



**FVB Center**  
for Health & Human Rights  
at Harvard University

# Reconciling discrepant findings in maternal incarceration and adolescent cannabis use using compositional effect modifiers

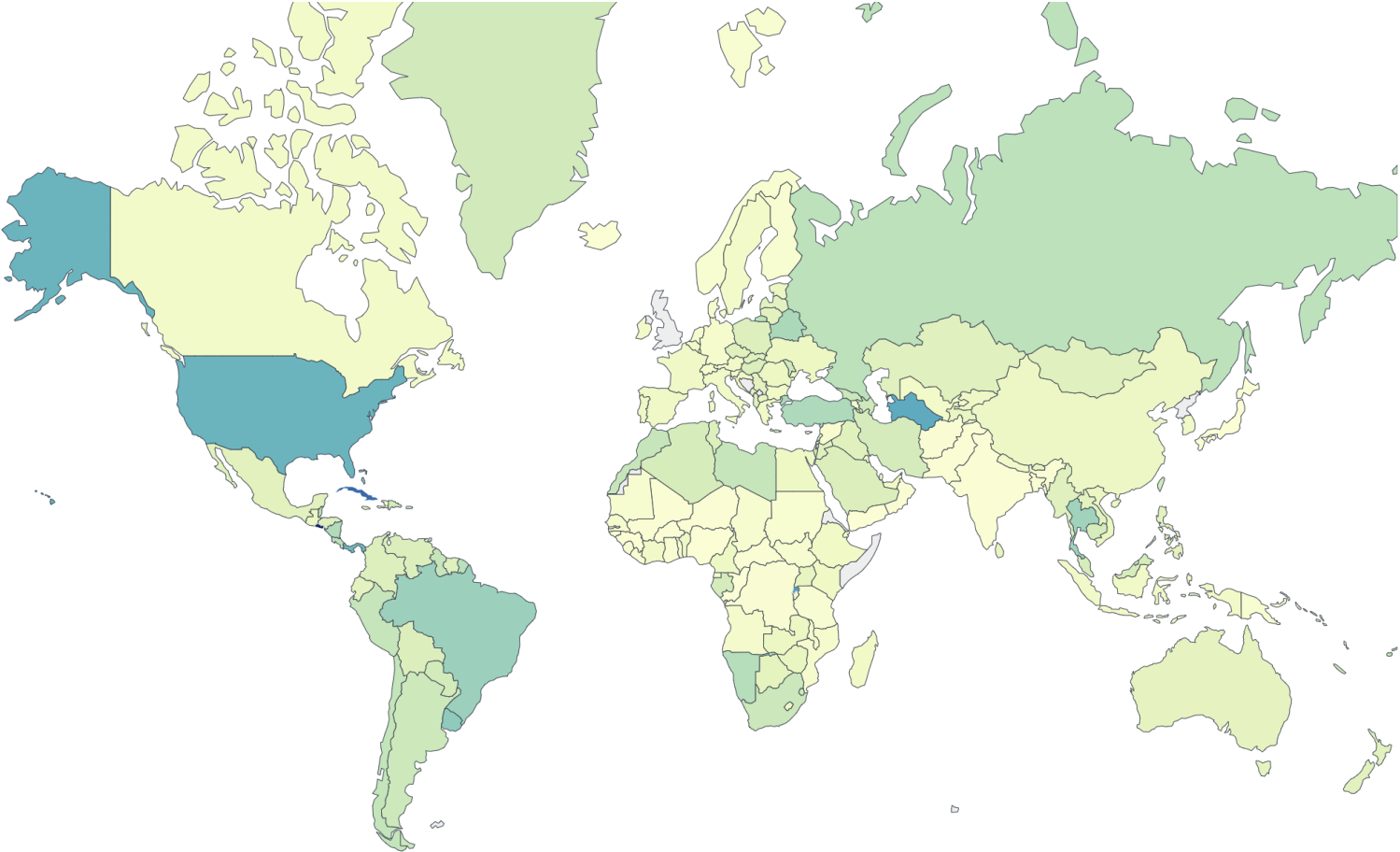
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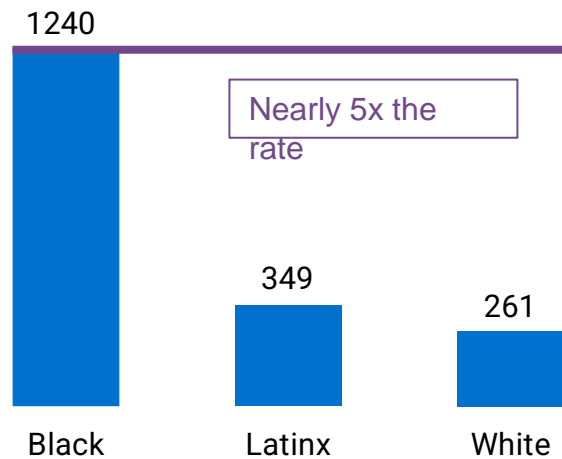
**Shadiya L. Moss, PhD, MPH**

# The U.S. incarcerates more of its citizens than most other countries in the world



# The rate of imprisonment among Black American adults is nearly five times the rate of imprisonment among white adults

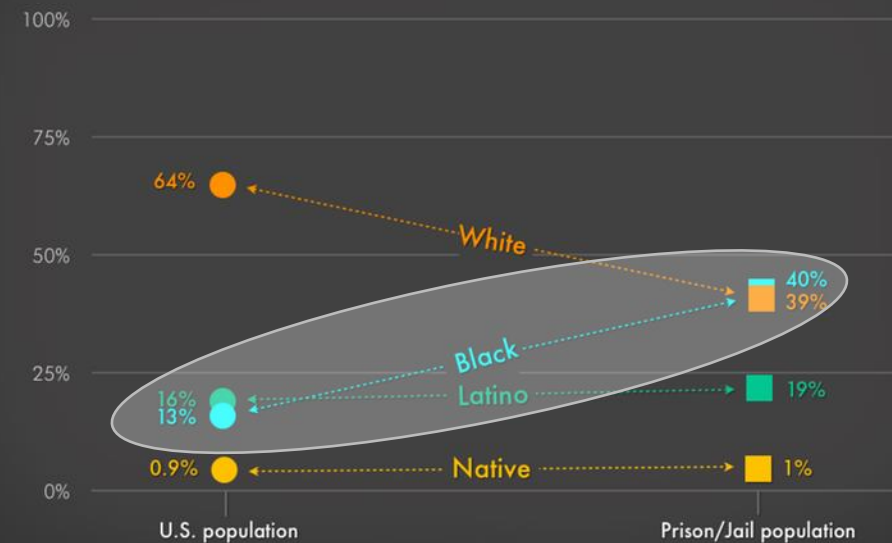
Average rate of imprisonment among Black, Latine and white adults per 100,000 residents



Data Source: Carson, E. A. (2021). Prisoners in 2019. Bureau of Justice Statistics; U.S. Census Bureau (n.d.). Age, sex, race, and Hispanic-origin--6 race groups. (SC EST 2019-ALLDATA6).

## Racial and ethnic disparities in prisons and jails

Whites are underrepresented in the incarcerated population while Blacks are overrepresented.



PRISON  
POLICY INITIATIVE

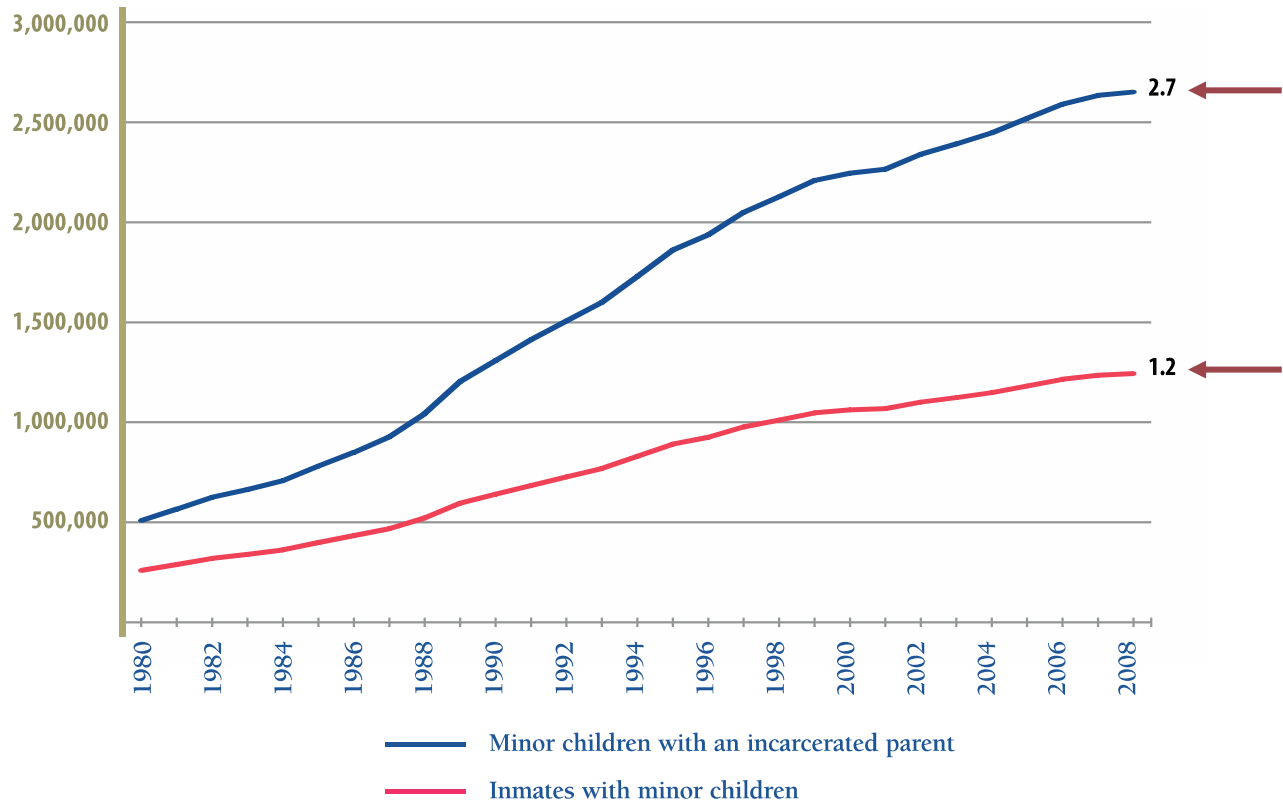
Compiled from 2010 Census, Summary File 1.

# In 2008, there were 2.2 million persons imprisoned in state and federal prisons, and local jails, 54% of whom were parents of minor children.

FIGURE 9

## RISING NUMBERS OF CHILDREN WITH INCARCERATED PARENTS

Minor children outnumber incarcerated parents by more than 2 to 1



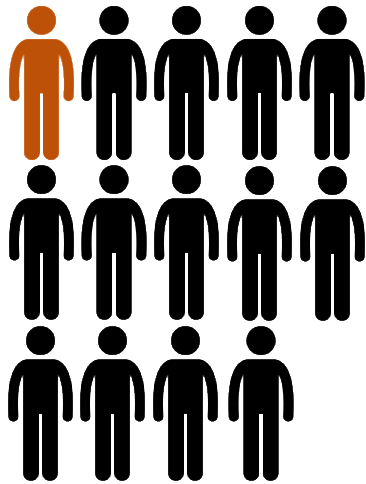
Source: Original analysis for The Pew Charitable Trusts by Bruce Western and Becky Pettit, 2009.

# Racial inequities in parental incarceration reflected by children left behind

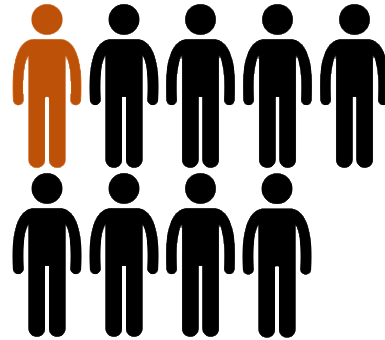
## Parental incarceration

Parent imprisoned or detained in local jails, state prisons, and/or federal prisons and jails

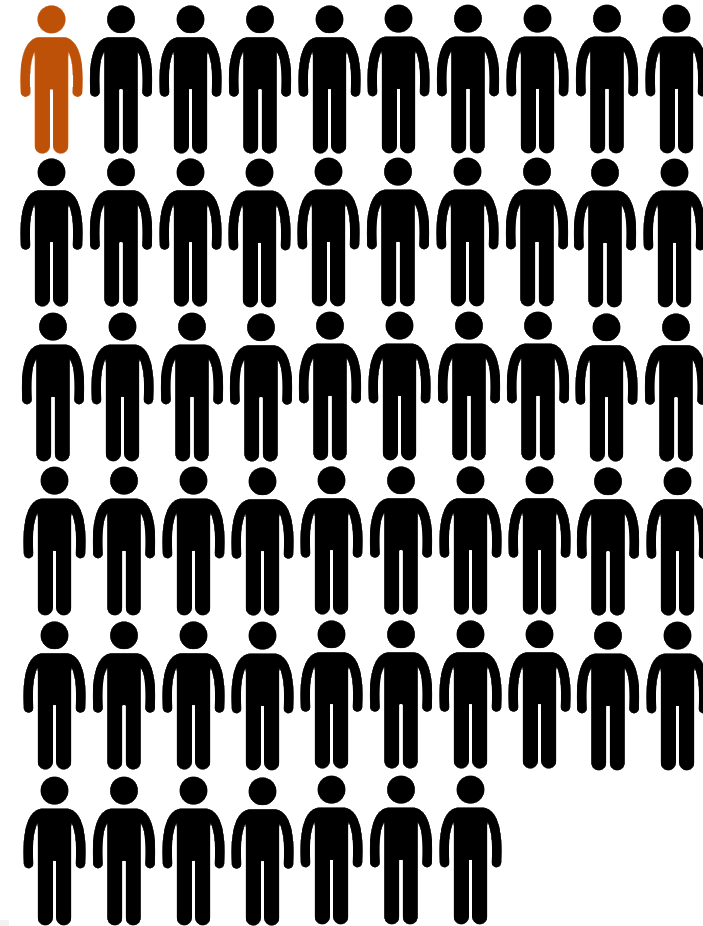
1 in 14 children



1 in 9 Black children



1 in 57 white children





# Future of Families & Child Wellbeing Study

PRINCETON | COLUMBIA



# Add Health

The National Longitudinal Study of Adolescent to Adult Health



UNC

CAROLINA  
POPULATION CENTER





- Longitudinal cohort study
- N = 4,898 children
  - 20 large/major U.S. cities
  - Many born to unmarried parents
- Predominately Black American sample
- Data from birth to adulthood



- Longitudinal cohort study
- N = 20,745 adolescents
  - 80 high schools and 52 middle schools
  - Parent marital status unknown
- Predominately white American sample
- Data from 12-18 years of age into adulthood

## Measurement of exposure and outcome



- **Maternal incarceration**
  - Lifetime: 0=never, 1=ever
  - Duration: 0=never, 1=1 year or less, 2=2+ years
  - Timing: 1=before birth to 11 years of age, 2=12 to 18 years of age



- **Cannabis use**
  - Past month/30 days
  - 0=did not use cannabis in the past month
  - 1=used cannabis in the past month



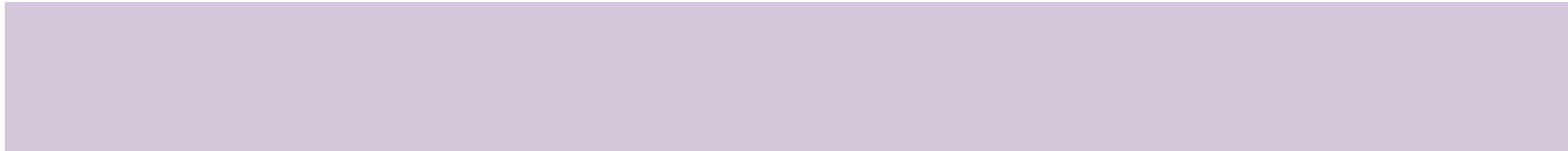
# Statistical analyses

- Modified-Poisson regression models
  - Robust standard errors
  - Relative risks
- Magnitude of difference
  - 10% “rule” for main measures of association
  - 20% “rule” for possible effect modification

$$\text{Magnitude of difference (\%)} = \left| \frac{RR_2 - RR_1}{RR_1} * 100 \right|$$

- Post-stratification weights

# Are there differences in the magnitude of the association between maternal incarceration and adolescent cannabis use between Future of Families and Add Health?



# Are the distribution of effect modifiers different across studies?

Effect modifiers in Future of Families, non-post-stratification-weighted Add Health, and post-stratification-weighted Add Health samples

# Do the hypothesized effect modifiers modify the association between maternal incarceration and adolescent past month cannabis use within studies?

Variables	<i>Past month Cannabis use</i>		<i>Past month Cannabis use</i>	
	<i>Future of Families</i>		<i>non-post-stratification-weighted Add Health</i>	
	RR	(95%CI)	RR	(95%CI)
<b>Lifetime maternal incarceration by sex</b>				
Girl	2.27	(1.42, 3.61)	1.74	(1.34, 2.28)
Boy	1.79	(1.21, 2.62)	1.36	(1.00, 1.86)
<b>Lifetime maternal incarceration by age</b>				
14-15 year olds	1.28	(0.70, 2.35)	1.45	(1.02, 2.08)
16-18 year olds	2.19	(1.55, 3.09)	1.70	(1.33, 2.17)
<b>Lifetime maternal incarceration by race</b>				
Non-Latine white	2.19	(0.89, 5.39)	1.54	(1.15, 2.07)
Non-Latine Black	1.81	(1.20, 2.73)	2.09	(1.50, 2.90)
Latine	1.76	(0.95, 3.27)	1.27	(0.52, 3.09)
Non-Latine other	3.43	(1.42, 8.29)	0.95	(0.45, 2.04)

If Add Health was reweighted to be similar to Future of Families on effect modifiers, would resulting measures of association between maternal incarceration and adolescent cannabis use be more comparable?

Variables	Future of Families		Past month Marijuana use post-stratification-weighted Add Health		Magnitude of difference %
	RR	(95%CI)	RR	(95%CI)	
<b>Lifetime</b>					
Never		reference		reference	
Ever	1.44	(1.04, 2.00)	1.41	(0.96, 2.07)	2.1
<b>Duration</b>					
Never		reference		reference	
1 year or less	1.36	(0.79, 2.33)	1.62	(0.97, 2.70)	19.1
2+ years	3.39	(1.49, 7.68)	1.90	(0.97, 3.71)	44.0
<b>Timing</b>					
Never		reference		reference	
Before birth to 11 years	0.64	(0.20, 2.01)	1.64	(0.99, 2.72)	156.3
12 year to 18 years	2.09	(1.36, 3.21)	1.42	(0.82, 2.46)	32.1

# Summary

- Differences in the distribution of effect modifiers across Future of Families and Add Health existed
  - Did not explain differences in effect estimates across studies
  - Measured and/or unmeasured effect modifiers may explain discrepancies
- Basis for assessing differences in effect modifiers across studies

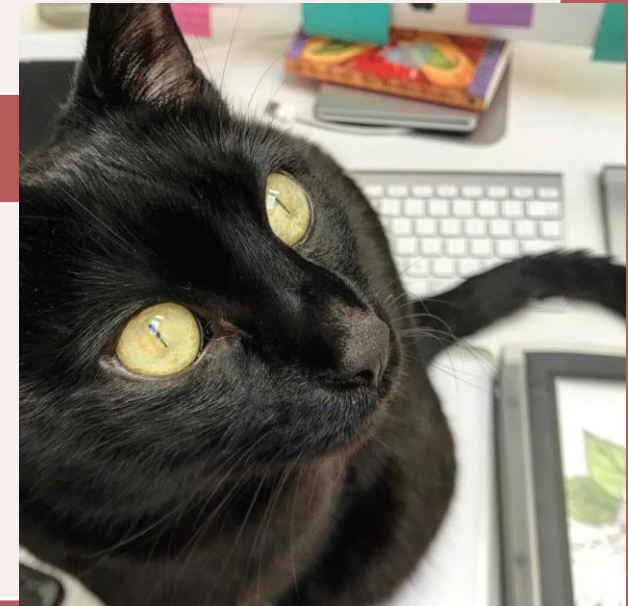
# Acknowledgements

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# Questions?

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Moment of silence for Marcellus Williams

Missouri executes Marcellus Williams despite prosecutors and the victim's family asking that he be spared



U.S. NEWS Missouri executes a man for the 1998 killing of a woman despite her family's calls to spare his life



News

Marcellus Williams dies by lethal injection Tuesday