

Emerging Indoor Air Laws for Onsite Cannabis
Consumption Businesses in the U.S.

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Introduction: Secondhand cannabis smoke, like secondhand tobacco smoke, creates unhealthy indoor air quality. Ventilation and engineering techniques cannot reduce this pollution to healthy levels, and complete smoke-free policies are the only way to provide healthy indoor environments. Even so, multiple state and local governments have begun to allow indoor smoking of cannabis in businesses.

Methods: A systematic search of Lexis Advance, NewsBank, and government websites for U.S. state and local laws passed between November 6, 2012 and June 10, 2020 that permit and regulate onsite cannabis consumption businesses was conducted in February–July 2020.

Results: In total, 6 of 11 states and the District of Columbia that legalized adult-use cannabis as of June 10, 2020 allowed onsite consumption and ≥ 56 localities within these 6 states allowed onsite cannabis consumption. Only 9% (5/56) of localities ban indoor smoking in these businesses; 23% (13/56) require indoor smoking to occur in physically isolated rooms. Other common local legal requirements address onsite odor control, ventilation/filtration, and building location.

Conclusions: The majority of the localities that allow onsite cannabis consumption do not explicitly prohibit smoking or vaping inside. Policymakers should be made aware that ventilation and other engineering interventions cannot fully protect workers and patrons. Health authorities and local leaders should educate policymakers on the science of secondhand smoke remediation and advocate for the same standards for secondhand cannabis smoking and vaping that apply to tobacco, particularly because other modes of cannabis administration do not pollute the air.

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INTRODUCTION

Smoking and vaporizing cannabis create secondhand cannabis smoke (SHCS) and unhealthy indoor air quality. Although not identical, cannabis and tobacco smoke contain many of the same toxins.¹ Cannabis joints generate 3.5 times the secondhand smoke (SHS) (measured as particulate matter less than 2.5 μm in diameter, $\text{PM}_{2.5}$) as a Marlboro cigarette.² Even vaping, which does not produce sidestream smoke, pollutes the air as much as a Marlboro.² Smoking cannabis is associated with some similar health effects as smoking tobacco, including myocardial infarction,³ ischemic stroke,^{3,4} and chronic bronchitis.⁵ SHCS impairs vascular endothelial function (a precursor to cardiovascular disease) in rats,⁶ an established model for human vascular response.⁷ SHCS results in detectable

cannabinoid levels in blood and urine among nonsmoking adults⁸ and children.⁹

Comprehensive tobacco smoke restrictions are a recognized and effective preventative health intervention.^{10,11} Comprehensive state or local 100% smoke-free laws in workplaces, restaurants, and bars covered 61% of the U.S. population as of January 2020.¹² The prevalence of secondhand tobacco smoke (SHS) exposure among U.S. nonsmokers from any source fell from 52.5% in

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1999–2000 to 25.2% in 2013–2014,¹³ with exposure higher among non-Hispanic Blacks, people living in poverty, and people living in multiunit housing.¹⁴

Legalization of adult-use cannabis threatens clean indoor air and public health. As of June 2020, a total of 34 states and the District of Columbia (DC) had legalized medicinal cannabis, and 11 states and DC legalized adult-use cannabis¹⁵; 5 additional states legalized medicinal use, adult use, or both through a ballot initiative in November 2020.¹⁶

Although all adult-use states prohibit cannabis consumption in public, some cannabis advocates argue that this prohibition inappropriately limits the opportunity for renters, tourists, and people experiencing homelessness to legally and safely consume cannabis.¹⁷ As of June 2020, a total of 6 states addressed this issue by allowing onsite cannabis consumption at some licensed cannabis businesses by combustion or vaporization, exempting them from existing clean indoor air laws. This study defines these *onsite cannabis consumption businesses* as businesses licensed by the local or state government to permit onsite cannabis consumption in any manner in a permanent structure, with or without cannabis sales.

Although there has been some research on state laws that permit cannabis consumption businesses¹⁸ and on California local cannabis laws,¹⁹ there was no multistate analysis of local onsite consumption laws. This study analyzes state and local laws that allow onsite cannabis consumption businesses to identify how localities approach protecting clean indoor air related to cannabis. Although fully protecting patrons and employees from the health effects of secondhand exposure in smoking areas through engineering controls remains impossible,^{11,20,21} some state and local governments are using ventilation and separation requirements for cannabis smoking lounges, despite the fact that they do not fully protect workers and patrons.^{11,20,21}

Whether ventilation systems are sufficient to protect nonsmokers from the health effects of SHS has been central to debates over emerging demands to protect nonsmokers since the 1980s.^{22,23} The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) is the professional association that develops technical standards for ventilation and indoor air quality that are often incorporated into municipal building codes in the U. S. In June 2005, ASHRAE modified its Standard 62.1 to acknowledge that some places continued to allow smoking indoors even though it is not possible to produce a ventilation standard that would result in acceptable indoor air quality in smoking areas.²⁴ In the newly added Section 5.19, ASHRAE described how these areas could be constructed to avoid leakage of smoke (which now includes cannabis smoke and emissions from E-cigarettes²⁵) into smoke-free areas. In June 2005, ASHRAE also released a

position statement elaborating on Standard 62 stating, “At present, the only means of effectively eliminating health risks associated with indoor exposure [to secondhand smoke] is to ban smoking activity.”²⁶ The 2019 version of this document describes the engineering approaches that have been taken to address SHS exposure in buildings.²⁰ ASHRAE only recommends 1 engineering approach: a complete ban on indoor smoking. Consistent with ASHRAE, the U.S. Surgeon General in 2006¹¹ and WHO in 2007²¹ both acknowledged the inadequacy of ventilation to eliminate exposures of nonsmokers to SHS and recommend 100% smoke-free indoor environments.

METHODS

Study Sample

As detailed in the [Appendix](#) (available online), between February and July of 2020, a systematic legal search of Lexis Advance, NewsBank, and government websites for state and local laws that permit and regulate onsite cannabis consumption among the 11 U.S. states that have legalized adult-use cannabis was conducted. The search focused on the 274 local jurisdictions with potentially relevant laws passed between November 6, 2012 (the date of first adult-use legalization) and June 10, 2020 (the study cut off date). Within those identified, there were 56 localities that allowed onsite cannabis consumption businesses in 5 states (Alaska, California, Colorado, Illinois, Michigan).

Measures

To assess the strength of clean indoor air laws for these localities, each locality was coded into 1 of the 4 Design and Operation Approaches described in ASHRAE’s 2019 Position Document on Environmental Tobacco Smoke.²⁰ These approaches are (1) banning smoking indoors, (2) smoking only in isolated rooms, (3) smoking in separate but not isolated spaces, and (4) mixed occupancy of smokers and nonsmokers.²⁰

RESULTS

All of the 11 states and DC where adult-use cannabis has been legalized ([Table 1](#)^{27–52}) prohibit consumption in public places (i.e., places where the public has access or a person could reasonably be expected to be observed by others) but allow cannabis consumption in private residences or private property with the owner’s permission if out of public view. A total of 6 states (Alaska, California, Colorado, Illinois, Massachusetts, and Michigan) allow onsite consumption in licensed cannabis consumption businesses subject to local government approval. The remaining 5 states (Maine, Nevada, Oregon, Vermont, and Washington) and DC explicitly prohibit cannabis consumption on the premises of licensed cannabis businesses. No state pre-empts localities from implementing more rigorous regulations for onsite cannabis consumption businesses.

Table 1. Regulations on Public/Onsite Consumption and Requirements for Onsite Consumption Businesses in States That Have Legalized Adult-Use Cannabis

State code/regs section	Prohibitions		Requirements			Notable features
	Public consumption prohibited	Consumption prohibited in cannabis businesses	Separation between smoking and nonsmoking areas	Smoke-free employee viewing area	Odor, visibility outdoor controls	
Alaska AK stat. § 17.38.010 et seq. ²⁷	✓					Establishes Marijuana Control Board in the Department of Commerce as a regulatory and quasi-judicial agency. Marijuana registration issued by the Marijuana Control Board required to operate retail stores. Local government may prohibit the operation of retail marijuana stores by enacting an ordinance or by voter initiative or enact laws governing time, place, manner, and number of establishments. Established village may prohibit retail stores by majority vote. Consumption is defined as ingesting, inhaling, or otherwise introducing marijuana into the body. Businesses with an onsite consumption endorsement must be freestanding. Unless consumption is outdoors, it requires (1) the consumption area be isolated, separated by walls and a secure door; (2) a smoke-free area for employees to monitor the marijuana consumption area; and (3) a ventilation system that directs air from the marijuana consumption area to the outside of the building through a filtration system sufficient to remove visible smoke and adequate to eliminate odor at the property line. If onsite consumption by inhalation is permitted, ventilation plans must be consistent with all applicable building codes and ordinances. However, Alaska has no statewide building codes, so it is left to localities.
3 AAC 306.370 ²⁸			✓	✓	✓	
California CA Bus & Prof Code § 26200 et seq. ²⁹					✓	Localities may allow for smoking or ingesting cannabis if 3 conditions are met: (1) access restricted to age ≥21, (2) consumption not visible in public, and (3) sale or consumption of alcohol or tobacco prohibited.
CA health & safety code § 11362.3 ³⁰	✓					Prohibits smoking or ingesting cannabis in public except in accordance with CA Bus & Prof Code § 26200. ²⁹ Prohibits smoking cannabis in locations where the sale or consumption of tobacco is prohibited. Retail or wholesale tobacco shops are excluded from the state prohibition against smoking tobacco in most indoor workplaces in California (CA Labor Code § 6404.5. ³¹). Because cannabis cannot be sold where tobacco is sold, the laws may conflict because smoking is prohibited in all retail stores other than retail tobacco shops, and the exclusion allowing smoking in retail tobacco shops could not logically apply to cannabis retailers.
Colorado Colo. Const. Art. XVIII, §16 ³² C.R. S. § 44-10-702(1) ³³ HB 19-1230 ³⁴	✓					Prohibits public consumption, including smoking, eating, and vaping. Created exception to public marijuana prohibition in Constitution and C.R.S. § 44-10-702 and to Colorado Clean Indoor Air Act ³⁵ by allowing marijuana consumption at licensed marijuana hospitality and retail marijuana hospitality and sales establishments if approved by local government. Display and consumption of marijuana may not be visible from outside the licensed premises. Marijuana hospitality establishments are prohibited from admitting people aged <21 years, distributing free samples, permitting consumption by a patron who appears intoxicated, allowing on-duty employees to consume, allowing alcohol or tobacco to be consumed on premises. Must provide informational materials about the safe consumption of marijuana, must not make health claims, and must include warning statements about the harmfulness of using marijuana while pregnant, breastfeeding, or driving.
1 CCR 212–3.6–700 Series ³⁶					✓	
District of Columbia DC code § 48–911.01 ³⁷	✓	✓				Criminalizes public smoking or consumption of marijuana and impairment owing to marijuana smoking or consumption. Smoking means to inhale, ingest, or otherwise introduce marijuana into the body or to hold or carry lighted smoking equipment filled with marijuana.
Illinois						

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Table 1. Regulations on Public/Onsite Consumption and Requirements for Onsite Consumption Businesses in States That Have Legalized Adult-Use Cannabis (continued)

State code/regs section	Prohibitions		Requirements			Notable features
	Public consumption prohibited	Consumption prohibited in cannabis businesses	Separation between smoking and nonsmoking areas	Smoke-free employee viewing area	Odor, visibility outdoor controls	
Illinois Public Act 101-0027 § 10–35 ³⁵	✓					Using cannabis in a public place is not permitted. Creates an exemption to Smoke Free Illinois Act to allow on-premises consumption in specially designated areas with authorization or permission from local government. Requirements for dispensing organizations with onsite consumption: (1) specially designated area for purpose of heating, burning, smoking, or lighting cannabis; (2) age ≥21 years; and (3) locked door or barrier to designated area.
410 ILCS 82/35 ³⁹					✓	
Maine		✓				Marijuana may only be consumed in the person's private residence (including curtilage) or on private property with the property owner's explicit permission. A violation carries a civil fine of up to \$100.
18–691 CMR ch.1 ⁴⁰						
MRS Title 28-B§ 508 ⁴¹	✓					Permits municipal regulation and licensing of marijuana establishments but prohibits the consumption of adult-use marijuana within licensed premises of a marijuana establishment.
Massachusetts	✓					
MGL Ch. 94G ⁴²			✓	✓		Allows local control and regulation, including prohibiting consumption on the premises. For the first 2 years, onsite consumption licenses will be awarded only to social equity and economic empowerment businesses. ⁴³
935 CMR 500.141 ⁴⁴					✓	Prohibits indoor consumption of combustible products but allows vaping and heated tobacco products (e.g., IQOS). Where vaping and other nonsmoking consumption permitted indoors, requires plans ensuring (1) that areas are isolated, separated by walls and a secure door; (2) that employees may monitor from smoke-free, vapor-free area; and (3) that ventilation system directs air from consumption area to outdoors through filtration system sufficient to remove visible vapor, consistent with building codes and ordinances and adequate to eliminate odor. Vaping may be permitted in a designated outdoor area if it cannot be viewed by the public.
Michigan	✓					Consuming marijuana in a public place or smoking marijuana in a private place where prohibited by the owner is prohibited except a public place does not include an area designated for consumption that is not accessible to persons aged <21 years and authorized by a municipality.
Mich. Admin. Code R 420.22 ⁴⁵			✓	✓	✓	A licensed, designated consumption establishment requires (1) smoke-free area for employees to monitor consumption area; (2) ventilation system that directs air outdoors through a filtration system sufficient to remove visible smoke, consistent with all applicable building codes and ordinances, and adequate to eliminate odor if consumption by inhalation is permitted; and (3) physical separation from areas where smoking is prohibited.
Nevada	✓					Consuming cannabis in public is a misdemeanor.
Nev. Rev Stat § 678D.310 ⁴⁷		✓				A local government is prohibited from licensing a business that allows the consumption of cannabis on its premises or allowing such a business to operate.
Nev. Rev Stat § 678B.510 ⁴⁸						
Oregon	✓	✓				Unlawful to use marijuana in a public place.
Or. Rev Stat § 475B.381 ⁴⁹						
Vermont	✓	✓				Unlawful to consume marijuana in a public place, including places of public accommodation (e.g., schools, restaurants, stores) or where tobacco products or tobacco substitutes (e.g., E-cigarettes) are prohibited.
18 V.S.A. § 4230a ⁵⁰						
Washington	✓	✓				Consumption is prohibited in public places.
RCW 69.50.445 ⁵¹						Consumption is prohibited at licensed retail marijuana outlets.
RCW 69.50.357 ⁵²		✓				

Alaska permits onsite cannabis consumption licensing and regulation on a statewide level through its Alcohol and Marijuana Control Board, as long as incorporated local governments do not protest (veto) these establishments. Local governments in Alaska also have the authority to add their own regulations related to onsite consumption on top of state requirements. California, Colorado, Illinois, Massachusetts, and Michigan prohibit onsite consumption unless authorized by local government and allow localities to impose regulations beyond state requirements. In California, onsite consumption businesses must first obtain a California state license to dispense cannabis and must meet 3 basic requirements: access must be restricted to adults aged ≥ 21 years (consistent with that in all the 6 states that allow onsite consumption), consumption must not be visible in public; and the sale or consumption of alcohol or tobacco is prohibited. Colorado and Vermont prohibit cannabis consumption where tobacco or alcohol is prohibited.

The 6 states that allow onsite cannabis consumption impose various other regulations. A total of 3 states (Alaska, Massachusetts, and Michigan) require physical separation between cannabis smoking and nonsmoking areas, separate ventilation systems, and a smoke-free area for employees to monitor the consumption area. These states also require local regulations to control cannabis odors outside the premises and ensure that consumption areas are not visible from outside the premises. Illinois requires cannabis businesses to install air treatment systems to reduce odors. All the 6 states restrict access to adults aged ≥ 21 years. None of these requirements have been proven effective in creating healthy indoor air quality or in eliminating SHCS exposure.

Illinois' 2008 Smoke Free Illinois Act was amended to allow onsite cannabis consumption in a designated area of cannabis dispensaries or retail tobacco stores even though it acknowledges ASHRAE's conclusion that "the only means of eliminating health risks associated with indoor exposure is to eliminate all smoking activity indoors" and the Environmental Protection Agency's determination that SHS "cannot be reduced to safe levels in businesses with high rates of ventilation."⁵³ By contrast, Alaska allows ventilation without specific requirements, specifying that if localities permit indoor consumption by inhalation, their ventilation plans must be consistent with applicable building codes,⁵⁴ which are determined by localities.

California's law (Business and Professions Code Section 26,200) permitting onsite smoking, vaping, and ingestion of cannabis (except where tobacco or alcohol is sold) seems to conflict with its law (Labor Code Section 6,404.5) prohibiting smoking in most indoor workplaces. Smoking tobacco is permitted in retail tobacco

shops, but cannabis cannot be sold where tobacco is sold,²⁹ suggesting that smoking cannabis would be prohibited in all retail shops, including cannabis stores.

Illinois explicitly permits retail tobacco stores to allow onsite consumption of cannabis in specially designated areas if authorized by the local government.³⁹ A total of 4 states (Alaska,²⁸ California,²⁹ Colorado,⁵⁵ and Massachusetts⁴⁴) explicitly prohibit tobacco consumption on the premises of cannabis consumption businesses, and Michigan prohibits smoking tobacco in places of employment, which includes onsite cannabis consumption businesses.⁵⁶ Although Massachusetts prohibits indoor consumption of combustible cannabis products, it allows cannabis to be consumed indoors through vaporization or other nonsmoking forms of consumption involving heat.

Of the 274 local jurisdictions included in the sample from 11 states and DC where adult-use cannabis is legal, 56 in 5 states (Alaska, California, Colorado, Illinois, and Michigan) allowed onsite consumption of cannabis in a licensed business under local laws. Although Massachusetts allows localities to permit onsite cannabis consumption businesses, no local laws allowing them were identified. The remaining 218 localities either explicitly prohibit or are silent on onsite cannabis consumption in licensed businesses.

The analysis below covers the 56 localities that permit onsite cannabis consumption businesses. These local laws should be interpreted in the context of corresponding state laws that establish minimum requirements. For example, even though the Grand Rapids, Michigan law is silent on ventilation or filtration systems, all licensed consumption establishments there must comply with state law that includes a ventilation system requirement.

Table 2⁵⁷ summarizes the local requirements for onsite cannabis consumption businesses. Each locality was categorized into 1 of ASHRAE's 4 Design and Operation Approaches.²⁰ Only 9% (5/56) of the localities that permit onsite cannabis consumption ban indoor cannabis smoking and vaping in cannabis businesses, restricting consumption to outdoor areas or only permitting edible consumption indoors. In total, 23% (13/56) of the localities require indoor smoking and vaping to be in isolated rooms only, meaning that the smoking and nonsmoking areas are physically separated so that smoke cannot drift to the nonsmoking areas.

In total, 16% (9/56) of the localities require smoking to be in separate or designated areas but do not require physical isolation. These places may allow smoking and nonsmoking areas to be in a single larger space or to be serviced by the same air handling system. In this situation, engineering may reduce irritation or odor but cannot effectively limit exposure in nonsmoking areas. In

Table 2. Local Legal Requirements for Cannabis Consumption Businesses in States That Allow Any Public Consumption

Locality	2019 Population estimates ^a	Design and operation approaches ²⁰					Additional local code features ^b					
		Indoor smoking ban	Smoking only in isolated rooms ^c	Smoking in separate but not isolated spaces	No separation requirements ^d	Odor control at property line	Ventilation or filtration system required	Consumption of tobacco is prohibited	Forms of indoor consumption prohibited	Freestanding building	Indoor consumption only	Outdoor consumption only
Alaska												
Anchorage (unified)	288,000	X				X	X			X		
Fairbanks	30,917				X							
Fairbanks North Star borough	96,849				X							
Juneau (unified)	31,974	X										S, V
California												
Adelanto	34,049	X					X					
Alameda	77,624	X				X		X		S, V	X	
Berkeley	121,363	X				X	X	X				
Calexico	39,825				X	X	X	X				
Cathedral City	55,007			X		X	X	X			X	
Coachella	45,743				X	X	X					
Colton	54,824				X	X	X	X				
Eureka	26,710	X				X		X				
Hayward	159,203				X	X		X				
Humboldt County	135,558				X			X				
Lemoore	26,725			X		X	X	X				
Lompoc	42,853				X	X	X			E		
Mendocino County	86,749	X								S, V, E		S, V, E
Oakland	433,031				X	X	X			S		
Palm Springs	48,518			X		X	X	X			X	
Point arena	449				X					S		
San Francisco	881,549		X			X	X	X				
San Jacinto	49,215				X	X	X	X				
San Leandro	88,815				X	X	X	X				
Santa Rosa	176,753	X				X	X	X		S, V		S, V if ≥25ft from the building
Sebastopol	7,674				X	X	X	X				
Union City	74,107				X	X	X	X		S ^c , V ^c		
Weed	2,725				X							
West Hollywood	36,475			X		X	X	X				
Colorado												
Black-hawk	128				X	X	X	X				
Colorado Springs	478,221				X	X	X					

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Table 2. Local Legal Requirements for Cannabis Consumption Businesses in States That Allow Any Public Consumption (continued)

Locality	2019 Population estimates ^a	Design and operation approaches ²⁰				Additional local code features ^b						
		Indoor smoking ban	Smoking only in isolated rooms ^c	Smoking in separate but not isolated spaces	No separation requirements ^d	Odor control at property line	Ventilation or filtration system required	Consumption of tobacco is prohibited	Forms of indoor consumption prohibited	Freestanding building	Indoor consumption only	Outdoor consumption only
Denver	727,211			X		X						
Glendale	5,441				X		X					
Illinois												
Carpentersville	37,254		X						X			
Collinsville	21,652				X	X				X		
E. Dundee	3,216				X							
Fox Lake	9,963				X							
Gilman	1,652		X						X			
Indian Head park	3,719		X						X			
Island lake	8,020		X						X			
Jacksonville	18,603		X						X			
Macomb	17,413				X			S ^f , V ^f , E ^f				
Pingree grove	9,874		X						X			
Rochelle	9,052		X						X			
Springfield	114,230				X	X						
Wheeling	38,646			X								
Michigan												
Ann Arbor	119,980				X	X				X		
Buchanan	4,263	X				X		S, V				
Clark township	1,976				X	X	X			X		
Grand Rapids	201,013				X							
Kalamazoo	76,200			X		X	X					
Lansing	118,210			X		X	X					
Marquette	20,995			X		X	X					
Muskegon	36,565				X	X	X					
Niles	11,149		X			X	X					
Wise township	1,385				X							
Ypsilanti	20,171				X						X	

Note: A copy of this table, including citations, is available in the Appendix (available online) to the online version of this article at <http://www.ajpm.org>.

^a2019 population estimates from census.gov.⁵⁷

^bLocation requirements: S (combustion), V (includes heating of liquid or solid cannabis), and E.

^cOnly San Francisco, California, and Niles, Michigan include requirements for isolating smoking rooms that match some of the technical requirements in ASHRAE Standard 62.1 Section 5.19.

^dThis is what ASHRAE calls mixed occupancy between smokers and nonsmokers.

^eAdult-use cannabis is prohibited, but medicinal is allowed here.

^fMedicinal Cannabis is prohibited, but Adult-Use is allowed here.

ASHRAE, American Society of Heating, Refrigeration, and Air Conditioning Engineers; E, edibles; S, smoking; V, vaporization.

total, 52% (29/56) across all the 5 states do not require separation between smoking and nonsmoking areas. Under this approach, which ASHRAE calls mixed occupancy of smokers and nonsmokers,²⁰ smoking may be allowed throughout the space, and there is no effort to isolate smokers.

Odor control at the property line of cannabis businesses (Table 3) was the most popular local law requirement, with 59% (33/56) of localities requiring either a specific odor control technical requirement (e.g., carbon air filters or controlled air pressure) or a general requirement that odor should not be detectable outside the business. In total, 21 localities (38%) require some form of ventilation or filtration system where onsite consumption is permitted. This requirement varies considerably, from Berkeley, California that mandates that a smoking room should have a “ventilation system capable of removing all detectable odors, smoke and by-products of combustion”⁵⁸ to Adelanto, California that simply asks that smoking lounges be well ventilated.⁵⁹

Localities also limit what kinds of products may be used onsite. In total, 29% (16/56) prohibit any consumption of tobacco onsite. In total, 80% (45/56) allow all forms of indoor cannabis consumption, whereas the remaining 20% (11/56) prohibit ≥ 1 form of cannabis consumption.

In total, 14% (8/56) of localities require that the building where cannabis consumption occurs be freestanding, meaning that it does not share a wall or connection with another building, to stop smoke from migrating into adjacent buildings. Doing so would stop smoke from migrating into adjacent buildings via passages, ventilation systems, plumbing, or walls.

In total, 13% (7/56) of the localities require all forms of consumption to be indoors, eliminating the possibility that a business in these areas would move consumption outdoors. By contrast, 5% (3/56) of the localities restrict smoking and vaping of cannabis in licensed businesses to outdoor areas only, presumably resolving indoor air quality concerns.

DISCUSSION

There is wide variation in how state and local governments address SHCS exposure in cannabis consumption businesses. Although the only effective means of preventing the health problems associated with SHCS is to require a smoke-free environment,^{11,20,21} most local laws that permit onsite cannabis consumption businesses either do not address SHCS or use ineffective ventilation or engineering requirements.

The 56 identified localities fell across the spectrum of Design and Operation Approaches described by

Table 3. Features of the 56 Local Laws Allowing Onsite Cannabis Consumption Businesses

Features	State					Total, n (%)
	AK	CA	CO	IL	MI	
Design and operations approaches						
Indoor smoking ban	1	3	0	0	1	5 (9)
Smoking only in isolated rooms	1	4	0	7	1	13 (23)
Smoking in separate but not isolated spaces	0	4	1	1	3	9 (16)
No separation requirements	2	13	3	5	6	29 (52)
Odor control at property line	1	19	3	2	8	33 (59)
Ventilation or filtration system required	1	13	1	0	6	21 (38)
Consumption of tobacco prohibited onsite	1	13	1	0	1	16 (29)
Restrictions placed on adult-use and/or medicinal smoking, vaping, or ingestion	2	7	0	1	1	11 (20)
Freestanding building	1	0	0	7	0	8 (14)
Indoor consumption only	0	3	0	1	3	7 (13)
Outdoor consumption only	1	2	0	0	0	3 (5)

AK, Alaska; CA, California; CO, Colorado; IL, Illinois; MI, Michigan.

ASHRAE,²⁰ with only 9% (5/56) requiring that indoors be smoke-free (including vaping and other inhaled forms of cannabis). The 23% (13/56) of local governments that provide for smoking in isolated rooms only do so through functional requirements, requiring that smoke not drift to nonsmoking areas or that there be a smoke-free employee viewing area. This approach can control cannabis smoke exposure in nonsmoking spaces in the same building if executed properly but does not protect employees and patrons from SHCS exposure in smoking areas. The remaining local approaches do not protect nonsmokers from SHCS because they do not require physical separation of smoking and nonsmoking areas.²⁰ They resemble the tobacco industry's accommodation framework by inviting smoke inside and positioning ventilation or engineering controls as solving SHS.^{22,60}

Ventilation system requirements are often vague, requiring systems to remove visible smoke, remove smoke, or provide reasonable mechanical smoke elimination. These requirements ignore the fact that ventilation cannot eliminate the health risks from SHS exposure when smoking is present.^{11,20,21}

In total, 77% (43/56) of the localities that allow onsite consumption are in states that prohibit tobacco consumption at onsite cannabis consumption businesses (Alaska, California, Colorado, Massachusetts, and Michigan). From an air quality perspective, there is no distinction between cannabis smoke and tobacco smoke, but this provision may discourage the co-use of tobacco and cannabis. Cannabis use predicts tobacco use onset,⁶¹ and co-use is associated with higher toxicant exposure⁶² and decreased smoking cessation.⁶³ Illinois allows tobacco and cannabis to be consumed at the same business location, and no local laws in Illinois prohibiting this activity were found.

A requirement that onsite cannabis consumption businesses operate in freestanding buildings would limit smoke contamination of adjacent buildings but does nothing for the business's occupants. Requiring cannabis consumption to be indoors only may keep consumption out of the public eye but does not prevent all the harms from SHCS. Alternatively, local code requirements to keep cannabis consumption exclusively outdoors may serve to normalize smoking if in public view.

This study contributes to a growing body of literature concerning onsite cannabis consumption businesses. These findings expand on those of previous studies that identified onsite cannabis consumption laws in 3 states¹⁸ (Alaska, California, and Colorado) and 27 California local governments¹⁹ (using a different methodology), and this study is the first to examine state and local laws

in Illinois and Michigan and to characterize the strength and characteristics of each local law.

The growing number of localities permitting onsite cannabis consumption businesses to bypass clean indoor air laws is concerning from a disease prevention perspective. Some advocates argue that designating indoor locations for renters, tourists, and people experiencing homelessness to smoke or vape cannabis is the only reasonable alternative to illegally consuming in public or exposing nonsmokers to SHCS. However, similar to tobacco,⁶⁴ by normalizing indoor smoking and exposing employees and customers to SHCS, these businesses may promote more smoking and fail to reduce overall exposure to SHCS. State and local governments have an opportunity to model strong preventative health standards by banning indoor smoking and vaping in onsite cannabis consumption businesses. Despite the challenge inherent in maintaining strong clean indoor air laws in the face of the increasingly powerful cannabis industry,⁶⁵ health advocates must ensure that public health is protected.⁶⁶ State and local laws should reflect the reality that ventilation, odor control, and other engineering features cannot adequately protect the public and employees from SHCS.^{11,20,21}

Reasonable alternatives to permitting indoor cannabis smoking and vaping may include permitting outside, out-of-view cannabis use at retailers or allowing only the use of non-inhalable modes of administration that do not pollute the air. If all onsite use is prohibited, local governments may encourage multiunit housing or other places serving these groups with fewer options (i.e., renters, the unhoused, and tourists) to create outdoor, designated smoking areas out of view of the public. To avoid conflicts with tobacco prevention program efforts around smoke-free multiunit housing, it is important that all indoor areas remain smoke free. If smoking or vaping is permitted indoors, smoking rooms must be completely isolated from nonsmoking areas as specified in ASHRAE Standard 62.1 Section 5.19 so that people are exposed to the least amount of SHCS possible.

Limitations

The study only examines the fully enacted laws passed by June 10, 2020 and does not include ballot initiatives from 4 states (Arizona, Montana, New Jersey, and South Dakota) that legalized adult-use cannabis in November 2020 or subsequent legalization in other states. These laws have not yet been implemented, making it impossible to determine whether onsite consumption businesses will be permitted. How onsite consumption laws are being implemented and enforced was outside the study scope. Laws governing cannabis consumption lounges

on tribal lands such as those allowed on the Las Vegas Tribe of Paiute Indian land⁶⁷ were not included because they fall outside state governance.

CONCLUSIONS

Onsite cannabis consumption businesses are subject to a broad range of unique state and local requirements. Unfortunately, most state and local laws that allow onsite consumption do not protect clean indoor air. Strong smoke-free cannabis laws, such as smoke-free tobacco laws, can reduce the health burdens of SHCS. Policymakers may be unaware that ventilation and other engineering interventions cannot fully protect workers and patrons. Health authorities and local leaders should educate policymakers on the science of SHS remediation and advocate for the same standards for secondhand cannabis smoking and vaping that apply to tobacco, particularly because other cannabis administration modes do not pollute the air. Where onsite smoking or vaping is permitted, even measures such as truly separate indoor and outdoor smoking areas may reduce but not eliminate SHCS exposure to patrons, staff, and residents.

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