



- Cannabis Legalization
- in San Francisco
- A Health Impact Assessment



Office of Policy and Planning
San Francisco Department of Public Health

**Executive
Summary Report
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Executive Summary

On November 8, 2016, California voters passed Proposition 64, the “Adult Use of Marijuana Act”. This proposition made it legal for individuals age 21 and older to use, possess, and make non-medical cannabis available for retail sale.^a While the legalization of cannabis may have direct benefits to communities, from the regulation and taxation of cannabis sales to the substance’s continued de-criminalization, the public health impacts of legalization are lessor known. The legalization of adult use cannabis is relatively new in the United States and therefore there is limited and conflicting evidence on its public health implications.

This report assesses the most up-to-date information and draws together evidence from multiple sources to better understand the potential health impacts associated with cannabis legalization in San Francisco. The report aims to help inform discussions on the legalization process and provide a health lens to more fully understand its implications. This report uses a health impact assessment (HIA) framework to evaluate any potential negative health impacts or harms to communities from legalization and strategies for their preventions and/or mitigation. The following goals were used to provide an overall structure to guide the project:

- Prevent youth access and exposure to cannabis
- Minimize potential harms to communities from cannabis use
- Prevent the renormalization of tobacco product use and reverse of declining use rates
- Ensure perceptions of cannabis recognize risks associated with use

Based on these goals, the following research question was formulated for the analysis: What are the health impacts of *adult use cannabis retailers* on San Francisco communities? More specifically, the report wanted to evaluate: How does the density of and proximity to adult use cannabis retailers impact youth exposure and neighborhood quality of life^b? And how does allowing onsite consumption of adult use cannabis impact youth exposure and neighborhood quality of life? For the latter question, evidence in the literature was sparse and key informant feedback was somewhat limited, thus it was not a focal point of the report.

a. The proposition allows the possession, transportation, purchasing and consuming up to one ounce of adult use cannabis and eight grams of adult use cannabis concentrates, and allows personal cultivation for up to six plants in a private residence.

b. Neighborhood quality of life refers to issues such as crime, nuisances (e.g. noise, double parking, etc.), and traffic related injuries (e.g. pedestrian, bike, and vehicle-related injuries).



This assessment draws together evidence from multiple different data sources to develop a holistic understanding of the health impacts associated with cannabis legalization in order to answer the aforementioned research questions. Data sources included epidemiological data, scientific literature, expert and key informant opinions collected from interviews and focus groups, and diverse quantitative indicators associated with health and the neighborhood environment. These data sources were analyzed for population wide trends and stratified to examine potential disproportionate impacts of different sub-populations (e.g. by age, race/ethnicity) in following with the goals of the report. Since adult use cannabis in the United States is an emerging industry and there was limited evidence about specialized cannabis services such as onsite consumption.

The following sections of this executive summary highlight cross-cutting key findings identified throughout the different analyses, and provide recommendations for mitigating the impacts documented by the findings.

Cross-cutting Key Findings

Disproportional Impacts

Certain communities, especially communities of color, are disproportionately impacted by the location of existing medical cannabis dispensaries (MCDs), current cannabis youth use rates, and negative health outcomes associated with cannabis use.

Youth Cannabis Use Rates: According to data from the Youth Risk Behavior Survey (YRBS), Black/African Americans, Native Hawaiian/other Pacific Islander, and Latino/Hispanic middle schools students in San Francisco have the highest reported cannabis use rates among racial/ethnic groups. Among San Francisco high school students, American Indian/Alaska Native, Black and African Americans, and Whites have the highest rates of current cannabis use among racial/ethnic groups. Both local key informants and focus group participants in this study noted that there is low perception of risk associated with cannabis use among youth. This follows nationwide trends of decreasing perceptions of risk associated with cannabis use among youth.¹

MCD Locations: Land use planning and zoning can influence location and density of retail in the built environment, which may impact health. The densities of alcohol and tobacco retailers have been found to influence youth

exposure to these substances and have been associated with other community health harms. These retail types have also been found to disproportionately impact certain communities and concentrate in low income communities of color. Increasing evidence suggest that MCDs and adult use retailers could have similar impacts. In San Francisco, MCDs are not spread throughout the city evenly, with 64% of dispensaries operating in just four neighborhoods (South of Market, Mission, Outer Mission and Financial District). The areas surrounding MCDs were found to have higher poverty rates and higher concentrations of people of color in comparison to areas without MCDs. Specifically, areas around MCDs were more likely to have higher percentages of Black/African American and Latino/Hispanic populations.

Historically in the United States, specific land use policies have contributed to negative impacts on communities, especially low income communities and communities of color.² In San Francisco, these policies have led to many different issues, including creating neighborhoods with high densities of alcohol and tobacco retailers. The location of these retailers are influenced by zoning laws specifying where commercial uses can locate, which are often in denser parts of the city with large populations of low-income residents and residents of color. The location of MCDs may be following these distributional patterns due to current zoning laws, and concentrating in select neighborhoods. Of note, even though many areas of the City allow for MCDs based on current zoning rules, community organization and participation in the approval process can have significant impact and varies by neighborhood.

Cannabis Related Hospitalizations: According to California State hospitalization data, Black/African Americans in San Francisco have the highest cannabis-related hospitalizations and emergency room (ER) visits rates compared to other racial/ethnic groups in the city. Between 2010 and 2015, Black/African Americans had 5.8 times the age-adjusted hospitalization rate and 5.2 times the ER visit rate as the overall city population.

Based on the key informant interviews and focus groups in this study, none of the stakeholders representing organizations serving communities of color, or living in these communities, believed cannabis legalization would benefit communities of color, and instead would have a negative impact and exacerbate current conditions. They specified that cannabis retailers would concentrate in these communities and place vulnerable residents at risk (e.g. youth), and that existing residents would not be able to access economic opportunities afforded by the new market (e.g. ownership of retailers).

Concerns about Cannabis Edibles

The majority of cities and states that have legalized adult



use cannabis have experienced health impacts with the initial roll out of edibles from adult retailers, with data demonstrating increases in emergency room visits for poisonings associated with the ingestion of edibles following legalization.^c This issue was also a top concern among key stakeholders in this study, especially among physicians addressing substance use disorders. While cannabis-related hospitalizations are still much lower than the hospitalization rates for alcohol use disorder, San Francisco has observed a significant increase in the rates of hospitalizations and ER visits related to cannabis poisonings over the past ten years according to California State hospitalization data. Between 2006-2010 and 2011-2015, the rate of hospitalizations for cannabis-related poisonings increased 137%, with hospitalization counts increasing from 21 to 52. For the same time period, the rate of ER visits increased 88%, with ER visit counts increasing from 133 to 251.



Youth Normalization and Advertising

Advertising is an important driver for normalizing substance use behaviors, with research demonstrating that youth and young adults are strongly influenced by heavily-advertised products. Research on effects of tobacco advertising could be instructive for understanding the potential impacts from allowing different types of cannabis advertising on youth. According to the US Surgeon General, tobacco advertising, including branding, imagery, event sponsorship, and marketing campaigns, cause the onset and progression to smoking among young people^{6, 7}. Even minimal exposure to tobacco advertising can positively influence youth attitudes and perceptions on smoking.⁸ Cannabis-focused advertising is occurring throughout San Francisco and already being seen as a problem by stakeholders who participated in this report. Responsible advertising is key to reducing underage use of cannabis and has been shown to be an effective substance use prevention strategy. Restrictions of advertising are recognized by the World Health Organization as one of the most effective strategies for reducing tobacco product use, with complete marketing bans proving to be the most effective.⁹

c. Drug poisoning refers to a state of major disturbance of consciousness level, vital functions, and behavior following the administration in excessive dosage (deliberate or accidentally) of a psychoactive substance. The risk for acute toxicity of cannabinoids is considered to be low and there are no reports of fatal overdoses in the epidemiological literature from cannabis. The most common acute adverse effects of cannabis include anxiety, panic reactions, and psychotic symptoms. There are reports of cannabis intake resulting in coma in children, and in other cases, resulting in cardiac arrhythmia, acute myocardial infarction, and transitory ischemic attack.³⁻⁵

Recommendations

- 1. Take a measured approach to regulating adult-use cannabis.** The City should consider taking a measured approach in regulating the entry of new adult use cannabis retailers and the different adult use cannabis modalities (i.e. on-site consumption, delivery). This will allow for the evaluation of each modality and the ability to create a feedback loop to inform the next phase of licensing. This approach should consider:

 - Ensuring current health protective laws, like tobacco regulations and clean air rules, are not reversed.
 - For new adult-use cannabis retailers, after the initial licensing phase, consider instituting mechanisms that would assure only the numbers of outlets needed to serve the market are opened and prevent the over-concentration of retailers in neighborhoods. Mechanisms that exist include density ordinances and de-concentration ordinances.
 - For on-site consumption, delivery, and accessory use consider having a substantial evaluative approach in order to assess emerging social and public health impacts.
 - A social equity lens should guide the development and evaluation of these new modalities, and provide input on future land use and licensing regulations. Policies should consider communities currently disproportionately and negatively impacted by issues associated with substance use and other related health harms.
- 2. Implement a robust public educational campaign.** The City should consider a robust public educational campaign that addresses cannabis legalization and cannabis use across the lifespan that encompasses targeted messages for different sub-population, including pregnant women, children, parents and seniors (e.g. for children it should focus on delay the age of the initiation of cannabis use). All public educational campaigns should be fact-based and highlight potential risks for cannabis, but not overstate negative health outcomes. This campaign should begin early- ideally the same time as permits are issued for adult use retail. If funding for public health prevention and for educational campaigns is dependent on an excise tax, there should be a mechanism to ensure upfront funding is provided (e.g. loan from the general fund) to prevent any delays in the initiative.
- 3. Integrate cannabis into youth prevention programming.** The City should consider providing youth substance use prevention programming and integrate



cannabis-specific health education into current health education that leverages existing resources. Education on cannabis should start early (middle school) and should take a non-punitive approach that focuses on reducing the negative impacts associated with drug use. Programming should include peer-to-peer education modalities, especially at the high school levels.

- 4. Address potential disproportionate impacts to communities.** When considering approaches for permitting adult use retailers, especially in communities experiencing high rates of substance use disorders and other health disparities, the City should consider robust community education and ensure engagement processes be put in place. Historically, government public input processes favor communities that are familiar with civic decision-making processes and can actively and continuously engage, leaving neighborhoods without the same experience and resources underrepresented. Underrepresented communities are more likely to be the same ones that could be vulnerable to any potential negative impacts of legalization, and have been shown to be at risk for the concentration of medical cannabis dispensaries and other types of retail that are associated community health harms (e.g. tobacco and alcohol retailers). There are several potential options that would lend themselves to community protections:
- *Consider providing preventative outreach that aims to enhance stakeholder engagement* to make sure that regulations are relevant for their specific neighborhood. The stakeholder engagement should take a people-centered planning approach where residents, businesses, and city agencies work together to actively shape the cannabis landscape for their neighborhoods. It would be important to be inclusive of communities that are low-income, have high rates of violent crime, high density of alcohol and tobacco outlets and high rates of substance use disorders.
 - *Consider community factors related to health during the approval process* for adult use retailer permits. Factors such as low-income levels, density of alcohol and tobacco outlets, and rates of substance use disorders should be considered in the decision to issue a permit.
- 5. Strong regulation of cannabis edibles.** The City should consider strong regulations for cannabis edibles and implement and enforce all state rules, including limiting the concentration of THC, requiring clear and simple instructions on how to safely consume, and prohibiting products that appeal to children (e.g. candy). Efforts to augment state rules, could include requiring all products should come in plain, sealed, and in re-sealable packaging with sufficient warnings. Explore the use of active

public health surveillance to monitor for incidences of poisonings and accidental overdoses, including strategies that leverage Poison Center data.

- 6. Develop advertising standards to protect youth and work to avoid creating social norms.** The City should consider regulating cannabis advertisements, as is currently done for alcohol and tobacco products. This could include a range of options such as working with the cannabis industry and other key stakeholders to adopt and comply with self-regulatory standards to reduce the extent to which cannabis advertising targets youth by both placement and content. Additionally, options could be explored for legally restricting advertising in youth-centered locations. While evidence is somewhat limited with cannabis, making consumption of tobacco less socially acceptable has been a major lesson of tobacco control over past decades. Prohibiting or reducing on-site consumption, as with tobacco, may also help to avoid creating social norms of acceptability of cannabis consumption.

The following section provides an Appendix with a summary of the relevant analyses from data generated from the literature review, key informant interviews, focus group interviews, youth survey information and baseline conditions of MCDs. Details about the methodology and an expanded explanation and discussion of the findings of this study are detailed in the full report (forthcoming November 2017).

Appendix A

[Summary of Key Analyses: Literature Review, Youth Survey Data, Youth Focus Groups, MCD Location Analysis, ER and Hospitalization Trends, Key Informant and Thematic Analysis, and Outside Jurisdiction Interviews](#)

Literature Review: Findings on legalized cannabis in other jurisdictions

Methods

The literature review was conducted on key topics related to the assessment focus, including: health impacts of cannabis use, impacts associated with medical cannabis dispensaries, impacts associated with retail-locations allowing on-site use, and impacts from legalized recreational cannabis use on youth. The review primarily used systematic reviews when available, and individual peer-reviewed studies and impact analyses when systematic reviews were unavailable. **Please note that both research and regulations for cannabis use are rapidly evolving and the information presented in this review may not align with the information most currently available**

Findings

- Systemic literature reviews found moderate to substantial evidence demonstrating the association between cannabis use and multiple health and social outcomes, including: worse respiratory symptoms, lower infant birth weight, development of schizophrenia, impaired performance in cognitive domains of learning, memory, and attention, and increased the risk for developing substance dependence.¹⁰
- Individual state monitoring reports have noticed increasing trends of cannabis related hospitalizations, increase in emergency department visits and increase calls to poison control mentioning human cannabis exposure increasing.
- The scientific literature examining the impacts of cannabis retailers and medical cannabis dispensaries (MCDs) is extremely limited, provides mixed findings, and focuses predominantly on MCDs. Studies examining MCD and retailer impacts have found that, similar to the impacts of alcohol and tobacco outlets, their proximity to and/or density within communities is positively associated with current cannabis use¹¹, recent cannabis use by certain adolescents groups (8th and 10th graders)¹², lower age of cannabis use onset¹³, cannabis use disorder hospitalizations¹⁴, and frequency of child physical abuse.¹⁵ Recent studies have also found that neighborhoods with lower household incomes, higher proportion of racial and ethnic minorities, higher crime, or greater density of on premise alcohol outlets have a greater density of MCDs.^{16,17}
- A recent study of Colorado adult use cannabis retailers found that stores were more likely to located in neighborhoods with lower proportions of young people, higher proportions of racial

and ethnic minority population, lower household incomes, higher crime rates, or greater densities of on premise alcohol outlets.¹⁸

- Conversely, some studies have also found no association between the density of medical cannabis dispensaries and specific issues such as violent or property crimes¹⁹, recent cannabis use by certain adolescents groups (12th graders)¹², or lifetime cannabis use.¹¹
- Literature on the impacts of onsite use of cannabis is sparse, in part, because this form of use is illegal in most places. No systematic reviews were identified, and the journal articles that were found focused on the impacts of sites in the Netherlands. These studies showed conflicting findings on the overall impact of onsite use locations in surrounding communities.^{20,21}
- The scientific literature on the impacts of alcohol outlets is substantially more robust than the cannabis literature and may provide insight into their potential impacts. Multiple systematic reviews have found that increases in outlet density is positively associated with increases in alcohol consumption and alcohol related harms, including, but not limited to crime, injuries and alcohol misuse.^{22–24} Alcohol outlets are also disproportionately located in certain communities, with neighborhoods that have lower household incomes and greater proportions of ethnic and racial minorities having greater outlet densities.^{25,26} For tobacco retailers, higher densities have shown to influence minors’ perception of acceptability, availability, enforcement, as well as their likelihood of purchasing their own products.^{27,27–31}

Youth Risk Behavioral Survey: Existing Conditions

Methods

Cannabis use among youth can have significant health and social impacts.^{4,10,32} Youth who use cannabis regularly are more likely to have a hard time learning, problems remembering and lower math and reading scores. Cannabis can be addictive and it harder for youth to stop if they start at a young age. This analysis examines cannabis use patterns among San Francisco Unified School District middle and high school students between 2009 and 2015 using survey data gathered using the Youth Risk Behavior Survey (YRBS). The survey asks students questions on a variety of different health behaviors, including substance use. The survey is administered to a random sample of classes at the middle and high school levels, and has an average sample size across of approximately 2,000 students per survey. The data collected provides insights into cannabis use patterns in youth and whether there are disparities by gender, race/ethnicity, and sexual orientation.

Findings

Middle School Students

Cannabis

Between 2008 and 2014:

- The percentage of students who have ever used cannabis has remained relatively stable. In 2014, 6.9% of students reporting using cannabis.
- Males and females have similar rates of cannabis use.

- Among racial/ethnic groups, Black/African American, Native Hawaiian/other Pacific Islander, and Latino/Hispanic groups reported having the highest percentages that ever used cannabis, with rates of 22.7%, 21.6% and 16.2%, respectively.
- Students who self-identify as Gay, Lesbian, or Bisexual had the highest percentage of reporting to have ever used cannabis among sexual orientation groups, with rates of 32.7%.

Tobacco

Between 2008 and 2014:

- Cigarette use has declined as measured by the percent that have ever smoked (from 15.7% to 8.7%), smoked before age 11 (from 4.3% to 1.9%), and current use (from 4.7% to 1.8%)
- Males and females have similar rates of smoking.
- Black and African Americans and Latino/Hispanic have the highest rates of current cigarette use among racial/ethnic groups, with rates of 5.7% and 4.8%, respectively.
- Students who self-identify as Gay, Lesbian, or Bisexual had the highest current cigarette use among sexual orientation groups, with rates of 19% (2008-2014)

Vapor Products

- In 2014, 8% of middle school students reported currently using vapor products. The survey question does not specify if products are cannabis or tobacco.

High School Students

Cannabis

Between 2009 and 2015:

- The percentage of students who have ever used cannabis has remained relatively stable. In 2014, 28.7% of students reporting using cannabis. This rate is lower than the most recent national rates, where 40.7% of high school students reported having ever used cannabis. Additionally, San Francisco’s high school student use rate is lower than rates in states that have legalized recreational cannabis. In 2015, approximately 38% of Colorado high school students report having ever used cannabis. While the legalization of the recreational cannabis market has not been open long enough to reliably evaluate its health consequences, there have been several initial post-impact analyses of legalization in Washington, Colorado, Oregon, and Alaska.³³⁻³⁷ Data show that legalization has not had a demonstrated impact on overall use rates and risk perception. Among different youth age groups in Colorado, Washington, Oregon and Alaska, survey data suggests that use rates (last 30 days and lifetime use) have remained stable or slightly decreased following legalization.^{35 31, 57, 58}
- Males and females have similar rates of cannabis use.
- American Indian/Alaska Native, Black and African Americans, and Whites have the highest rates of current cannabis use among racial/ethnic groups, with rates of 49.2% (large MOE), 37.4%, and 34.5%, respectively. Latina/Hispanic and Native Hawaiian/other Pacific Islander also had high than average rates, with 29.3% and 27.2% reporting current cannabis use.
- Students who self-identify as Gay/Lesbian or Bisexual have the highest percentages of current cannabis use among sexual orientation groups, with rates of 28.0% and 37.2%, respectively.

Tobacco

Between 2009 and 2015:

- Cigarette use has declined as measured by the percent that have ever smoked (from 35.6% to 24.4%), smoked before age 13 (from 8.5% to 5.4%), and current use (from 10.4% to 5.4%)
- Males and females have similar rates of smoking
- Native Hawaiian/other Pacific Islander, White, Latino/Hispanic, and Black and African Americans have the highest rates of current cigarette use among racial/ethnic groups, with rates of 24.2% (had large MOE), 18.9%, 11.7%, and 11%, respectively.
- Students who self-identify as Gay/Lesbian or Bisexual had the highest current cigarette use among sexual orientation groups, with rates of 24.8% and 22.8 %, respectively.

Vapor Products

- In 2015, 13% of high school students reported currently using vapor products. The survey question does not specify if products are cannabis or tobacco.

Youth Focus Group on Cannabis Legalization

Methods

An hour-length focus group was conducted with 14 local youth age 14 to 22 using a semi-structured question guide. The focus group transcripts were then analyzed for key themes, which were identified based on the number of focus group subjects who mentioned them.

Findings

Current Environment Key Themes:

- There are concerns about the health impacts, but also information isn’t provided about what they are.
- Cannabis is easy to access and use is normalized and associated with being chill/cool
- Cannabis use starts early, with some youth using it to cope with life stressors
 - “I’m scared about how young students are when they start using. They don’t have the information about the issue because they’re starting so young”
 - “Some people smoke to cope with different emotions and struggles in life. Sometimes cannabis makes it even worse”.
- MCD are seen as having a negative impacts on neighborhoods: They are not benefiting communities, increasing in presence, and they disproportionately located in communities of color.
 - “Community members are influenced by stores located near them. Just like how liquor stores lead to more smoking, obesity. People of color are not benefiting from these dispensaries.”

Future Environment Key Themes:

- Legalization will not benefit communities of color and instead have a negative impact.
- Subjects specified fears of criminalization of youth and that legalization will increase exposure, use, and normalization of cannabis.

Youth Focus Group Recommendations:

- Provide education on health risks and on what the rules are.
 - “Need education around regulations. There wasn’t enough information about new tobacco laws that passed and people got in trouble without even know what rules they were breaking.
- Provide Education at an early age and ensure parents are included as well
 - Incorporate harm reduction and peer-to-peer approaches
 - “Peer on peer education that includes people of color. You need to ensure educators reflect the students they are educating”
- Provide restorative programs and policies: clear records of imprisoned, less criminalization of youth, provide opportunities to ownership for communities of color
- Ensure there rules for dispensaries: buffer from schools, no concentrating in communities of color
 - “Can’t keep placing dispensaries in our communities. The dispensaries need to be spread out and not concentrated in one area”

Medical Cannabis Dispensaries in San Francisco: Existing Conditions

Methods

The literature demonstrates that land use types like MCDs, cannabis retailers, and retailers associated with community harms (e.g. alcohol outlets) often concentrate in low income communities and communities of color and can influence youth exposure to harmful substances. The following analysis examines whether these distributional patterns are being reproduced in San Francisco with MCDs, and how the current proposal to change land use restrictions overseeing MCDs and cannabis retailers (per Ordinance 171041, as introduced Sept 26, 2017) could impact that distribution. The geographic analyses were conducted using the most recently available data from San Francisco Department of Public Health (SFDPH), San Francisco Department of City Planning (SF Planning), American Community Survey(ACS) and California Department of Education (CDE) and sought to examine three main questions:

- (1) Where are MCDs (excluding delivery-only locations) currently operating in San Francisco?
- (2) Based on current San Francisco land use regulations, what areas are currently zoned for new MCDs?
- (3) What are the demographic characteristics in areas with MCDs and areas that are currently zoned from new MCDs?

Findings

- As of August 2017, there are a total of 28 licensed MCDs (excludes delivery only licensed MCDs, n=10) operating in San Francisco.
- MCDs are not spread throughout the City evenly, with several neighborhoods and supervisorial districts containing a disproportionate share of MCDs in operation. MCDs are located in 12 different neighborhoods, with 64% operating in just four neighborhoods: South of Market (8), Mission (4), Outer Mission (3), and Financial District (3). MCDs are located in 10 of the 11 supervisorial districts, with 68% operating in just three districts: District 6 (11), District 9 (5), and District 11 (3).

- MCDs follow a similar distributional patterns as alcohol outlets and tobacco retailers throughout San Francisco. The neighborhoods with some of the highest concentrations of MCDs, SOMA, Mission, and the Financial District were also the neighborhoods with some of the highest densities of alcohol outlets and tobacco retailers. Of note, MCDs were found to concentrate to a high degree in SOMA, Financial District, and Outer Mission in comparison with alcohol and tobacco retailers.
- Similar to the geographic distribution of MCDs, areas zoned to allow dispensaries are not distributed equally across the city. Three neighborhoods contain 46% of the zoned area that allow for new MCDs to open: South of Market with 19.5% of total MCD zoned areas, Financial District with 15.7%, and North Beach with 10.4%. By Supervisorial District, three districts account for 63% of area zoned for new MCDs: District 3 (21.0%), District 6 (30.0%), and District 10 (12.0%).
- Areas surrounding MCDs were found to have higher poverty rates (35.1% vs 27.0%) and higher concentrations of people of color (64.4% vs 58.5%) in comparison to areas without MCDs. There were differences in the percentage of youth populations between the two areas, with areas without an MCD having a lower percentage of youth population (11.4% vs. 13.5%)
- When examining by specific racial/ethnic categories, the areas surrounding MCDs were more likely to have higher percentages of Black/African American (6.8% vs 5.3%) and Latino/Hispanic (19.9% vs. 15.1%) populations compared to areas without MCDs. Inversely, areas with MCDs have lower percentages of White populations compared to areas without MCDs (35.6% vs. 41.5%).
- Areas surrounding areas zoned for MCDs (“green zone”) not within 1,000 feet of schools were found to have higher rates of poverty (29.8% vs 25.9%), but similar percentages of people of color (59.2% vs 58.5%). There were differences in the percentage of youth populations between the two areas, with areas not containing green zone areas having a lower percentage of youth population (12.0% vs. 14.3%).
- Under the proposed rules under Ordinance 171041 (as introduced 9/26/17) to expand the green zone (excluding PDR zoning allowances), South of Market, Financial District, and Downtown/Civic Center would have the most area zoned for MCDs and cannabis retailers and would contain 43.1% of the proposed additions to the green zone. Areas surrounding the proposed green zones were found to have higher rates of poverty (30.6% vs 23.2%), similar percentages of people of color (58% vs 58%), and a lower percentage of youth (11.9% vs 15.4%). By race/ethnicity, there would be similar proportions of African American, and White, and differences in the percentage of Asian (32% vs 35%) and Latinos (16% vs 13%).

Cannabis-Related Hospitalization and Emergency Department: Existing Conditions

Methods

Hospitalizations and emergency room (ER) from cannabis use disorder and poisonings are potential health outcomes associated with cannabis use.^{10,40} This analysis examines the burden of cannabis-related hospitalizations and emergency room (ER) visits among San Francisco residents, as measured by hospitalizations and ER visits where cannabis could be a causal, contributing, or coexisting factor noted by the physician during the ER visit or hospitalization. Hospitalizations and ER visits were included if they had a cannabis-related ICD-9 code (E854.1, 969.6, 305.20-305.230-305.20-305.233) in one or more of the diagnostic fields (one primary field, and up-to 24 other diagnosis can be noted) or injury field (one

primary injury code, and up to 4 other injury codes can be noted). Hospitalization and ER data was obtained from the Office of State Health Planning and Development (OSHPD). **Please note that cannabis may not be a causal reason for the hospitalizations or ER visits in the analysis.**

Findings

- Hospitalizations and ER visits with cannabis-related primary diagnosis represent a very small fraction of cannabis-related cases. Between 2010 and 2015, 1% of all cannabis-related hospitalizations and an estimated 10% of all cannabis-related ER visits had cannabis-related primary diagnoses.
- Cannabis use disorder diagnoses are responsible for most cannabis-related hospitalizations and ER visits where cannabis-related ICD-9 codes are present in any diagnosis field. Between 2010 and 2015, cannabis use disorder diagnoses accounted for an estimated 99% of all cannabis-related hospitalizations and 95% of all cannabis-related ER visits.
- Among cannabis-related hospitalizations and ER visits with cannabis-related primary diagnosis, cannabis poisonings accounted for 68% of hospitalizations and 40% of ER visits.
- Between 2006-2010 and 2011-2015, cannabis-related hospitalizations and ER visits increased substantially. Hospitalization counts increased 50%, the percentage of hospitalizations increased 45%, and age-adjusted rates increased 45%. ER visit counts increased 185%, the percentage ER visits increased 140%, and age-adjusted rates increased 180%.
- By sex, males had the highest cannabis-related hospitalizations and ER visits rates. Between 2010 and 2015, males had 1.8 times the age-adjusted hospitalization rate and 2.1 times the ER visit rate as females.
- By race and ethnicity, Black and African Americans had the highest cannabis-related hospitalizations and ER visits rates. Between 2010 and 2015, Black and African Americans had 5.8 times the age-adjusted hospitalization rate and 5.2 times the ER visit rate as the overall population.
- Young adults age 18-20 and adults age 21-24 had the highest hospitalization and ER rates among all age groups. Between 2011 and 2015, these age groups had hospitalization rates about two times the overall cannabis hospitalizations rate, and ER rates over three times the overall cannabis ER visit rates.
- When examined by cause, cannabis use disorder was the primary drivers of most age-specific rates and counts of hospitalizations and ER Visits. Among those ages 0-4, cannabis-related poisonings accounted for all hospitalizations and most ER visits.
- Residents from zip codes 94102 (Downtown Civic Center, Western Addition) and 94103 (South of Market, Mission, Financial District, Mission Bay) had the highest hospitalization rates for cannabis, with rates of 29 hospitalizations per 1,000 total hospitalizations and 30 hospitalizations per 1,000 total hospitalizations.
- Residents from zip codes 94104 (Financial District) and 94117 (Haight Ashbury, Western Addition) had the highest ER visit rates for cannabis, with rates of 8.3 visits per 1,000 total ER visits and 11.6 visits per 1,000 total ER visits.
- Primary diagnoses were examined for hospitalizations where cannabis-related diagnosis was not listed a primary diagnosis. The prevalence of the primary diagnosis category *mental illness* was over five-fold higher among cannabis-related hospitalizations compared to hospitalizations without cannabis-related diagnosis.

- The primary diagnoses were also examined for ER visits where cannabis-related diagnosis was not listed a primary diagnosis. The prevalence of the primary diagnosis category *mental illness* was over two-fold higher among cannabis-related ER visits compared to ER visits without cannabis-related diagnosis.
- Overall, cannabis-related hospitalizations in San Francisco are still much lower than the hospitalization rates for alcohol use disorder. Between 2012 and 2014, age-adjusted hospitalizations due to alcohol use disorder in adults, age 18-plus, was 8.37 per 10,000 residents^a. In comparison, between 2011 and 2015, the hospitalizations rate where cannabis was a primary diagnosis was 0.11 per 10,000 residents (notes this estimate includes all age groups).

San Francisco Key Informant Interviews with on Cannabis Legalization

Methods

Hour-length structured interviews were conducted with 11 different key informants regarding the current and future impacts of cannabis and recommendations for their mitigation. Key informants included three physicians with focus on substance use issues and cannabis use, two representatives from local regulatory agencies, a neighborhood organization, three youth serving organizations, cannabis/tobacco policy researchers, and a cannabis industry representative. Interview transcripts were analyzed for key themes, which were identified based on the number of informants who mentioned them.

Findings

Current Environment Key Themes:

- There are negative impacts to individuals from use, especially cognitive impacts on youth. There are disparities in these impacts, especially by age and race.
 - According to a substance use physician, “Though 6% of the population is black, they account for 20-30% of treatment population in every addiction treatment program in the City”.
 - There is a low perception of risk about the harms associated with cannabis use.
- According to a substance use physician, “Marijuana is seen as natural, nicotine isn’t. Pills aren’t natural, but marijuana is. They think of it like basil”
- Key informants had diverse views on Medical Cannabis Dispensaries. Some thought that they had minimal impact on surrounding community (e.g. don’t contribute crime; most adhere to rules; any issues are mostly quality of life issues), some thought they had positive impact on the neighborhood (e.g. improved block; lowered crime through activation and security), and others thought they negatively impacted communities (e.g. cluster in certain neighborhoods; crowd out other retail; attract problem clientele; have normalizing effect on youth)
- According to youth organization key informant: “MCDs are open early in the morning. The exposure to kids when they walk by makes a difference. Cannabis becomes normalized when

^a Patient Inclusion criteria are: 1) 18 or over at the time of admission, 2) primary diagnosis equal to any of the following ICD9 codes: 291, 2910, 2911, 2912, 2913, 2914, 2915, 2918, 2919, 29181, 29182, 29189, 303, 3030, 3039, 3575, 4255, 5353, 3050, 5710, 5711, 5712, 5713, 7903, 9800, E860, E8600, E8601, and 3) residence in San Francisco at the time of admission.

they walk by it every day. If you see cannabis every day, young people may not realize that it still needs to be consumed responsibly”

- Cannabis is widely available and use is already de-facto legalized
- Several informants noted that some of cannabis’s impacts were not as significant, especially in comparison to other drugs (e.g. cancer risk, addiction).

Future Environment Key Themes:

- Almost all key informants raised concerns about the legalization of cannabis. Primary concerns from legalization included:
- Increase in access and use from increased exposure to cannabis and normalization of use, especially among youth.
 - Accidental overdoses from cannabis products not being properly dosed, labeled, and/or packaged
 - Widespread advertisement campaigns by industry and the targeting of youth and communities of color with marketing and misinformation
 - A youth organization representative noted: “I think about the impact of the tobacco industry, and how young people of color are the target of advertisements, having the product more readily available, and available in more acceptable manner”.
- Impacts of onsite use, especially in relation to smoke exposure and public intoxication
- Impacts on high risk/vulnerable communities. Communities with high rates of mental illness, chronic disease, substance use disorders, violence will be vulnerable to the impacts of legalization and these same communities will be targeted for dispensaries
- Increased Influence of cannabis industry/big business leading pressures to roll back regulations, crowding out of small retailers, and more engineered products
- There won’t be legal place to consume cannabis (especially for tourists), leading to unsafe and public consumption
- Several informants specified positive impacts from legalization, including economic benefits, decriminalization of cannabis, and the de-medicalization of cannabis.
- Several informants believed that cannabis legalization won’t have substantial impact because cannabis use is already de-facto legal in San Francisco.
 - According to substance use physician, “95% of people who are going to use cannabis are already using cannabis. There isn’t going to be a huge expansion of it. It’s already been effectively legal and available for 20 years”

Recommendations Key Themes:

- Near unanimous agreement for education and awareness of legalization and cannabis’s impacts.
 - Education needs to explain the health impacts, especially on youth
 - Education and messaging needs to be fact-based and not be sensational:
 - “We need to break the myth that cannabis is harmless. Education doesn’t need to go the reefer madness route. There is enough evidence to make a solid case otherwise”- Researcher
 - Education needs to target both youth and adults, explain legalization and what the rules are; educate parents how to talk to youth, focus on targeting youth early, focus on de-normalizing use, and use peer-led models for youth education.
 - According to a school official: “It’s confusing to students and students need to understand that it’s not allowed and they need to be informed about what the law is.”
- Near unanimous agreement for restrictions for retailers, especially to ensure they don’t disproportionately impact low-income communities, communities of color, and communities with high health-risks (e.g. substance use issues, violence, chronic disease).
 - Provide land-use restrictions, including rules on: anti-clustering, anti-density, sensitive site buffers (e.g. schools, youth serving facilities)
 - Provide operating hours for retailers
- If on-site use is allowed, provide rules on enhanced ventilation
- There needs to be interdepartmental coordination, especially to ensure consistent application of rules and consistent messaging.
- Most suggested that, overall, rulemaking should initially take a “restrictive approach” and slowly legalize.
 - “We should not repeat the mistakes made with tobacco and alcohol”-Youth Organization
- Some suggestions for liberalized rules (e.g. loosen zoning controls) and to not over-regulate or tax.
- Provide prevention and treatment programming, especially for youth, and approaches need to focus on harm reduction and not criminalization.
- There needs to be advertising rules to prevent saturation campaigns, predatory marketing, and youth-targeted marketing
- Provide strong product controls, especially with regards to dosing and labeling to prevent accidental overdoses and targeting of youth.

Outside Jurisdictions Key Informant Interviews with on Cannabis Legalization

Methods

Hour-length structured interviews were conducted with health agency representatives from six different government jurisdictions that have legalized recreational cannabis regarding health impacts it has had. Jurisdictions included Washington State, King County, Oregon, Multnomah County, Colorado, and

Denver. Interview transcripts were analyzed for key themes, which were identified based on the number of informants who mentioned them.

Findings

- Most of the jurisdictions interviewed felt that the retail sales of cannabis were rolled out too quickly and there was not adequate time to prepare. There was also long delay of before prevention funds were ready due to the delay in the excise tax.
- Edible cannabis poisonings was seen as a significant health problem. Many of the jurisdictions wished that they had had better control over the cannabis market with regard to concentration of THC, packaging and availability. None of the places that had legalized cannabis had permitted on-site consumption.
- While most jurisdictions saw a reduction in tobacco use, they stated that there should be no leeway with tobacco laws. Some jurisdictions saw an increase of e-cigarette use.
- Many of the jurisdictions have recommended having very strict advertising laws in place. Places that had legalized adult use cannabis saw rampant advertising and also spoke about many advertising loop-holes being exploited by the cannabis industry.
- Most of the jurisdictions interviewed thought that they had put a successful youth education campaigns in place. Access to these campaigns and materials were available on-line. One jurisdiction had a failed campaign because it overstated the health risk associated with cannabis and warned other jurisdictions not to focus on “dramatic health impacts”.
- Many of the jurisdictions spoke about equity issues that were persistent in the legalization. Many of the residents of places that legalized cannabis felt that starting a cannabis businesses was very experience and opportunities were limited to the wealthy and non-minorities. Also those inequities were perpetuated in that there were prohibitions against individuals getting cannabis dispensary licenses if owner had prior convictions.
- There were neighborhood issues with the clustering of cannabis dispensaries and it was recommended to have a de-concentration ordinance geared towards reducing density in certain neighbors.
- Many local jurisdictions felt there was a reduction in crime after the legalization of cannabis with the exception of the cannabis retailer being subject to robberies because most of them being cash businesses.
- Most jurisdictions said the number one community complaint was odor. There were also some mentions of the pesticide use and violation of the clean air act.

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