Cannabis
2022, Volume 5 (1)

researchmj.org
DOI: 10.26828/cannabis/2022.01.004

Racial Equity in Cannabis Policy: Diversity in the Massachusetts Adult-Use Industry at 18-months

Samantha M. Doonan[1,2], Julie K. Johnson[1], Caislin Firth[3,4], Alyssa Flores[1], & Spruha Joshi[5]

[1]Massachusetts Cannabis Control Commission (CCC), 2 Washington Sq., Worcester, MA, 01604, United States
[2]New York University School of Medicine, 180 Madison Ave. New York, NY, 10016, United States
[3]Faculty of Health Sciences, Simon Fraser University, 8888 University Dr., Burnaby, British Columbia, V5A 1S6, Canada
[4]Alcohol & Drug Abuse Institute, University of Washington, 1107 NE 45th St., Seattle, WA, 98105, United States
[5]New York University School of Medicine and School of Nursing, 180 Madison Ave. New York, NY, 10016, United States

ABSTRACT

Background: Cannabis criminalization disproportionately harms communities of color in the United States. In Massachusetts' legal recreational ("adult-use") cannabis industry, state regulations intend to promote diverse participation. We assessed short-term racial/ethnic and gender diversity across the industry and in senior-level positions with greater opportunities to build wealth (i.e., board members, executives, directors). **Methods:** We extracted race/ethnicity and gender from required registration forms submitted to state regulators for each person working in a licensed adult-use cannabis business from October 2018 to April 2020 (n=4,883). We conducted descriptive analysis and negative binomial regression to assess characteristics associated with senior positions. **Results:** As of April 2020, racial/ethnic and gender diversity in the Massachusetts adult-use cannabis market (n=4,883) was 75% white, 7% Latino, 6% Black/African American, similar to the state labor market, and 65% male. Diversity was more limited in senior positions. Agents in senior positions (n=403) were 84% white, 2% Latino, 5% Black/African American, and 82% male. Senior-level participation was markedly low for women of color. **Conclusion:** Despite legislative and regulatory commitment, diversity lacks in senior positions in this emerging cannabis market. States considering adult-use cannabis markets, and those that have already done so, should monitor participation to identify inequities and adapt initiatives to ensure Black/African American and Latino communities socially and economically benefit from state legalization.

Key words: social equity; cannabis; cannabis policy; marijuana policy; diversity; cannabis market

Despite federal illegality, U.S. states are increasingly legalizing cannabis for adult use (people at least 21 years old) and establishing licensure of cannabis establishments. Ensuring that Black/African American, Latino, and Indigenous communities socially and economically benefit from the state's legal industry is critical, as cannabis prohibition enforcement disproportionately harmed these communities (Ahrens, 2020; Bender, 2016; Perlman, 2020). In 1971, the Nixon Administration declared a War on Drugs, and punitive enforcement measures ramped up in the

Corresponding Author: Samantha M. Doonan, BA. Massachusetts Cannabis Control Commission (CCC), 2 Washington Sq., Worcester, MA, United States; New York University School of Medicine, 180 Madison Ave. New York, NY 10016, United States. Email: Samantha.Doonan@nyulangone.org

late 1980s under the Reagan Administration (Bender, 2013). Racism was a driving force in these policies (Provine, 2011). Taken together, the War on Drugs and associated punitive enforcement policies (including for cannabis) created structural changes to substance use enforcement and are implicated in the disproportionately high arrest and incarceration rates for people of color and particularly Black men for drug-related offenses (Bender, 2013). Today, impacts persist with diffuse harms. Consequences include disruption to key correlates of health (e.g., housing, employment), economic opportunities, the social cohesion of neighborhoods, the wellbeing of family units, and have generational implications (Bayerl et al., 2017; Berson, 2013; Valleriani et al., 2018). In contrast, some legalization proponents envision cannabis legalization as a means toward restorative social and economic justice for communities most harmed by prohibition enforcement (Adinoff & Reiman, 2019).

Cannabis legalization alone does not eliminate the individual, family, and community-level impacts of prohibition, but it opens doors for advancing equity. For example, cannabis arrests decline following legalization, but racial disparities persist (Firth et al., 2019, 2020). Participation in state legal industries is one opportunity to advance economic justice. Senior industry positions (i.e., board members, executives, directors) are particularly important roles to consider as pathways to build wealth. However, the gray literature indicates that senior positions in cannabis enterprises are disproportionately held by white men (Analytic Insight, 2020; Lewis, 2016; Marijuana Business Daily, 2017). In response and in recognition of historical and persistent disparities, states are implementing unique approaches aimed at increasing equity through cannabis policies. The evidence-basis for specific equity-related policies is still developing.

People and communities most harmed by cannabis prohibition face disproportionate barriers to enter the cannabis industry (Bender, 2016; Danquah-Brobby, 2017; Hamilton et al., 2019; Rahwanji, 2019). All aspiring entrepreneurs face major financial barriers (e.g., access to capital, real estate costs), which are compounded by a lack of access to traditional banking services in the cannabis industry. Yet racial disparities in wealth and discrimination in access to capital make such barriers more prohibitive for disproportionately impacted communities of color (Bender, 2016; Danquah-Brobby, 2017; Swinburne & Hoke, 2020). In addition, necessary approvals and various regulatory complexities across local and state governments require access to legal services, favoring the politically well-connected (Adinoff & Reiman, 2019). For all positions, prior criminal convictions (including for cannabis) may restrict employment opportunities. This barrier then disproportionately restricts participation by people of color because of inequitable enforcement practices and outcomes in the justice system (Perlman, 2020; Rahwanji, 2019). Further, cannabis remains a federally illegal substance (Drug Enforcement Agency, n.d.). Harms from prohibition and greater scrutiny of people of color by law enforcement may result in greater reluctance to enter a high-profile market that is not federally legal (Bender, 2016; Danquah-Brobby, 2017). Critically, these cannabis-specific barriers occur in the context of larger social systems and factors, including structural inequity, racism, and discrimination (García & Sharif, 2015).

Women also participate in state's legal cannabis markets less than men, and little is known about participation by women of color (August, 2013; Camors et al., 2020; Kittel, 2018; Vangst, 2019). Researchers in other fields identified distinct barriers to entry, particularly in senior positions, for women of color (Sanchez-Hucles & Davis, 2010). These overlapping institutional and interpersonal barriers (e.g., discriminatory practices in access to capital, racism and sexism within the industry, disadvantage resulting from systemic inequity), may similarly restrict access and opportunity in the cannabis industry (Bowleg, 2012). Given these barriers and past harms, particularly among disproportionately impacted communities of color, policies that facilitate access to economic opportunities in the newly legal industry are critical.

Social equity provisions in adult-use cannabis legislation often intend to increase equitable industry participation (Swinburne & Hoke, 2020). Laws and regulations with this goal appear increasingly frequent in recent states to legalize cannabis (e.g., Illinois [2019], Michigan [2018], Massachusetts [2016]) (Swinburne & Hoke, 2020). See Appendix Table A for Massachusetts' provisions. Simultaneously, city-led initiatives such as policies, procedural changes, grants, and/or programs are spreading in both early- and later-

adopting states (e.g., Oakland, California; Portland, Oregon; Cambridge, Massachusetts) (Adinoff & Reiman, 2019). State and local variation necessitate careful attention to provision and implementation heterogeneity for larger outcomes assessment (e.g., a manual expungement process for past convictions may affect fewer people compared to an automatic expungement process) (Perlman, 2020). Once provisions are defined, conducting a baseline analysis and ongoing monitoring of industry participation by race/ethnicity is needed to inform program evaluation and adaptation of programs to ensure success.

Massachusetts is an ideal case to examine the participation of people of color and women in the cannabis industry, as it was the first state to explicitly include a participation-related equity directive in enabling adult-use cannabis legislation. To meet this statutory requirement, the regulatory commission created and continues to develop and modify regulations and programs aiming to produce equitable participation in the cannabis industry [see Appendix Table A]. It is important to note that these provisions do not exclusively target specific racial and ethnic groups, but more broadly focus on people and geographic communities harmed by cannabis prohibition and the War on Drugs. Additionally, Massachusetts collects robust demographic data on participation in licensed enterprises, enabling assessment that, to date, no other state provides. As part of employment and ownership registration requirements, all cannabis businesses report employee race/ethnicity, gender, position title, and residency information. In 2020, the Massachusetts Cannabis Control Commission published a gray literature report using one year of participation data which found that 75% of agents were white and 67% were male (Doonan et al., 2020). However, this report was limited to registration forms which contained multiple counts of individuals and did not examine diversity within senior positions. The present study extends this report by combining duplicate registration forms to examine unique agent-level participation in the adult-use cannabis industry during the first 18 months of retail operations across position seniority. We examined racial/ethnic and gender diversity across the industry and among senior positions (i.e., board members, executives, directors). We expected that disproportionate barriers would result in lower participation among Black/African American and Latino people (as compared to percent of the state's workforce), particularly in senior positions, despite equity provisions aimed at promoting diversity within the cannabis industry.

METHODS

Sample

The sample consists of paid personnel working in a licensed Massachusetts adult-use cannabis business ("agents") (Massachusetts Cannabis Control Commission, 2021). We included all agents that submitted a registration form (required to legally work in the industry) from the first submitted form on October 15, 2018, through April 28, 2020. To fully capture short-term industry participation, we included all active and inactive agents.

We extracted all agent registration forms (n=8,450), then merged forms for the same individual into a single unique agent entry for analysis through a unique identifier built into the registration system (n=4,918). To verify that individuals were correctly associated with only one unique identifier, we queried first name, last name, and residential state. If these identifiers were a direct match but more than one unique identifier was associated, we examined street address, residential city/town, and place of employment. If two or more of the latter were direct matches, then we assumed this was the same individual and merged data into a single entry (dropped n=24 duplicate agent records). Persons working as unpaid volunteers only were also dropped (n=11). The final data set included 4,883 agents.

Variables

Race/ethnicity. On registration forms, individuals may select all races that apply, but we utilized a single race/ethnicity variable for analysis to create mutually exclusive groups. This variable pooled agents into one of the following: white, Black/African American, Latino ethnicity, Asian, other race, two or more races, or race not provided [see Appendix Table B for inclusion criteria]. We included those with missing race/ethnicity ("race not provided") in this baseline estimate because we were unsure if there was systematic bias in

reporting race/ethnicity. To ensure anonymity, we used "other race" to categorize agents whose race/ethnicity had a small sample size. This included people who identified as: American Indian or Alaska Native, Native Hawaiian, Pacific Islander, and Middle Eastern or North African. Our analysis focused on participation among Black/African American and Latino people as these communities were disproportionately impacted by prohibition in Massachusetts, had a sufficient sample size in our data, and were specifically identified in several state equity provisions (i.e., mentioned in qualification criteria for equity programs) [see Appendix Table A] (Doonan et al., 2020).

Gender. We extracted gender for all agents. Agents were coded as male or female. To protect anonymity due to low sample size, agents who identified as non-binary, or reported different gender identities across forms, were combined with agents missing gender. We examined participation by gender because, over the period of analysis, Massachusetts identified women for inclusion in diversity plans.

Seniority status. We extracted agent job titles and classified agents as their most senior title (from most to least senior: board member, executive, director, manager, employee). Agents were stratified as holding a senior position if they worked as a board member, executive, or director and less senior if they worked as a manager or employee. Promoting participation in all levels of seniority is a goal of the Massachusetts Social Equity Program, and several qualifiers for Economic Empowerment Priority applicants included specific ownership criteria [see Appendix Table A].

Analysis

First, we conducted descriptive statistics for the entire industry. We do not report population groups with five or fewer people to protect anonimity. In order to obtain risk ratios (RRs), which are more interpretable, we ran a negative binomial model to assess the relationship between demographic characteristics and holding a senior position (binary outcome) (Davies et al., 1998). *Stata MP 15* was used for all analyses.

RESULTS

Racial/Ethnic Diversity in the Entire Cannabis Industry

Agent characteristics for the full industry (n=4,883) are reported in Table 1. The majority of agents worked as employees. Across the entire industry, agents were 75% white, 7% Latino, 6% Black/African American, and 1% Asian. For comparison, 2019 American Community Survey (ACS) estimates of the Massachusetts labor force indicated that the labor force was approximately 78% white, 11% Latino, 8% Black/African American, and 7% Asian (U.S. Census Bureau, 2019). While these populations are not analogous, the comparison indicates that the racial and ethnic diversity of the entire industry is similar to the Massachusetts workforce, except among Asian people who participated at lower levels compared to proportion of the labor force.

Gender Diversity in the Entire Cannabis Industry

The industry skewed male (65%) [see Table 1]. Within all racial and ethnic groupings, women represented a smaller percentage of industry participation as compared to same-race men.

Racial/Ethnic Diversity in Senior-Positions

Characteristics of agents holding senior positions and results of the RR analyses are shown in Table 2. Agents in senior positions were 84% white, 2% Latino, and 5% Black/African American. Senior positions had lower levels of racial/ethnic diversity compared to less-senior positions (i.e., employees, managers) ($p<.001$, chi-squared test not shown). Latino agents were 79% less likely to have a senior role compared to white agents (RR=0.21, 95% confidence interval (CI):0.10-0.45). No difference in likelihood was identified between Black/African American and white agents. Sensitivity analyses further indicated that in-state residents and residents of geographic areas targeted for inclusion by regulators had a lower likelihood of holding senior positions compared to out-of-state residents and in-state residents outside of geographically targeted areas respectively (data not shown, available upon request).

Table 1. *Descriptive statistics for entire industry*

Characteristics as identified in agent registration forms	Total Industry Frequency (%) n=4,883
Position	
Board member	93 (1.90%)
Executive	210 (4.30%)
Director	100 (2.05%)
Manager	322 (6.59%)
Employee	4,158 (85.15%)
Gender	
Male	3,162 (64.76%)
Female	1,683 (34.47%)
Non-binary, multiple gender identities, or missing gender	38 (0.78%)
Race/ethnicity	
White	3,679 (75.34%)
Black/African American	281 (5.75%)
Latino	357 (7.31%)
Asian	67 (1.37%)
Other race	74 (1.52%)
2 or more races	111 (2.27%)
Race not provided	314 (6.43%)
Race/ethnicity and gender[1]	
White male	2,351 (48.52%)
Black/African American male	195 (4.02%)
Latino male	232 (4.79%)
Asian male	47 (0.97%)
Other race male	57 (1.18%)
2 or more races male	77 (1.59%)
Race not provided male	203 (4.19%)
White female	1,303 (26.89%)
Black/African American female	86 (1.78%)
Latino female	123 (2.54%)
Asian female	20 (0.41%)
Other race female	17 (0.35%)
2 or more races female	30 (0.62%)
Race not provided female	104 (2.15%)

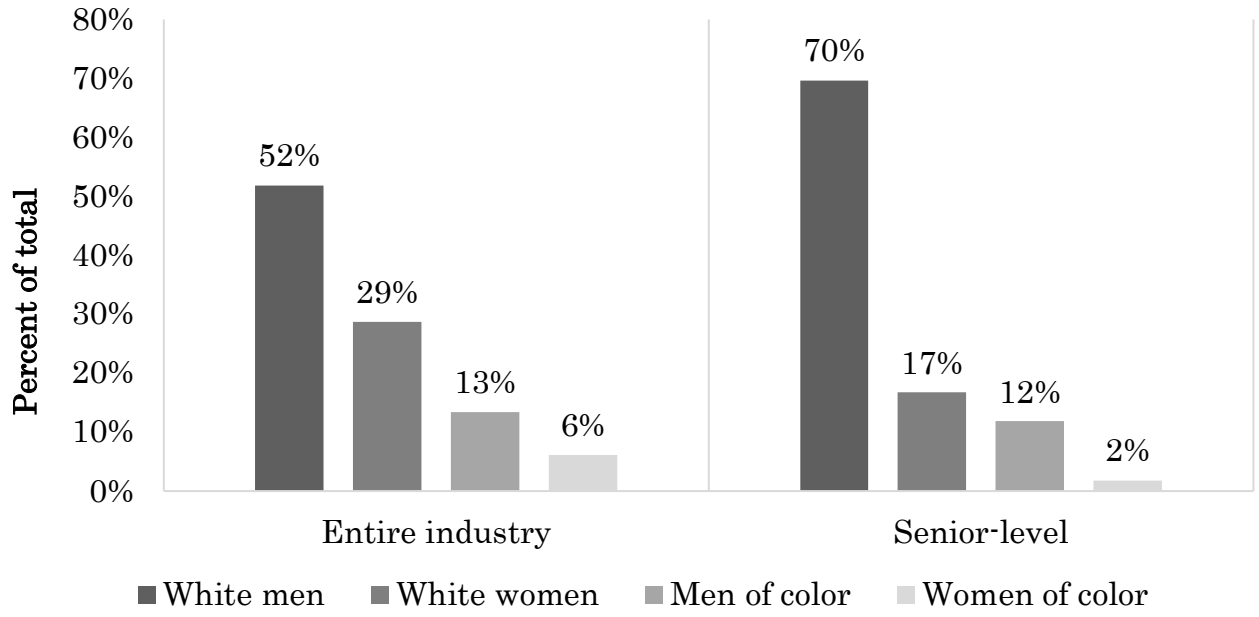
Note. [1]Persons with non-binary, multiple gender identities, or missing gender not shown (n=38).

Table 2. *Senior-level Positions*

Characteristics as identified in senior-level agent registration forms (n=403)	Unadjusted RR (95%CI)
Gender[1] (frequency [percent])	
Female (73 [18%])	Ref
Male (329 [82%])	2.40 (1.87-3.07)
Race/ethnicity	
White (337 [84%])	Ref
Black/African American (22 [5%])	0.85 (0.57-1.29)
Latino (7 [2%])	0.21 (0.10-0.45)
Asian (untabulated)	untabulated
Other race (untabulated)	untabulated
2 or more races (13 [3%])	1.28 (0.76-2.15)
Race not provided (13 [3%])	0.45 (0.26-0.78)
Race/ethnicity x gender[1]	
White male [271 (67%)]	Ref
Black/African American male (untabulated)	0.80 (0.51-1.26)
Latino male (untabulated)	0.26 (0.13-0.55)
Asian male (untabulated)	untabulated
Other race male (untabulated)	untabulated
2 or more races male (untabulated)	1.24 (0.71-2.17)
Race not provided male (untabulated)	0.51 (0.29-0.90)
White female [65 (16%)]	0.43 (0.33-0.56)
Black/African American female (untabulated)	untabulated
Latina female (untabulated)	untabulated
Asian female (untabulated)	untabulated
Other race female (untabulated)	untabulated
2 or more races female (untabulated)	untabulated
Race not provided female (untabulated)	untabulated

Note. Untabulated demotes small sample size untabulated to protect anonymity. RRs were not run for groups that had a sample size of ≤ 5 in senior positions. [1]Persons with non-binary, multiple gender identities, or missing gender not shown.

Figure 1. *Industry Participation*



Note. Persons with non-binary, multiple gender identities, or missing gender or missing race (n=314 in entire industry, n=13 in senior-level) are not shown. Men of color includes persons identified in our data as male and Black/African American, Latino, Asian, other race, and two or more races. Women of color includes persons identified in our data as female and Black/African American, Latino, Asian, other race, and two or more races.

Gender Diversity in Senior-Positions

Males were 2.4 times more likely to have a senior position compared to female agents (RR=2.4, 95% CI: 1.87-3.07) [see Table 2]. We were unable to calculate the RR for each intersectional race/ethnicity and gender cohort in this sample because the sample size for women of color in senior positions was too low to run. After excluding those with missing race/ethnicity or gender, summary statistics show that women of color had approximately 2% of senior positions, in contrast men of color had 12%, white women had 17%, and white men had 70% of positions [see Figure 1]. Among agents with intersectional identities that we were able to run analyses for, we found that compared to white men, Latino men had a 74% lower likelihood of having a senior position (RR=0.26, 95% CI:0.13-0.55). There was not a statistically significant difference of having a senior position among Black/African American men compared to white men. White women had a 57% lower likelihood of holding a senior position as compared to white men (RR=0.43, 95% CI:0.33-0.56) [Table 2]. These findings suggest participation is disproportionally limited among women, particularly women of color.

DISCUSSION

At 18-months in operation, the racial and ethnic makeup of the adult-use industry is similar to the Massachusetts labor market, except among Asian people for whom cannabis industry participation is lower than state labor market participation. However, senior positions in the cannabis market, roles with the greatest opportunity to build wealth and create opportunity for others, suggest a concerning lack of diversity in the short-term, despite state equity provisions and programs. Senior-level participation is particularly

low among Latino people and among Black/African American and Latina women. This suggests more work is needed to achieve participatory equity.

Importantly, study findings are preliminary and reflect the demographic characteristics of earliest adopters to work and start cannabis businesses in Massachusetts. The state's adult-use market started from an existing medical cannabis market that did not have requirements or incentives to recruit staff from disproportionally impacted communities. Established medical facilities are also vertically integrated, inherently more expensive to build than separate establishments, and thus have greater economic barriers for ownership. Since medical cannabis businesses received prioritized application review for adult-use licenses, these establishments were poised to enter the adult-use marketplace in Massachusetts (with existing staff) more quickly than new businesses. The earliest adult-use industry adopters may also reflect expansion of cannabis businesses from other legalized states, thus, racial composition and disparities operating in other markets could be reflected in the Massachusetts market. However, additional systemic barriers and discrimination toward Black/African American and Latino people and communities likely create compounding and substantial obstacles for equity provisions to be fully successful.

Our finding of lower levels of racial diversity in senior-level cannabis industry positions aligns with research in other industries. For example, a comprehensive analysis of Equal Opportunity Employment Commission (EEOC) data representing about 35% of the civilian labor force identified stark disparities between racial and gender diversity in middle management and senior positions (Bloch et al., 2020). Evidence of increasing senior-level diversity is also important to monitor as it could indicate a positive trend toward overall diversity; people of color in senior positions are more likely to hire employees of color (Swinburne & Hoke, 2020). The current study shows that baseline analyses of diversity in cannabis markets should specifically monitor senior-level positions to accurately characterize industry participation. In Massachusetts, we also identified extremely low numbers of senior positions held by women of color; such small subgroup sample sizes precluded inclusion of these cohorts in the regression analysis. Other state assessments should similarly stratify by intersectional race/ethnicity and gender identity as aggregate data could obscure critical differences.

As we identified [see Appendix Table A], multiple current regulatory requirements could positively impact findings overtime. For example, state regulators scrutinize business Positive Impact Plans and Diversity Plans prior to granting the establishment a final license and may place conditions upon businesses to improve these plans (Hamilton et al., 2019). Massachusetts also restricts the number of cannabis business licenses that any person or entity may own (i.e., three of each license type). This provision prevents a small number of companies from monopolizing the market. As these considerations illustrate, heterogeneity between states, cannabis provisions, and enforcement tools are critical to document as differences may, directly and indirectly, impact participation outcomes (Johnson & Doonan, 2019).

Recently implemented and planned equity initiatives in Massachusetts may also positively impact future diversity through a focus on ownership opportunities. For example, in January 2021, the regulatory commission promulgated regulations that restrict Social Consumption Establishment, Marijuana Courier, and Marijuana Delivery Operator licenses to certified Economic Empowerment Priority applicants, Social Equity Program applicants, microbusinesses, and/or craft marijuana cooperatives, all of which have residency requirements, for a period of three years. Commissioners will evaluate the impact of this provision in promoting diversity and small business participation to determine whether to extend the exclusivity period. This provision may particularly impact senior-level participation as it primarily targets ownership. The current study provides a baseline prior to the enactment of these provisions.

Regulatory complexity and differences across systems of government (i.e., local, state, federal) form interlocking and unique barriers to entry in the cannabis industry, yet equity-focused initiatives frequently address a single factor. Breaking such barriers requires a commitment to equity across multiple levels of government and social systems, thus, limits the abilities of any single entity (e.g., state legislation, state regulation, local policy, activist and nonprofit organizations, cannabis establishments) to affect change alone. Our findings suggest that state

policy and regulatory provisions (as of April 2020) have not resulted in equitable senior-level participation among Black/African American and Latino agents at 18-months of the adult-use market's operation.

The present analysis represents preliminary findings for Massachusetts, a majority white state, and the first East Coast state to implement an adult-use cannabis market. We are unable to disentangle the effects of specific provisions in this study [see Appendix Table A], and the provisions in Massachusetts do not represent all variations of equity provisions that affect industry participation. For example, Massachusetts does not provide grants to equity program participants; in contrast, Illinois established a funding mechanism through the "Restore, Reinvest, and Renew Program" to directly provide capital to equity program participants (Swinburne & Hoke, 2020). Policy and procedural changes also occurred during this study, for example, the Massachusetts Social Equity Program eligibility changed from 400% of the federal poverty line to 400% of area median income, and provisions continue to change. Policy and provision evolution add additional complexity to understanding the impact of equity provisions. Further, while certain Massachusetts equity provisions specify inclusion of Black/African American and Latino people, provisions also intend to promote participation from specified geographic areas and other groups, including: veterans, farmers, and LGBTQ+ people. Assessment of participation across these cohorts is beyond the scope of this study, but our sensitivity analyses indicate that further study of state residency and residency in targeted geographic areas is warranted. Future work could also consider company characteristics (e.g., number of employees in company, leadership characteristics). The present study does not analyze the impact of local-level provisions, which remain an important and often overlooked barrier or facilitator for equity in the marketplace (Dilley et al., 2017). Finally, while this study is limited to participation, equity-related outcomes of legalization are complex and multi-faceted (e.g., cannabis-related arrests, access to expungement, cannabis-related disciplinary actions in schools, tax revenue for harmed communities). Nonetheless, equitable participation is an intention of multiple policies and regulations and an important outcome to assess. As the industry matures, researchers and regulators should develop and/or continue monitoring participation by race/ethnicity and gender to evaluate participatory-related provisions.

Limitations

This study is subject to limitations. First, experiences in Massachusetts may not compare to other states with legal cannabis markets, given demographic differences and the unique laws and regulations for each market. In addition, our comparison to census data is imperfect. Cannabis businesses hire adults at least 21 years old, while the census estimates used for comparison includes employed persons who are at least 16 years old. Latino ethnicity is also coded differently in the present study as compared to the census (i.e., coded as a "single-race/ethnicity" in the present study and coded as ethnicity in addition to race in the census). Data accuracy and missing data are also a concern. Registration forms may be completed by a supervisor, rather than self-reported by agents, thus the extent to which race/ethnicity was self-reported is unknown. Race/ethnicity data were missing for 6% of the sample. For analysis purposes, we pooled individuals into a single race or ethnicity category, but this could obscure participation differences for agents identifying multiple races and ethnicity. In addition, due to low sample size for African American/Black and Latina women in senior-level positions, we did not run regression analyses to assess participation for these intersectional cohorts. To capture all participation in the short-term market, we included all active and inactive agents, but further work is necessary to understand the characteristics of agents that exit the industry.

Finally, industry participation can take many forms, including ancillary businesses (e.g., accounting, consulting, sanitation services). The Massachusetts Social Equity Program explicitly includes ancillary businesses as a pathway to positively impact industry diversity, yet this study only includes agents directly working under a cannabis license(s) in the state's legal adult-use industry. Future research should additionally assess diversity within ancillary enterprises.

Conclusion

Structural racism is evident in U.S. drug prohibition and punitive enforcement policies (e.g.,

War on Drugs) (Bailey et al., 2017; Provine, 2011). Cannabis criminalization resulted in negative individual, community-level, and generational impacts, which disproportionately impacts Black/African American and Latino people in Massachusetts (Doonan & Johnson, 2019). State cannabis legalization provides opportunities to advance equity. This study is a baseline assessment for one pathway: employment and economic opportunities in a state's legal cannabis industry with a focus on senior-level positions. Our findings of shortcomings in senior-level diversity, despite codified equitable aims and actions in Massachusetts, should promote concern and suggest additional scrutiny of structural barriers that equity provisions operate within (e.g., enforcement policies, economic inequity) is necessary.

We also identify key metrics for states to monitor in their markets, including intersectional diversity (at a minimum race, ethnicity, and gender) across seniority levels. While this study is unable to account for the impact of unmeasured structural barriers to participation (e.g., racism, intersectional racism and sexism), these findings suggest current equity provisions alone have not produced the desired outcomes among senior roles in the short-term. As this study reflects participation in one state, continued and multi-state assessments remain critical.

REFERENCES

Adinoff, B., & Reiman, A. (2019). Implementing social justice in the transition from illicit to legal cannabis. *The American Journal of Drug and Alcohol Abuse*, 45(6), 673-688.

Ahrens, D. M. (2020). Retroactive legality: marijuana convictions and restorative justice in an era of criminal justice reform. *Journal of Criminal Law and Criminology*, *110*(3), 379–440.

Analytic Insight. (2020). *Cannabis business and employment opportunity study*. https://www.denvergov.org/content/dam/denvergov/Portals/782/documents/Denver_Cannabis_Business_and_Employment_Opportunity_Study.pdf

August, K. (2013). Women in the marijuana industry. *Humboldt Journal of Social Relations*, *35*, 89–103.

Bailey, Z. D., Krieger, N., Agénor, M., Graves, J., Linos, N., & Bassett, M. T. (2017). Structural racism and health inequities in the USA: evidence and interventions. *The Lancet*, *389*(10077), 1453–1463.

Bayerl, P., Karlovic, R., Akhgar, B., & Markarian, G. (2017). *Community policing - a european perspective strategies, best practices and guidelines*. Springer.

Bender, S. W. (2013). Joint reform? The interplay of state, federal, and hemispheric regulation of recreational marijuana and the failed war on drugs. *Albany Government Law Review*, *6*, 359–396.

Bender, S. W. (2016). The colors of cannabis: race and marijuana. *University of California, Davis Law Review*, *50*, 689–705. https://digitalcommons.law.seattleu.edu/faculty/778

Berson, S. B. (2013). Beyond the sentence — understanding collateral consequences. In *National Institute of Justice Journal* (Issue 272).

Bloch, K. R., Taylor, T., Church, J., & Buck, A. (2020). An intersectional approach to the glass ceiling: gender, race and share of middle and senior management in U.S. workplaces. *Sex Roles*, 84, 312-325.

Bowleg, L. (2012). The problem with the phrase women and minorities: intersectionality-an important theoretical framework for public health. *American Journal of Public Health*, *102*(7), 1267–1273.

Camors, C., Chavez, S. L., & Romi, A. M. (2020). The cannabis industry within the USA: the influence of gender on cannabis policy and sales. *Sustainability Accounting, Management and Policy Journal*.

Lewis, A.C. (2016). How Black people are being shut out of America's weed boom: whitewashing the green rush. *BuzzFeed News*. https://www.buzzfeednews.com/article/amandachicagolewis/americas-white-only-weed-boom

Danquah-Brobby, E. (2017). Comment: prison for you. Profit For me. Systemic racism effectively bars blacks from participation in newly-legal marijuana industry. *University of Baltimore Law Review*, *46*(3), 523–546.

Davies, H. T. O., Crombie, I. K., & Tavakoli, M. (1998). When can odds ratios mislead? *BMJ*, *316*(7136), 989–991.

Dilley, J. A., Hitchcock, L., McGroder, N., Greto, L. A., & Richardson, S. M. (2017). Community-level policy responses to state marijuana legalization in Washington state. *International Journal of Drug Policy*, *42*, 102–108.

Doonan, S. M., & Johnson, J. K. (2019). *A baseline review and assessment of cannabis use and public safety part 2: 94C violations and social equity: literature review and preliminary data in Massachusetts*. https://mass-cannabis-control.com/wp-content/uploads/2019/04/1.-RR2-94C-Violations-FINAL.pdf

Doonan, S. M., McKenna, D., & Johnson, J. K. (2020). *A baseline review and assessment of the Massachusetts adult-use cannabis industry: market data and industry participation*. https://masscannabiscontrol.com/wp-content/uploads/2020/02/Market_Data_and_Industry_Participation_February_2020.pdf

Drug Enforcement Agency. (n.d.). *Drug scheduling*. Retrieved November 8, 2021, from https://www.dea.gov/drug-information/drug-scheduling

Firth, C. L., Hajat, A., Dilley, J. A., Braun, M., & Maher, J. E. (2020). Implications of cannabis legalization on juvenile justice outcomes and racial disparities. *American Journal of Preventive Medicine*, *58*(4), 562–569.

Firth, C. L., Maher, J. E., Dilley, J. A., Darnell, A., & Lovrich, N. P. (2019). Did marijuana legalization in Washington state reduce racial disparities in adult marijuana arrests? *Substance Use & Misuse*, *54*(9), 1582–1587.

García, J. J., & Sharif, M. Z. (2015). Black lives matter: a commentary on racism and public health. *American Journal of Public Health*, *105*(8), e27–e30.

Hamilton, J. R., Doonan, S. M., & Johnson, J. K. (2019). *Special report: a baseline review and assessment of the Massachusetts cannabis industry's required positive impact plans*. https://mass-cannabis-control.com/wp-content/uploads/2019/10/Special_Report_A_Baseline_Review_and_Assessment_of_the_Massachusetts_Cannabis-Industry's_Required_Positive_Impact_Plans-Oct-2019.pdf

Johnson, J. K., & Doonan, S. M. (2019). Building evidence-based prevention mechanisms into cannabis legalization policy and regulations. *American Journal of Public Health*, *9*(109), 1165–1166.

Kittel, J. (2018). Women in weed: gender, race, and class in the cannabis industry. *The Arbutus Review*, *9*(1), 32–45.

Marijuana Business Daily. (2017). *Women & Minorities in the Marijuana Industry*. https://mjbizdaily.com/women-minorities-cannabis-industry/

Massachusetts Cannabis Control Commission. (2021). *Open data platform*. https://opendata.mass-cannabis-control.com/

Perlman, M. (2020). Reefer blues: building social equity in the era of marijuana legalization. *UC Davis Social Justice Law Review*, *24(2), 94-124*.

Provine, D. M. (2011). Race and inequality in the war on drugs. *Annual Review of Law and Social Science*, *7*, 41–60.

Rahwanji, M. (2019). "Hash"ing out inequality in the legal recreational cannabis industry. *Northwestern Journal of International Law & Business*, *39*(3), 333–358.

Sanchez-Hucles, J. V., & Davis, D. D. (2010). Women and women of color in leadership: complexity, identity, and intersectionality. *American Psychologist*, *65*(3), 171–181.

Swinburne, M., & Hoke, K. (2020). State efforts to create an inclusive marijuana industry in the shadow of the unjust war on drugs. *Journal of Business & Technology Law*, *15*(2), 235–280.

U.S. Census Bureau. (2019). *American Community Survey (ACS) 1-year estimates: Massachusetts*.

Valleriani, J., Lavalley, J., & McNeil, R. (2018). A missed opportunity? Cannabis legalization and reparations in Canada. *Canadian Journal of Public Health*, *109*, 745–747.

Vangst. (2019). *Vangst 2019 report: women in cannabis*. https://vangst.com/blog/vangst-2019-women-in-cannabis-report

Funding and Acknowledgements: S.M. Doonan, A. Flores and J.K. Johnson were supported by the Massachusetts Cannabis Control Commission. The content is solely the

responsibility of the authors and does not necessarily represent the views of the Massachusetts Cannabis Control Commission. S. Joshi was supported by the NIH/NIDA funded T32 training grant 5T32DA007233-36. S.M. Doonan, S. Joshi, and J.K. Johnson designed the study. S.M. Doonan drafted the article and led the data analysis. S. Joshi and C. Firth advised on data analysis. All authors interpreted results, provided critical revisions, reviewed, and provided feedback on drafts of the article. All authors approved the article. No conflicts declared. Three authors work for the Cannabis Control Commission, Commonwealth of Massachusetts, the regulatory agency for cannabis laws in the Massachusetts Commonwealth as staff (S.M. Doonan, J.K. Johnson, A. Flores). We gratefully acknowledge Shawn Collins, Massachusetts Cannabis Control Commission, Erika Scibelli, Massachusetts Cannabis Control Commission, David McKenna, Massachusetts Cannabis Control Commission, Kyle Potvin, Massachusetts Cannabis Control Commission, Olivia Laramie, Massachusetts Cannabis Control Commission, Alisa Stack, Massachusetts Cannabis Control Commission, and Shaleen Title, Massachusetts Cannabis Control Commission.