A Science- and Equity-Centered Framework to Reimagine Workplace Cannabis Testing

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coalition for cannabis
Policy, Education, and Regulation

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Introduction

AS STATES HAVE LEGALIZED CANNABIS FOR MEDICAL AND RECREATIONAL USE, workplace safety has emerged as a complex and thorny issue for state governments, business owners, and employees. As we know, cannabis use has the potential to impair an individual's motor skills, short-term memory, and ability to drive or operate heavy machinery, resulting in concerns about how best to protect workers, customers, business owners, and others. At the same time, technology has not kept up with changes in cannabis policies, and current measures of cannabis impairment are imprecise and can result in false negatives or incorrectly identifying individuals who are not/were never impaired. Workplace impairment and drug testing wades into issues around employer rights, patient rights, and civil rights, and lawmakers and business owners often use blunt policy instruments to deal with the problem.

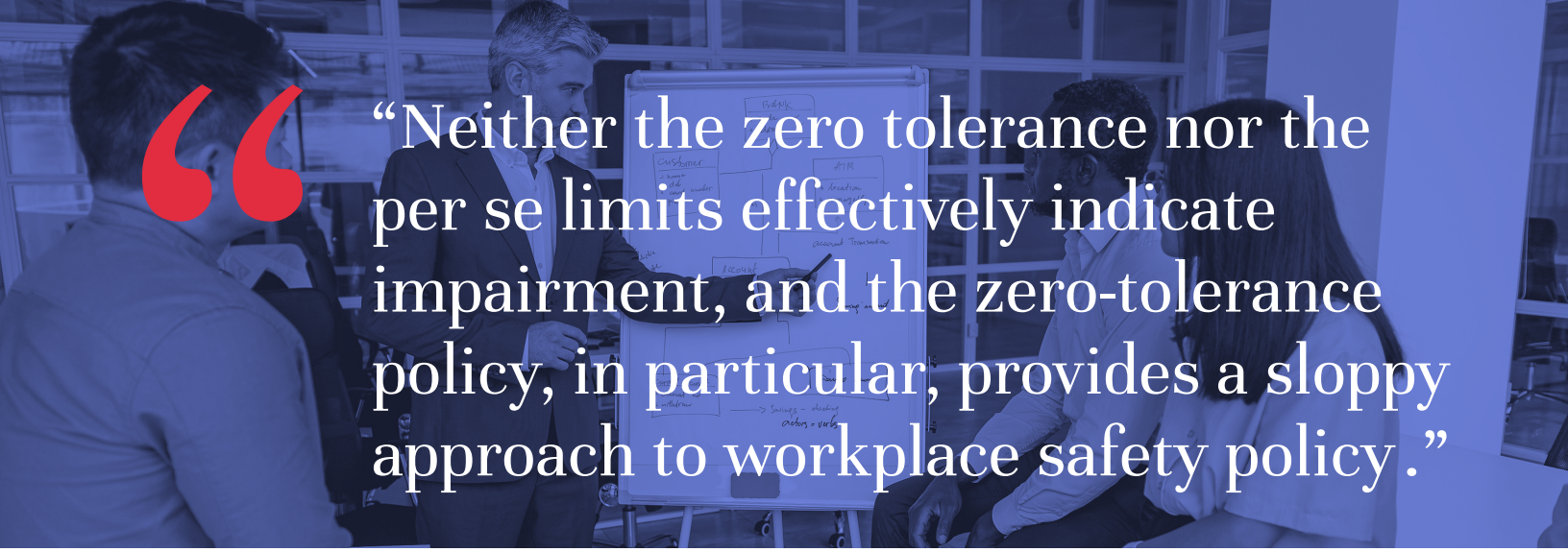
This paper explores the myriad issues that surround workplace safety in the context of cannabis legalization. It provides a comprehensive look at the medical, scientific, legal, regulatory, and ethical issues surrounding the topic. It examines the history of our knowledge on this topic, and how new technologies and nuanced policy approaches are rapidly transforming this space. Ultimately, this paper makes a series of recommendations around three areas: scientific research into cannabis impairment, the need for new technologies, and policy changes for both the public and private spheres. The goal of these recommendations is to balance the several important, and often conflicting interests that complicate this issue so significantly, while relying on a scientifically sound, technologically advanced, and equitable approach.

Cannabis and Workplace Safety: Defining the Problem

AS PREVIOUSLY NOTED', ISSUES OF CANNABIS IMPAIRMENT AND WORKPLACE SAFETY TOUCH ON A VARIETY OF COMPLICATED, COMPETING, AND CONTROVERSIAL TOPICS, for which easy solutions are not available. That has not stopped policymakers and many businesses from taking an overly simplistic, sledgehammer approach to dealing with the problem. In states that have legalized cannabis for medical and/or adult use, ballot initiative drafters and legislators have largely empowered businesses to set their own rules, allow workplace drug testing for cannabis (even among registered medical users), and use an employee's positive cannabis test as legal and acceptable grounds for termination.

Many businesses in cannabis-legal states embrace such an approach, oftentimes lobbying legislatures for those rights and protections; however, a one-size-fits-all tool for cannabis enforcement in the workplace is, in many cases, inappropriate or outdated. Policymakers and business owners should seek better solutions that balance protecting businesses, consumers, and employees, with the rights of employees to use cannabis as medicine and/or to use it responsibly for recreational purposes on their own time.

Impairment of any kind in the workplace creates challenges for an employee to work effectively. There are clear scenarios in which cannabis impairment in the workplace presents risks that must be mitigated. That issue is magnified when an individual's workplace behavior presents risks to their own safety, or that of other other employees, customers, or others in the community. Surgeons, school bus drivers, first responders, truck drivers, forklift operators, or woodworkers (to name a few) should not be doing their jobs while impaired by cannabis, other substances, or fatigue. There are genuine public and private interests in regulating against such behaviors.



> “Neither the zero tolerance nor the per se limits effectively indicate impairment, and the zero-tolerance policy, in particular, provides a sloppy approach to workplace safety policy.”

However, the way we test for cannabis impairment faces serious measurement challenges that undermine the validity of the tests. That is, the results of such workplace drug tests are designed to detect fairly recent use of cannabis or cannabinoid-based products, but a positive test does *not* reflect impairment. In measuring impairment, be it for a driver on the road or an employee in a workplace, states and private businesses put into place two types of drug testing policies: zero tolerance and per se rules. Zero tolerance policies, most commonly utilized in workplace drug testing protocols, provide the employer grounds to terminate an employee if the presence of a substance like cannabis or its metabolites is present. This policy dictates that any amount of cannabis or its metabolites in one’s system is deemed “too much” by the employer.

Per se rules, on the other hand, set a standard measure of impairment and thus grounds for an intervention—an arrest for driving under the influence or the punishment of an employee (including termination). In the context of driving under the influence, many states set this per se limit at five nanograms per milliliter of blood or equivalent for testing other biospecimens such as urine. This standard dictates any measurement at that limit or higher to demonstrate impairment. Per se rules are controversial, particularly as they are held up as having the same measurement validity as blood alcohol tests’ designation of impairment. What’s more, some jurisdictions do not limit testing to active delta-9-THC but also include active and inactive metabolites, the latter of which demonstrates that an individual has used THC at some point in the recent past.

Neither the zero tolerance rule nor the per se limits accurately measure impairment, and the zero-tolerance policy in particular provides a sloppy approach to workplace safety. Given the duration of time cannabinoid metabolites remain in one’s system—multiple weeks in many cases and up to three months with hair samples—a zero tolerance policy can punish an individual who lacks any impairment and used cannabis responsibly outside of work hours. Once again, a comparison with alcohol here is apt. Employers typically do not terminate an employee on a Tuesday simply because they consumed a few glasses of wine while watching a movie on a Saturday night at home. However, in many workplace settings, someone could be terminated on a Tuesday for having consumed one 10 mg edible on a Saturday night at home.

While such policies are commonplace in American enterprise and often commonly accepted, that does not make them good policies. Nor is such a challenge entirely the fault of businesses. Part of the problem rests with incomplete science and technology that have failed to keep up with social progress. Surely, some workplaces should and would have a zero-tolerance policy even with fully informed science and technology, but many would enact more nuanced policies that both measure impairment accurately and put such testing considerations into a risk matrix, based on a given employee's job responsibilities and expectations. However, even with incomplete science and technology, employers could develop more nuanced policies and offer better guidance to human resources departments tasked with enforcing drug testing rules.

Increasingly, some companies are starting conversations about how to improve workplace drug testing rules. Some employers in cannabis-legal states and even in large, transnational corporations have taken very public steps toward eliminating drug testing policies. Others have sought to make some exceptions, particularly for medical cannabis patients. Those conversations, in too few situations, engage deeper issues of equity and justice when reconsidering workplace drug testing policies and the procedures used to enforce such rules. However, given biases in drug enforcement from a public safety perspective and similar biases in drug enforcement in private, workplace settings, these issues must play an important role in the conversation. And as the United States emerges from one of the most significant workplace-transforming events in our nation's history—the COVID-19 pandemic—employers are reconsidering many of the rules that have traditionally been part of the workplace experience. Those changes to workplace rules and procedures focus on efficiency, cost-savings, and the employee experience, especially for those seen as vulnerable. Now is an ideal time to reconsider workplace drug testing rules and their associated guidance with those same sensitivities for worker protection and the workplace experience.

The Science Behind Cannabis Testing and Impairment

Testing Positive for "Cannabis" is Not So Straightforward

DRUG TESTING FOR CANNABIS IS MORE COMPLICATED THAN MANY REALIZE. Cannabis is comprised of hundreds of different compounds, but it is important to recognize that urine drug tests for cannabis are currently designed only to assess metabolites related to delta-9-tetrahydrocannabinol (delta-9-THC), the primary intoxicating compound in cannabis. In other words, delta-9-THC is what typically makes a person feel high or altered, and therefore important when assessing workplace safety. However, detecting metabolites of delta-9-THC in someone's urine does not necessarily mean that they ever experienced intoxication, felt high, or were impaired. Similarly, *failure* to detect delta-9-THC or metabolites does not eliminate the possibility that a person has used intoxicating cannabinoid-based products and may have experienced impairment.

The proliferation of medical cannabis and hemp-derived products has resulted in thousands of commercially available cannabinoid-based options, many of which are designed to be non-intoxicating with low levels of delta-9-THC. In fact, within the U.S., hemp-derived products may legally contain ≤0.3% delta-9-THC by weight. Importantly, however, actual quantities of delta-9-THC in hemp-derived products are *not* required on product labels. As a result, many consumers may not recognize that hemp-derived products could contain detectable levels of delta-9-THC, and some may believe they are using "THC free" products. Although it may seem unlikely that products with such low levels of delta-9-THC could contribute to a positive result on a urine drug test, this is a very real possibility. Cannabinoids are highly lipophilic, meaning they bind to fat, increasing the amount of time required for elimination from the body.

Many who have recently used cannabis and want to increase chances of passing a drug test often resort to alternative strategies or remedies designed to "flush out" their systems, with varying levels of success. However, some are now trying to circumvent positive drug tests through the use of novel cannabinoid products, which has important implications for cannabis testing and workplace safety. Newly discovered intoxicating cannabinoids that typically avoid detection on urinary drug tests pose significant challenges.

Accordingly, exposure to even small amounts of delta-9-THC can build up over time, resulting in a positive drug test. In fact, a recent study examined urinary drug test results in patients enrolled in a clinical trial of a high-CBD product. The sublingual oil used in this trial contained one-tenth the amount of delta-9-THC legally allowed in hemp products, yet half of those enrolled in the study tested positive for metabolites of delta-9-THC after four weeks of use (Dahlgren et al., 2021). Interestingly, no patient reported feeling intoxicated and none reported use of any other cannabinoid-based products during the trial. Results suggest that even those using *non-intoxicating* cannabinoid-based products may still test positive despite never feeling high or experiencing impairment. Future studies are needed to determine what factors may be related to positive urine drug tests for some but not others who use products with very low levels of delta-9-THC. Possible variables could include age, sex, genetic factors, medication use, body mass index, or other yet-to-be explored variables. In addition, it is possible to quantify a range of cannabinoids other than THC (e.g. CBD) from urine, which would be helpful for those claiming the use of high-CBD, full spectrum products when they test positive for THC.

Importantly, some people are interested in feeling intoxicated yet want or need to avoid the consequences of a positive urine screen. Many who have recently used cannabis and want to increase the chances of passing a drug test often resort to alternative strategies or remedies designed to "flush out" their systems, with varying levels of success. However, some are now trying to circumvent positive drug tests through the use of novel cannabinoid products, which has important implications for cannabis testing and workplace safety. Newly-discovered intoxicating cannabinoids that typically avoid detection on urinary drug tests pose significant challenges. The most common of these, delta-8-THC (often simply referred to as "delta-8") is produced by the plant but in extremely low amounts and is posited to be less potent than its "cousin," delta-9-THC. However, manufacturers now synthesize products rich in delta-8, which can result in significant intoxication. These products (specifically those derived from hemp) represent a legal grey area, often considered a loophole for purchasing intoxicating products

where recreational cannabis is illegal or where medical certification is required for cannabis use. Notably, an increasing number of states have either blocked sales of delta-8 products or require purchase at a dispensary.[1] Regardless, these products continue to be widely available and may have negative consequences and significant workplace safety implications, especially as they are not specifically assessed on drug tests. Although research regarding delta-8 is sparse, a recent online survey of delta-8 consumers revealed that the majority of respondents substituted delta-8 for delta-9-THC, and experienced euphoria and cognitive distortions, including difficulty concentrating, difficulties with short-term memory, and altered sense of time (Kruger & Kruger, 2022). Further, trends indicate that products rich in other novel intoxicating cannabinoids may also be gaining popularity given the "loophole" regarding their legal status and the likelihood of avoiding detection on standard urine assays. Included among these is delta-9-tetrahydrocannabiphorol (THCP), which is actually *more potent* that delta-9-THC.

In addition to standard risks associated with using intoxicating cannabinoids, concerns associated with the use of products containing novel cannabinoids also relate to the processes required to manufacture these products. Given inherently low levels of these cannabinoids within the plant, manufacturers often use harsh chemicals or solvents to extract compounds and create more potent products; exposure to even trace amounts of these chemicals is potentially harmful and removal of these solvents is rarely if ever complete. In essence, delta-8 and THCP products are created by adulterating natural products, which can have negative consequences for consumers. In fact, a recent report by the FDA highlights that delta-8 products have been associated with adverse events (e.g., hallucinations, vomiting, tremor, anxiety, dizziness, confusion, and loss of consciousness) as well as a significant number of calls to poison control centers over the past two years.[2]

A Positive Drug Test is Not Equivalent to Impairment

Given what we know about cannabis, it's time re-evaluate potential tools for assessing intoxication and impairment. With other substances like alcohol, assessment of intoxication is relatively straightforward as the amount within the body can easily be assessed, and generally correlates with levels of intoxication at a common threshold (.08) Unfortunately, this approach does not translate to cannabis. Metabolites of delta-9-THC can be present for weeks to months after use, which renders it nearly impossible to differentiate between acute intoxication and recent or past use using standard methods. Further, assessing metabolite levels in different fluids cannot provide information about the product used or pattern of use—for example, it is impossible to know whether someone is intermittently using products high in delta-9-THC vs. consistently using products with low levels of delta-9-THC. Despite the passage of per se laws that set limits for the amount of detectable metabolites related to delta-9-THC, research suggests the presence of these metabolites in blood, urine, or saliva are not reliable indicators of *intoxication or impairment* (McCartney et al., 2022).[3]

1 See Kristen Nichols. 2022. *Rules governing delta-8 THC vary widely by state.*
2 See FDA. 2022. *5 Things to Know about Delta-8 Tetrahydrocannabinol – Delta-8 THC*
3 See National Institute of Justice. 2021. *Field Sobriety Tests and THC Levels Unreliable Indicators of Marijuana Intoxication*

The Legal Landscape of Testing for Cannabis in the Workplace

THE LEGAL AND REGULATORY ENVIRONMENT AROUND CANNABIS AND THE WORKPLACE IS JUST AS COMPLICATED AND CONFOUNDING AS THE SCIENCE. Since cannabis remains a Schedule I substance and Congress has failed to address workplace testing issues in the context of a shifting landscape in the states, there is no inherent federal protection of individuals who use cannabis for medical or adult use. Instead, workplace drug testing operates similarly to the broader cannabis policy space: a state and local patchwork, with varying rules by jurisdiction, business, and even job position. In a federal system without national-level guidance, such a patchwork is not surprising, but it makes it challenging for individual employees and employers to fully understand where the line between employer power and employee rights is drawn. What's more, in many places, legislative and judicial efforts over the past few years have injected further uncertainty and increasing change into the system.

As states began to reform their cannabis laws—for medical and later for adult use—little to no protection existed for cannabis patients and consumers who sought to use cannabis, even outside of the workplace. State governments and employers still freely allowed employers to make their own choices regarding drug-free workplace designations and the processes by which to enforce those rules. Often, that resulted in zero tolerance policies for testing for cannabis, a lack of interest in enforcing solely against impairment on the job, and even a disregard for whether active cannabinoids or metabolites were found in one's system.

Cannabis advocates, and especially medical cannabis patient advocates, argued passionately that exceptions should be made at least for medical cannabis patients and that "reasonable accommodations" should be made so as not to discriminate against an individual for having a health condition and using cannabis to treat it. Much of that language is drawn directly from the *Americans with Disabilities Act*, the 1990 federal law that barred discrimination of individuals living with disabilities.

Eventually, cannabis patients began challenging these policies in the courts. Two of the early major rulings came out of California and Colorado.[4] In a 2008 case titled, *Ross v. Ragingwire Telecommunications*, the California Supreme Court held that, "Nothing in the text or history of the Compassionate Use Act suggests the voters intended the measure to address the respective rights and duties of employers and employees." Here, a qualified medical patient under the state's medical cannabis program was terminated from a job days after starting because his preemployment drug test was positive for cannabinoids, and the state high court deemed that termination legal.

The 2015 Colorado case involved a medical patient living in a state that had legalized both medical and adult-use cannabis. An employee tested positive for cannabis in a random drug test he was administered after working at a company for a period of time. In this case, *Coates v. Dish Network*, the Colorado Court of Appeals ruled that the plaintiff could not seek relief for being fired for testing positive for cannabis (for which he was a registered, qualified patient in the state) because his consumption of cannabis was deemed illegal behavior. The Colorado Supreme Court affirmed the lower court's ruling, arguing that cannabis' Schedule I status under federal law deemed consumption of the product illegal, regardless of what state voters had decided.

These cases demonstrated that, early on, state courts were unwilling to side with employees regarding their medical cannabis use, held that the federal designation of cannabis as an illegal substance was a critical aspect of the law, and signaled that if considerations would not even be extended to qualified medical patients, adult-use consumers should not expect protection either.

4 See also *Emerald Steel v. Bureau of Labor and Industries,* 2010 (Oregon S.Ct.)

State Legislative Activity Around Workplace Cannabis Testing

In many states, especially as adult use legalization commenced, ballot initiatives and state laws specifically built employer protections into the law, leaving it up to individual companies whether to continue drug-free workplace designations and employee drug testing. In other situations, those ballot initiatives and laws remained silent on the issue, opting not to change existing employer rights in those states. The first two adult-use ballot initiatives passed in 2012 in Colorado and Washington took such approaches. And given that, within the cannabis policy space, states often learned from states with prior legalization in passing their own laws, those provisions (or non-provisions) that maintained employer power became quite common.

In most states, employer power to drug test, discipline, and terminate individuals for a positive test remains the law. However, there are specific exceptions that further complicate the patchwork workplace safety policy environment. As cannabis use has been de-stigmatized, in large part because of dramatic shifts in public opinion, especially around medical cannabis and as more people become comfortable with the idea of cannabis as medicine, the conversation around employee protection has expanded. At the same time, as issues of justice and equity have become a central part of the broader cannabis policy debate, the realities of bias and discrimination in employee drug testing and drug test-based workplace discipline have bubbled to the surface.

A more dynamic cannabis-centered workplace safety conversation has evolved and has impacted both legislative and judicial efforts in several states. Varying protections have emerged. More than a dozen states have provided some protections for medical cannabis patients.[5] Some states including Arkansas, Pennsylvania, West Virginia, and others include a ban on discrimination solely for being a registered medical cannabis cardholder.[6] Other jurisdictions have required an employer to use impairment as the standard for workplace discipline, not simply a positive cannabis drug test. Those states offer a more nuanced understanding of how cannabis affects the body, how long it stays in one's system, how the body metabolizes cannabinoids, and what impact the presence of cannabinoids or their metabolites may have (or not have) on the body.

That nuanced understanding has pushed states to enact changes to their laws around workplace testing and employee protections. While some states include protections when they pass medical and/or adult use reform, others including Maine, Nevada, Illinois, Arizona, and the District of Columbia have all taken steps *after* the passage of cannabis reform to amend those provisions, and in the case of Illinois, to clarify a vague provision in its adult-use legalization law.[7] Nevada's law passed in 2021 is among the ones that goes the furthest in extending protections in the workplace.[8] It bars employers in the

5 See Americans for Safe Access report: *An Analysis of Medical Cannabis Access in the United States* (2022)
6 Although it should be noted that not all those rules protect cannabis use, but instead simply the designation of being a patient.
7 It should be noted, advocates in Illinois would argue that vagueness continues in that law.
8 Nevada AB132 (2021).

state from discriminating against potential employees because they test positive in a pre-employment screening for cannabis. This goes further than most other states that simply bar discrimination in varying degrees for medical cannabis. It involves protection for positive tests and would also extend to retail customers (adult-use users).[9] This law does have important limitations, including exemptions for certain positions including first responders, healthcare workers, truck drivers, heavy machine operators, bus drivers, and other positions that could put people's health or safety at risk. It also only focuses on pre-employment drug screenings. Nevada still allows employers to keep workplaces drug free and for testing of existing employees, which can result in discipline or termination for a positive test.

Other states have tried to follow suit with proposals in state legislative chambers—some of which passed individual chambers. In many of those states, the failure to pass protections have not dissuaded advocates from continuing to try, and those efforts continue in states including California, Colorado, Florida, and others.

State Administrative Guidance Around Workplace Cannabis Testing

Even as all of these legislative changes are happening or being proposed—from the basic decision of a state to legalize cannabis for medical or adult use or for a state to revise its laws regarding employee rights in this context—states have worked in varying ways to protect workers in another way: through guidance. State departments of labor and other similar entities have strongly encouraged employers to provide complete, comprehensive, and easily digestible guidance on *precisely* what the state and local laws are regarding cannabis use and employment and what the company's policies are regarding the same. Some employees may unknowingly think that changes in the legal status of cannabis automatically immunizes them from workplace discipline for its use. So ensuring that employees are fully informed is key for worker protection and workplace safety.

Variation among state departments of labor in providing workplace drug testing guidance creates problems. In some cases, employers and employees alike are not fully informed on the up-to-date laws and regulations around this issue. Such a lack of information—especially in a rapidly changing policy environment—can mean that well-intentioned individuals who believe they are following the rules can end up in an unfortunate situation. Employers may improperly punish or terminate employees. Employees may consume a substance without realizing that they are violating a company rule that complies with the law and be punished as a result. As we have discussed, the medical science and legal landscapes are confusing and new information is coming to light regularly, and the best protection for both companies and their workers is clear and timely guidance from relevant state agencies about the rules of the game.

9 New Jersey and New York included similar protections when they legalized adult-use cannabis in 2021.

Recent Judicial Activity Around Workplace Cannabis Testing

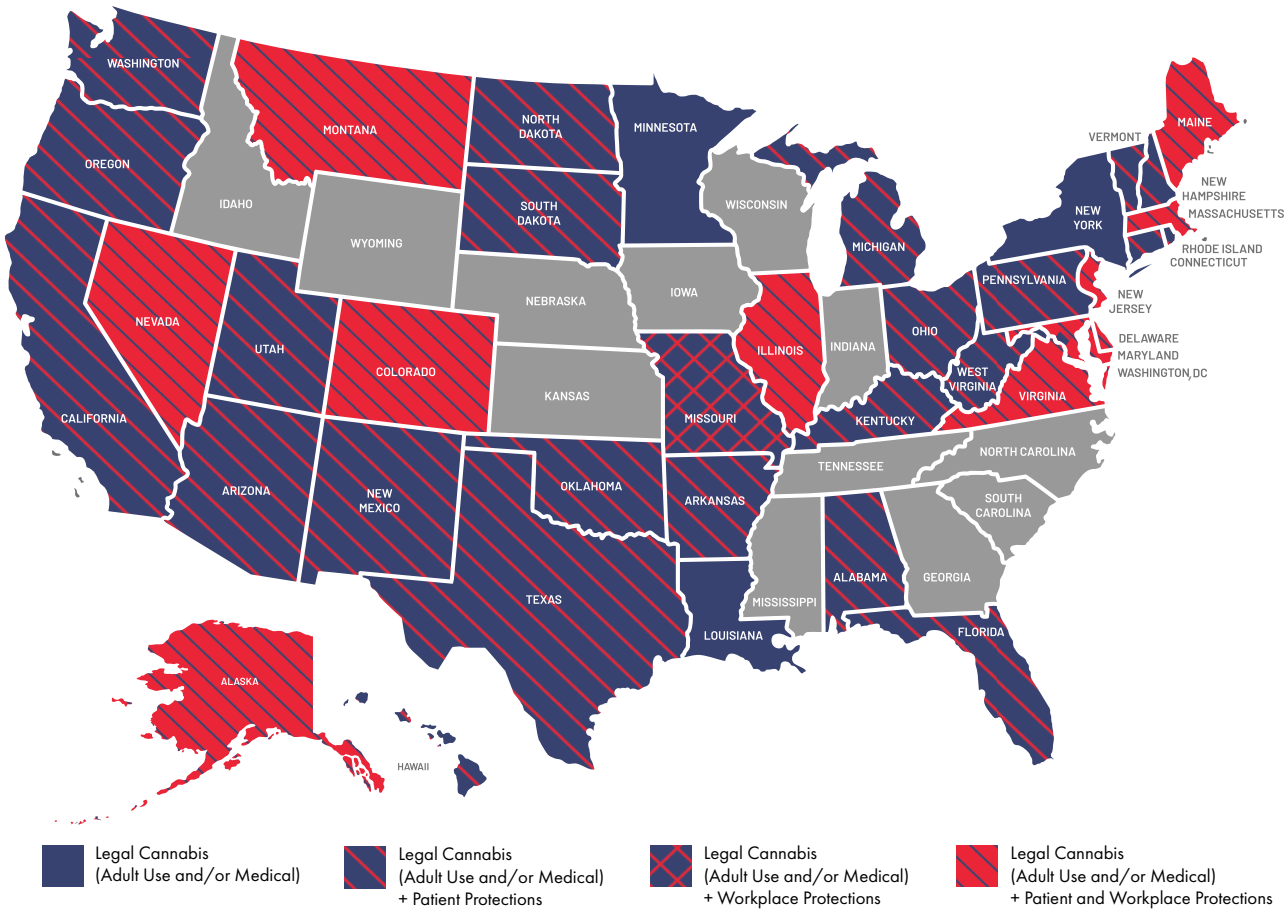
Despite those efforts in legislative bodies, executive agencies, and in workplaces, vague provisions endure and challenges to existing laws continue. Over the past five years, the courts have been a setting in which cannabis patients and users have found increasing success in challenging workplace policies. Employers' policies have been successfully challenged (to varying levels) in states including Arizona,[10] Connecticut,[11] Delaware,[12] Massachusetts,[13] New Jersey,[14] Pennsylvania,[15] and Rhode Island,[16] and a pending case in New Hampshire saw that state's high court send a case back to a lower court for reconsideration.

The Arizona case, which was filed in federal court, argued that the provisions of Arizona's medical cannabis law included protections against discrimination of medical cannabis patients, and that because the employee in the case was not impaired at work, she was improperly terminated, given those discrimination protections. The federal district court in this case relied on *Noffsinger*, another federal case out of Connecticut, which noted that the *Americans with Disabilities Act* does not preempt the state's medical cannabis law, allowing employees to sue. The Arizona court also pointed to Delaware's *Chance v. Kraft Foods*, a state court case that upheld employee protections because the state enacted anti-discrimination measures in its medical cannabis legislation. Slowly, an area of caselaw is developing that finds in favor of employees who are medical cannabis patients who use on their own time and are not impaired at work, specifically in states that build those employee anti-discrimination provisions into their laws.

Thus, the legal landscape is changing in many states, either through the efforts of legislative leaders or through courts—federal and state—finding that anti-discrimination protections must be afforded in this space. Complexities still remain regarding which states or jurisdictions extend those protections to cannabis users, which cannabis users are covered, and the scenarios that qualify for protection. Short of federal protections via legalization or some other congressional reform, that patchwork will largely remain, and even under federal extensions of anti-discrimination policies, the complexity of workplace safety and testing rules will remain across the states.

10 Whitmire v. Walmart, 2019
11 Noffsinger v. SSC Niantic, 2017
12 Chance v. Kraft Foods, 2018
13 Barbuto v. Advantage Sales and Marketing, 2017
14 Wild v. Carriage Funeral, 2020
15 Palmiter v. Commonwealth Health Systems, 2021
16 Callaghan v. Darlington Fabrics, 2017

Cannabis & Workplace Safety: Summary of the Evidence



Taken together, acute and chronic recreational cannabis use may confer effects that could negatively impact workplace safety, but more studies are needed to *directly* assess this relationship. Additional research is also needed to determine the relationship between medical cannabis use and workplace safety. In fact, studies indicate the possibility that medical cannabis use could improve workplace safety outcomes, although it is premature draw conclusions given limited available data. In assessing the relationship between cannabis and workplace safety, it is critically important to consider a number of variables, rather than treating all cannabis use equally, assuming that a positive drug test is equivalent to impairment, or that a negative test excludes the possibility of cannabinoid use. Factors that will likely impact workplace safety outcomes include age of onset of regular cannabis use, current age, and level of cannabinoid exposure (e.g., frequency, amount, product type, mode of use, and cannabinoid profile), as well as genetic vulnerability and likely other variables. However, in thinking about workplace safety, there are also alternative, forward-thinking avenues for employers to consider that do not rely on drug testing for cannabis or cannabinoid use.

The Impact of Cannabis on Workplace Safety: Current Data

Occupational Injury, Cognition, and Relevant Research

WORKPLACE SAFETY INVOLVES PROTECTING THE HEALTH AND SAFETY OF ALL EMPLOYEES. In order for employees to work safely and efficiently, it is essential that cognitive processes, such as memory, processing speed, attention, executive function, problem-solving, decision-making, inhibition, and emotional self-regulation are intact. These processes are affected by alcohol or drug use, fatigue, and medical and psychological conditions.

Given well-documented cognitive and physical effects related to cannabis use, it is plausible that cannabis may be associated with injury and mortality in the workplace (Biasutti et al., 2020). While some studies have specifically assessed a potential relationship between cannabis use and occupational injury, the existing evidence is mixed (Biasutti et al., 2020). A number of studies show that cannabis use is related to increased risk of occupational injury, but just as many studies find no evidence of a relationship. Further, among those who reported that cannabis use is related to increased risk of injury, very few have been able to demonstrate that cannabis use occurred *before* the injury, raising questions about the nature of this potential relationship.

Other lines of research assessing the acute (i.e., while intoxicated) and residual (i.e., long-term) effects of cannabis use have also generated important findings related to workplace safety. In addition to feelings associated with being "high," such as sedation or disorientation, a large body of work has focused on the cognitive effects associated with cannabis use (Broyd et al., 2016; Crane et al., 2013; Crean et al., 2011; Gruber & Sagar, 2017; Lisdahl et al., 2014). Specifically, studies indicate that psychomotor function is altered during acute intoxication and may persist over time, raising concern for tasks like driving, operating machinery/tools, or anything involving fine or gross motor skills. In addition, verbal learning and memory are among the most consistently affected cognitive domains as a result of both acute and chronic cannabis use. These domains correspond with skills like remembering a to-do list or being able to recall tasks someone verbally requested. Difficulty with

focus, attention, and executive function—a critically important set of "higher-order" skills that impact sound decision-making (goal-oriented behaviors, cognitive flexibility, and inhibition)—have also been reported among cannabis users. Typically, greater frequency and higher amounts of cannabis used correlate with poorer performance across these domains. In contrast, some studies have reported less impairment among heavier cannabis users, suggesting that tolerance may dampen or even prevent negative cognitive effects in those who use frequently or daily (Colizzi & Bhattacharyya, 2018). These data further underscore the idea that a positive drug test is not necessarily indicative of impairment.

Thus far, the majority of studies of cannabis and cognition have assessed adolescent or emerging adult populations and have often focused on those with chronic or heavy recreational use. As the goal of recreational use is to feel high, euphoric, or altered, it is important to understand that these studies largely reflect the impact of significant exposure to delta-9-THC, typically in those who are not yet neurodevelopmentally mature. As a result, cannabis use may yield different effects in other populations. In fact, rapidly growing numbers of individuals use cannabis for *medical* purposes, and those who do often select products designed to *avoid* intoxication and instead focus on symptom alleviation. Accordingly, many of these products have much less delta-9-THC than products selected for recreational use, and are often non-intoxicating (e.g., hemp-derived products or other products with low or no delta-9-THC). In addition, certain cannabinoids, such as the extremely popular cannabidiol (CBD) as well as other "minor" cannabinoids, have been shown to have therapeutic and neuroprotective effects which may even mitigate some of the negative effects commonly associated with THC (Lorenzetti et al., 2016; Morgan et al., 2012; Walsh et al., 2021; Yucel et al., 2016). Although far less research has examined the impact of medical cannabis use, emerging data suggest that adults using cannabis for medical purposes may actually experience stable or *improved* cognition, as well as improved sleep, quality of life, pain, and mood (Bar-Sela et al., 2019; Gruber et al., 2021; Sagar et al., 2021), all of which are likely to *positively* impact workplace safety and performance.

In addition to the variables noted above that may impact outcomes (age of onset, frequency, amount, recreational vs. medical goal of use, and level of exposure to specific cannabinoids), several other factors likely influence outcome and ultimately, workplace safety. First, not everyone responds the same way to cannabinoids, given a combination of genetic, physiologic, and metabolic factors (Gasse et al., 2020; Hryhorowicz et al., 2018). For example, some individuals are slow metabolizers of delta-9-THC, which results in high sensitivity to even small amounts of delta-9-THC, while others may metabolize THC so quickly, they don't necessarily experience intoxication, even from products containing considerable amounts of THC.

Certain modes of use also increase the likelihood of impairment or negative consequences, and some of these are increasingly difficult to detect, a major consideration for the workplace. Cannabis products are available in many forms including dried flower, concentrates (typically referencing products with very high levels of delta-9-THC), oils and extracts, edibles, and more, each of which are tied to specific routes of administration. While "traditional" methods of smoking and vaping are often accompanied by telltale signs of use (noticeable odor, red or glassy eyes, etc.), other ways of using cannabis, including using an edible or swallowing an oil or capsule, are much harder to detect as more obvious indicators of use may be absent. Different ways of using cannabis impact how active ingredients enter the body, how long it takes to feel an effect ("rise time"), and how long effects will last. Although research examining the impact of specific modes of use is still nascent, some routes of administration that deliver high doses of delta-9-THC quickly are likely to pose a higher risk for negative outcomes. For example, "dabbing"—vaping a small amount of a highly concentrated-THC product (a "dab")— is designed to deliver a large dose all at once to the consumer that creates an intense high. Compared to smoking or vaping, which allow individuals to titrate their intake relatively easily, "dabbing" is more difficult to control with regard to dosing and appears to be associated with negative cognitive outcomes (Bidwell et al., 2021). In addition, products that are orally ingested (edibles, beverages, etc.) must be digested and then processed by the liver before entering the bloodstream. During this process, delta-9-THC is converted to 11-OH-THC, which is actually more psychoactive than delta-9-THC. The effects of ingested products typically have a slower onset but also last much longer compared to other routes of administration. Differences in the ability to detect use and the variable onset, duration, and strength of effects associated with specific product types of and modes of use all clearly have the potential to impact workplace safety.

Other factors such as sex or cognitive reserve—a term which refers to an individual's ability to adapt brain function to compensate in the face of insult or injury to the brain (Stern et al., 2018)—are also likely to influence the degree to which cannabinoids may result in impairment or improvement, and to what degree. Interactions between cannabinoids and conventional medications are also a concern, as the same liver enzyme system is commonly involved (Kocis & Vrana, 2020). Accordingly, use of cannabinoids and certain medications can amplify or dampen the effects of either substance.

New Data and Technology that Employers Should Consider

IMPAIRMENT FROM ANY SOURCE—DRUGS, ALCOHOL, OTHER MEDICATIONS, FATIGUE, DEHYDRATION, ILLNESS, OR EMOTIONAL STATE—CAN JEOPARDIZE WORKPLACE SAFETY AND NEGATIVELY IMPACT PERFORMANCE ON THE JOB. While testing for delta-9-THC metabolites in urine is designed to alert an employer that an employee has been exposed to cannabis somewhat recently (anywhere from a few hours to several weeks prior), it essentially provides no information about whether an individual is impaired or is able to work safely and productively. Some have attempted to create breathalyzers to assess recent cannabis use, but there are a number of obstacles related to the way cannabis is metabolized that make this extremely challenging. Moreover, this approach still does not identify impairment. Field sobriety tests for cannabis use have proven unreliable (Gilman et al., 2022; Spindle et al., 2021), and while other creative solutions to specifically assess *cannabis-related impairment* have been conceived and investigated by scientists, this line of research is in early stages and currently faces significant obstacles to widespread implementation, such as high cost, bulky equipment, and/or questionable reliability and validity.

Employers may find it more advantageous to consider alternative options that *directly assess impairment, regardless of the source*. Impairment testing provides real-time feedback to employers and employees about whether an individual may be compromised. Ideally, impairment tests would be quick and easy to administer (i.e., non-proprietary hardware, app-based, or wearables), low-cost, and would assess an employee's performance relative to their own baseline level of performance on tasks that directly correlate with essential cognitive processes needed to work safely and efficiently in their environment. The goal of impairment testing is to flag potential safety or performance concerns by identifying significant deviation from an individual's typical performance. Currently, a number of companies offer a variety of products for testing impairment, but empirically sound research assessing their efficacy is needed to ensure specific metrics are valid and reliable.

Implications of Per Se Rules and Bad Science in "Informing" This Issue and Setting Public and Private Policy

UNFORTUNATELY, A LACK OF UNDERSTANDING REGARDING THE NUANCES RELATED TO CANNABIS USE HAVE LED TO SOME UNINFORMED DECISIONS for setting public and private policies about cannabis and the workplace. Per se laws do not consider that:

- **Conventional drug tests assess for presence of metabolites associated with delta-9-THC exposure, but do not assess impairment.** Someone who has never been intoxicated or impaired could still test positive for "cannabis," while someone routinely getting high using novel cannabinoids such as delta-8, THCP, or other intoxicating cannabinoids not detected by drug tests, may test negative.

- **The same amount of delta-9-THC (or other intoxicating cannabinoids) can impact individuals very differently, resulting in vastly different levels of potential impairment.** Some individuals are highly sensitive to intoxicating cannabinoids, whereas others experience little to no effect from considerable amounts. This may be related to genetics, metabolism, weight or body mass index, tolerance, use of other medications, or other unexplored factors.

- **Use of cannabinoids may be related to beneficial effects for some.** Emerging evidence suggests that those using cannabis or cannabinoids for medical purposes could experience symptom relief, which could actually lower the risk for occupational injury or improve work performance. For example, individuals may be able to think more clearly or focus better at work if their symptoms improve or if they subsequently decrease use of conventional medications that cause cognitive fogginess or sedation.

Accordingly, per se laws are inherently flawed and could 1) easily fail to identify individuals who are impaired and 2) falsely identify some cannabinoid consumers as impaired when they are not impaired and may actually have a lower risk of occupational injury. It is important to remember that currently no specific level of cannabinoid exposure (acutely or over time) is linked to impairment.

Equity Considerations in Workplace Drug Testing

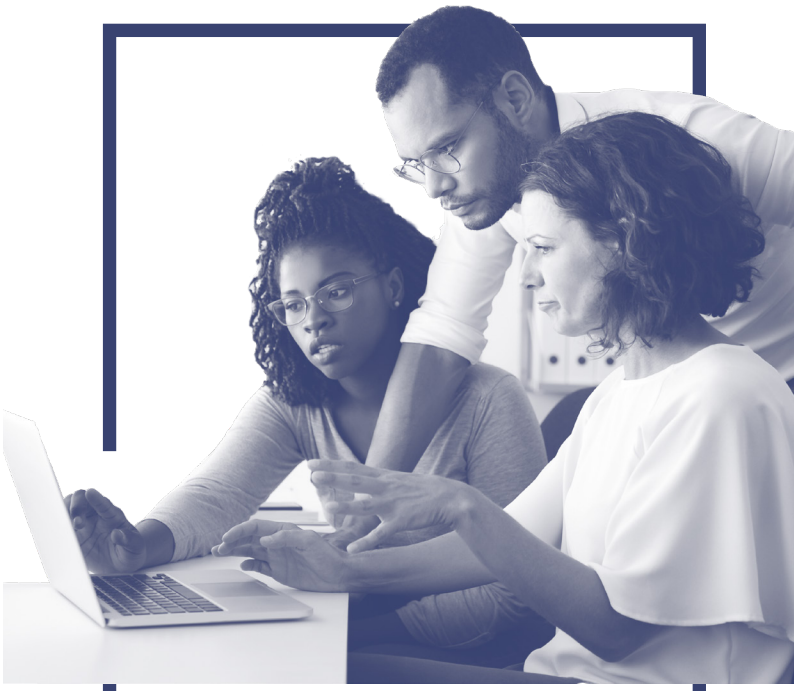
THERE ARE PLENTY OF CHALLENGES THAT ARE PRESENTED BY INCOMPLETE DATA, BAD SCIENCE, AND MISINFORMATION ABOUT THE RELATIONSHIP BETWEEN IMPAIRMENT AND RISK AND THEIR RESULTANT PUBLIC AND PRIVATE POLICIES AROUND WORKPLACE DRUG TESTING. There exists an entire other set of challenges that infect this area of policy that intersect all of those underlying risks and flow from a dangerous element of the human condition: bias.

A growing concern in workplace drug testing policies centers on whether they are implemented in an equitable manner. Various questions arise at the intersection of equity considerations and workplace drug testing. Are drug tests administered equally among employees regardless of age, race, ethnicity, gender, or background? Are policies designed in ways that target specific subpopulations under the guise of achieving a workplace goal? Beyond concerns about workplace and public safety, are certain types of industries, occupations, or workers testing via procedures that generate inequities? Do biases in the workplace carry over to choices made around workplace testing?

Each of these questions exposes some of the controversy that has arisen as workplace drug testing has become more commonplace in a significant portion of the American workforce, particularly over the past 40 years. The research literature on workplace bias and discrimination is significant and covers complex issues of policy, and it is not our intent to review that entire literature here. However, in the context of bias in workplace drug testing, two major sets of questions arise. First, does bias affect pre-employment testing policies and implementation? Second, does bias within the workplace affect workplace testing of current employees? Given the private nature of American commerce and personnel management, these issues can be difficult to investigate.

We do know that biases exist with regard to hiring diverse candidates. Betrand and Mullainathan (2004) show that employers in Boston and Chicago were significantly less likely to call back applicants with names that sounded like the candidate was Black, compared to candidates with "white sounding" names. Biases in discrimination also extend to the formerly incarcerated, where employers are much more likely to hire a white job candidate who was formerly incarcerated than a Black candidate who was (Pager and Quillian, 2005). In addition, the work of Wozniak (2011) highlights that hiring

managers believe that Black job candidates and Black employees were significantly less likely to pass a drug test than were white candidates or employees. Wozniak's later work (2015) showed that while states and companies with drug testing did benefit non-substance using Black employees, much of that benefit occurred because of existing bias among employers in non-substance testing states and industries. Specifically, the same kind of pre-existing bias about the likelihood of Blacks to fail a workplace drug test, meant that candidates of color were often not hired and that white women candidates benefitted from that bias.



Identifying similar bias within the workplace and specific to testing is critical. Employers today are unlikely to admit to explicit bias in testing, and workplace personnel files are private and protected.[17] However, Becker, et al (2013) shows that Black employees are much more likely to report being tested for drugs in the workplace than are white employees, even when controlling for "relevant demographic, occupational, and other covariates and among stratified analyses in occupations with the lowest and highest proportions of black workers" (361). The authors go on to note that such biases are absent in industries such as transportation where federal law required workplace testing. In those industries, self-reported incidences of workplace testing did not differ between Black and white employees. Instead, racial bias in the context of workplace drug testing appears in private industry where those charged with administering workplace substance testing policies have discretion.

Discretion in the implementation of workplace substance testing rules can be the source of significant bias in other areas as well. This is particularly true in workplace decisions and processes that are generally unobservable to researchers. Much of the research mentioned above relied on self-reported incidences of individuals' experience with workplace testing. It is harder to rely on the same methodological approach to examine differences in the enforcement of failed substance tests and subsequent choices over penalization, including termination.

17 But see LaPiere (1934) about the likelihood and willingness of establishments to openly admit in surveys their unwillingness to serve Chinese-American patrons. In addition, during long periods of American history establishments openly stated and advertised that they would discriminate in service and in hiring based on race, ethnicity, gender, and religion.

Employers are unlikely to turn over even de-identified personnel files to examine the potential for racial (or other forms of) bias in workplace substance testing penalties. They are equally unlikely to admit openly to biases that exist in process. In fact, Pager and Quillian (2005) demonstrates that among employers who are audited and show racial bias in hiring the formerly incarcerated, those employers refuse to admit that biases exist in pre-audit surveys. Because of federal and state protections against racial discrimination in hiring and other employment matters, it should come as no surprise that employers are unwilling to admit to such behaviors or to open their books voluntarily in ways that could expose such behaviors. Criminal and civil actions could and would be in order if such biases were uncovered, and businesses would sustain significant reputational damage if it were true.

It is important, then, to put each of the pieces together to gain a better understanding of potential concerns over racial bias in workplace drug testing and the response to test results. This will allow us to build theory around how bias can manifest beyond what the research already demonstrates. We know discrimination can and does exist in the workplace and that such discrimination can be based on race and/or ethnicity. We know that such bias can impact the decision of firms to hire individuals and that biases can be socialized into the way employers and employees think of individuals, particularly people of color. That is especially true in the context of pre-conceived notions of who is more or less likely to fail a workplace drug test and even which "types" of employees are more likely to be substance users.[18] This can lead to a racialized view of "good" versus "bad" employees, which can transform into a lens through which transgressions are also perceived, weighed, and adjudicated.

Thus, the question arises whether bias in workplace substance testing also impacts penalization. It is difficult to imagine that it does not. If biases impact all aspects of employment, it must then also influence how a company deals with a failed drug test. Some firms have strict zero tolerance laws in which someone who tests positive is terminated. What is unclear is how "automatic" that zero tolerance environment truly is and whether discretion exists among employees charged with carrying out that termination. We know from the literature that discretion in the workplace provides an avenue by which racial bias can determine outcomes, and thus, we must assume the same can be true in dealing with a failed workplace drug test. Surely, it will not happen in all cases, but it would present that opportunity.

We also know that not all workplaces that utilize drug testing maintain a zero tolerance or "terminate on the spot" approach. Some workplaces provide a variety of outcomes when an employee tests positive. Some firms maintain strike systems or second-chance opportunities. Others, particularly for someone who violates the company's substance use rules the first time, provide an option for medical treatment, counseling, therapy, and/or rehabilitation services. Still others allow those dealing with such a violation wide latitude, ranging from a verbal reprimand to termination and anything in between. It is in these spaces where racial bias may manifest in significant ways. One can imagine a scenario in

18 Perceptions of which groups are more likely to use drugs in America is highly racialized by a variety of factors including media representations and normative judgments about the level of dangers associated with specific substances and their users, among other reasons (Beckett et al, 2005). The racialized perception of substance use bleeds throughout society in its view of groups and individuals and will inform workplace bias and subsequently decision making.

which the person in human resources tasked with dealing with the issue—a manager or an owner with conscious or unconscious bias about who substance users are and which substance users are "bad people"—could face similar failed drug tests for two employees. Imagine a situation in which there is one white employee and another similar employee who is Black. Typically, personnel and human resources rules within a company prevent the details of one's failed drug test to be made known within the company. Thus, the mere existence of a failed drug test by one employee is inherently hidden information from other employees. So, too, then would the punishments for failed drug tests among multiple employees. The decision maker could choose a harsher punishment such as termination for the Black employee, while being more lenient on the white employee.

This hypothetical is not at all far-fetched, and we have an entire literature in a similar space that demonstrates for us these types of behaviors in action: the criminal justice system.

Bias in Drug Policy and the Criminal Justice System

THERE IS AN EXTENSIVE LITERATURE ON RACIAL AND ETHNIC BIASES (AMONG OTHER BIASES) IN THE CRIMINAL JUSTICE SYSTEM THAT IS FAR TOO SIGNIFICANT IN SIZE TO COVER HERE. For decades, researchers have written extensively about the extent of those biases in our system. They manifest at the federal, state, and local levels. They impact violent crime and non-violent crime. Author Michelle Alexander in her book *The New Jim Crow: Mass Incarceration in the Age of Colorblindness* highlights these problems and talks extensively about its connection to drug policy in the United States. Hudak (2020), among many others, highlights that biases in drug policy and in the enforcement of drug laws, specifically cannabis laws, is not a coincidence, but instead is by design. Alexander's book concisely reviews the literature on how the design of three-strikes laws, crack cocaine sentencing laws, stop-and-frisk procedures, mandatory minimum sentences, and many other policies were crafted, by design, to punish and harm BIPOC communities in a significant way.

Layered into a system built on a foundation of racial discrimination and unequal treatment, are conscious and unconscious racial bias in policing that reinforce those inequities daily.[19] Prosecutors, judges, and juries all bring to the criminal justice system these types of bias unknowingly and worse purposefully to ensure that they infect every step of the system. Elizabeth Hinton, LaShae Henderson, and Cindy Reed authored the 2018 report for the Vera Institute of Justice entitled, "An Unjust Burden: The Disparate Treatment of Black Americans in the Criminal Justice System."[20] This report reviews the literature of both the types of laws that serve as the biased foundation for criminal justice in the United States as well as the ways in which bias influences every aspect of and every decision point in the system.

It is critical to understand the two central forces in this bias: the racialized predispositions of the actors operating within the system that is structured by rules, laws, and procedures designed around discriminatory goals. That double whammy of bias is not reserved for formal laws that undergird our

19 See Horace and Harris. 2019. *The Black and the Blue: A Cop Reveals the Crimes, Racism, and Injustice in America's Law Enforcement* for a gripping account of such practices.

20 See Hinton, Henderson, and Reed. 2018. *An Unjust Burden: The Disparate Treatment of Black Americans in the Criminal Justice System.*

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For an employee, the workplace drug test is a collection of evidence, similar to what law enforcement officials would do when investigating a crime of any kind. The result of that workplace test can clear a person of potential wrongdoing in the same way a breathalyzer, blood test, DNA sample, corroborated alibi, or other evidence could be used to eliminate an individual from being investigated by law enforcement.

penal code and the systems that administer it. It is a construct that affects public and private institutions including education, health care, financial services, housing, and yes, employment.

It is thus important to re-envision workplace substance testing as a private judicial action that is subject to the same forces and biases that is a “public” judicial action—law enforcement activity subject to the criminal justice system. The comparisons are easy to make. Workplace substance testing can be administered randomly, such as a roadside check for an impaired driver or the automated processing of a license plate number by a camera mounted on a police cruiser. Or the workplace substance test can be administered because a manager believes a worker may be impaired. This is similar to a law enforcement official having reasonable suspicion to pull an individual over because of their driving or having probable cause to arrest an individual for a potential crime.

For an employee, the workplace drug test is a collection of evidence, similar to what law enforcement officials would do when investigating a crime of any kind. The result of that workplace test can clear a person of potential wrongdoing in the same way a breathalyzer, blood test, DNA sample, corroborated alibi, or other evidence could be used to eliminate an individual from being investigated by law enforcement. A positive test—as noted above—is evidence of guilt, and in scenarios in which per se rules apply, it can result in an automatic or nearly automatic penalty; this is true in the workplace or (in contexts like impaired driving) in the criminal justice system.[21] In some workplace settings, a positive substance test can lead to a type of internal administrative meeting or hearing in which the evidence is presented to the employee, and the employee has an opportunity to offer an explanation for the result. The designated workplace officials can then weigh the information he or she has received in order to determine whether to punish and to what extent. This process functions similarly to due process rights afforded to the accused in a criminal proceeding. In addition, in some companies, if a

21 While no penalty in the criminal justice system is “automatic,” per se rules around impaired driving function quite closely to it.

person believes he or she was improperly or too harshly punished, there is an appeal process that they can request where other individuals review the details of the situation, and once again this situation parallels the due process rights of those convicted in criminal proceedings.

What we also know, as stated above is that each step in the judicial system is wrought with racial bias. From law enforcement's determinations of suspicious activity to investigation to arrest to bail decisions to decisions to prosecute to trial processes to convictions to sentencing to appeals, people of color are treated differently in the United States (and elsewhere in the world). Because workplace substance testing processes in many ways mirror the criminal justice system, we should be concerned that racial bias and discrimination will manifest in similar ways. Except there is one glaring difference between the two. The criminal justice system is one of public record. Data are collected at each stage of the process and made public. And thus, research into racial bias in the criminal justice system—because of its public nature and the availability of data—is relatively easy. That is not true for private employment, and the procedures, including the details of workplace drug testing and its associated punishments, are hidden from public view. And so given that the level of racial bias that manifests in plain view in public proceedings in the criminal justice system is so significant, one can assume that the same level of bias or even greater bias would riddle a private, closed system. Supreme Court Justice Louis Brandeis famously said, "sunlight is said to be the best of disinfectants," in referencing transparency, and so when racial bias sustains even in bright sunlight, one can only imagine how it thrives in the darkness.

Thus, as we rethink how we approach workplace substance testing rules generally, and cannabis testing specifically, we need to think holistically about the weaknesses in the current system. One key aspect is to evaluate internal, private workplace substance testing processes as similar to public judicial proceedings in the criminal justice system. In that way, they are subject to the same biases—or even greater biases—that have been well documented in policing and the court system. As a result, companies should think about the risk matrix that exists around workplace drug testing and whether and to what extent such testing is necessary to keep a workplace safe and how best to minimize the types to biases we know to exist.

Policy Recommendations and Avenues for Future Research and Inquiry

GIVEN THE LIMITATIONS IN SCIENCE, TESTING, AND OUR UNDERSTANDING OF THE MEASUREMENTS OF IMPAIRMENT COMBINED WITH THE EVER-CHANGING LEGAL LANDSCAPE AND INHERENT BIASES IN EMPLOYMENT, the workplace substance testing system needs significant reform. We recommend a series of reforms that will improve the ability of employers to keep workplaces safe, protect workers from unnecessary punishment or termination, and empower research to meet the needs of the current policy space.

1. **We need to assess the degree to which understudied factors impact risk of cannabis-related impairment** such as: A) an individual's genetic profile, metabolism, age, sex, cognitive reserve, or other biological traits; B) variables related to cannabis use, such as exposure to minor cannabinoids, route of administration, tolerance, etc.; and C) use of other medications.

2. **We must investigate valid and reliable alternative methods that assess impairment *regardless of the source*** (cannabis vs. another drug, substance, or condition) and expand our understanding of measurement of and impairment from other cannabinoids beyond delta-9-THC. While not yet standard, quantification of additional cannabinoids (e.g., CBD) is possible and can provide valuable information regarding an individual's use. However, as the presence of any metabolite is not a direct reflection of impairment, research designed to assess impairment potential of other cannabinoids will provide a more thorough understanding about the relationship between individual cannabinoids, their metabolites, and their potential for impairment.

3. **Governments and employers, particularly large private employers, should evaluate the weaknesses in the current workplace testing science and technology** and invest heavily in technology that can provide better information about impairment and risk in the workplace. Such technologies will provide employers with accurate products that can protect workers from inappropriate or unintended disciplinary actions and insulate businesses from litigation costs. Those technologies will also inject greater fairness into a system with profound weaknesses.

4. **It is vital to collect data and disseminate information from:** A) the experience of employers in states that have legalized cannabis regarding employee impairment, workplace testing, and workplace safety; B) the experience of employers that have changed their testing protocols and the successes or challenges that they experienced as a result; and 3) the experience of employers that have eliminated workplace testing entirely and their experience with changes in workplace safety. To achieve this, governments should provide incentives to companies to collect and share such data.

5. **Governments or private organizations should create a clearinghouse of best practices and the latest data** regarding the intersection of cannabis use and workplace safety in order to inform employers across the country. Similar to the previous point, governments should design incentive structures that simultaneously protect proprietary information and induce companies to compile and share sufficient data to achieve clearly stated goals.

6. **The U.S. Department of Labor must respond to the reality of state-level cannabis reform**, even as the substance remains categorized as Schedule I. It should launch a campaign across state and local jurisdictions to clarify drug testing policies, especially cannabis testing policies. It should encourage state departments of labor to promote best practices regarding: A) workplace testing policies and B) guidance and information to employees about drug testing policies, employee rights, company adjudication processes, and the potential punishments they can face if company drug testing policies are violated.

7. **States should promulgate regulations that require employers to report de-identified workplace drug testing punishments** that allows the evaluation of bias and discrimination in those procedures. Such data reporting requirements will disincentivize employers from engaging in explicit bias and help employers subject to unconscious bias adjust procedures accordingly.

8. **Unions and other workers rights' organizations should** A) elevate issues of fairness and equity related to workplace substance testing, especially those related to cannabis in states with medical and adult-use cannabis reform and B) increase advocacy for the rights of medical cannabis users, particularly in jobs in which cannabis use poses little to no risk for the employee, employer, and the public.

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