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What Does National Prevalence Hide?

Implications of Timely State Estimates of Psychedelic Substance Use

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What Do National Estimates Hide?

The problem with single numbers

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National Estimates

Tells us how common something is

Substance Specific Estimates

Tell us what is happening

State Estimates

Tell us where it is happening

Want a methodological approach that recovers epidemiological signal that aggregate data hides

Disaggregation is not merely descriptive it can fundamentally change our interpretation

Importance of place and specificity

Overdose Deaths

Importance of place and specificity

Historic Example: From 2018 to 2019[1]

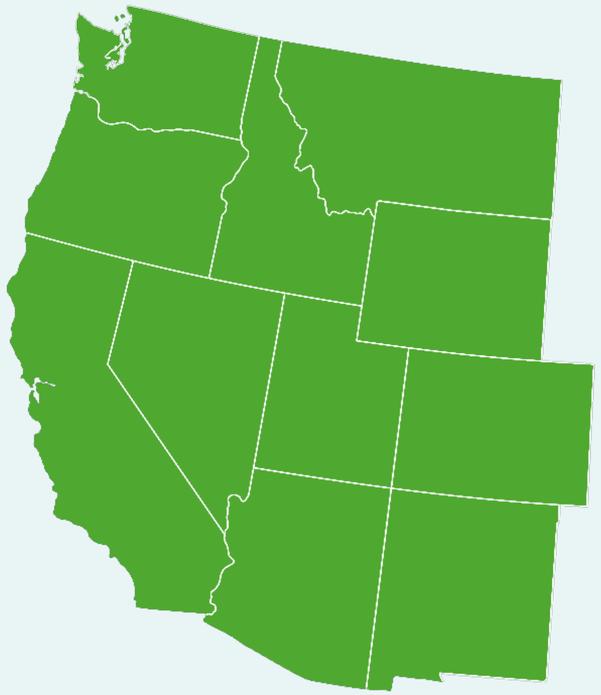
- Nationally overdose death rates rose 4.3%
- Single estimate can be both accurate and a poor description for reality

State estimates exist in federal surveillance already

- We know state-level estimates are important
- We know direct estimation becomes difficult for smaller areas or low prevalence items
- Small area estimation is an established solution

We applied a small area estimation approach to psychedelics

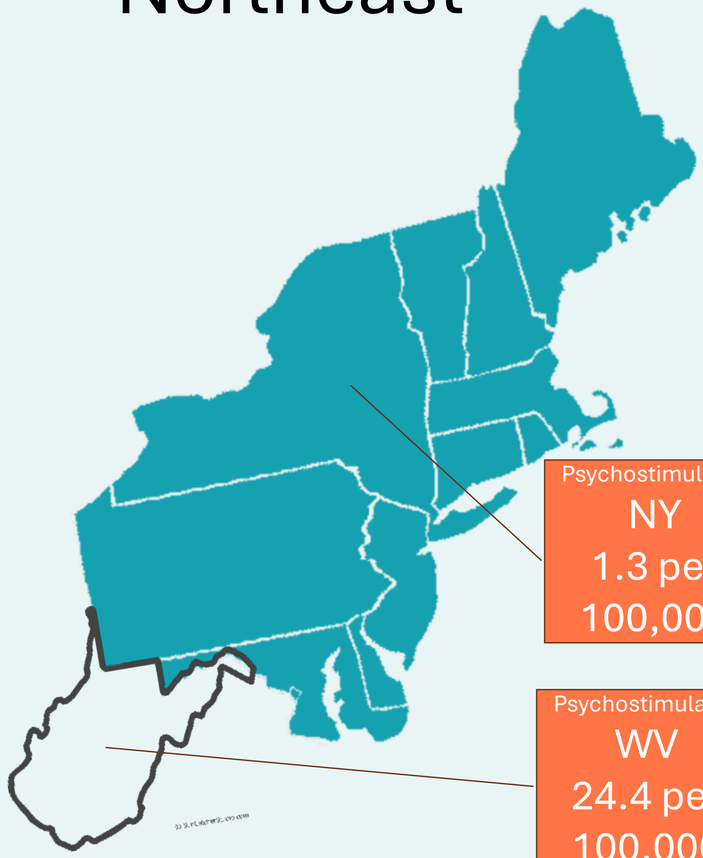
West



44% Psychostimulant deaths highest

↑68% Largest relative increase in the opioid death rate

Northeast



71% Synthetic opioid deaths highest

↑44% Largest relative increase in the psychostimulant death rate

National Survey Investigating Hallucinogenic Trends (NSIHT)

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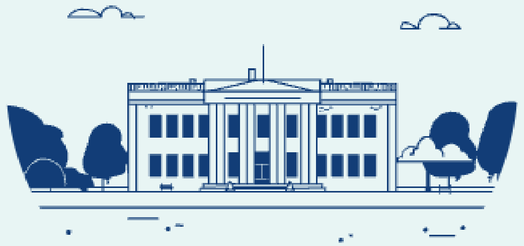
Measuring Behaviors and Outcomes

Characterizes substance-specific behaviors and corresponding perceived risks, benefits, and health outcomes



Understanding People

Applies a socio-ecological perspective for measuring individual, peer, community, and societal factors



Evolving Environment

Captures and adapts to rapidly changing environment

The three measurement pillars of NSIHT come together to allow for successful small area estimation applied to nationally representative, cross-sectional survey of adults in the United States

A Rigorous Small Area Estimation Approach

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2-Stage Validation Pre-registered[2]

Multilevel SAE

Unit-level model with weighted respondent-level data[3] from NSIHT and county- and state-level auxiliary data[4-6]

Substance Specific Transfer

Used this base model to refine substance-specific state models



Recovering both place and specificity

External Validation of Aggregate “Any Hallucinogen” Use

Validated NSIHT model against National Survey on Drug Use and Health (NSDUH) 2023-2024 aggregate model[7], multiple geographic structures tested

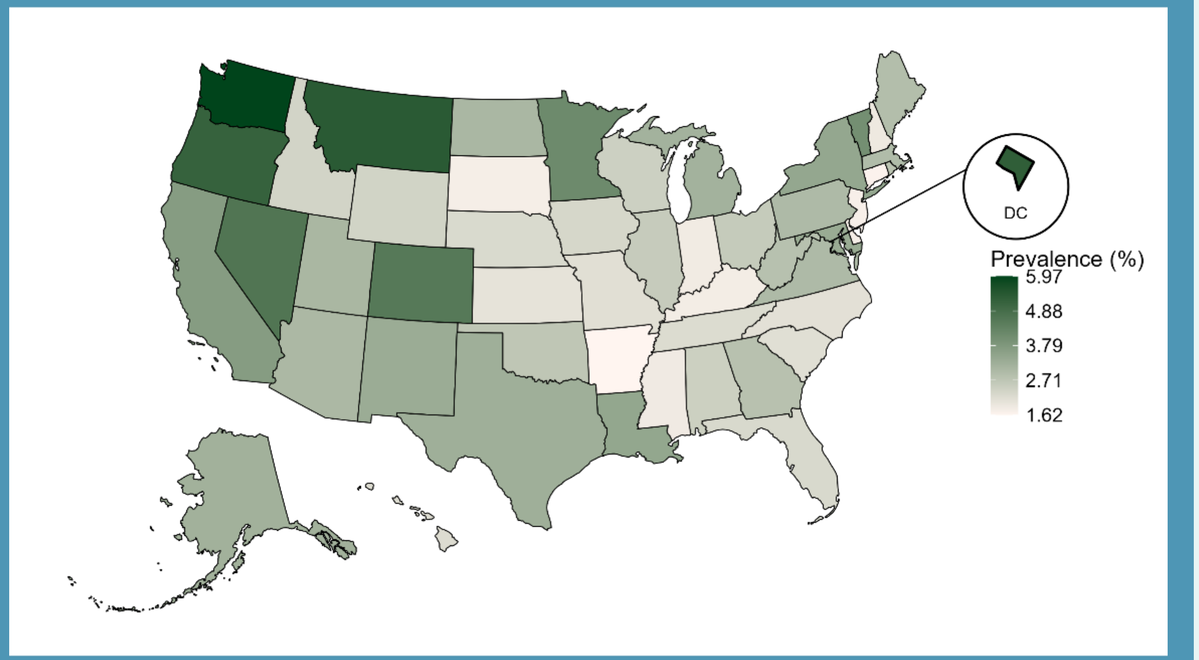
Internal Validation

No benchmarks exist, models performed well when compared to direct design-based estimates of census divisions

Psilocybin Use in Last Year, 2025

National Prevalence: 2.9% (95% CI: 2.8, 3.1)

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- States are distributed substantially above and below the national estimate
- Some approaching roughly 2× the national prevalence
  - Highest Washington 5.97%
  - Lowest Arkansas 1.62%

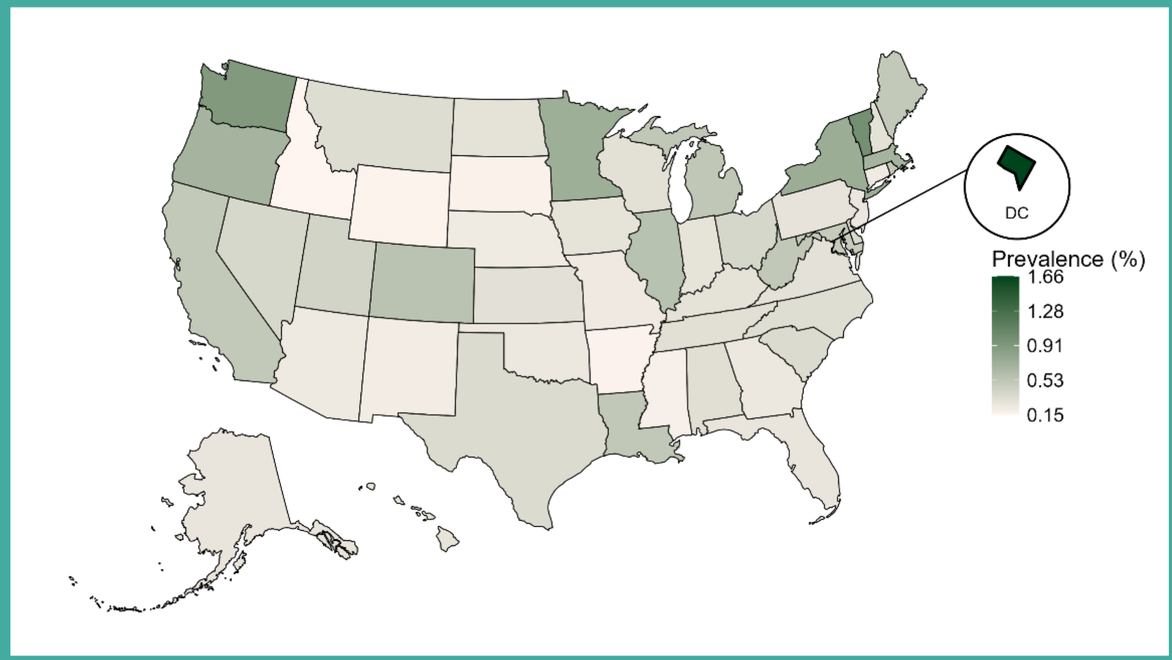
- State prevalence heterogeneous, highest in the West
- National prevalence obscures geographic variation
- More information for data-driven policy decisions and evaluations

Illicit Ketamine Use in Last Year, 2025

National Prevalence: 0.4% (95% CI: 0.3, 0.5)

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- Most states cluster around the national estimate (light green)
- A small number of states drive the upper end of the distribution, approaching roughly 4× the national prevalence
    - Highest Washington D.C. 1.66%
    - Lowest Idaho 0.15%

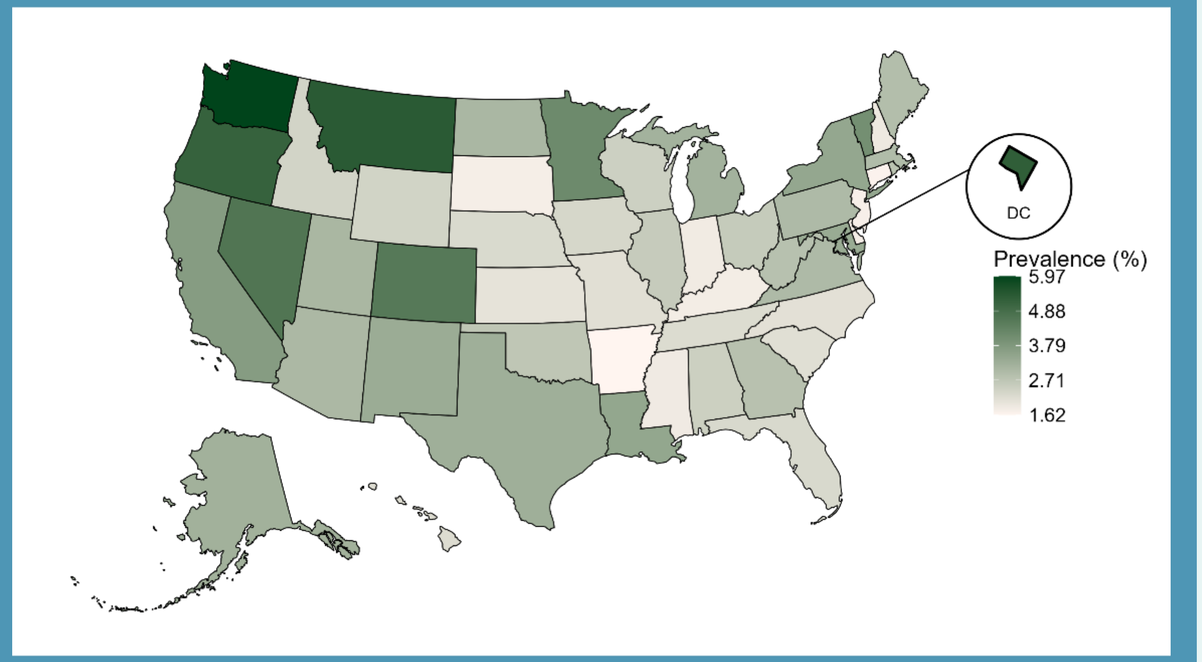


- Geographic range driven by a few states
- National prevalence obscures geographic variation
- May call for different public health approaches

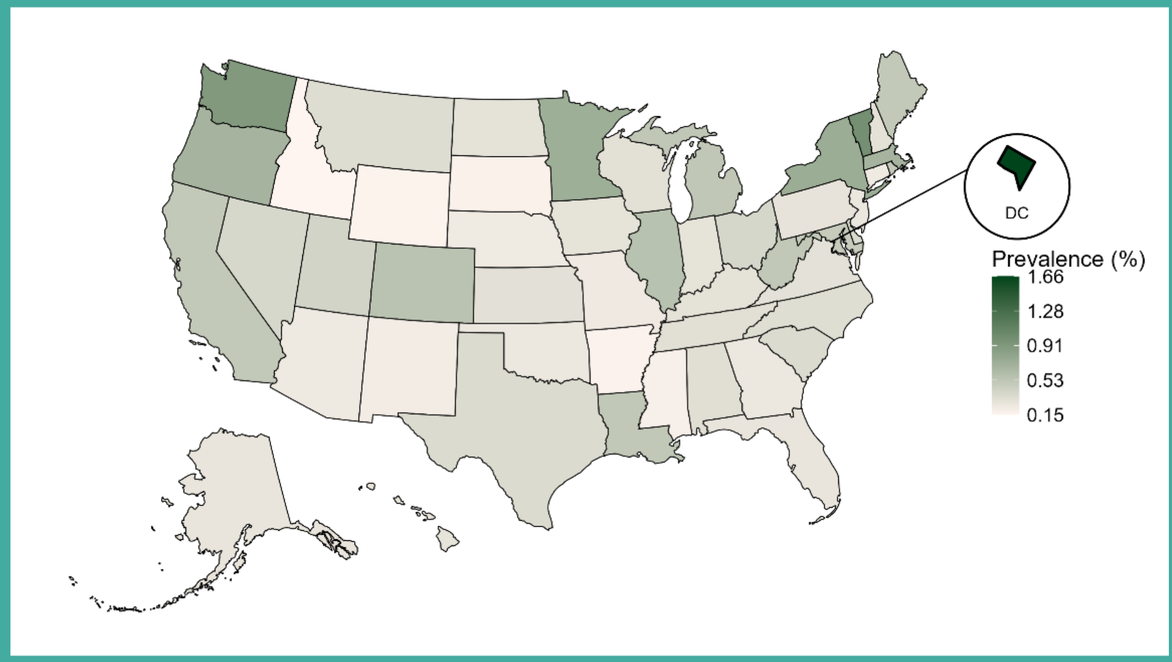
Psychedelic Use in the Last Year, 2025

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Psilocybin – Diffuse Distribution



Illicit Ketamine – Concentrated Distribution



National aggregation hides not only the *magnitude* of geographic variation — but its **structure**

Distinct implications for surveillance and intervention approaches

Approach Leads to New Learnings

Why a single national number is not enough in today's landscape

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National Estimates

Answers "How Common?"

But obscure where and what is the driving pattern



State Small Area Estimation

Answers "Where"

Revealing geographic concentrations, diffuse spread, or outlier states



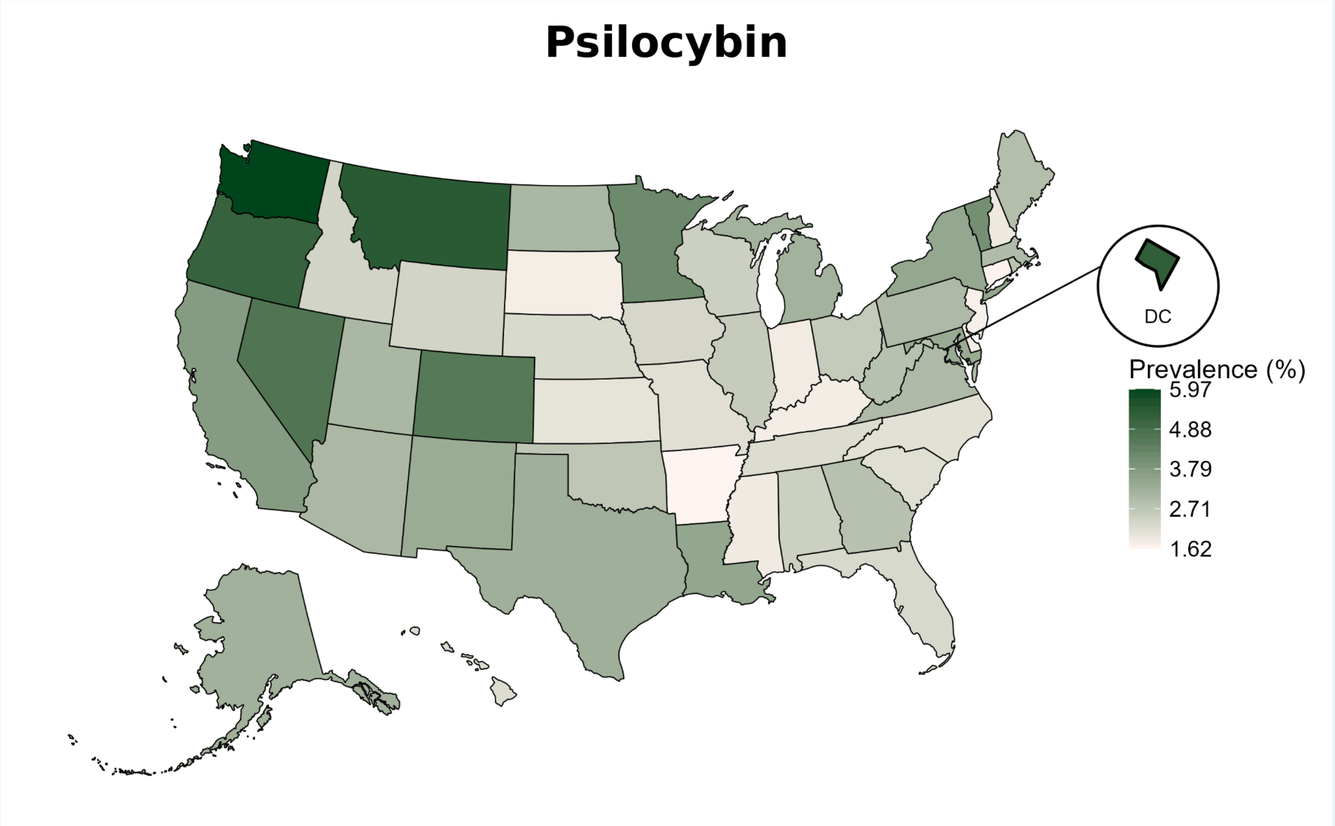
Substance Small Area Estimation

Answers "What"

Revealing how geographic variation differs by substance

Timely State Estimates Are Necessary

For psychedelics, aggregation hides signals about place and specificity. Small area estimation gives us a validated way to recover that for surveillance and policy.



On our website in the coming weeks:
www.rmpds.org/nsiht

- 2-Stage Validation
- Timely Release
- 10 psychedelic substances

Implications for Small Area Estimation

Measuring place and specificity

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Timely assessment of substance-specific psychedelic use in small geographic areas is a public health priority. This SAE work is a precursor to measurement of:

Public Health	Policy Evaluation	Landscape Changes	County Estimates
Where to implement efforts and measuring success	Data-driven decision making for policy implementation and evaluation	Changing landscape over time, actionable epidemiological intelligence	SAE at the county and state level, for more granular decision making

Available this month

Coming 2027-2028

Thank you

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Acknowledgements: ellie bau, Nicole Schow, Dr. Joshua Black, Dr. Andrew Monte

Funding: Development of SAE models funded by Substance Abuse and Mental Health Services Administration under #HHSS283201700075I/75S20321F42002.

More about NSIHT:

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