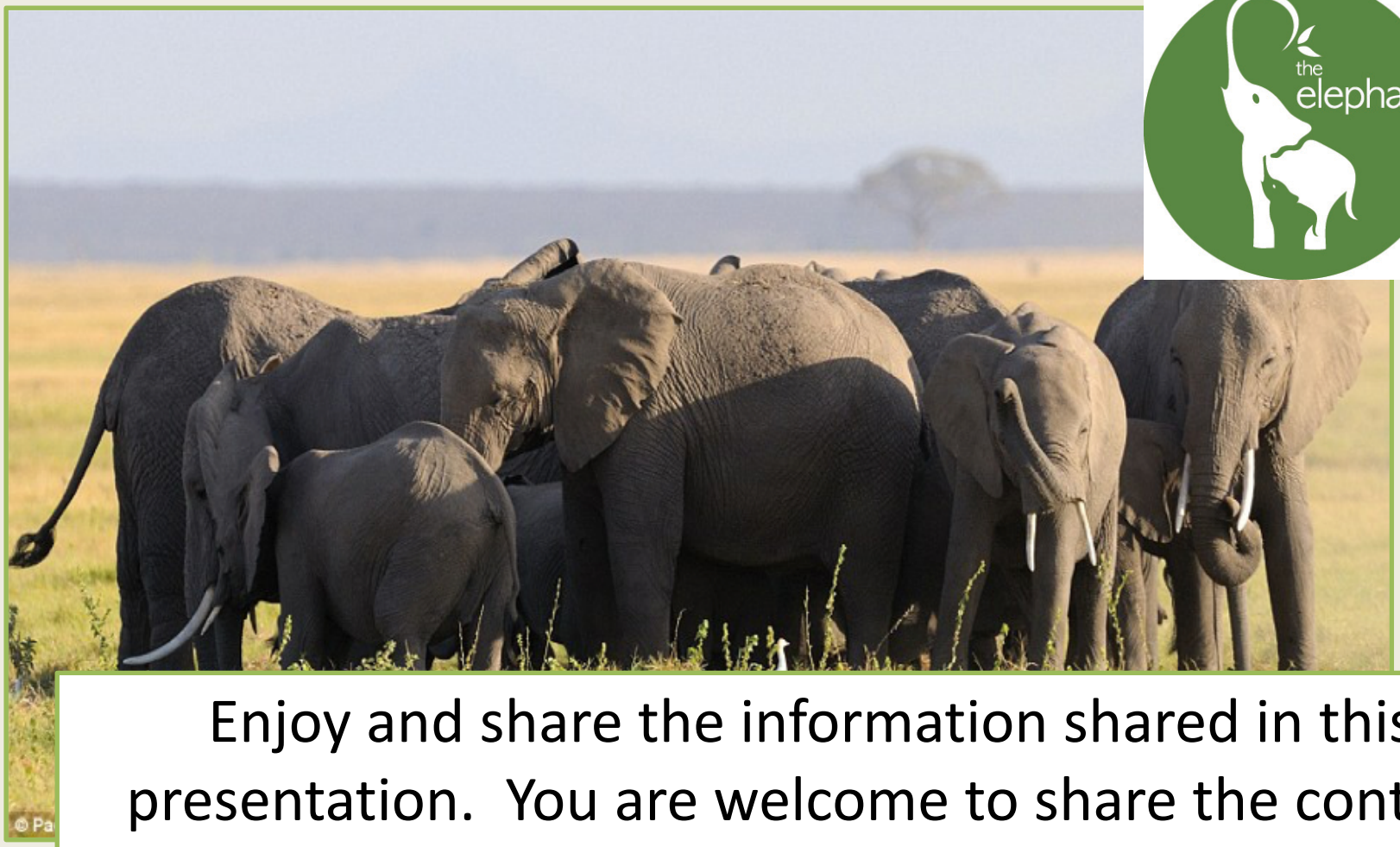
Perinatal Cannabis Use:
A Risk-benefit Analysis

American Association of Birth Centers Conference 2020

Presented by
Heather Thompson, MS, PhD



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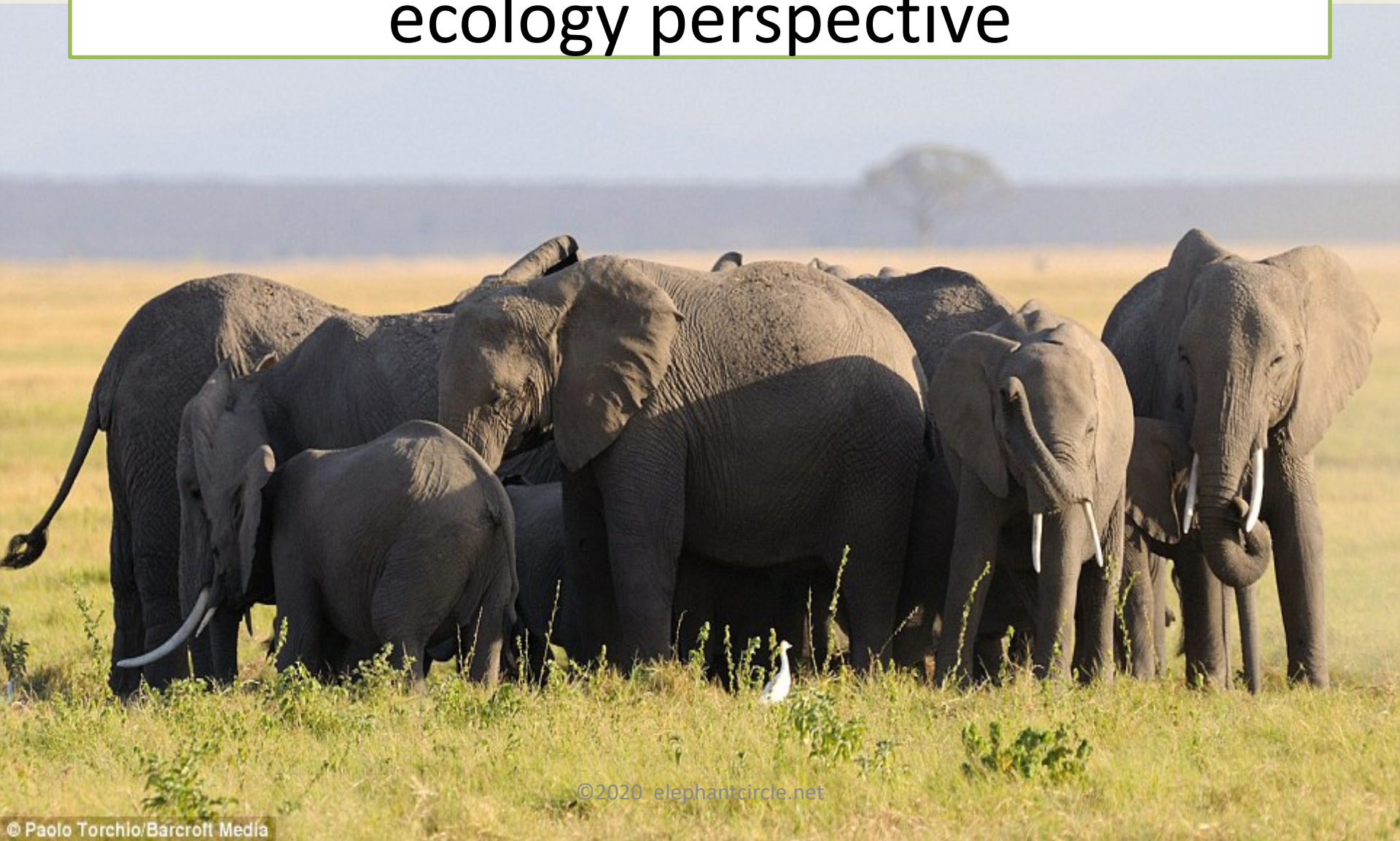
Elephant Circle works from a family ecology perspective



Overview

1. My perspective and biases
2. Key concepts
3. A risk/benefit analysis of perinatal Cannabis use – health, legal and child welfare implications
4. Application of harm reduction

My perspective and biases

- Deputy Director, Elephant Circle, a birth justice org
- 7 years as Research Director and member of Governing Body at a community, midwife-led birth center
- 17 years as in-home postpartum care provider

My Biases

- I am a scientist, I am not a clinician
- I believe mammalian biology can exert protective factors during the perinatal period
- I believe deeply in harm reduction
- Born and raised in Colorado
- White, English speaking, US citizen, able-bodied, owning class, queer parent with non-binary gender

Birth Justice

Reproductive Health	Reproductive Rights	Reproductive Justice
Sees the problem as a lack of access to health services, lack of information about health services, a lack of accurate health data	Sees the problem as a lack of legal protection or lack of laws protecting individual's rights.	Sees the problem as self-determination being limited by power inequities across multiple systems.

Birth Justice
Sees the problem as self-determination during the perinatal period as being limited by power inequities across multiple systems.

BIRTH JUSTICE REQUIRES

HOW

strategies for
tackling systems of power & oppression
and
strategies for change and resilience

the elephant circle

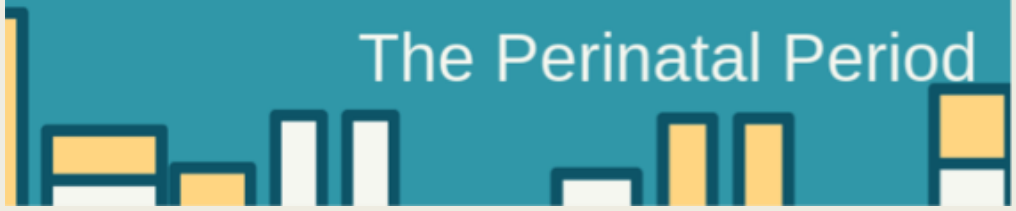
BIRTH JUSTICE REQUIRES EXPERTISE
IN THREE AREAS

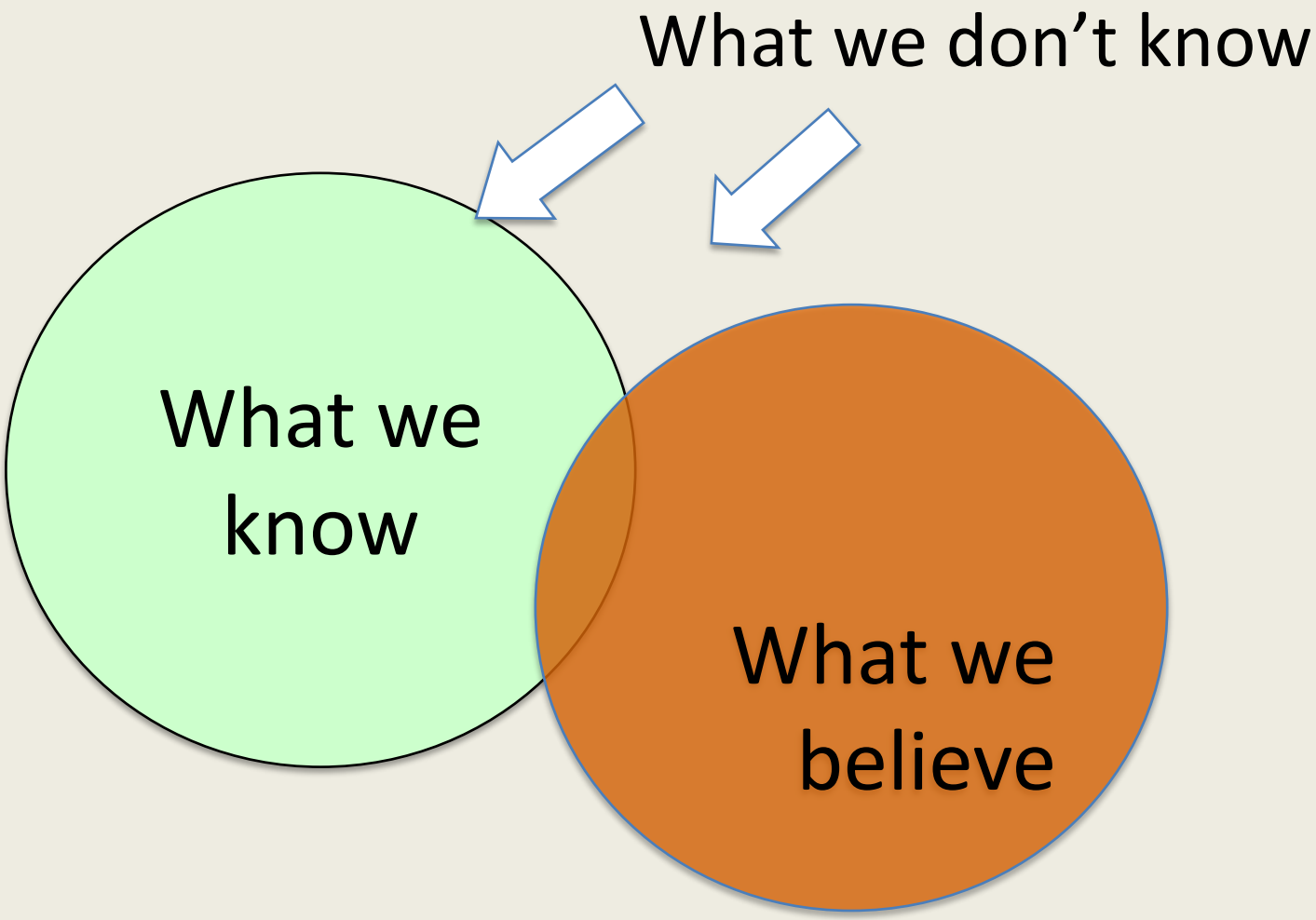
WHAT

Health Systems

Legal Systems

The Perinatal Period





The perinatal period

Pregnancy plus postpartum

A process of adaptation that impacts all body systems

There is no such thing as no risk

Risk is political

“Black motherhood has borne the weight of centuries of disgrace manufactured in both popular culture and academic circles. A lurid mythology of Black mothers’ unfitness, along with a science devoted to proving Black biological inferiority, cast Black childbearing as a dangerous activity.”

-Dorothy Roberts, Killing the Black Body

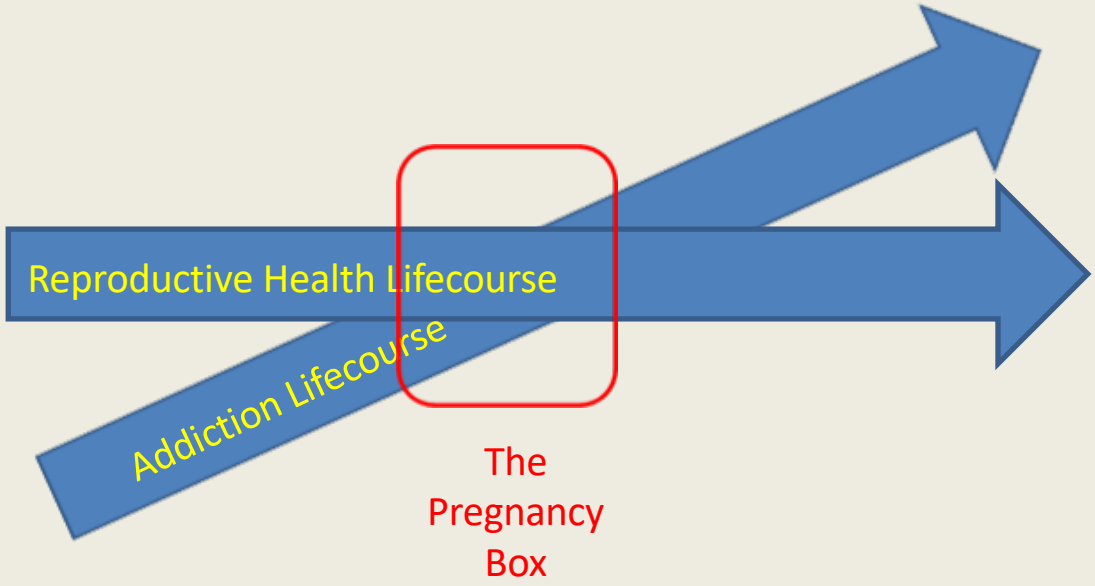
"We must stop believing that what the law says about itself is true and that what the law says about us is what matters."

-Dean Spade, author of Normal Life: Administrative Violence, Critical Trans Politics and the Limits of Law

Evaluating risk

Consider: https://implicit.harvard.edu/implicit/takeatest.html

Reproduction intersects with addiction

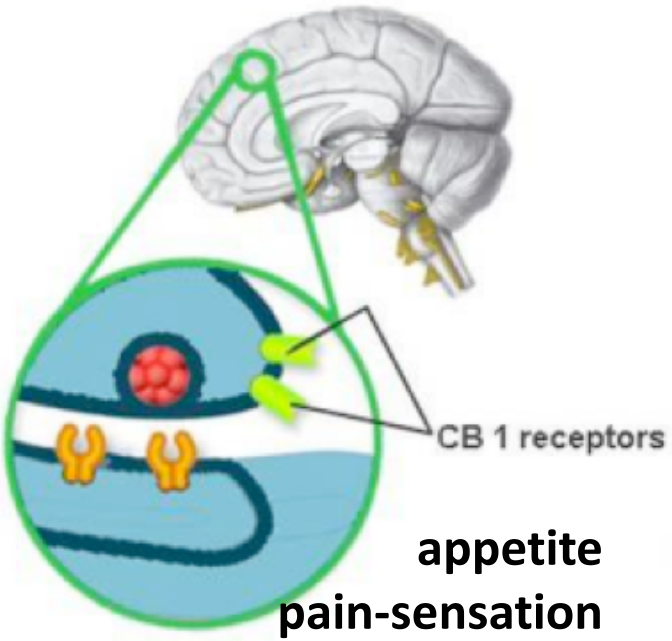


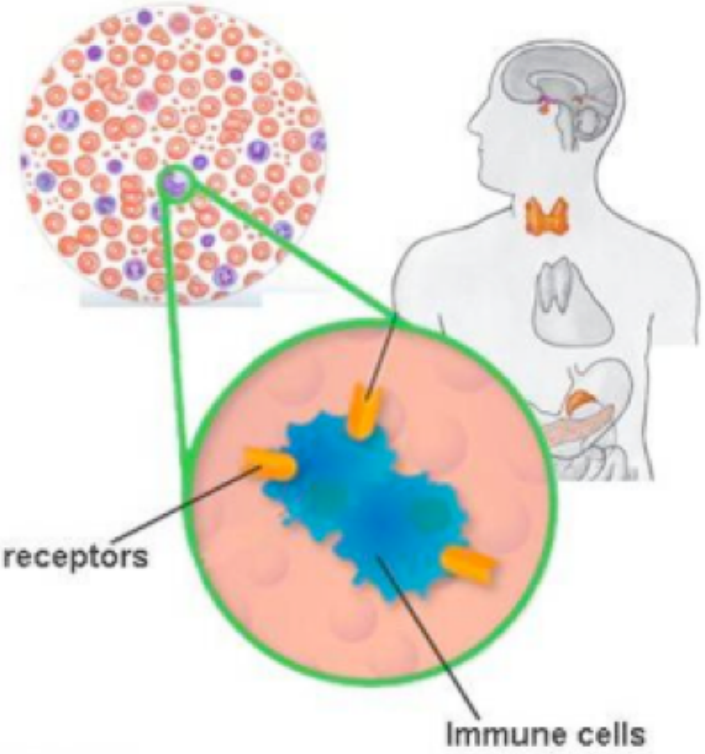
Endocannabinoid action

Mode of action

CB1 receptors
mainly localized in the brain
(*hippocampus, cerebellum and cerebrum*)

CB2 receptors
mainly situated in the periphery
(*spleen, tonsillar and immune cells*)





appetite
pain-sensation
mood
memory
Immune function

Sobotta: Atlas der Anatomie des Menschen
Urban & Fischer Verlag München

Cannabis as medicine

Third millennium B.C.: First medicinal use recorded by Chinese Emperor Shen Nung

Until 1942: *Cannabis* part of US Pharmacopeia; tinctures were commonly used for menstrual cramps, labor pains, gout, malaria, rheumatism, nausea, lack of appetite and to improve mood

***Marihuana Stamp Act of 1937*:** As with most "illicit" substances, criminalization of cannabis was rooted in racism – and was a response to Mexican immigration and ongoing anti-Blackness.

Drug War under Nixon, 1972: "We knew we couldn't make it illegal to be either against the war or black, but by getting the public to associate the hippies with marijuana and blacks with heroin, and then criminalizing both heavily, we could disrupt those communities. We could arrest their leaders, raid their homes, break up their meetings, and vilify them night after night on the evening news. Did we know we were lying about the drugs? Of course we did."

John Ehrlichman, top Nixon aide

From *Cannabis: A History*, Martin Booth

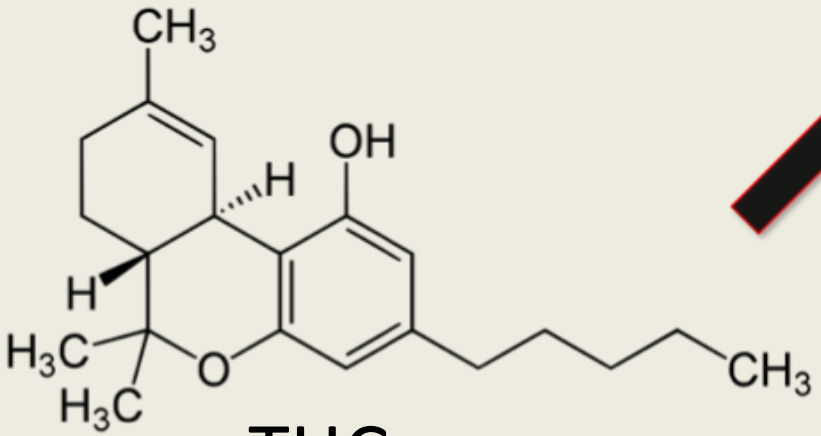
In June 1971, President Nixon declared a “war on drugs.”

A top Nixon aide, John Ehrlichman, later admitted: “You want to know what this was really all about. The Nixon campaign in 1968, and the Nixon White House after that, had two enemies: the antiwar left and black people. You understand what I’m saying. **We knew we couldn’t make it illegal to be either against the war or black, but by getting the public to associate the hippies with marijuana and blacks with heroin, and then criminalizing both heavily, we could disrupt those communities. We could arrest their leaders, raid their homes, break up their meetings, and vilify them night after night on the evening news. Did we know we were lying about the drugs? Of course we did.”**

Nixon temporarily placed marijuana in Schedule One, the most restrictive category of drugs, pending review by a commission he appointed led by Republican Pennsylvania Governor Raymond Shafer.

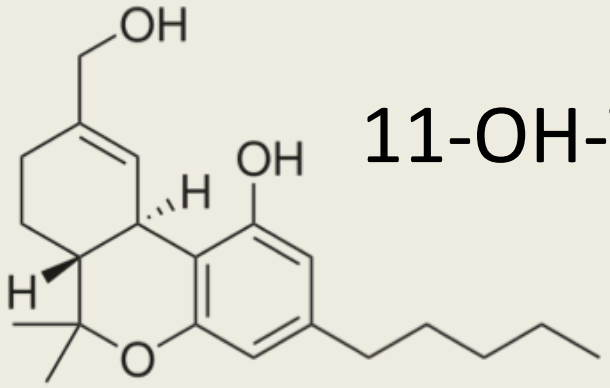
Cannabis in the body: the metabolism of THC

THC -> 11-OH-THC and THC-COOH

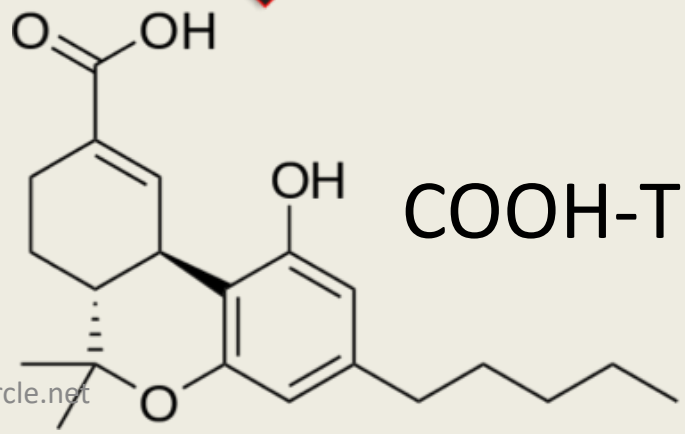


THC

***trans*-Δ^9-tetrahydrocannabinol**



11-OH-THC



COOH-THC

THC and 11-OH-THC
are both psychoactive molecules
COOH - THC is *not* psychoactive

Scheduling of marijuana began in the 1970s

Schedule I

heroin, lysergic acid diethylamide (LSD), marijuana (cannabis), 3,4-methylenedioxymethamphetamine (ecstasy) and peyote

High potential for abuse, no accepted medical use and no safe use even under medical supervision

Schedule II (high potential for abuse/dependence but medical use):

cocaine, methamphetamine, methadone, hydromorphone (Dilaudid), meperidine (Demerol), oxycodone (OxyContin), fentanyl, Dexedrine, Adderall, and Ritalin

Schedule III (moderate potential for abuse or dependence):

combination products with less than 15 milligrams of hydrocodone per dosage unit (Vicodin), Products containing less than 90 milligrams of codeine per dosage unit (Tylenol with codeine), ketamine, anabolic steroids, testosterone, ***Marinol***

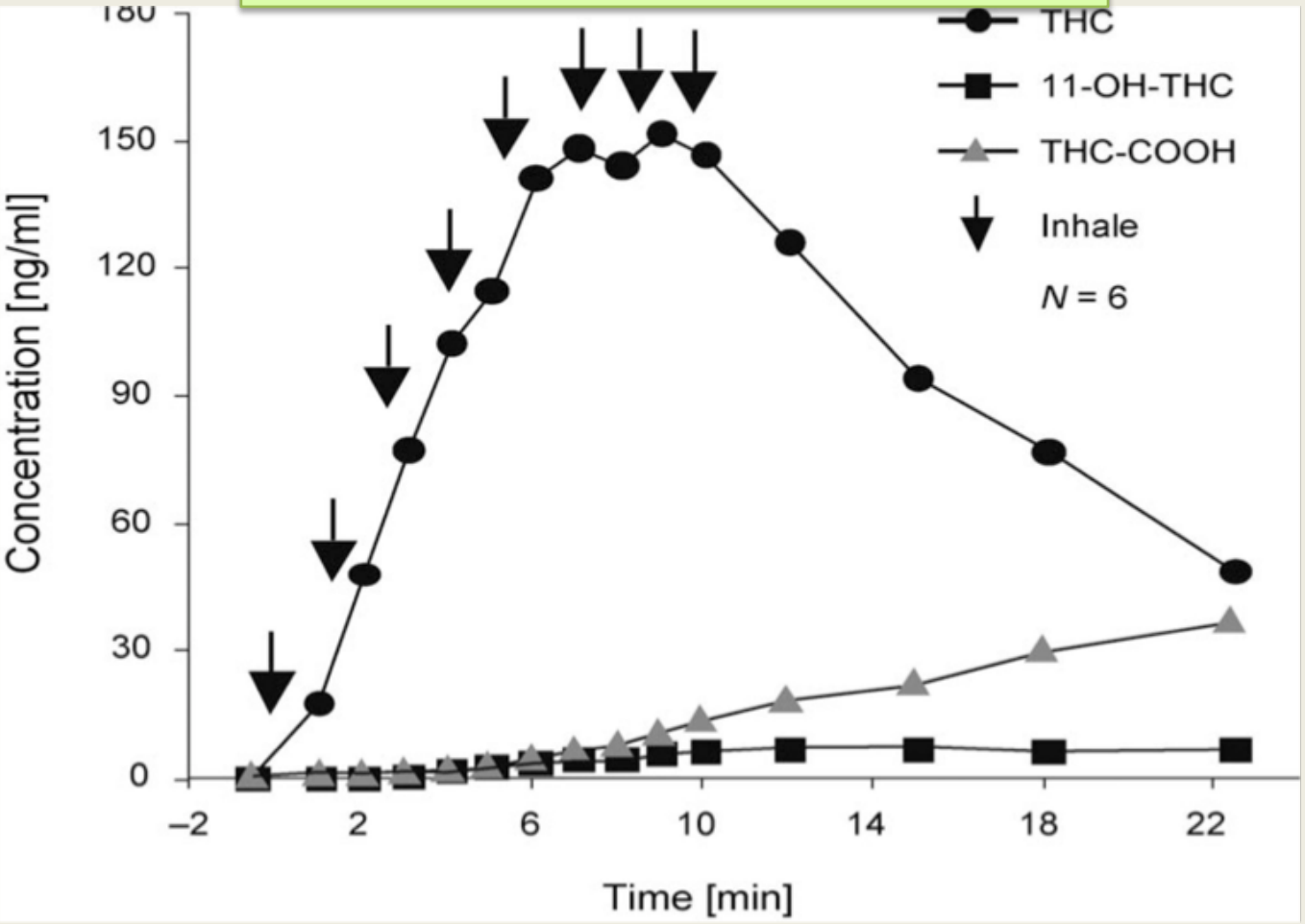
Schedule IV (little risk of abuse or dependence):

Xanax, Soma, Darvon, Darvocet, Valium, Ativan, Talwin, Ambien

Schedule V

cough preparations with less than 200 milligrams of codeine or per 100 milliliters (Robitussin AC), Lomotil, Motofen, Lyrica

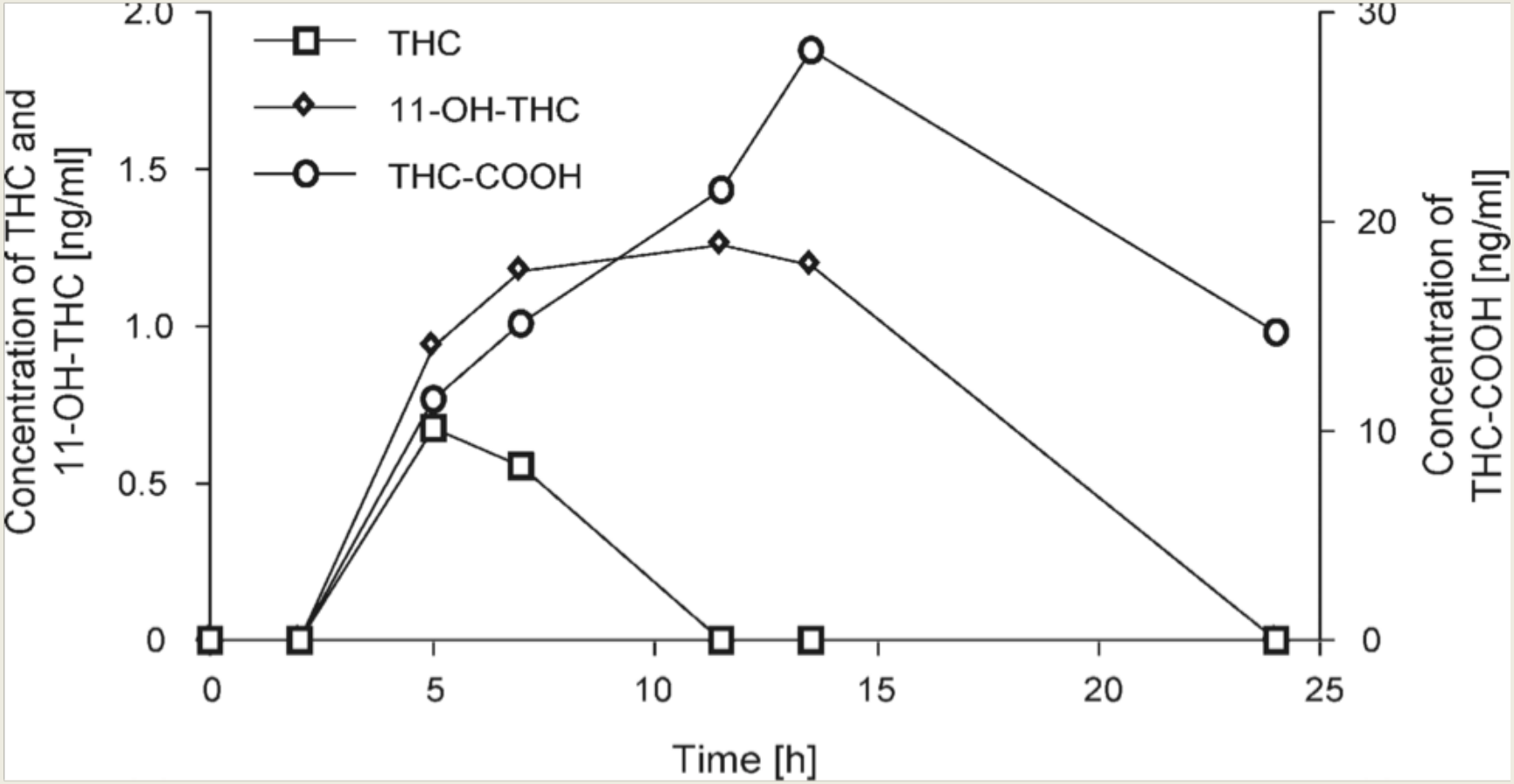
Smoking marijuana



Mean (N=6) plasma concentrations of THC, 11-OH-THC, and THC-COOH during smoking of a single cannabis cigarette containing 3.55% of THC. Arrows (↓) indicate one inhalation or puff on the cannabis cigarette.

Reprinted and adapted with permission by Springer-Verlag, 'Handbook of Experimental Pharmacology', 2005, p. 660, Fig. 1.

Eating synthetic THC (dronabinol)



Plasma concentrations (N=1) over 24 h for THC, 11-OH-THC, and THC-COOH following administration of two doses (2.5 mg each) of synthetic THC (dronabinol) at 4.5 and 10.5 h.

Reprinted and adapted with permission by Elsevier, p. 152 in ‚'Handbook of Experimental Pharmacology', 2005,. Fig. 2.

Prenatal Cannabis Use: Health Effects

Cannabis Use and Fertility

Regular cannabis use in males can

- decrease sperm count (*Nassan, 2018)*
- decrease sperm motility (*Nassan, 2018)*
- increase the risk of miscarriage *(Harlow, 2019)*
- decrease serum “reproductive hormone” levels *(Nassan, 2018)*

THC and the placenta

- The placenta has both CB1 and CB2 receptors (Kenney, 1999)
- The placenta serves as a barrier to THC and its metabolites (Bailey, 1987, Lee 1985)
- Serum fetal COOH-THC was not detected in the first or third trimester (animal studies)
- In rats, THC levels were 1/3 less in fetal plasma than maternal plasma (Hutchings, 1989)
- In 10 humans who smoked daily in the third trimester, cord blood THC levels were 2-6 times lower than maternal serum levels at the same time (Blackard, 1984)
- One paper describes decreased mRNA expression of enkephalin/D2 receptors and changes in opioid receptor mRNA expression midgestation (Hurd, 2005; Wang, 2006)

The effects of prenatal marijuana use has been studied for over 30 years

Study	Primary Investigator	Year and place of initiation	Population	Looked at
Ottawa Prenatal Prospective Study (OPPS)	Fried	1978 Ottowa, Canada	Low-risk, European-American, middle-class	Marijuana and cigarettes
Maternal Health Practices and Child Development Study (MHPCD)	Day	1982 Pittsburgh, Pennsylvania	High-risk, mixed ethnicity (57% AA), single (71%), low SES	Marijuana and alcohol
Generation R	Hofman	2001 Rotterdam, Netherlands	Mixed ethnicities, higher SES	Wide range of effects and outcomes

Confounding factors – race, poverty, tobacco

Common Questions

Stillbirth

- Cannabis use alone does not increase the risk of stillbirth

Deformities

- Cannabis is not teratogenic. There are no reported cases of fetal or infant deformities related to cannabis exposure.

Pre-term birth

- Cannabis use alone does not appear to increase the risk of pre-term birth.
- Pre-term birth is sometimes associated with regular cannabis use, especially in the case of other sociodemographic or lifestyle risk factors

Low Birth Weight/Small for Gestational Age

- Some research suggests that babies born to regular prenatal cannabis users experience LBW/SGA.
- This risk is primarily associated with chronic cannabis use and other sociodemographic or lifestyle risk factors

KNOW THE FACTS

Marijuana and Pregnancy:

- Using marijuana while pregnant may harm your baby. Marijuana that passes to your baby during pregnancy may make it hard for your child to pay attention and learn, especially as your child grows older. This would make it harder for your child to do well in school.

GOOD to KNOW

To learn more, visit GoodToKnowColorado.com/Baby.

Cognitive/learning issues in adolescence

- The data most often cited come from the MHCPD (55% African American)
- Only regular use ($\geq$ 1 joint/day) was associated with any decrease in reading scores
- In 6-10 year-olds, 2nd trimester use was most important, in 14 year-olds, 1st trimester use was most important
- "Other predictors of lower reading subscale scores were African American race, lower maternal education, male gender, and lower family income."
- Exposure to one or more alcoholic drinks/day in the second trimester of pregnancy significantly predicted a reduction in the Basic Reading subscale of WIAT (coefficient = −7.7, $t = 2.2$, $p < 0.05$).
- "There were no other significant associations between prenatal substance exposure and the measures of academic achievement."

frontiers in Psychology

SYSTEMATIC REVIEW
published: 08 May 2020
doi: 10.3389/fpsyg.2020.00816

Totality of the Evidence Suggests Prenatal Cannabis Exposure Does Not Lead to Cognitive Impairments: A Systematic and Critical Review

*Ciara A. Torres[1,2], Christopher Medina-Kirchner[2], Kate Y. O'Malley[3,4] and Carl L. Hart[2,3]**

[1] School of Social Work, Columbia University, New York, NY, United States, [2] Department of Psychology, Columbia University, New York, NY, United States, [3] Division on Substance Use, Department of Psychiatry, New York State Psychiatric Institute, New York, NY, United States, [4] Department of Psychological Sciences, Swinburne University, Hawthorn, VIC, Australia

May 2020

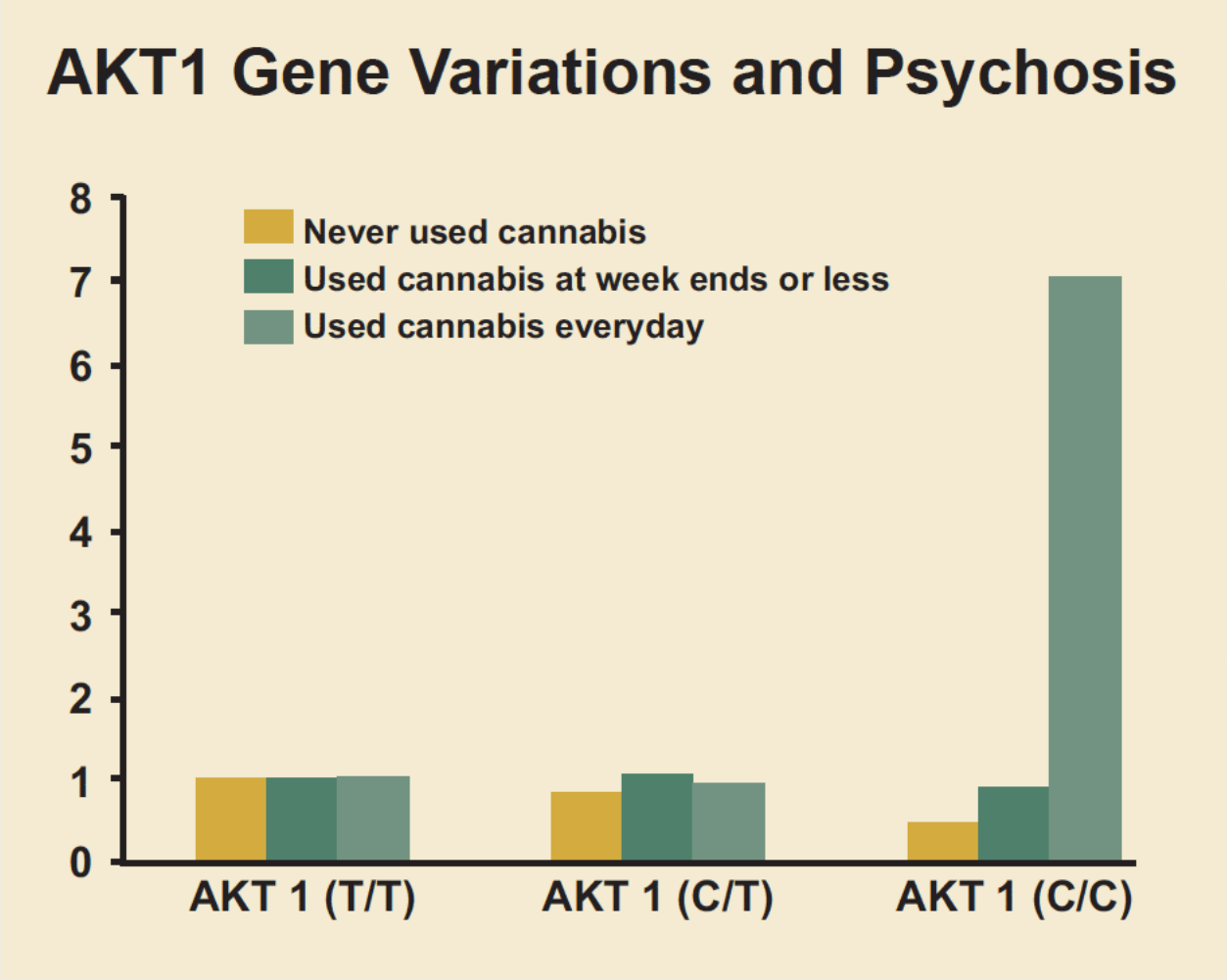
Fried and Watkinson, 2000	OPPS	*Basic visuoperceptual functioning* (TVPS, perceptual quotient composed of visual discrimination, memory, spatial relations, form constancy, sequential memory, figure-ground, and closing subtests); *Visual attention/task shifting* (Trail making test, time A and time B); *Visuoperceptual*	9–12 year old children of women who reported MJ use during pregnancy (heavy MJ: $N = 21$; infrequent-moderate MJ: $N = 23$; CTL: $N = 102$)	MJ use self-reported throughout pregnancy **Categories:** Infrequent-moderate = 0 < AWJ < 6 Heavy = AWJ ≥ 6	Prenatal MJ exposure associated with poorer performance on the object assembly subtest* and the perceptual organization index* (WISC-III) No other differences observed	Despite poorer performance on two measures, MJ-exposed participants performed in the normal range on all cognitive tests Mothers reported tobacco cigarette smoking, alcohol, and cocaine use, which makes it difficult to assess the effect of MJ
Goldschmidt et al., 2004	MHCPD	*Academic achievement* (WRAT-R, reading, spelling, and arithmetic subtests) and (PIAT-R, reading comprehension subtest) **Total no. of outcome measures** = 15	10 year old children of women who reported MJ use during: 1st trimester (MJ: $N = 253$; CTL: $N = 353$), 2nd trimester (MJ: $N = 127$; CTL: $N = 421$), 3rd trimester (MJ: $N = 116$; CTL $N = 490$)	MJ use self-reported at 4th & 7th pregnancy months and at 24–28 h post-delivery **Categories:** Exposed by trimester Not heavy=ADJ < 1 Heavy = ADJ ≥ 1	**2nd trimester:** MJ exposure associated poorer academic achievement (PIAT-R: reading comprehension)* No other differences were observed	Cognitive scores were not compared against a normative data set. Thus, the clinical importance of findings could not be determined Mothers reported tobacco cigarette smoking, and alcohol use, which makes it difficult to assess the effect of MJ Maternal MJ use was determined exclusively from self-report

Implications

The current review of the literature found that there are relatively few cognitive alterations noted in offspring exposed to cannabis prenatally. It is important also to note that these results should be interpreted taking into account limitations of the current state of the literature. It is also critical to understand that subsequent studies, especially those that address the limitations point out here, may yield a more concerning pattern of effects.

Regardless, at present, we are concerned that a misunderstanding of the relationship between prenatal cannabis exposure and subsequent cognitive functioning leads to an oversimplification of the complex relationships between socioeconomic factors and functioning of the individual whether drug use is involved or not. Misinterpretations of the complex interactions of relevant factors in itself can cause harm to pregnant women and their children by leading to punitive policies and enhancing unwarranted stigma. In some cases, intense stigma has resulted in removal of children from their families, and even in maternal incarceration. The rationale for such policies is, in part, that prenatal cannabis exposure causes persistent deleterious effects, especially on cognitive functioning. Findings from this review suggest that this assumption should be reevaluated to ensure that our assumptions do not do more harm than the drug itself.

What about schizophrenia?
What about autism?



Source: NIDA

Those who use marijuana daily (green bars) with the C/C variant have a seven times higher risk of developing psychosis than those who use it infrequently or use none at all. The risk for psychosis among those with the T/T variant was unaffected by whether they used marijuana.

Maternal cannabis use in pregnancy and child neurodevelopmental outcomes

Daniel J. Corsi, Jessy Donelle, Ewa Sucha, Steven Hawken, Helen Hsu, Darine El-Chaâr, Lise Bisnaire, Deshayne Fell, Shi Wu Wen & Mark Walker

Nature Med, Aug 2020.

The incidence of autism spectrum disorder diagnosis was 4.00 per 1,000 person-years among children with exposure compared to 2.42 among unexposed children, and the fully adjusted hazard ratio was 1.51 (95% confidence interval: 1.17–1.96) in the matched cohort. The incidence of intellectual disability and learning disorders was higher among offspring of mothers who use cannabis in pregnancy, although less statistically robust. **We emphasize a cautious interpretation of these findings given the likelihood of residual confounding**.

Aran *et al. Molecular Autism* (2019) 10:2
https://doi.org/10.1186/s13229-019-0256-6

Molecular Autism

RESEARCH Open Access

Lower circulating endocannabinoid levels in children with autism spectrum disorder

Adi Aran[1*], Maya Eylon[2], Moria Harel[1], Lola Polianski[1], Alina Nemirovski[2], Sigal Tepper[3], Aviad Schnapp[1], Hanoch Cassuto[1], Nadia Wattad[1] and Joseph Tam[2]

Maternal marijuana use and adverse neonatal outcomes: A systematic review and meta-analysis

Conner et al., *AJOG*, 2016

N=31 studies

Primary outcomes

- low birth weight
- preterm birth < 37 weeks

Secondary outcomes

- birth weight
- gestational age at birth
- SGA
- NICU admission
- stillbirth
- spontaneous abortion
- low Apgar score
- placental abruption
- perinatal death

"Maternal marijuana use during pregnancy ***is not an independent risk factor*** for adverse neonatal outcomes after adjusting for confounding factors.

Thus, the association between maternal marijuana use and adverse outcomes appears attributable to concomitant tobacco use and other confounding factors."

This echoes the findings by the **CDC in 2010**:
"Reported cannabis use does not seem to be associated with low birth weight or preterm birth."

consistent with

Maternal marijuana use and neonatal morbidity.

Conner et al., *AJOG*, 2015 *retrospective review, N=8138*

What did we learn from studying the development of babies exposed to crack cocaine *in utero* in the 1990s?

In 1989 a study in Philadelphia found that nearly one in six newborns at city hospitals had mothers who tested positive for cocaine.

Poverty

is a more powerful influence on the outcome of inner-city children than gestational exposure to cocaine

Dr. Hallum Hurt,
lead investigator for the 25+ year longitudinal study
Investigating the effect of prenatal cocaine use

The Surgeon General

- Cited research that is often used as evidence that more pregnant folks are using cannabis throughout pregnancy (*Volkow 2019)*
- In fact, these data show that more folks are using cannabis in the first trimester (we can't determine if they knew they were pregnant), but **use did not increase in the 2nd or 3rd trimesters significantly over pre-legalization rates of use**
- There are no data to suggest that cannabis exposure through human milk reduces cognitive or developmental abilities – the study cited was about pregnancy, not nursing

Most folks adapt during pregnancy

Substance use by trimester		Not pregnant	Abstinence during pregnancy	Postpartum
Alcohol				
First	19.0	54.0	92%	45.4
Second	5.0			
Third	4.4			
Cigarettes				
First	19.9	24.0	47%	20.1
Second	13.4			
Third	12.8			
Illicit drugs				
First	9.0	11.4	79%	8.7
Second	4.8			
Third	2.4			

NSDUH 2012/13 Past Month

The FDA

- Generally does not regulate whole plants, but the quickly expanding market of CBD products has the FDA concerned
- There are reports that CBD toxicity is real and can result in organ damage
- Also misstated the literature on cannabis exposure through human milk and the negative impact on cognitive abilities
- Links to NIDA page which has errors and misinterpretations of the data

Known Health Effects of Cannabis Use and Chest/breastfeeding

Cannabis and Human milk

Perez-Reyes and Wall (1982), *NEJM*

Quantitative analysis of transfer of THC into human milk

"Both mothers and babies were in good health."

Tennes *et al*. (1985), *NIDA Research Monograph Series*

No significant growth, weaning, mental/motor development differences with cannabis use

Astley and Little (1990), *Neurotoxicology and Teratology*

Reported a relationship between prenatal and 1m pp exposure and decreased motor development; no such relationship after 3^{m} pp

Quantification of THC transfer from nursing parent to baby

PRESENCE OF Δ^9-TETRAHYDROCANNABINOL IN HUMAN MILK

New England Journal of Medicine
Letter to the Editor
1982

MARIO PEREZ-REYES, M.D.
University of North Carolina
School of Medicine

MONROE E. WALL, PH.D.
Research Triangle Institute

- ✓ N=2, 1x/day smoker and 7x/day smoker
- ✓ 7 & 8 month old infants, respectively
- ✓ THC-COOH was not detected in the urine of either infant
- ✓ Both infants (and both mothers) were in good health and developing normally
- ✓ The final conclusion was that marijuana use was incompatible with breastfeeding

PRESENCE OF Δ^9-TETRAHYDROCANNABINOL IN HUMAN MILK

NEMJ, Letter to the Editor, 1982

MARIO PEREZ-REYES, M.D.
University of North Carolina
School of Medicine

MONROE E. WALL, PH.D.
Research Triangle Institute

data are from <u>one</u> heavy, chronic cannabis user one hour post cannabis use

	THC	THC-11-OH	THC-COOH
plasma	7.2 ng/mL	2.5	19
	8:1		
breastmilk	60.3	1.1	1.6
The bioavailability of THC when consumed by mouth is between 1-5%.			
Baby fecal sample	347	67	611

"Both mothers and babies were in good health"

Conclusion: "marijuana use is incompatible with breastfeeding"

Drugs in Pregnancy: *Original Research*

Transfer of Inhaled Cannabis Into Human Breast Milk

Teresa Baker, MD, Palika Datta, PhD, Kathleen Rewers-Felkins, MS, Heather Thompson, PhD, Raja R. Kallem, PhD, and Thomas W. Hale, PhD

Obstetrics and Gynecology
2018

The InfantRisk team came to Colorado

Individual responses

Reported using 5x/wk

Table 3. Drug Concentrations Observed Across the Dose Interval for Each Individual

	Sample ID							
	1	2	3	4	5	6	7	8
	Concentration (ng/mL)							
Time (h)								
0	ND	ND	ND	ND	5.8	15.8	ND	ND
0.33	7.0	11.1	16.3	12.3	47.1	115.8	8.2	23.4
1	11.3	34.8	47.2	5.9	115.8	420.2	19.3	97.3
2	17.3	42.2	28.5	12.2	95.2	193.3	27.8	83.5
4	9.2	21.7	10.7	4.7	67.2	43.0	24.2	24.4
AUC (ng/h/mL)	48.9	119.7	101.3	33.9	331.1	744.4	89.1	242.7
C_{avg} (ng/mL)	12.2	29.9	25.3	8.4	82.7	186.1	22.2	60.6
C_{max} (ng/mL)	17.6	42.1	47.2	12.2	115.8	420.3	29.8	97.3
RID (%)	0.6	1.4	1.2	0.4	3.8	8.7	1.0	2.8

ND, not determined (below the level of detection); AUC, area under the drug concentration time curve; C_{avg}, average drug concentration across the dose interval; C_{max}, maximum drug concentration across the dose interval; RID, relative infant dose for delta-9-tetrahydrocannabinol in milk.

- Only 2/8 had detectable THC at time zero = 5.8 and 15.8 ng/mL
- THC concentration peaked one hour after dosing with lots of variability
- At 4 hours after dosing, THC levels were declining and nearing baseline

Baker *et al.* 2018
Obstetrics and Gynecology

Parameter (Units)	Calculated Value*	Median (Range)
C_{max} (ng/mL)	94	44.7 (12.2–420.3)
T_{max} (h)	1	1 (1–2)
Infant dose (micrograms/kg/d)	8 µg/kg/day	4.1 (1.3–27.9)
RID (%)	2.5 %	1.3 (0.4–8.7)

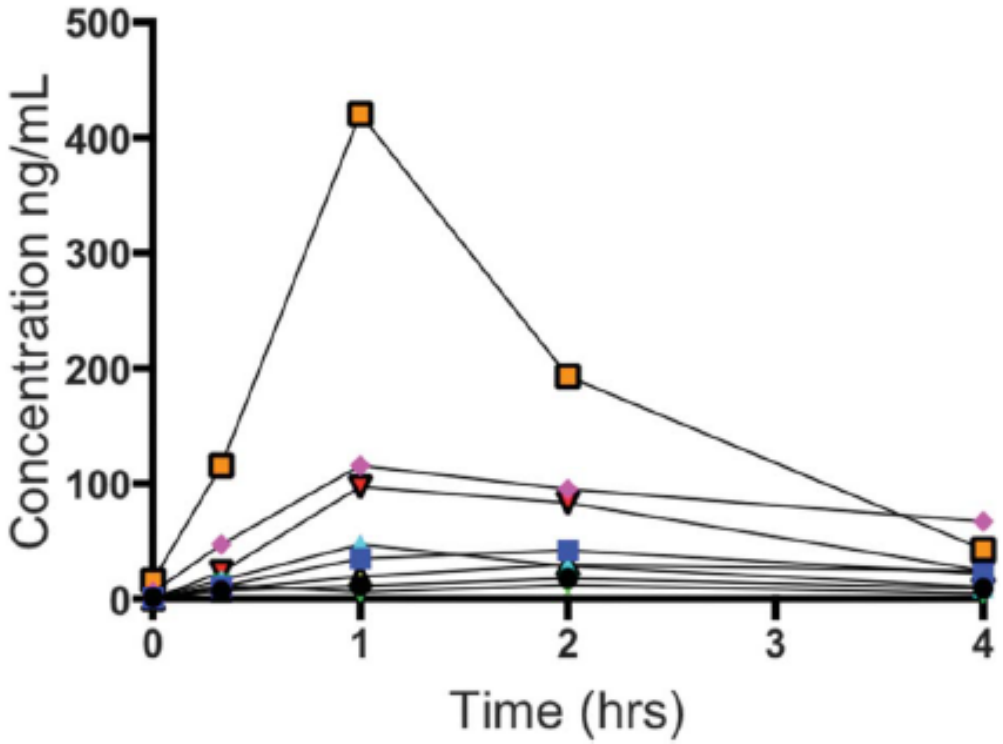


Fig. 3. Illustrated graph of each patient's data points (n=8). Each *color* represents an individual.

Baker. Inhaled Cannabis in Human Breast Milk. Obstet Gynecol 2018.

Baker *et al.* 2018
Obstetrics and Gynecology

Marijuana Use by Breastfeeding Mothers and Cannabinoid Concentrations in Breast Milk

Kerri A. Bertrand, MPH, Nathan J. Hanan, PharmD, Gordon Honerkamp-Smith, MS,
Brookie M. Best, PharmD, MAS, Christina D. Chambers, PhD, MPH

Pediatrics, 2018

- ✓ 20/54 samples did not show any detectable THC
- ✓ median milk THC concentration = 9.47 ng/mL (1.01 – 323) N = 34
- ✓ In this sample THC = 323 ng/mL (the highest in the study)
- ✓ Calculated a ½ life of ~ 27 hours
- ✓ ***The longest duration between use and THC was detected in one sample at 6d after use***
- ✓ The no THC cohort had fewer daily users and a longer average time since the last use (53h vs 24h). Neither of these findings were significant.

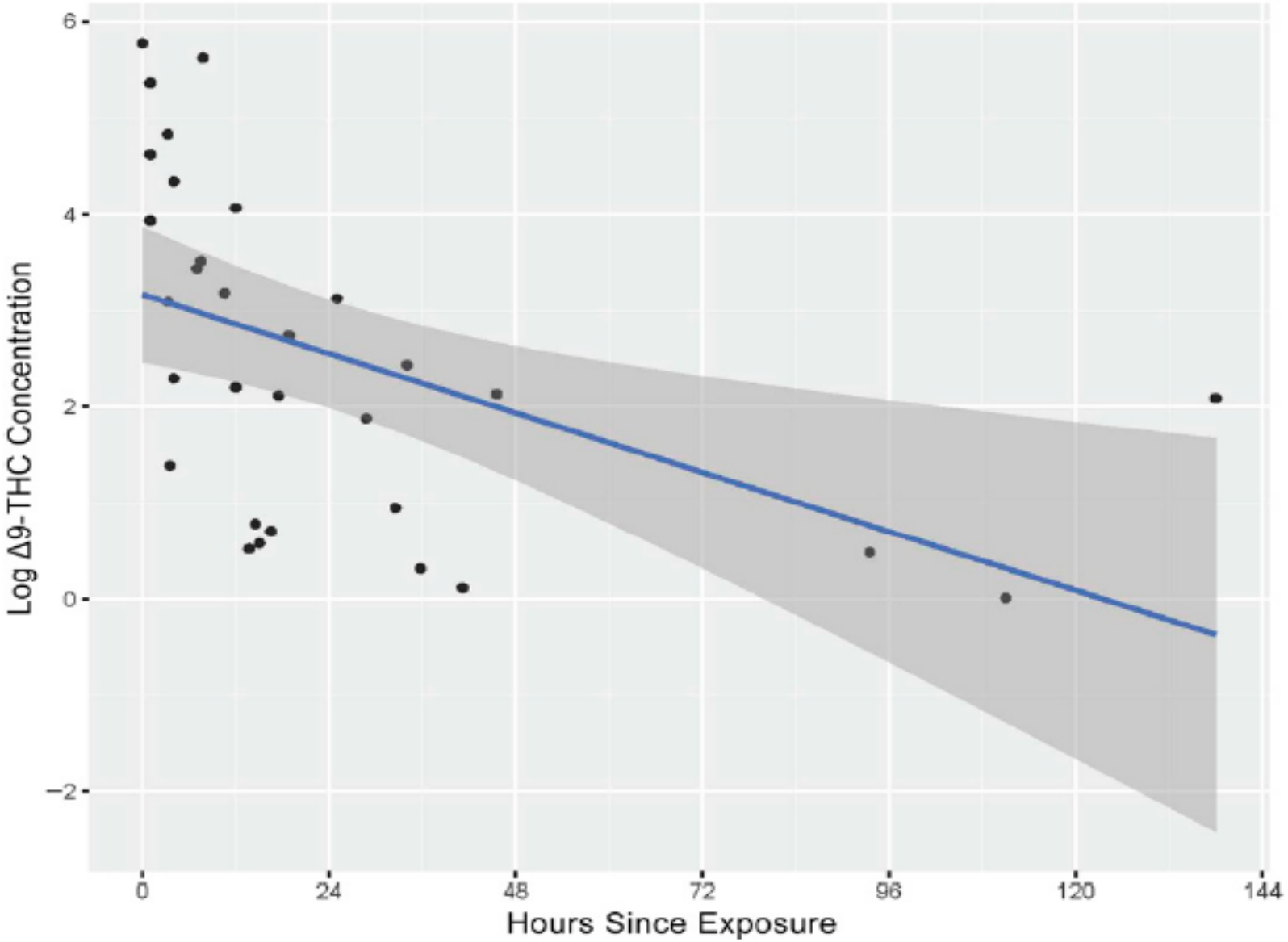


FIGURE 1

Scatterplot and fitted regression line of log concentration of Δ9-THC by hours since last use of marijuana, $n = 34$. The fitted regression line is shaded with 95% confidence limits around the regression line.

Key messages from these data

- ✓ Nursing infants are exposed to THC ***orally***
- ✓ The bioavailability of THC when consumed by mouth is between 1-5%
- ✓ Nursing infants are exposed to a dose 100-1000 less than the parent's dose

✓ **There appears to be a curve for THC metabolism in human milk**

- The shape of the metabolic curve is quite consistent between individuals
- The THC concentration at the peak of this curve varies dramatically between individuals
- Peak THC levels occur 60 to 120 minutes after use
- The half-life of THC in breastmilk is ~ 1d in daily users

✓ **THC detection and metabolism in human milk most likely varies dramatically between regular (daily) and occasional users**

- Clinical advice should distinguish between these two types of users in both perspective and advice

MARIJUANA USE WHILE BREASTFEEDING

Know how marijuana use can affect breastfeeding women and their babies.

If THC gets into your breast milk, it can be passed to your baby, and may impact your baby's ability to learn later in life.

GOOD to KNOW

To learn more, visit GoodToKnowColorado.com/Baby.

- Because THC is stored in body fat, it stays in your body for a long time. A baby's brain and body are made with a lot of fat. Since your baby's brain and body may store THC for a long time, you should not use marijuana while you are pregnant or breastfeeding.
- Breast milk also contains a lot of fat. This means that "pumping and dumping" your breast milk may not work the same way it does with alcohol. Alcohol is not stored in fat so it leaves your body faster.

The perinatal environment plays a demonstrable role in a child's development

- ✓There are still no data to show that the exposure of cannabis through human milk negatively impacts development (***the absence of a known risk is not the same as confirmation of safety***)

- ✓Current data and historical perspective confirms that environment is more of an independent effect than substance exposure *(ie. An infant's exposure to poverty was more impactful than their exposure to crack cocaine)*

Roots daughters in rural Jamaica

Dreher *et al.* (1994) *Pediatrics*

Hayes *et al.* (1991) *West Indian Medical Journal*

- Followed children of “Roots Daughters” in rural Jamaica
- Found that kids exposed to cannabis performed better than non-exposed kids, up to 5 years of age
- This was correlated with a home environment conducive to a child’s development
- Cannabis ***did not have an independent effect***
- Originally funded by NIDA, funding discontinued
- n=24

"Conventional wisdom would suggest that mothers who are long-term marijuana users are less likely to create optimal caregiving environments for the neonates …. ***it seems that roots daughters have the capacity to create a postnatal environment that is supportive of neonatal development***."

Dreher et al., 1994

The health risks of not breastfeeding are real and well- documented

For infants

- Infectious morbidity
- lower IQ
- childhood obesity
- type 1 and type 2 diabetes
- leukemia
- SIDS
- asthma
- child abuse and neglect

(Forray, 2009, Strathearn, 2009)

For mothers

- Premenopausal breast cancer
- Ovarian cancer
- Retained gestational weight gain
- Type 2 diabetes
- Myocardial infarction

Stuebe, *Rev Obstet Gynecol*, 2009

Milk substitutes are not a benign intervention. They are expensive and have documented health risks.

The Surgeon General's Call to Action to Support Breastfeeding

2011

Maternal & Child Nutrition

2016

Suboptimal breastfeeding in the United States: Maternal and pediatric health outcomes and costs

Melissa C. Bartick[1,2*] | Eleanor Bimla Schwarz[3] | Brittany D. Green[4] | Briana J. Jegier[5] | Arnold G. Reinhold[6] | Tarah T. Colaizy[7] | Debra L. Bogen[8] | Andrew J. Schaefer[9] | Alison M. Stuebe[10,11]

Not breastfeeding costs $18.5 Billion dollars annually
Maternal deaths made up 78% of deaths
Maternal medical costs were 79% of all costs
The US ranks 26/29 for infant mortality

Mother-Baby Dyad

a

Single Psychobiological Organism

- ✓ Extragestation by the mom/baby dyad is a biologic protection and defense mechanism for parents *and* babies during this vulnerable time.
- ✓ Features of a successful dyad include close proximity between mom/parents and baby, skin-to-skin contact, access to breastfeeding early and often.
- ✓ A successful parent/baby dyad improves health and wellbeing of the entire family.

Babies are entirely dependent on another human.
Biologically, their number one priority is survival.

- ✓ They have the ability to be noticed, promote attachment
- ✓ They have the ability to avoid detection if necessary
- ✓ They must be acutely aware of their surroundings and their primary caregivers

Breastfeeding is more than just food, it is also about place.
The chest of a primary caregiver is baby's natural habitat.
Simply being in that place increases survival.

- ✓ Hormonal profiles (Oxytocin!) promote bonding, stimulate reward centers
- ✓ Eyegaze is a part of this biology
- ✓ Olfactory cues promote milk production, bonding and attachment
- ✓ Immunity and physiologic stability are maximized

What happens to mammalian physiology when we separate mammals from their mothers?

- Chimps to be used in research must remain with their mothers for 6-18 months or their physiology is considered too dysregulated/abnormal to make them good research subjects. (Poole and Thomas, 1995)
- Horses separated from their foals, even for just the first hour after birth, showed insecure attachment to their mothers, more aggression toward their peers and were less adaptable to change. (Henry, 2009)

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Does Breastfeeding Protect Against Substantiated Child Abuse and Neglect? A 15-Year Cohort Study

Lane Strathearn, M.B.B.S., F.R.A.C.P.[1,2], **Abdullah A. Mamun, Ph.D.**[3], **Jake M. Najman, Ph.D.**[3], and **Michael J. O'Callaghan, M.B.B.S., F.R.A.C.P**[4]

1*The Meyer Center for Developmental Pediatrics, Department of Pediatrics, Baylor College of Medicine, Houston, Texas USA*

2*Human Neuroimaging Laboratory, Baylor College of Medicine, Houston, Texas, USA*

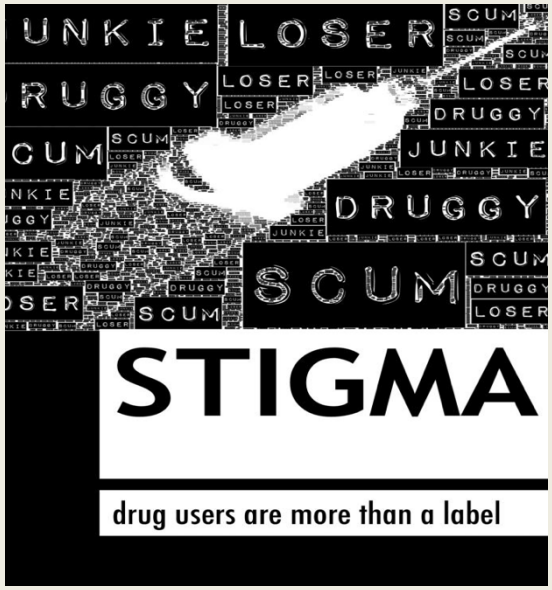
3*School of Population Health, University of Queensland, Australia*

4*Mater Misericordiae Children's Hospital, Brisbane, Queensland, Australia.*

"Among other factors, breastfeeding may help to protect against maternally perpetrated child maltreatment, particularly child neglect."

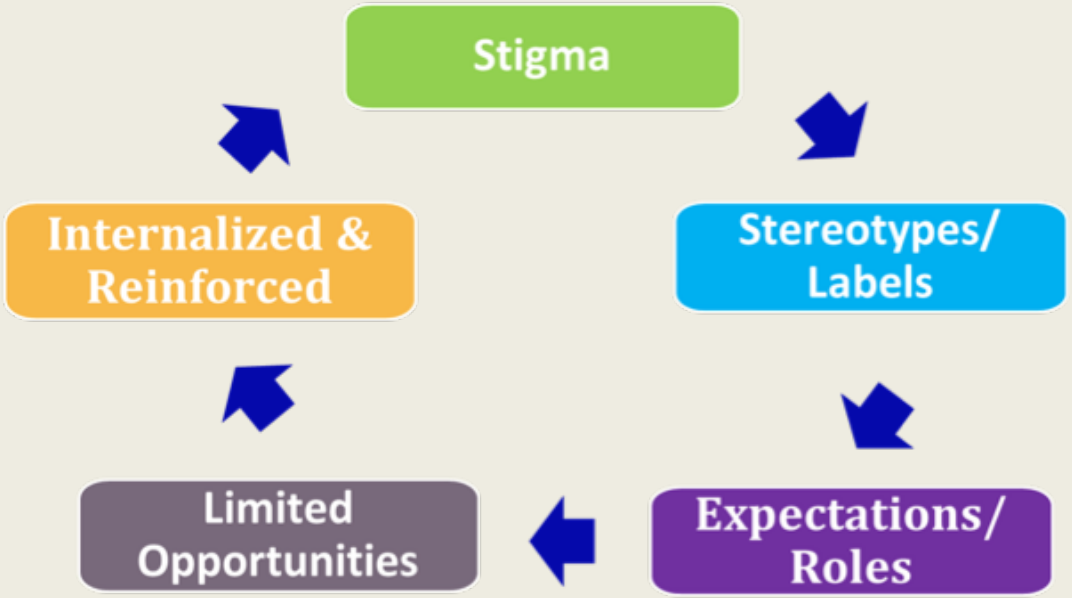
Other risks

- State and federal criminal laws
- State child welfare laws
- State mandatory reporter laws
- Federal child welfare laws



Severe disapproval of someone's characteristics or beliefs considered unacceptable to dominant cultural norms

Cycle of Drug-Related Stigma



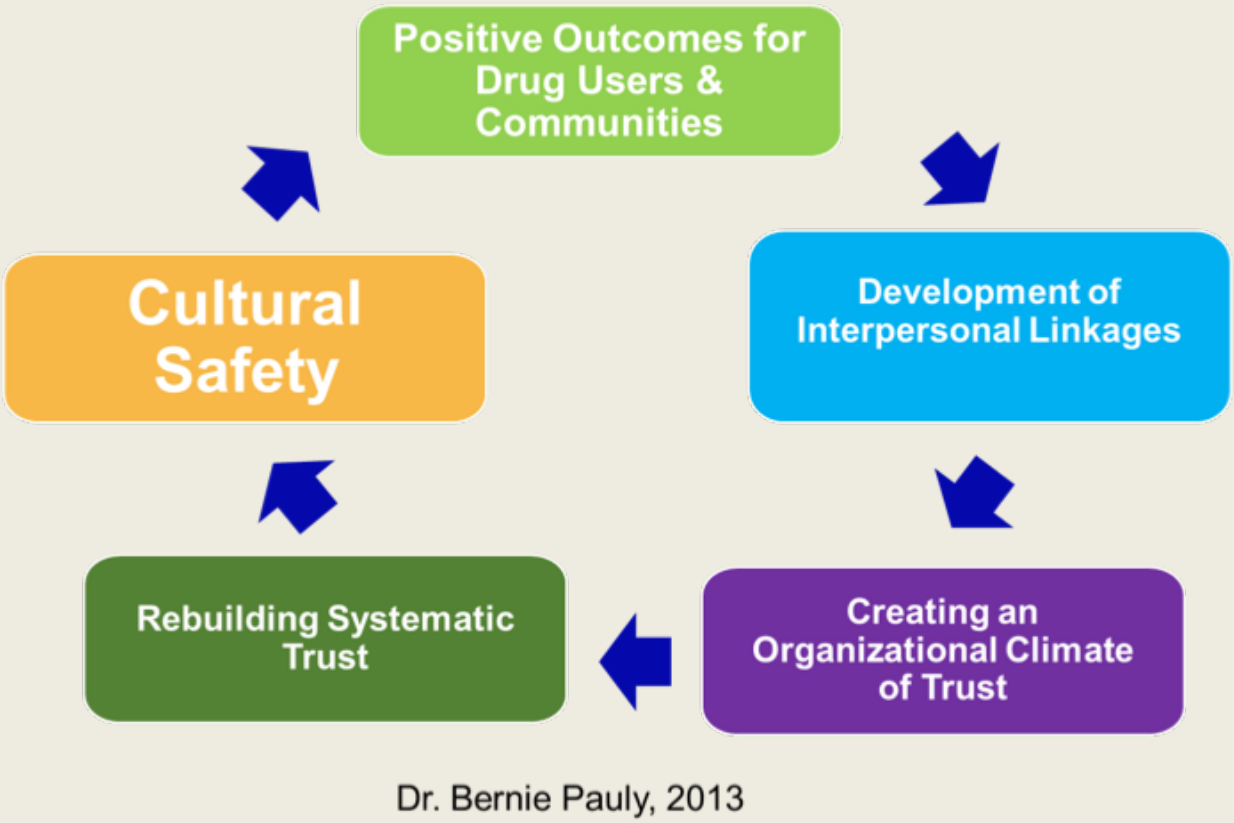
(Adapted from Julian Buchanan, Social Inclusion Unit, Glyndwr University, Wrexham)

Harm Reduction

Strategies that reduce negative consequences

Belief in and respect for people who use drugs

In response to stigma, harm reduction aims to create a culture of safety and care.



Dr. Bernie Pauly, 2013

Harm reduction is not hinged on abstinence

"You're in a room where someone says I've been drug free for 14 years and everyone claps, well, I want to be in a room where people will clap because someone has been using sterile syringes for 14 months, and not shared with anyone else".
(harmreductiontips.org)

A spectrum of strategies from
safer use → managed use → abstinence

Harm reduction addresses inequalities & injustices

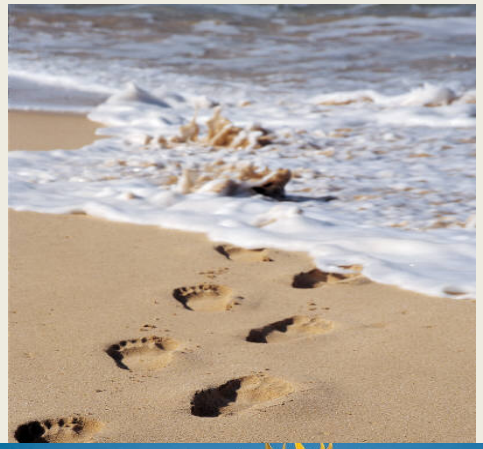
Recognize the impact and complexities of poverty, class, racism, isolation, past trauma, sex-based discrimination and other inequalities and how they affect **people's vulnerability,** and **capacity** for effectively **dealing with harm**

"Harm reduction is revolutionary love, and it's very real, and it's very concrete…. we try to embody that as much as possible by creating this loving space, and really caring for people"

Rafi Torruella, Executive Director, Intercambios, Puerto Rico

Physiologic Harm Reduction

"[Addiction] alters the way the brain decides what it values." - Maia Svalavitz, Unbroken Brain



Pregnancy and Breastfeeding alter the way the brain decides what it values

So, is it safe?

the elephant circle

Questions?