Welcome
Please stand by. We will begin Shortly.

“Big Marijuana – Lessons from Big Tobacco”

Thursday, February 19, 2015
11:00 am PST/ 2:00 pm ET
(90 minutes)
Disclosure

Dr. Kimber Richter, Dr. Sharon Levy, Catherine Saucedo, and Dr. Steven Schroeder have disclosed no financial interest/arrangement or affiliation with any commercial companies who have provided products or services relating to their presentation or commercial support for this continuing medical education activity.
Moderator

Catherine Saucedo

• Deputy Director, Smoking Cessation Leadership Center, University of California, San Francisco
• catherine.saucedo@ucsf.edu
Thank you to our funders
Housekeeping

- All participants will be in **listen only mode**.
- Please **make sure your speakers are on** and adjust the volume accordingly.
- If you do not have speakers, please request the dial-in via the chat box.
- **This webinar is being recorded** and will be available on SCLC’s website, along with the slides.
- **Use the chat box to send questions** at any time for the presenters.
Steven A. Schroeder, MD

- Director, Smoking Cessation Leadership Center
- Distinguished Professor of Health and Health Care, Department of Medicine, UCSF
Today’s Speaker

Kimber P. Richter, PhD, MPH
Director of UKanQuit and Professor in the Department of Preventive Medicine and Public Health at the University of Kansas Medical Center
Sharon J. Levy, MD, MPH
Assistant Professor of Pediatrics at Harvard Medical School and the Director of the Adolescent Substance Abuse Program in the Division of Developmental Medicine at Boston Children's Hospital
Big Marijuana – Lessons From Big Tobacco

Kimber Richter, PhD, MPH
Sharon Levy, MD, MPH
Big Marijuana — Lessons from Big Tobacco
Kimber P. Richter, Ph.D., M.P.H., and Sharon Levy, M.D., M.P.H.

The United States is divided over the legalization of marijuana. Arguments in favor include protection of individual rights, elimination of criminal sentencing for minor offenses, collection of tax revenue, and elimination of the black market. Counterarguments include the possible escalation of use, adverse mental and physical health effects, and potential medical and social costs.

Some steps have already been taken to reduce harsh and racially biased sentencing. There is growing support in Congress to eliminate federal mandatory minimums for drug offenses, and 19 states have either decriminalized or eliminated jail time for possession of small amounts of marijuana. Furthermore, 21 states and the District of Columbia have legalized the medical use of marijuana.

Washington State and Colorado went further, authorizing the retail sale of marijuana and opening the door to a legal marijuana industry. Given the lessons learned from the 20th-century rise of another illegal addictive substance, tobacco, we believe that such an industry could transform marijuana and its effects on public health. Like tobacco, marijuana harms health and is addictive; unlike alcohol, both tobacco and marijuana came of age after the Industrial Revolution. And although the United States has, since tobacco’s rise, adopted regulatory structures designed to protect consumers, they do not apply to marijuana, in part because marijuana use and sales remain illegal under federal law. Colorado and Washington are developing regulatory infrastructures to fill this gap, but the goals and potential effectiveness of their proposed regulations are unclear. No evidence exists regarding which regulations might minimize population harm from marijuana. The marijuana industry’s trajectory could therefore repeat tobacco’s.

In its current form, smoked marijuana is less deadly than tobacco. Although case-control studies have found increased mortality associated with heavy marijuana use — attributable to vehicle crashes from driving while high, suicide, respiratory cancers, and brain cancers — the nonfatal adverse effects of marijuana use are much more prevalent. These include respiratory damage, cardiovascular disease, impaired cognitive development,
## Legalizing Marijuana

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Individual rights</td>
<td>• Health/mental health harms</td>
</tr>
<tr>
<td>• Eliminating harsh sentencing</td>
<td>• Developmental harms</td>
</tr>
<tr>
<td>• Tax revenues</td>
<td>• Misguided treatment</td>
</tr>
<tr>
<td>• Eliminate black markets</td>
<td>• Social costs</td>
</tr>
</tbody>
</table>

- Pros - Individual rights, Eliminating harsh sentencing, Tax revenues, Eliminate black markets
- Cons - Health/mental health harms, Developmental harms, Misguided treatment, Social costs
Marijuana is a Moving Target

In 1970, 1 joint = .5 g weight=5 mg
• 10 joints (heavy daily use) 50 mg

<table>
<thead>
<tr>
<th>Year</th>
<th>THC %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970’s</td>
<td>1.08</td>
</tr>
<tr>
<td>1980’s</td>
<td>2.83</td>
</tr>
<tr>
<td>1990’s</td>
<td>3.76</td>
</tr>
<tr>
<td>2000’s</td>
<td>5.73</td>
</tr>
</tbody>
</table>

Learning Lessons From Tobacco

20,679* Physicians
say “LUCKIES
are less irritating”
“LUCKIES
are less irritating”

It’s toasted”

Your Throat Protection against irritation against cough

About

443,000

U.S. Deaths Atributable
to Cigarette Smoking

Lung Cancer

126,000 (28%)

Ischemic Heart Disease

126,000 (28%)

Other Diagnoses
44,000 (10%)

Stroke 15,900 (4%)

Other Cancers
35,300 (8%)

NOW 540,000!

2018-02-05

www.arc.org
Spit to Cigarettes

• 1880s <1% of tobacco consumed as cigarettes
• New mild strains developed
• Flue curing made tobacco inhalable
• Bonsack Machine could produce 70k cigs/day
• American Tobacco Co. created monopoly
• Tobacco tax financed Civil & Spanish-American wars
• 1900 - 1 out of 3 tobacco users smoked cigs

Cigarettes for All

• WWI spread use of cigarettes
• 1922-cigarette smokers outnumbered other tobacco users
• 1949 – 45% of Americans smoked
• 1950s introduced asbestos-filtered cigarettes
• 50s-60s – introduced free-basing with ammonia to promote rapid absorption
• 1970s Virginia Slims/Silvas marketed to women

Policy Efforts

• 1900 3 states banned cigarette sales due to Lucy Gaston campaign against youth tobacco use
• 1965 Labeling act
• 1967 FCC ruling
• 1970 Hearings on advertising
• 1990s Liability claims
• 1998 Master settlement agreement
• 2009 US FDA has regulatory oversight over tobacco products

Tobacco Industry Lobbied Against Meaningful Regulation

- 1906 Food and Drug Act
- 1966 Fair Labeling and Packaging Act
- 1970 Controlled Substance Act
- 1972 Consumer Product Safety Act
- 1976 Toxic Substances Act

Product, Marketing, Lobbying
How’s That Working for Us?

“The Public Health Service feels the weight of the evidence is increasingly pointing in one direction: that excessive smoking is one of the causative factors in lung cancer.”

Surgeon General Leroy E. Burney July 12, 1957

The benefits of electronic cigarettes

- NO cancer causing chemicals
- Healthy alternative to the real thing
- Smoke in smoke free areas
- Cheaper alternative
- No cancer causing tabacco
- No fire therefore not a fire risk
- No passive smoke to those around
- No bitter aftertaste

Read More...
Marijuana
Cannabinoids in Marijuana

- delta-9-tetrahydrocannabinol (THC)
- delta-8-tetrahydrocannabinol
- cannabidiol
- cannabinol
- cannabichromene
- cannabigerol
- More than 100 in total

Delta-9-tetrahydrocannabinol

Anandamide
THC vs. Anandamide

- Anandamide blocks the release of a number of neurotransmitters thereby reducing neuronal activity.
- THC has a MUCH STRONGER, LONGER effect than anandamide on brain cells.
- THC interferes with anandamide function hampering the innate homeostatic system in chronic marijuana users.
The neuron’s “volume control”: dials down neuron activity when too strong.
Dopamine Pathways

- Frontal cortex
- Nucleus accumbens
- VTA

Functions
- Reward (motivation)
- Pleasure, euphoria
- Motor function (fine tuning)
- Compulsion
- Perseveration

Serotonin Pathways

- Striatum
- Substantia nigra
- Hippocampus
- Raphe nucleus

Functions
- Mood
- Memory processing
- Sleep
- Cognition
• THC reduces hippocampal neuron activation
• With chronic THC exposure, neurons are gradually lost due to continual suppression
• THC users have smaller hippocampuses, and poorer memory

Persistent cannabis users show neuropsychological decline from childhood to midlife

Madeline H. Meier\textsuperscript{a,b,1}, Avshalom Caspi\textsuperscript{a,b,c,d,e}, Antony Ambler\textsuperscript{e,f}, Honalene Harrington\textsuperscript{b,c,d}, Renate Houts\textsuperscript{b,c,d}, Richard S. E. Keefe\textsuperscript{d}, Kay McDonald\textsuperscript{f}, Aimee Ward\textsuperscript{f}, Richie Poulton\textsuperscript{f}, and Terrie E. Moffitt\textsuperscript{a,b,c,d,e}

\textsuperscript{a}Duke Transdisciplinary Prevention Research Center, Center for Child and Family Policy, \textsuperscript{b}Department of Psychology and Neuroscience, and \textsuperscript{b}Institute for Genome Sciences and Policy, Duke University, Durham, NC 27708; \textsuperscript{d}Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC 27710; \textsuperscript{d}Social, Genetic, and Developmental Psychiatry Centre, Institute of Psychiatry, King’s College London, London SE5 8AF, United Kingdom; and \textsuperscript{f}Dunedin Multidisciplinary Health and Development Research Unit, Department of Preventive and Social Medicine, School of Medicine, University of Otago, Dunedin 9054, New Zealand

The Dunedin Study
N=1,037

Assessment ages
13 yrs (Pre-initiation)  18 yrs  21 yrs  32 yrs  38 yrs

Source: Meier et al. PNAS, 2012
Average IQ change:

• “Never used”
  • 99.8 to 100.6

• “Mj dependent 3+ yrs”
  • 99.7 to 93.9

Source: Meier et al. PNAS, 2012
## Association between cannabis use and schizoaffective disorder

<table>
<thead>
<tr>
<th></th>
<th># Exposure</th>
<th># Cases</th>
<th>HR Crude</th>
<th>HR adjusted*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never used cannabis</td>
<td>39,978</td>
<td>47</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ever used cannabis</td>
<td>5,109</td>
<td>12</td>
<td>2.1 (1.1-3.8)</td>
<td>0.8 (.2-2.9)</td>
</tr>
<tr>
<td>&gt;50 times</td>
<td>855</td>
<td>7</td>
<td>7.5 (3.4-16.7)</td>
<td>7.4 (1.0 – 54.3)</td>
</tr>
</tbody>
</table>

* Adjustments for: prior personality disorders at conscription, IQ, disturbed behavior in childhood, social adjustment, risky use of alcohol, smoking, early adulthood socioeconomic position, use of other drugs, brought up in a city. The category “Ever used cannabis” includes all individuals who reported cannabis use, including those who reported “>50 times”.

Manrique-GarciaBMC Psychiatry, 12, 112.
Patient with Schizophrenia
Age at First Use and Later Risk of Marijuana Disorder

## “Medical Marijuana” v. Cannabinoids

<table>
<thead>
<tr>
<th>“Medical Marijuana”</th>
<th>Cannabinoids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant species</td>
<td>Pharmaceutical product</td>
</tr>
<tr>
<td>Decided by popular vote in 18 states</td>
<td>Regulated by the FDA</td>
</tr>
<tr>
<td>Delivered by smoking or orally</td>
<td>Delivered by inhalation or orally</td>
</tr>
<tr>
<td>“Recommendation” by physician</td>
<td>Standard prescribing procedures</td>
</tr>
<tr>
<td>Efficacy poorly defined</td>
<td>Efficacy carefully studied</td>
</tr>
</tbody>
</table>
IOM poses “compassionate” use to relieve suffering in terminally ill patients.

CA passes “medical marijuana ballot initiative”

20 states and DC have “medical marijuana laws”

CNN documentary supporting “medical marijuana”

History of “Medical Marijuana”
“Charlotte’s Web”
Cannabinoids have pharmaceutical potential, but ......
Marijuana is not medicine
1. Limited evidence of therapeutic efficacy of medical marijuana

<table>
<thead>
<tr>
<th>Condition</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemotherapy induced Nausea and Vomiting in Adults</td>
<td>Modest evidence&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Chronic Pain</td>
<td>Insufficient evidence&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>HIV/AIDS and Anorexia associated with AIDS</td>
<td>Insufficient evidence&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Neurological Problems</td>
<td>Insufficient evidence&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

*Not one single study has ever included children*

2. No standardization of product
2. No standardization of product
2. No standardization of product
3. Dispensaries are NOT pharmacies
Dispensaries: the Colorado experience

“Medical Marijuana” was approved in Colorado in 2001.

The Colorado Medical Marijuana Code creating a commercial scheme for “dispensaries” went into effect July 1, 2010.
Applications for marijuana card in CO


<table>
<thead>
<tr>
<th>Condition</th>
<th># Patients</th>
<th>% Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>495</td>
<td>1%</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>837</td>
<td>1%</td>
</tr>
<tr>
<td>Cachexia</td>
<td>1,137</td>
<td>1%</td>
</tr>
<tr>
<td>Seizures</td>
<td>1,329</td>
<td>2%</td>
</tr>
<tr>
<td>Cancer</td>
<td>2,217</td>
<td>3%</td>
</tr>
<tr>
<td>Severe Nausea</td>
<td>9,998</td>
<td>12%</td>
</tr>
<tr>
<td>Muscle Spasms</td>
<td>14,255</td>
<td>17%</td>
</tr>
<tr>
<td>Severe Pain</td>
<td>76,887</td>
<td>94%</td>
</tr>
</tbody>
</table>


http://www.cdphe.state.co.us/hs/Medicalmarijuana/
<table>
<thead>
<tr>
<th>Condition</th>
<th># Patients</th>
<th>% Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>495</td>
<td>1%</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>837</td>
<td>1%</td>
</tr>
<tr>
<td>Cachexia</td>
<td>1,137</td>
<td>1%</td>
</tr>
<tr>
<td>Seizures</td>
<td>1,329</td>
<td>2%</td>
</tr>
<tr>
<td>Cancer</td>
<td>2,217</td>
<td>3%</td>
</tr>
<tr>
<td>Severe Nausea</td>
<td>9,998</td>
<td>12%</td>
</tr>
<tr>
<td>Muscle Spasms</td>
<td>14,255</td>
<td>17%</td>
</tr>
<tr>
<td>Severe Pain</td>
<td>76,887</td>
<td>94%</td>
</tr>
</tbody>
</table>


http://www.cdphe.state.co.us/hs/Medicalmarijuana/
<table>
<thead>
<tr>
<th>Reported Condition</th>
<th>Total # Patients 1/31/2009</th>
<th>Total # Patients 1/31/2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cachexia, cancer, HIV/AIDS, glaucoma, severe nausea, seizures, muscle spasms</td>
<td>2829</td>
<td>31,258</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11X increase</td>
</tr>
<tr>
<td>Just “severe pain”</td>
<td>1559</td>
<td>46,619</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30X increase</td>
</tr>
</tbody>
</table>

http://www.cdphe.state.co.us/hs/Medicalmarijuana/
Age of Patients Using

Total Patients = 127,816

Average age = 41 years

- <25: 12.3%
- 25-34: 27.1%
- 35-44: 19.6%
- 45-54: 17.3%
- 55-64: 14.1%
- 65+: 9.7%

http://www.cdphe.state.co.us/hs/Medicalmarijuana/

Graph courtesy of Christian Thurstone, MD
Teen Past Month MJ Use
National v. Colorado

2011 National Average = 7.64%
2011 Colorado Average = 10.72%
Drug-related School Suspensions and Expulsions in Colorado

No. Reported

Year

Drug-related School Suspensions and Expulsions in Colorado

No. Reported

Year

Suspensions
Expulsions

http://www.cde.state.co.us/cdereval/rv2011sdiincidents.htm
Source of marijuana for adolescents entering SUD treatment program

Decriminalization and Legalization

Decriminalization: marijuana remains illegal but punishment for possession and use are reduced to non-criminal offences.

*Intent: Discourage use, prohibit distribution.*

Legalization: marijuana becomes a legal product that adults can buy and use and companies can sell and market

*Intent: Eliminate black market, regulate sales, collect taxes.*
Impact of Legalization: Colorado

• The city Denver has the highest rate of teen marijuana use in the country.

• The rate of car crashes with drivers testing positive for marijuana in Colorado have almost tripled between January and April 2014.

Changing Product

The THC content of U.S. marijuana has more than **doubled** over the past 40 years.

<table>
<thead>
<tr>
<th>Decade</th>
<th>Avg THC %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970’s</td>
<td>1.08</td>
</tr>
<tr>
<td>1980’s</td>
<td>2.83</td>
</tr>
<tr>
<td>1990’s</td>
<td>3.76</td>
</tr>
<tr>
<td>2000’s</td>
<td>5.73</td>
</tr>
</tbody>
</table>
• Edible products are available for people who do not want to smoke.
• Producers are manufacturing strains that they *claim* are less addictive or less harmful to mental health.
• New vaporizer delivery systems now yield an equivalent THC dose to smoked marijuana with less throat irritation.
• Pure cannabis oils (100%) THC are now available.
• “Because they're so potent, you don't need a large amount to get high.”
• “Reduces exposure to other toxins.”
High potency THC

• **Increases risk of psychosis**

• **Decreases age of onset psychosis**

• **Impairs “creative thinking”**
Exclusive: Bethenny Frankel Planning to Launch “Skinnygirl Marijuana”, a Strain of Pot That Won’t Cause the Munchies!

An insider close to the Skinnygirl cocktails creator, tells Us, “She read about how profitable the cannabis industry is and wants to get in on that.”

-US Magazine online
Conclusions

• Marijuana is harmful for the adolescent brain
• Marijuana is not medicine. Administering cannabinoids via marijuana is a disservice to those who receive it.
• The impact of legalization is unknown. The history of the tobacco industry should make us cautious about allowing a marijuana industry, regulated by the free market, to develop.
Questions and Answers

• Submit questions via the chat box
FREE CME/CEUs of up to 1.5 credits are available to all attendees of this live session. Instructions will be emailed after the webinar.

SCLC has added two new recorded webinars, offering FREE CE credit, on our website: “Tobacco Kills: Intervention and Policy Solutions in Addiction Treatment” and “Where's the Justice? Tobacco Use and the Incarcerated”. Please refer to the SCLC website for details: http://smokingcessationleadership.ucsf.edu/webinars/cme
Visit us online
• http://smokingcessationleadership.ucsf.edu

Call us toll-free
• 1-877-509-3786
CME/CEU Statement

Accreditation:
The University of California, San Francisco (UCSF) School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

UCSF designates this live activity for a maximum of 1.5 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the webinar activity.

Nurse Practitioners and Registered Nurses: For the purpose of recertification, the American Nurses Credentialing Center accepts AMA PRA Category 1 Credit™ issued by organizations accredited by the ACCME.

Physician Assistants: The National Commission on Certification of Physician Assistants (NCCPA) states that the AMA PRA Category 1 Credits™ are acceptable for continuing medical education requirements for recertification.

California Pharmacists: The California Board of Pharmacy accepts as continuing professional education those courses that meet the standard of relevance to pharmacy practice and have been approved for AMA PRA category 1 credit™. If you are a pharmacist in another state, you should check with your state board for approval of this credit.

Social Workers: This course meets the qualifications for 1.5 hours of continuing education credit for MFTs and/or LCSWs as required by the California Board of Behavioral Sciences. If you a social worker in another state, you should check with your state board for approval of this credit.