

Indigenous health disparities in context:

- A discussion about the impact of stress, trauma, and discrimination on metabolic disorder

Melissa E. Lewis, PhD, IMFT

University of Minnesota Medical School, Duluth campus
Research for Indigenous Community Health (RICH) Center



Contributors to this presentation

- Melissa Walls
- Laurelle Myhra
- Erica Hartwell
- Ann Bullock
- Jackie Williams-Reade
- Claudia Grauf-Grounds

Metabolic Disorders

- **Metabolic syndrome** is a name for a group of risk factors that occur together and increase the risk for cardiovascular disease, stroke, and type 2 diabetes. Risk factors include (NHLBI, 2012):
 - Large Waistline
 - High Triglyceride level
 - Low HDL
 - High Blood Pressure
 - High fasting Blood Sugar
-
- **Cardiovascular disease (or Heart Disease)** is a broad term used to describe a range of diseases that affect your heart. Cardiovascular disease (CVD) generally refers to conditions that involve narrowed or blocked blood vessels that can lead to a heart attack, chest pain (angina) or stroke. Other heart conditions, such as infections and conditions that affect your heart's muscle, valves or beating rhythm, also are considered forms of heart disease (Mayo Clinic, 2012)

CVD Risk Factors

High Blood Pressure & Cholesterol

Diabetes & Prediabetes

Obesity or Overweight

Smoking

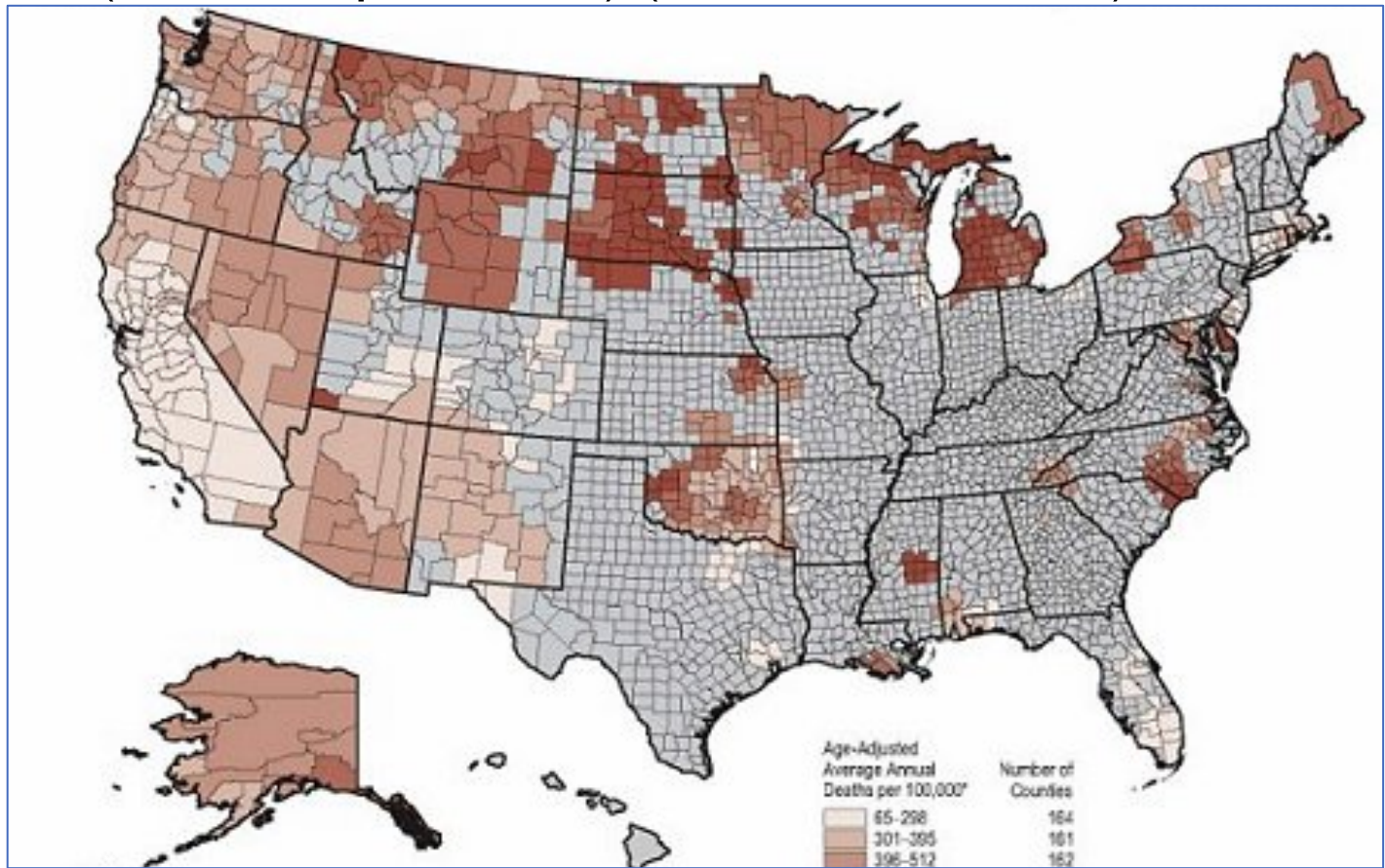
Lack of Physical Activity

Unhealthy Diet

Stress

Indigenous Mortality Rates

- ✓ **Highest mortality rate** in the US of any ethnic group
- ✓ CVD rates for Indigenous people **is double the rate** of non-indigenous people with women being particularly vulnerable (3.0 vs. 7.5 per 100,00) (Howard et al., 1999).



CVD and Indigenous Community

- ✓ Indigenous people have between **15-20% more atherosclerotic plaque**, a significant CVD risk factor, than non-Indigenous people (Galloway, 2002).
- ✓ In a study of Midwest Indigenous people (Harwell et al., 2003):
 - 26% had high cholesterol
 - 28% had high blood pressure
 - 40% smoked cigarettes
 - 52% did not have regular physical activity
 - 74% were overweight

Causes of CVD

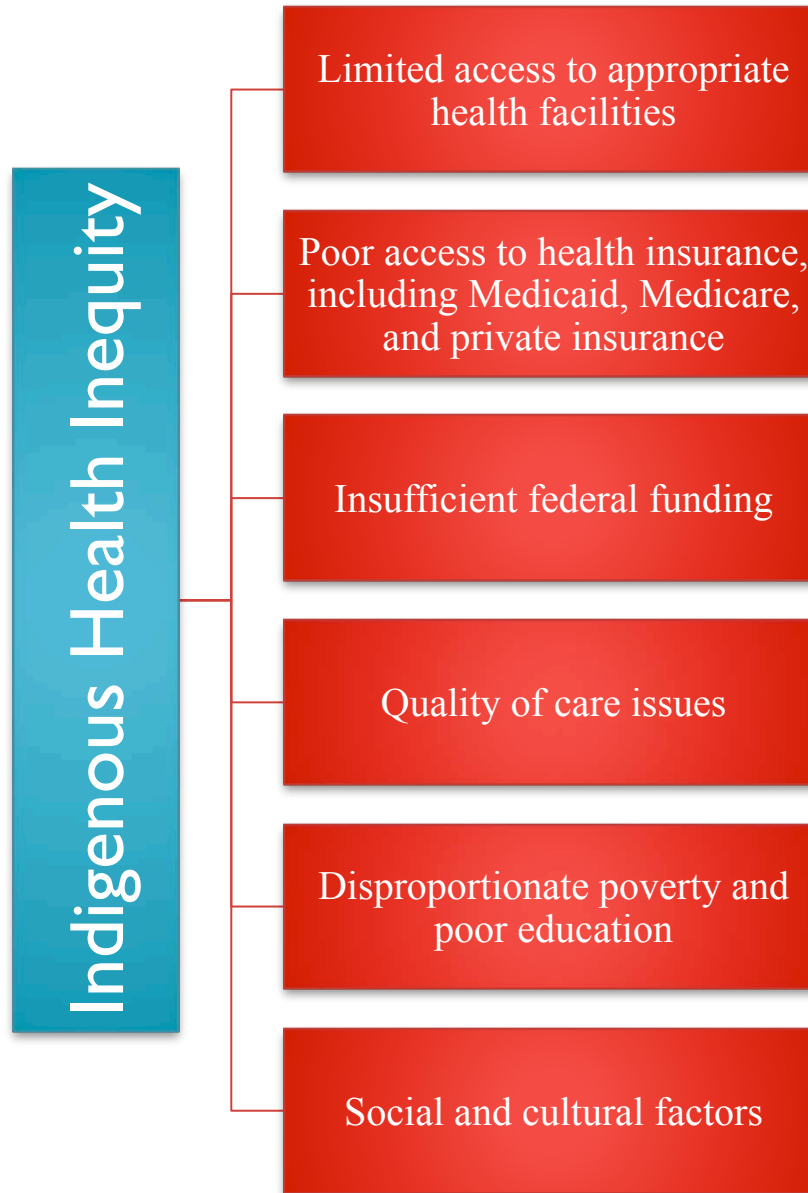
Genetic Risk Factors

- Heart Defects
- Heart Infection
- Family Hx of CVD

Modifiable Risk Factors

- Physical Activity
- Diet
- Smoking
- Drinking/Drug Use

Health Disparity Research



I am curious...

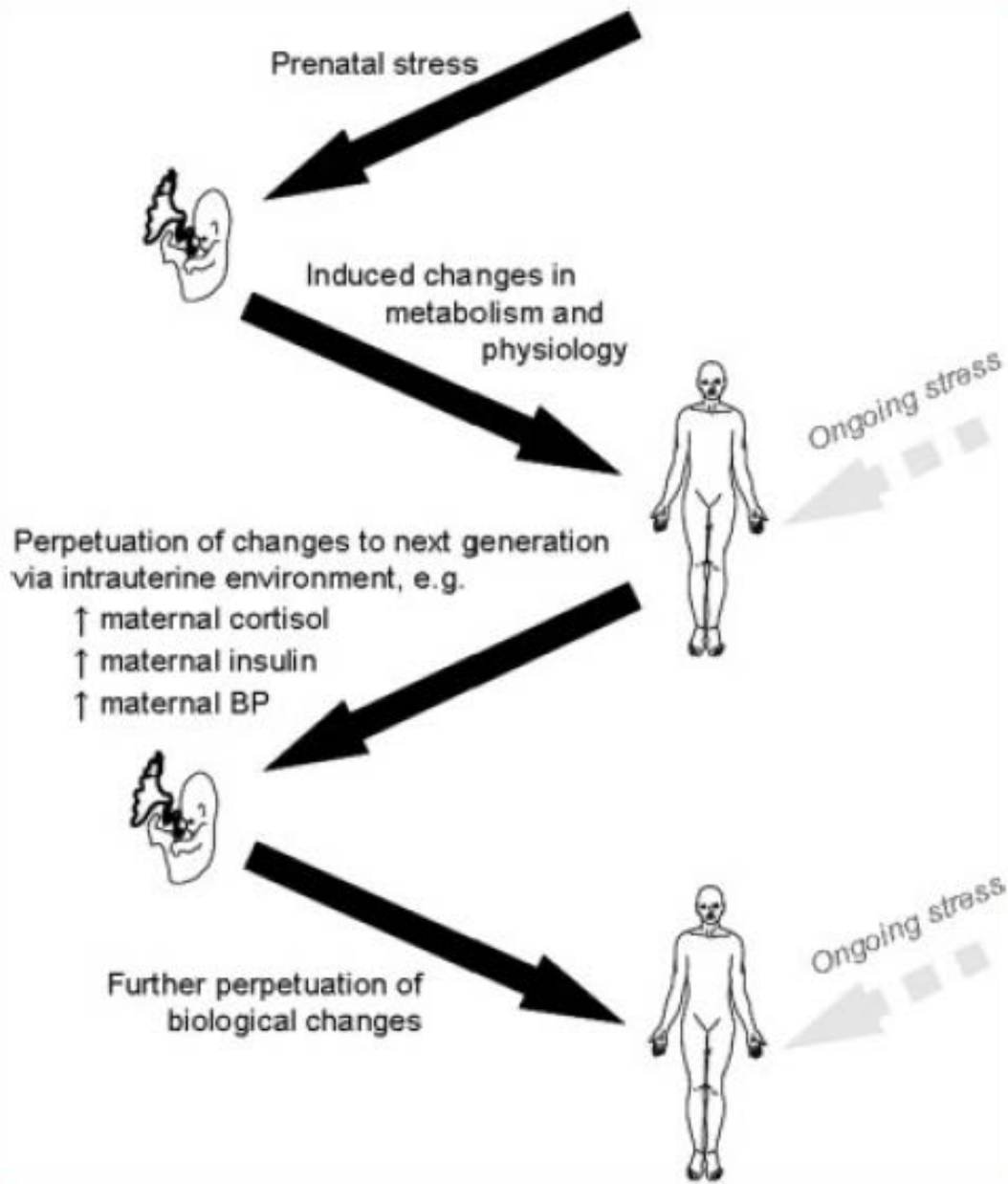
1. Why do Indigenous people have more risk factors?
 - a. Lifestyle alone?
2. What is the relationship between genetics and 'modifiable' risk factors?
 - a. Is there no overlap?
3. What about the way we live our lives/spend our time affect our health?
 - a. How do our relationships with each other and dominant society affect our health?
4. What about stress??



STRESS & METABOLIC SYNDROME

Genetics

“Our findings suggest a substantial component of metabolic disease risk has a **prenatal developmental basis.**”



I. Genetics

- Genes Inherited

- It **does** matter what genes we inherit
 - But **proportion of predisposition explained for type 2 DM (5-10%)** is small
 - And genes which are associated with ↑ diabetes risk are **as common in non-minority as in minority people**

- Genes Expressed

- “Epigenetics”: the “on/off switches” for genes
 - Reaction **to the environment**
 - **Not always reversible** if at key developmental stage of life
 - Heritable—Once turned on by environment, may be **passed to next generation**

2. Epigenetics: Stress and Early Life Experiences

- Early Life Experiences: “programmed in”
 - Rat pups raised by nurturing mothers
 - Gene which codes for stress hormone receptors “turned on”
 - **Grow up to be stress resilient**
 - Rat pups raised by neglectful mothers
 - Gene which codes for stress hormone receptors “turned off”
 - **Grow up to be very stress reactive**
 - Same process now shown in humans

3. Low Birth Weight (SGA) and Preterm

- Maternal stressful life events during 1st trimester ↑ risk of preterm birth and SGA (OR 2.4)
- SGA and/or Preterm are **both** are strongly associated with that baby's later risk for chronic disease

TABLE 3

Risk ratios for life events stress during pregnancy on preterm birth

Perceived impact rating of life events stress	n (n = 1800)	Preterm birth		Crude			Confounder adjustment ^a		
		n (n = 96)	%	RR	95% CI	P value	RR	95% CI	P value
Exposure in the first trimester									
0	1576	76	4.8	1.00			1.0		
1	138	10	7.2	1.54	0.78–3.05	.21	1.69	0.84–3.40	.14
≥2	86	10	11.6	2.60	1.29–5.22	.01	2.40	1.13–5.09	.02
Exposure in the second trimester									
0	1647	84	5.1	1.00			1.0		
1	92	4	4.3	0.84	0.20–3.33	.73	0.91	0.28–3.21	.60
≥2	60	8	13.3	2.86	1.32–6.22	.01	2.86	1.26–6.47	.01
Exposure in the third trimester									
0	1694	90	5.3	1.00			1.0		
1	64	3	4.7	0.88	0.27–2.85	.83	0.72	0.21–2.41	.59
≥2	32	3	7.1	1.37	0.41–4.52	.60	0.95	0.28–3.22	.93

CI, confidence interval; RR, relative risk.

^a Adjustment for maternal age at birth (20–24, 25–29, 30–34 years), education (≤9, >10 years), income (lower, medium, higher), social support (low support, medium-low support, medium-high support, high support), negative coping (low support, medium-low support, medium-high support, high support), infant sex, and interaction of life events stress among first, second, and third trimesters. Zhu. Prenatal life events stress and birthweight. Am J Obstet Gynecol 2010.

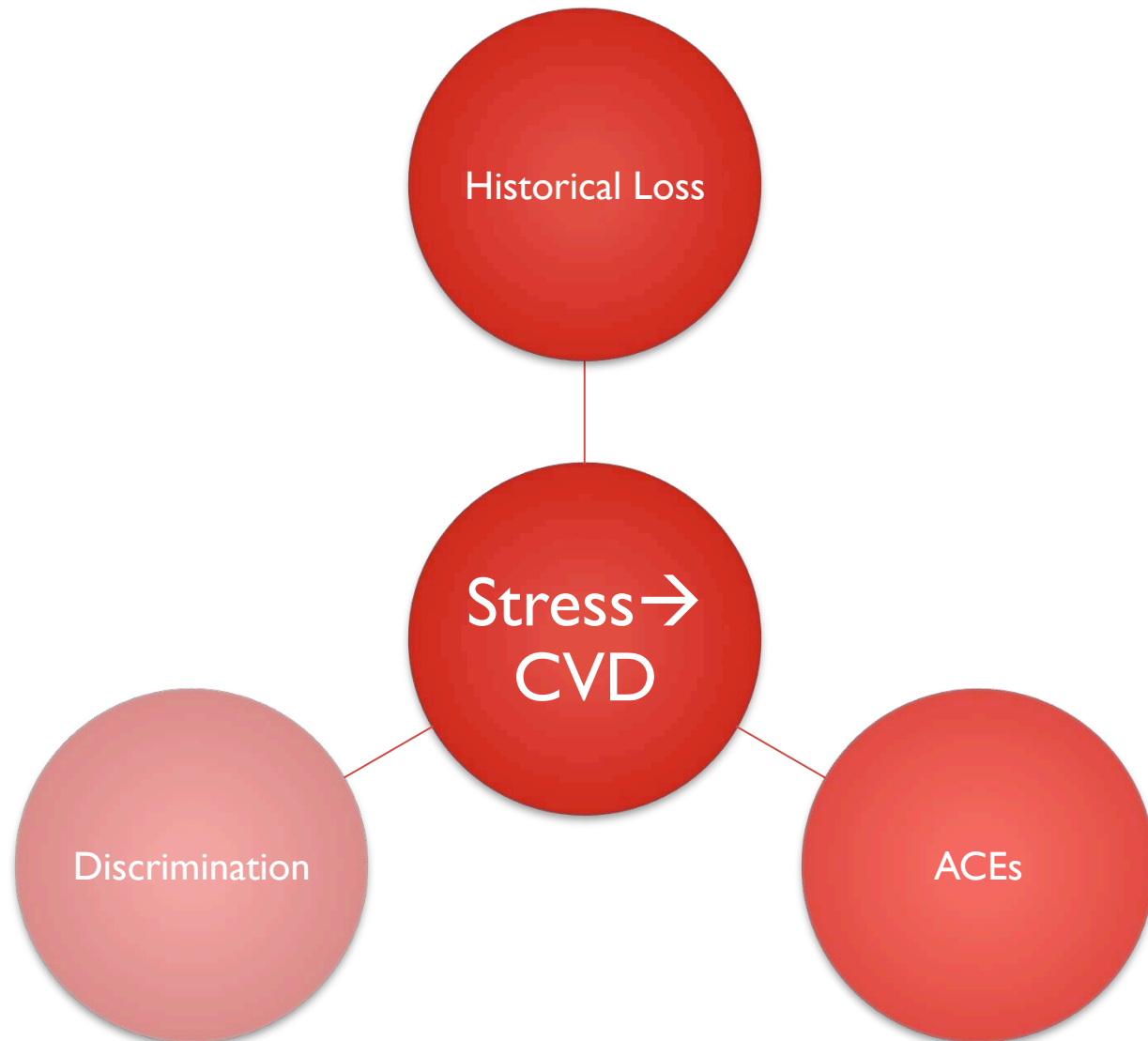
-Fetal Programming of Type 2 Diabetes-

“It is important to understand that the story is **NOT** about birth weight **but about fetal programming**, and that **intergenerational prevention of type 2 diabetes will need to target maternal (health)...****Prevention of fetal programming of diabetes will need to concentrate on the health of young girls.**”

STRESS → CVD OUTCOMES

- Meta-analysis of stress in the workplace alone found that CVD was **50% more likely for those reporting work-related stress** (Kivimaki, et al., 2006).
- Stress is **more predictive of CVD than cholesterol** which is deemed a critical predictor of CVD (Rosch, 2010),
- Stress:
 - ✓ Increase the likelihood of Framingham CVD risk factors (e.g., cholesterol, smoking, diabetes)
 - ✓ Is an independent risk factor itself making it a powerful CVD contributor.
- Stress has been linked to CVD through the following pathways;
 - increased vasoconstriction
 - increased levels of homocysteine, fibrinogen and CRP
 - increased atrial fibrillation
 - increased likelihood of myocardial infraction even in the absence of atherosclerosis
 - increased deep abdominal fat deposits which secrete cytokines leading to insulin resistance
 - predicting and worsening of congestive heart failure
 - increased likelihood of Takotsubo cardiomyopathy

Indigenous Specific Lifespan Stressors






HISTORICAL LOSS & TRAUMA



Colonization



What does it mean
for indigenous
people, past, present,
and future?



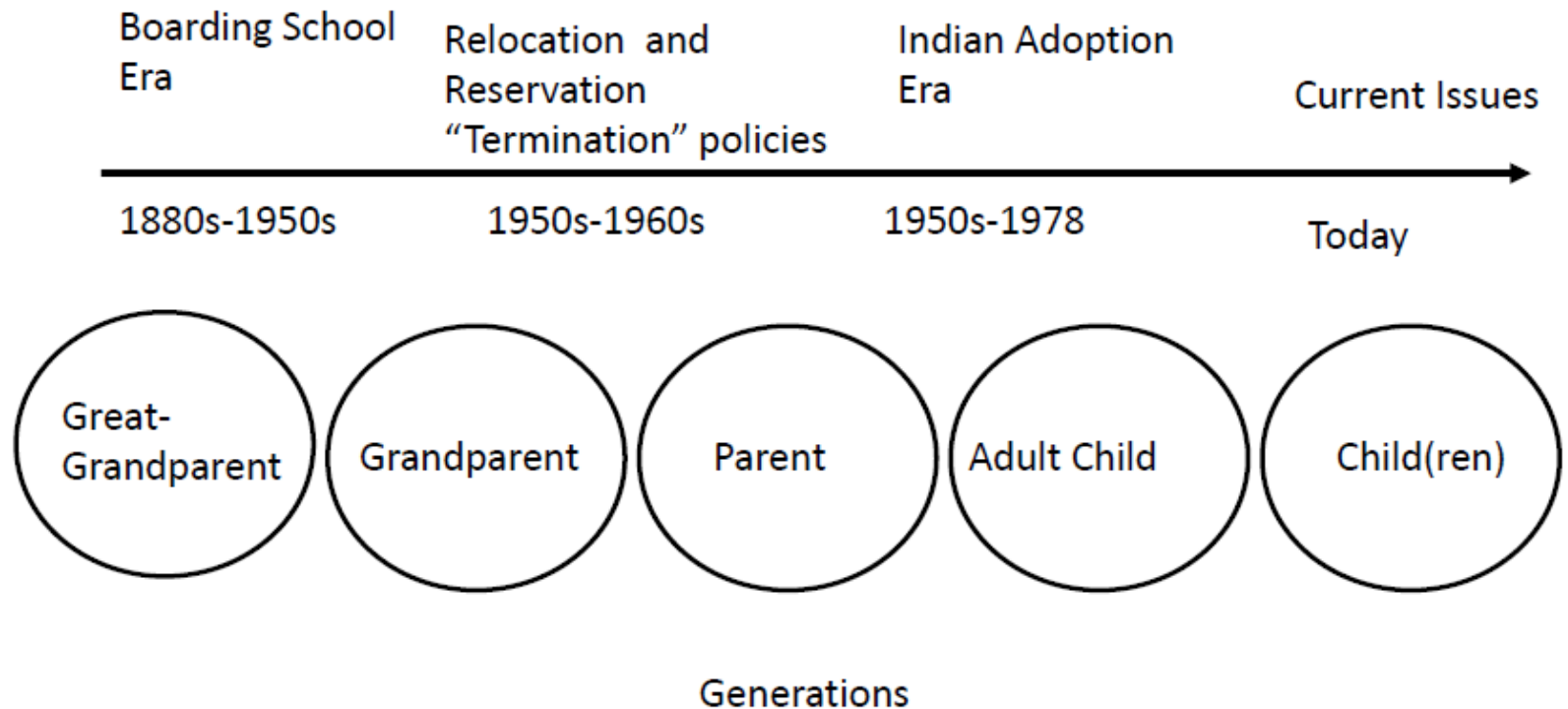
Native American Land Loss

Historical
Loss



There is a
relationship
between historical
factors and
current health and
well-being

Intergenerational Transmission of Historical Trauma and Loss



(Myhra, 2011)

Intergenerational Historical Loss & Trauma

- Forced assimilation & genocide since 1800's, including:
 - Forced removal of children from families
 - Forbidding children to speak native tongue
 - Prohibiting religious traditions
 - Forced sterilization
- Loss of cultural practices and oral history has a devastating effect for generations

(Deloria, 1988; Weaver, 1998)

What does it mean to be colonized?

- **Diminished autonomy**
 - Congress forcibly interrupts tribal governments
 - Many tribes named by Europeans
 - Government defines citizenship (“authentic” American Indians)
- **Diminished identity**
 - Creation of “race” combined many distinct nations into one group
 - Success is measured by assimilation
- **Diminished self-worth**
 - Your history is not taught in schools
 - Indigenous people exist in dominant discourse as caricatures of a past era

What is Historical Loss?

- “The cumulative **emotional and psychological wounding over the lifespan and across generations**, emanating from massive group trauma experiences.”
- Thoughts of loss around: Land, language, spirituality, boarding schools, removal era, broken treaties, early deaths

...the problems we have are just symptoms of our main problems, I think...like we try to solve alcohol problems, sniffing, and the fighting families, you know...those are just symptoms to me....Like residential schools, for example, that's where we lost pretty well everything

Historical Loss & Trauma: Individual

- Historical Loss is associated with
 - Anger (Whitbeck and colleagues, 2004)
 - Depression (Whitbeck and colleagues, 2004; 2009)
 - Suicidal Ideation (Brave Heart, 2003)
 - Anxiety (Brave Heart, 2003)
 - IPV (Duran and colleagues, 1998)
 - Substance Use/Abuse (Myhra, 2011; Walls, 2012)
 - Negative self-image (Brave Heart, 2003)
- Prevalence:
 - Many adolescents report **daily thoughts about historical loss** (Whitbeck, 2009)
 - Up to 1/3 of adults report **multiple daily thoughts** about historical loss (Whitbeck and colleagues, 2004)

Historical Loss & Trauma: Family

➤ Systemic in nature

a. Cultural/Community event.

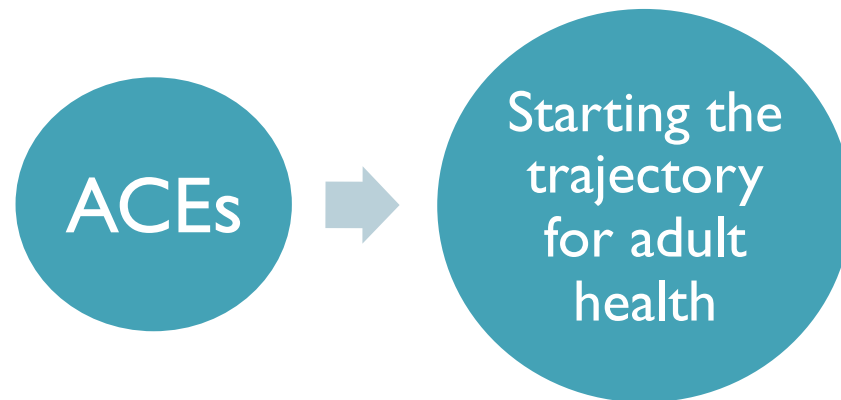
b. Familial event (Intergenerational).

- Parenting, substance use, depression over 3 generations. (Walls, 2012)
- Adolescent HT \geq caregiver (Whitbeck, 2009)
- Substance use patterns over 2 generations (Myhra, 2011)

Historical Loss & Trauma: Society

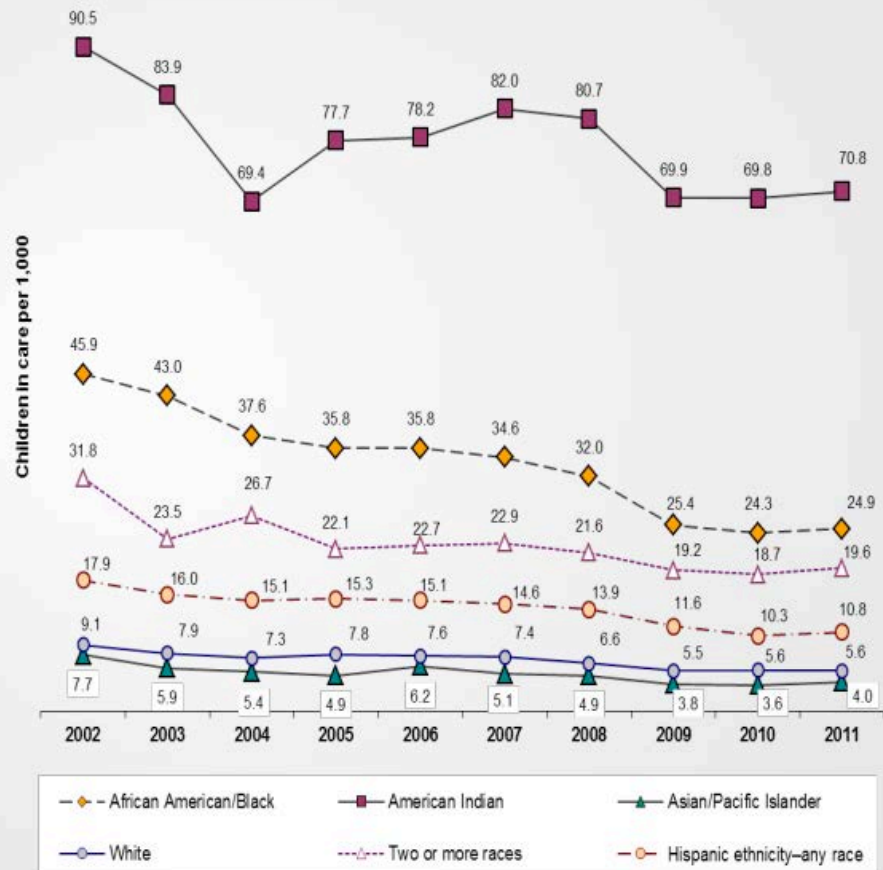


EARLY CHILDHOOD EXPERIENCES & HEALTH OUTCOMES



Out-of-Home Placement

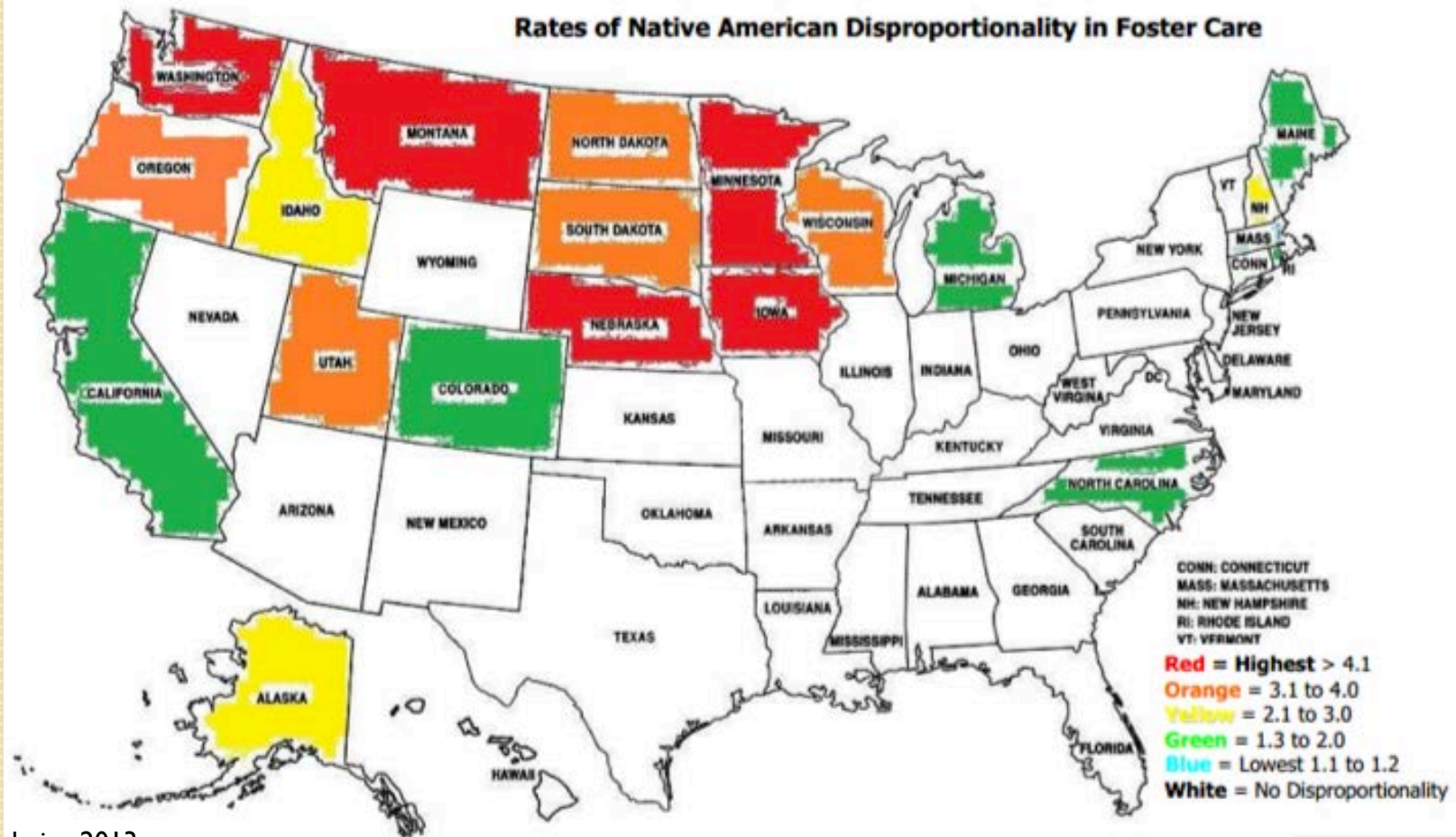
Children in Out-of-home Care per 1,000 in the Child Population by Race/Ethnicity, 2002–2011



- ✓ The rate of Ind children in foster care is **2.1 x the general population**.
- ✓ Ind children are placed out-of-home at rates **13 x higher** than that of a White child.
- ✓ **20% more likely** to be placed outside the home post-adjudication
- ✓ Ind children represent **2.6% of the foster care population**, yet only encompassed 1.2% of the general child population.

Which state has the highest rate of NA out of home placement?

Across the United States, Native American children are overrepresented in foster care at a rate of 2.1 times their rate in the general population. While not all state show disproportionality, 20 states do have some overrepresentation. Twenty-six percent of the states that have overrepresentation have a disproportionality index of greater than 4.1. In Minnesota, the disproportionality is index 12, in Washington State it is 5.



The Impact of Childhood Trauma

Childhood

- Emotional abuse/neglect
- Physical abuse/neglect
- Substance abuse in the home
- Sexual abuse
- Mother's experience of violence
- Incarcerated family member
- Parental divorce

Adolescence

- Alcohol abuse
- Tobacco use
- Sexual intercourse
- Illicit drug use
- Suicide attempt

Adulthood

- Alcoholism
- Smoking
- Drug use
- Depression
- Unintended pregnancy
- STI
- Obesity
- Liver disease
- Cardiovascular disease

ACE's for Indigenous communities

- In a study of seven tribes, the overall exposure for participants with ≥ 1 ACE's was **86%** (Koss et al, 2003).
 - Male: 74%-100%; Female: 83%-93%

	Non-Indigenous	Indigenous
Physical Abuse (male)	30%	40%
Physical Abuse (female)	27%	42%
Sexual Abuse (male)	16%	24%
Sexual Abuse (female)	25%	31%
Emotional Abuse	11%	30%
Household Alcohol	27%	65%
≥ 4 ACE's	6%	33%

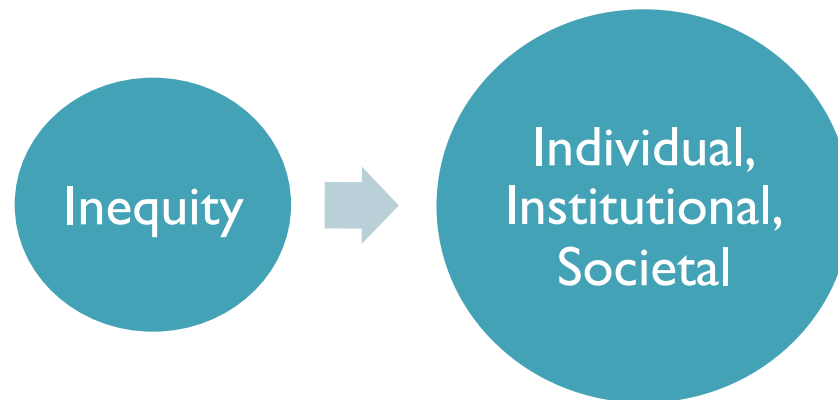
Childhood Trauma

- AI children are **5x** more likely to experience **4+ adverse childhood experiences**
- *Adverse childhood experiences* are linked to:
 - ✓ **Worsened mother-child relationships**
 - ✓ **Reduced cognitive development**
 - ✓ **Increased risk for obesity (1.5x), diabetes (1.5x), heart disease (3x), cancer (1.2x)**
- Interventions for AI children and families are a priority

ACE's & Epigenetics

- ✓ Assaultive trauma is linked to highest risk for PTSD, and therefore, ACE
- ✓ ACE most linked to epigenetic changes is child abuse
- ✓ Direct physical abuse, observing abuse of mother associated with greater methylation
- ✓ Victims of child abuse or neglect is related to a reduction to an inflammatory regulation gene

RACISM, DISCRIMINATION, & OPPRESSION



Types of Oppression

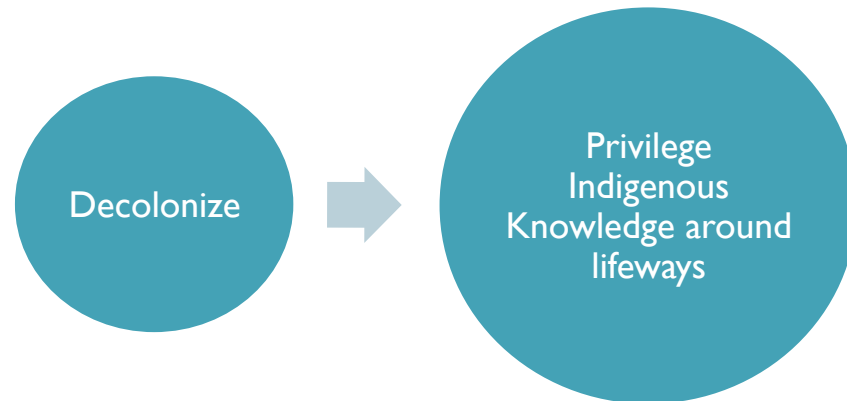


1. Discrimination/ Racism
2. Microaggressions
3. Colorblind Racism; "I don't see color. We are all the same."
4. Historical Trauma symbols/reminders- (see Pics)
5. Cultural Appropriation

Discrimination → CVD

- *Discrimination does indeed have a significant relationship with (Pascoe & Richman, 2009):*
 1. Mental health outcomes (90%)
 - Depression, Clinical Psychiatric Distress, Well-being
 2. Physical health outcome (99%)
 - CVD risk factors related to cardiovascular disease such as blood pressure, intramedial thickness, plaque, and heart rate variability
 3. Increased participation in unhealthy behaviors and decreased participation in healthy behaviors (89%)
 4. Causal pathways for heightened psychological and physiological stress responses
- **Social support significantly buffers these effects**

HOW DO WE INTERVENE?



Solutions

- “We...know that **sound maternal and fetal nutrition, combined with positive social-emotional support of children** through their family and community environments, will reduce the likelihood of negative epigenetic modifications that increase the risk of later physical and mental health impairments.”



Decolonize and Keep Calm, Jacque Fragua, Indian Alley, Los Angeles, CA

“...to uncover the detrimental effects of European American colonialism and to assist historically colonized groups with **preserving** and **reclaiming** their distinctive cultural legacies, strengths, and institutions.”

(Wednt & Gone, 2012)

Early Childhood Development



SOARING EAGLES Pow-wow Dance Workshops, 2008 • Sponsored by SCAIR www.scair.org

Photo: www.gballard.net

“A great general has said that the only good Indian is a dead one... I agree... but only in this: that all the Indian there is in the race should be dead. **Kill the Indian in him, and save the man.**”

- Captain Richard Pratt, 1892

Privileging Indigenous Knowledge

- Cultural Revitalization
 - Immersion schools (language)
 - Exercising treaty rights
 - Foraging, fishing, hunting
 - Cultural schooling
 - Beading, moccasin-making, bow-making



Prenatal/Early Life Home Visiting

- One of the key evidence-based interventions proven to **improve the life trajectories of at-risk women and children**
 - Positive effects now shown up to age **9 yrs**
 - If home visiting were a medication, it would be malpractice not to provide it
- Tribal Maternal, Infant & Early Childhood Home Visiting Program
 - 19 tribes/T.O.'s now funded to provide home visiting
 - 9 home visiting models with “evidence of effectiveness”

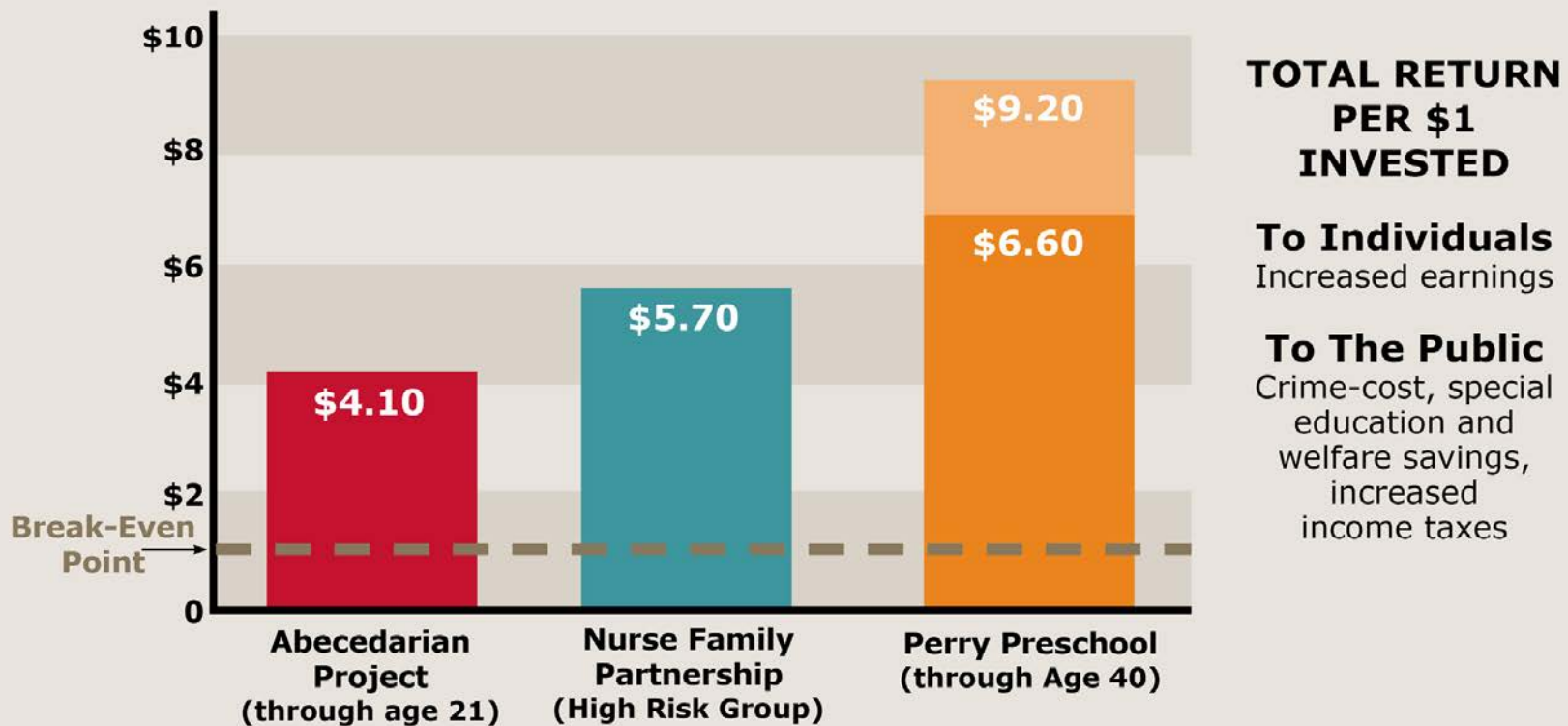
Nurse-Family Partnership

- Example of an evidence-based home visiting program:
 - Works with vulnerable first-time mothers living in poverty—**starting early in pregnancy through child's 2nd birthday**
 - Partnering mothers with a registered nurse
 - Goals:
 - Improve prenatal care
 - Quality of parenting and
 - Quality of life prospects

Nurse-Family Partnership Results

	Non-Participants	Participants
Academic Achievement	35	45
Preschool Language	87	91.5
Days hospitalized	.18	.04
Months Between Births	21	30
Months Receiving Welfare Assistance	39	33
Months Receiving Food Stamps	45	40

\$7 (av) returned for every \$1 invested in ECP



Interventions must be...

- Cohesive, seamless, tailored interventions with one consistent staff person at the center for each family
 - **Integrated:** Not a “stitched together” list of disjointed services
 - **“Carrots” (not “sticks”)** for participating in intervention
 - Pay pregnant women for clean drug/cotinine screens, going to prenatal appointments and parenting classes, etc.
 - e.g.: FDL: Moccasins
 - **Strengths and relationship-based**
 - Mirror back to young women (and men) that they have the ability to be a good parent
 - **Pregnant women have to opt out, not opt in**





COMMENTS & QUESTIONS?

Feel free to contact me:

Melissa Lewis at melewis@d.umn.edu