

# Public Health Impact of Medical Marijuana and Legalization

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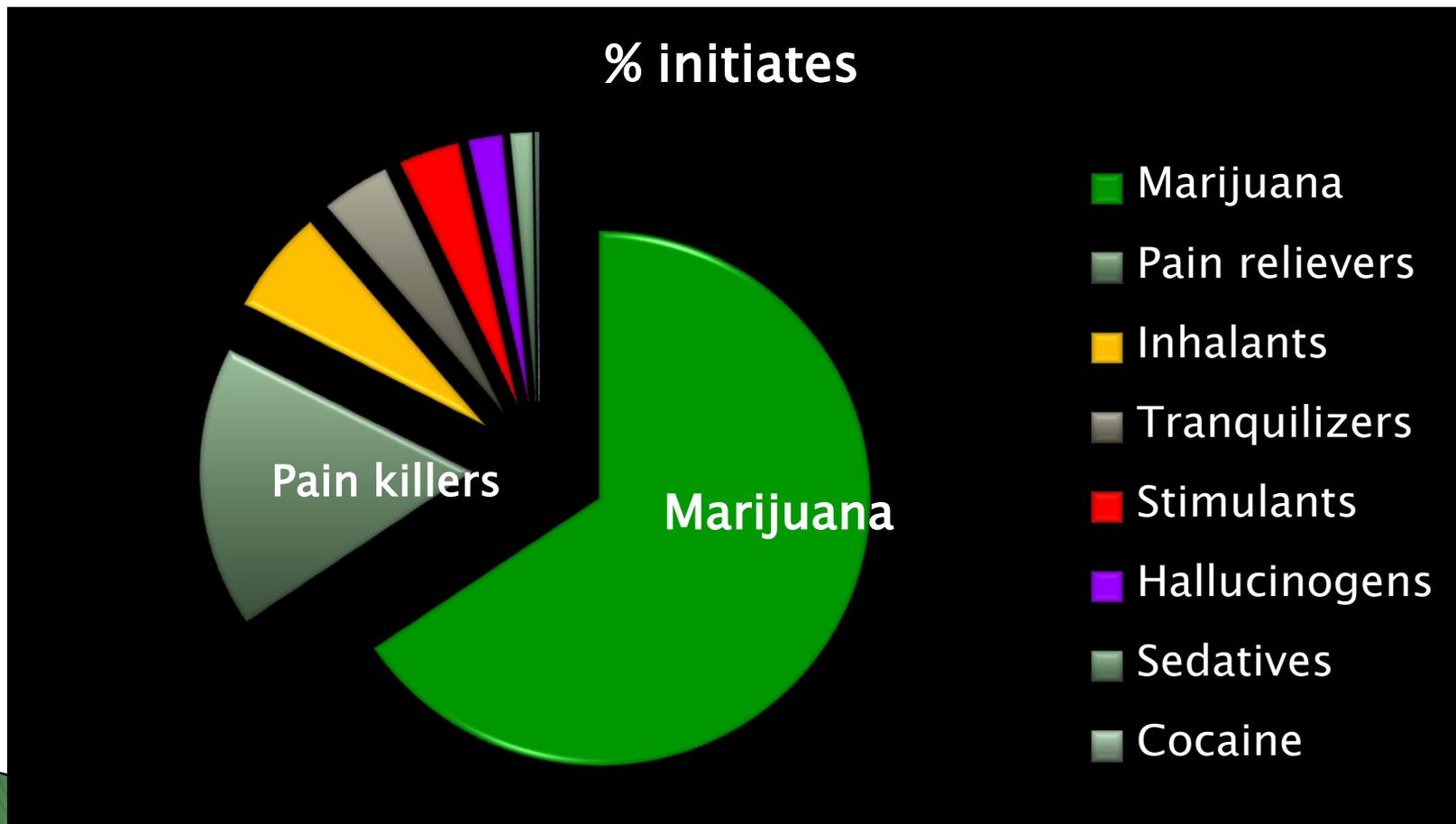
# Marijuana Epidemiology

- ▶ **Nationally, 2.7 million people over age 12 meet criteria for addiction to marijuana**
  - *2012 National Survey on Drug Use and Health*
- ▶ **Nationally, 40% of 9<sup>th</sup>–12<sup>th</sup> grade students have used marijuana**
  - *2013 CDC Youth Risk Behavior Surveillance Data.*
- ▶ **In Virginia, nearly 800,000 users**
  - Highest rates of use 18–25 year olds
  - *2014 Department of Behavioral Health and Development Services*

# Gateway **Drug** for 2.9 Million Initiates?

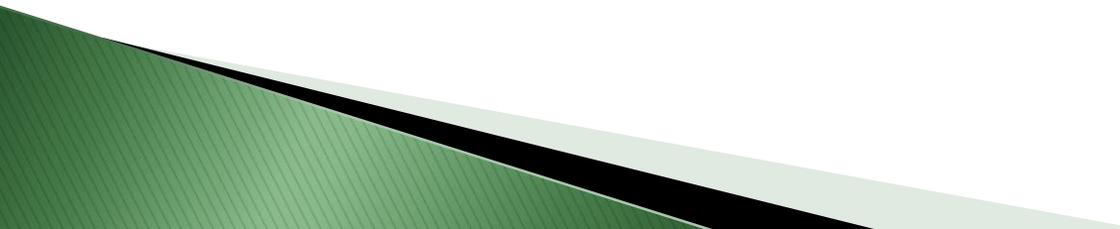
Marijuana the Most Common First Illicit Drug

*55.1 % were younger than 18 years*



Source: NSDUH 2102 survey; Reported September 2013

# *Now the Language is Changing*

- ▶ **Marijuana** as a **DRUG**
  - ▶ **Marijuana** as a **MEDICINE**
- 



# Defining the Language

## ▶ **Medical Marijuana**

- Allows an individual the to defend him or herself against criminal charges of marijuana possession if the defendant can prove a medical need for marijuana under state law.

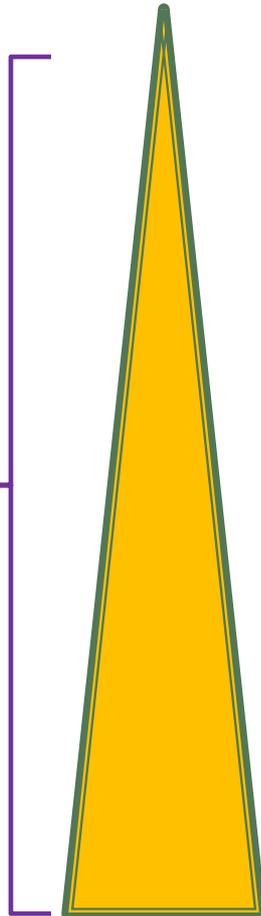
## ▶ **Marijuana Decriminalization**

- The repeal or amendment of statutes which made certain acts criminal, so that those acts no longer are crimes or subject to prosecution

## ▶ **Marijuana Legalization**

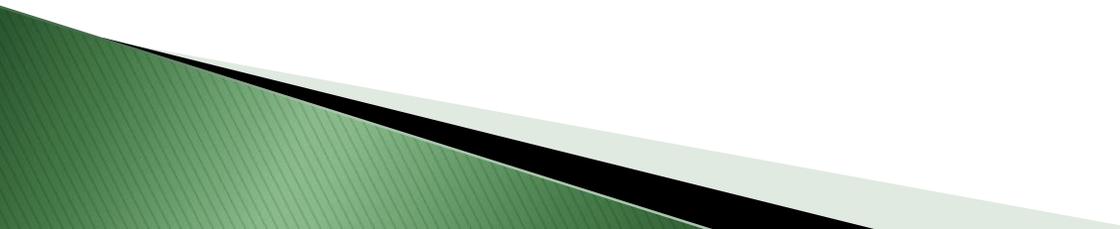
- Creating laws or policies which make the possession and use of marijuana legal under state law

PUBLIC  
HEALTH



# Medical Marijuana

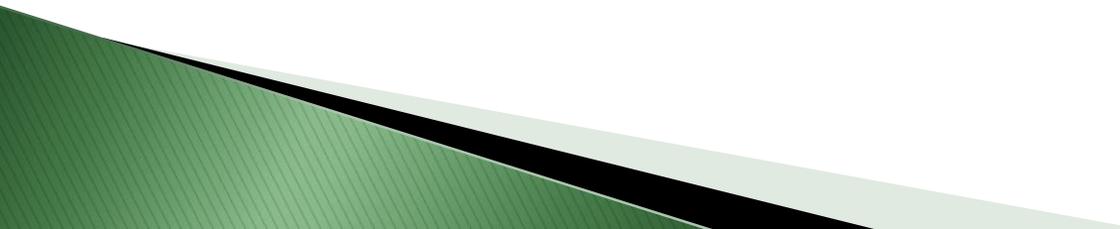
## Risks vs. Benefits of Marijuana

- ▶ Appetite Stimulant
  - ▶ Antiemetic
  - ▶ Impact on Behavior
  - ▶ Impact on Learning and Memory
  - ▶ Impact on Motor Coordination
- 

# Marijuana

- ▶ A safe and effective dose is not established
- ▶ The risk–safety profile is unclear
  - Interactions with other medications?
  - Impact on other disease conditions?
  - Long–term side–effects?

***NOT APPROVED BY THE FDA***



# Professional Organizations *AGAINST* Medical Marijuana

- ▶ The American Medical Association
- ▶ The American Society for Addiction Medicine
- ▶ The American Cancer Society
- ▶ American Glaucoma Society
- ▶ American Academy of Pediatrics
- ▶ National Multiple Sclerosis Society
- ▶ The Association of for Addiction Professionals
  - *“NAADAC, **does not support the use of marijuana as medicine.** Marijuana should be subject to the same research, consideration and study as any other potential medicine, under the standards of the U.S. Food and Drug Administration (FDA). Further, NAADAC does not support legislative or voter ballot initiatives to legalize marijuana for medical use.” (Jan 2011)*

# DEA – Controlled Substance Schedule

<http://www.deadiversion.usdoj.gov/schedules/index.html>

## ▶ Marijuana – Schedule I

- no currently accepted medical use in the United States
- a lack of accepted safety for use under medical supervision
- high potential for abuse

# FDA Approved Medications that Mimic Delta-9 THC

## ▶ **Cesamet (nabilone) – Schedule II**

- a high potential for abuse, may lead to severe psychological or physical dependence.
- **Indications**
  - **Nausea and vomiting associated with cancer chemotherapy** in patients who have failed to respond adequately to conventional antiemetic treatments

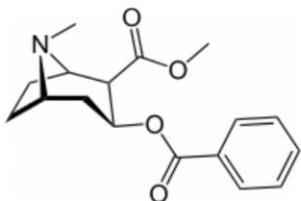
## ▶ **Marinol (dronabinol) – Schedule III**

- potential for abuse less than Schedules I or II and abuse may lead to moderate or low physical dependence or high psychological dependence.
- **Indications**
  - Treatment of anorexia associated with **weight loss in AIDS patients.**
  - **Nausea and vomiting associated with cancer chemotherapy** who have failed conventional therapy

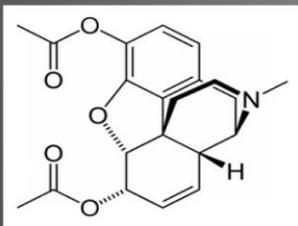
# Psychoactive Plants Also Produce Medications



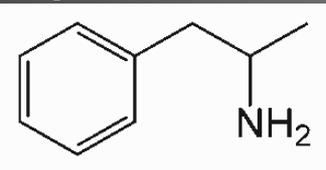
## Cocaine



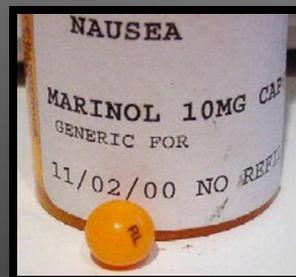
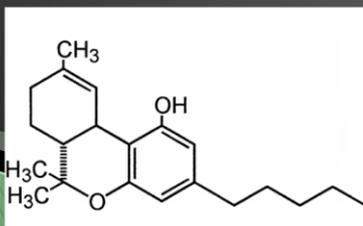
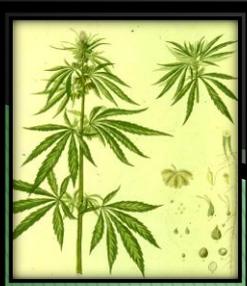
## Morphine



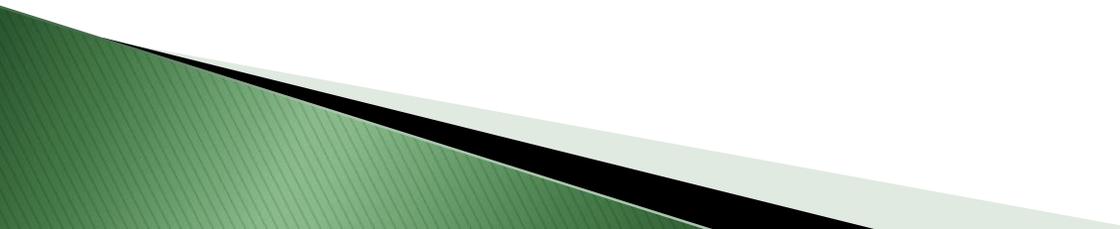
## Amphetamine



## $\Delta$ -9-tetrahydrocannabinol (THC)



**Marijuana: Are we really ready to call it a medicine?**



# Lack of Consistency in 'Approved' Conditions

## *State Medical Marijuana Laws*

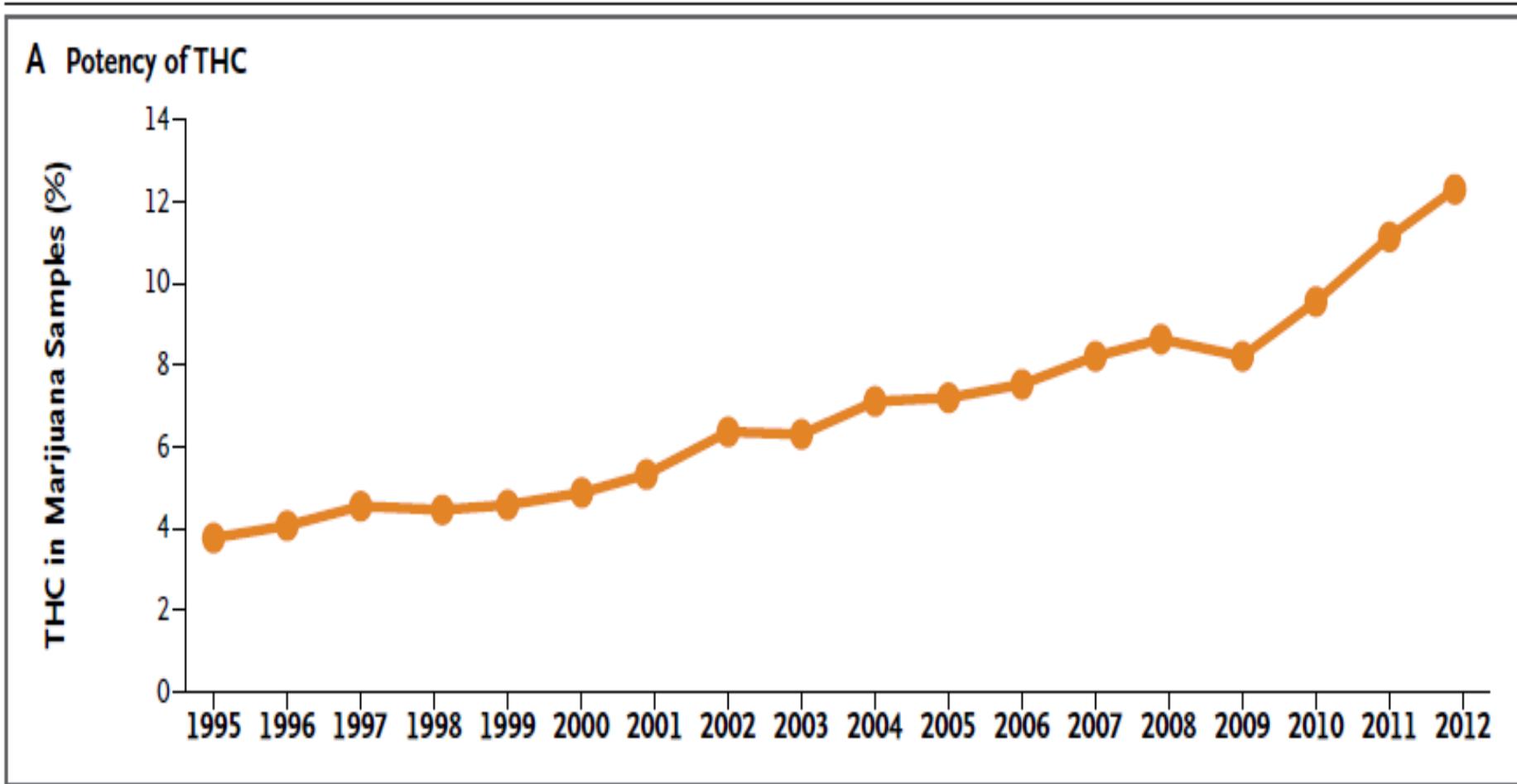
- ▶ **Common Indications:** Nausea, Pain, Multiple Sclerosis, Epilepsy, Glaucoma, HIV/AIDS, Cancer
- ▶ **Less Frequently:** Crone's Disease, Hepatitis C, Parkinson's, Alzheimer's, PTSD
- ▶ **Delaware:** Decompensated Cirrhosis
- ▶ **Illinois:** Over 40 medical conditions
  - Various Neuropathies, Lupus, Interstitial Cystitis
- ▶ **Montana** – Admittance into Hospice Care

# Lack of Consistency in

## *Possession Limits in State Medical Marijuana*

- ▶ Alaska – 1 oz usable 6 Plants (3M/3IM)
- ▶ Colorado – 2 oz 6 Plants (3 / 3)
- ▶ Maine – 2.5 oz 6 Plants
- ▶ Rhode Island – 2.5 oz 12 Plants
- ▶ Hawaii – 3 oz 7 Plants
- ▶ **Delaware** – **6 oz** –
- ▶ **California** – **8 oz** **6 M or 12 IM**
- ▶ Washington – 24 oz 15 Plants
- ▶ Oregon – 24 oz 24 Plants (6/18 )
  
- ▶ New Hampshire – 2 oz in a 10 day period

# Lack of Consistency in Strength



# If we say Marijuana is Medicine, then let's treat it as one.

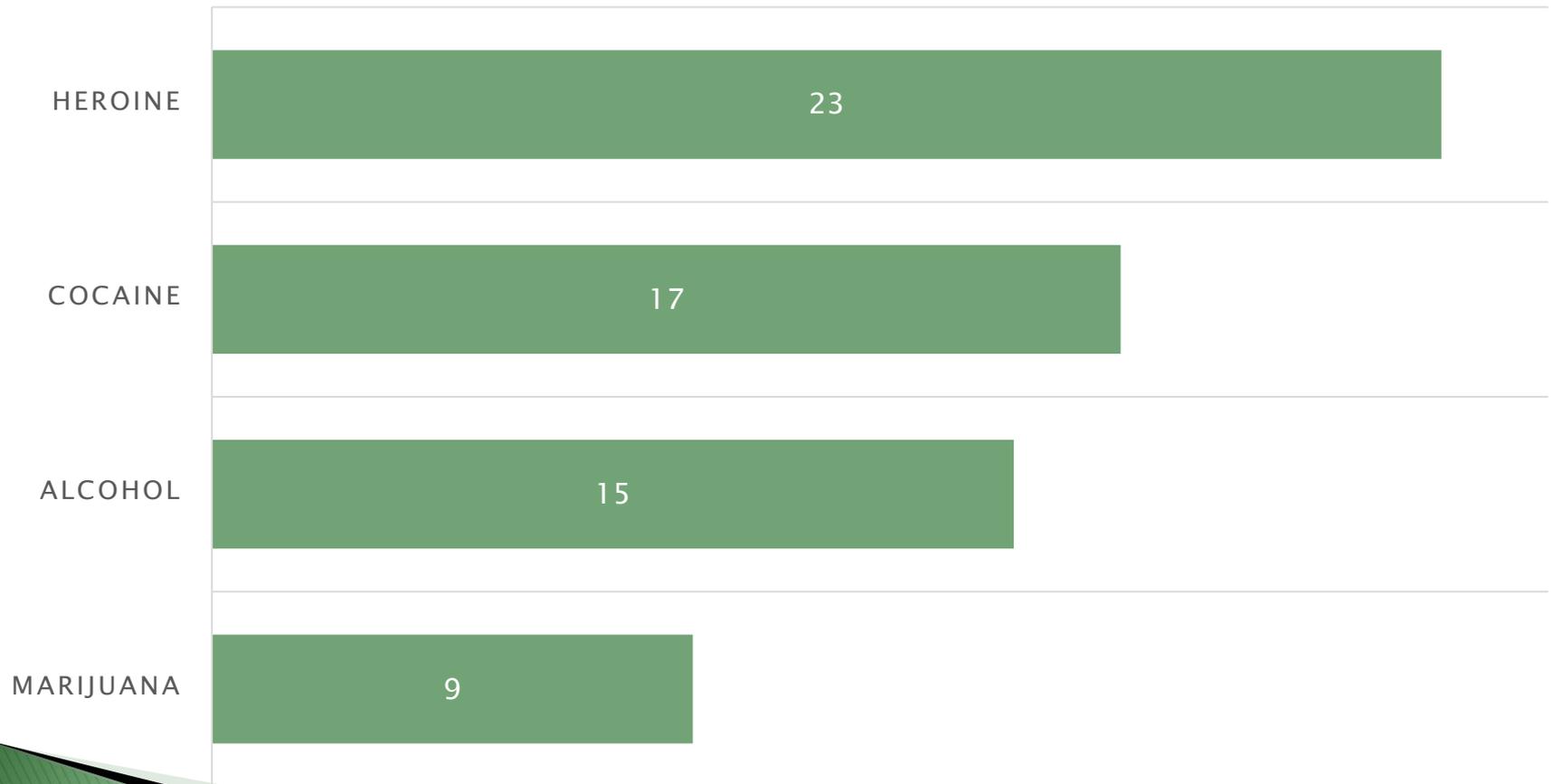
- ▶ Determine Indications
  - ▶ Develop dosage standards
  - ▶ Study short and long-term side-effects
  - ▶ Demonstrate effectiveness/safety beyond existing alternatives.
  - ▶ Determine appropriate DEA Schedule
  - ▶ Apply the same systematic standards for approval and use as all other medications used in the U.S.
- 

# And if Marijuana becomes an “approved” Medicine...

- ▶ **How will it Impact the Prescription Drug Epidemic?**
- ▶ Marijuana has high abuse potential:
  - Use not as directed
  - Not for intended purposes
  - For the experience or feeling it causes
- ▶ Drug Overdose Deaths leads all-cause mortality for 25–64 y/o surpassing in 2011 deaths due to motor vehicle crash deaths.
  - Predominant Medications: Opioids, Sedatives, Stimulants
    - Medications approved by FDA, regulated dispensing, trained professionals

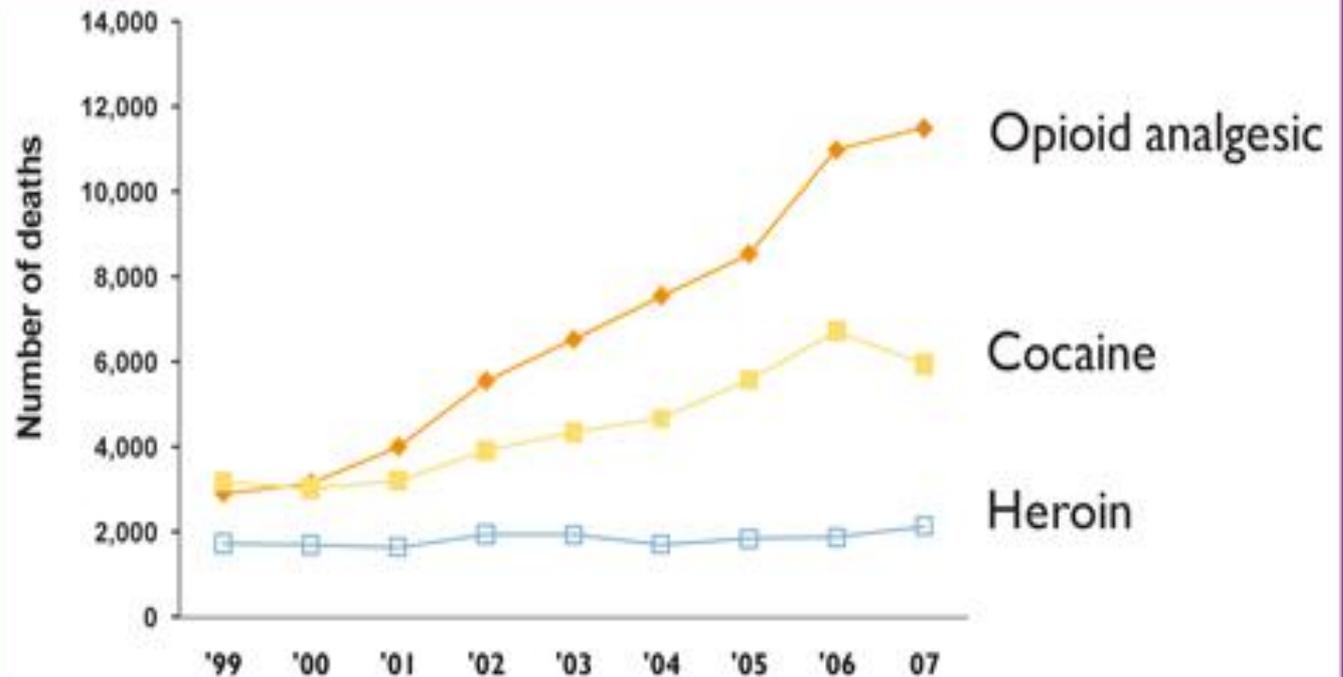
# What about the comparisons between marijuana and illicit drugs and alcohol?

## *Addiction Potential*



# What have we learned about “less dangerous?”

Figure 2: Unintentional drug overdose deaths by major type of drug, United States, 1999-2007



Source: National Vital Statistics System

# Marijuana vs. Tobacco Cigarette

- ▶ Marijuana smoke has **20 x** the level of **ammonia** as compared to tobacco smoke.
- ▶ Marijuana smoke has **3–5 x** the level of **hydrogen cyanide, nitric oxide** and certain **aromatic amines**.

*Is it not logical to conclude that marijuana can increase cancer risk?*

# Other Public Health Considerations

## ▶ **Medical**

- Impact on Chronic Conditions
- When do clinicians stop prescribing due to abuse, addiction? Age Restrictions?
- Potential misuse by other family members

## ▶ **Impact on anti-tobacco smoking efforts**

- Will we see an increase in tobacco cigarette use due to a resurging social acceptability for smoking?

## ▶ **Obesity**

# Impacts on Our Communities

## ▶ **Academic**

- Lower Educational Attainment/Diminished Lifetime Achievement
- Loss of 8 IQ points

## ▶ **Public Safety**

- Dispensaries becoming “fronts” for illegal activities
- “Gateway Drug” to other crimes
- Impaired Driving (2-5x)

## ▶ **Workforce**

- Positive Toxicology Screens on Employment Application
- Lost Productivity
- Impairment on the Job
- Workman’s Compensation Claims

# Economic Impact Tax Revenues?

## ▶ Marijuana

- Not Fully Known

## ▶ Alcohol

Tax Revenues

**15.3 billion**

Federal excise taxes (2009), \$9.4 Billion  
State and local revenues, \$5.9 Billion

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Total Societal Costs

**237.8 Billion**

Healthcare  
Lost productivity  
Criminal justice

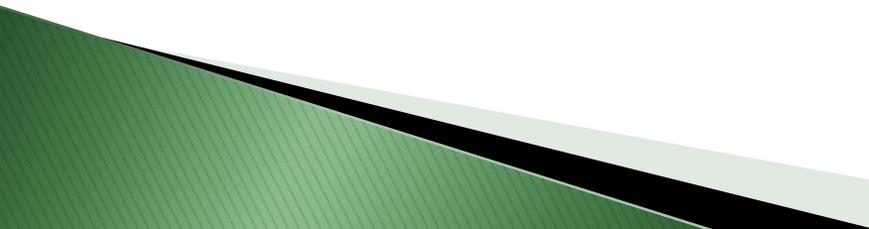
# Virginia Marijuana Users

[http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/RD722014/\\$file/RD72.pdf](http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/RD722014/$file/RD72.pdf)

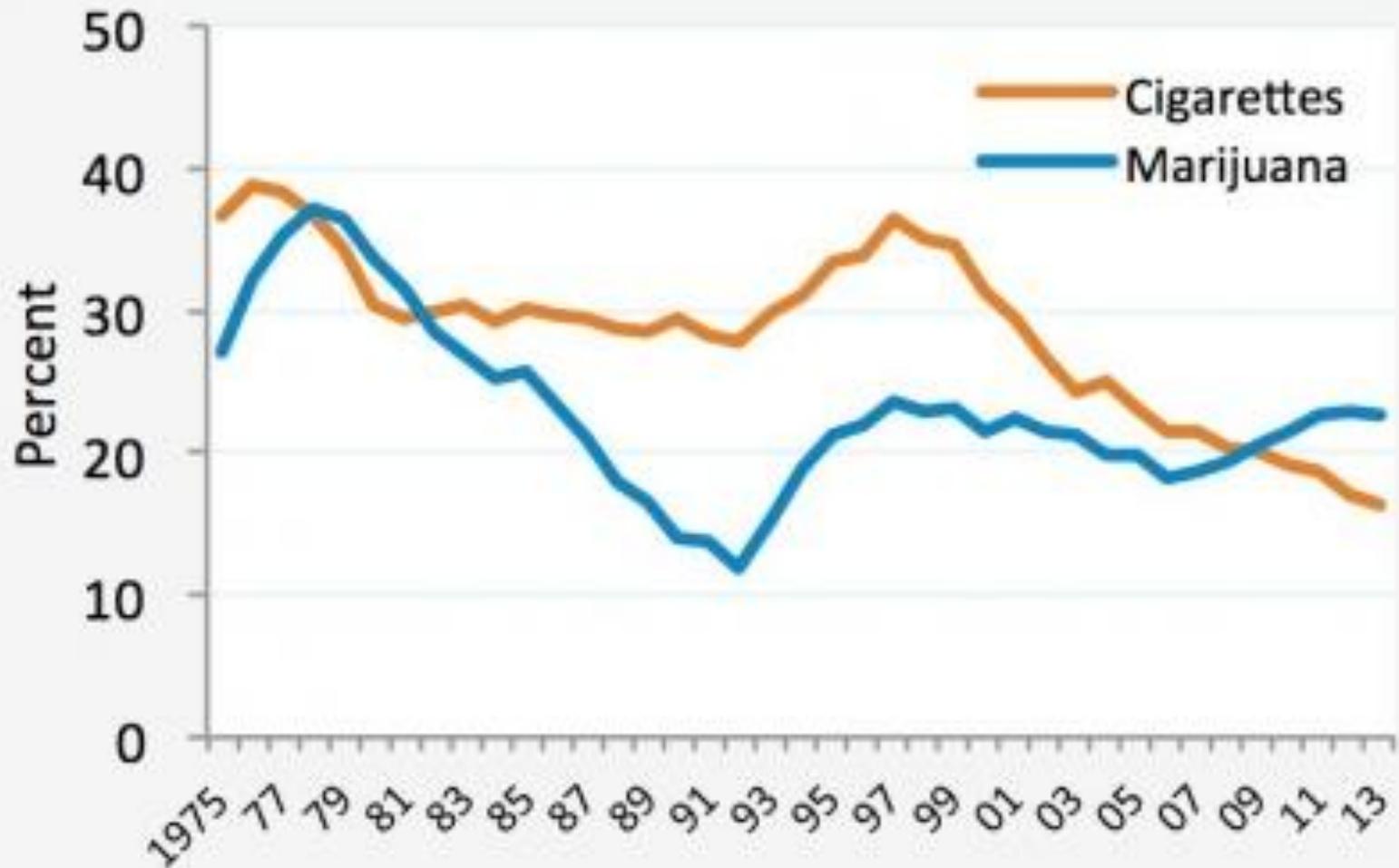
## ▶ **~794,000 users**

- ~712,000 adults (18+)
  - Estimated Addicted adults (9%) ~ **64,000**
- ~82,000 youth (12–17)
  - Estimated addicted youth (17%) ~ **14,000**

# How could Medical Marijuana, Decriminalization or Legalization affect number of *users* and those *addicted*?

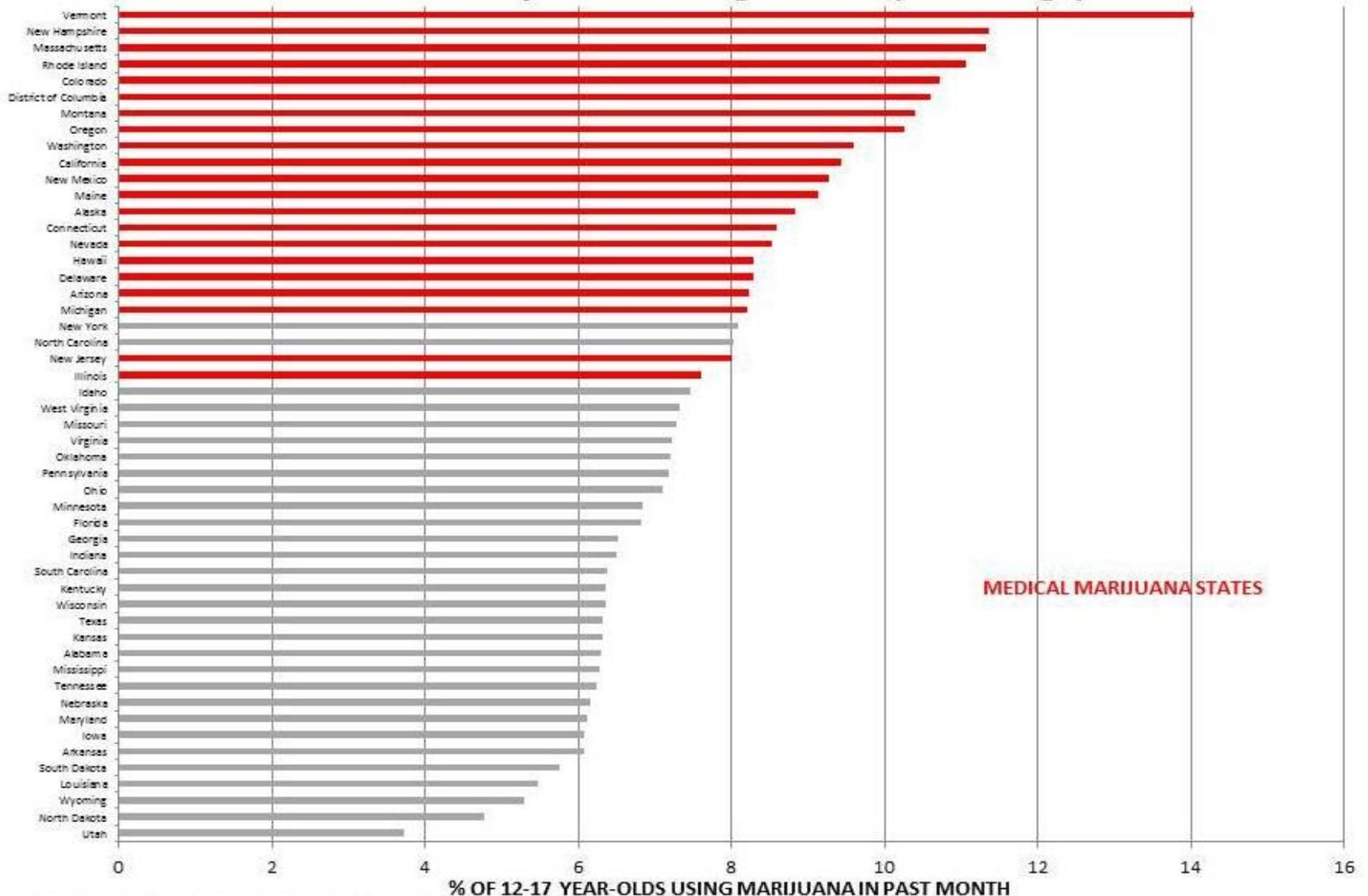
- ▶ UN Report (2014)
    - For every 10% decline in prices, 3% more users
  - ▶ Increased Social Acceptability
  - ▶ Increased Availability
  - ▶ Decreased Perceived Risk
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## Past-Month Use of Cigarettes and Marijuana by 12th Graders, 1975–2013



SOURCE: University of Michigan, 2013 Monitoring the Future Study

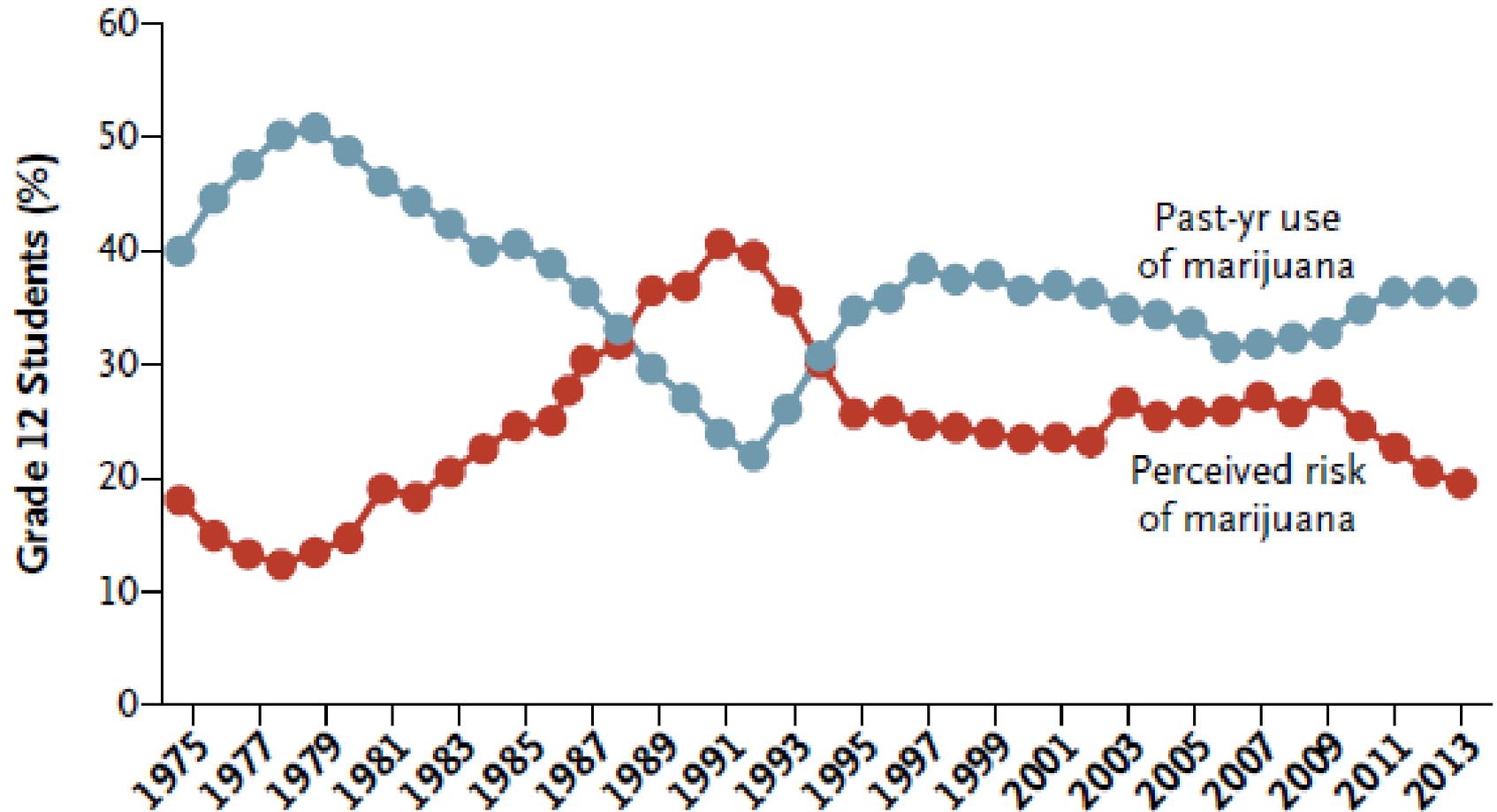
## Past Month Marijuana Users Aged 12-17 (Percentage)



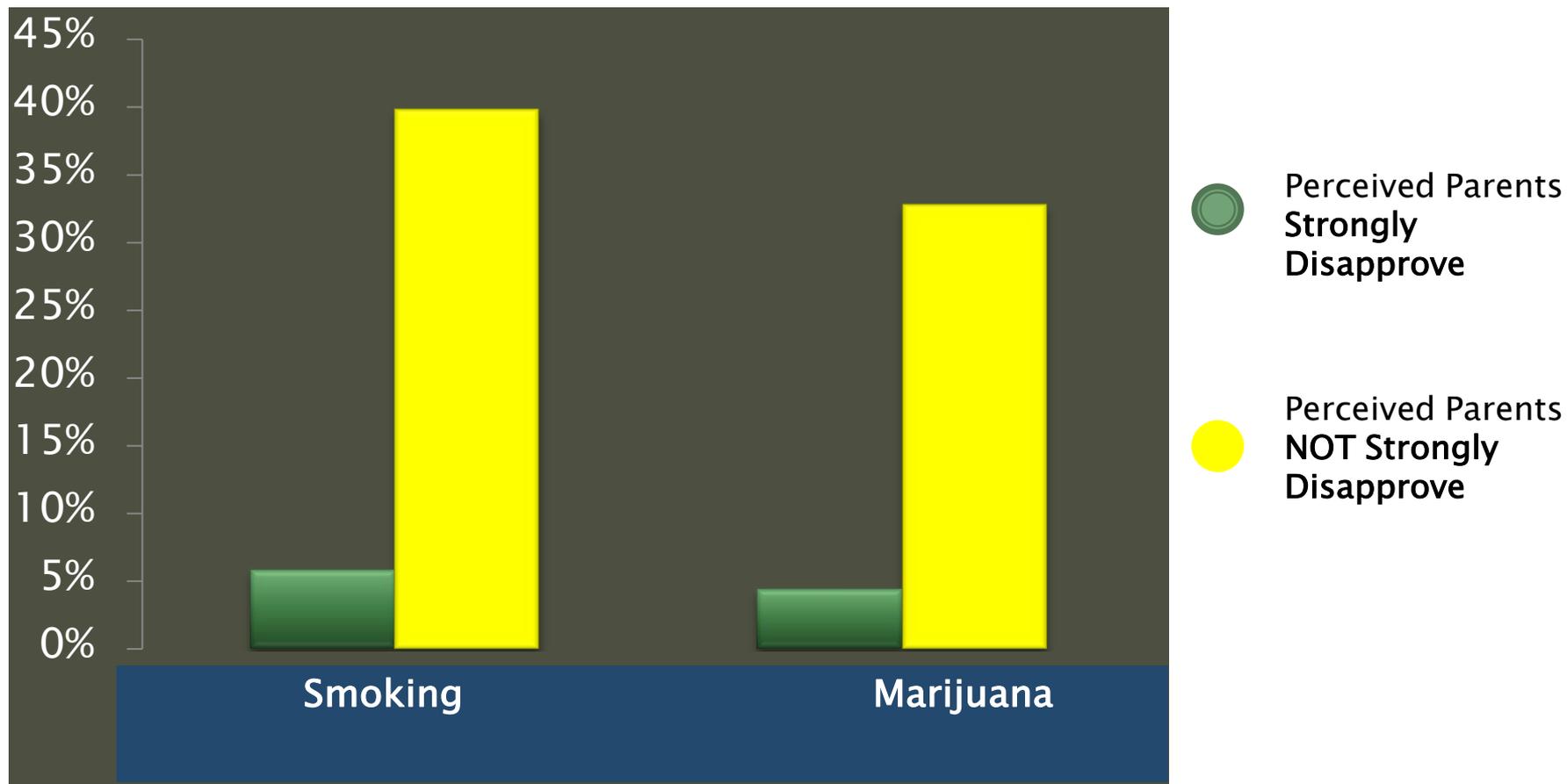
MEDICAL MARIJUANA STATES

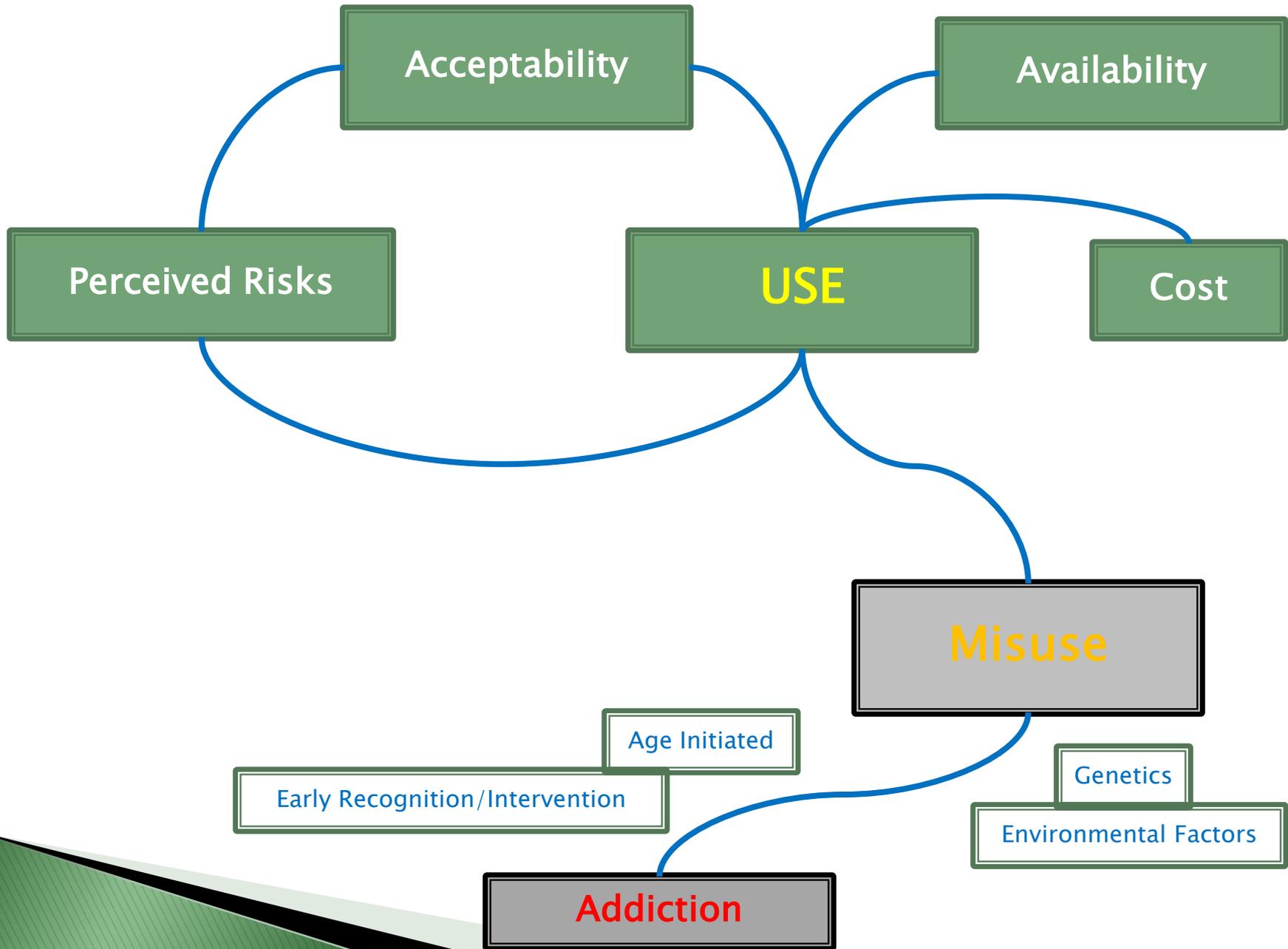
Source: National Survey on Drug Use and Health (NSDUH), HHS/SAMHSA (2010-11) and National Conference of State Legislatures (NCSL)

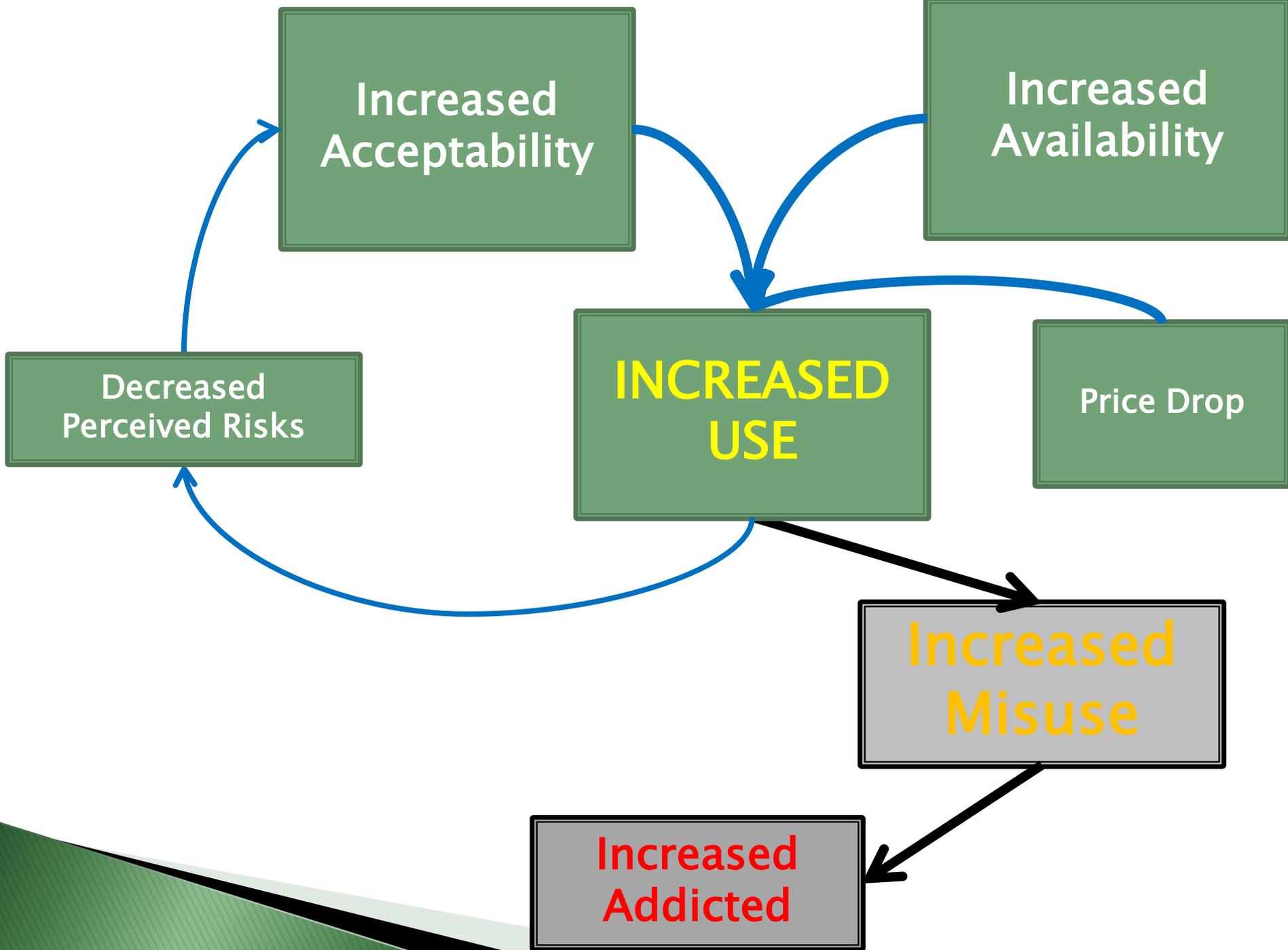
## A Correlation between Perceived Risk and Use



# Impact of Perceived Parental Views on Rates of Substance Abuse for Youth







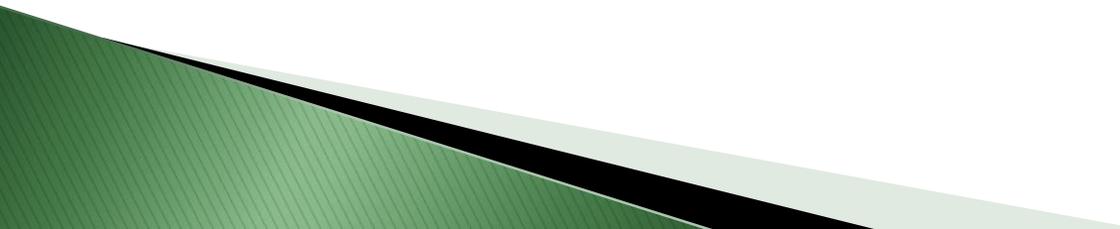
# Final Thoughts

- ▶ “We have come too far in 2014 to smoke our medications.”
  - Dr. Kevin Sabet (Smart Approached to Marijuana)
- ▶ The medical community encourages additional research on potential benefits derived from active components and/or the cannabis sativa plant.
- ▶ There is potential for significant impact on educational attainment, public safety, and workforce readiness and productivity.
- ▶ Public health lessons learned from the tobacco and alcohol industry as well as strategies used to address the prescription drug epidemic may be applicable.

# Final Thoughts;

- ▶ **An increase in the availability and acceptability of marijuana in the raw form will lead to increased rates of use, misuse, and addiction.**
- ▶ **Additional resources will be needed:**
  - address public health and public safety concerns
  - community education
  - training
  - prevention and treatment services

**Thank You!**



# Additional References

- ▶ <http://www.whitehouse.gov/ondcp/frequently-asked-questions-and-facts-about-marijuana>
- ▶ <http://www.deadiversion.usdoj.gov/schedules/index.html#define>
- ▶ Volkow ND, Baler RD, Compton WM, Weiss, SRB. Adverse Health Effects of Marijuana, N Engl J Med 2014;370:2219–27.
- ▶ Slide Set Presentation from Bertha K Madras, PhD, Harvard School of Medicine, presented March 13, 2014.