This occurs as baby’s own brain is developing

- Fetal programming again
- Mother’s stress hormone level establishes “set point” for developing baby’s
The Uterine Environment

• The Placenta
  – Shared blood supply
  – Shared nutrients
  – Shared toxins
  – Shared hormones
  – Shared stress
Mother Nature’s Preparations: Fetal Programming

- Though genetically programmed, systems develop according to info from the (uterine) environment
- When signals say environment is dangerous, fetus adapts to survive it*
- When environment is different after birth, adaptation may be harmful

* Not totally unchangeable
Example #1: Dutch Hunger Winter
Effects Lasted At Least 3 generations
Dutch Hunger Winter: Famine & Stress

- Babies 70 years old now
- Greater cognitive decline with age
- Women X5 breast cancer
- More kidney disease & diabetes
- More and earlier CHD
- More obstructive airway disease
- More other cancers
- Mental illnesses
Beginning peak synaptogenesis: 40,000 per second!
Opioid Use & Neonatal Abstinence Syndrome

[Bar chart showing rates per 1,000 live births for different regions in 2014 and 2015. The chart indicates variations in rates across regions.]
Symptoms of NAS

• Muscle pain
• Tremors
• Feeding problems
• Breathing problems
• Seizures
• High-pitched cry
In-utero Opioid Exposure and Brain Development

- Smaller brain structures
- Damage to visual centers & somatosensory cortex
- Altered connective tracts
- Changes in myelination
- Disturbances in neuronal differentiation
- Decreased neurogenesis
- Premature neuronal death
Children with NAS

• Delayed development
• Poor academic achievement
• Behavior problems

• HARD TO KNOW WHAT IS THE EFFECT OF OPIOIDS VS. WHAT IS DUE TO OTHER DRUGS, POVERTY, CHAOS & PARENTING
Racism: Epigenetic Effects

• Epigenetics
  – Methylation from slavery, Jim Crow
  – Greater daily stress since (MEES or microaggression)
  – Poverty: Housing, employment, education discrimination

• Weathering in women
  – Increasing poor health & chronic disease with age
  – Independent of poverty, but exacerbated by it
Gene expression: Potential

Racism: fear, humiliation, MEES

Poverty: violence, poor nutrition

Jim Crow: Poverty, stress, Lynchings, fear, grief

Slavery-hard labor & poor nutrition

Slavery-chronic stress & grief
The ACEs Study

- Decade long. 17,000 people involved.
- Looked at effects of adverse childhood experiences over the lifespan.
- Largest study ever done on this subject.
ACE Study Findings

Childhood experiences are powerful determinants of who we become as adults.
Adverse Childhood Experiences are Common

Of the 17,000 HMO Members:

- **1 in 4** exposed to **2** categories of ACEs
- **1 in 16** was exposed to **4** categories.
- **22%** were sexually abused as children.
- **66% of the women** experienced abuse, violence or family strife in childhood.
The higher the ACE Score, the greater the likelihood of:

- Severe and persistent emotional problems
- Health risk behaviors
- Serious social problems
- Adult disease and disability
- High health and mental health care costs
- Poor life expectancy
The past isn’t dead. It isn’t even past.

William Faulkner