



# Break the Cycle

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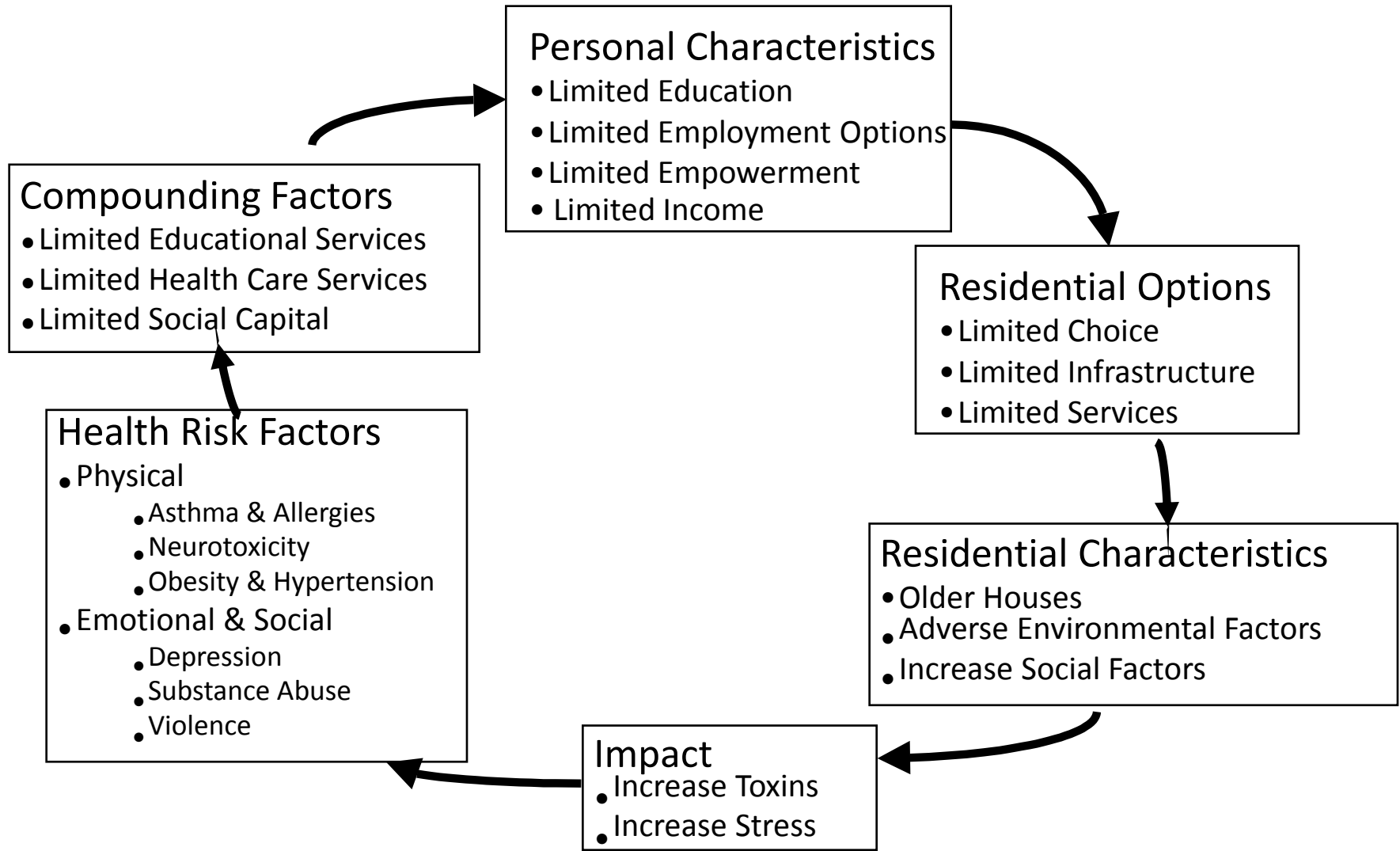
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# Cycle of Environmental Health Disparities



# Social Determinants of Health

- The social determinants of health are the circumstances in which people
  - are born, grow up, live, work, and age, &
  - the systems in place to deal with illness.
- These circumstances are, in turn, shaped by a wider set of forces:
  - economics, social policies, and politics

# Children: Poverty & Vulnerability

<b><u>Child Outcomes</u></b>	<b><u>Risk for poor relative to non-poor children</u></b>		
<b>Child abuse and neglect</b>	<b>6.8</b>		
<b>Lead Poisoning</b>	<b>3.5</b>		
<b>Birth to unmarried teenager</b>	<b>3.1</b>		
<b>depression</b>	<b>2.3</b>		
<b>Experiencing violent crimes</b>	<b>2.2</b>		
<b>Short-stay hospital episode</b>	<b>2.0</b>		
<b>Grade repetition and high school dropout</b>	<b>2.0</b>		
<b>Substance abuse</b>	<b>1.9</b>		
<b>Low birth weight</b>	<b>1.7</b>		
<b>Mortality</b>	<b>1.7</b>		
<b>Learning disability</b>	<b>1.4</b>		
<b>Parent report of emotional or behavior problem that lasted 3 months or more</b>	<b>1.3</b>		

# The Built Environment

- The term built environment refers to the human-made surroundings that provide the setting for human activity, e.g. buildings, neighborhoods and cities
- In recent years, public health research has included healthy food access, green spaces, community gardens, “walkability”, and “bikability”

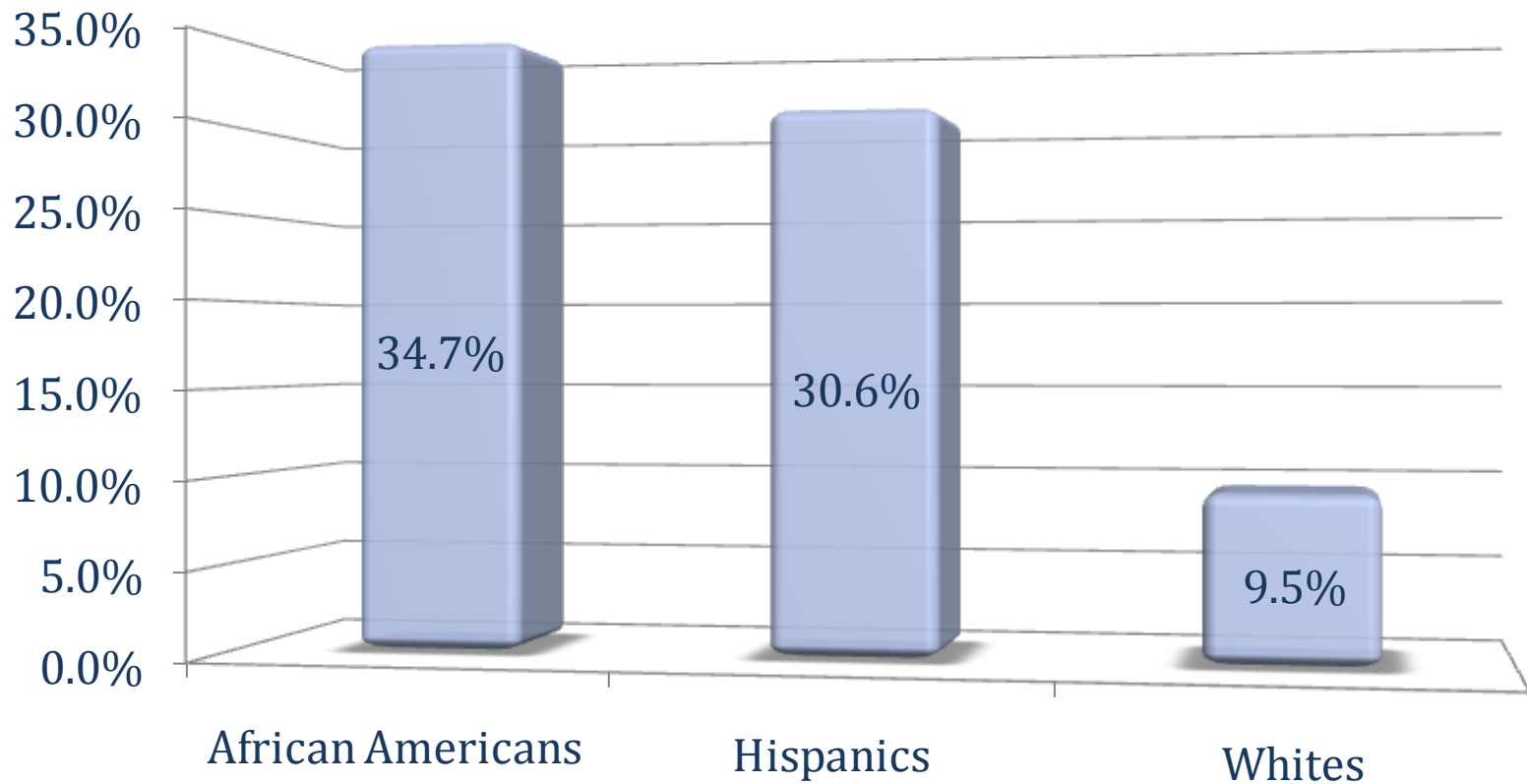
## Environmental Living Conditions of Poor Communities

- According to Grant Makers For Health (2007), environmental hazards are often located in or near poor communities because these areas are undesirable and inexpensive AND because they are politically disenfranchised.

# Environmental Living Conditions of Poor Communities

- Heavily polluting industries
- Hazardous waste sites
- Contaminated water and soil
- In old housing with poor indoor air quality and deteriorating lead based paint
- Adjacent to major roadways
- Lack of or limited green space
- Limited access to healthy food options

# Children Living in Poverty



Source: Children's Defense Fund





# Density of Fast Food Restaurants





*Drink!*  
**Coca-Cola**

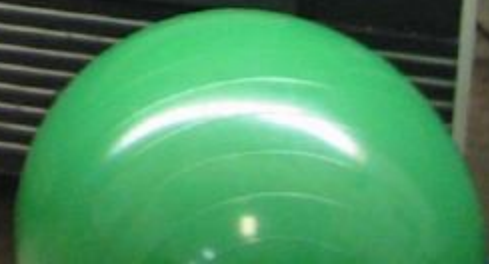
This vending machine is red and features a large, clear image of a Coca-Cola bottle. The word "Coca-Cola" is printed in white on the red background. To the right of the bottle, the word "Drink!" is written in a small font. Below the bottle, there is a coin slot and a dispensing mechanism. The machine has a control panel on the right side with several buttons and a coin slot.

**Fruitopia**  
20-oz plastic bottle

fruit integration  
**Fruitopia**

This vending machine is white and features a large, clear image of a Fruitopia bottle. The word "Fruitopia" is written in a stylized font at the top. Below it, the text "20-oz plastic bottle" is written. The bottle label includes the words "fruit integration" and "Fruitopia". The machine has a control panel on the right side with several buttons and a coin slot.

This vending machine has a large, colorful, abstract pattern on its front panel, possibly a digital display or a large graphic. The pattern consists of various shapes and colors, including red, yellow, and blue. To the right of the main panel, there is a control panel with several buttons and a coin slot. The machine has a coin slot and a dispensing mechanism on the right side.



# Fat chance

*Steady diet of chicken nuggets poses health risk to children, experts warn*



SCHOOL LUNCHES: GOOD CHOICES?

# Fast-food profits tempt schools



LOUIE FAVORITE

-fat foods such as french fries, served in large portions, have increased cafeteria sales at Kell  
ool in north Cobb County and elsewhere, schools report. Such items are sold a la carte.

# Study details distress felt by fat children

By LINDSEY HUNTER / Associated Press

Chicago — (UPI) — These children rate their quality of life with scores as low as those of young cancer patients on chemotherapy, a study has found, highlighting the physical and emotional toll of being too fat.

Travelling at school, difficulties playing sports, fatigue, sleep apnea and other obesity-linked problems all severely affect obese young

# Built Environment Factors in Poor Communities

- Unsafe Neighborhoods
  - Due to: Crime, Traffic Density, Litter & Trash, Poor Lighting
  - 61% more likely to be Obese; 43% more likely to be overweight
  - 26% of black children and 23% of Hispanic children are reported to live in unsafe neighborhoods, compared with 8% of white children.
- No Access to Sidewalks or Walking Paths
  - 32% higher adjusted odds of obesity
- No Access to Parks or Playgrounds
  - 26% higher adjusted odds of obesity
- No Access to Recreation or Community Centers
  - 20% higher adjusted odds of obesity

# As a Result:

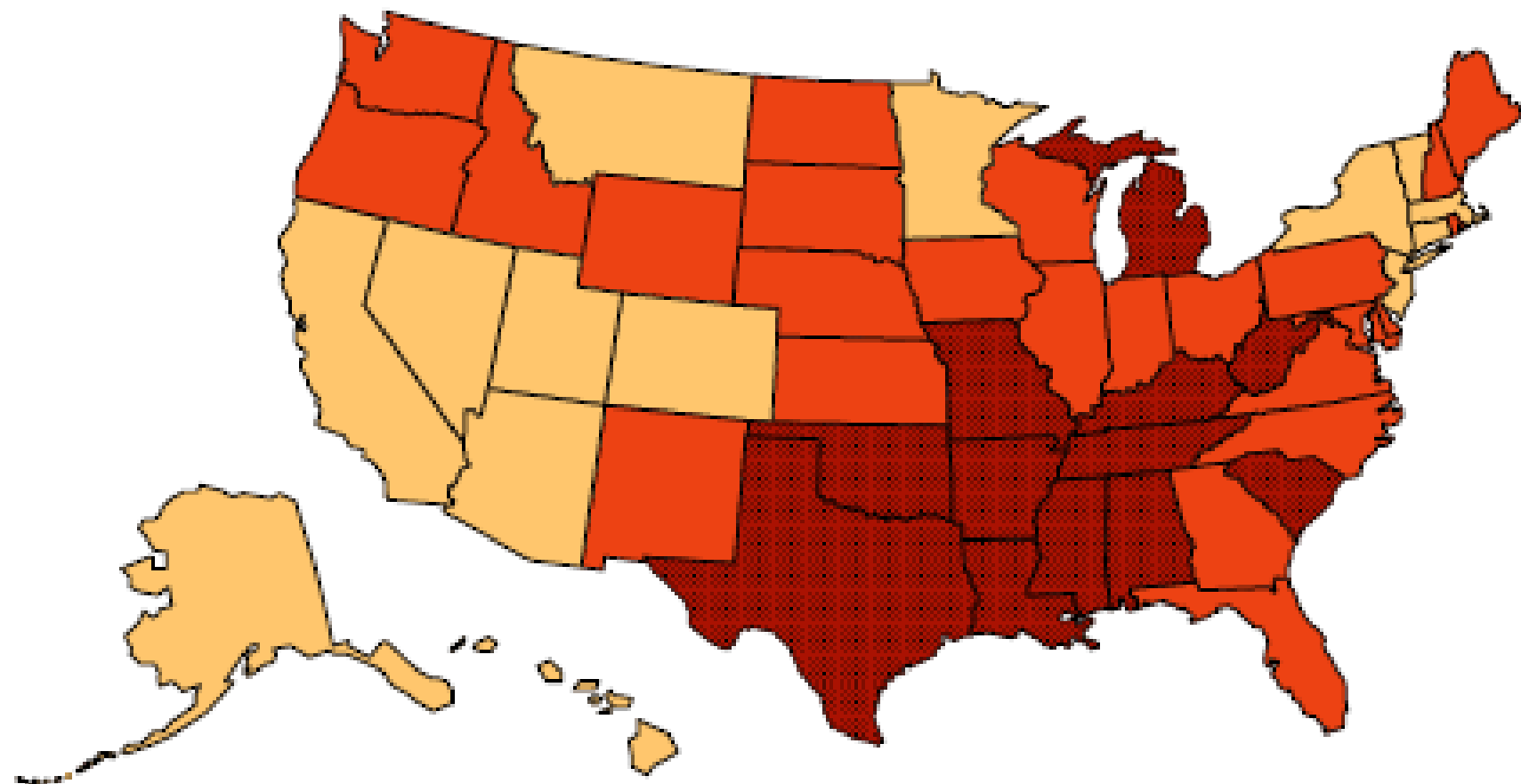
- Children who live in neighborhoods with the least favorable built environment factors:
  - 50% more likely to be physically inactive
  - 52% more likely to watch television more than two hours per day
  - 65% more likely to engage in recreational computer use more than 2 hours per day
- Children living in neighborhoods with the fewest health-amenities:
  - 55% more likely to be overweight
  - 104% more likely to be obese



# Obesity Trends\* Among U.S. Adults

## BRFSS, 2010

(\*BMI  $\geq 30$ , or  $\approx$  30 lbs. overweight for 5' 4" person)



# Consequences of Obesity

- Cardiovascular Disease
  - Hypertension
- Metabolic Disorders
  - Type II Diabetes Mellitus
- Psycho-Social Issues & Quality of Life
  - Depression, Suicide, Friendship & Social Interaction
- Lower Life Expectancy
  - Estimated 25% lower for Obese young-adults today



# Childhood Obesity: Economic Implications

- Females who become Obese Adults
  - Have Less Education
  - Lower Earning Power
  - Higher Likelihood of Poverty
- Obese Individuals
  - Less Likely to be Admitted to College
  - More likely to experience housing discrimination
  - More likely to experience employment discrimination
- High Economic Cost
  - Direct medical costs of Childhood Obesity: \$4.34 billion annually
  - Direct medical costs of Adult Obesity: \$147 billion annually
  - Additional Costs:
    - Lower Productivity, Obesity-related job absenteeism
    - Other costs: lower education, more reliance on government programs, & lower earning potential

# Screen Time

- Television
- Video Games
- The Internet
- Hand held games
- Smart phones
- Social Media
- Are POTENT, NEUROLOGICALLY AROUSING  
sensory input

# Television Viewing as a Cause of Increasing Obesity Among Children

- There was a strong dose-response relationship between the prevalence of overweight and hours of television viewed.
- The odds of being overweight were 4.6 times greater for youth watching more than 5 hours of television per day compared with those watching for 0 to 2 hours.
- Gortmaker, et al *Arch Pediatr Adolesc Med.* 1996;150(4):356-362.

# The Immediate Impact of Different Types of Television on Young Children's Executive Function

- Sixty 4-year-olds were randomly assigned to watch a fast-paced television cartoon or an educational cartoon or draw for 9 minutes. They were then given 4 tasks tapping executive function
- Children who watched the fast-paced television cartoon performed significantly worse on the executive function tasks than children in the other 2 groups when controlling for child attention, age, and television exposure
- BA Lillard & Peterson Pediatrics September 12, 2011



# AAP Advice on TV Watching

- The first two years of your child's life are especially important in the growth and development of her brain. During this time, children need positive interaction with other children and adults. This is especially true at younger ages, when learning to talk and play with others is so important.
- Until more research is done about the effects of screen time on very young children, the American Academy of Pediatrics strongly discourages television viewing for children ages two years old or younger, and encourages interactive play.
- For older children, the Academy advises no more than one to two hours per day of educational, nonviolent programs, which should be supervised by parents or other responsible adults in the home.

American Academy  
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

- The Lifelong Effects of Early Childhood Adversity and Toxic Stress

**PEDIATRICS**®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

- Volume 129, Number 1, January 2012



# Physiologic Response to Stress

- Transient increases in stress hormones are protective and even essential for survival,
- Excessively high levels or prolonged exposures can be quite harmful or toxic

# Toxic Stress

- strong, frequent, or prolonged activation of the body's stress response systems in the absence of the buffering protection of a supportive, adult relationship.

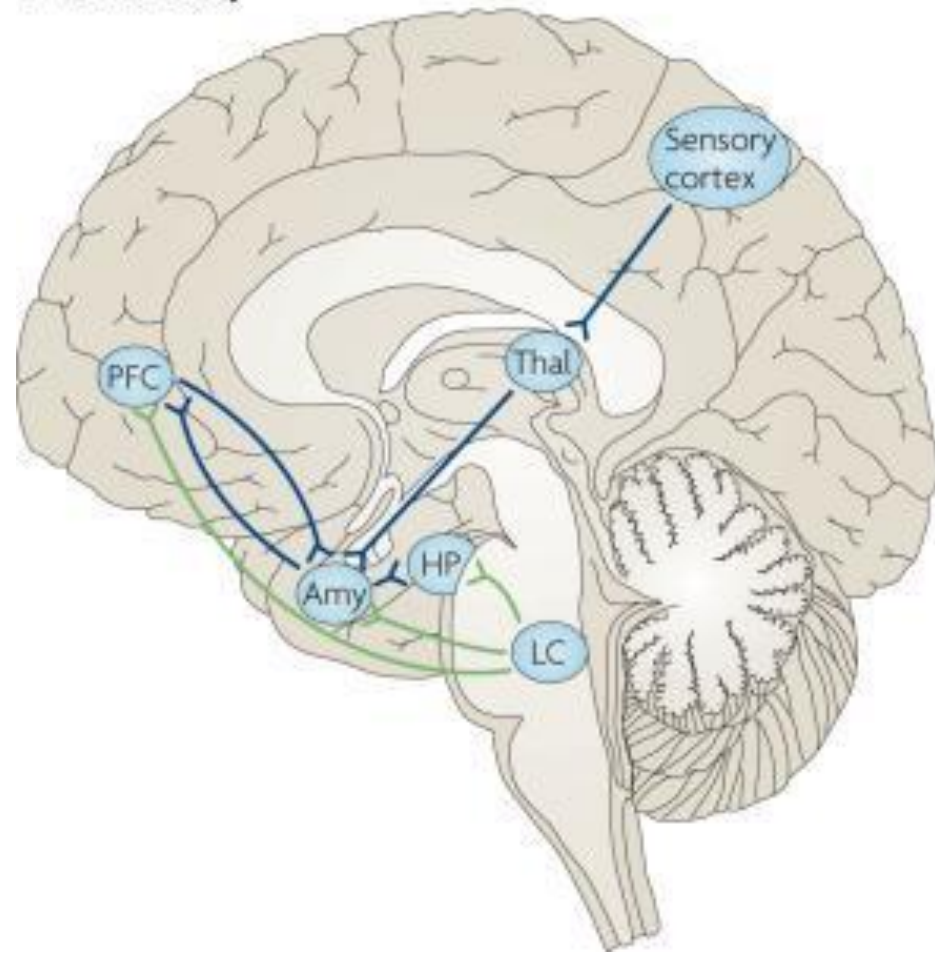
# Stress and the Brain

- Persistently elevated levels of stress hormones can disrupt its developing architecture.
- Exposure to stressful experiences has been shown to alter the size and neuronal architecture of amygdala, hippocampus, and prefrontal cortex
- This leads to functional differences in learning, memory, and aspects of executive functioning.

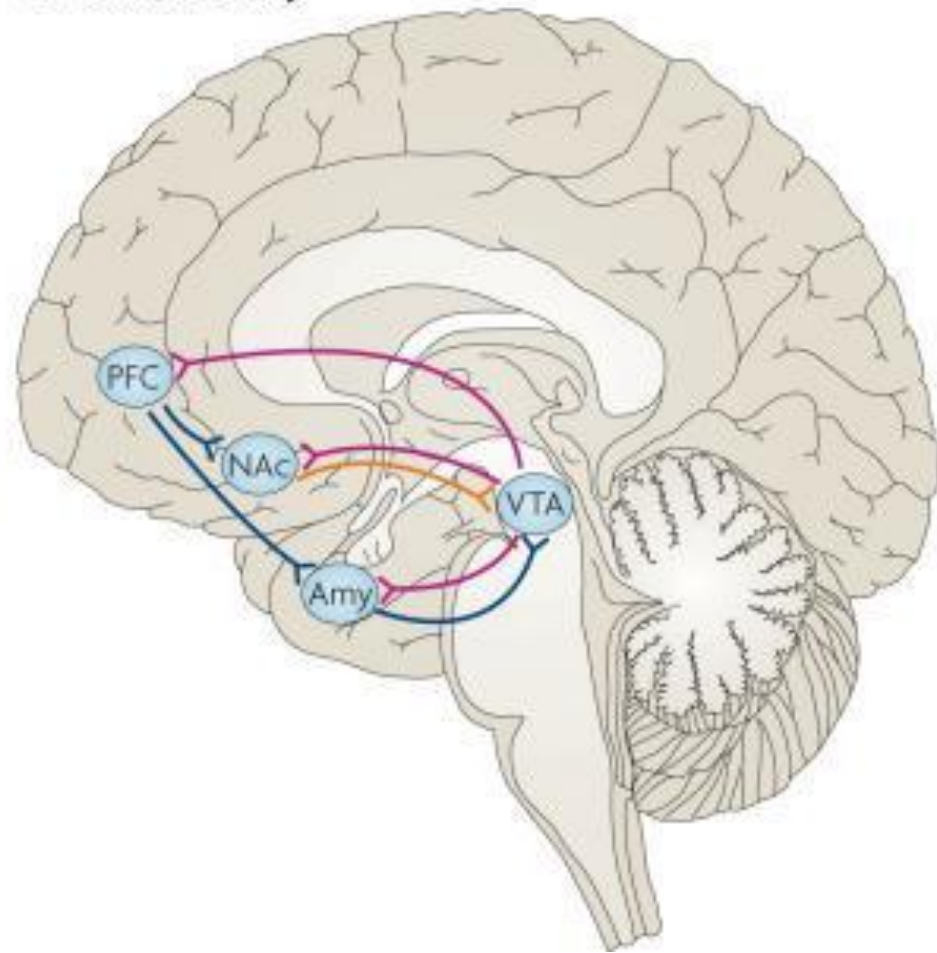
# Functional Impact

- decision-making, working memory, behavioral self-regulation, and mood and impulse control.
- This can then result in some children appearing to be both more reactive to even mildly adverse experiences and less capable of effectively coping with future stress

**a** Fear circuitry



**b** Reward circuitry



# Long Term Effects

- Adolescents and adults manifest higher rates of risk-taking behaviors
- are also more likely to have trouble maintaining supportive social networks and
- are at higher risk of school failure, gang membership, unemployment, poverty, homelessness, violent crime, incarceration, and becoming single parents.

# Biological Manifestations

- Toxic stress can result in alterations in immune function and measurable increases in inflammatory markers, which are known to be associated with poor health outcomes
- Up to 40% of early deaths have been estimated to be the result of behavioral or lifestyle patterns

A SOCIAL AUTOPSY OF  
DISASTER IN CHICAGO

# HEAT WAVE

ERIC KLINENBERG



# Chicago Heat Wave of 1995

- Thursday, July 13, the temperature hit 106 degrees, and the heat index rose above 120 degrees
- Cook County's chief medical examiner, reported 465 heat-related deaths for the heat wave week
- Overall 739 Chicagoans *above the norm* died during the week of 14 to 20 July

# The CDC identified a list of conditions of vulnerability

- not having an air conditioner
- lacking access to transportation
- being sick or bedridden
- living alone
- not leaving home daily
- not having social contacts nearby

# Demographics of Deaths

- Chicago Public Health Department found that the black/white mortality ratio was 1.5 to 1.
- Latinos, who represent about 25 percent of the city population and are disproportionately poor and sick, accounted for only 2 percent of the heat-related deaths.

# Community Characteristics

- Most of the African American neighborhoods with high heat wave death rates had been abandoned—by employers, stores, and residents.
- The social ecology of abandonment, dispersion, and decay makes systems of social support exceedingly difficult to sustain.

# Community Characteristics

- Chicago's Latinos tend to live in neighborhoods with high population density, busy commercial life in the streets, and vibrant public spaces.
- This social and spatial context makes close family ties possible, and
- Makes people care about each other and look after each other.

# Epigenetics

- The idea that environmental factors (such as diet, lifestyle choices and behaviors, and stress) can change the health not only of the people who are exposed to them, but also the health of their descendants
- There is no change in the underlying DNA sequence of the organism; instead, non-genetic factors cause the organism's genes to behave (or "express themselves") differently



# Value-Added Teachers and Student Outcomes

- Tracked one million children from a large urban school district from 4th grade to adulthood.
- Found that when a high VA teacher joins a school, test scores rise immediately in the grade taught by that teacher
- Found that students assigned to higher VA teachers are more likely to attend college, earn higher salaries, live in better neighborhoods, and save more for retirement.



# Child Health and Development

- is driven by an ongoing, interaction between
- Biology as defined by genetic predispositions = **Nature**
- and ecology as defined by the social and physical environment = **Nurture**

# Interaction of Nature & Nurture

- Brain development is determined by genetic code
- Environmental factors influence the process of brain development at all stages and in many ways
- The process can be enhanced as well as disrupted
- Our job is to enhance the potential of our children in order to help them become responsible and successful adults and our future leaders

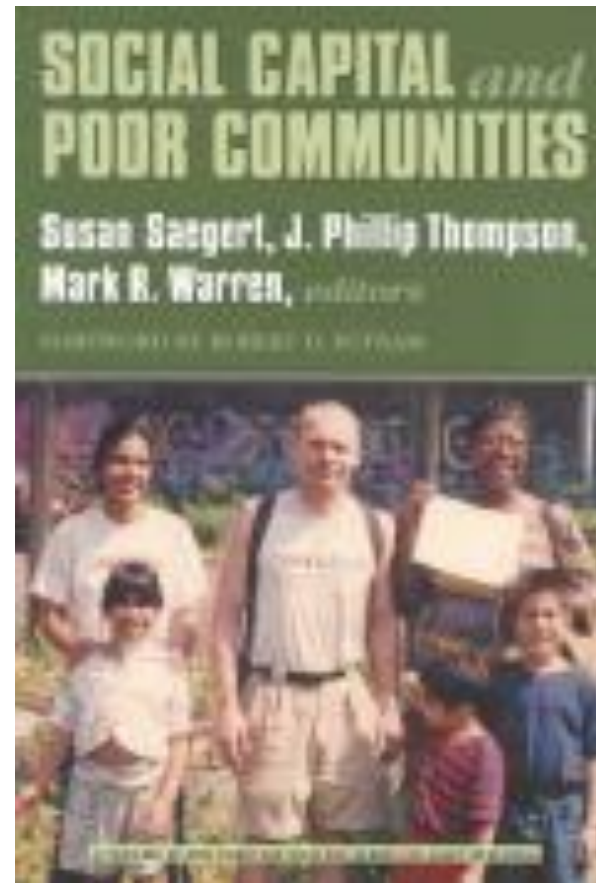
# Social Capital

— *n*

the network of social connections that exist between people, and their shared values and norms of behavior, which enable and encourage mutually advantageous social cooperation

# Building Social Capital

- Examines civic initiatives that promoted community building
- At the core of each initiative lie local institutions



# Project GRANDD

- Sponsored by the Atlanta Regional Commission
  - Started in 2005 with 8 grandparents
  - Now has over 80 grandparents and growing
  - Over 200 children between them
- 
- Monthly meetings
  - Annual Zoo outings and holiday parties



# GRANDD Partnership with Emory Nursing School

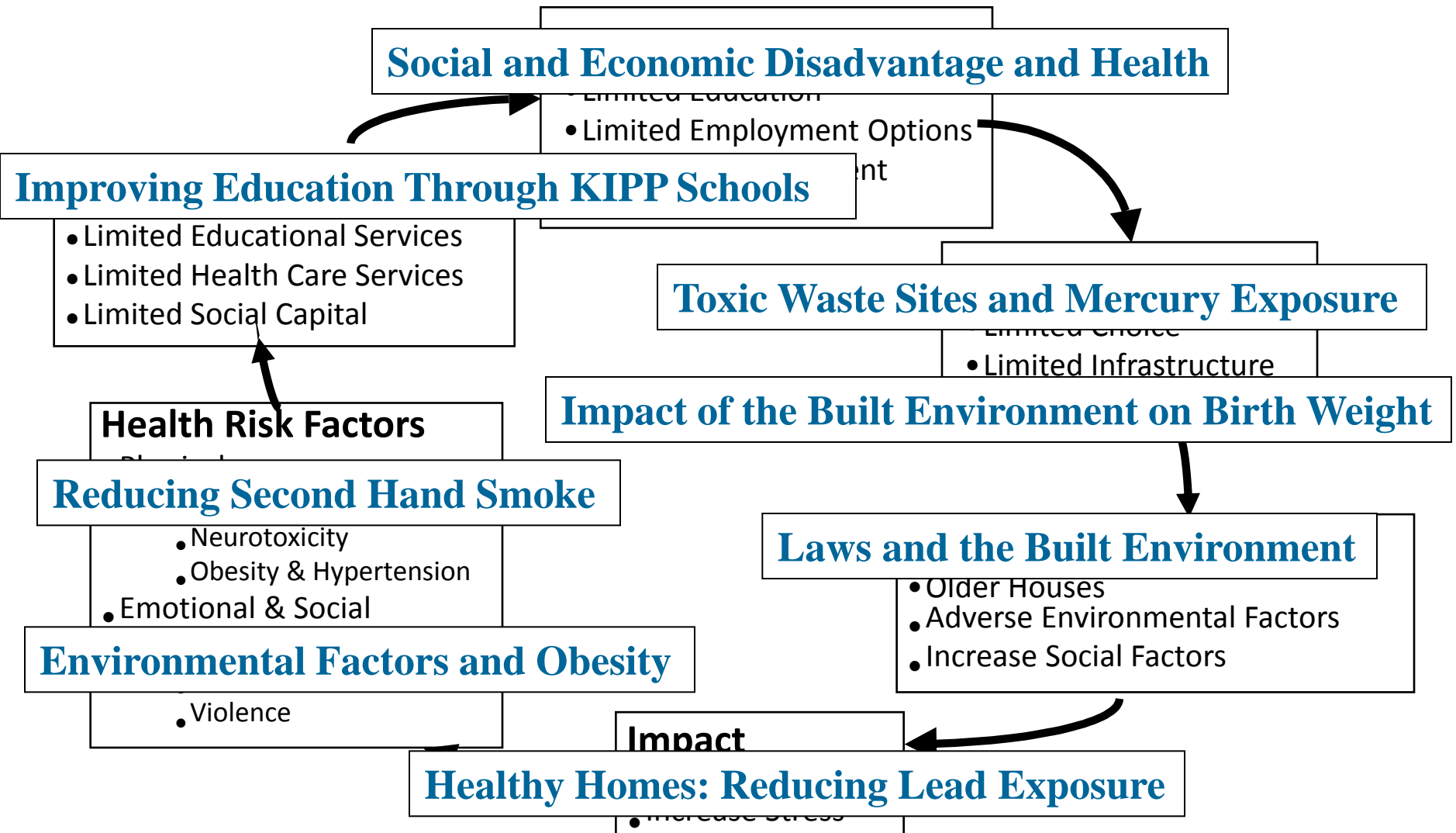
- Nursing Students go into the homes
- Health assessments on Grandmothers
- Environmental assessments on homes
- Data will be analyzed



# GRANDD Oral Histories

- Partnership with Art Institute of Atlanta
- Project has gone into the homes of families to interview grandparents
- Qualitative analysis of the interviews will be done through colleagues at Department of Sociology at Georgia State University

# Break the Cycle

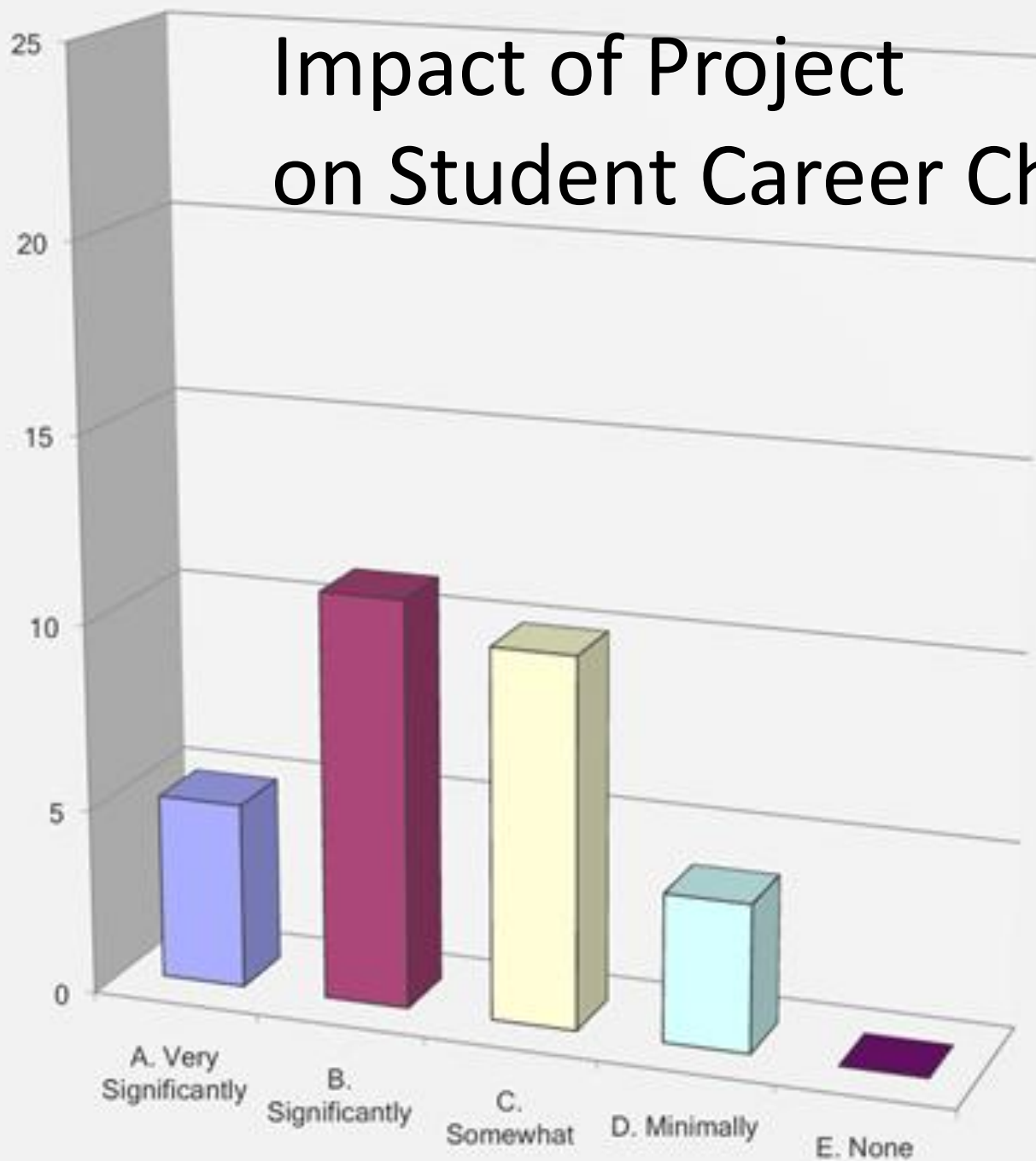




# Accomplishments to date

- To date we have had 7 such programs involving more than 50 students from as many as 20 different universities and departments in 7 different states
- We have had 4 published monographs of their projects
- The students report that they have learned from their experience and it has affected their career decisions

# Impact of Project on Student Career Choices



# Lessons

- Children who grow up in circumstances of social and economic disadvantage can get trapped in a cycle of disadvantage and disability
- It is possible to break the cycle and for the children to have a more positive future in their lives with significant contributions to society
- Although it is difficult to change the system in a short period of time it is possible to make small changes which can have major positive long term benefits
- If enough small changes occur this could cumulatively result in major long term changes for the better for all children to grow up with a positive view of their individual and collective future

- We may not be required to complete a task but we are not allowed to desist from undertaking the challenge



# Thank You.....

Leslie Rubin MD

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