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**Call to Action for Enhanced Equity and Inclusion in Cannabis Research**

[Renée Martin-Willett](https://pubmed.ncbi.nlm.nih.gov/?term=Martin-Willett%20R%5BAuthor%5D)1,\* and [L. Cinnamon Bidwell](https://pubmed.ncbi.nlm.nih.gov/?term=Bidwell%20LC%5BAuthor%5D)1,2

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Abstract

**Introduction:** Policies regarding cannabis use are rapidly evolving in the United States as exemplified by the legalization of recreational use in 11 states and the District of Columbia. Previous cannabis-related laws, however, disproportionately targeted communities of color before legalization, and many argue new policies are not being developed with the input of minority stakeholders postlegalization. Given that biomedical research has also historically underrepresented communities of color, there is an obligation on the part of researchers now to actively work toward improving equity in cannabis research at a time when the field is rapidly expanding. This is particularly important for research concerning therapeutic uses of cannabis and risk liabilities.

**Objective:** This article is a call to action to improve equity and inclusion in cannabis research design and practice. Specifically, it includes three recommendations focusing on (1) inclusiveness of recruitment, (2) improve demographic reporting in articles, and (3) strengthening publication requirements.

**Conclusion:** These efforts will enhance the shared values and ethics of our field and improve the quality and validity of our research findings moving forward.

**Keywords:**cannabis, equity, marijuana, research methods, underrepresented groups

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Introduction

Cannabis has been used throughout human history as an alternative medicine,[1–3](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B1) first cultivated in China in 4000 B.C. Later cannabis was used as a medicinal plant (2700 B.C.), eventually disseminating to India, Western Asia,[4](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B4) the Mexican folk medicine tradition of *curanderismo*,[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B5),[6](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B6) and was added to the U.S. Pharmacopeia in 1850.[7](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B7),[8](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B8) However, public perception and policies swung in the opposite direction after Prohibition and cannabis was banned from nonmedical use in 1937.[9](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B9) It was later listed as a schedule I drug in 197110 resulting in the prosecution and incarceration of millions of people for cannabis use or possession and disproportionately targeting communities of color, largely related to racialized stereotypes of Latinx and black American users as “risks” to public welfare.[9](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B9),[11–16](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B11)

Given that biomedical research has also historically underrepresented communities of color,[17](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B17),[18](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B18) there is an obligation to actively work toward improving equity in cannabis research at a time when the field is rapidly expanding. This article is a call to action to improve equity and inclusion in cannabis research design and practice, with pragmatic recommendations toward meeting that goal.

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Equity Challenges Facing Cannabis Research

As recently as 2018, more than 600,000 arrests were made for cannabis-related offenses, accounting for wholly 40% of all drug-related offenses that year,[19](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B19) despite the fact that recreational cannabis use is increasingly legal across the United States. It is also well documented that previous and current cannabis laws disproportionately target communities of color.[9](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B9),[11–15](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B11) For example, systematic profiling and deportation of Hispanic community members,[13](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B13),[16](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B16) evidence that “intensity of enforcement” of cannabis-related laws is significantly related to the income level and race of an individual,[20](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B20) and that African American men in particular are overrepresented in drug-related arrests, especially since the U.S. War on Drugs in the 1970s led to aggressive policing of black American neighborhoods.[9](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B9),[21](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B21) Importantly, these inequities persist despite the fact that black and Hispanic Americans use cannabis at roughly the same rate as whites.[22](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B22) Even though many people with cannabis-related convictions remain incarcerated, new policies are not being developed with the input of minority stakeholders postlegalization,[23](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B23),[24](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B24) and there is evidence that the economic benefits of the so-called Green Rush are inequitably distributed.[25](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B25) Thus, distrust and fear of prosecution may contribute to reluctance on the part of communities of color to contribute to cannabis research.

Cannabis research participants, as in other areas of biomedical research,[26](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B26) have also historically been and continue to be predominantly male white Americans. Many cannabis research articles do not take consideration of ethnicity or gender in study designs, and often do not report ethnicity or gender in results. In a recent meta-analysis with a pooled sample of >20,000 individuals, 72% of all participants were white and 69% were male,[27](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B27) and in a recent review of the behavioral health effects of cannabis concentrates, 71.8% of participants were white and 64.7% were male.[28](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B28) Importantly, 47.9% of studies in the latter review did not report gender or ethnicity at all.

Ethnicity can be differentially conceptualized[29](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B29) or can reify harmful or socially constructed categories or stereotypes,[30](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B30),[31](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B31) suggesting race, and not structural racism is at the root of health disparities,[32](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B32),[33](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B33) but it is still important to consider in research. Lack of reporting altogether may serve to situate maleness or whiteness as *de facto* default categories or standards to which all others are compared.[34](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B34) It also absolves researchers of the responsibility to diversify their samples, impacting the validity and generalizability of studies.[35](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B35),[36](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B36) Finally, although racial categories are not biological realities as much as social constructions that facilitate exclusion, they—in context with other critical socioeconomic factors—can inform us about the ways that discrimination and prejudice can lead to disparate health outcomes.[37](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B37)

Even when researchers are interested in increasing representation, there are problems of distrust among groups underrepresented by research, justifiably due to a long history of discrimination or mistreatment from the research or medical community,[38](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B38),[39](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B39) as well as ineffective recruitment strategies[40–43](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B40) and stigma and fear toward cannabis research in particular.[44](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B44) In addition, researchers may neglect to consider that the goals of the community may not align with their goals, or the benefit of research to the community may not be apparent. For example, African American respondents in a telephone survey were significantly more likely than whites to believe that their physicians exposed them to extra risk and would not fully explain research participation to them.[38](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B38) Or in listening sessions with more than 100 community members, respondents noted that researchers had low cultural competency and humility that discouraged them from participating in research.[43](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B43) Importantly, these issues are likely exacerbated in cannabis research by a history of cannabis-related legal profiling and prosecution, which is unique from other fields.

Despite these challenges, cannabis researchers have an obligation to renew their commitment to equity in research toward improving validity, generalizability, and quality in the field as well as equity and justice in biomedical research overall. Moves toward more inclusive recruitment strategies, more consistent demographic reporting, and more stringent publication requirements are also an opportunity to propel cannabis researchers beyond other fields of biomedical research in addressing this important and long-standing problem.

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Proposed Solution #1: Inclusive Recruitment Strategies

Although the challenges of recruiting underrepresented groups in research are well documented, there is a burgeoning literature as well as action at the professional, organizational, and governmental level to help researchers improve recruitment. In particular, the field of Community Engaged Research has published extensively on pragmatic strategies to support more equitable research.[45–51](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B45) We will describe hereunder a series of recommendations adapted for cannabis research specifically from the guiding principles of this field.[52](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B52)

The nine guiding principles of community engaged research can be summarized as (1) improving communication of research goals that are couched in an understanding of the community's values and goals, (2) proactively building relationships that are mutually respectful, and (3) respecting that research and community goals may not align.[52](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B52) Communicating with potential community or recruitment partners about values before commencing with a study can guide researchers on what level of engagement participants may be receptive to, or even inform research design to be more reflexive to the interests of the community.[53](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B53) In the listening session study that was previously mentioned, community members were primarily concerned with prevention of chronic disease,[43](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B43) thus researchers working in that area or integrating prevention into their studies would likely be more positively viewed by the community. In addition, communication with key stakeholders through interviews, qualitative focus groups, or listening sessions can reveal barriers that prevent participation before a study commences. For example, if transportation to a laboratory or campus is a barrier, study designs could include funds and infrastructure for rideshares/taxis in addition to traditional research honorariums.[50](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B50)

Communication with the community before commencing recruitment not only can better prepare a study team for a successful effort, but also build mutually respectful and long-term relationships with community groups. Some examples of this approach include proactively seeking partnerships with community-serving organizations through research presentations to leadership or organizational members, or through attending organization-sponsored events to meet community members and introduce yourself and your work. This can be especially critical to cannabis research; many people may feel wary of participation due to perceptions of cannabis use or fear of prosecution. Another approach can be the development of a research participant registry to which community members can provide basic demographic information and learn about your research program without having to immediately commit to participation. The registry can then be leveraged to communicate regularly about your work (e.g., newsletters or lay-public research reports) and for study-specific recruitment. A research registry and community-based partnerships can also serve the purpose of tracking a community's changing goals and the need for long-term engagement, including feedback of research results. These mechanisms simplify the process by which the results of research can be shared with those who participated in the study, who are often motivated beyond monetary gain by interest in the topic or in a service to society.[54](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B54)

Overall, by engaging in some or all of these practices before, during, and after a study, researchers can improve the diversity, equity, and generalizability of their work, but importantly, provide acknowledgment of the community as a key partner.

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Proposed Solution #2: Consistent Demographic Reporting

There are emerging debates surrounding the role of demographics in biomedical research, and how best to report demographics in a way that is both equitable and scientifically robust. This includes questions of when to employ expansive versus targeted reporting of gender and/or sex, or including gender categories that are nonbinary,[55](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B55) and the interpretation of race and ethnicity when ethnic categories are not discrete. Nonetheless, reporting demographics in some form continues to be preferable to not reporting at all, as demonstrated by National Institutes of Health (NIH) and other funding agency policies on this issue.[56](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B56) Demographics help to clearly define both experimental and control groups more often than not, thus enhancing the validity of an experiment,[57](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B57),[58](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064966/#B58) while also serving to gauge progress in the field toward equity in representation. Despite the aforementioned challenges of reporting demographics, it is possible to take a pragmatic and robust approach.

First, when comparing ethnic or gender groups, researchers should explicitly state the rationale for the selected comparisons. Our recommended best practice approach is to compare all ethnic and gender groups in similar ways. For example, models can compare all groups against each other as opposed to common current practices that include comparing whites to all other groups, men to just women, or grouping nonbinary gender with women (a practice that suggests that white maleness is a condition to which all others should be compared for differences). Regardless of the approach selected, providing transparent rationales around such choices will elevate standards of inclusivity and equity in research reporting. Also, allow for “fill in” options for describing demographics, which does not limit participants to selecting only one category. Be broadly inclusive, and only limit studies to particular groups when there is a sound scientific rationale to support that approach. And finally, allow for self-assignment measures for gender, race, and ethnicity over researcher assignment whenever possible.

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Proposed Solution #3: Updating Publication Requirements

In the light of recent global activism in support of racial justice, many scientific journals and institutional departments have come forward with statements on equity and justice in research and academia. However, many organizations face criticism for positions that are antiracist in image only, without accompanying action to support their positions. Scholarly journals can actionize their statements, however, by undertaking an evidence-based needs assessment of their publication requirements by the editorial staff, external interlocutors, or working groups to realign policies toward serving equity and inclusion in research and implementing simple guidelines toward meeting that goal.

For example, journals in the biomedical sciences are increasingly updating their publication guidelines to include new requirements such as including data files with article submissions, adherence to a particular reporting standard such as Consolidated Standards of Reporting Trials (CONSORT), or the names of colleagues who informally reviewed an article before submission. These efforts are meant to increase reproducibility and transparency in science, but they can also serve to increase equity when combined with other initiatives that are specific to this goal, such as having minimum requirements for demographic reporting, disallowing single race or single gender studies unless there is a sound scientific rationale for the exclusion of others, or flexibility in how racial and ethnic categories are reported or represented as long as it is in support of more equitable opportunities for self-identification among research participants.

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Conclusion

There is a long history of cannabis-related laws disproportionately targeting communities of color before legalization, as well as a negligence on the part of the research community to equitably include diverse groups in cannabis research. Although the recommendations listed in this study are by no means meant to be an exhaustive answer to these inequities, they do represent feasible and implementable strategies to improve research recruitment, publication practices, and journal requirements. A shared commitment from the cannabis research community to improving engagement among diverse shareholders will benefit the field.

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Abbreviation Used

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| CONSORT | Consolidated Standards of Reporting Trials |

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**Being thoughtful about cannabis legalization and social equity**

[Beau Kilmer](https://pubmed.ncbi.nlm.nih.gov/?term=Kilmer%20B%5BAuthor%5D)1and [Erin Kilmer Neel](https://pubmed.ncbi.nlm.nih.gov/?term=Neel%20EK%5BAuthor%5D)2

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Hall and Lynskey[1](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0001)highlight several out­comes featured in cannabis policy debates and correctly note that they will be shaped by the type of legalization that is imple­mented. Their excellent review of the e­merging evidence about how the commercial ap­proach influences health outcomes will hopefully inform future debates in the US and elsewhere.

A related outcome increasingly receiving attention in these debates is whether cannabis legalization can be used to promote social equity and help communities of col­or that have been and still are disproportionately affected by prohibition. Indeed, at a time when some in the US are discuss­ing reparations and how to acknowledge and address the fact that the country's econ­omy was heavily built on slavery, this is a parti­cularly salient issue to consider.

Cannabis arrests have dropped dramatically in legalization states, although in some places they were already falling before the policy change[2](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0002), [3](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0003). Overall, fewer people of color are being arrested for cannabis in legalization states, but this does not mean that legalization will eliminate racial and ethnic disparities in cannabis arrests[3](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0003).

Having a criminal record has implications for health and economic well‐being and, in the US, there are additional consequences associated with having a drug offense on one's criminal record[4](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0004). For example, in some places a cannabis offense can make it harder to access public housing or work in the newly legal industry. While the early efforts to legalize cannabis in the US did not directly address expunging criminal records, jurisdictions soon began to make it easier for individuals to clear these cannabis offenses from their records[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0005). Some places have gone further by automatically expunging these offenses.

Beyond issues surrounding criminalization, an increasing number of US jurisdictions are implementing social equity programs which give preferences for business licenses to people from communities disproportionately affected by cannabis prohibition[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0005). Some of these programs also provide technical assistance for those who are new to the process of starting and growing a business. There are also some efforts to directly target cannabis tax revenues to support these communities. For example, one Chicago suburb (Evanston) recently announced that it plans to set aside some of its cannabis tax revenues to help fund its new local reparations program for African Americans.

While it is too early to evaluate the effectiveness of these efforts, their utility must be considered in the context of the economic realities of cannabis legalization, especially as they are unfolding in the US. In theory, there are multiple reasons why legalization will push down cannabis production and distribution costs, which can in turn influence prices[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0005), [6](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0006). First, legalization reduces the risk of arrest for sellers, which decreases the risk premium they must be paid. Second, the “structural consequences of illegality” create inefficiencies that will no longer exist in a legal market[7](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0007). Third, firms can take advantage of increasing economies of scale if large producers are allowed. Fourth, with legalization it will be easier for producers and processors to benefit from improvements in technology. With declining costs in a competitive market, we would expect prices to decline.

Large declines in cannabis prices can affect revenues for governments and businesses, which can in turn affect efforts to promote social equity. If cannabis taxes are set as a function of its price (e.g., Washington applies a 37% excise tax on retail purchases) and the price declines, so will the tax revenue available for social equity programs (although this could be offset by an increase in total cannabis sales). Price declines can also make it harder for small businesses to stay competitive with larger firms. Thus, giving a license preference to a small business that does not have much of a chance in a lightly‐regulated commercial market could be counterproductive. It might make some people worse off than if they invested their money elsewhere.

This is not a theoretical concern. Hall and Lynskey note that cannabis prices are already falling in places that have legalized. Further, in early legalization states such as Washington, there are reports of small cannabis businesses closing down or being bought out at a steep discount by larger firms[8](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0008).

While an increasing number of US states are creating commercial cannabis regimes, this activity remains illegal under federal law. Among other consequences, federal prohibition is preventing some of the largest corporations, including alcohol and tobacco companies, from getting involved in the industry. US federal legalization could cause cannabis prices to bottom out, especially if imports are allowed and Amazon can deliver. This will make it even harder for small businesses to compete.

But there are many approaches to legalization[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0005), [6](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0006). Hall and Lynskey mention a few, including a government monopoly on cannabis production and sales. Government stores could play an important role in promoting social equity if the revenues are thoughtfully allocated. Since the government would set the price instead of the market, this could prevent the large price declines. Further, this approach would allow the government to keep the revenue instead of having it go to profit‐maximizing firms. If a certain percentage of these revenues were allocated to evidence‐based programs to build wealth for historically affected individuals, this might help improve economic conditions.

There could be other social equity and public health advantages to the government monopoly approach. In addition to stabilizing prices and revenues, it would be easier to limit the types of products and control marketing in the US with this approach versus the commercial model[6](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0006). Further, liquor stores tend to concentrate in minority communities and there is some evidence suggesting that this is happening with cannabis outlets[9](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/#wps20741-bib-0009). Thoughtful siting of state‐operated retail stores could avoid this type of predatory concentration.

Of course, it is possible to both give license preferences and set aside tax reve­nues for programs supporting social equity; they are not mutually exclusive. But given declining prices and the dominance of the for‐profit commercial model in US policy discussions, it is unclear whether license preferences will ultimately have the desired effect.

We applaud the public servants who have worked hard to implement social eq­uity programs in places that have legalized cannabis. Our hope is that jurisdictions considering alternatives to cannabis supply prohibition and seeking to improve social equity outcomes – and public health – not limit their discussions to the “for‐profit with license preference” model. We encour­age these jurisdictions to consider the pros and cons of various legalization options as well as use the growing evidence about the economics of legalization to implement an approach that is most likely to succeed in its social and economic goals.

[Go to:](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7215057/)

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