

# **PRENATAL SUBSTANCE USE: A SYSTEMS PERSPECTIVE TO PREVENTION & TREATMENT**

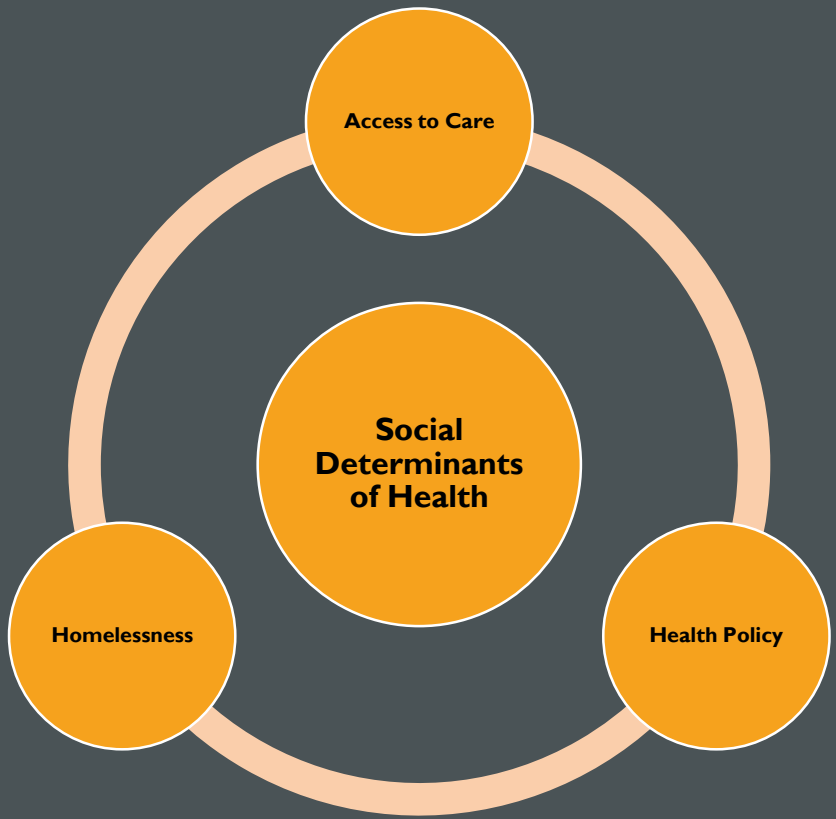
**Qiana L. Brown, PhD, MPH, LCSW**

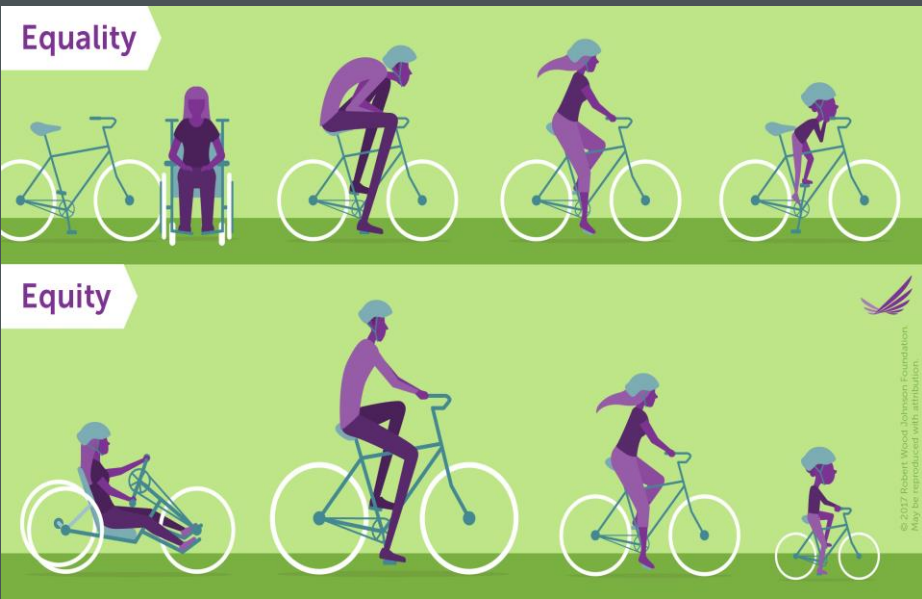
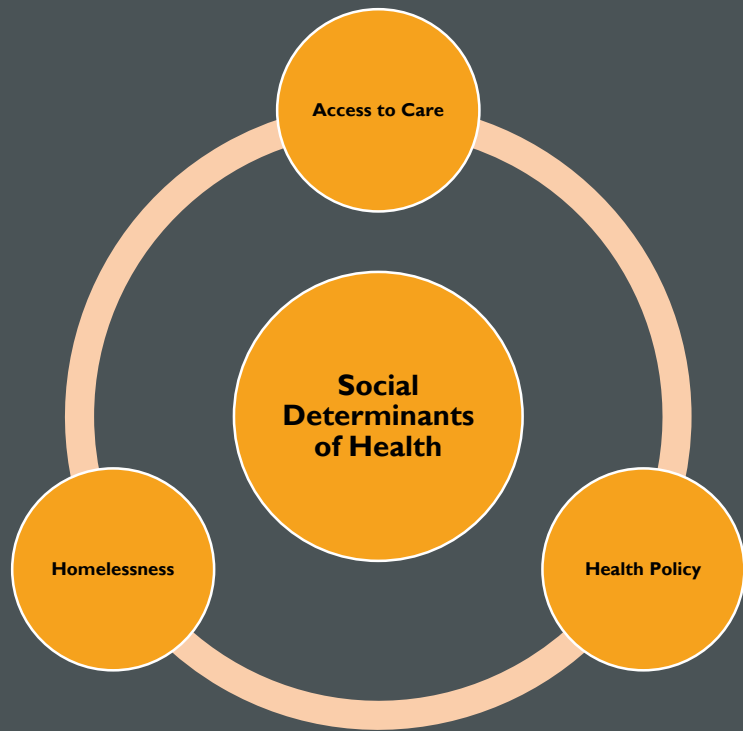
Assistant Professor & Director,  
Substance Use Research, Evaluation, and Maternal and Child Health (SURE MatCH) Group  
School of Social Work & Department of Urban-Global Public Health, School of Public Health  
Rutgers University

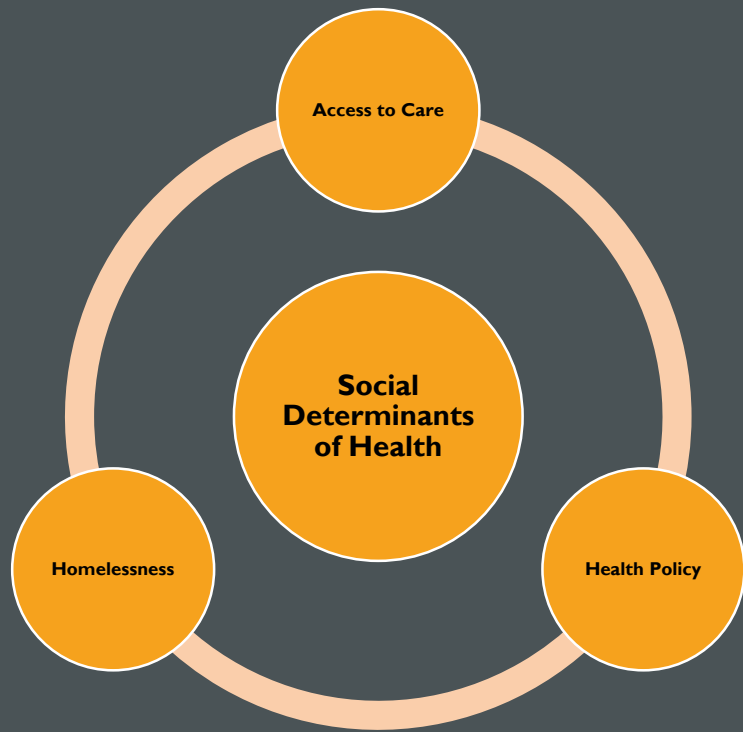
**Society for the Study of Addiction**

November 8, 2018

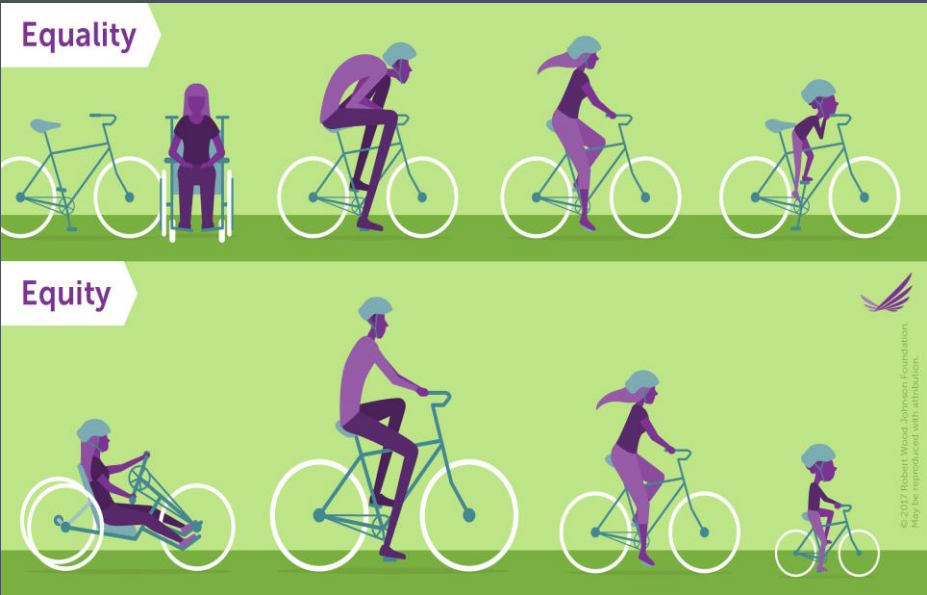








1. Whose job is it to address social determinants of health?
2. Is the current system working?
3. What is your role in promoting health equity?
4. Are you willing to do more?

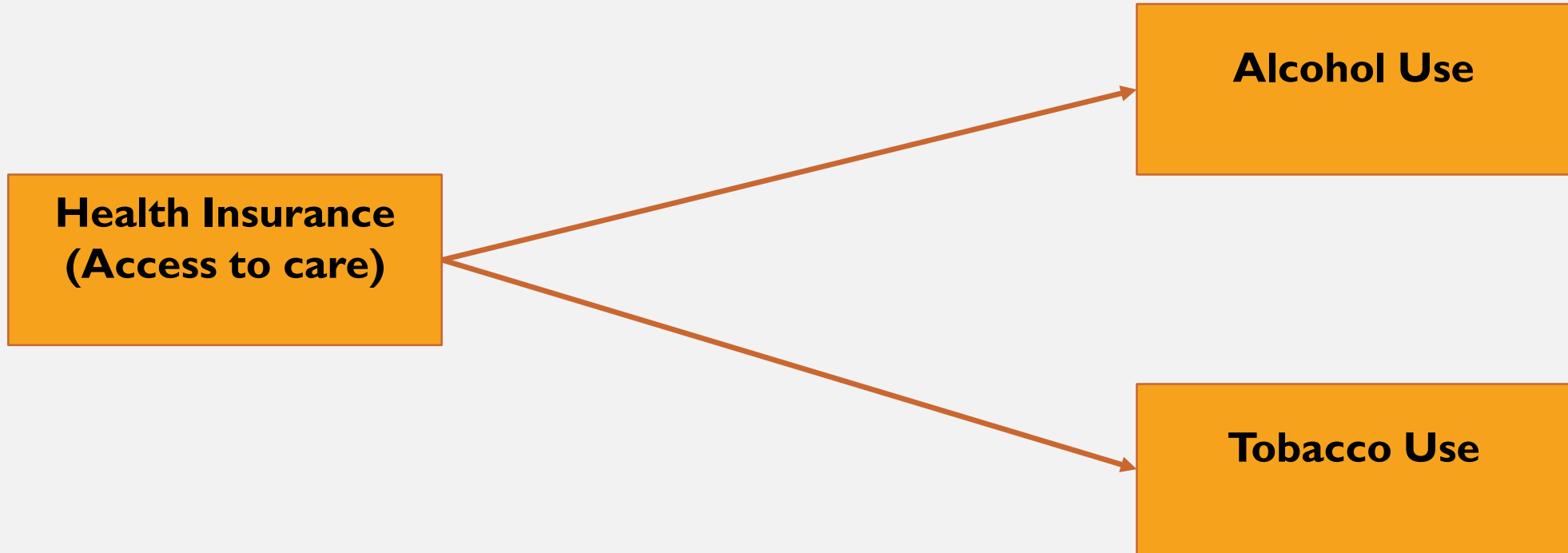


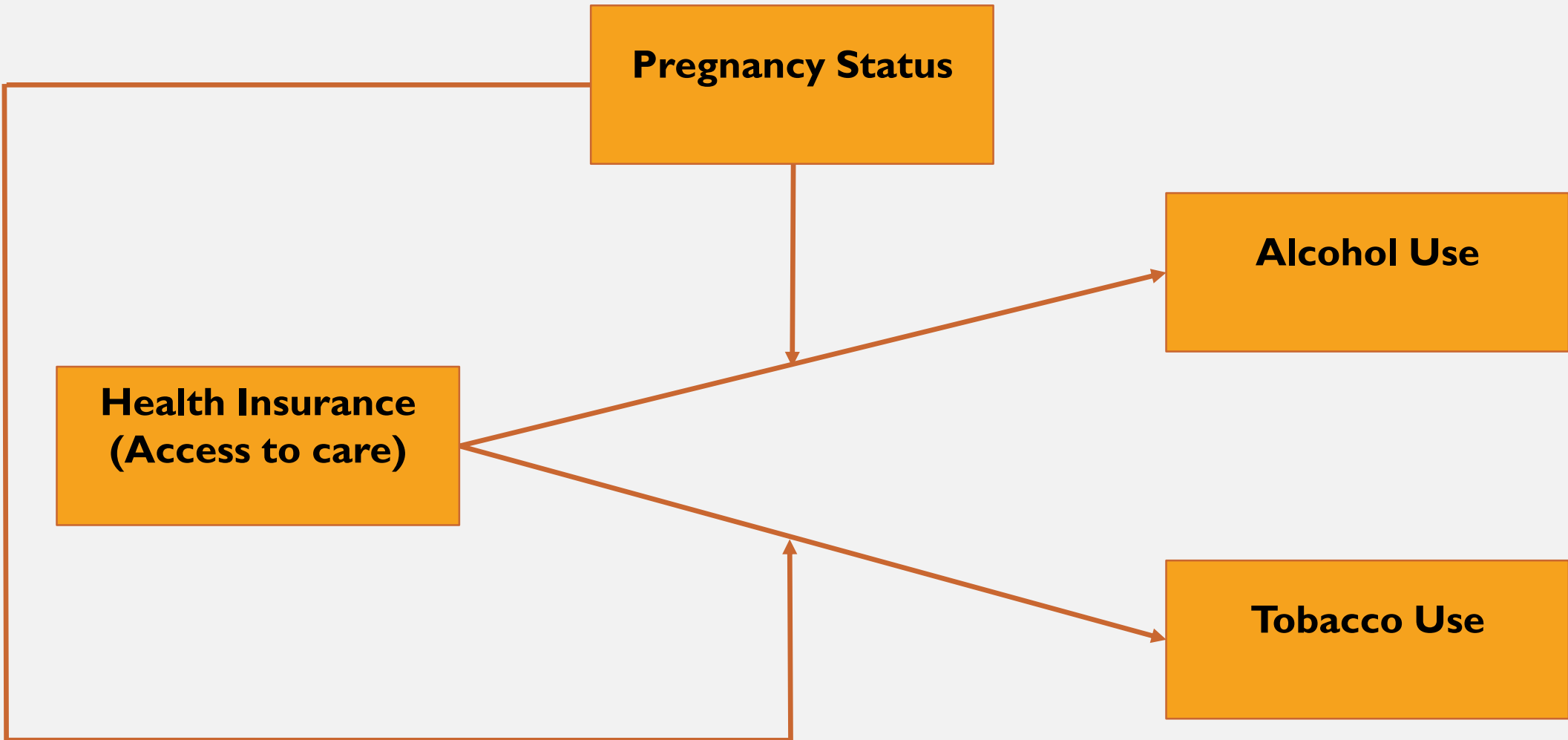
# Health Insurance (Access to Care)

## Health outcomes associated with prenatal tobacco and alcohol use:

<b>Tobacco associated problems</b>	<b>Alcohol associated problems</b>
Low birth-weight	Fetal Alcohol Syndrome
Pre-term deliveries	Spontaneous abortion
Neurodevelopmental deficits	Neurodevelopmental deficits
Infant mortality	Pre/postnatal growth deficits

Dietz et al., 2010; Floyd et al., 2008; Hankin, 2002; Key et al., 2007; Maier et al, 2001







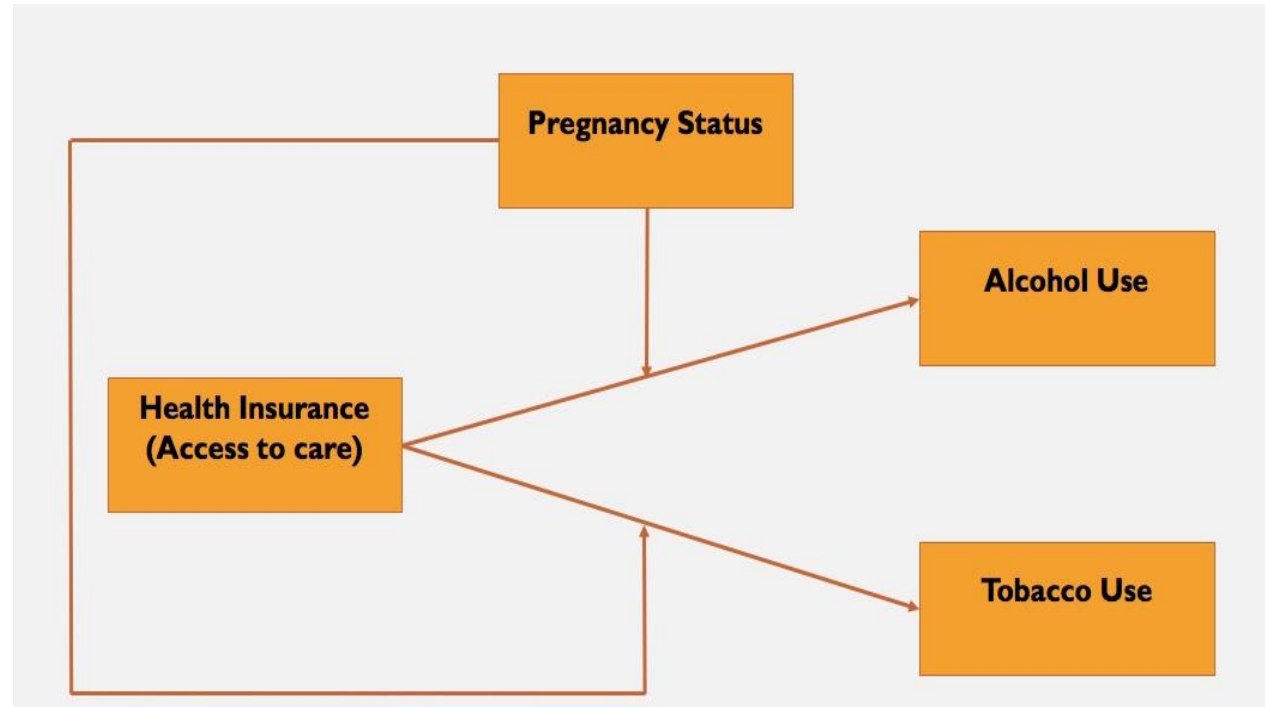
# HYPOTHESES

1. Inverse association between health insurance coverage and alcohol and tobacco use.

2. Pregnancy status is a moderator –

(The magnitude of association between health insurance coverage and alcohol/tobacco use will be stronger among pregnant women.)

# CONCEPTUAL MODEL

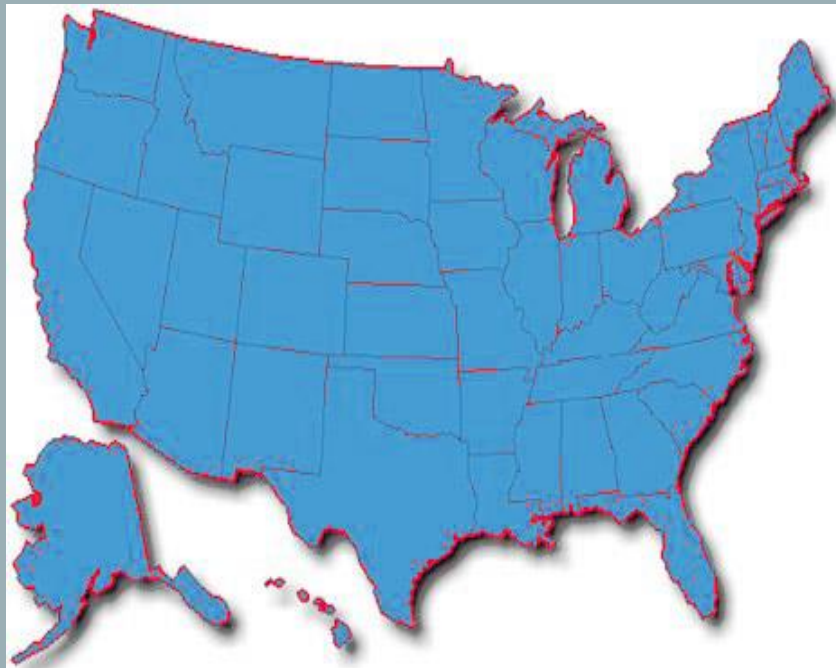


# Methods

**Sample (N= 97,788)**

(Pregnant n= 3,267; non-pregnant n= 94,521)

- **US National Survey on Drug Use and Health (NSDUH)**
- **Nationally representative sample**
- **4 Years: 2010-2013**
- **Reproductive-age women 12-44 years old**



\*Analyses adjusted for complex survey design and survey year using Stata/SE 14

**Brown QL, Hasin DS, Keyes KM, Fink DS, Ravenell O, Martins SS.** Health insurance, alcohol and tobacco use among pregnant and non-pregnant women of reproductive age. *Drug Alcohol Depend* 2016;166:116-24.

**Measures/ Study Design**

- **Cross-sectional**
- **Logistic regression**
- **Outcomes (binary)**
  - Past month tobacco use
  - Past month alcohol use
- **Independent variable (binary)**
  - Health insurance coverage
- **Moderator**
  - Pregnancy status
- **Covariates**

Age	Race/Ethnicity
Marital Status	Past month alcohol use (when tobacco use was the outcome)
Education	Past month tobacco use (when alcohol use was the outcome)
Poverty	

## **Descriptive Characteristics (N=97,788)**

Age 26-44 years – **57.32%**

Non-Hispanic White – **57.77%**

High School Education or Greater – **72.12%**

Not Married – **63.67%**

200+% or above poverty threshold – **55.22%**

Health Insurance Coverage – **81.91%**

Alcohol Use Past Month – **49.18%**

Tobacco Use Past Month – **23.97%**

Nicotine Dependent Past Month – **11.67%**

Alcohol Abuse Past Year (DSM-IV) – **3.51%**

Alcohol Dependence Past Year (DSM-IV) – **3.36%**

## ASSOCIATION BETWEEN HEALTH INSURANCE COVERAGE, AND PAST MONTH TOBACCO AND ALCOHOL USE AMONG REPRODUCTIVE-AGE WOMEN IN THE US, N=97,788

	Tobacco use – past month			Alcohol use – past month		
	Pregnant n=3,267	Not Pregnant n=94,521	Interaction p-value	Pregnant n=3,267	Not Pregnant n= 94,521	Interaction p-value
<b>Health Insurance</b>						
<b>Yes</b>	1.14 (0.73, 1.76)	<b>0.67 (0.63, 0.72)**</b>	<b>p≤0.01</b>	<b>0.47 (0.27, 0.82)*</b>	<b>1.23 (1.15, 1.32)**</b>	<b>p≤0.01</b>
<b>No</b>	---	---		---	---	

\* p≤ 0.01; \*\* p≤ 0.001

Brown et al., 2016

\*Estimates are adjusted odds ratios

## ASSOCIATION BETWEEN HEALTH INSURANCE COVERAGE, AND PAST MONTH TOBACCO AND ALCOHOL USE AMONG REPRODUCTIVE-AGE WOMEN IN THE US, N=97,788

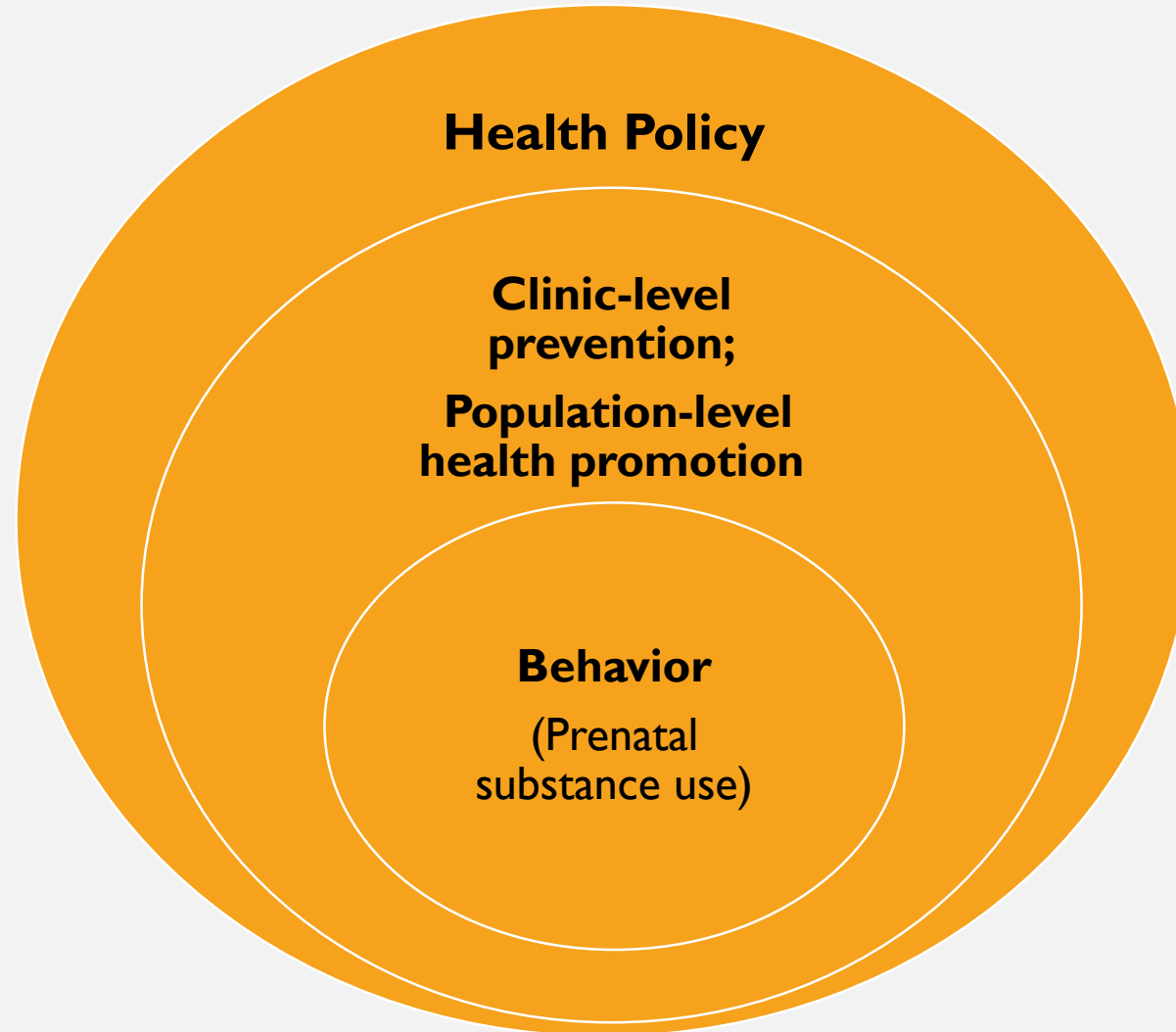
	Tobacco use – past month			Alcohol use – past month		
	Pregnant n=3,267	Not Pregnant n=94,521	Interaction p-value	Pregnant n=3,267	Not Pregnant n= 94,521	Interaction p-value
<b>Health Insurance</b>						
<b>Yes</b>	1.14 (0.73, 1.76)	<b>0.67 (0.63, 0.72)**</b>	<b>p≤0.01</b>	<b>0.47 (0.27, 0.82)*</b>	<b>1.23 (1.15, 1.32)**</b>	<b>p≤0.01</b>
<b>No</b>	---	---		---	---	

\* p≤ 0.01; \*\* p≤ 0.001

Brown et al., 2016

\*Estimates are adjusted odds ratios

# SYSTEMS



## ASSOCIATION BETWEEN HEALTH INSURANCE COVERAGE, AND PAST MONTH TOBACCO AND ALCOHOL USE AMONG REPRODUCTIVE-AGE WOMEN IN THE US, N=97,788

	Tobacco use – past month			Alcohol use – past month		
	Pregnant n=3,267	Not Pregnant n=94,521	Interaction p-value	Pregnant n=3,267	Not Pregnant n= 94,521	Interaction p-value
Health Insurance Yes	1.14 (0.73, 1.76)	0.67 (0.63, 0.72)**	<b>p≤0.01</b>	0.47 (0.27, 0.82)*	1.23 (1.15, 1.32)**	<b>p≤0.01</b>
No	---	---		---	---	

\* p≤ 0.01; \*\* p≤ 0.001

Brown et al., 2016

### 5 A's of tobacco cessation (brief intervention)

- **Ask** about tobacco use
- **Advise** to quit
- **Assess** willingness to make a quit attempt
- **Assist** with quit attempt
- **Arrange** for follow-up

\*Estimates are adjusted odds ratios

## ASSOCIATION BETWEEN HEALTH INSURANCE COVERAGE, AND PAST MONTH TOBACCO AND ALCOHOL USE AMONG REPRODUCTIVE-AGE WOMEN IN THE US, N=97,788

	Tobacco use – past month			Alcohol use – past month		
	Pregnant n=3,267	Not Pregnant n=94,521	Interaction p-value	Pregnant n=3,267	Not Pregnant n= 94,521	Interaction p-value
<b>Health Insurance</b>						
<b>Yes</b>	1.14 (0.73, 1.76)	0.67 (0.63, 0.72)**	<b>p≤0.01</b>	0.47 (0.27, 0.82)*	1.23 (1.15, 1.32)**	<b>p≤0.01</b>
<b>No</b>	---	---		---	---	

\* p≤ 0.01; \*\* p≤ 0.001

Brown et al., 2016

### 5 A's of tobacco cessation (brief intervention)

- **Ask** about tobacco use
- **Advise** to quit
- **Assess** willingness to make a quit attempt
- **Assist** with quit attempt
- **Arrange** for follow-up

### Barriers to providing tobacco cessation treatment according to providers

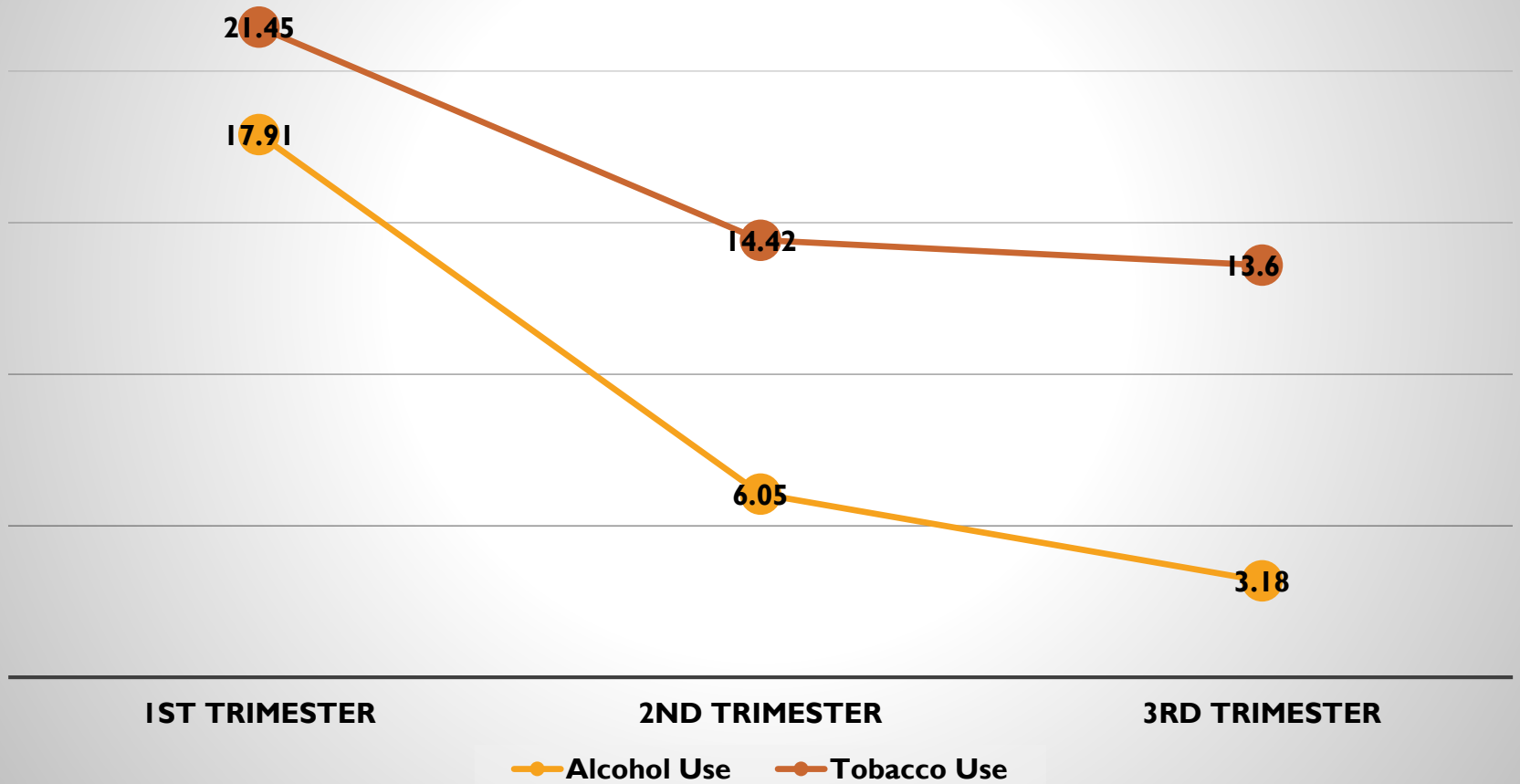
- **Lack of Time**
- **Lack of Reimbursement**
- **Lack of Training**
- **Competing Demands**
- **Prioritize Other Health Conditions**

American College of Obstetricians and Gynecologists, 2010; Coleman-Cowger et al., 2014; Quinn et al., 2009

\*Estimates are adjusted odds ratios



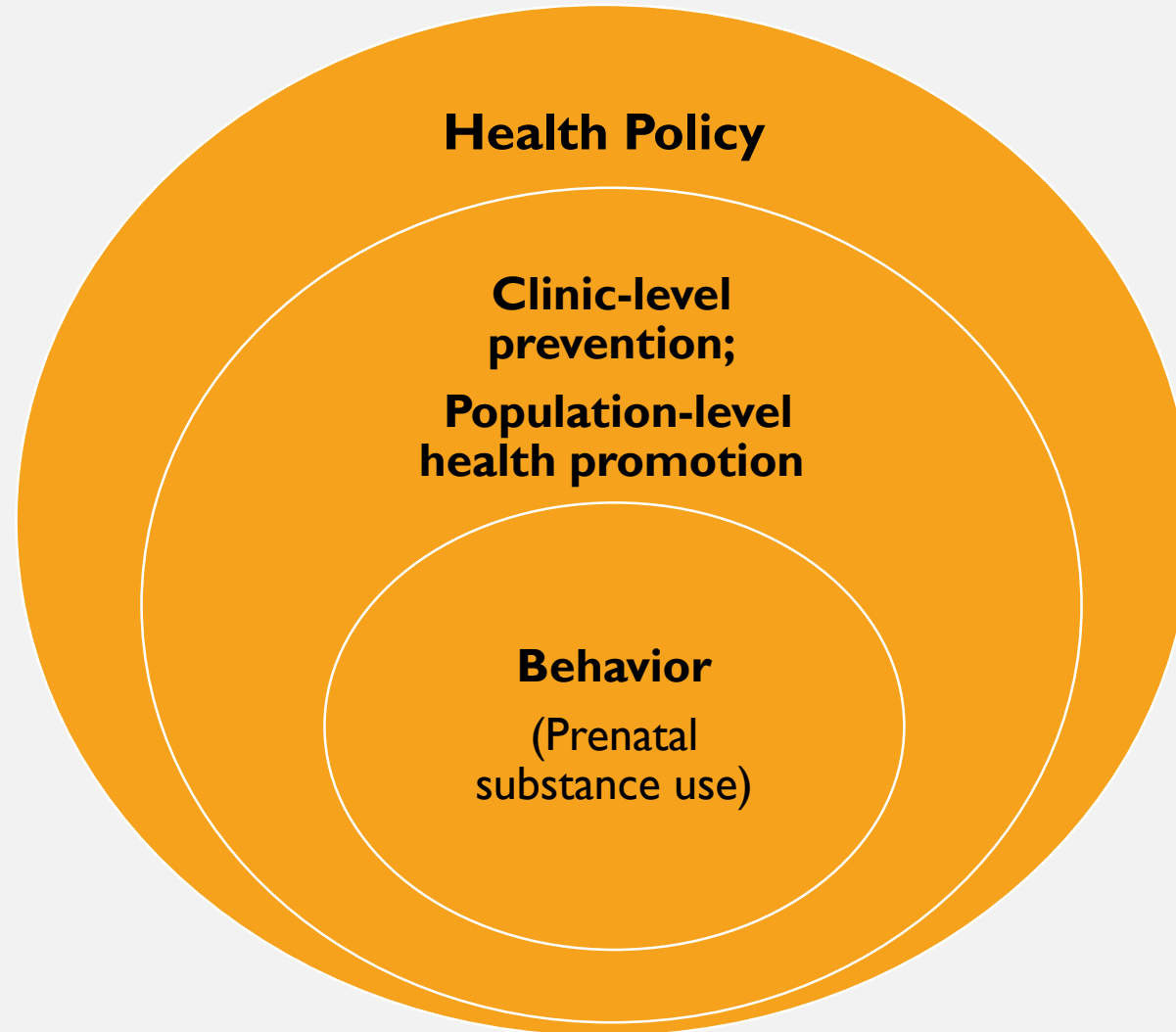
## Percent of Insured Pregnant Women Using Alcohol and Tobacco in the Past Month in the US, N=3,267



Adjusted for complex survey design

Adapted from **Brown** et al., 2016

# SYSTEMS



**Homelessness**

**Homelessness**



**Sex Trade**

## **HYPOTHESIS**

**POSITIVE ASSOCIATION  
BETWEEN  
HOMELESSNESS & SEX TRADE**

## **CONCEPTUAL MODEL**

**Homelessness**

**Sex Trade**



# METHODS

- **N=81** (pregnant women in drug treatment)
- **Cross-sectional**
- **Recruitment Period 2006-2008**
- **Logistic regression**
- **Outcome (binary)**
  - Sex trade in past 6 months
- **Independent variable (binary)**
  - Homeless in past 6 months
- **Covariates**
  - Age
  - Race
  - Education
  - Lifetime psychiatric diagnosis

## Descriptive Characteristics (N=81)

Age range 18-43 years

African American – **60.5%**

Less than high school education – **55.6%**

Lifetime psychiatric diagnosis – **59.3%**

Homeless in past 6 months – **26%**

Traded sex in past 6 months – **31%**

- Traded sex for survival needs (e.g., shelter, money, not drugs) – **88%**
- Traded sex for drugs only – **12%**

Substance use disorder in past month

- Opioid use disorder – **53.1%**
- Cocaine use disorder – **56.8%**
- Alcohol use disorder – **9.9%**
- Cannabis use disorder – **9.9%**
- Sedative use disorder – **6.2%**
- Stimulant use disorder – **1.2%**
- Poly substance use disorder – **9.9%**

# ASSOCIATION BETWEEN HOMELESSNESS, PSYCHIATRIC COMORBIDITY, AND SEX-TRADE AMONG PREGNANT WOMEN IN DRUG TREATMENT N=81

**Homeless in past 6 months**

**Yes**

**4.74 (1.42, 15.85)\***

**No**

**---**

**Lifetime psychiatric diagnosis**

**Yes**

**5.41 (1.48, 19.78)\***

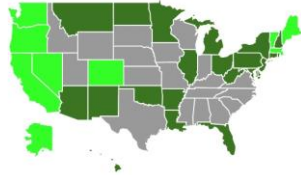
**No**

\* p < 0.05

Brown et al., 2012



Information is current as of Oct. 19, 2018.



**Marijuana Legalization Status**  
■ Medical marijuana broadly legalized  
■ Marijuana legalized for recreational use  
■ No broad laws legalizing marijuana

Governing.com

ARTICLE IN PRESS  
Preventive Medicine  
Journal homepage: www.elsevier.com/locate/ypmed

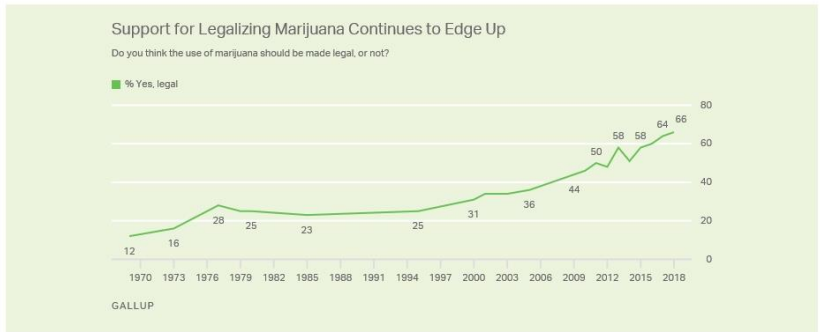
Review Article  
**Cannabis use, attitudes, and legal status in the U.S.: A review**  
Hannah Carliner<sup>1,2</sup>, Qiana L. Brown<sup>3,4</sup>, Aaron L. Sarvet<sup>1</sup>, Deborah S. Hasler<sup>5,6,7\*</sup>



**ARTICLE INFO**  
Article history:  
Received 15 January 2017  
Received in revised form 17 June 2017  
Accepted 1 July 2017  
Available online xxx

**ABSTRACT**  
Cannabis is widely used among adolescents and adults. In the U.S., marijuana laws have been changing, and observational research has been highlighting concerns for mental and neurological risks. While some of our knowledge on the health effects of cannabis is limited, there is growing evidence that cannabis use is associated with increased risk of mental health problems, particularly among adolescents. The objective of this review is to summarize the current evidence on the health effects of cannabis, particularly among adolescents, and to discuss the implications for public health practice and policy. We review the current evidence on the health effects of cannabis, particularly among adolescents, and discuss the implications for public health practice and policy. We review the current evidence on the health effects of cannabis, particularly among adolescents, and discuss the implications for public health practice and policy.

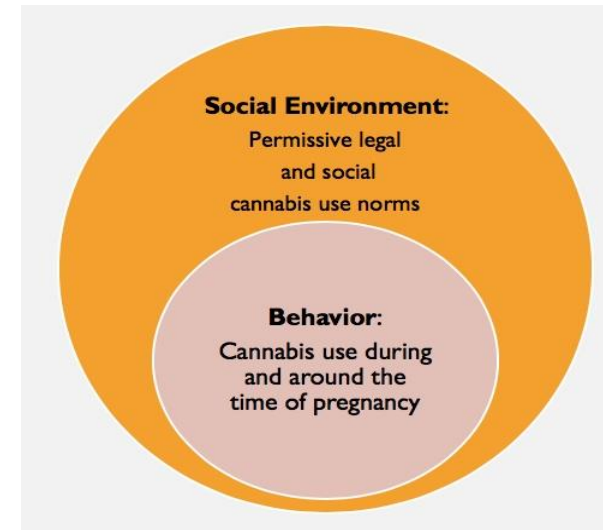
# CANNABIS USE: POLICY & SOCIAL NORMS

WASHINGTON, D.C. -- Sixty-six percent of Americans now support legalizing marijuana, another new high in Gallup's trend over nearly half a century. The latest figure marks the third consecutive year that support on the measure has increased and established a new record.



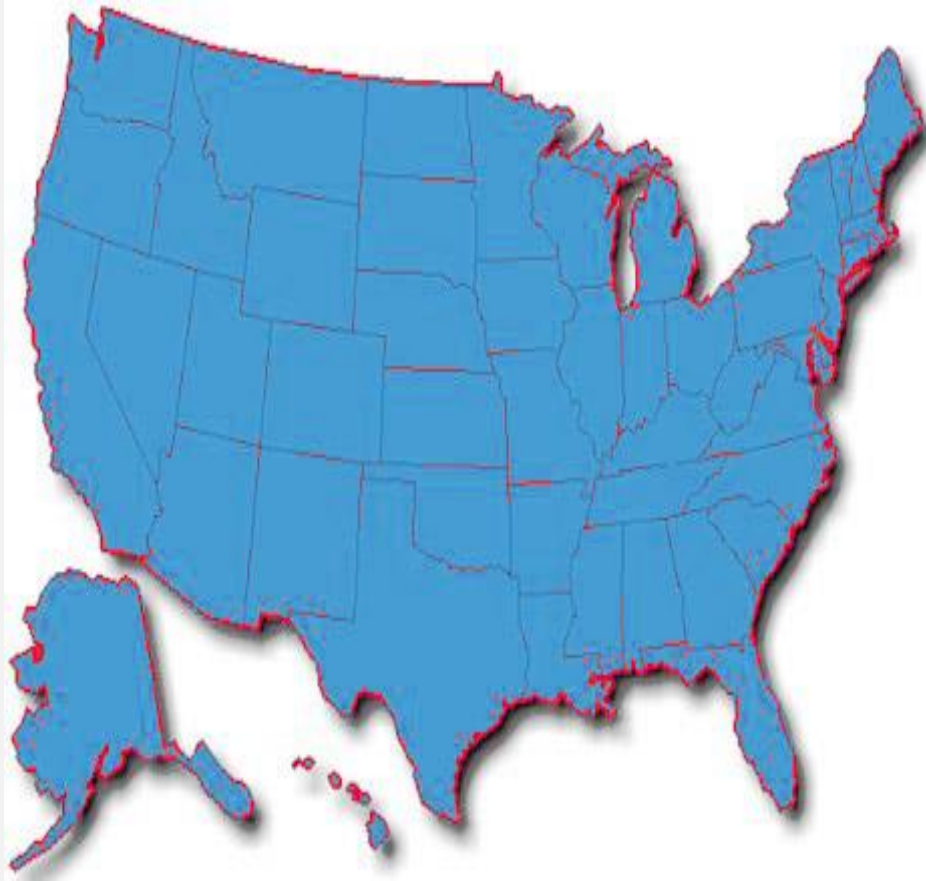
	prenatal	neonatal	infant	child	adult
<b>A</b> 	Reduced fetal growth <sup>1</sup>	<b>Decreased birth weight</b>	Impaired mental development <sup>1</sup> (9 months)	Increased externalizing behaviour <sup>1</sup> (hyperactivity; 6 and 10 years)	Altered functioning in visuo-spatial memory <sup>1</sup> (18–22 years)
	Reduced head circumference <sup>2</sup>	Altered gestational length <sup>3</sup>	Increased aggression and inattention in girls <sup>4</sup> (18 months)	Impaired abstract and visual reasoning <sup>5</sup> (10 years)	
	Increased pulsatility and resistance index of uterine artery <sup>6</sup>	Increased startles and tremors <sup>7</sup>	<b>Impaired memory function<sup>8</sup></b> (36–48 months)	Impaired visuosperceptual functioning <sup>9</sup> (9–12 years)	
	Decreased inner diameter of aorta <sup>10</sup>	Reduced abblution to light <sup>11</sup>	Decreased verbal scores <sup>12</sup> (36–48 months)		
	Placental resistance <sup>13</sup>	Altered EEG sleeping recordings <sup>14</sup>	<b>Increased anxiety and depression<sup>15</sup></b>		
<b>B</b> THC or cannabinomimetic 	Axonal bundle malformation (Tortorello, 2014)	<b>Decreased birth weight</b> (Fried, 1973)	Increased rearing and locomotor activity at P16–20 (Navarro, 1994)	Altered open field performance (Fride, 1996)	<b>Memory impairment at P40–60</b> (Mereu, 2003)
			Hyperactivity at P12 (Mereu, 2003)	Impaired consolidation of long-term memory at P22 (Siva, 2012)	<b>Reduced synaptic plasticity</b> (Tortorello, 2013)
			<b>Learning impairment at P18–12</b> (Antonelli, 2005)	Inhibited social interaction and play behaviour (Trezza, 2008)	<b>Cognitive impairment</b> (Campolongo, 2007)
			<b>Increased ultrasonic vocalization at P10</b> (Antonelli, 2005)		Altered social behaviour (Navarro, 1995)
			Impaired synapse formation (Tortorello, 2014)		<b>Anxiogenic-like profile</b> (Trezza, 2005)

Calvigioni et al., 2014



# RISKS, RECOMMENDATIONS & THEORY

# METHODS



- **NSDUH**
- **Nationally Representative Sample**
- **13 Years: 2002-2014**
- **Repeated cross-sectional**
- **Log-poisson regression**
- **Examined**
  - **Time-trends in past month (and past year) cannabis use**
  - **Differences in trends by pregnancy status**
- **Women 18-44 yrs old**
- **N = 200,510 (includes 10,587 pregnant women)**

\*Analyses adjusted for complex survey design and survey year using SUDAAN 11.0.1

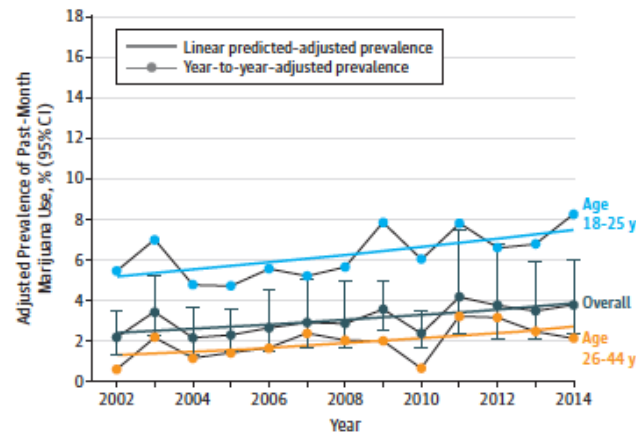
# CANNABIS USE IS INCREASING AMONG REPRODUCTIVE-AGE WOMEN IN THE US.

~50,000 More Pregnant Cannabis Users in 2014 vs 2002

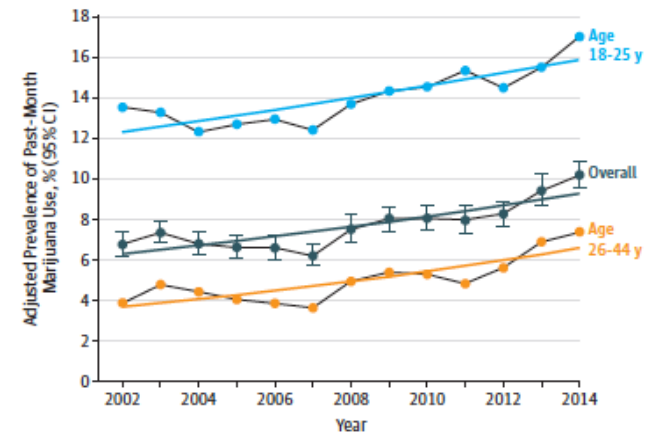
~1.98 Million More Non-pregnant Reproductive-age Cannabis Users in 2014 vs 2002

Increases in past-month cannabis use did not differ by pregnancy status.  
 $P = 0.64$

**A** Pregnant women



**B** Nonpregnant women



# JANE'S HOUSE OF INSPIRATION







# MEDICAL RESIDENTS AT JANE'S HOUSE OF INSPIRATION