Marijuana prevention in a changing legal environment

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Reefer Madness

The ghost of this movie still haunts the way health messages are heard regarding marijuana.
Things have changed

Questions

- California’s Proposition 19 failed in 2010, and Initiative 502 may fail in Washington. Could it be that in reality we really don’t have to worry about this topic?
  - Yep, legalization may be dead and gone in a few months
  - Nope, no matter what the pendulum seems to be swinging in one direction only.
- Should lung health be our primary marijuana concern?
  - Sure, smoking anything has got to be bad
  - Who knows, the research is too murky
  - Nope, marijuana poses much more serious risks than lung problems.
Questions

• According to credible recent research, marijuana actually _____ crash risk.
  - Increases
  - Has no effect on
  - Decreases
  - None of the above, there is no credible research

• We have agreed upon definitions of moderate and low risk levels of marijuana use.
  - True
  - False

So what’s in the news?

Screen image taken 6/10/12
Medical Marijuana

<table>
<thead>
<tr>
<th>Medical Marijuana States</th>
<th>State Legislation Pending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>Montana</td>
</tr>
<tr>
<td>Arizona</td>
<td>Nevada</td>
</tr>
<tr>
<td>California</td>
<td>New Jersey</td>
</tr>
<tr>
<td>Colorado</td>
<td>New Mexico</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Rhode Island</td>
</tr>
<tr>
<td>Delaware</td>
<td>Vermont</td>
</tr>
<tr>
<td>Hawaii</td>
<td>Washington</td>
</tr>
<tr>
<td>Maine</td>
<td>Washington, D.C.</td>
</tr>
<tr>
<td>Maryland*</td>
<td>Maryland*</td>
</tr>
<tr>
<td>Michigan</td>
<td></td>
</tr>
<tr>
<td>Alabama</td>
<td>Massachusetts (Ballot?)</td>
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<tr>
<td>Arkansas (Ballot?)</td>
<td>Missouri</td>
</tr>
<tr>
<td>Idaho</td>
<td>New Hampshire</td>
</tr>
<tr>
<td>Indiana</td>
<td>North Dakota (Ballot?)</td>
</tr>
<tr>
<td>Iowa</td>
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<td>Kentucky (Ballot?)</td>
<td>Pennsylvania</td>
</tr>
<tr>
<td>Maryland*</td>
<td>West Virginia</td>
</tr>
<tr>
<td>Wisconsin</td>
<td></td>
</tr>
</tbody>
</table>

Over 98 Million Americans live in a Medical Marijuana State*

* Using 2009 U.S. Census data

Varying Medical Marijuana Controls

Spectrum of controls

- California does not require patient registration, list of conditions based upon physician judgment.
- Arizona’s new law more specific list of conditions, and requires patient registration.
- Washington appears to have a specific list of conditions, require that traditional medicines fail, and does not permit dispensaries.
Studying the Ads

- Sampled 335 ads placed in major weekly newspapers from all states with medical marijuana laws as of June 2010.
- Coded them using a variety of methods
- Found three main themes:
  - Traditional medicine
  - Holistic/alternative medicine
  - Counterculture/recreation
- Varies substantially by state.

CA Marijuana Advertising

Sexualized images
Happy Hour Specials
WA Marijuana Advertising – Tame

2012 Non-Medical Use Legalization Ballot initiatives so far

<table>
<thead>
<tr>
<th>State</th>
<th>Initiatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>1 Initiative</td>
</tr>
<tr>
<td>Washington</td>
<td>1 Initiative</td>
</tr>
<tr>
<td>Possible:</td>
<td>Michigan, Missouri, Montana, Nebraska, Ohio, Oregon</td>
</tr>
</tbody>
</table>

Already Decriminalized
California Example – An 18 Year Old

<table>
<thead>
<tr>
<th>Holding &lt; 1 oz Marijuana</th>
<th>Holding a Can of Beer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infraction Citation</td>
<td>Misdemeanor</td>
</tr>
<tr>
<td>$100 Fine (no record)</td>
<td>$250 First Offense $500 Second</td>
</tr>
<tr>
<td>DMV Action Unclear</td>
<td>Loss of Drivers License for 1 year</td>
</tr>
</tbody>
</table>

Annual Use from MTF

FIGURE 5-3a
Marijuana: Trends in Annual Prevalence among Respondents of Median Ages 18 through 50, by Age Group
What about Prevention?

• Cannot rely on illegal status to frame discussion.
• Need to avoid “Reefer Madness” mistakes.
• What does the research show?
• What levels of use are most harmful?
• Are there ways of preventing harmful use?

Physical Health

• Conflicting evidence of lung cancer (c.f. Han et al., 2010 and Chen et al., 2008).
• Pulmonary functioning improvements (Pletcher et al., 2012).
• Possible increase in testicular germ cell tumors with very heavy use (Trabert et al., 2011).
• Decrease in head and neck tumors (Aldinton et al., 2008). Also other therapeutic effects of cannabinoids on tumors (see Bifulco et al., 2006).
Maternal use

- Huizink and Mulder (2006) - Focus on functional abnormalities not malformations. They also reviewed smoking and alcohol.
- Results:
  - Decrease cognitive functioning.
  - Lower verbal skills.
  - Lower memory scores.
  - With older children (9 and 12) executive function - needed for problem solving - was hampered.
  - Hyperactivity, delinquent behavior, impulsive in 6 year olds.

Proposed DSM V Revisions

- Cannabis Use Disorder – includes withdrawal as a possible criterion.
- Merges the abuse and dependence disorders.
- Has levels (moderate or severe).
- Categories:
  - With or without Physiological Dependence based upon withdrawal and tolerance.
- Separate cannabis withdrawal.

DEA “Abuse” vs. DSM “Abuse”

- Abuse: “When drugs are used in a manner or amount inconsistent with the medical or social patterns of a culture.” (p.32 DEA, 2011)
- DEA Working* Definition of Potential for Abuse:
  - Taking the drug in amounts that create hazard to health and safety.
  - Significant diversion from legitimate drug channels.
  - Taking on own accord.
- Drugs are abused to “alter mood, thought, and feeling.”
- “The ‘feel good’ effects of the drugs contribute to their abuse.”
*Abuse not defined within CSA.


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Academic Performance

- Hunt et al. (2010) found marijuana use disorder lessened the chance of college degree.
- Brill (1982) found no relationship between marijuana use and poor academic or other social adaptation.
- Little support for “amotivational syndrome.”
- Only suggestive and weak link to other psychopathology like schizophrenia.
Impaired Driving

- Some believe that marijuana posses no risk to road safety.

"No one has ever been killed in a traffic accident because of marijuana, but look at the alcohol numbers," said Barbara Cooke, 24. "I think it should be regulated and legalized."

- quote from VisaliaTimesDelta.com, 9/30/10

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High School Seniors

For high school seniors, O’Malley & Johnston (2007) found that driving after marijuana was more common than driving after heavy drinking.
Hear about this one?

It looks like good science: But it’s not!

estimating a model that includes both state and year fixed effects. Specifically, the baseline estimating equation is:

\[ \ln(\text{Fatalities Total}_{st}) = \beta_0 + \beta_1 \text{MML}_{st} + \mathbf{X}_{st} \beta_2 + \nu_s + \nu_t + \nu_{st} \]

where \( s \) indexes states and \( t \) indexes years. The variable \( \text{MML}_{st} \) indicates whether a MML was in effect in state \( s \) and year \( t \), and \( \beta_1 \), the coefficient of interest, represents the marginal effect of legalizing medical marijuana. In alternative specifications we replace \( \text{Fatalities Total}_{st} \) with the remaining dependent variables listed in Table 5.

Using trends to claim causation

![Graph showing trend](image)

Epidemiological Findings

- While there are conflicting results, reviews have found consensus that there is increased risk.
- Odds of being involved in crash about double (Asbridge et al., 2012).
- Possible cutoff THC/whole blood level of 5 ng/mL.
- Arria, and colleagues (2011) found in their sample of college students that drugged driving prevalence is similar to drunk driving. Defined drugged driving as “drove while high.”
THC in the Blood

![Graph showing THC levels over time]

Figure 1. Plasma levels of (a) mean THC, (b) mean 11-OH-THC, (c) mean THCCOOH, and (d) mean total THC levels for six volunteers during and after receiving a single oral dose of 20 mg THC 120 mg oral THC. The panel 3-minute period followed by 28 of digital hourly spatial (2-second) task and 10-second task period during an 11-28 time period.


Mixing with Alcohol

- Even very low levels of each can cause dramatic increases in impairment.

- THC level beginning to show impairment was 5 ng/mL dropped to 2.3 ng/mL when any alcohol was present.

- Grotenhermen et al. (2007) note that cannabis impaired automatic functions, while alcohol impaired cognitive functions. Thus the compensatory ability of marijuana users is impaired by even small amounts of alcohol.
Recommendations for Driving

- *per se* limit set at 7-10 ng/mL.
- Advise users to wait 3 hours before driving.
- Drivers should not mix even low amounts of alcohol with cannabis.

Prevention Strategies

- Comprehensive Strategy:
  - Motivational focus
  - Alternative focus
  - Access focus
Access Focused

• Acknowledge DFSCA supremacy
• Most difficult to control in shifting environment.
• Advertising restrictions.
• Community Action:
  – Examples are forming such as www.butwhataboutthechildren.org
  – Conditional Use Permits around campus.
  – Enhanced DUID enforcement efforts.

When should Public Health professionals get involved?

• It’s now or never
• Pick your battles
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Thank you

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