Improving the health and development of children: A public health perspective

Margaret O’Brien Caughy, Sc.D.
Associate Professor
UT School of Public Health
Questions for today

• How does poverty affect the health and development of children, both short term and long term?

• How can we implement effective interventions to improve outcomes for children at risk?
Risks associated with child poverty

- Substance abuse: 1.9
- Victim of violent crime: 2.2
- Depression: 2.3
- Child abuse/neglect: 6.8
- Emotional/behavior problem: 1.3
- Learning disability: 1.4
- Mortality: 1.7
- Low birth weight: 1.7
- Grade retention/HS drop out: 2
- Hospitalization: 2
- Birth to unmarried teen: 3.1
- Lead poisoning: 3.5

Improving the development of children: A public health perspective

Health Care Access and Childhood Poverty
The health and well-being of Texas children ranked 35th

- Demographic indicators:
  - Children in poverty: 26%
  - Uninsured children: 17%

- Health indicators:
  - Preterm birth rate: 13%
  - Child overweight/obesity: 33%
  - Repeat teen pregnancies: 22%
  - Fair/poor oral health: 38%

- Education indicators:
  - Below proficient in science in 8th grade: 71%
  - Below proficient in math in 8th grade: 60%
  - Below proficient in reading in 8th grade: 73%
  - On time graduation: 75%

Annie E. Casey Foundation, Kids Count Datacenter: http://datacenter.kidscount.org/
Poverty and poor health/development more likely to affect minority children

- Compared to White children, Black children are:
  - >3x as likely to live in poverty (39.1% vs. 12.4%)
  - >2x as likely to die before their first birthday
  - >1.5x as likely to be obese
  - Less likely to graduate from high school (64% vs. 82%)

- Compared to White children, Hispanic children are:
  - Almost 3x as likely to live in poverty (35% vs. 12.4%)
  - >1.5x to be uninsured
  - >1.5x as likely to be obese
  - Less likely to graduate from high school (66% vs. 82%)

Source: Children’s Defense Fund
The maternal and child health (MCH) life course perspective

• Today’s experiences and exposures determine tomorrow’s health
• Health trajectories are particularly affected during critical or sensitive periods
• The broader environment strongly affects the capacity to be healthy
• Inequality in health reflects more than genetics and personal choice

Amy Fine, Milt Kotelchuck, 2009
Improving the development of children: A public health perspective

Relationships are the foundation of healthy development

• Babies come “wired” for interaction
  – Child forms attachment to primary caregiver between 9 and 12 months of age

• Sensitive, responsive caregiving associated with:
  – Greater security of attachment
  – Better developed self regulation skills
  – Fewer behavior problems
  – Better cognitive outcomes
Improving the development of children: A public health perspective

Security of attachment and risk of obesity

Adjusted odds = 1.30 (95% CI: 1.05-1.62)

Improving the development of children: A public health perspective


Figure 1. A biodevelopmental framework for understanding the origins of disparities in learning, behavior, and health.
Neighborhoods as a source of risk and resilience

- Neighborhood poverty is an independent source of developmental risk, over and above risk factors at the family level
Improving the development of children: A public health perspective

Neighborhood economic impoverishment and child cognitive and behavioral competence

Caughy, O’Campo, & Nettles (2008)
Neighborhoods and health: What’s the evidence?

- Perinatal health (LBW/PTB, etc.)
- Physical health
  - Obesity/diet/physical activity
  - Cardiovascular health
  - All cause mortality
- Mental health
  - Depression
  - Substance abuse
- Youth/child outcomes
  - Risky behavior
  - Behavior problems
  - Academic achievement
Improving the development of children: A public health perspective


Figure 1. A biodevelopmental framework for understanding the origins of disparities in learning, behavior, and health.
Improving the development of children: A public health perspective

Lacked Money for Food, January-June 2012

Texas: ranked 15th; 20% had experienced food insecurity

http://www.gallup.com/poll/156806/one-four-mississippi-residents-struggle-afford-food.aspx#1
Improving the development of children: A public health perspective


**Figure 1.** Mental health, at age 12 years, of United Kingdom children always food secure and ever food insecure during ages 7–10 years, Environmental Risk Longitudinal Twin Study, 1999–2000. Food insecurity refers to material hardship related to food, including hunger. Error bars indicate ±1 standard error; *P* < 0.001 for all comparisons.
## Developmental resilience in the face of adversity

<table>
<thead>
<tr>
<th>Individual</th>
<th>Family</th>
<th>Extra-familial</th>
</tr>
</thead>
</table>
| • Good intellectual functioning  
• Easy disposition  
• Self esteem  
• Talents  
• Faith            | • Close relationship with caring adult  
• Authoritative parenting  
• Socioeconomic advantages  
• Extended family support      | • Bonds to prosocial adults outside family  
• Connections to prosocial organizations  
• Attending effective schools |

Masten & Coatsworth, 1998
Improving the development of children: A public health perspective

A significant proportion of low income parents engage in positive parenting

- Child-oriented
- Directive
- Hostile/Intrusive
- Low Involvement

African American mothers (n = 177) vs. Latina mothers (n = 216)
Improving the development of children:
A public health perspective

A significant proportion of low income parents engage in positive parenting

- **African American fathers (n = 86)**
  - Child-oriented: [Bar chart data]
  - Directive: [Bar chart data]
  - Hostile/Intrusive: [Bar chart data]

- **Latino fathers (n = 138)**
  - Child-oriented: [Bar chart data]
  - Directive: [Bar chart data]
  - Hostile/Intrusive: [Bar chart data]
How does the stress of poverty “get under your skin”? 

Figure 1. A biodevelopmental framework for understanding the origins of disparities in learning, behavior, and health. 

What is self regulation?

• “.. the cognitive, motivational, affective, social and physiological processes that modulate attention, emotion and behavior to a given situation/stimulus, for the purpose of pursuing a goal.”

Improving the development of children: A public health perspective

Inhibitory Control

The ability to ignore distraction and stay focused, and to resist making one response and instead make another

Working memory

The ability to hold information in mind and manipulate it

Cognitive flexibility

The ability to flexibility switch perspectives or focus of attention

Improving the development of children: A public health perspective

Neural basis of self regulation

- PFC – controls higher order processes including planning, monitoring and goal setting; effortful
- ACC – connects PFC with limbic areas
- Limbic areas (amygdala, hypothalamus) responsive to emotion/stress; more automatic
Improving the development of children: A public health perspective

Neural basis of self regulation

Executive Functions
(inhibitory control, cognitive flexibility, working memory)

Emotion/Stress

Deficits in self regulation implicated in:

- Early academic failure
- Higher rates of child overweight/obesity
- Substance use/sexual risk taking in adolescence
- Poor health in adulthood
After controlling for gender, SES, ethnicity and age, executive control associated with:

- Substance use (↓)
- Snack food intake (↓)
- Fruit and vegetable intake (↑)
- Out of school physical activity (↑)
- Sedentary behavior (↓)

Improving the development of children: A public health perspective

Improving the development of children: A public health perspective


Figure 1. A biodevelopmental framework for understanding the origins of disparities in learning, behavior, and health.
Interventions to improve child health and development

- CATCH
- Fast Track
- Healthy Start
- RediStart
- Triple ‘P’: Positive Parenting Program
- Healthy Steps
- PATHS
- KiVa Anti-bullying Program
- Infant Health and Development Program
- Early Head Start
- Infant Health and Development Program
- Baby University
- WIC
- Child Parent Center
- Parents as Teachers
- WIC
- CHIP
- Head Start
- RediStart
Limitations of interventions

• Most health and development problems have similar root causes
• Virtually no coordination across intervention efforts
Improving the development of children: A public health perspective

Intervention “cross-over”

• RCT of parenting intervention to prevent child behavior problems
  – N = 186
  – Ethnic minority
  – Enrolled at age 4
  – Followed until age 10

Improving the development of children: A public health perspective

Other examples of intervention “cross-over”

• Using physical activity as a treatment for ADHD; clinical trial at University of Vermont (Betzy Hoza) and Purdue (Alan Smith)

• Translation of PATHS intervention (adolescent substance use and violence prevention) to reduce obesity (Sakuma et al. (2012). *Health Education Research, 27* (2), 343-358.)
MCH Life Course Initiatives

• “A MCH Life Course Organization is an entity that develops the capacity over time to deliver integrated, continuous and comprehensive health and social services and support to women and their infants from the cradle to the grave.”

• Northern Manhattan Perinatal Partnership (est. 1990)

• http://www.sisterlink.com/index.htm
## Improving the development of children: A public health perspective

### Northern Manhattan Perinatal Partnership

**Life Course Continuum of Interventions**

<table>
<thead>
<tr>
<th>Centering Pregnancy</th>
<th>Child abuse prevention</th>
<th>Latch-key program</th>
<th>Managing relationships</th>
<th>Health policy activities</th>
<th>Reproductive social capital</th>
<th>Harlem Weight Watchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internatal care</td>
<td>School readiness</td>
<td>Fitness &amp; health activities</td>
<td>Pregnancy prevention</td>
<td>Women’s health protocol</td>
<td>Depression group work</td>
<td>Women’s health protocol</td>
</tr>
<tr>
<td>Perinatal care</td>
<td>Universal Pre-K</td>
<td>Beacon school</td>
<td>College prep</td>
<td>Perinatal care</td>
<td>Reproductive life planning</td>
<td>Specialty care</td>
</tr>
<tr>
<td>Harlem Birthing Center</td>
<td>Early Head Start/Head Start</td>
<td>Health/life story telling</td>
<td>Preconception, interconceptional care</td>
<td>Chronic disease</td>
<td>Chronic disease management</td>
<td>Chronic disease</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Birth</th>
<th>Early childhood</th>
<th>Preteen</th>
<th>Teen</th>
<th>Young Adult</th>
<th>Women &gt;35</th>
<th>Senior Citizens</th>
</tr>
</thead>
</table>

**Axis 1**

Drummonds (2008)
## Improving the development of children: A public health perspective

### Northern Manhattan Perinatal Partnership

#### Life Course Continuum of Interventions

<table>
<thead>
<tr>
<th>Axis 2</th>
<th>Public Policy Initiatives</th>
<th>Community Environmental Impact</th>
<th>Organizational Impact</th>
<th>Group/Interpersonal Impact</th>
<th>Individual Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Economic Empowerment Zone</td>
<td>St. Nick Tenant Organizing</td>
<td>Healthy Start Consortium</td>
<td>Centering Pregnancy</td>
<td>OB/GYN Medical Homes</td>
</tr>
<tr>
<td></td>
<td>Supermarket Zone Expansion Policy</td>
<td>Food &amp; Fitness Coalition</td>
<td>Diabetes Prevention Coalition</td>
<td>Baby Mama’s Club</td>
<td>Case Management</td>
</tr>
<tr>
<td></td>
<td>NYC Affordable Housing Policy</td>
<td></td>
<td></td>
<td></td>
<td>Depression Screening &amp; Treatment</td>
</tr>
</tbody>
</table>

Drummonds (2008).
Improving the development of children: A public health perspective

Central Harlem
Infant Mortality Rate

September 13, 2006
Bureau of Vital Statistics
New York City Department of Health and Mental Hygiene

Drummonds (2008).
Can we build a life course approach to improve child health in North Texas?