Landscape and impacts of local cannabis policies in California following recreational cannabis legalization

U.S. national Academies of Sciences, Engineering and Medicine virtual meeting on cannabis regulatory models

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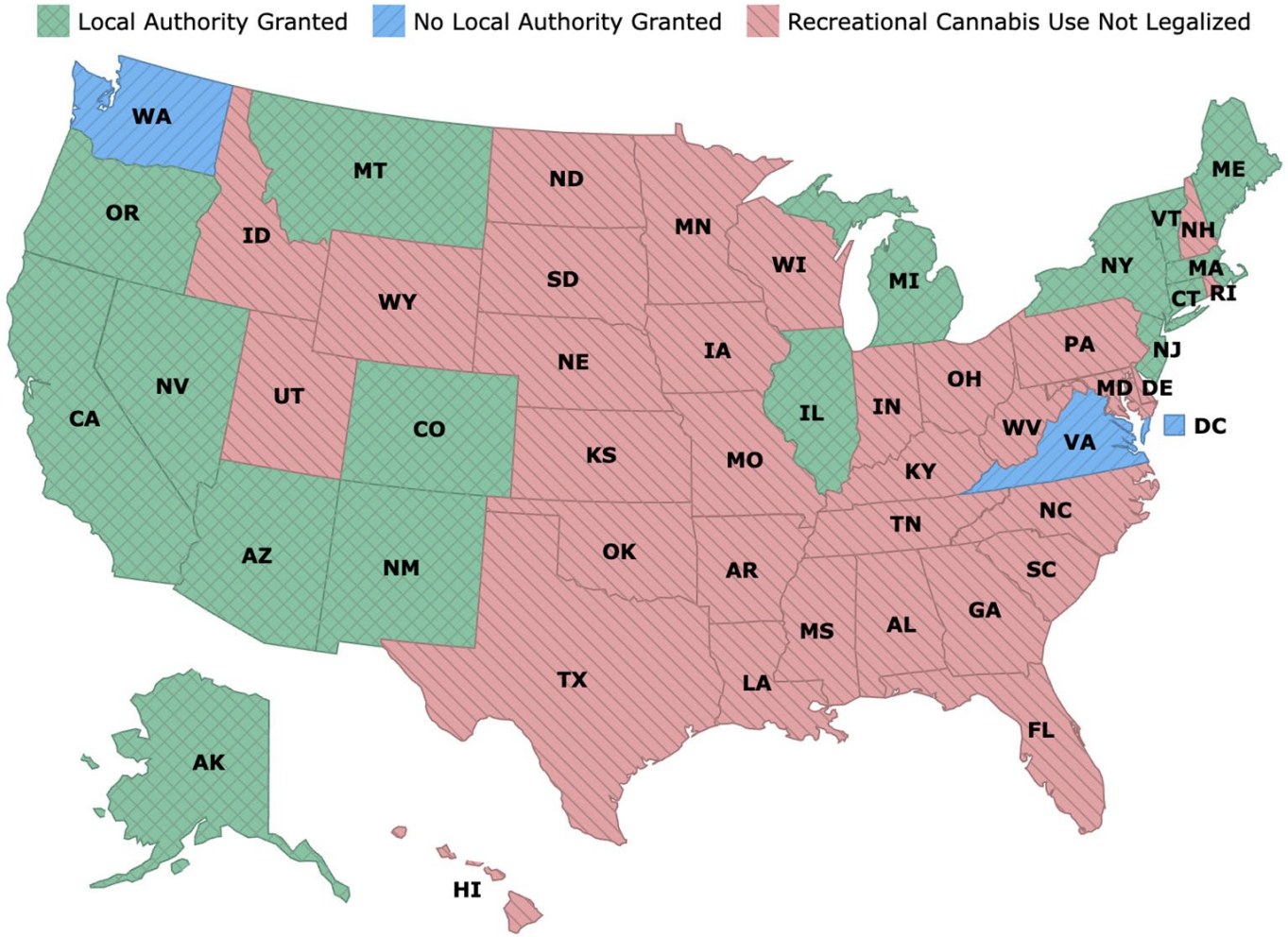
Most legalization states permit local control of cannabis

- Many states cede substantial powers to local governments
  - Number, type of cannabis businesses
  - Outlet locations
  - Hours, days of sale
  - Types, potency of products sold
  - Packaging, labelling
  - Advertising
  - Tax rates
  - Clean air regulations



Alcohol Policy Information System, January 2022

Within-state variation in local policies may impact health

- Wide variation in local cannabis policies across localities in California,[1] Washington,[2,3] Colorado[3]
- Varying uptake of policies recommended based on alcohol and tobacco research
- Why local variation matters:
  1. Implications for health equity
  2. Opportunity to compare alternative cannabis control policies to learn what works

[1] Silver et al, 2020, JAMA Netw Open. [2] Dilley et al, 2017, Int J Drug Policy. [3] Payan et al, 2021, Milbank Q.

Research Questions

1. What are the demographic and socioeconomic characteristics of communities subject to different types of local cannabis control policies?
2. How are local cannabis control policies patterned in relation to local alcohol control policies?
3. How do local policies regulating the number and placement of retail cannabis outlets affect the spatial distributions of outlets within communities?
4. Do any of California's local cannabis control policies help to prevent harmful cannabis exposures reported to Poison Control?

Research Questions

1. What are the demographic and socioeconomic characteristics of communities subject to different types of local cannabis control policies?

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Local cannabis control policy measurement

Data Collection

- All 539 cities and counties in CA (initially 241 cities and counties)
- Assessed cross-sectionally, November 2020 - August 2021
- Legal epidemiology approach
  - Systematically identify legal text
  - Structured data collection instrument
  - Independent duplicative coding for reliability
  - Legal expert consultation

J Primary Prevent (2017) 38:295–314
DOI 10.1007/s10935-017-0475-6

ORIGINAL PAPER

The New Cannabis Policy Taxonomy on APIS: Making Sense of the Cannabis Policy Universe

Michael D. Klitzner[1] · Sue Thomas[2] · Jonathan Schuler[1] · Michael Hilton[3] · James Mosher[4]

Local cannabis control policy measurement

Data Collection

- All 539 cities and counties in CA
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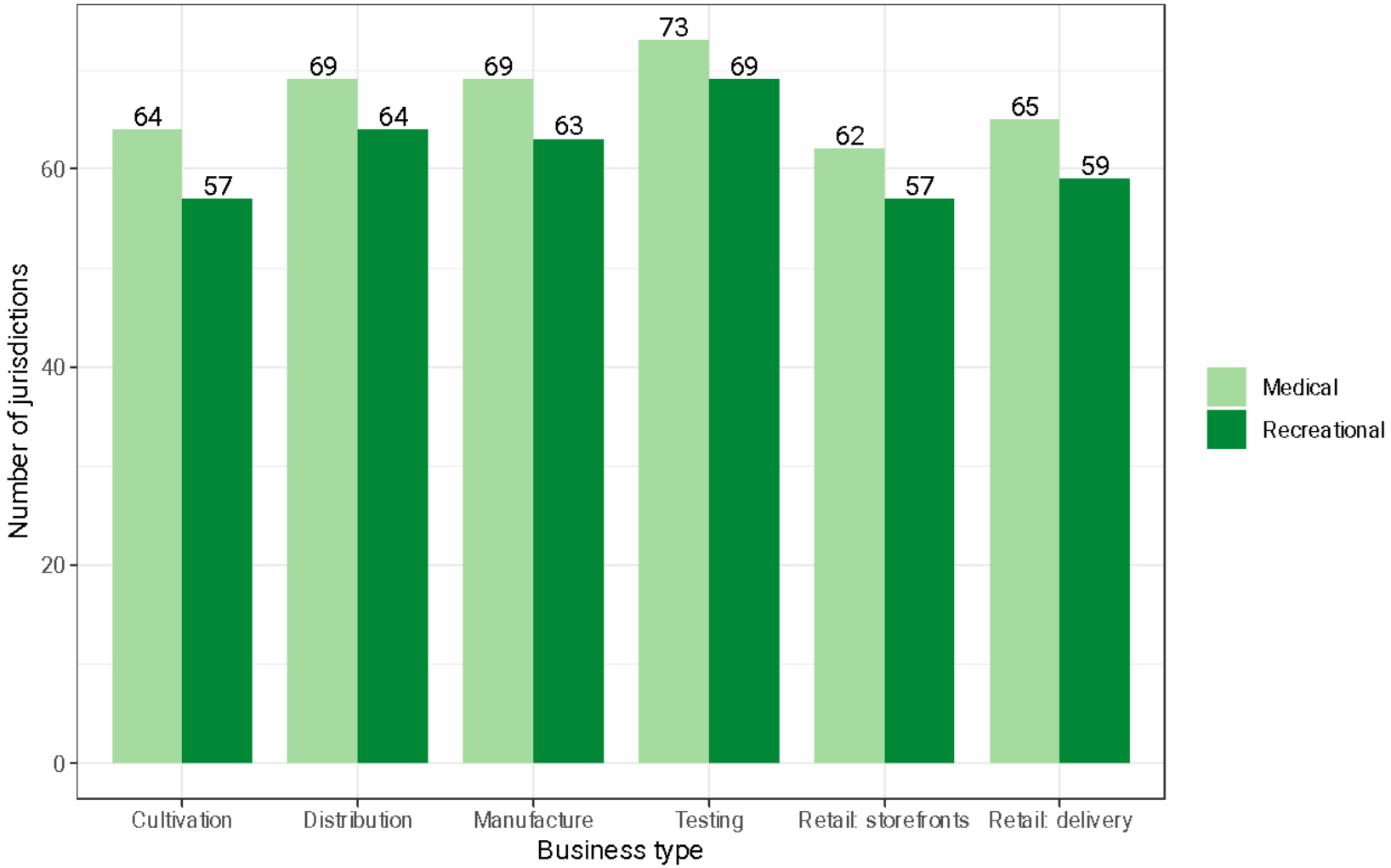
Policy measures

1. Bans on commercial cannabis businesses

If commercial cannabis not banned:

2. Overall restrictiveness (sum score)
3. Specific individual policies

Number of jurisdictions (out of 241) permitting each type of commercial cannabis business



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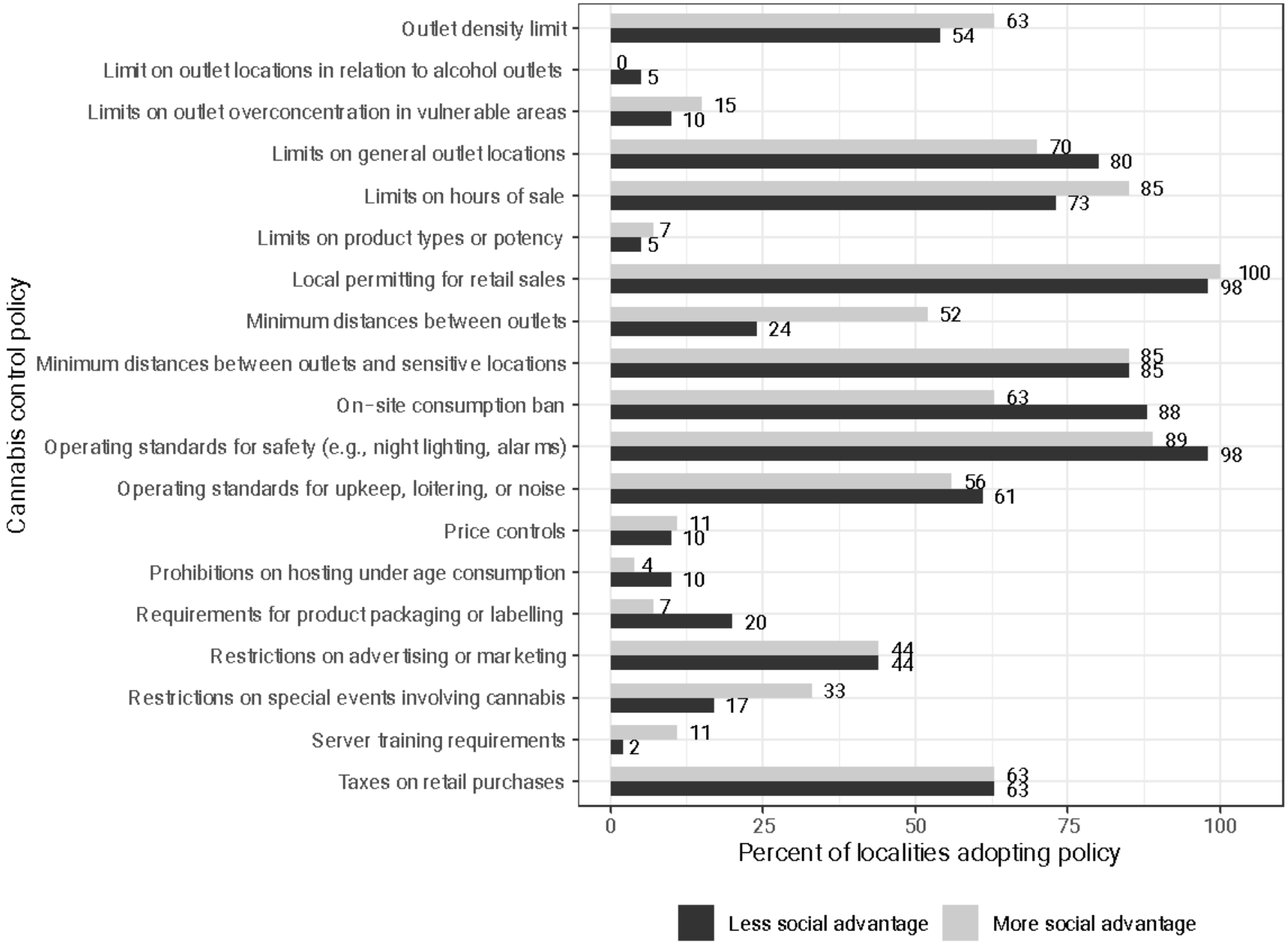
Bans on cannabis businesses were more common in localities with greater advantage

Characteristic	Bans cannabis businesses	Permits cannabis businesses
Education		
% with Bachelor's degree	25.4	24.3
Poverty and income		
Median income ($)	75,044	61,536
% with income below 150% of poverty level	24.3	34.2
Unemployment rate (%)	4.8	5.3
% crowded households	26.5	40.7
Race/ethnicity		
% Asian	14.6	12.2
% Black	4.4	6.9
% Latinx	45.6	50.3
% White	55.7	50.6

Varied patterning of individual policies in relation to social advantage



Varied characteristics for localities with more protective policies

Characteristic	< median # of cannabis control policies	≥ median number of cannabis control policies
Education		
% with Bachelor's degree	19.8	24.8
Poverty and income		
Median income ($)	57,314	60,745
% with income below 150% of poverty level	34.9	35.3
Unemployment rate (%)	5.9	5.2
% crowded households	29.0	44.4
Race/ethnicity		
% Asian	6.3	12.6
% Black	2.5	7.9
% Latinx	55.9	49.6
% White	59.5	49.1

Research Questions

2. How are local cannabis control policies patterned in relation to local alcohol control policies?

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Contents lists available at ScienceDirect

International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo

Research Paper

Alignment in local approaches to alcohol and cannabis control policy: A case study of California cities and counties ☆

Ellicott C. Matthay[a,*], Leyla Mousli[b], Dorie E. Apollonio[c], Laura A. Schmidt[b,d]

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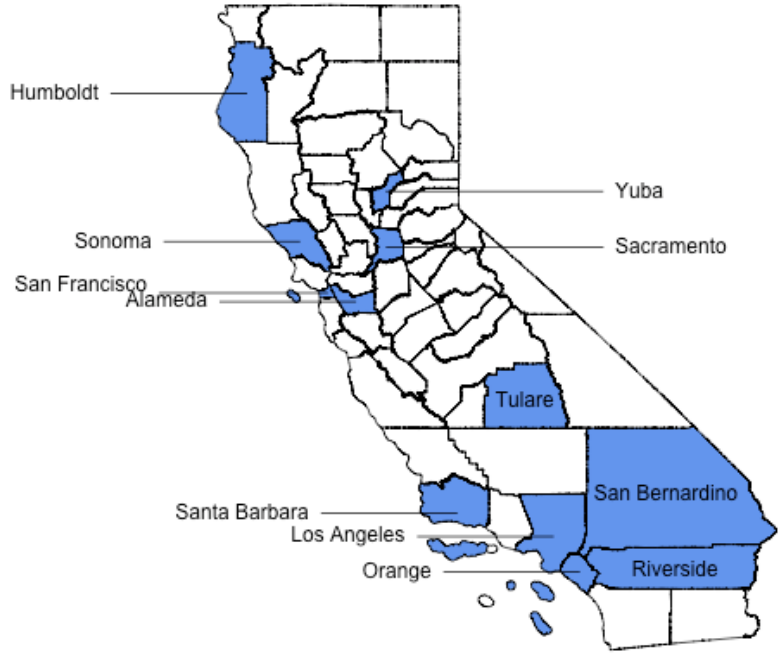
Local alcohol control policy measurement

Data Collection

- 12 counties and all of the cities within them (241 total localities), selected to capture diverse CA settings
- Assessed cross-sectionally, November 2020 - Jan 2021
- Legal epidemiology approach
  - Systematically identify legal text
  - Structured data collection instrument
  - Independent duplicative coding for reliability
  - Legal expert consultation



Thomas *et al. Substance Abuse Treatment, Prevention, and Policy* 2012, **7**:26
http://www.substanceabusepolicy.com/content/7/1/26

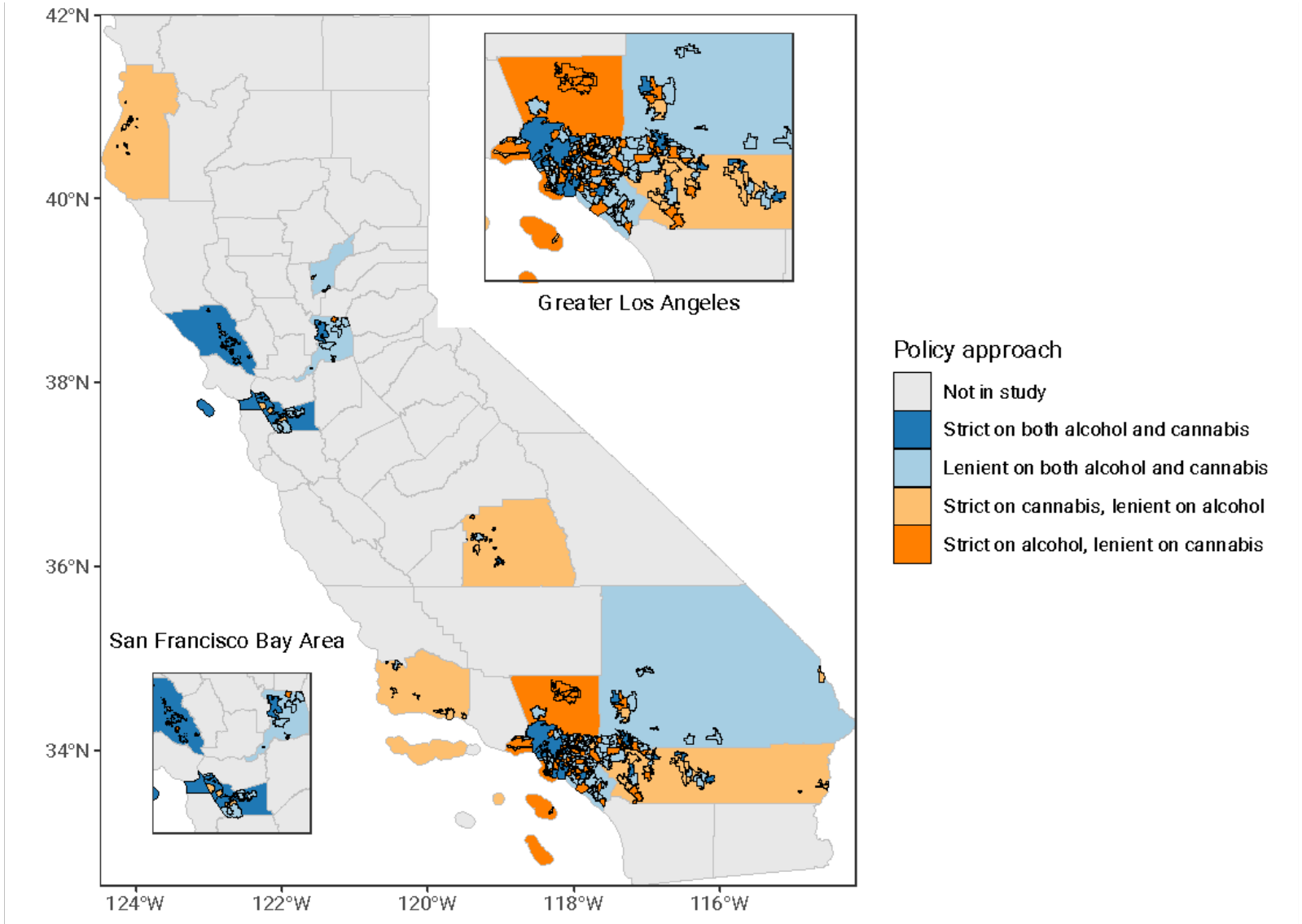
SUBSTANCE ABUSE TREATMENT, PREVENTION, AND POLICY

RESEARCH Open Access

Underage alcohol policies across 50 California cities: an assessment of best practices

Sue Thomas[1*], Mallie J Paschall[2], Joel W Grube[2], Carol Cannon[1] and Ryan Treffers[1]

Diverse approaches to alcohol-cannabis control across California cities and counties



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Characteristics of localities by alcohol-cannabis control approach

		Cannabis control approach	
		Strict	***Lenient***
Alcohol control approach	***Strict***	N = 50 (21%) Urban Intermediate education, income Most Asian residents	N = 29 (12%) Highest population density Most poverty, unemployment Most liberal voters Most Black, Hispanic residents Least White residents
	Lenient	N = 122 (51%) Most education Least poverty, unemployment Most conservative voters Most Asian, White residents Least Black, Hispanic residents	N = 40 (17%) Rural Least education Predominantly White residents

Research Questions

3. How do local policies regulating the number and placement of retail cannabis outlets affect the spatial distributions of outlets within communities?

Epidemiology • Volume 33, Number 5, September 2022

ORIGINAL ARTICLE

OPEN

A Spatiotemporal Analysis of the Association of California City and County Cannabis Policies with Cannabis Outlet Densities

Ellicott C. Matthay,[a] *Leyla Mousli,*[b] *William R. Ponicki,*[c] *M. Maria Glymour,*[d] *Dorie E. Apollonio*[b,e] *Laura A. Schmidt,*[b,f] *and Paul Gruenewald*[c]

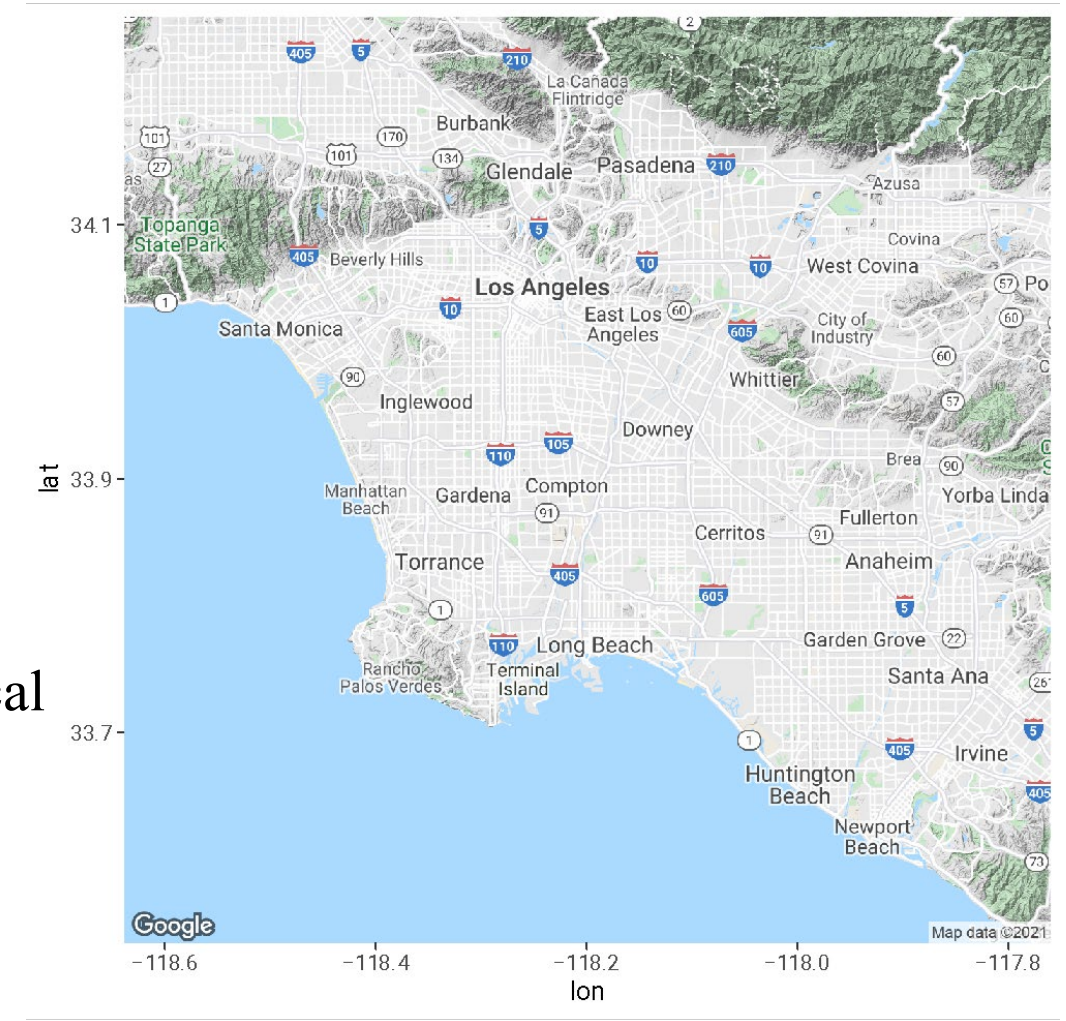
Measuring and modeling cannabis outlets

Cannabis outlets

- Webscraped quarterly from Weedmaps since mid-2017 [1]
- Geocoded to block groups (>99% success)
- Focus on storefront recreational outlets

Statistical analysis

- Bayesian spatiotemporal models
- Outlet densities denominated by land area (physical access)
- Associations with cannabis control policies
- Overall and moderation by block group median income, racial/ethnic composition

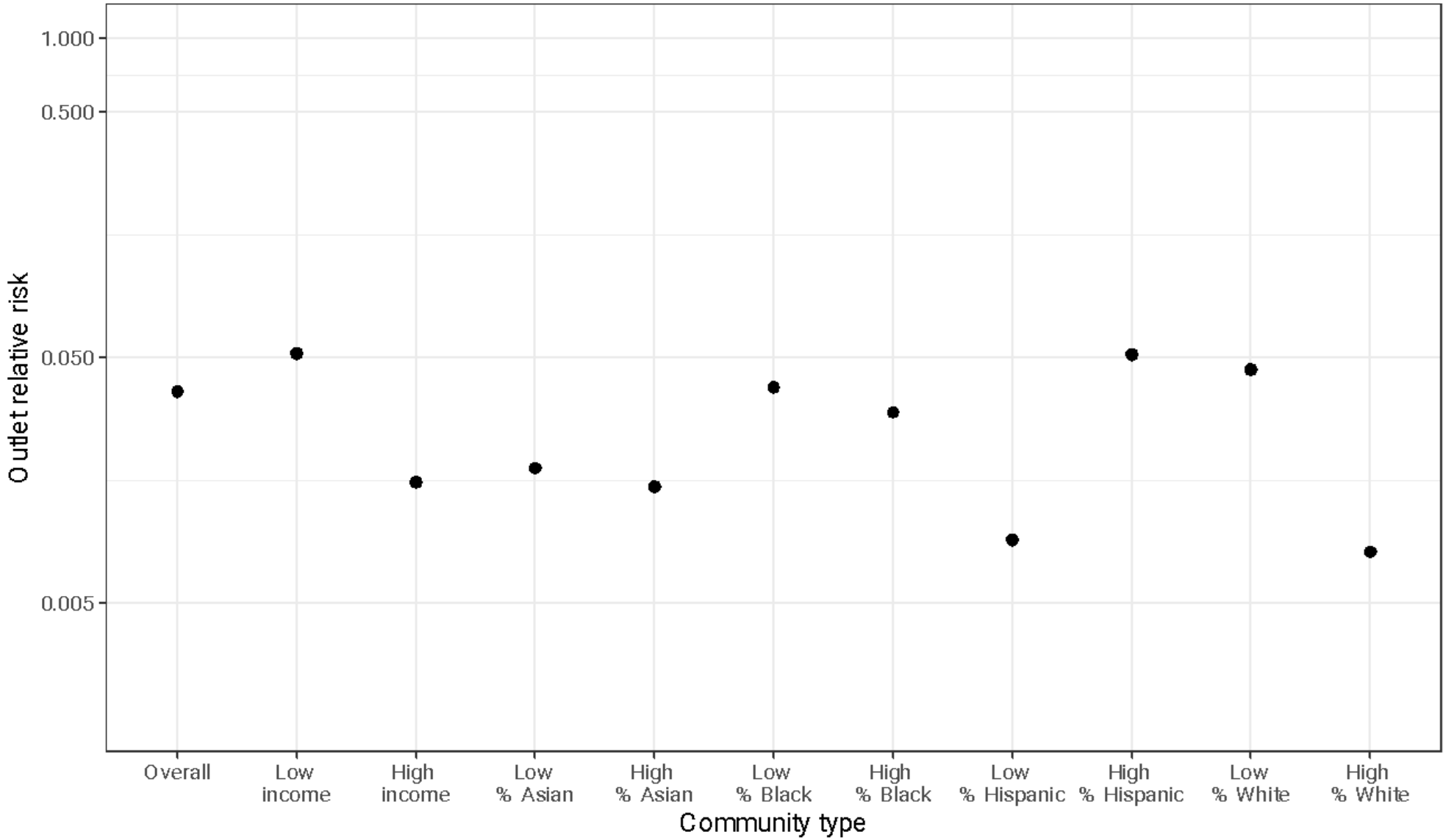


[1] Cao et al (2020) *Drug and Alcohol Dependence*.

Cannabis outlet densities are disproportionately located in communities with lower incomes, more Hispanic residents, more alcohol outlets, and fewer Black residents

Block Group Characteristic	RR (95% credible interval)
Median income (per $10,000)	0.76 (0.70, 0.82)
% below 150% of federal poverty level	1.15 (1.10, 1.20)
% with Bachelor's degree or higher	0.93 (0.89, 0.98)
Racial and ethnic composition	
% Asian	0.96 (0.89, 1.03)
% Black	0.91 (0.83, 0.98)
% Hispanic	1.05 (1.02, 1.09)
% White	0.99 (0.95, 1.03)
Alcohol outlet density (per 1000 sq mi)	1.07 (1.06, 1.09)

Bans on commercial cannabis businesses appear to work



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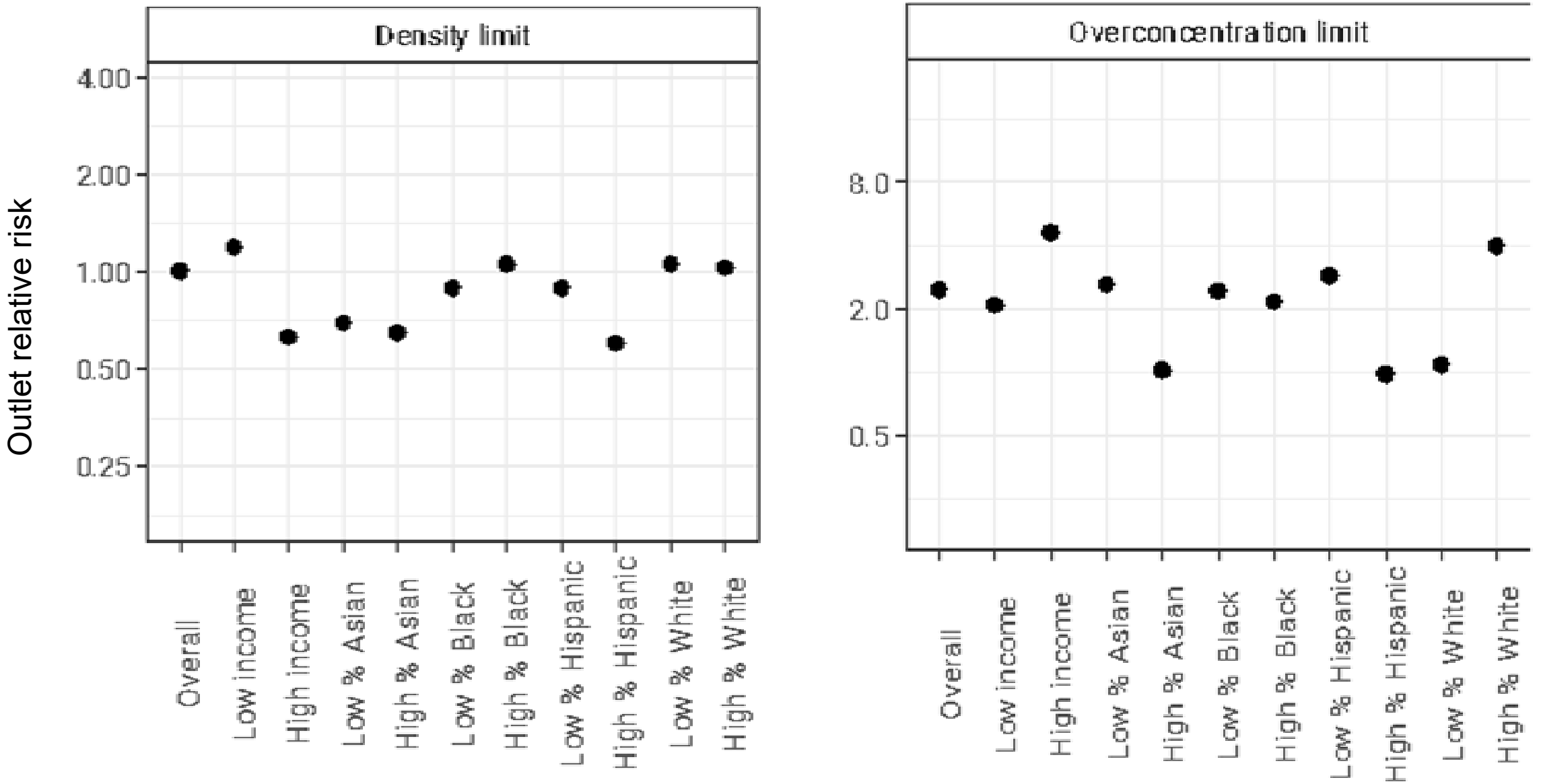
Estimating impacts of more specific provisions is challenging



Research Questions

4. Do any of California's local cannabis control policies help to prevent harmful cannabis exposures reported to Poison Control?

Matthay EC, Mousli LM, Sun C, Lewis J, Jacobs LM, Heard S, Ho R, Schmidt LA, Apollonio DE. (2023). Associations of local cannabis control policies with harmful cannabis exposures reported to the California Poison Control System. In revision at *Epidemiology*.

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Cannabis and poison control

- Surveillance data recommended by public health experts: Calls to poison control centers
- Potential problems captured:
  1. Unintentional overdoses: uncontrolled vomiting, ataxia, disorientation, psychotic symptoms
  2. Product safety concerns: spoiled food, contamination of cannabis products with other drugs or chemicals
  3. Unintentional child access and consumption: health consequences similar to unintentional overdoses

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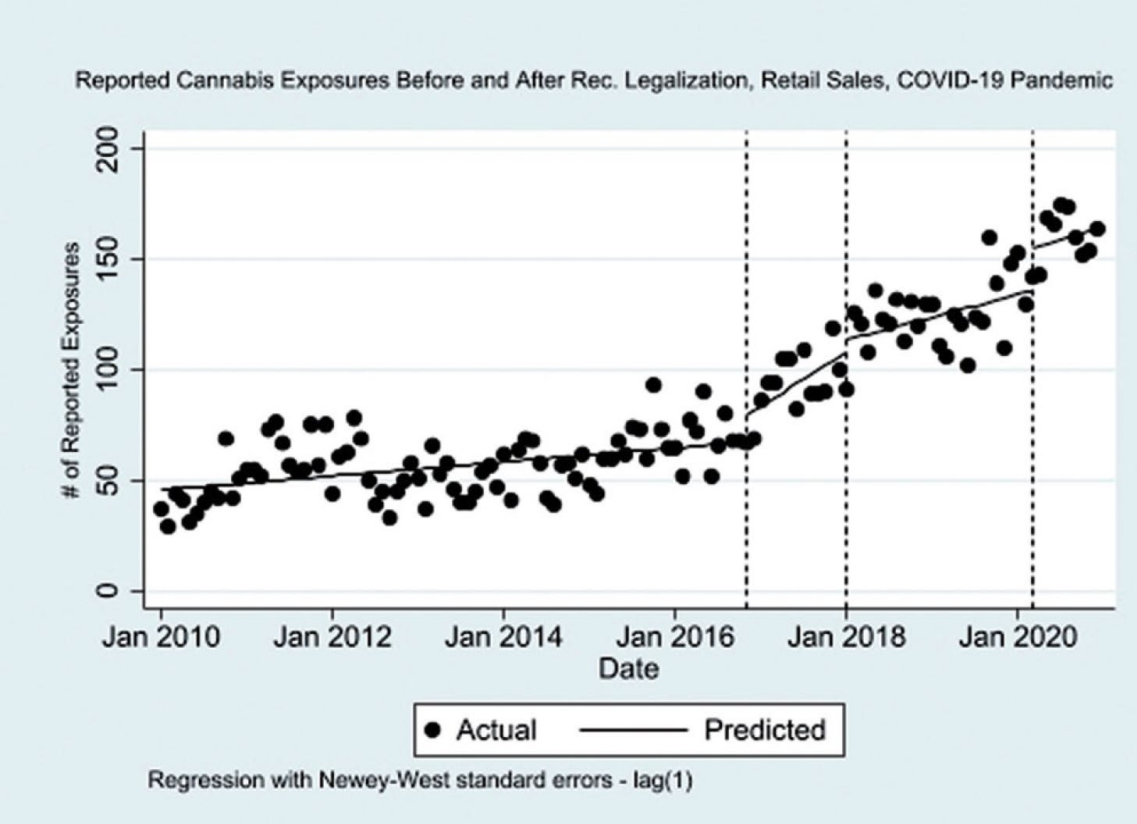
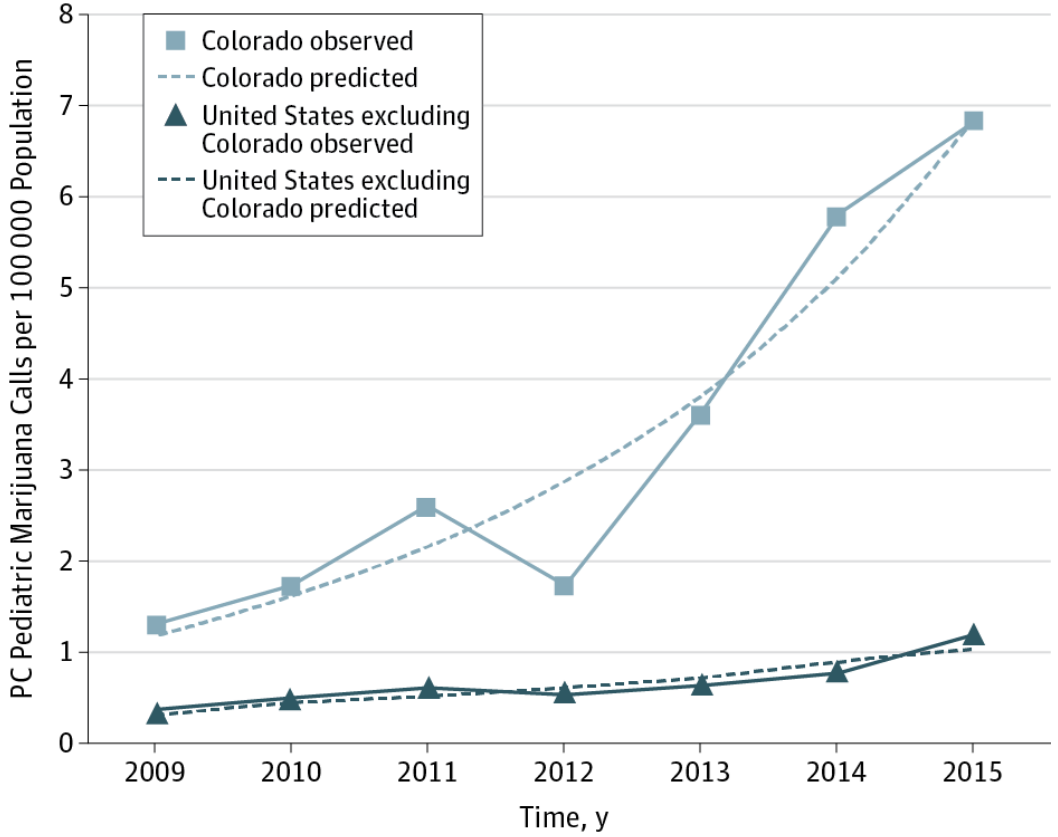
State recreational cannabis legalization is associated with increases in cannabis exposures reported to poison control [1-4]

Cannabis exposures reported to California Poison Control System, 2010-2020



Unintentional pediatric exposures to marijuana in Colorado, 2009-2015



[1] Dilley et al, 2021, JAMA Netw Open. [2] Wang et al, 2016, JAMA Peds. [3] Roth et al, 2022, Clin Toxicol. [4] Shi and Liang, 2020, Addiction.

Methods

California Poison Control System data

- All records 2010-2019 involving exposure to a cannabis product
  - Restricted to exposures with health harms
  - Aggregated to locality – quarter

Analytic approach

- Differences-in-differences design
- Negative binomial regression: population-based rate of harmful cannabis exposures as a function of policies, locality fixed effects, and time fixed effects
- SEs clustered at the locality level

Policy exposures

1. Bans on recreational retail cannabis businesses
2. Overall restrictiveness (18 policies)
3. Three specific provisions recommended as solutions to unintentional overdoses and ingestion
   a) Limits on product types and potency (7%)
   b) Product packaging and labelling requirements (14%)
   c) Server training requirements (3%)

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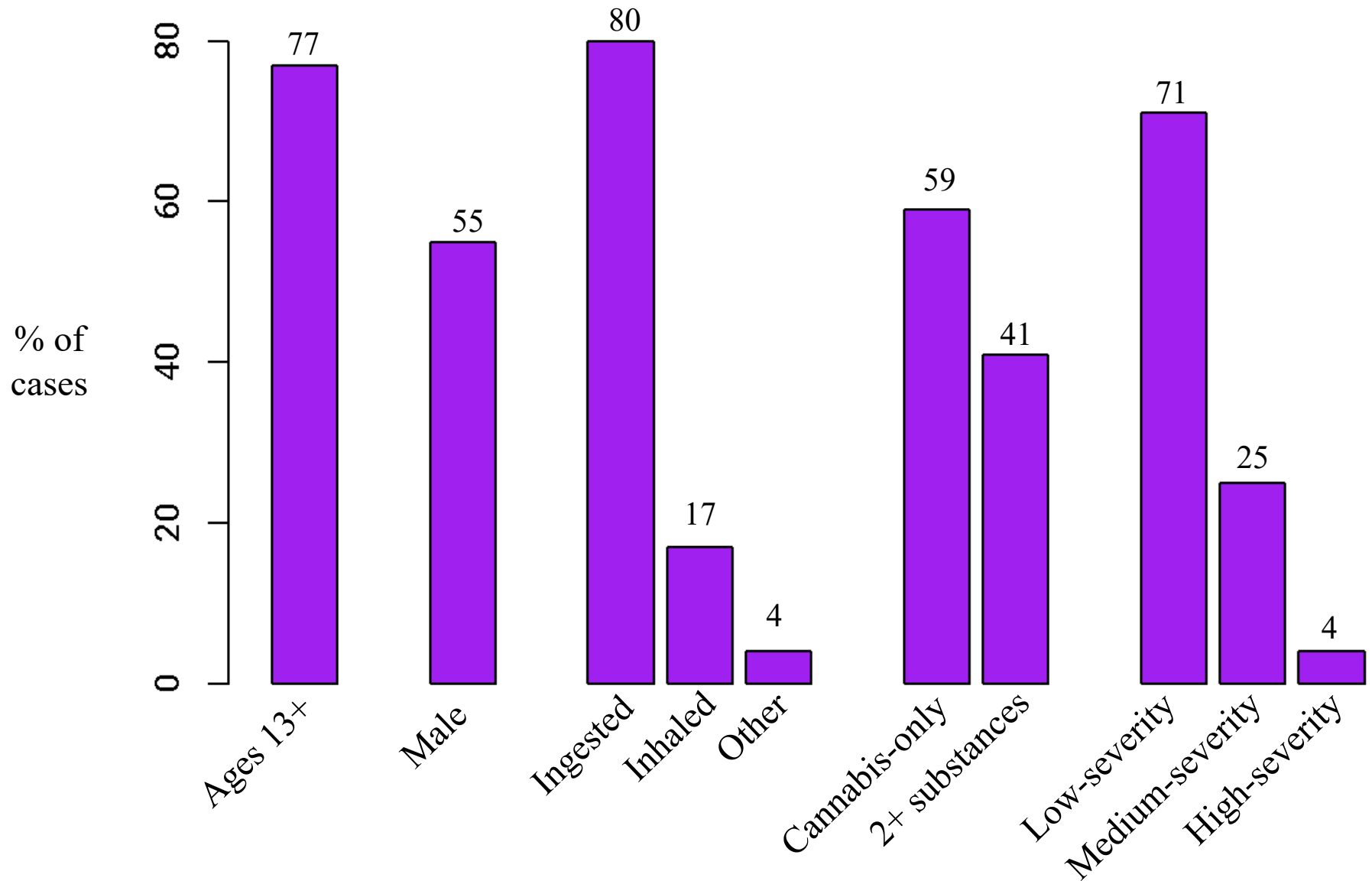
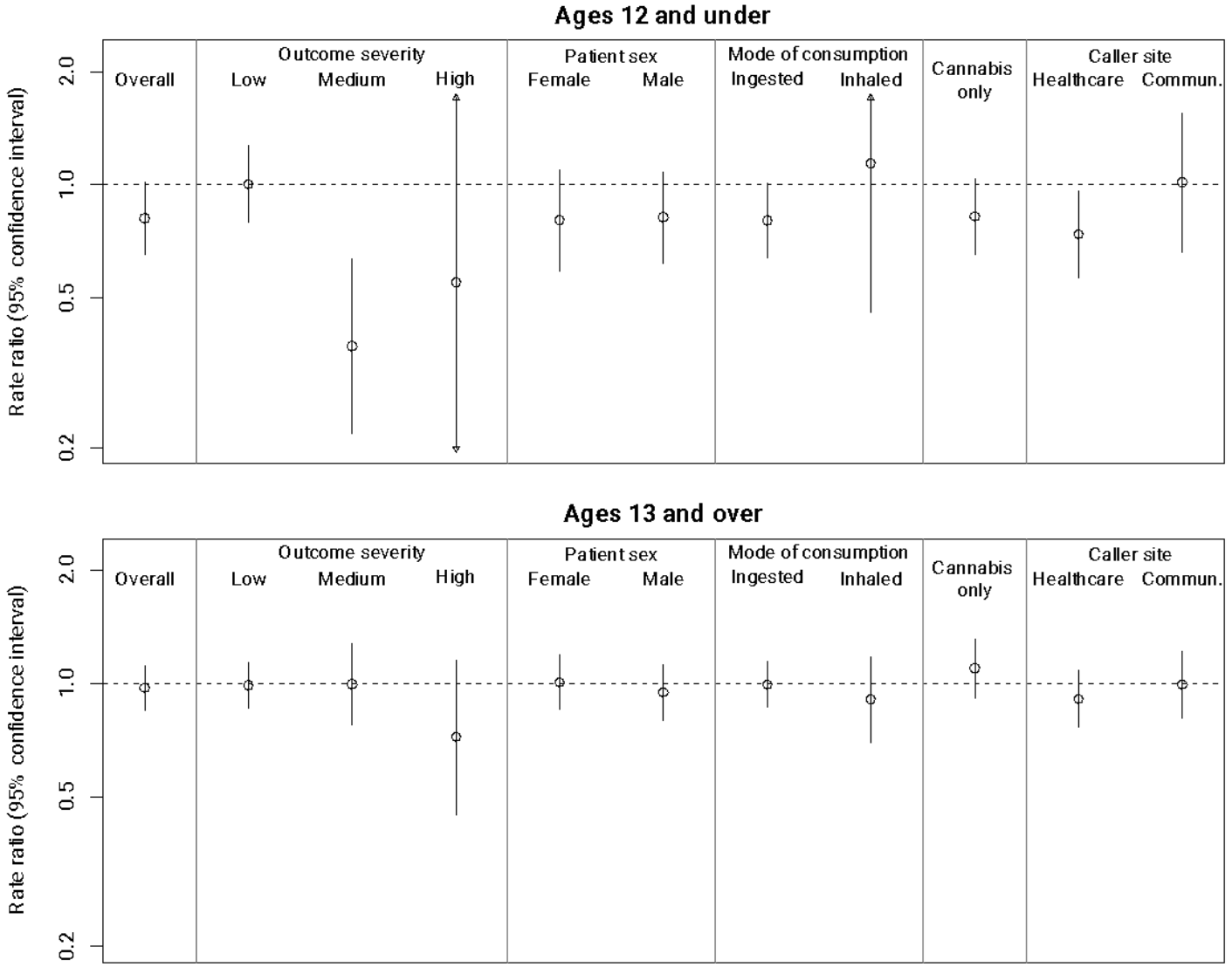
Harmful cannabis exposures reported to CPCS



N=8,050 total reported harmful exposures

Bans on recreational retail cannabis businesses were associated with lower rates of harmful cannabis exposures among children (<13)



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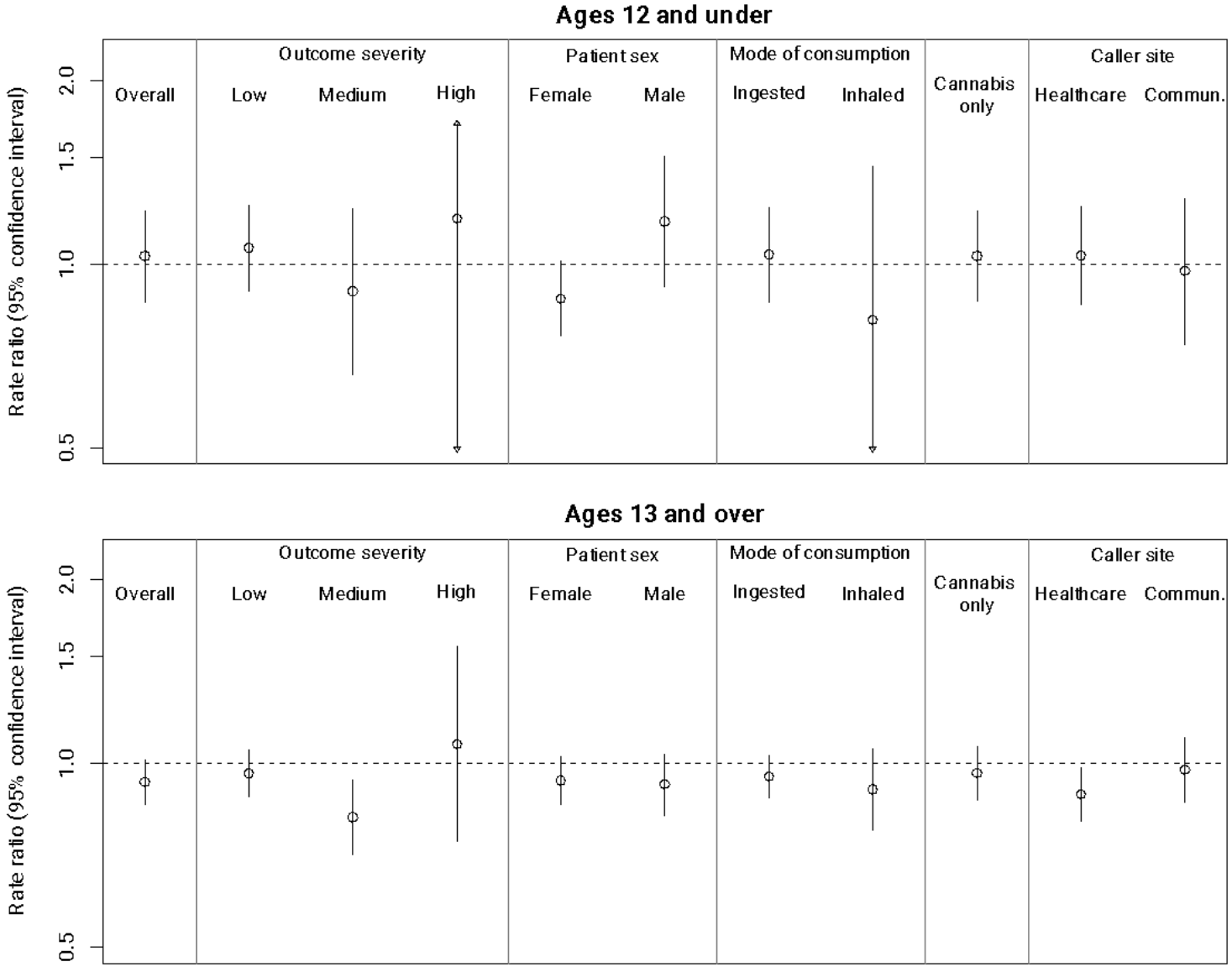
Overall restrictiveness was associated with lower rates of harmful cannabis exposures among people aged 13+



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Conclusions

- California cities and counties have taken diverse approaches to cannabis control
- Recommended (i.e., protective) cannabis control policies have been disproportionately adopted in socially advantaged localities, which could exacerbate health disparities
- Coordination between alcohol and cannabis control policies appears rare
- Specific policy impacts
  - Bans may help prevent child cannabis poisonings
  - Overall restrictiveness (demand reduction?) may help prevent adult poisonings

Other considerations

- Local policies are continuing to evolve
- Policy landscape reflects local government capacity?
- Many sources of THC products, not just storefront recreational outlets (home delivery, illicit market, hemp-derived products)
- Specific local policies of interest are rarely adopted, often poorly enforced, and difficult to study
- Easy travel across localities may compromise policy effectiveness

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Thank You

Collaborators:

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Justin Lewis
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Raymond Ho
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Serena Zhang
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California Bureau of Cannabis Control
Prevention Research Center
California Poison Control System
University of California, San Francisco

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Thank You

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