



# **Medical and Adult-Use Cannabis and its Impact on Health and Social Outcomes in Lawrence, Massachusetts**

July 5, 2017

Prepared by  
Cannabis Community Care and Research Network (C3RN)

## Table of Contents

About Cannabis Community Care and Research Network .....	3
Executive Summary .....	4
Evidence Based Recommendations for Adult –Use Retail Sales Lawrence, MA.....	4
Youth Prevention and Addiction .....	4
Ensuring Regulation and Responsible Cannabis Cultivation and Sales .....	5
Improved Economic Development.....	5
Equity in the Cannabis Industry.....	6
Access for Communities of Color in the Cannabis Industry .....	6
Medical Benefits of Adult-Use Cannabis in Lawrence, MA .....	6
Conclusion.....	7
Background .....	8
Legal Adult-Use of Cannabis in the Commonwealth of Massachusetts .....	8
Economic Impact of legal Adult-Use Cannabis on Local Communities.....	8
Impact of Adult-Use Cannabis in Lawrence, Massachusetts.....	9
Overview of Lawrence, MA.....	9
Economic Opportunities in Lawrence with Legal Adult-Use Cannabis.....	10
Examples of Revenue Models to Promote Local Development in Lawrence .....	11
Equal Opportunity in the Cannabis Industry in Lawrence.....	12
Legalizations’ Impact on the Black Market .....	13
Access for People of Color in the Cannabis Industry in Massachusetts .....	14
Models of Change from Other States .....	15
The Medical Benefits of Adult-Use Cannabis in Lawrence .....	16
The Evidence Surrounding Medical Cannabis .....	16
Health Situation in Lawrence, MA .....	17
Patients in Massachusetts and Lawrence with an “Unmet Need” for Medical Cannabis .....	18
Opioid Use Disorder in Lawrence.....	19
Medical Cannabis Benefits for the Elderly in Lawrence .....	21
Youth Cannabis Addiction and Prevention in Lawrence.....	21
Conclusion.....	22
References .....	23

## About Cannabis Community Care and Research Network

Cannabis Community Care and Research Network (C3RN) is a strategic consulting firm that specializes in providing high-quality research and analytic services related to the impacts of medical and adult-use recreational Cannabis. As a social justice-oriented organization, we specialize in designing, monitoring, and evaluating models of integrating adult-use and medical Cannabis to positively impact social, clinical, and public health outcomes. Our goal is to support the development of a Center of Excellence in Massachusetts that advances the scientific evidence-base for medical and legal Cannabis in the Commonwealth and beyond. For more information about our work and consulting services, please visit: [www.cannaresearchnetwork.com](http://www.cannaresearchnetwork.com)

Marion McNabb, CEO and Founder  
[marion@c3researchnetwork.com](mailto:marion@c3researchnetwork.com)

and

Randal MacCaffrie, Creative Director and Founder  
[randy@c3researchnetwork.com](mailto:randy@c3researchnetwork.com)

### Acknowledgements

This white paper was written by C3RN in order to advance the roll out of legal adult-use and medical Cannabis in Lawrence, Massachusetts. This paper was developed by Marion McNabb, DrPH, MPH, CEO and Founder, C3RN and Margaret D'Elia, MPH candidate, Research Associate, C3RN in collaboration with Joshua Alba, Founder of The Rogue in Lawrence, MA.

## Executive Summary

As of March 2017, twenty-nine states and the District of Columbia have laws that legalize the consumption of Cannabis in some form, whether for medical or legal adult-use of Cannabis.<sup>1</sup> In November 2016, 1.8 million voters (54% of those who voted) in Massachusetts approved ballot questions 4 to legalize Cannabis in the Commonwealth.<sup>2</sup> With the adult-use of Cannabis now legal in Massachusetts it is expected to become an over \$1.1 billion industry by 2020, and reach \$300 million in 2018 alone.<sup>3</sup> This reality opens many economic and financial opportunities for both the State as well as local municipalities and cities in the Commonwealth. legal Cannabis retail sales are now expected to start on July 1, 2018.<sup>4</sup>

Lawrence is a city in Essex county, located on the Merrimack river in northern Massachusetts.<sup>5</sup> Lawrence is also known as the “Immigrant City”, lively with a multi-ethnic population of over 80,000, with 76% of residents Hispanic or Latino.<sup>5,6</sup> Nearly half of the population is young, with 31% of the population less than 20 years old and 18% between the ages of 20-29 years.<sup>6,7</sup> As of 2016, the median household income in Lawrence was very low, at \$34,000, with 28% of the families living below the poverty line.<sup>8</sup> Additionally, 14% of the population unemployed and residents report a lack of job opportunities.<sup>8</sup>

**As of July 2017, policy makers in Lawrence are in the process of deciding to allow adult-use Cannabis in the city.**

As legal, Adult-Use Cannabis rolls out in communities, there is a lack of specific guidelines or toolkits about how to integrate recreational Cannabis into mainstream healthcare, while ensuring youth prevention and addiction services are at the forefront. This is causing cities and towns to face challenges with the legalization of Cannabis in the Commonwealth. This white paper analyzes the current situation in Lawrence, MA, discuss potential benefits and concerns about Adult-Use Cannabis, and provides recommendations for Lawrence that can support the city to strengthen regulations around legal Cannabis retail sales, encourage employment and economic growth, and ensure responsible consumption and youth prevention services are at the forefront.

## Evidence Based Recommendations for Adult –Use Retail Sales Lawrence, MA

### Youth Prevention and Addiction

**Recommendation 1: Design and implement youth prevention education campaigns to reduce youth consumption and promote responsible adult-use of Cannabis.**

Youth cannabis addiction and prevention is at the forefront of the evolving cannabis laws in Massachusetts and is a great concern for many communities. While statistics for Lawrence, MA specifically are not reported, the Massachusetts Youth Health Survey reported that 3.4% of middle school students and 24.0% of high school students admitted to current Cannabis use in 2013<sup>9</sup>. There are several model youth prevention campaigns in Colorado and Washington that can be adapted for Lawrence. Other options include incorporating Cannabis education and prevention into the public-school system from an early age.

**Ensuring Regulation and Responsible Cannabis Cultivation and Sales**

**Recommendation 2: Allowing Legal Adult-Use Sales in Lawrence will drive down the black market, and ensure safe and tested products are in the market and prevent youth from accessing them.**

Cannabis is currently widely available on the black market, yet it is unregulated, the quality of products available are variable and un-tested, therefore could potentially have contaminants, mold, lead, or be laced with other drugs. Most recently, some states are seeing Cannabis cut with fentanyl, a drug up to 100 times more potent than morphine.<sup>10</sup> This is of particular concern for Essex county, which is already seeing an increased presence of fentanyl. In 2016, Essex county reported 284 opioid-related deaths.<sup>10</sup> By allowing legal Adult-Use retail sales, Lawrence can drive down the black market of untested and unsafe Cannabis, ensure safe and tested products are available, and youth prevention is ensured.

**Improved Economic Development**

**Recommendation 3: Allow Adult-Use Retail Sales in Lawrence and Use Tax Revenues to drive economic growth, social services, opioid addiction, and youth prevention and responsible use campaigns.**

Allowing adult-use sales and retail in Lawrence opens the possibility for additional revenue for the city and facilitate local job creation, reduce the black market, and drive down unemployment rates. As the original ballot 4 referendum states, Cannabis sales will have a 3.75% retail tax, and communities can also levy and additional 2% sales tax.<sup>11</sup> If Lawrence opts-out, the city would not benefit from the 2% sales tax, and residents will continue to purchase in Lawrence through the black market and/or legally in other towns.<sup>11</sup> The new legalized Cannabis industry will not only benefit Cannabis cultivators and retail, but also will create new opportunities for ancillary businesses such as marketing, consulting, logistics, transportation, security services, among others.<sup>3</sup>

## Equity in the Cannabis Industry

### **Recommendation 4: Change local policies related to arrests for Cannabis in a new legal market in Massachusetts**

In 2014, the arrest rate for Cannabis sales for Black people was 7.1 times higher than arrest rates for white in MA.<sup>12</sup> Cannabis charges can also negatively impact an individual's ability to access key social and economic benefits, affect potential employment, financial aid, and public housing, among others.<sup>13</sup> In Essex county, black people are 1.3 times more likely to be arrested for Cannabis possession, and 2.7 times more likely for Cannabis sales than whites.<sup>12</sup> After legalization in November 2016, people in Essex county are still being arrested for Cannabis-related offenses and police are refusing to give back confiscated drugs.<sup>14</sup>

## Access for Communities of Color in the Cannabis Industry

### **Recommendation 5: Implement State supported language in Ballot Initiative 4 that encourages access for people of color to have job opportunities in the new legal Cannabis industry.**

A survey conducted in 2016 found that less than 1% of Cannabis Industry owners in the United States were African American.<sup>15</sup> The lack of access of people of color to the industry is often attributed to States who have regulations barring anyone with a criminal record from entering the Cannabis industry.<sup>15</sup> Recognizing the need for racial justice and equity in the local Cannabis market, the Massachusetts' Ballot Initiative 4 was the first to insert specific language encouraging those disproportionately harmed by marijuana prohibition and enforcement to actively participate in the local industry.<sup>16</sup> There are several models of facilitating employment from California and Oregon that can be adapted for Lawrence.

## Medical Benefits of Adult-Use Cannabis in Lawrence, MA

### **Recommendation 6: Improving access to safe, regulated, and tested Cannabis Products through legal sales in Lawrence will expand access to safe Cannabis, specifically for those facing opioid addiction as a treatment alternative**

Recreational Cannabis use, not consumed for a specific medical purpose, but rather users might consume with the goal of getting "high"<sup>17</sup>, however there is considerable overlap between medical and recreational "users". Data show that "self-medication" is common among recreational users and adults who use medical cannabis may report prior recreational use.<sup>17</sup> The evidence base related to medical Cannabis is growing. In January 2017, *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and<sup>18</sup> Recommendations for Research*, provides the latest evidence available around the medical benefits of cannabis use on a variety of health conditions.<sup>19</sup>

**Lawrence is facing a serious opioid crisis,** compared to surrounding cities and the State average. Given the 28.64 opioid related deaths per 100,000 individuals in Lawrence in 2014 alone<sup>20</sup>, medical cannabis stands to have an incredible impact on the opioid epidemic that is only growing. The scientific evidence related the effect of Cannabis for the treatment of opioid addiction and chronic pain is well established.<sup>21</sup> Several studies have documented a range of 31% - 80% of medical patients reporting successfully substituting cannabis for opioids and other prescription medications.<sup>21-26</sup> Three separate but recent studies also show that states with medical Cannabis laws have also seen from 13% - 35% significant reduction in opioid overdose deaths compared to states without.<sup>27-29</sup> In 2016, The CDC Published new opioid recovery guidelines that explicitly state to remove Cannabis (THC) testing from treatment protocols.<sup>30</sup>

Over 9,000 patients in Lawrence have qualifying conditions for which Cannabis can be used as a treatment alternative.

## Conclusion

A full report was prepared to support local community activists in Lawrence to work with the city to allow the sale of Adult-Use Cannabis in Lawrence, highlighting the benefits, how to mitigate public health and safety risks, while ensuring youth prevention is at the forefront. While these recommendations are not a perfect template for incorporating recreational Cannabis into the daily operations of Lawrence, they provide a place from which to start shaping Lawrence's position in the legal Cannabis industry in Massachusetts.

## Background

### Legal Adult-Use of Cannabis in the Commonwealth of Massachusetts

As of March 2017, twenty-nine states and the District of Columbia have laws that legalize the consumption of Cannabis in some form, whether for medical or legal adult-use of Cannabis.<sup>1</sup> As more and more States are adopting laws, the potential economic gains across the United States are expected to be \$48-68 billion by 2021.<sup>31</sup> According to a report released in April 2017, states with legalized Cannabis are expected to generate \$655 million (85% directly from Cannabis) in state taxes on retail sales in 2017 alone.<sup>32</sup>

In November 2016, 1.8 million voters (53.6% of those who voted) in Massachusetts approved ballot questions 4 to legalize Cannabis in the Commonwealth.<sup>2</sup> With the adult-use of Cannabis now legal in Massachusetts it is expected to become an over \$1.1 billion industry by 2020, and reach \$300 million in 2018 alone.<sup>3</sup> This reality opens many economic and financial opportunities for both the State as well as local municipalities and cities in the Commonwealth.

In January 2017, Governor Charlie Baker and other lawmakers approved delays to the voter approved law in order to recraft the legislation.<sup>4</sup> In early 2017, a Special Joint Committee for Marijuana policy was formed to review the referendum and propose key changes to the law. The committee, made up of 17 House and Senate members, posed over 90 bills to alter the law and from March to April 2017 held five public hearings to get public opinion about the potential changes.<sup>33</sup>

After the public hearings, both the House and the Senate drafted new bills. In June 2017, both the House and the Senate passed very different bills that would alter the law, with issues including raising the tax rate, allowing municipal officials to decide to ban or limit Cannabis businesses, and expungement, among others.<sup>34</sup> In order to come to an agreement, a smaller committee of six members from the House and Senate was formed in late June to come to an agreement on the bills posed, with a deadline of June 30, 2017 for Governor Charlie Baker to sign it into law.<sup>35</sup> As of July 5, 2017 the smaller committee had not reached a resolution.<sup>4</sup> Given the delays, legal Cannabis retail sales are now expected to start on July 1, 2018.<sup>4</sup>

### Economic Impact of legal Adult-Use Cannabis on Local Communities

Local communities in Massachusetts, such as Lawrence, stand to receive substantial financial income through Cannabis taxes. This income can be used to further develop local economies, facilitate job creation, reduce the Cannabis black market through community engagement, and contribute to the advancement of responsible, and regulated medical and adult-use Cannabis in the Commonwealth.

The original law pass by voters in November 2016 allows communities to have 3.75% excise tax, on top of a 6.25% sales tax. Municipalities can also enact a 2% tax and keep the proceeds for local use.<sup>3</sup> A study commissioned by the Joint Committee on Marijuana



Policy estimated a revenue of \$50 to \$60 million in the first year of sales alone in the Commonwealth.<sup>36</sup>

The original referendum approved by Massachusetts voters in November 2018, calls for an local public vote to approve or ban the cultivation and sale of adult-use Cannabis in the Commonwealth.<sup>11</sup> However, the current debate at the State level is allowing public vote or giving the authority to the city council to outright ban legal Cannabis sales. The final decision will be made when the House and Senate come to an agreement on the final bills to change the law. To date, some towns in MA have opted out of adult use Cannabis, with a variety of ways that cities and towns are determining if they will allow sales in their communities.<sup>11</sup>

**As of July 2017, policy makers in Lawrence, MA are in the process of deciding to allow adult-use Cannabis in the city.**

This massive economic growth both at the local and State level in Massachusetts opens a myriad of possibilities to grow a variety of supporting services and attract tourism to the Commonwealth. The new legalized Cannabis industry will not only benefit Cannabis cultivators and retail, but also will create new opportunities for ancillary businesses such as marketing, consulting, logistics, transportation, security services, among others.<sup>3</sup>

## Impact of Adult-Use Cannabis in Lawrence, Massachusetts

The potential impact of allowing legal adult-use of Cannabis in Lawrence is great in terms of the ability to generate revenue, create new job opportunities, and community building. In November 2016, 42% of Lawrence residents voted yes to Question 4 and 58% voted no.<sup>37</sup> Despite the public hesitation, the city still has the opportunity to allow legal adult-use sales and explore the potential economic, social, and medical advantages of a free market in the city. Allowing recreational sales locally has the real potential to revitalize the economy from developing skilled workers from cultivators, business owners, and educators on responsible consumption. Concerns related to responsible use and youth prevention are valid and should be considered. Several youth focused prevention campaigns referenced in this white paper have been successful in other states and can be explored in Lawrence.

Allowing adult-use Cannabis sales in Lawrence, *while ensuring youth prevention and responsible use*, has the potential positively impact local employment, improve health outcomes, and have an impact on the opioid epidemic in Lawrence.

### Overview of Lawrence, MA

Lawrence is a city in Essex county, located on the Merrimack river in northern Massachusetts. About an hour north of Boston, Lawrence was the first planned industrial city in the United States. Once known for its textiles and mills, Lawrence was a world leader in cotton and woolen textiles.<sup>5</sup>

Lawrence is also known as the “Immigrant City”, lively with a multi-ethnic population and a high percentage of foreign-born residents. The current population is over 80,000, with over 76.4% of residents Hispanic or Latino.<sup>5,6</sup> Lawrence also has a high foreign-born population, with 37.4% of the population born in another country, which is approximately 2.8 times higher than the U.S. average of 13.2%.<sup>7</sup>

Nearly half of the population is young, with 31% of the population less than 20 years old and 18% between the ages of 20-29 years.<sup>6,7</sup> Persons over the age of 65 account for only 8.6% of the population.<sup>6</sup> Lawrence also has an average family size of 3.6, the highest compared to others in the area.<sup>7</sup> The high housing cost in Lawrence has led to an increase of over 40% of homeless population over the last 7 years, with more than 21,000 homeless.<sup>8</sup>

Overall Lawrence draws most of its budget from the State. Lawrence’s 2017-2018 budget estimates revenue for the city to be \$264,503,018 for fiscal year 2017. Of this, 69% is from State revenue, followed by taxes and excise at 28%.<sup>38</sup> The majority of the city’s budget is allocated to education (68%) followed by public safety (10%).<sup>38</sup>

**Allowing adult-use sales and retail in Lawrence opens the possibility for additional revenue for the city and facilitate local job creation, reduce the black market, and drive down unemployment rates. As the original ballot 4 referendum states, Cannabis sales will have a 3.75% retail tax, and communities can also levy and additional 2% sales tax.<sup>11</sup>**

**If Lawrence opts-out, the city would not benefit from the 2% sales tax, and residents will continue to purchase in Lawrence through the black market and/or legally in other towns.<sup>11</sup>**

## Economic Opportunities in Lawrence with Legal Adult-Use Cannabis

As of 2016, the median household income in Lawrence was very low, at \$34,000, with 28% of the families living below the poverty line.<sup>8</sup> Unemployment also remains a challenge with 14% of the population unemployed and residents report a lack of job opportunities.<sup>8</sup> As of 2016, 32% of the population had a high school diploma and 31.5% had no high school diploma.<sup>8</sup>

Over the years, the economy of Lawrence has declined, offering fewer job and economic opportunities for residents. Currently, around 35% of Lawrence’s economy is based in manufacturing industry.<sup>5</sup>

In addition to revenue generated from taxes, there are other economic benefits that Lawrence can enjoy to further revitalize the economy. Based on 2017 data, it is

estimated that for each dollar spent by patients or recreational customers at the retail level, and additional \$3 in economic benefit is also realized at the local level.<sup>31</sup>

Benefits noted from other States with legal recreational Cannabis include:<sup>31</sup>

1. Wages paid to employees of Cannabis companies also benefit other local businesses including restaurants, grocery stores etc.
2. Cannabis businesses can pay both State and local taxes, which can fund health, education, and other infrastructure needs.
3. Real estate and construction businesses benefit from new Cannabis cultivation sites.



### Chart of the Week

Marijuana Business Daily

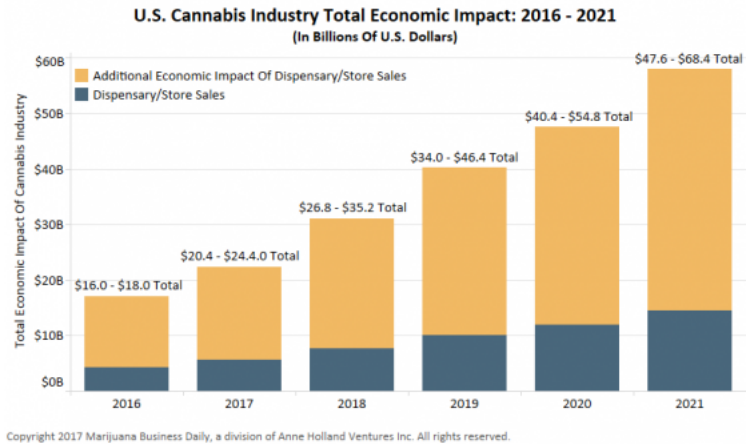


Figure 1: Total Economic Value of Cannabis Industry, 2016

In Colorado, the Cannabis industry is estimated to have created approximately 10,000 new jobs, most of which pay above the national minimum wage<sup>39</sup>.

Lawrence can utilize the new adult-use Cannabis market to drive down unemployment, create new jobs, and support those operating in the black market to have opportunities in the industry.

Colorado has seen great financial and social impacts of legal Cannabis on the economy. Since legalization of recreational marijuana in 2014, Colorado has seen a decrease in unemployment with the development of the new cannabis industry.<sup>39</sup> It has been estimated that the cannabis industry created approximately 10,000 new jobs, most of which pay above the national minimum wage.<sup>39</sup>

### Examples of Revenue Models to Promote Local Development in Lawrence

With an influx of retail sales for recreational Cannabis in Colorado, cities and towns are receiving large amounts of revenue that are benefiting infrastructure, education, and healthcare.<sup>40</sup> In late 2016, Colorado recreational sales hit \$1.3 billion and small towns are benefitting from the retail sales tax applied at the

point of sale. Colorado saw a 57.2% increase in the total Cannabis taxes from 2015-2017. This massive influx of capital allowed the State to put \$16 million towards Affordable Housing Grants and Loans in 2016 alone.<sup>32</sup>

Cities and small towns in Colorado are increasing using their revenue to support local community development activities. Edgewater Colorado, a town of 5,300 people, has generated \$1.4 million in sales tax revenue, now accounting for 20% of its annual

budget.<sup>40</sup> This money in Edgewater is being used to repave streets, build a new city hall, police station, and a library.<sup>40</sup> Other cities in Colorado are using the revenue to give local scholarships for graduating high school students.<sup>40</sup>

### Equal Opportunity in the Cannabis Industry in Lawrence

According to the American Civil Liberties Union (ACLU), black people are 3.7 times more likely to be arrested for Cannabis possession than white people, despite similar usage rates.<sup>41</sup>

Massachusetts is the first state to include a section of the law that requires participation of communities criminalized and economically disadvantaged from the war on drugs. The voter-approved law also explicitly includes provisions to not bar former convicted felons from operating in the industry.<sup>15</sup>

Lawrence has the opportunity to not only facilitate access for people of color to the industry, but also to embrace equity-based approaches to economic development and empowerment, while facilitating justice for those that have been jailed for the now legal adult use

However, the laws around adult-use Cannabis have historically unequal outcomes across racial groups, including biased enforcement for communities of color.<sup>12</sup> For example, in Massachusetts, an African American is 3.9 times more likely than a white person to be arrested for marijuana possession despite Cannabis use at similar rates among white and African Americans.<sup>13</sup>

Cannabis charges can also negatively impact an individual's ability to access key social and economic benefits, affect potential employment, financial aid, and public housing, among others.<sup>13</sup> In fact, since decriminalization in Massachusetts in 2008, rates of arrests for possession of marijuana have declined overall, but have in fact worsened among communities of color.<sup>13</sup>

In 2014, the arrest rate for Cannabis sales for Black people was 7.1 times higher than arrest rates for white in MA.<sup>12</sup> Note, that the federal arrest data does not distinguish between white and Latinos, and are considered the same category.<sup>12</sup> Young people are also disproportionately affected in Massachusetts. While young people (18-24) represent only 14% of the population but account for 63% of those arrested for marijuana possession.<sup>12</sup>

Lawrence faces very high crime rates compared to State and national averages. In 2016 the city had 1,094 offenses per 100,000 population, much higher than that of the state rate of 392 per 100,000.<sup>8</sup> These arrest are also typically targeting low-income and minorities.

**In Essex county, black people are 1.3 times more likely to be arrested for Cannabis possession, and 2.7 times more likely for Cannabis sales than whites.**<sup>12</sup>

After legalization in November 2016, people in Essex county are still being arrested for Cannabis-related offenses and police are refusing to give back confiscated drugs.<sup>14</sup> Since legalization Essex courts arraigned at least 41 people on Cannabis charges from November to April 4, 2017. Charges ranged from an intent to distribute misdemeanor for two years in prison, to a felony trafficking charge that can be 2 to 15 years in prison.<sup>14</sup> Most of the charges were in Lawrence District Court, and made six of those arrests.<sup>14</sup> Shanel Lindsay, a lawyer and advocate, suggests clearer guidelines and training for police is necessary.<sup>14</sup>

**With the legalization of Cannabis in Massachusetts, reducing the arrests for legal Cannabis can promote socially fair justice and decrease the *societal and economic costs* of incarceration.**

Incarceration can have lifelong consequences for employment, education, immigration status, and family life.<sup>42</sup> Convictions for Cannabis can also leader to revocation of a professional license, inability to get insurance, mortgage or other bank loans, be denied public housing, and lose student aid.<sup>42</sup> The long term costs on employment are great, an arrest is often available online for one year for employers to look up.<sup>42</sup>

Federal data have shown that arrests for possession and distribution of pot have dropped by nearly half in states since Cannabis became legal.<sup>43</sup> Nationwide, Harvard economist Jeffery Miron has estimated that legalization will reduce the need for prosecution, judicial, correctional, and police resourcing by approximately \$7.7 billion to \$12.7 billion per year.<sup>44</sup>

Lawrence can save significant financial resources related to reduced prosecution, judicial, correctional and police for eliminating arrests in a legal Cannabis market.

### Legalizations' Impact on the Black Market

The Commonwealth is currently revising the tax structure to have the best form of taxation to reduce the black market for Cannabis in the State.<sup>45</sup> A study commissioned by the State while preparing the law reports the black market value of Cannabis sales in Massachusetts ranges from \$230-900 million in 2015 alone.<sup>46</sup>

Cannabis on the black market is unregulated, the quality of products available are variable and un-tested, therefore could potentially have containments, mold, lead, or be laced with other drugs. Most recently, some states are seeing Cannabis cut with fentanyl, a drug up to 100 times more potent than morphine.<sup>10</sup>

This is of particular concern for Essex county, which is already seeing an increased presence of fentanyl. In 2016, Essex county reported 284 opioid-related deaths.<sup>10</sup>

**Allowing legal adult-use of Cannabis in Lawrence can reduce the black market, crime and arrest rates, and improve access to safe and regulated Cannabis.**

## **Cannabis testing and other regulations in place in Massachusetts are designed to ensure safe and regulated legal Cannabis products are on the market.**

Denver saw a 2.2% drop in violent crime in the year after legal Cannabis sales started and property crime dropped 8.9% in the same period and violent crime rates also dropped by 10% from 2011 to 2014 in Washington.<sup>77</sup>

Cannabis legalization in other states has also found no evidence of an increase in rates of crime. A study looking at crime rates from 11 states in the west of the United States found that there was no evidence of increased violent or property crime rates, but instead found significant drops in rates of violent crime in states with medical marijuana laws.<sup>47</sup>

### **Access for People of Color in the Cannabis Industry in Massachusetts**

Despite the lack of rigorous hard data on the ethnicity or race of people who are currently dominating the Cannabis industry, a survey conducted in 2016 found that less than 1% of Cannabis Industry owners in the United States were African American.<sup>15</sup> Further reports of racial breakdown of investors, entrepreneurs and others in the Cannabis industry is currently lacking. However, some in Massachusetts suggest few people of color are in the race for dispensary licensing or sales.

The lack of access of people of color to the industry is often attributed to States who have regulations barring anyone with a criminal record from entering the Cannabis industry.<sup>15</sup> In 2013, a study showed that black men were six times more likely to be incarcerated for Cannabis than white men.<sup>15</sup> Other reasons include a high price for entering the market with high licensing fees, with little room to take loans or access capital.<sup>15</sup>

Recognizing the need for racial justice and equity in the local Cannabis market, the Massachusetts' Ballot Initiative 4 was the first to insert specific language encouraging those disproportionately harmed by marijuana prohibition and enforcement to actively participate in the local industry.<sup>16</sup> Specifically, the regulations include:<sup>13</sup>

“procedures and policies to promote and encourage full participation in the regulated marijuana industry by people from communities that have previously been disproportionately harmed by marijuana prohibition and enforcement and to positively impact those communities” with the goal of preventing “the pursuit of profits from disproportionately harming low-income and minority communities”

This provides a challenge to those in Lawrence whose records reflect legal trouble due to the possession of the now legal Cannabis. For many people, the issue of a Cannabis-related conviction is one that has long lasting impacts on their employment status. Depending on the classification of the conviction, those individuals convicted could be grouped with others who have been charged with offenses such as assault, murder, or

rape. Having a felony prohibits many from finding work, receiving loans, and may even pose a deportation threat for some, creating additional hurdles when working to establish a future.

With the legalization of Cannabis in the Commonwealth, Lawrence has the opportunity to not only facilitate access for people of color to the industry, but also embrace equity-based approaches to economic development and empowerment, while facilitating justice for those that have been jailed for the now legal adult use Cannabis based on the war on drugs.<sup>15</sup> The section below document some models of change from other States with legal Cannabis, that Lawrence has the opportunity to continue to leverage to advance models of development, inclusion, and community building to advance adult use and medical Cannabis.

### Models of Change from Other States

The City Council of Oakland, CA has been working not only to create job opportunities to enhance their local economy, but also to be more inclusive of the Latino and African American populations.<sup>48</sup> Oakland is about one-third black, one-third white, and one third-Hispanic, however Cannabis arrests in 2015 were 77% black and people of color in about 95% of arrests.<sup>15</sup> In March of 2017, the Oakland city council voted to set regulatory measures as an “equity permit program” for medical cannabis dispensaries.<sup>15</sup>

The city began awarding cannabis permits to those who have or want to start businesses within the cannabis industry. Half of those permits, however, are reserved for applicants who are Oakland residents who have lived at least two years in designated police beats in East Oakland with a high number of cannabis arrests or individuals who were incarcerated in Oakland for cannabis related offenses within the last twenty years. These applicants, called equity applicants, must maintain at least a 50% stake in the business they wish to permit.<sup>48</sup> Applicants must also earn less than 80% of the city’s median income.<sup>15</sup>

Portland Oregon also has taken measures to promote equality and is the first city to direct part of its Cannabis revenue towards reinvesting for communities of color.<sup>15</sup> The tax revenue is slated to support minority-owned businesses in the form of incubators, job training, and financial support in addition to supporting drug and alcohol treatment programs, investments in public safety, and supporting women-owned businesses.<sup>41</sup> San Francisco and Los Angeles are also starting to consider these types of policies.<sup>15</sup>

## The Medical Benefits of Adult-Use Cannabis in Lawrence

In 2012, the Commonwealth of Massachusetts passed Question 3, the Medical Cannabis Initiative. Despite great gains in establishing the program, as of 2017, only 0.5% of the population registered as a medical Cannabis patient and less than 0.01% of physicians registered as medical Cannabis recommenders.<sup>49,50</sup> Despite the great potential medical Cannabis can have on many health conditions, the numbers of those enrolled do not match those who might benefit from medical or recreational Cannabis. As of May 2017, the Department of Public Health reports:<sup>49</sup>

- 41,822 total active patients
- 3,460 active caregivers
- 193 registered physicians
- 11 registered medical dispensaries are open

### The Evidence Surrounding Medical Cannabis

The evidence base related to medical Cannabis is growing. In January 2017, *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*, was published by the National Academies of Sciences, Engineering, and Medicine, and provides the latest evidence available around the medical benefits of cannabis use on a variety of health conditions.<sup>19</sup> The following are the most up to date findings regarding cannabis use available.<sup>19</sup>

There is conclusive or substantial evidence that cannabis or cannabinoids are effective in the treatment of:<sup>19</sup>

- chronic pain in adults
- as an antiemetic in the treatment of chemotherapy induced nausea/vomiting
- improving patient-reported multiple sclerosis spasticity symptoms

There is substantial evidence of a statistical association between cannabis use and:<sup>19</sup>

- increased risk of a motor vehicle crash (MVC)
- the development of schizophrenia or other psychoses

There is moderate evidence of a statistical association between cannabis use and:<sup>19</sup>

- better cognitive performance among individuals with psychotic disorders
- increased incidence of social anxiety disorder
- increased incidence of suicide contemplation

There is limited evidence of a statistical association between cannabis use and:<sup>19</sup>

- the triggering of an acute myocardial infarction
- risk of ischemic stroke or subarachnoid hemorrhage
- risk of prediabetes
- risk of developing chronic obstructive pulmonary disorder (COPD)



- impaired academic achievement and education outcomes
- increased rate of unemployment and / or low income
- impaired social functioning in developmentally appropriate social roles
- increased symptoms of anxiety
- increased severity of posttraumatic stress disorder symptoms
- initiation of tobacco use

There is insufficient or no evidence of statistical association between cannabis use and:<sup>19</sup>

- death due to cannabis overdose

There is moderate evidence to support the *lack* of statistical association between cannabis use and:<sup>19</sup>

- the incidence of lung, head, and neck cancer
- worsening of negative symptoms of schizophrenia among individuals with psychotic disorders

## Health Situation in Lawrence, MA

According to a 2016 needs assessment conducted the Lawrence General Hospital and Greater Lawrence Family Health Center, only 32% of the population reported their community health as “good” and 47% reported the communities health was fair.<sup>8</sup> Providers interviewed during the needs assessment reported perceived 30% of the community to be in good health and 49% to have fair health.<sup>8</sup> Drug use, access to health care, obesity, and mental health issues were identified as the top health concerns among both residents and providers.<sup>8</sup> Premature mortality was also noted as a large concern in the community, with very high death rates compared to the state rate of 269 deaths per 100,000.<sup>8</sup> In 2012, the Cancer death rates in Lawrence were 497 per 100,000, slightly higher than the state average of 472 deaths per 100,000.<sup>8</sup>

In terms of mental and behavioral health, the community reported this as a significant issue, with long wait lists for services and a lack of community health care providers. Opiates was a rising concern among residents, in addition to other substance abuse disorders including abuse of alcohol, marijuana and Cocaine.<sup>8</sup> In 2016, Lawrence had 7,131 hospitalizations per 100,000 for mental health disorders, higher than the state average of 5,673 per 100,000.<sup>8</sup>

The need for additional substance abuse services was identified as a top health priority and the community needs to have more inpatients beds, substance abuse counselors, and enhanced follow up care services.<sup>8</sup>

## Patients in Massachusetts and Lawrence with an “Unmet Need” for Medical Cannabis

The population of Lawrence can greatly benefit from allowing recreational and Medical Cannabis in the new legal market. Ensuring that the public is educated about responsible adult-use of Cannabis, while preventing youth access and addiction will be important. In Massachusetts, the following conditions are considered eligible for a physician referral for Cannabis:<sup>51</sup>

- Cancer
- Glaucoma
- HIV/AIDS
- Hepatitis C
- Lou Gehrig’s Disease (ALS)
- Crohn’s Disease
- Parkinson’s Disease
- Multiple Sclerosis
- Other debilitating conditions as determined in writing by a qualifying patient’s certifying physician

Over 9,000 patients in Lawrence have qualifying conditions for which Cannabis can be used as a treatment alternative.

As seen in the table below, there are around 9,041 residents in Lawrence alone that could be benefitting from medical Cannabis. While the potential impact of medical cannabis can be seen amongst each of the qualifying conditions for medical cannabis, the most profound impact will be on the opioid addiction in Lawrence.

Lawrence has one of the highest rates of HIV/AIDS in MA with an annual average rate of HIV infection diagnosis of 20.8 per 100,000 residents<sup>52</sup>. While the exact rates of HIV/AIDS in the 65 and older population of Lawrence is not recorded, the persons living in MA with an HIV infection have an average age of 52 years old, and 59% of HIV positive state residents are over the age of 50 years old<sup>53</sup>.

Table 1. **Estimated Cases of Health Conditions that Qualify for Medical Cannabis in Massachusetts**

Health Condition	Rate per 100,000 Population	Potential Medical Cases in Massachusetts*	Potential Medical Cases in Lawrence, MA
Cancer	170.3 per 100,000 <sup>54</sup>	11,495	130
Glaucoma	N/A	58,588 <sup>55</sup>	663
HIV	261 per 100,000 <sup>54</sup>	17,618	199
Hepatitis C	190.2 per 100,000 <sup>56</sup>	12,839	145
ALS	2.4 per 100,000 <sup>57</sup>	162	2
Crohn's disease	241 per 100,000 <sup>58</sup>	16,268	184
Parkinson's disease	1.6% of people over of the age of 65 <sup>59</sup>	16,632	188
Multiple Sclerosis	103 per 100,000 <sup>57</sup>	6,953	79
Opioid Addiction	9,756 per 100,000 <sup>60</sup>	658,530	7,451
Total Estimated Patients with "unmet need" for Medical Cannabis		799,555	9,041

\* Population of Massachusetts used to estimate cases: 6.75 million

\* Population of Lawrence, MA used to estimate cases: 76,377<sup>61</sup>

### Opioid Use Disorder in Lawrence

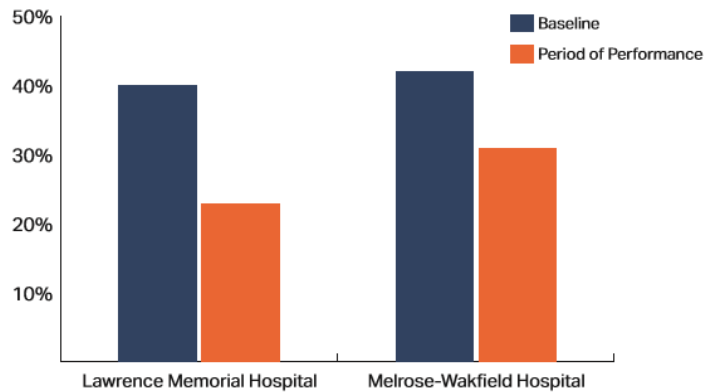
The Commonwealth of Massachusetts is facing a serious opioid addiction epidemic, with rates of visits to the emergency room twice as high as the national average; between 2007 and 2014, all opioid related hospital discharges increased by 84%.<sup>62</sup> In 2016 alone, the Department of Public Health (DPH) reported 1,465 confirmed opioid related deaths, with an additional 469-452 deaths suspected to be overdoses.<sup>63</sup>

According to the latest Federal report published April 2017, Massachusetts had the highest rate of opioid related visits to the hospital emergency room, as compared to 30 states included in the report.<sup>64,65</sup> There were more than 450 visits per 100,000 population (around 30,375 persons) to the emergency department in Massachusetts, much higher than the second state of Maryland with 300 visits per 100,000 population.

The majority of the visits were associated with fentanyl use, a synthetic opioid.<sup>64</sup> Residents in the Berkshires, Fall River, Metro South, New Bedford, and East Merrimack regions had the highest rates of opioid-related hospital discharges.<sup>62</sup>

Lawrence is facing a serious opioid crisis, compared to surrounding cities and the State average. In 2014, Lawrence had 1,002 hospital discharges, similar to rates in Lowell (1,200), Lynn (1,185), and New Bedford (1,297).<sup>62</sup> Lawrence providers have made strides to reduce the number of opioid prescriptions to prevent future addiction with a nearly 20% reduction in provider prescriptions.<sup>62</sup>

*Opioid prescription rates in Melrose-Wakefield and Lawrence Memorial Hospital EDs before and after access to practice pattern data.*



*Figure 2: Opioid Use Disorder Massachusetts, Health Policy Commission, 2016*

Given the 28.64 opioid related deaths per 100,000 individuals in Lawrence in 2014 alone<sup>20</sup>, medical cannabis stands to have an incredible impact on the opioid epidemic that is only growing.

The scientific evidence related the effect of Cannabis for the treatment of opioid addiction and chronic pain is well established.<sup>21</sup> Several studies have documented a range of 31% - 80% of medical patients reporting successfully substituting cannabis for opioids and other prescription medications.<sup>21-26</sup> Three separate but recent studies also show that states with medical Cannabis laws have also seen from 13% - 35% significant reduction in opioid overdose deaths compared to states without.<sup>27-29</sup>

The financial burden related to opioid intakes and discharges is also significant. In 2014 alone, MassHealth paid for 42% of opioid related discharges and Medicare covered an additional 24%.<sup>62</sup> The cost savings related to integrating medical cannabis is also compelling. A recent study reviewed Medicare Part D prescriptions enrollees from 2010 to 2013 and found that prescription drug use fell significantly for those medications that Cannabis could serve as a clinical alternative. Additionally, national reductions in Medicare spending when States implemented medical Cannabis laws were estimated to be \$165.2 million per year in 2013.<sup>66</sup> These findings suggest that State and private insurance companies could save the hundreds of millions of dollars that they would normally payout to cover thousands of these prescription medications.<sup>67</sup>

## Medical Cannabis Benefits for the Elderly in Lawrence

The elderly commonly suffer from chronic pain and other conditions where medical Cannabis can serve as a treatment alternative.<sup>68</sup> Lawrence, MA is currently home to 6,310 individuals over the age of 65.<sup>61</sup> Lawrence is higher than the state average for the percentage of older residents who are dually eligible for Medicare and Medicaid, a statistic that indicates a higher poverty rate amongst the senior population.<sup>69</sup> With increased poverty rates, the senior population is less likely to be able to afford essential drugs, specifically those that may manage pain.

Lawrence General Hospital and Health Center sees a patient population of which 8-14% are over the age of 65.<sup>70</sup> In 2016, 36% of residents and 26% of providers surveyed noted expanding the health/medical services focused on seniors as a priority at Lawrence General Hospital.<sup>70</sup>

There are several housing facilities in Lawrence for the elderly, including four nursing homes: The Berkeley Retirement Home, MI Nursing & Restorative Center, Sunbridge Care & Rehab Colonial, and Sunbridge Care & Rehab-Wood Mill, and two assisted living facilities: The German House and Marguerites House Assisted Living Residence.<sup>71,72</sup> There are several models from other states allowing medical Cannabis as a treatment alternative for pain and other conditions that Lawrence can adopt to include these therapeutics into routine care and supervised by health professionals to improve the quality of life among residents.

## Youth Cannabis Addiction and Prevention in Lawrence

Youth cannabis addiction and prevention is at the forefront of the evolving cannabis laws in Massachusetts. While statistics for Lawrence, MA specifically are not reported, the Massachusetts Youth Health Survey reported that 3.4% of middle school students and 24.0% of high school students admitted to current cannabis use in 2013<sup>9</sup>.

There are prevention campaigns and strategies that can be leveraged from other states to develop a Lawrence specific youth prevention campaign. In Colorado, youth cannabis use has slightly decreased since the legalization of recreational cannabis<sup>73</sup>. The Colorado Department of Public Health and Environment launched a campaign in 2015 that sought to encourage youths to consider the goals they want to achieve and how they will be more easily obtained without cannabis use<sup>74</sup>. The campaign also provides vital information to adults about how to have open conversations with the youth population. The “What’s Next” campaign also seeks to establish not using cannabis as the norm for Colorado youths. The campaigns in CO are currently funded by the annual cannabis tax revenue, an approximate two million dollars<sup>74</sup>.

In Washington, the “Listen2YourSelfie” campaign aims to reach youth aged 12-17 years old through selfies that demonstrate potential health risks for youth associated with cannabis use<sup>75</sup>. The campaign was funded by Initiative 502, which legalized recreational cannabis in the state<sup>75</sup>.

In a similar attempt at youth cannabis use prevention, Oregon began the “Stay True to You” campaign. This campaign relates to the notion of how difficult being a teen can be, and how cannabis use has the potential to affect the present and future<sup>76</sup>.

Smoking Cannabis in public is also a potential concern for youth. However under the current law for recreational Cannabis Local boards can decide to prohibit the use of different types of Cannabis in public places, in accordance with the limitations of the use of alcohol and tobacco in public settings.<sup>13</sup>

## Conclusion

With the new rollout of recreational Cannabis in Massachusetts, the city of Lawrence has an opportunity to leverage this to improve the local economy, facilitate job creation and support key populations suffering from chronic pain and opioid recovery. Coupled with appropriate youth prevention strategies, the city could be a leader in designing strategies that support local ownership, community building to reduce the black market and improve the quality of regulated and tested Cannabis in the market.

## References

1. 29 Legal Medical Marijuana States and DC - Medical Marijuana - ProCon.org. <http://medicalmarijuana.procon.org/view.resource.php?resourceID=000881>. Accessed June 12, 2017.
2. Election results 2016 - Massachusetts Ballot questions, 4 - Legalize Marijuana - The Boston Globe. [http://www.bostonglobe.com/elections/2016/MA/Question/4 - Legalize Marijuana?p1=BG\\_election\\_full\\_results](http://www.bostonglobe.com/elections/2016/MA/Question/4-Legalize-Marijuana?p1=BG_election_full_results). Accessed April 2, 2017.
3. Legal marijuana could be a \$1.1 billion industry in Mass. by 2020, researchers forecast - The Boston Globe. <https://www.bostonglobe.com/business/2016/03/27/legal-marijuana-could-billion-industry-mass-researchers-forecast/kNXpuKI0k4LKrLUTlaqfXL/story.html>. Accessed July 3, 2017.
4. No deal yet on rewrite of Massachusetts marijuana law | masslive.com. [http://www.masslive.com/news/index.ssf/2017/06/no\\_deal\\_on\\_rewrite\\_of\\_massachusetts.html](http://www.masslive.com/news/index.ssf/2017/06/no_deal_on_rewrite_of_massachusetts.html). Accessed July 3, 2017.
5. About the City - City Of Lawrence. <http://www.cityoflawrence.com/about-the-city.aspx>. Accessed July 3, 2017.
6. U.S. Census Bureau QuickFacts selected: Lawrence city, Massachusetts. <https://www.census.gov/quickfacts/table/PST045216/2534550>. Accessed July 3, 2017.
7. Lawrence MA Demographics data with population from census. <http://www.towncharts.com/Massachusetts/Demographics/Lawrence-city-MA-Demographics-data.html>. Accessed July 3, 2017.
8. Lawrence General Hospital and Greater Lawrence Family Health Center. *Lawrence Community Health Needs Assessment 2016*.; 2016. [https://www.lawrencegeneral.org/uploads/LGH\\_GLFHC\\_CHNA\\_2016.pdf](https://www.lawrencegeneral.org/uploads/LGH_GLFHC_CHNA_2016.pdf). Accessed July 3, 2017.
9. Program HS. A Profile of Health Among Massachusetts Middle and High School Students, 2013 Results from the Massachusetts Youth Health Survey (YHS).
10. Police fear arrival of fentanyl-laced pot | Merrimack Valley | eagletribune.com. [http://www.eagletribune.com/news/merrimack\\_valley/police-fear-arrival-of-fentanyl-laced-pot/article\\_8426fa4a-7183-5c14-b062-30031614d3af.html](http://www.eagletribune.com/news/merrimack_valley/police-fear-arrival-of-fentanyl-laced-pot/article_8426fa4a-7183-5c14-b062-30031614d3af.html). Accessed July 5, 2017.
11. More towns calling timeout on marijuana stores - The Boston Globe. <https://www.bostonglobe.com/metro/regionals/west/2017/03/22/more-towns-calling-timeout-marijuana-stores/2b9jRVJoHGT4iGqGR4IFQI/story.html>. Accessed July 2, 2017.
12. A MASSACHUSETTS UPDATE IN BLACK AND WHITE THE WAR ON MARIJUANA. 2016. <https://aclum.org/wp-content/uploads/2016/10/TR-Report-10-2016-FINAL-with-cover.pdf>. Accessed July 5, 2017.
13. Rebuttal to the Report of the Special Senate Committee on Marijuana. 2016. <https://aclum.org/wp-content/uploads/2016/10/Rebuttal-to-the-Report-of-the-Special-Senate-Committee-on-Marijuana-FINAL-8-30-16.pdf>. Accessed July 3, 2017.
14. Pot arrests continue even after legalization | Merrimack Valley | eagletribune.com.

- [http://www.eagletribune.com/news/merrimack\\_valley/pot-arrests-continue-even-after-legalization/article\\_55af96b1-c66c-5956-99de-50fbd00673d4.html](http://www.eagletribune.com/news/merrimack_valley/pot-arrests-continue-even-after-legalization/article_55af96b1-c66c-5956-99de-50fbd00673d4.html). Accessed July 5, 2017.
15. A billion-dollar industry, a racist legacy: being black and growing pot in America | US news | The Guardian. [https://www.theguardian.com/us-news/2017/jun/15/legal-marijuana-industry-racism-portland-jesce-horton?CMP=fb\\_us](https://www.theguardian.com/us-news/2017/jun/15/legal-marijuana-industry-racism-portland-jesce-horton?CMP=fb_us). Accessed July 3, 2017.
  16. Growing Pot Industry Offers Breaks to Entice Minorities | California News | US News.
  17. Barrus DG, Capogrossi KL, Cates SC, et al. Tasty THC: Promises and Challenges of Cannabis Edibles. *Methods Rep RTI Press*. 2016;2016. <http://www.ncbi.nlm.nih.gov/pubmed/28127591>. Accessed April 15, 2017.
  18. Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016. *MMWR Recomm Reports*. 2016;65(1):1-49. doi:10.15585/mmwr.rr6501e1er.
  19. National Academies of Sciences E and M. *The Health Effects of Cannabis and Cannabinoids*. Washington, D.C.: National Academies Press; 2017. doi:10.17226/24625.
  20. A town-by-town look at the opioid epidemic's deadly toll in Massachusetts - The Boston Globe.
  21. Alliance DP. *Marijuana and Opiates*.; 2016. [http://www.drugpolicy.org/sites/default/files/DPA\\_Fact\\_Sheet\\_Marijuana\\_and\\_Opiates\\_August\\_2016.pdf](http://www.drugpolicy.org/sites/default/files/DPA_Fact_Sheet_Marijuana_and_Opiates_August_2016.pdf). Accessed April 6, 2017.
  22. UNM study suggests medical marijuana could decrease prescription opiate abuse | The Daily Lobo. <http://www.dailylobo.com/article/2017/03/medical-cannabis-research>. Accessed April 6, 2017.
  23. Lucas P, Walsh Z. Medical cannabis access, use, and substitution for prescription opioids and other substances: A survey of authorized medical cannabis patients. *Int J Drug Policy*. 2017;42:30-35. doi:10.1016/j.drugpo.2017.01.011.
  24. Haroutounian S, Ratz Y, Ginosar Y, et al. The Effect of Medicinal Cannabis on Pain and Quality-of-Life Outcomes in Chronic Pain: A Prospective Open-label Study. *Clin J Pain*. 2016;32(12):1036-1043. doi:10.1097/AJP.0000000000000364.
  25. Bradford AC, Bradford WD. Medical Marijuana Laws Reduce Prescription Medication Use In Medicare Part D. *Health Aff (Millwood)*. 2016;35(7):1230-1236. doi:10.1377/hlthaff.2015.1661.
  26. Kral AH, Wenger L, Novak SP, et al. Is cannabis use associated with less opioid use among people who inject drugs? *Drug Alcohol Depend*. 2015;153:236-241. doi:10.1016/j.drugalcdep.2015.05.014.
  27. Shi Y, Hockenberry JM, Cummings JR, et al. Medical marijuana policies and hospitalizations related to marijuana and opioid pain reliever. *Drug Alcohol Depend*. 2017;173:144-150. doi:10.1016/j.drugalcdep.2017.01.006.
  28. Bachhuber MA, Saloner B, Cunningham CO, Barry CL, B C, PO C. Medical Cannabis Laws and Opioid Analgesic Overdose Mortality in the United States, 1999-2010. *JAMA Intern Med*. 2014;174(10):1668. doi:10.1001/jamainternmed.2014.4005.
  29. Bachhuber M, Bradford WD, Butts D, et al. WHAT IS THE OPIOID CRISIS?



- <https://thecannabisindustry.org/wp-content/uploads/2016/10/NCIA-Cannabis-and-Opioids-Report.October-2016.pdf>. Accessed April 9, 2017.
30. New CDC guidelines urge doctors to stop marijuana drug testing | Extract. <http://extract.suntimes.com/news/10/153/17742/new-cdc-guidelines-urge-doctors-stop-testing-patients-for-thc-marijuana/>. Accessed April 13, 2017.
  31. Chart: U.S. marijuana industry's economic impact to approach \$70B by 2021 - Marijuana Business Daily. <https://mjbizdaily.com/chart-u-s-marijuana-industrys-economic-impact-approach-70b-2021/>. Accessed July 2, 2017.
  32. \$1 Billion In Marijuana Taxes Is Addictive To State Governors. <https://www.forbes.com/sites/debraborchardt/2017/04/11/1-billion-in-marijuana-taxes-is-addicting-to-state-governors/#319b3d542c3b>. Accessed July 3, 2017.
  33. Mass. panel opens hearings on recreational cannabis law - The Boston Globe. <https://www.bostonglobe.com/metro/2017/03/20/mass-panel-opens-hearings-recreational-cannabis-law/yRphuYoXCeG3zNgzG3snsM/story.html>. Accessed July 3, 2017.
  34. Week in Review: Massachusetts rec logjam, Pennsylvania MMJ grower licensees & Oregon testing woes - Marijuana Business Daily. <https://mjbizdaily.com/week-review-massachusetts-rec-logjam-pennsylvania-mmj-grower-licensees-oregon-testing-woes/>. Accessed July 3, 2017.
  35. Chart: Fears may be overblown about impact of proposed tax hike on Massachusetts rec cannabis sales - Marijuana Business Daily. <https://mjbizdaily.com/chart-giving-context-proposed-tax-hike-massachusetts-rec-market/>. Accessed July 3, 2017.
  36. Marijuana Taxes: Lessons from Colorado and Washington - Tax Foundation. <https://taxfoundation.org/marijuana-taxes-lessons-colorado-washington/>. Accessed April 10, 2017.
  37. Marijuana legalization and charter schools: See how your town voted on the Massachusetts ballot questions | masslive.com. [http://www.masslive.com/politics/index.ssf/2016/11/marijuana\\_legalization\\_and\\_cha.html#incart\\_river\\_home](http://www.masslive.com/politics/index.ssf/2016/11/marijuana_legalization_and_cha.html#incart_river_home). Accessed July 2, 2017.
  38. City of Lawrence Fiscal Year 2018 Mayors Budget. 2017. <http://www.cityoflawrence.com/SharedFiles/Download.aspx?pageid=450&mid=1298&fileid=30421>. Accessed July 2, 2017.
  39. Economic Effects of Colorado's Legalization of Cannabis 2017 - Euflora Colorado.
  40. Tax revenue from Colorado pot helps fund community projects, scholarships - CBS This Morning - CBS News. <http://www.cbsnews.com/news/pot-marijuana-tax-revenue-colorado-national-weed-day/>. Accessed July 2, 2017.
  41. Could a marijuana tax help Portland's minority-owned businesses? | Business | The Guardian. <https://www.theguardian.com/business/2016/sep/29/portland-marijuana-tax-minority-business>. Accessed July 4, 2017.
  42. The Injustice of Marijuana Arrests - The New York Times. <https://www.nytimes.com/2014/07/29/opinion/high-time-the-injustice-of-marijuana-arrests.html>. Accessed July 5, 2017.
  43. Legalizing Pot Brings Down Drug-related Crime in Colorado. <https://www.voanews.com/a/legal-marijuana-and-crime/3379448.html>. Accessed July 2, 2017.

44. Kleiman M, Livingston A, Heizer D, et al. The Economic Impact of Marijuana Legalization in Colorado Marijuana Policy Group. 2016. [http://www.mjpolicygroup.com/pubs/MPG\\_Impact\\_of\\_Marijuana\\_on\\_Colorado-Final.pdf](http://www.mjpolicygroup.com/pubs/MPG_Impact_of_Marijuana_on_Colorado-Final.pdf). Accessed July 2, 2017.
45. Henchman J, Scarboro M. SPECIAL REPORT Marijuana Legalization and Taxes: Lessons for Other States from Colorado and Washington. 2016. [https://files.taxfoundation.org/legacy/docs/TaxFoundation\\_SR231.pdf](https://files.taxfoundation.org/legacy/docs/TaxFoundation_SR231.pdf). Accessed April 10, 2017.
46. Lewis J, Moore M, Chandler H, et al. *Report of the Special Senate Committee on Marijuana in the Commonwealth of Massachusetts*.; 2016. <http://www.telegram.com/assets/pdf/WT1817038.PDF>. Accessed July 3, 2017.
47. Shepard EM, Blackley PR. Medical Marijuana and Crime. *J Drug Issues*. 2016;46(2):122-134. doi:10.1177/0022042615623983.
48. Oakland hopes to light the way for minority-owned pot businesses - San Francisco Chronicle.
49. The Medical Use of Marijuana Program. <http://www.mass.gov/eohhs/gov/departments/dph/programs/hcq/medical-marijuana/>. Accessed April 18, 2017.
50. Massachusetts QuickFacts from the US Census Bureau. <https://www.census.gov/quickfacts/table/PST045216/25>. Accessed April 2, 2017.
51. Qualifying Conditions for Medical Marijuana by State | Leafly.
52. What is the geographic distribution of the HIV/AIDS epidemic in Massachusetts? 2012.
53. Department of Public Health M, of Infectious Disease B, Sciences L, of HIV O. Massachusetts Integrated HIV/AIDS Prevention and Care Plan. 2017.
54. Executive Office of Health and Human Services. MassCHIP. <http://www.mass.gov/eohhs/researcher/community-health/masschip/>. Accessed April 19, 2017.
55. Glaucoma Prevalence Rates by State. <http://www.visionproblemsus.org/glaucoma/glaucoma-map.html>. Accessed April 13, 2017.
56. Department of Public Health. Hepatitis C. <http://www.mass.gov/eohhs/gov/departments/dph/programs/id/epidemiology/hepatitis/hepatitis-c/>. Accessed April 13, 2017.
57. - Bureau of Environmental Health M. The Prevalence of Amyotrophic Lateral Sclerosis and Multiple Sclerosis and Ecologic Evaluation of Selected Environmental Factors in Southeastern Massachusetts Information Booklet. 1998. <http://www.mass.gov/eohhs/docs/dph/environmental/investigations/als-ms/als-ms-info-booklet-2013.pdf>. Accessed April 13, 2017.
58. Kappelman MD, Moore KR, Allen JK, Cook SF. Recent trends in the prevalence of Crohn's disease and ulcerative colitis in a commercially insured US population. *Dig Dis Sci*. 2013;58(2):519-525. doi:10.1007/s10620-012-2371-5.
59. Parkinson's Disease in Massachusetts - APDA Massachusetts. <http://apdama.org/wcms/about-us/information-referral-center/parkinsons-disease-in-massachusetts/>. Accessed April 13, 2017.
60. Rudd R, Seth P, David F, Scholl. Opioid Addiction 2016 Facts & Figures.

- MMWR Morb Mortal Wkly Rep.* 2010;65:1445-1452.  
doi:10.15585/mmwr.mm655051e1.
61. Lawrence, Massachusetts Population 2017, 2016.
  62. Health Policy Commission C of M. *OPIOID USE DISORDER IN MASSACHUSETTS: An Analysis of Its Impact on the Health Care System, Availability of Pharmacologic Treatment, and Recommendations for Payment and Care Delivery Reform.*; 2016. <http://www.mass.gov/anf/budget-taxes-and-procurement/oversight-agencies/health-policy-commission/publications/opioid-use-disorder-report.pdf>. Accessed April 1, 2017.
  63. Nearly 2,000 died from overdoses in Mass. last year - The Boston Globe. <https://www.bostonglobe.com/metro/2017/02/17/nearly-died-from-overdoses-mass-last-year/NdvnkZUYTQICONACHnlivN/story.html>. Accessed April 15, 2017.
  64. Weiss AJ, Elixhauser A, Barrett ML, Steiner CA, Bailey MK, O'malley L. Opioid-Related Inpatient Stays and Emergency Department Visits by State, 2009-2014. 2005. <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb219-Opioid-Hospital-Stays-ED-Visits-by-State.pdf>. Accessed April 15, 2017.
  65. Mass. had highest rate of opioid-related ER visits - The Boston Globe. <http://www.bostonglobe.com/metro/2017/04/02/mass-had-highest-rate-opioid-related-visits/6vJ4kwtO1dvQGf7TGuXueN/story.html>. Accessed April 6, 2017.
  66. Bradford AC, Bradford WD. Medical Marijuana Laws Reduce Prescription Medication Use In Medicare Part D. *Health Aff (Millwood)*. 2016;35(7):1230-1236. doi:10.1377/hlthaff.2015.1661.
  67. This is Why Medical Marijuana Should Be Covered by Health Insurance - Medical Marijuana, Inc. (OTC: MJNA). <http://www.medicalmarijuanainc.com/medical-marijuana-covered-health-insurance/>. Accessed April 8, 2017.
  68. Medical Cannabis For Elderly. <http://www.tikun-olam.info/article.php?id=1040>. Accessed June 2, 2017.
  69. Community Profiles 2014.
  70. Community Health Needs Assessment. 2016.
  71. Massachusetts State List: Nursing Homes.
  72. Massachusetts State List: Assisted Living Facilities.
  73. Colorado's Teen Marijuana Usage Dips after Legalization - Scientific American.
  74. State health department launches youth marijuana education and prevention campaign | Department of Public Health and Environment.
  75. Washington launches youth marijuana prevention campaign | Q13 FOX News.
  76. Oregon launches youth marijuana use prevention pilot campaign - State of Reform | State of Reform.
  77. Sessions: Legal pot drives violent crime, statistics be damned. <https://thinkprogress.org/sessions-legal-pot-violent-crime-8640413ca090>. Accessed July 2, 2017.