Cannabis and Public Health in an era of Legalization

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Gillian Schauer, PhD, MPH
University of Washington
Gillian Schauer Consulting

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1

Agenda

• Botany and history
• Epidemiology
• Products
• Endocannabinoid System and Health Effects
  -- BREAK --
• Policy in the US and NY
• Implications for Public Health
• Overlay with other substances, nicotine, vaping

2

Acknowledgements

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The findings and conclusions in this presentation are my own and do not necessarily represent the official position of any of the agencies with whom I consult.

3

Quick Primer on the plant

>90 Cannabinoids
>100 Terpenes

THC

4

Marijuana Policy in the U.S.

5

Marijuana policy in the US, as of July, 2019

6
How did we get here?

Painting of Cannabis Sativa, AD 512
Global Cannabis Trade
Jamestown Settlers, late 1600s
George Washington, Mt Vernon, 1700s
Medical cannabis in American pharmacy, 1850s

Brief Timeline of Cannabis Legalization in US States

Ogden memo, 2009
...DOJ won't focus on individuals who are complying with state medical marijuana laws

Cole memo, 2013
...DOJ guidance to adult use states

Sessions memo, 2018
...rescinds but does not replace Cole memo

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Farm bill, 2018

Hemp vs. Marijuana

What are the health effects of marijuana (briefly)?

Acute effects

Impaired memory, learning, and attention

Impaired motor coordination/reaction time

In high doses, acute psychosis and paranoia

Altered judgment, increasing likelihood of risky behaviors

Longer-term effects

Therapeutic Effects

Schedule I substance
- No currently accepted medical use

Anecdotal evidence
- Vocal advocacy community

Increasing scientific evidence for medical use of cannabis or cannabinoids:
- Most promising for: pain relief, nausea relief, patient-reported symptoms from MS, rare seizure disorders; some evidence for sleep
- 3 FDA approved synthetic THC drugs; 1 FDA approved cannabis-derived CBD drug (and related rescheduling)
Who uses marijuana?

Population based surveys

- National Survey on Drug Use and Health (NSDUH)
- Behavioral Risk Factor Surveillance System (BRFSS)
- Monitoring the Future (MTF)
- Youth Risk Behavior Survey (YRBS)
- Pregnancy Risk Assessment Monitoring System (PRAMS)
A deeper dive into specific populations...

- The brain develops into young adulthood.
- Marijuana use in adolescence and young adulthood can change the way the brain develops, and impact memory, learning, and attention.
- THC is fat soluble – crosses the blood/brain barrier in utero, passes into breast milk during breastfeeding.
- THC may disrupt the endocannabinoid system – which is important for a healthy pregnancy and fetal brain development.
Prevalence of marijuana use among women of reproductive age, NSDUH, 2007-2012

Prevalence of daily/near daily marijuana use and marijuana abuse/dependence, NSDUH, 2007-2012

Past month cannabis use among pregnant and nonpregnant women, NSDUH 2002-03 vs. 2016-17
Past month daily/near daily cannabis use among pregnant and nonpregnant women, NSDUH 2002-03 vs. 2016-17

Possible reasons for use in pregnancy?

How is marijuana consumed?

Marijuana Products and Modes of Use

- Combusted products (e.g., joints, pipes, bongs, bowls, blunts, spliffs)
- Vaporizers (e.g., electronic vaping devices, or older models that are heat-not-burn)
- Edibles (e.g., brownies, cookies, candies)
- Drinks (e.g., elixirs, syrups, hot chocolates)
- Dabbing (e.g., using concentrates and waxes)
- Other ways
Important gaps and limitations in marijuana surveillance

- Funding
- Data on mode or method of use
- Quantity/amount used questions
- Type of product used (CBD/THC)
  - Comment on CBD and surveillance
- Medical marijuana questions
- Driving question limitations
- General lack of cognitively tested questions
- Rapidly evolving marketplace

Surveillance is one of the most important things we can do prior to legalization!

HEALTH EFFECTS AND THE ENDOCANNABINOID SYSTEM

Cannabis Policy and Public Health Considerations

What do these policies look like on the ground?
Legalization of MJ-derived CBD/Low-THC

- Often focus on CBD/low-THC oils
- Allow clinicians to “recommend” CBD...
- Laws often do not address how CBD oil is made, purchased or shipped
- Typically no marketplace
- Typically no regulatory agency
- Typically no product testing or oversight
- Legalization often looks more like decriminalization of CBD/low-THC products
- Regulations have traditionally been separate from hemp-derived products...though this is changing.

*Notable exception to all of this: Iowa

Medical Legalization Policies

- Public health is often the regulatory agency
- Wide range of regulations in terms of:
  - Marketplaces/number of outlets
  - Types of available products
  - Product preapprovals
  - Product/ingredient restrictions
  - Registries, cards, and fees
  - Who can dispense products
  - Homegrows
  - Lab testing
- Wide range of indications (not all based on science)
- Often paves the way for non-medical framework

Non-Medical Use Policy Tracking - Methods

- Multi-State Collaborative on Cannabis and Public Health (est. 2013)
- Data Collection:
  - Quarterly updates from State Public Health Agencies and Regulatory partners
  - Review of ballot measures, laws, rules & regulations
- Data Validity:
  - Snapshot in time – as of July, 2019
  - Cross checked by state agencies directly
- Analyses:
  - Overall, similarities and differences

Non-Medical/Adult Use States

<table>
<thead>
<tr>
<th>State</th>
<th>Year Passed (% support)</th>
<th>Retail marketplace open?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>2013 (55%)</td>
<td>January, 2014</td>
</tr>
<tr>
<td>Washington</td>
<td>2012 (56%)</td>
<td>July, 2014</td>
</tr>
<tr>
<td>Oregon</td>
<td>2014 (56%)</td>
<td>October, 2015 (through medical dispensaries)</td>
</tr>
<tr>
<td>Alaska</td>
<td>2014 (52%)</td>
<td>October, 2016</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>2014 (65%)</td>
<td>No retail marketplace approved</td>
</tr>
<tr>
<td>Nevada</td>
<td>2015 (54%)</td>
<td>July, 2017</td>
</tr>
<tr>
<td>California</td>
<td>2016 (56%)</td>
<td>January, 2018</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>2016 (54%)</td>
<td>November, 2018</td>
</tr>
<tr>
<td>Maine</td>
<td>2016 (50%)</td>
<td>Expected in March, 2020</td>
</tr>
<tr>
<td>Vermont</td>
<td>2018 (legislative)</td>
<td>No retail marketplace approved</td>
</tr>
<tr>
<td>Illinois</td>
<td>2019 (legislative)</td>
<td>Expected in early, 2020</td>
</tr>
</tbody>
</table>

*DC, VT not included in subsequent data, IL included when possible

Policy Basics

- Regulatory Authority:
  - Typically Depts. of Revenue/Taxation/Consumer Affairs AND/OR Liquor/Alcohol/Beverage Control Boards (WA, AK, OR)
  - Public health has had retail regulatory role in 2 states (CA, OR)
  - 7 states (AK, CA, ME, MA, NV, OR, WA) have rule making/advisory boards; public health on all but 1 (WA); industry on all but 1 (WA)
- What’s Legal?
  - Most states have ~1oz possession or 7-8g concentrate (ME and MI have 2.5 oz total)
  - MA and OR have higher home possession (10 oz and 8 oz)
  - Non-medical home grows allowed in all states (~6 plants; MI has 12), with exception of WA (and IL is not currently planning to allow them).

Policy Basics

- Taxes:
  - Excise taxes vary widely: ~10-15% (ME, MA, MI, NV) to 37% (WA)
  - AK is only state with no user-based excise tax (only growing/processing taxes)
  - IL is only state with tiered tax based on THC content
- Vertical integration
  - Allowed in all states except for WA (limitations in CA)
- Funding for Public Health Agency:
  - 7 states (AK, CA, CO, MA, OR, WA) have funding for public health agency. Wide range in $5 ($1.5M to $18M annually).
  - Not protected. May supplant other funds.
  - Public health funding typically for surveillance, public education, lab testing work
**Policy Basics**

- **Local Control to Ban/Amend Policy**
  - Allowed in all states (with some tax implications and restrictions on extent of local control)

- **Medical Marijuana Marketplace**
  - AK is only state without existing medical marketplace
  - WA is only state with fully merged markets
  - All other states have or moving towards parallel regulation

- **Delivery**
  - Allowed (with restrictions) in 3 states (CA, NV, OR); pending in 2 states (CO, MI)

**Packaging and Labeling**

- **Universal Symbol**
  - Required in 6 states (CA, CO, MA, NV, OR, WA); poison control line sticker also required for infused products in WA, similar adopted in MA

- **Warning Labels**
  - Required in all states, but vary widely
  - Most commonly include warnings against: youth use, operating machinery/driving/impairment
  - Some include warnings about: dependence (AK, WA) delayed effects from edibles (CO, MA, NV, WA)

**Packaging and Labeling**

- **Childproof packaging**
  - Required in all states; resealable requirements in most states, some also require opaque, childproof exist bag.

- **Edibles**
  - 30mg serving size in CA, CO, MI, NV, WA; 5mg in AK, OR, MA.
  - All states have provision that can’t appeal to kids (i.e., no cartoons, limitations on gummy shapes)
  - Most states prohibit products that look like commercial food items, including adulterated products.
  - Most states prohibit health and benefit claims on labels
  - Shelf-stable products only in WA

**Lab Testing**

- **Third party testing:**
  - Exists in all states that have testing systems set up or planned

- **Reference lab?**
  - Exists in NV, pending in MA, CO

- **Sampling and testing procedures:**
  - Vary widely by state (with most testing for microbial contamination, residual solvents, metals, and cannabinoid content). Sampling approaches vary as timing of testing.

- **Cannabinoid/pesticide labeling**
  - All states require THC content on label; 3 (CO, MA, OR, WA) require CBD content. No states require pesticide disclosure on label, differences in pesticide testing across states.

**Public Consumption, Zoning, Advertising**

- **Public/On-Site Consumption**
  - Public/on-site consumption currently prohibited (MA, ME, NV, OR, WA)
  - Local/municipal exemptions allowed for onsite consumption/social clubs (CA, CO, IL)
  - Allowed/will be allowed statewide (unless locality “opts out”) (AK, MI)

- **Zoning and Advertising/Marketing**
  - Zoning for retail locations varies (300 ft (NV) to 1000 ft (WA)) from child/community-related locations (many localities can change)
  - In AK, CA, NV, WA: no advertising 1000 ft from child/community-related locations
  - In all states: cannot advertise health benefits, therapeutic effects, or make false statements
  - Warnings on ads: MA, NV, OR, Billboard restrictions: CA, CO, WA
  - Some TV/radio/print/internet ads allowed in most states, with audience restrictions

**Summary of state non-medical legalization policy**

- Public health has a seat at the table, but so does industry
- Taxes vary widely, and new models may hold promise for public health
- Various medical/non-medical marketplace approaches
- Warning labels and universal symbols vary widely – potential implications?
- Opportunities to improve packaging...
- Onsite consumption/social clubs are an issue in every state
- Advertising is an area of opportunity for public health
- Public health funding…making progress, but insufficient to do this work
Differences in state regulation between marijuana-derived CBD and hemp-derived CBD

 Marijuana-derived CBD products
• Regulated by marijuana regulator (e.g., depts of revenue, taxation, etc.)
• Typically contains some THC
• Can only be sold in regulated retail stores

 Hemp-derived CBD products
• Typically regulated by Dept. of Agriculture; regulatory framework not yet clear...
• Contains <0.3% THC
• Sold virtually everywhere (and in some states, it CANNOT be sold in retail cannabis stores)

Public health implications for:
surveillance, social norms, vaping policy, youth access and potential use, advertising, messaging, testing, food enforcement, etc.

What’s happening on the ground in NY?

Isn’t cannabis just like...

How does cannabis overlap with other substances?

Major areas of overlap between cannabis and tobacco:
• Populations
• Products / modes of consumption
• Policies
• Industry

Implications for: surveillance; policy; public education; social norms

Population overlap

Source: Schauer, Berg, Kegler, Donovan, & Windle, 2016 (Data from the National Survey on Drug Use and Health)
11/12/19

Overlapping Methods of Use and Products

Methods of use:
• Both primarily smoked
• Emerging products look alike
• Emerging technologies crossing over...

Implications:
• For surveillance
• For policy
• For enforcement
• For messaging, public education


68

Policy Overlap

• Vaping policies
• Smokefree policies

→Learnings for tobacco control, too:
• Licensing
• Point of sale
• Product limitations
• Testing regulations

67

Vaping Lung Injury

What we know:
• Linked to a mode of consumption (vaping), not a substance...yet
• Involved substances include THC, CBD, and nicotine
• Licit and illicit markets

State Executive Orders
• Advising against vaping
• Banning vaping
• Banning Flavors
• Requiring ingredient disclosures
• Requiring point of sale warnings
• Setting infrastructure for ongoing recommendations

Vaping Lung Injury

Implications and considerations for cannabis...
• Flavors
• Other additives
• The device itself
• Testing and quality assurance processes in legal market
• Recall processes
• Unregulated markets

69

What do we know about secondhand marijuana smoke?

• THC has not been found to be carcinogenic, but cannabis smoke has...¹
• Cannabis smoke → many of the same constituents as tobacco smoke, and some in higher concentrations.²
• CA Office of Environmental Health Hazard Assessment: marijuana is a carcinogen in 2009 (w/ at least 33 carcinogens present in the smoke).³
• American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) considers marijuana smoke and indoor pollutant.

70

Why is this a complicated landscape?

Equity issues
• Banned from public spaces
  → use at home
• Use in public and rented housing
  → disparities in law enforcement

Science still unclear, lacking research and surveillance data
Cannabis ≠ Commercial Tobacco Solutions?
Industry: Similarities to Big Tobacco

- Commercial industry
- Advertising
- Youth Appeal
- Harm reduction language
- Marketing, point of sale issues

Big Tobacco and Big Marijuana merging?

- Federal prohibition and state laws are limiting now....
- Big tobacco has long been interested in the marijuana industry
  1
- Evidence of current interest:
  - Name changes to broaden brand potential
  - Cannabis industry people moving onto tobacco industry boards, and vice versa
  - Acquisitions of stakes in cannabis companies
  - Acquisitions of patents on specific cannabis strains/products

Public Health Implications and Challenges

- Touches many areas of public health and safety:
  - Adolescent health
  - Reproductive/maternal/child health
  - Chronic disease
  - Tobacco control, opioid prevention, other substance use
  - Injury prevention and control (drugged driving, accidental/consumption/ingestion)
  - Environmental health (pesticides, lab testing, food safety, secondhand smoke exposure)
  - Behavioral health
  - Occupational health
  - Equity/Inequities
  - Often a new area for public health agencies (capacity building);
  - Lack of data, surveillance, research to inform messaging, education, programming;
  - Limited funding for public health agencies to do this work;
  - Differences from other substances like tobacco, alcohol, and opioids.

What is public health doing?

- Surveillance/monitoring
- Public education:
  - Educating adults about the law, responsible use
  - Drive high get a DUI campaigns
  - Campaigns for kids (and parents), pregnant & breastfeeding women
  - Safe storage/edibles messages
- Building coalitions/capacity
- Contributing to research
- Educating policymakers
Main take-aways for prevention and public health

- Policy is far ahead of the science.
- “Head in the sand” is no longer an option.
- Public health must have a seat at the table (and needs to be funded).
- Acknowledge both harms and potential benefits.
- Cannabis is different from other substances (but has overlaps).
- Broad coalitions across government are needed – public health does not have all the answers here...
- Learn from other states...and countries

THANK YOU!

Contact information:

gillian@gschauerconsulting.com
schauerg@uw.edu