both for the state and drug policy nationwide (Clockburn et al. 2013). Enforcement of those laws has disproportionately fallen on poor people and minorities. In theory, legal recreational use will reduce the burden on the state’s police, courts, prisons, and jails, saving money. As noted though, enforcing a new regulatory structure and suppressing the illegal market might ultimately cost the state more money.²²

Regulating recreational marijuana raises multiple questions. Table 2 shows some of the most important provisions adopted by Alaska, Colorado, Oregon, Washington, and the District of Columbia, where use is now legal. To greater or lesser degrees, the four states place restrictions on retail sales of recreational marijuana, and sale remains illegal in the District of Columbia.²³ Existing laws also limit when, where, and how marijuana may be consumed, packaged, and labeled.

TABLE 2
Regulating the sale, use, and consumption of marijuana

	Alaska	Colorado	Oregon	Washington	District of Columbia
Age restrictions	21 and older	21 and older	21 and older	21 and older	21 and older
Resident sales limits	Up to 1 ounce	Up to 1 ounce	Up to 1 ounce	Up to 1 ounce	Sales illegal
Fines, suspensions for sale to minors	Determined by Marijuana Control Board	License revocation or up to \$100,000 in fines	License cancellation and \$4,950 fine	License cancellation and \$2,500 fine	N/A
Public consumption	Unlawful	Unlawful	Unlawful	Unlawful	Unlawful
Drug “tourist” distinction	No distinction	Sales limited to 0.25 ounces to non-residents	No distinction	No distinction	N/A
Home grows for personal use	Permitted	Permitted	Permitted	Not permitted	Permitted
Local ordinances restricting sale/use	Permitted	Permitted	Local governments may not prohibit sales or use, except by general election referendum	Permitted	Congress can intervene

SOURCES: Alaska Ballot Measure 2, Colorado Amendment 64, Oregon Measure 91, Washington Initiative 502, and District of Columbia Initiative 71. NOTES: See [Technical Appendix B](#) for complete description of the provisions.

²² As noted in Figure 1, the number of adult arrests associated with marijuana dropped dramatically beginning in 2011. Criminal justice savings could be quite modest since it require a further drop in the number of adults arrested. Use and possession will remain illegal for those under 21.

²³ Congress prohibits the District from making expenditures to regulate recreational marijuana.

Alaska, Colorado, Oregon, and Washington limit recreational sales to people 21 or older. California is also likely to impose a 21-year age requirement. The concern about marijuana use by minors is supported by research showing that marijuana can affect brain development—particularly thinking and memory—and learning.²⁴

The decision to set an age requirement is a case of regulatory trade-off. Though many people favor legal recreational marijuana, understanding that such a reform would increase overall marijuana use, even the most ardent advocates hold that young people’s access to marijuana should be restricted in the same way their access to alcohol is restricted. By setting an age requirement, policymakers seek to limit youth exposure. However, keeping marijuana illegal for those under 21 means marijuana will remain a criminal justice matter. Providing marijuana to minors will still be a crime. Despite legal recreational use, enforcement of marijuana laws will remain a responsibility of the police and court systems.

The four states that have legalized recreational sales confine them to marijuana-only stores, a distinction from alcohol, which in many states is sold in groceries and other retail establishments. Neither Colorado nor Washington allow marijuana to be consumed on store premises, and public use is prohibited. The two states also give local authorities some control over whether marijuana stores can locate in their jurisdictions and what restrictions govern their operations.

Laws limiting access to marijuana will only be effective if they are enforced. California should implement stiff penalties on underage marijuana sales and apply the law similarly to the way rules prohibiting underage alcohol sales are enforced. To test retailer compliance, law enforcement agencies can implement youth purchase programs in which minors attempt to buy marijuana (National Institute on Alcohol Abuse and Alcoholism 2014). California can also mandate use of ID scanners for age verification or installation of closed-circuit televisions. In Colorado, the Marijuana Enforcement Division conducted 172 compliance checks between January 1, 2014, and September 30, 2015, according to the Department of Revenue. The agency found 16 violations, a 91percent compliance rate.²⁵ Washington completed its first round of compliance investigations in July 2015. It found 18 of 157 recreational marijuana stores sold to minors, an 88% compliance rate. The noncompliant business faced a 10-day suspension or \$2,500 fine.²⁶ Finally, California should consider extending the state’s social host law to marijuana. Currently, it makes adults and minors liable if they provide alcohol to those under 21 or allow them to consume alcohol on their property.²⁷

One wild card is home grows—marijuana cultivation for personal use. The states that allow personal cultivation limit the number of plants an individual may grow. Nonetheless, allowing home grows creates a loophole in cultivation and consumption regulation. Individuals found with marijuana that cannot be traced in the production tracking system, is unlabeled, or exceeds quantity limits can claim to have grown it at home. In order to maintain tight control over cultivation and consumption, Washington prohibits home grows. California should consider doing the same. By removing the home-grow loophole, such a step would simplify the question of possession. However, banning home grows would be unpopular with recreational marijuana supporters.

Consistent with creation of a tight market, we recommend restricting use to those 21 and over. Quantity limits should be imposed and marijuana should only be available in stores established specifically to sell it. To discourage underage sales, penalties for selling to minors should be significant, including possible license forfeiture.

²⁴ See the [National Institute on Drug Abuse](#).

²⁵ Reported in *The Denver Post* on September 30, 2015. Colorado Marijuana and Enforcement Division (MED), 2015.

²⁶ From [Washington State Liquor and Cannabis Board, July 2015 Press Release](#).

²⁷ Under the law, recently upheld by the State Supreme Court (*Ennabe v Manosa*, 2014), victims of crimes committed by minors may seek damages from the person who gave them alcohol or allowed them to consume it.

Taxes and Finance

Taxes are usually seen as measures to raise revenue for government. But, for certain products perceived as having harmful social or health effects, taxation provides a way to influence consumer choice and reduce negative consequences. Depending on how taxes are levied, they affect a product's price. Higher prices tend to lower consumption, thereby reducing the harm a product causes.²⁸ Policymakers must determine the goals of marijuana taxation and strike the right balance between reducing consumption and raising revenue. If the goal is to limit consumption, high tax rates that raise retail prices should deter recreational use and reduce negative consequences, such as abuse. However, this benefit may be lost if prices are set too high. Steep marijuana prices could fuel the illicit market, the opposite of what legalization is intended to achieve.²⁹

Cigarette taxes are the obvious analogy. Research shows that higher cigarette costs reduce consumption, particularly among young people.³⁰ Thus, reduced consumption and increased revenue are both benefits of cigarette taxes. But finding the best cigarette tax rate involves difficult trade-offs. A higher tax would deter consumption, but might diminish revenue.

The four states with legal sale of recreational marijuana impose taxes both to raise revenue and deter use. Those taxes keep marijuana prices artificially high, but not so lofty as to fuel the illicit market. State experience with taxing marijuana is too brief to identify the price inflection points. However, both Washington and Colorado have generated millions of dollars in marijuana tax revenue.

In taxing marijuana, states must decide the tax base, that is, what to tax. They must also decide where to apply taxes: at final sale or at various points along the production cycle. For the tax base, three areas are usually considered: weight, price, and potency, each with advantages and disadvantages. A weight-based tax is fixed by quantity, for example, \$50 dollars an ounce. Such a tax is easy to administer, simple to understand, and can be implemented quickly. However, it creates an incentive for sellers to differentiate products by potency, which could harm consumers (Caulkins et al. 2015).

A price-based tax—also known as an excise tax—is set as a percentage (ad valorem) of value. Such a tax is levied on the seller and treated as a business cost. Typically, it is passed along to consumers in the final retail price.³¹ However, states should consider that higher retail prices spurred by this tax could run counter to the goal of reducing the size of the illegal market.³² A price-based tax is simple and easy to implement and administer.³³ But, if imposed on cultivators, producers, and processors, it creates incentives for tax evasion from “phony prices” along the supply chain (Oglesby 2015).

A potency-based tax is assessed on a product's THC content and could potentially control product quality. Unlike a weight-based tax, which enables sellers to differentiate their products according to THC content, a potency-based tax addresses product strength directly.³⁴ However, a potency-based tax has many disadvantages, especially the challenge of ensuring that product testing is reliable (Gravelle and Lowry 2014). Determining when and at

²⁸ The extent of the change in consumption depends on what economists refer to as the price elasticity of demand.

²⁹ Product quality control can also check the illicit market. Consumers may favor legal marijuana because they have greater assurance that the product doesn't contain toxic adulterants or pesticides

³⁰ For a synthesis of 108 studies on the impact of taxes and prices on cigarette consumption, Bader, Boisclair, and Ferrence, 2011. Of the 31 published studies that focused specifically on youth, 23 found a reduction in prevalence and four found reduced prevalence under particularly circumstances.

³¹ A substantial body of literature notes that the excise tax burden is not borne solely by the consumer. How the burden is distributed depends on the relative elasticities of supply and demand.

³² A price-based tax can also be assessed on consumers of the final product through a sales tax. A sales tax is calculated as a percentage of the retail value (percentage of the final sale price) and is much simpler to manage. Unlike the excise tax on sellers, its cost is directly apparent to consumers who see it added to the retail price at the final point of sale. However, a sales tax might enable tax evasion, “because it allows untaxed marijuana to linger in the supply chain before a retail sale takes place” (Oglesby 2015).

³³ However, because it is calculated as a percentage, a price-based tax is regressive, taking a larger share of the disposable income of poor people.

³⁴ A potency-based excise tax could help control potency levels and ensure that consumers know a product's strength (McCoun 2010).

what stage to test products would be a regulatory nightmare. And a potency tax could encourage “lab shopping” in which marijuana producers and sellers look for testers who offer the most favorable results.

Another question is whether product transfers along the supply chain should be taxed. Such a levy could be structured as an excise tax at a fixed price per unit of volume when a product is moved between locations. Alternatively, it could be assessed as a percentage of product value at various transfer points before reaching consumers. Such a tax would also affect retail prices.^{35, 36}

Colorado imposes a 15 percent excise tax, a special 10 percent sales tax, and the standard 2.9 percent state sales tax, plus applicable local taxes, on recreational marijuana. Medical consumers pay only the 2.9 percent state sales tax and other local taxes (Colorado Department of Revenue 2015). Washington initially levied a 25 percent tax at three stages along the supply chain. In July 2015, the state legislature changed the tax model, imposing a 37 percent retail tax on top of the standard 6.5 percent state sales tax. Business taxes, occupation taxes, and other local taxes also apply.³⁷

In the end, simplicity and convenience may determine how and at what point in the supply chain California sets marijuana taxes. A complex tax system designed to achieve multiple social objectives has some advantages. But Washington offers a cautionary tale. It found that complexity created undue administrative and regulatory burdens. Simplicity won the day.

Table 3 shows that revenue generated from marijuana taxes can be substantial. How much revenue California collects will depend on the scale of the legal market, the tax rate structure, tax avoidance, and individual behavior.³⁸ In 2010, when California looked at taxing recreational marijuana use, revenue estimates ranged from \$674 to \$1.4 billion.³⁹ The California Legislative Analyst’s Office (LAO) estimates that legalizing recreational marijuana could save the state more than \$100 million in criminal justice expenditures and generate “from the high hundreds to over \$1 billion” in additional revenue (2015). By comparison, in 2014, the state collected \$49.5 million in sales tax from medical marijuana dispensaries that reported sales, according to the state Board of Equalization.⁴⁰ California received \$782 million in revenue from tobacco taxes in 2013 (California State Board of Equalization 2015).

³⁵ Discussion with Colorado officials suggests that the state’s tax or fee on product transfers has a problem because returned products are subject to the fee.

³⁶ Under federal tax law, businesses in states that permit medical and/or recreational use are prohibited from deducting standard business expenses such as payroll and rent against gross sales receipts (26 US Code, 280E). Marijuana businesses also may not deduct the state excise taxes assessed on retail marijuana sales. Thus, federal taxes are assessed largely on gross rather than net income, substantially increasing tax burdens of marijuana businesses. Those businesses may still deduct expenses unrelated to marijuana (Internal Revenue Service, 2015). This high federal tax burden, combined with the need to keep retail prices in line with demand, may make recreational marijuana less profitable than some entrepreneurs anticipated and hold back the legal recreational market’s growth.

³⁷ Washington originally charged producers, processors, and retailers a 25 percent value-added tax, but administering it proved complicated. The 37 percent tax took effect July 1, 2015. See Second Engrossed Second Substitute House Bill 2136, Washington state legislature, 2015.

³⁸ The Washington and Colorado experiences suggest there will be a learning curve no matter how reasonable initial forecasts may appear. The challenge forecasting revenue is that little is known about consumer demand because recreational marijuana has been illegal. Colorado grossly overestimated tax revenue in the first year after legalization. It projected \$70 million, but only realized \$44 million (*Associated Press* February 2015). Washington significantly underestimated first-year tax revenue. It projected \$36 million and realized \$70 million (*Associated Press* July 2015). Since then, tax revenue has grown tremendously in both states and has begun to cover regulatory costs, plus earmarks for service such as substance abuse prevention.

³⁹ The RAND Corporation estimated from \$674 million to \$883 million based on a \$50-per-ounce excise tax (Kilmer et al. 2010). Using the same tax rate, the California Board of Equalization estimated \$1,382 million (2009).

⁴⁰ Those taxes were based upon reported taxable income of \$570 million from 1,623 dispensaries registered with the Board of Equalization. It is not clear what share of California dispensaries that represents. Passage of MMRSA is expected to routinize tax reporting. See <https://www.boe.ca.gov/news/marijuana.htm>.

TABLE 3

Colorado and Washington marijuana taxes generate substantial revenue (dollars in millions)

	Colorado	Washington
Tax rates	15% excise 10% special sales	37% retail sales
State sales tax	2.9%	6.5%
Taxes on medical marijuana	Only sales tax	Same
Projected FY2016 recreational marijuana tax revenue ¹	\$125.0	\$115.1
Actual receipts, first quarter fiscal year 2016 ²	\$34.0	\$38.6

NOTES: ¹ The Colorado and Washington fiscal years begin in July and end in June. The revenue forecast for Washington is for a July–June 2015–2017 biennial budget. The Washington forecast for the cannabis excise tax as of September 2015 is \$230.2 million. ² Colorado tax receipts are for the first quarter of FY 2016 (July – September) as reported by the Colorado Department of Revenue.

Another question is how to use marijuana tax proceeds. It is politically advantageous to temper opposition to a marijuana tax by designating a popular cause or program to receive revenue. Earmarking revenue can be a way of financing regulatory oversight of the marijuana industry and supporting public health activities.⁴¹

Making regulatory enforcement dependent on tax revenue from the industry it oversees could create conflicts of interest. And it can be argued that earmarking is bad budgeting policy (Phillips 2015). On the other hand, designating marijuana revenue for regulatory operations makes regulatory costs transparent. Colorado earmarks marijuana funds for public schools, capital construction, and enforcement of marijuana industry regulations (Colorado Proposition AA 2013). Washington earmarks funds for campaigns to discourage use by minors, public education and public health, and program impact evaluation. Marijuana revenue does not finance regulatory oversight⁴²

Finally, cash is the financial elephant in the room. Because marijuana remains illegal under federal law, businesses cannot obtain standard banking and financial services. In response, states accept license and tax payments in cash. Even the IRS now accepts cash. But the fact that cultivators, producers, processor, and retailers do so much of their business in cash makes it easier to avoid reporting income. Moreover, marijuana businesses pay for services such as construction and legal assistance in cash, multiplying the problem of unreported income. Lack of access to financial services means that, despite legalization, a large fraction of marijuana commerce will remain unreported, resulting in lost taxes for governments at all levels.⁴³

Public Safety and Public Health

For any psychoactive substance, an important regulatory goal is protecting the community and, in particular, the well-being of young people. Californians already use marijuana at a relatively high rate. As with other drugs, some of that use is abusive and harmful. If recreational marijuana becomes legal, the amount of use will probably rise further.⁴⁴

The challenge is to mitigate the of impact of legal recreational marijuana on public health and safety. The issues of greatest concern include drugged driving, protecting young people, and preventing addiction and abuse.

⁴¹ Regulatory costs include licensing, product monitoring, and enforcing product quality, lab certification, labeling, and other rules. In a public health context, marijuana-funded services could include programs discouraging minors from using marijuana and providing treatment if they abuse it. Marijuana education and health campaigns, and treatment and recovery services for adult abusers can also be earmarked.

⁴² Washington State Legislature, Uniform Control Substance Act 69.50.545.

⁴³ Large quantities of cash also mean marijuana businesses must spend heavily on security to deter robberies and protect employees.

⁴⁴ See [Technical Appendix D](#) for a discussion of current levels of marijuana use in California and the impact of legalization in other states.

California can take specific steps that draw on the experience of other states and on efforts to counter the dangers of alcohol.

Driving and impairment

Driving under the influence of marijuana can be dangerous, but little is known about how marijuana impairs driving. Marijuana affects reflexes and motor skills (Ramaekers et al. 2006) and its use has been linked to increased accidents (Asbridge et al. 2012).⁴⁵ Moreover, research shows that accidents are much more likely for those under the influence of both marijuana and alcohol (Smiley 1999). Many Californians who consume marijuana already get behind the wheel (Lacey et al. 2012). If the number of recreational users grows, it will increase the number of drugged drivers on the roads, even if the rate of people who engage in this risky behavior stays the same. The state should take whatever steps it can to minimize drugged driving.

An obvious starting point is a public service campaign to educate drivers about the danger of driving after using marijuana, similar to efforts aimed at combatting drunk driving. In addition, the state can increase enforcement and penalties to deter drugged driving. Harsh sanctions should offer a deterrent. But cannabis presents a unique enforcement challenge. Blood alcohol content (BAC) has long been used to measure driving impairment. All states now use a 0.08 BAC level as the legal limit for driving under the influence of alcohol. Technology allows accurate roadside testing. And the California Department of Motor Vehicles has issued guidelines that let drivers estimate their BAC based on body weight and quantity of alcohol consumed.

No equivalent standard exists for marijuana. Researchers disagree about a “safe” level of blood THC. One study suggests that impairment is correlated with a THC content between 7 and 10 nanograms per milliliter (Grotenhermen et al. 2007). States with *per se* laws—including Washington and Colorado—have settled on 5 nanograms per milliliter to establish impairment.⁴⁶ Those opposed to setting an absolute level note that the causal link between THC blood levels and impairment has not been established as it has with blood alcohol (Armentano 2013). A recent US Department of Transportation study echoed the point, concluding that “specific drug concentration levels cannot be reliably equated with a specific degree of driver impairment” (Berning, Compton, and Wochinger 2015).

There is also a practical consideration regarding testing for drugged driving. The alcohol breathalyzer is accurate and can be administered safely on the side of the road. Drawing blood to test for THC is far more complicated, requiring medical personnel and chain-of-custody procedures.⁴⁷

Data from Washington and Colorado show that increases in positive tests for marijuana are associated with higher rates of traffic accidents and driving infractions. However, it is difficult to determine whether the rise in drugged driving detection is the result of increased access to marijuana, more people using marijuana, or simply stepped-up law enforcement.

Colorado law enforcement officials point to a recent increase in cannabis-related traffic fatalities as evidence of harm from legalization. The federal highway fatality reporting system found that the share of Colorado drivers involved in fatal accidents who tested positive for marijuana rose from less than 8 percent in 2008 to almost 11

⁴⁵ Like alcohol and driving, the level of impairment and subsequent level of risk varies according to person’s size, the length of time between use and driving, and frequency of use.

⁴⁶ For Washington, the DUI limit was part of the legalizing initiative I 502. The Colorado legislature passed their DUI limit (HB 1325) as part of a group of laws implementing Amendment 64.

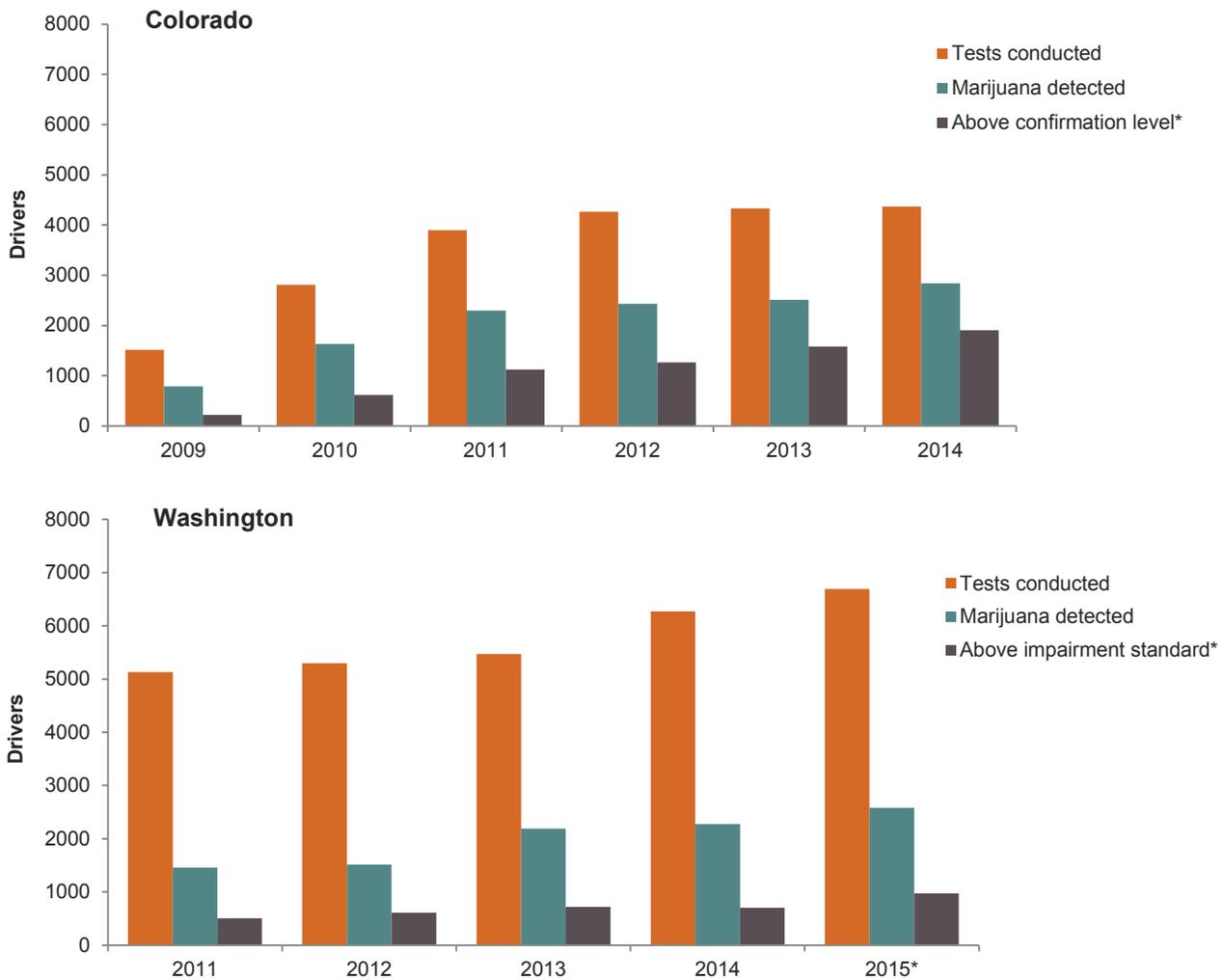
⁴⁷ Saliva testing—done in the United Kingdom—has been proposed as an alternative. However, the large number of motorists who tested positive in early use of the test suggests either an epidemic of drugged driving or an overly sensitive test (Massey and Payne, 2015). The cheek swab test was introduced in March 2015. In the first two months of implementation, police reported a positive testing rate for cannabis and cocaine ranging from 25 percent to 56 percent, with cannabis accounting for the vast majority of positives. This compares with a positive rate of about 5 percent in roadside alcohol tests. Researchers at Washington State University have said they hope to have a breathalyzer-like test available by 2016 (Santos 2015).

percent in 2010 after medical marijuana was legalized and 19 percent in 2014 after recreational use was legalized (Rocky Mountain High Intensity Drug Trafficking Area 2015).

Blood tests performed on Washington motorists also show an increase in drugged driving. Positive tests for THC rose from 18 percent in 2009 to 33 percent in the first four months of 2015 (Couper 2015). However, no THC blood level trend is evident. Of drivers who tested positive for THC in 2015, 44 percent were above the state’s 5 nanogram per milliliter impairment standard, with an average concentration of 4.2 ng/mL. That compares with 49 percent above 5 nanograms and average concentration 4.6 ng/mL in 2009 (Couper 2015).

If California legalizes recreational use, it should act decisively to reinforce drugged driving prevention and deterrence. The state must take steps to ensure that enforcement of drugged driving laws is consistent and effective. That will require training and development of an accurate, practical test for marijuana that can withstand court scrutiny.

FIGURE 3
Positive driver tests increased in Colorado and Washington.



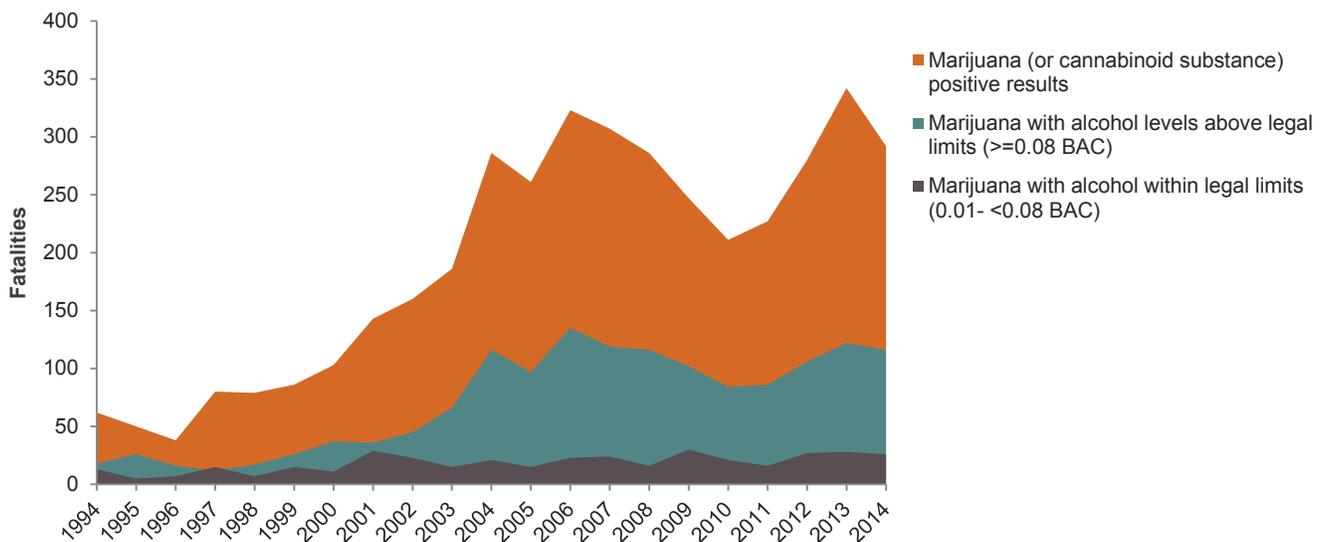
SOURCES: Rocky Mountain High Intensity Drug Trafficking Area. Washington State Toxicologist.

NOTE: Washington data for 2015 is projected from the first four months of the year. Washington impairment standard was THC levels 5 ng/mL and above. The Colorado lab used THC levels of 2 ng/mL to confirm a positive test.

A prime source of information about marijuana and driving is the Fatality Analysis Reporting System (FARS), a nationwide National Highway Traffic Safety Administration database on fatal motor vehicle accidents. The FARS data provide information on the number of drivers involved in fatal car accidents who tested positive for cannabinoids. However, this data has limitations. Reporting in California is inconsistent because there is no statewide standard for lab testing of drugs, and measurement has changed over time. And, importantly, positive results don't necessarily demonstrate impairment, especially because cannabinoids stay in the system much longer than other drugs.

With those caveats, the data indicate that fatalities in California involving drivers testing positive for cannabinoids rose from 62 in 1994 to 292 in 2014.⁴⁸ Of fatal crashes with positive marijuana results, 37 percent also involved blood-alcohol concentrations above the legal limit. By comparison, fatalities that involved BAC concentrations above the legal limit dropped from 1,468 to 882 over the same period.⁴⁹

FIGURE 4
Testing for marijuana and alcohol in California traffic fatalities



Source: Fatality Analysis Reporting System, National Highway Traffic Safety Administration.

Minimizing underage use

Many young Californians use marijuana. That will continue if recreational use for adults is legalized despite prohibition of sale to minors. Moreover, permitting a recreational market sends a message to youth and could make marijuana more appealing. California should help young people make good choices about psychoactive substances such as marijuana and act to prevent its promotion to minors.

To keep young people from using marijuana, California should implement prevention strategies similar to those involving prescription drug misuse and underage alcohol and tobacco use. Although underage alcohol and tobacco consumption are illegal—as is use of prescription drugs without medical authorization—adults are free to

⁴⁸ In 1994, 4,227 traffic fatalities occurred in California. A driver tested positive for marijuana in just over 1.5%. In 2014, of 3,074 fatalities, 9.5% reported a driver with positive marijuana tests.

⁴⁹ Some research suggests that increased marijuana use could reduce traffic fatalities if marijuana were to become a substitute for alcohol (Anderson, Hansen, and Rees 2012). This does not suggest that driving under the influence of marijuana is safe, but that patterns of use may affect driving differently from alcohol.

use these products. The social acceptance and legal status of these products for adults may cause young people to assume they are safe (National Research Council 2004). Strategies to prevent minors from using marijuana should first disseminate accurate information to correct this normative belief and then address other factors.

In addition, California can implement parental education programs to encourage adults to keep recreational marijuana secure and monitor supply. These could be modeled after similar parental education programs for prescription drugs (Johnson et al. 2007). By encouraging parents to lock up marijuana, such programs could reduce both intentional and accidental use by children and youth.

Deterrence and education are the best strategies to minimize underage marijuana use, but regulation of marketing also plays a part. Both Washington and Colorado adopted provisions to limit marijuana's appeal including restrictions on marketing through traditional media such as billboards, television, radio, newspapers. They also regulate outlets and signage. Washington's law is specific, even dictating square inches allowed for signs. However, Washington's marijuana agency finds enforcement of signage provisions cumbersome and believes some retailers have developed ways to circumvent the law's spirit.

California currently prohibits advertisements promoting physician recommendations of medical marijuana unless such ads note that cannabis is a Schedule I drug (Section 2525.5 of Article 25, U.S. Senate Bill 643, 2015). If recreational use is approved, regulation of marijuana marketing must be strengthened to protect minors. California should adopt a realistic strategy that acknowledges the difficulty of controlling messages that reach young people. The rise of digital media makes regulation much harder and social media have boosted the impact of word-of-mouth marketing. A new law should restrict itself to establishing basic principles and leave details to a regulatory agency. Such an approach enables restrictions to react more easily to unforeseen marketing practices.

California can look to Colorado and Washington and its own medical marijuana rules for strategies to prevent accidental recreational marijuana use by young people. Colorado and Washington have packaging requirements similar to a recently passed California law covering medical marijuana (SB 266). This law does not require childproof containers like those for prescription medicine and dangerous household products. But it sets packaging standards arguably more stringent than those for tobacco and alcohol, requiring that marijuana and cannabis products use tamper-evident packaging that cannot be "attractive to children." Packages also must include specific caution labels (section 19347). California can apply these and other rules to recreational use as well.

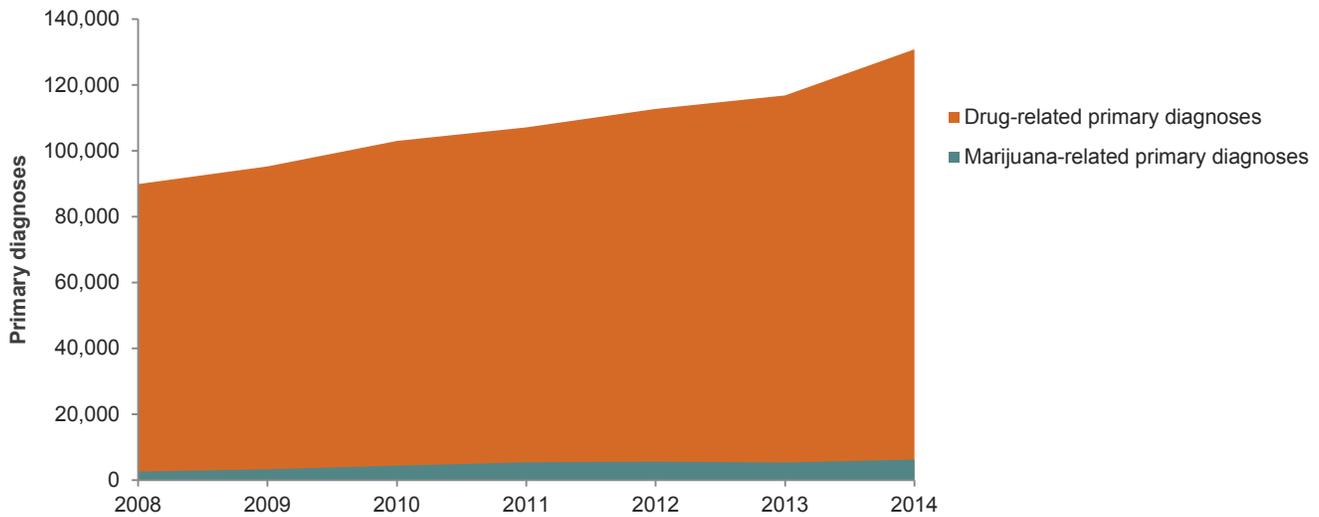
Abuse, dependence, and treatment

The extent of marijuana abuse and dependence will depend directly on how prevalent marijuana becomes if recreational use is legalized. Research suggests that a rise in users and easier access to marijuana will increase the incidence of addiction and abuse (Hasin et al. 2015). For example, studies in Los Angeles showed a relationship between medical marijuana dispensaries and rising marijuana-related hospitalizations (Mair et al. 2015). If marijuana use rises, abuse and dependence will also increase. California's public health and substance abuse treatment systems would feel the impact.

Emergency department data show that from 2008 to 2014, visits with drugs as the primary diagnosis increased 40,942. Of these, the share of marijuana-related primary diagnoses increased a few percentage points.

FIGURE 5

Emergency department visits in California: Marijuana-related primary diagnoses increased as a share of all drug-related primary diagnoses



SOURCE: Emergency Department ICD-9-CM Code Frequencies, California Office of Statewide Health Planning and Development (OSHPD).

US Substance Abuse and Mental Health Services Administration data show treatment facility admissions in which marijuana was the primary substance of abuse fell from 33,691 in 2012, equal to 20.5 percent of all admissions, to 24,022 in 2014, or 15.3 percent of all admissions. Although marijuana treatment admissions decreased, the under-21 share rose to 53.9 percent in 2014 from 10.4 percent in 2012 (Substance Abuse and Mental Health Services Administration 2012, 2015). This suggests that marijuana legalization may not have a large overall impact on California’s drug treatment system, but that client age distribution could change.⁵⁰ These statistics only indicate the primary substance of abuse. Many heroin and amphetamine users also use marijuana. Such secondary marijuana use may increase with legalization. RAND has estimated that legalization would increase state treatment costs by \$2 million to \$5.6 million (Kilmer et al. 2010; Pacula 2010).

Historically, about half of all treatment referrals in which marijuana was the primary substance of abuse have come from the criminal justice system (Pacula 2010). In the wake of Proposition 47, these referrals have already begun to fall in California.

If recreational marijuana use becomes legal, California must develop strategies to minimize patterns of use that could lead to abuse and dependence. California’s embrace of the Affordable Care Act, including Medicaid expansion and a statewide health insurance marketplace, ensures wide coverage of substance abuse treatment (US Department of Health and Human Services 2013). To build on this, California should enforce coverage mandates, address adequacy of insurer networks, and implement Medicaid reimbursement rates acceptable to providers. California also must continue to finance treatment programs for uninsured individuals.

Under legalization, young people who abuse marijuana will still be committing a crime. The state should direct them to treatment and diversion programs rather than prosecuting them. Because adult referrals for marijuana treatment from the criminal justice system have fallen, mechanisms to identify those who need treatment should be expanded. One such avenue could be the Screening, Brief Intervention, and Referral to Treatment (SBIRT)

⁵⁰ Interestingly, the number and proportion of drug treatment admissions with heroin or methamphetamine the primary substances of abuse increased during this period. These two drugs now represent 55% of all drug treatment admissions in California.

approach in primary health care facilities, hospital emergency rooms, and other settings. SBIRT is a comprehensive, integrated public health practice that provides early intervention and treatment in cases of substance abuse and for those at risk.

Governance and Accountability

Legalizing recreational marijuana would be a far-reaching policy change. Little research is available on its potential effects on usage rates, public health, and safety (Caulkins et al. 2012). Studies have examined the social cost of illicit drug abuse, focusing on health, crime, and lost productivity (National Drug Intelligence Center 2011), but it isn't clear how those findings would translate to a legal market. Legalization would bring California into a brave new world filled with uncertainties.

California's marijuana regulatory structure should incorporate a feedback mechanism to determine what is working and what is not. Such a mechanism would track key metrics, conduct analyses, and perform sophisticated research to show both the intended and unintended results of policy. Good governance will require effective monitoring of outcomes so that adjustments can be made as needed. The new status of recreational and medical marijuana is not just a legal change. It is a systemic change with an impact extending well beyond the criminal justice system. Collection and analysis of data on processes and outcomes will help regulators and policymakers adapt and better serve the public interest.

A good feedback mechanism is transparent. It should show clearly how a program or policy is performing by comparing results with expectations (Simeone et al. 2005).⁵¹ Outcome evaluation, that is, evaluation of performance, should be quantitative, scientific, and based on data, preferably from publicly available sources. The feedback mechanism should also include qualitative, descriptive, and detailed process evaluations—that is, evaluations of administrative systems, whether newly created or modifications of existing systems.

To date, little information is available to support recreational marijuana process evaluations. In Washington and Colorado, formal documentation is scant on how regulatory change was determined and implemented. Colorado organized a task force to implement recreational marijuana, but no process evaluation has been produced on how task force recommendations were carried out. Washington's legalization initiative included a provision requiring process and outcome evaluations, the only state with such a requirement written into its marijuana law.⁵² Washington recently released a preliminary implementation report that spells out plans for outcome evaluations (Darnell 2015). Washington's evaluation efforts represent good governance. They help ensure that the state's marijuana experiment meets public expectations and generates information useful to policymakers inside and outside the Washington (Wallach 2015).

California should act sooner rather than later to set up a data collection system to track processes and outcomes. It should also plan regular performance evaluations, which will help guide policy refinements.⁵³ The state took a step forward when it established a governance framework as part of MMRSA. That legislation is a start, but high-

⁵¹ Evaluation is best structured using logic models that start with inputs and work their way through outputs and outcomes to determine whether progress matches objectives (Millar et al. 2001). The Washington State Institute for Public Policy released a logic model explaining how it will conduct a benefit-cost study that identifies the data and their sources that Initiative 502 requires in 2017. It also released a logic model that describes the interrelationships among inputs from seed-to-sale, prevention and education, consumption, and consequences that will support the benefit-cost study and other economic impact studies.

⁵² Part IV of Initiative 502, Washington's legalization law, includes a provision for a dedicated marijuana fund that, among other things, earmarks all marijuana excise taxes, license fees, penalties, forfeitures, and other income from marijuana-related activities for biennial youth drug use surveys, a benefit-cost evaluation and outcome studies by the Washington State Institute for Public Policy, an Internet public education site with information about the health and safety risks posed by marijuana use, prevention programs, a hotline providing referrals to treatment, and other public education activities.

⁵³ Researchers on all sides of the issue should have access to reliable data. The objective is not to keep researchers happy, but instead to give researchers means to keep policymakers and the public happy.

quality information requires that data be collected and made available for analysis. The kinds of information that should be collected are generally straightforward.⁵⁴ Table 4 presents examples.

TABLE 4
Examples of data collection to monitor implementation

Regulatory area	Data elements
Cultivation and production	Number of business licenses; business characteristics such as location, size, number of employees; major business cost categories; production tracking by product and potency; environmental violation citations.
Sales, consumption, and possession	Population-based drug incidence and prevalence estimates; measures of attitudes and perceived risk from drug use; drug product prices along the supply chain; drug purities at point of sale for marijuana and marijuana-infused products.
Taxes and finance	Revenues projected and realized by revenue source, such as tax types, license fees, fines, penalties; total sales.
Public health and safety	Drugged driving arrests and accidents; treatment admissions; emergency department admissions; calls to poison control; school dropout rates, expulsions, and absenteeism; marijuana arrests; public use citations.
Governance	Number of regulatory inspections; regulatory workforce size; number and types of violations; budget earmarked for data collection and research; process and outcome studies on benefits and costs, social costs, diversion, demand, and other topics.

The table does not present an exhaustive list, but it represents the minimum that should be in a public data set. It took 20 years following passage of California’s medical marijuana initiative before comprehensive market regulation was put in place. As a result, we lack basic information about the state’s medical marijuana market. How much is sold? At what price and in what form? Expanding the market without building in reporting requirements would severely hamper the state’s ability to monitor legal marijuana’s impact.

Effective data collection instills a capacity for change in the marijuana governance structure. Both Washington and Colorado significantly modified marijuana regulation during the first year of implementation. Delegating the specifics of regulations to an oversight body and ensuring that resources are available to support it are ways to build in this capacity. Most importantly, high-quality data and analysis help ensure that policies are based on clearly defined goals.

California must also decide whether to set up a unitary system in which the same rules govern medical and recreational marijuana licensure and taxation. Separate structures could make the medical market more attractive than the recreational market, encouraging “cheaters” who use medical marijuana for recreation. Colorado separates medical and recreational sales, though regulations are similar for both. The key difference is a lower effective tax on medical marijuana. Colorado sales figures indicate that the medical market accounts for more than 40 percent of marijuana sales.⁵⁵ This suggests some recreational consumers are buying medical marijuana because it costs less.

Like California, Washington had a robust, relatively unregulated medical marijuana market for a number of years. Washington’s recreational law did not originally take into account medical retailers. As a result, two markets with different regulations exist side-by-side. In 2015, Washington began reconciling the two regulatory systems.

⁵⁴ Hopefully, data gathering and analysis will be financed with dedicated funds collected from the marijuana industry, although a case can be made that state general funds should be used to avoid conflicts of interest.

⁵⁵ This figure is based on reported state retail sales tax receipts from medical and recreational stores. In the law’s first months, medical sales accounted for a majority of total sales. Once recreational retailers were more fully operational, the medical share dropped.

Eventually it will create one market with a single tax schedule. Medical users will be able to apply for exemption from the marijuana sales tax.

For transparency and simplicity, California should establish recreational marijuana market regulations that adopt most features of the medical market. MMRSA represents a constructive step in developing a plan for regulating recreational marijuana. It requires licensing of all commercial cannabis activity, establishes a Bureau of Medical Marijuana Regulation, sets environmental protections, promulgates standards for producing and labeling marijuana-infused products, and imposes other requirements.

Still, the simplest approach would be to create a single system for producing and selling marijuana in California. If necessary, exceptions can be made for medical consumers. A single system would be easier to understand and enforce. California regulates few, if any, other products under two different sets of laws based on product use.⁵⁶ We recommend a unified system, in keeping with the idea that a restrictive and transparent approach is best and can be modified as needed.

⁵⁶ We could not think of any. Alcohol, tobacco, and gasoline are subject to oversight by different government agencies. But the product itself is treated the same. Gambling provides the closest parallel. Lotteries, casino gaming, and horse racing are treated separately. In the case of gambling though, the products are different, although the purpose is the same.

Conclusion

Californians will shortly consider whether to permit recreational use of marijuana. Such a decision touches many policy sectors. This report groups those sectors into five regulatory areas, each with distinct objectives. The Washington and Colorado experiences offer recreational marijuana regulatory models. If California heads down the same path, we can learn from them. We offer recommendations for California based on the Washington and Colorado examples. The most important lesson learned is that recreational marijuana legalization should start with a relatively tight regulatory strategy—one that limits access at the outset. California can build in the capacity to ease regulations in the future as we learn from experience. Table 5 shows what this strategy might look like in practice in the five regulatory areas.

TABLE 5

Elements of a tightly regulated marijuana market.

Regulatory area	Recommendations	Future Flexibility
Cultivation and production	Limited number of licenses and size of cultivations, seed-to-sale tracking, strict environmental and water use requirements	Expandable license availability, technology used to improve tracking systems
Sales, use, and consumption	Sales limited to individuals 21 and older, retail outlets restricted to marijuana-only stores, home grows prohibited	Expansion of the number of outlets, legalization of home growing
Taxes and finance	A sales and/or excise tax as a percentage of selling price	Tax rates raised or lowered as market performance and social impact indicate
Public health and safety	Aggressive prevention/education campaign aimed at youth, funded research to develop an impairment standard, substance abuse treatment for the uninsured	New research-based impairment standards and prevention efforts
Governance	A single regulatory system that requires reporting and data collection across many indicators, built in reporting and impact assessment	Adjustable data and reporting systems, determination of whether exceptions needed for medical consumers

If California legalizes recreational marijuana, the state should develop a single regulated market, combining both medical and recreational marijuana. Such a market is most consistent with the approach we recommend, and would be simpler, more transparent, and easier to supervise.

Building in strong oversight and data collection will help ensure that future changes are based on research and analysis. Very little is known about California’s illegal marijuana market and surprisingly little information is available on the medical market—even though medical marijuana has been legal for nearly 20 years. The lack of information makes it impossible to perform a rigorous analysis of proposed regulations.

The state would be well served to err on the side of more-restrictive regulation. A tighter, smaller market would make California’s marijuana law easier to enforce and reduce the likelihood that legal marijuana would be diverted to other states or end up in the hands of young people. Of course, a highly regulated legal market would be accompanied by a robust illegal market. Still, the arguments for a relatively restricted market outweigh the arguments for a more lightly regulated market. The fundamental fact is, from a political perspective, it will be easier to loosen a tight market, than tighten a loose one.

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