Traversing the triangulum: the intersection of tobacco, legalised marijuana and electronic vaporisers in Denver, Colorado

Emily Anne McDonald  
*CUNY John Jay College*

Lucy Popova  
*University of California, San Francisco*

Pamela M. Ling  
*University of California, San Francisco*

How does access to this work benefit you? Let us know!

Follow this and additional works at: [https://academicworks.cuny.edu/jj_pubs](https://academicworks.cuny.edu/jj_pubs)

Part of the [Anthropology Commons](https://academicworks.cuny.edu/jj_pubs), [Chemicals and Drugs Commons](https://academicworks.cuny.edu/jj_pubs), and the [Food and Drug Law Commons](https://academicworks.cuny.edu/jj_pubs)

Recommended Citation

McDonald, Emily Anne; Popova, Lucy; and Ling, Pamela M., "Traversing the triangulum: the intersection of tobacco, legalised marijuana and electronic vaporisers in Denver, Colorado" (2016). *CUNY Academic Works*.  
[https://academicworks.cuny.edu/jj_pubs/142](https://academicworks.cuny.edu/jj_pubs/142)

This Article is brought to you for free and open access by the John Jay College of Criminal Justice at CUNY Academic Works. It has been accepted for inclusion in Publications and Research by an authorized administrator of CUNY Academic Works. For more information, please contact AcademicWorks@cuny.edu.
Traversing the triangulum: the intersection of tobacco, legalised marijuana and electronic vapourisers in Denver, Colorado

Emily Anne McDonald, 1 Lucy Popova, 2 Pamela M Ling 3

ABSTRACT

Objective To explore the intersection of tobacco, legalised marijuana and electronic vapouriser use among young adults in the ‘natural laboratory’ of Colorado, the first state with legalised retail marijuana.

Methods We conducted semistructured interviews with 32 young adults (18–26 years old) in Denver, Colorado, in 2015 to understand the beliefs and practices related to the use of tobacco, marijuana, and vapourisers.

Results We found ambiguity about whether the phrase ‘to smoke’ refers to the use of tobacco or marijuana products. Smoking marijuana blunts (emptied cigarillo or tobacco wrap filled with marijuana) was common, but few interpreted this as tobacco use. Marijuana vapourisers were used to circumvent public consumption laws (eg, while at work or when driving). Young adults considered secondhand tobacco smoke dangerous, but perceived secondhand marijuana smoke as benign.

Discussion Using tobacco products as a delivery method for marijuana (eg, blunts) might be increasing and normalising tobacco use among young adults. Surveillance should explicitly ask about use of tobacco products for marijuana. Marijuana vapourisers, often indistinguishable from nicotine vapourisers, may be used to circumvent public consumption laws; communities concerned about use of marijuana in public spaces should include vapourisers (for nicotine or marijuana) in smoke-free regulations. Tobacco, marijuana and electronic vapourisers should be studied together, rather than separately. This approach is essential in informing research and policy as more US states and countries worldwide move to legalise marijuana.

INTRODUCTION

The legal landscape around marijuana in the USA is changing rapidly. Currently, medical marijuana is legal in 25 states and Washington DC, with retail (‘recreational’) marijuana legalised in four states and Washington DC. On 1 January 2014, Colorado became the first state to legally sell retail marijuana to people 21 years or older. Shifting regulations have been accompanied by technological innovations, including electronic vapourisers for tobacco and marijuana. These developments are likely to transform use of these substances, especially among young adults.

Nationally, young adults have the highest rates of current (past 30 days) marijuana use, with 18.9% aged 18–23 years using in 2013, compared to 7.1% aged 12–17 years and 5.5% aged ≥26 years. According to 2014 data, almost 30% of young adults in Colorado reported current marijuana use. Young adults also have the highest current rates of tobacco smoking (37%). More young adults have ever tried e-cigarettes (21.6%) compared to other age groups. Rates of dual and poly use are also high: in 2013, among US young adults who smoked cigarettes in the past 30 days (16% of the sample), 47% were current marijuana users.

Given high rates of co-use of tobacco and marijuana among young adults, as well as transformations in the realm of policy and technology, tobacco, marijuana and vapourisers are most effectively studied in relationship to one another. Referring to a ‘the triangulum’ (Latin for triangle), this approach reflects interest in the intersection of tobacco, marijuana and electronic vapouriser use, with implications for surveillance (eg, evaluating tobacco and marijuana use, product taxonomies), policy (eg, smoke-free policies related to marijuana and e-cigarettes) and treatment (eg, effects of dual use on cessation). Several quantitative studies examined some aspects of the triangulum, including co-use of combustible tobacco and marijuana, perceptions of comparative harm of tobacco and marijuana, prevalence of vapouriser use among marijuana users and reasons for use of marijuana vapourisers. Two qualitative studies examined the intersection of tobacco and marijuana by interviewing youth in Scotland.

The data in the studies, however, were collected over a decade ago and do not reflect changing legal and normative environments around marijuana or the proliferation of vapourising devices. Several quantitative studies have addressed marijuana vapourisers use by adults, including Lee et al and Etter, but neither was designed to explore in depth why users choose to vapourise marijuana, or the social or policy contexts shaping vapouriser use. To the best of our knowledge, this is the first in-depth, qualitative investigation of the triangulum in the ‘natural laboratory’ of Colorado. We interviewed young adults in Colorado to understand how they use, perceive and ascribe meaning to various tobacco, marijuana and vapouriser products.

METHODS

Collaboration

As part of the State and Community Tobacco Control (SCTC) research initiative (http://www.sctcresearch.org), this project was developed in a strategic partnership with Denver Public Health and Jefferson County Public Health departments in Colorado. Beginning in early 2014, we worked with local agencies to identify research questions that would advance policy solutions and practice. These questions were further refined iteratively.
throughout the data collection period. Local agencies provided staff to recruit participants, assisted with interviewing, provided space for interviews and engaged key stakeholders in reviewing early findings.

Study recruitment
Participants were recruited using flyers placed in marijuana dispensaries, vape shops, cafes, stores and on bulletin boards at community colleges in the Denver Metro area. Online recruitment was conducted through Craigslist and posting on Facebook. Inclusion criteria included being 18–26 years old and current use (past month) of at least one of the three products (marijuana, tobacco or electronic vapourisers). Prospective participants were screened and enrolled in the study via telephone by trained research staff. We attempted to interview all 32 participants twice, in order to allow conversations to develop more deeply. Twenty-four completed both interviews. Participants were compensated $35 for the first interview and $65 for the second. Each participant gave written consent. All study protocols were approved by the Committee on Human Research at the University of California, San Francisco.

Data collection
Semi-structured interviews were conducted between January and August 2015 by six trained interviewers (three PhDs, one MD and two MPHs), following a standard interview guide. Interviews were conducted individually (one participant with one or more interviewers) in public places (coffee shops, libraries) or in meeting rooms in local health departments. Before each interview, participants completed brief questionnaires with demographic information and past tobacco and marijuana use history. Discussion topics included definitions of smoking, experiences with tobacco, e-cigarettes, marijuana, marijuana vapourisers and other products, perceived benefits and risks of products and experiences with marijuana legalisation in Denver. Interviews lasted between 60 and 90 min, and were audio recorded.

Data analysis
Audio recordings were professionally transcribed. Data were coded using Dedoose software. Researchers McDonald and Popova independently blind-coded a subset of transcripts, which were then compared to develop coding guidelines. Researchers created code definitions and developed a consistent coding scheme to ensure that codes were applied consistently. The larger set of transcripts was divided and coded independently. Themes were generated iteratively during review of coded transcripts. Memos summarising each theme with illustrative quotes were reviewed by authors and discussed iteratively to reach consensus and theme saturation. Pseudonyms are used for all participants quoted in this article and no real names have been used.

RESULTS
Sample characteristics
Participants were 32 young adults with a mean age of 23 years (SD=2.36); 43.8% were women, 34% were Hispanic, 31% non-Hispanic white, 19% non-Hispanic black and 13% more than one race, non-Hispanic. The majority (19 participants or 59%) were currently enrolled in or attending school, five participants were in community college, four in high school, two in a 4-year college or university, one in a technical or trade school and one in a professional (law or medical) school.

Ninety-one per cent of participants had ever smoked a tobacco cigarette; 56% smoked 100 cigarettes or more; 97% ever smoked marijuana and 44% were daily marijuana smokers. Table 1 shows rates of use of each product as collected in our intake questionnaire. Three-quarters (75%) of participants reported dual use of tobacco and marijuana in the past 30 days, while 19% reported only marijuana use and 6% only tobacco use in the past 30 days. Sixty-nine per cent of participants had used all three products—combustible tobacco, marijuana and vapourisers (for nicotine or marijuana)—in the past 30 days.

Themes
Participants highlighted fluidity between use of tobacco, marijuana and vapourisers. Reflecting this fluidity, the term ‘smoke’ and to be a ‘smoker’ were used to describe either tobacco or marijuana use in ways that left unclear which substance was referred to. While dual and poly use was our primary focus, some participants also reported co-use through merging products, including use of tobacco wraps (blunts) or little cigars/cigarillos to smoke marijuana and the use of tobacco cigarettes to ‘extend’ the effects of marijuana. Vapourising devices were used to consume either nicotine or marijuana concentrates, with such devices nearly indistinguishable in appearance. Participants remarked upon the increasing popularity of ‘vaping’, expanded interest in vapourisers for nicotine and marijuana products and the convenience of vapourisers for use in public spaces.

In some contexts, participants clearly distinguished between tobacco, marijuana and vaping, as they did when discussing the risks of secondhand smoke. Participants viewed secondhand tobacco smoke as potentially dangerous, often limiting or prohibiting use of combustible tobacco in homes or cars. Marijuana secondhand smoke, in sharp contrast, was widely considered safer and more pleasant smelling than tobacco smoke, with few participants restricting combustible marijuana indoors.

Do you smoke?
Our question ‘Do you smoke?’ was frequently met with the question: ‘smoke what?’ The term ‘smoking’ was used interchangeably to refer to the use of marijuana or tobacco, with this ambiguity only uncovered through conversation: when a researcher asked ‘Ethan’, 22, ‘In terms of your social circle in Colorado, do many people smoke?’ ‘Ethan’ responded, ‘[e]veryone that I work with under the age of 30 smokes. I have five roommates and they all smoke. Just about everyone I know in Denver smokes. I have one friend that doesn’t, just because he gets panic attacks’. When the researcher asked whether these friends were regular or occasional smokers, ‘Ethan’ responded, ‘Much more regular marijuana smokers...[pause] are we still talking about tobacco smoking? When I hear “smoking” now, I associate it more with marijuana than tobacco smoking’. ‘Ethan’ clarified that among his friends, only five were regular tobacco smokers, whereas the majority smoke marijuana. In Colorado, he elaborated, the term ‘smoke’ primarily indicates use of marijuana, but added, ‘If I go back to Texas, and somebody says, “I’m going to go for a smoke,” I know [they mean] cigarettes—tobacco’.

When asked if he ever smoked while drinking, ‘Owen’, 20, commented, ‘Yeah... if I have one drink I’ll probably be smoking before, you know?’ When the researcher asked him to clarify whether he meant smoking marijuana or tobacco, he responded, ‘Marijuana. I don’t really smoke tobacco products like that. The only reason why I put 20 times [of tobacco use per month on the questionnaire] is because [of] Swisher Sweets...
I’d have to get a Swisher Sweet to roll up the marijuana, you know? He added that he would not smoke cigarillos ‘straight’, but only as a wrap for marijuana.

Blunts: bringing together marijuana and tobacco

Participants frequently discussed smoking marijuana using blunts (the emptied shell of a tobacco cigarillo or a tobacco wrap filled with marijuana). However, many of these participants did not report using blunts as a form of tobacco use. Some participants seemed unsure whether to categorise the use of blunt wraps or cigarillos for marijuana as a form of tobacco use. ‘Daniela’, 22, states, ‘I’ve never smoked a cigar… the blunt wrap, I don’t know if it should even be considered [tobacco] just because it’s its own [product]… it’s just a paper… it’s not like you can get addicted to blunt wraps’.

Other participants recognised the effects of nicotine in blunt wraps when compared to other methods of consuming marijuana. ‘Nia’, 19, commented she could ‘feel’ the nicotine in blunt wraps and elected to use ‘papers’ rather than blunt wraps, ‘because the papers don’t have any nicotine’.

Traditional surveys may fail to record tobacco wrap use. When asked about his response of using tobacco products on 3 of the past 30 days, ‘Andre’, 22, clarified:

Interviewer: You’re smoking a tobacco product three days out of the month?

‘Andre’: Yeah.

Interviewer: How often are you using wraps for marijuana, tobacco wraps?

‘Andre’: Oh, tobacco wraps? Definitely every day. Definitely every day.

Interviewer: Okay. How many times per day are you using blunt wraps?

‘Andre’: I’d say three, four blunts a day maybe.

Interviewer: Walk me through the timing of those during your day.
'André': Let's start with 8:00 and I'll usually finish that whole blunt. That would be one gone. And then by noon or 1:00 at least. After lunch usually, that's when I have my second one. And then depending how tired I am, after my day is done, it's my winding down. Sometimes it takes one, sometimes it takes two. So, that's what I mean…three or four.

One reason participants used cigarillos to consume marijuana was enjoyment of flavours. André commented that while he had smoked joints (marijuana rolled in paper), he preferred blunt wrap flavours:

I love wraps way more. It might be the tobacco, but there's something about smoking weed in the wraps that's different from blunt papers to me. When you inhale it, you get that flavor sometimes of whatever flavor wrap you choose…I just love fruit flavors…they put out new flavors all the time too. I tried a chicken and waffle wrap flavor the other day. It tasted like syrup mainly, but that's what I'm saying. I didn't know they could do stuff like that so I'm like, 'I've got to try it!' It's just kind of fun to me. I do it with my brothers and we'll just chill—we'll have a good time.

Another reason participants reported choosing blunts over other forms of marijuana consumption was the social nature of sharing with partners or friends. 'April', 24, commented she often smokes blunts with her boyfriend, sharing up to four a day. When she is not sharing with him, she prefers to use her personal vaporizer while at work, or, if by herself, smoke marijuana in a glass pipe. She reflected, 'blunts are kind of more social…'I'd rather smoke blunts in a social setting rather than hitting a pipe and passing it…That's just how it's always been with me and my friends. If we're all together, a blunt will last longer and it's easier to just pass…you keep it continuously lit and continuously circling'.

Participants also reported using cigarettes, particularly menthols, to extend the high from marijuana, or for mixing marijuana with comparatively inexpensive tobacco. As 'André' states:

I know a lot people who need cigarettes and weed…they smoke a blunt and then they're high…they say cigarettes keep their high going. They'll have like two cartons of cigarettes…weed is way more expensive…so they'll try to have plenty of cigarettes and just a little bit of weed…that's a cheaper way to keep a buzz going. I've even seen people with a little bit of weed…break down the cigarette, use all the tobacco. It will be more tobacco than weed, but they mix it all together…cigaweed. That's what they call it, cigaweed. [laughs].

Electronic vapourisers for nicotine and marijuana

Adding complexity to this ‘smoking’ landscape, participants questioned whether or not electronic cigarettes should be considered tobacco products, and reflected on the use of electronic vapourisers for marijuana.

'Victor', 24, used to smoke marijuana blunts using Dutch Masters cigar wraps while living in Florida. But since moving to Colorado, he has switched to vapourizing concentrates, primarily cannabis wax in a portable vapourising pen. As he explains, he barely smokes ‘real weed’ anymore, because ‘flower’ does not get him high. He tries not to smoke much while at his job in construction, ‘if anything I’ll take a little hit (from a vape pen), just to line up the head, and just keep going’.

Participants also reflected on using marijuana vapourisers in locations where marijuana use is illegal due to public consumption laws. For example, ‘Rashawn’, 24, indicated that vapourisers can be used while driving. He explained, ‘I do drive when I’m high…marijuana is not necessarily something that makes you impaired’. When asked if he worried about the legality of driving under the influence, he explained, ‘…I try and be a little safe since I know what [the police are] looking for. I use a vaporizer if I’m driving because they’re basically odorless…and it’s a lot better than smoke because if they do smell marijuana in your car, I guess they’re allowed to search it or check you for anything’.

Another reason for using marijuana vapourisers was the ability to smoke while at work. ‘April’ commented, ‘If I’m traveling and I don’t really want to be smoking a bowl in the middle of wherever, then I like the marijuana version of [an e-cigarette]. If I’m at a job where I’m okay smoking, then on break I’ll go out to the parking lot or whatever and maybe smoke a vaporizer’.

The lack of potent smell was associated not only with evading public consumption laws but also with managing social stigma. ‘Danielle’, 25, commented:

I guess it’s more—especially the vape pens—more subtle…This one girl at school…she always gives me this death stare. It’s like, ‘I can’t believe you’re smoking pot.’ So yeah, I’m trying to vaporize just for that. There’s still a little bit of a stigma there. I mean, everyone [in Colorado] smokes…at the same time, I feel it’s polite to keep it under wraps sometimes.

Participants commented that some personal vapourisers could be used for marijuana concentrates or for nicotine solutions. When asked to clarify whether she was referring to using a vapouriser for nicotine or marijuana, ‘Angela’, 18, commented ‘You can do both on the pen that I have…You can go up to the [marijuana] dispensary and get it filled up for 30 bucks. Or you can go to the gas station and get nicotine for 5 bucks’.

Some participants reported that the legalised marijuana market has encouraged the proliferation of electronic devices and expanded interest in electronic vapourisers more broadly. ‘Molly’, 25, commented, ‘I think because marijuana has been so present in Colorado, all these different smoking devices are very common. You just see everyone walking around with electronic cigarettes or with vape pens…it’s just the culture here’.

Some exclusive nicotine users felt troubled by the inability to distinguish between vapourisers used for marijuana and nicotine. ‘Samuel’, 21, commented, ‘A lot of vape shops take a negative stance towards the electronic vaporization of marijuana because then people tend to associate you with [marijuana] no matter what. When you’re walking down the street and you’re vaping, a lot of people straight up just assume it’s marijuana’. He continued, ‘…if I ever get pulled over while driving…the cop comes up, and he’s, like, ‘well, what’s all this? Is this just an electronic cigarette or is there tetrahydrocannabinol (THC) in it?’ Because there’s no public knowledge of this; you wouldn’t know unless you were vaping’.

Smoke is smoke? Young adults assess harm of secondhand tobacco and secondhand marijuana smoke

Participants consistently viewed secondhand tobacco smoke negatively, commenting that it ‘smells bad’ and is harmful for bystanders. Secondhand marijuana smoke, however, was identified as having a ‘pleasant aroma’ that quickly dissipated. Participants sometimes mentioned that there may be harmful effects of secondhand marijuana smoke (‘smoke is smoke’), but marijuana smoke was generally considered less dangerous.

Participants often differentiated between cigarettes and marijuana in maintaining smoke-free spaces. ‘Scott’, 26, remarked that marijuana and alcohol were similar in that ‘you can’t drink on the streets, you can’t smoke on the streets. You have to go to a private place’. Yet, he noted, there are no public cannabis bars,
requiring young adults to create their own use rules in private (and sometimes public) spaces. Here, the distinction between cigarettes and cannabis comes into relief. As ‘Scott’ remarked:

As far as secondhand cigarette smoke goes, I’m glad that you can’t smoke cigarettes in a bar because I personally don’t like the smell. I think it leaves a really gross stench. And I don’t let people smoke [cigarettes] in my apartment...[or] in my car...I’m not concerned about the health effects of secondhand smoke because it just never concerned me. But for me, it’s just I don’t like the smell.

When asked to compare the smell of cigarette smoke to cannabis smoke, ‘Scott’ explained:

I enjoy the smell of cannabis. And I think a lot of people [do]; Ever since I was younger, I love the smell of it. It was just intoxicating. And the smell doesn’t linger as much.

Smoke tobacco outside, smoke marijuana inside
While many young adults established household rules prohibiting tobacco smoke indoors, they were far more lenient about indoor use of marijuana or e-cigarettes.

‘Daniela’ maintained strict rules prohibiting the use of cigarettes in her home, but had no such prohibitions against smoking marijuana. When asked if she lets friends smoke inside her home, she explained:

No, no, no. I mean, we smoke weed. Yeah, that’s for sure. But not smoke tobacco. I don’t see why not [smoke marijuana] unless the smell is too bad. We can open a window. But no cigarettes in the house for sure...cigarettes smell worse. They’re no fun for secondhand smokers. It’s worse for you as a secondhand smoker than it is as a first-hand smoker.

‘Daniela’ mentioned that while growing up in Southern California, she saw many educational antitobacco messages, which she described as ‘these horror stories of how tobacco destroyed lives and families and stuff’. Most saliently, she recalled the story of a man whose smoking affected his kids and pets. As she remembered thinking, “Not the dog!” So, I won’t have [tobacco smoke] around my cats or dog. You’re going to kill them. That’s why I don’t like that in the house’.

When asked if secondhand marijuana smoke would affect her pets, she explained, ‘Oh, I mean, it definitely affects them, but...it’s not bad for them...there’s marijuana in pet medicine...there’s so many medicinal properties’.

When asked about rules regarding smoking in his multiunit housing complex, ‘Xavier’, 24, mentioned that ‘technically’ he was in a non-smoking building. He explained that cigarette smoke negatively affects furniture and walls, and that tenants ‘technically would have to go outside’. When asked if these rules also applied to marijuana, he responded, ‘I don’t know. I think it might say cigarettes specifically. I know the picture [on the sign] is cigarettes. But, it could just say a general “no smoking,” with a cigarette and the non-smoking [symbol]. I couldn’t tell you. I just assumed it was cigarettes, I guessed’. He continued, ‘marijuana smoke disappears a lot quicker...just the smell and the aroma. I don’t think it’s as harmful. Not only to you, but to the surrounding area. That’s just my personal opinion on marijuana smoke’.

Another reason participants chose to smoke marijuana inside is that doing so had protected them from police surveillance during the years marijuana was illegal. ‘Teresa’, 21, explained that when she started smoking marijuana at the age of 13, her mother told her ‘just smoke the weed in the house. Don’t go outside. Just go in the bathroom. Lock yourself in there. Don’t let nobody see you. Don’t do it out on the street’.

Finally, some participants elected to smoke marijuana indoors because they did not have access to private, outdoor spaces (such as a backyard), or lived in multiunit housing where outdoor space was shared. When young adults did have access to private, outdoor spaces, they reported being more likely to smoke outside. ‘Daniela’ stated that, ‘[m]ost of my friends are not super-duper potheads. They don’t want their house smelling like marijuana or anything like that, so they do go outside...they have a little patio—their backyard’.

DISCUSSION
The emerging issues uncovered in this qualitative study highlight the need to reconsider the traditional silo-based approach to tobacco control and marijuana research. It is particularly important to consider the triangle of tobacco, marijuana and vapourisers, and we believe this is the first study to address this intersection in the context of legalised marijuana.

We found widespread ambiguity about whether ‘to smoke’ referred to the use of tobacco or marijuana products. While not unique to Colorado, this linguistic equivalence between tobacco and marijuana use may signal increasing normalisation of marijuana. Researchers should be aware of this ambiguity in designing precisely worded research instruments. Additionally, antitobacco messaging that focus on ‘smoke’ or ‘smoker’ identity may be diluted in this context, as combustible marijuana moves towards legality and widespread availability.

Participants reported the use of tobacco products as part of the consumption of marijuana. This points to several key issues. Tobacco products are used as a delivery method for marijuana (eg, blunts) because of convenience and/or to facilitate sharing, even when tobacco products are not explicitly desired. Therefore, tobacco consumption may increase and become normalised even in the absence of the desire to use tobacco. Second, as noted previously, participants reported using traditional tobacco cigarettes to extend the ‘high’ of marijuana consumption, particularly because of tobacco’s comparatively lower cost. Third, participants did not uniformly agree whether the use of tobacco products for consuming marijuana ‘counted’ as using tobacco. This may lead to a significant under-reporting of current tobacco use. For example, the participant who reported using tobacco products 3 days of the last 30 on the questionnaire revealed during his interview that he used tobacco wrappers for marijuana 30 days out of the past 30 (3–4 per day). It was not until specifically asked about his method of marijuana consumption that it became evident he was a daily tobacco user.

Tobacco researchers should be aware that tobacco products used to consume marijuana may not be reported as tobacco use, and should specifically ask about the use of blunt wraps and cigarillos for marijuana consumption. While this issue has been raised before, with at least one nationally representative survey (National Survey on Drug Use and Health (NSDUH)) asking about cigarillos for marijuana consumption, it has not been widely adopted and will become increasingly critical as marijuana is more widely legalised.

Participants reported the appeal of electronic vapourisers for nicotine and marijuana. Some participants used the same vapouriser for both products (switching cartridges between marijuana concentrates and nicotine solutions), while others reported owning devices for each. Although past studies showed that vaping was less common than smoking marijuana among a convenience sample of adults, given the rapid growth of the marijuana vapouriser industry and the growing popularity of...
Reduced odour was frequently mentioned in the appeal of marijuana vapourisers, cited as advantageous when consuming marijuana in public spaces (currently illegal under Colorado’s public consumption laws). Those wishing to vapourise marijuana in public may benefit from the broader normalisation of nicotine vapourising (legal in many, though not all, outdoor, public spaces), as the similar appearance of the devices may make it difficult for the passers-by or law enforcement to identify which product is being consumed. This was experienced negatively by some participants who exclusively vapourise nicotine, as they felt falsely identified as marijuana users.

Communities concerned about the use of marijuana in public spaces should consider including all vapourisers (for nicotine or marijuana) in smoke-free regulations to prevent this confusion. Additionally, there is a concern that growing popularity of marijuana vaporisers, cited as advantageous when consuming marijuana smoke, or limited where combustible marijuana could be used. This was, in part, due to the subjective experiences of marijuana smoke was largely regarded as benign, neutral or even pleasant. Few participants expressed concern about secondhand marijuana smoke where applicable. Information about harmful effects of secondhand marijuana smoke has negative effects of secondhand tobacco smoke was found to be a deterrent to smoking initiation and a motivator for cessation for youth.\textsuperscript{35–37} Studies should explore messaging around the negative effects of secondhand marijuana smoke.

As a qualitative study, our relatively small sample provides insight into how some young adults in Colorado integrate tobacco, marijuana and vapouriser use. While these experiences may not be representative, this work begins to shed light on how these products are used and made sense of alongside one another. Further in-depth qualitative work is needed to document the complexities of perceptions of tobacco and marijuana in distinct legal contexts (including in other states and countries), and examine differences between perceptions of medical and retail marijuana in relationship to tobacco. More work is also needed to understand those who primarily vapourise nicotine, those who vapourise marijuana and those who use both.

The SCTC research initiative addresses high-priority gaps in tobacco control research through collaboration between academic researchers and local tobacco control agencies and community organisations. Legalisation of marijuana is one area that is highly salient for many state and community tobacco programmes because of its potential to affect use and perceptions of tobacco. Moreover, tobacco control experts within agencies are frequently tasked with recommending marijuana policies or educating citizens about rules of use and potential health effects.

Tobacco, marijuana and vapourisers are most effectively studied together and future research should address perceptions of comparative harm of these products; social, political and health effects of their use; and adequate measurement of use patterns, especially when products are combined. Finally, tobacco programmes and policies should take into account emerging research on the complexities of this triangulum, particularly in the context of marijuana legalisation.

Current research indicates that secondhand marijuana smoke contains many of the same chemicals as secondhand tobacco smoke and some in greater concentrations\textsuperscript{28} with recent studies demonstrating that secondhand marijuana smoke has negative cardiovascular effects similar to tobacco smoke.\textsuperscript{29} Non-smokers exposed to secondhand marijuana smoke had detectable levels of THC and metabolites, with levels increasing when higher potency marijuana was used.\textsuperscript{10–13} Non-smokers exposed to cannabis smoke for 60 min in an unventilated room had detectable levels of THC in blood following the exposure, increased heart rate, mild to moderate self-reported sedative drug effects and performed worse on a cognitive test.\textsuperscript{28} As normalisation of marijuana use continues, it is important to monitor the effects of normalisation on tobacco use, perceptions and smoke-free spaces. Smoke-free policies should cover all products, including combustible marijuana and electronic vapourisers for tobacco and marijuana. Signs and information signalling smoke-free policies should be adapted to clearly include marijuana smoke where applicable. Information about harmful effects of secondhand tobacco smoke was found to be a deterrent to smoking initiation and a motivator for cessation for youth.\textsuperscript{35–37} Studies should explore messaging around the negative effects of secondhand marijuana smoke.
Acknowledgements The authors gratefully acknowledge the support of Tracey Richers Maruyama, Erica Berg, Ava Cannon and staff at Denver Public Health, Donna Vivette, Andzej Stadnik and staff at Jefferson County Public Health. Additionally, the authors acknowledge the participants of this study as well as Rachel Barry and Dr Nicolas Shoen for help with data collection and analysis.

Contributors EAM, LP and PL designed the study and collected the data. EAM and LP conducted data analysis and wrote the initial draft. All authors contributed to the writing and revision and approved the final version of the manuscript.

Funding This work was supported by the National Cancer Institute of the National Institutes of Health (U01 CA154240 and K99CA187460). Additional funding was provided by the City University of New York (CUNY), John Jay College of Criminal Justice Funded Faculty Incentive Program.

Disclaimer The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or CUNY.

Competing interests None declared.

Ethics approval Committee on Human Research at the University of California, San Francisco.

Provenance and peer review Not commissioned; externally peer reviewed.

Open Access This is an Open Access article distributed in accordance with the Open Access Committee on Human Research at the University of California, None declared. Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/

REFERENCES
20 Callahan Research Associates. A summary of focus group research among young Black people on mentholated cigarettes, Feb 1972. https://www.industrydocumentslibrary.ucsf.edu/tobacco/docs/id=mi0045