Resources for MCHB-funded Training Programs

Life Course
SLIDES

Life Course Slides

The following group of slides has been collected to serve as a resource for MCHB-funded training programs. These slides maybe used in any order to support a better understanding of the life course perspective.

Section 1: The Social Determinants of Health

Section 2: The Life Course Model as an Organizational Framework

Section 3: Examples of Life Course Development

Slides and Ideas

These slides were adapted from many different sources. A special thank you to the following individuals and organizations who contributed to their development:

- Joann Bodurtha
- Jeff Brosco
- Karen Edwards
- Amy Fine
- Holly Grason
- Neal Halfon
- Milton Kotelchuck
- Michael Lu
- Cheri Pies
- Association of University Centers on Disabilities
- Johns Hopkins School of Public Health
- Maternal and Child Health Bureau, HRSA

Section 1

The Social Determinants of Health

Social Determinants

The social determinants of health are those factors which are outside of the individual; they are beyond genetic endowment and beyond individual behaviors. They are the context in which individual behaviors arise and in which individual behaviors convey risk. The social determinants of health include individual resources, neighborhood (place-based) or community (group-based) resources, hazards and toxic exposures, and opportunity structures.

– Camara Jones, CDC, 2010

Social Determinants of Health

Two thousand years (up to 1850s):

- Illness as humors out of balance
- Physician investigated a patient's environment & habits
- No clear distinction between public and personal health

By 1930s:

- Illness as disruption of the body by an invading organism
- Physician treats individual patients; public health professionals deal with epidemics & environment

– Jeff Brosco

History of Medical Care in the US

1850s

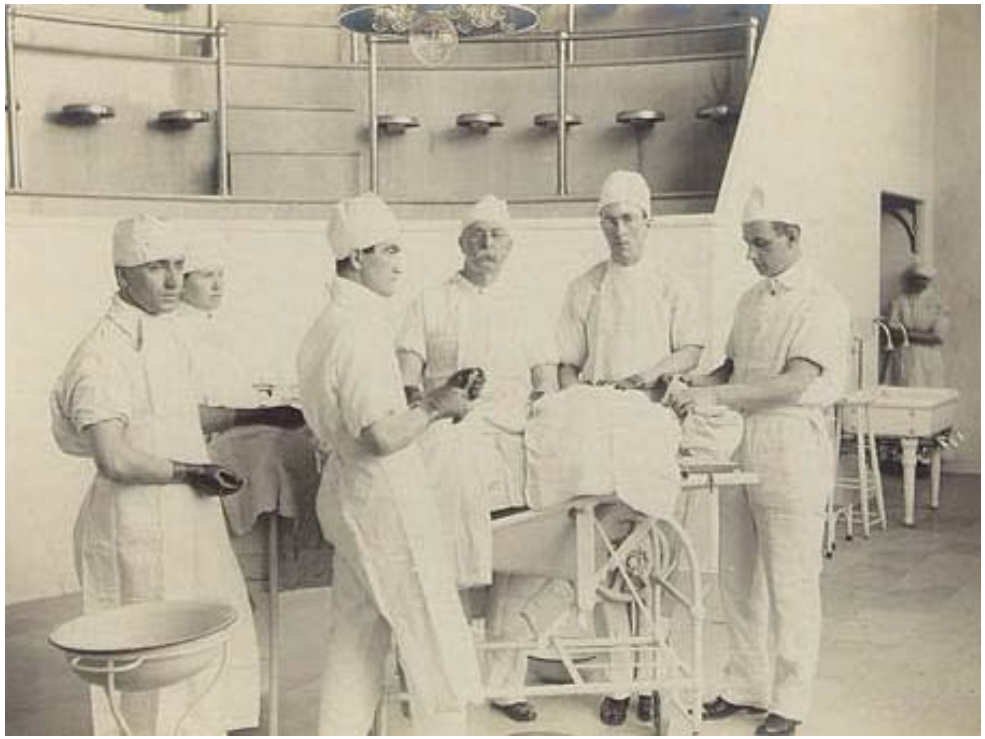
- General practice
- Varied training
- Rural/local/isolated
- Low income/prestige
- +/-State license
- Pre-germ theory
- Eclectic therapies

1930s

- Specialization
- Standardized training
- Urban/connected
- Reasonable income/prestige
- License required
- Scientist as hero

– Jeff Brosco

Hospital Operating Suite, c.1910



Health Equity

- Where systematic differences in health are judged to be avoidable by reasonable action they are, quite simply, unfair. It is this that we label health inequity.

- Putting right these inequities – the huge and remediable differences in health between and within countries – is a matter of social justice.

– World Health Organization Commission on Social Determinants of Health

Health Disparities (Birth Outcomes)

1970s –2000: solution to disparities is improve health care

- Better/more accessible prenatal care
- Better/more accessible neonatal care

Governmental and private actions improved prenatal care rates and decreased disparities in health care, but poor outcomes worsened and disparities increased

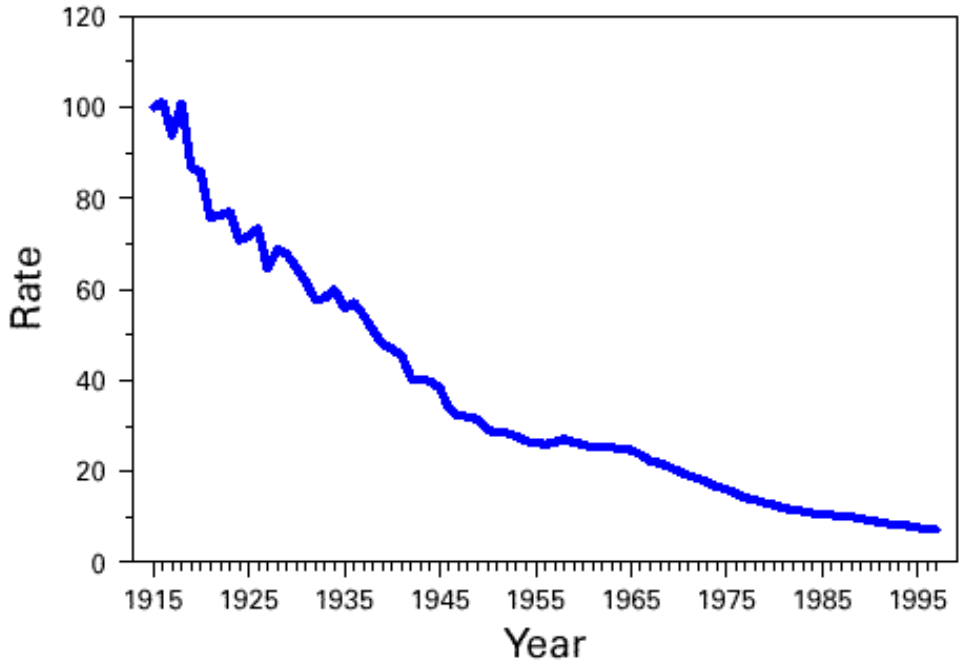
"You can't cure a lifetime of ills in nine months of a pregnancy"

– Milton Kotelchuck

Infant Mortality

(U.S. Bureau of Statistics)

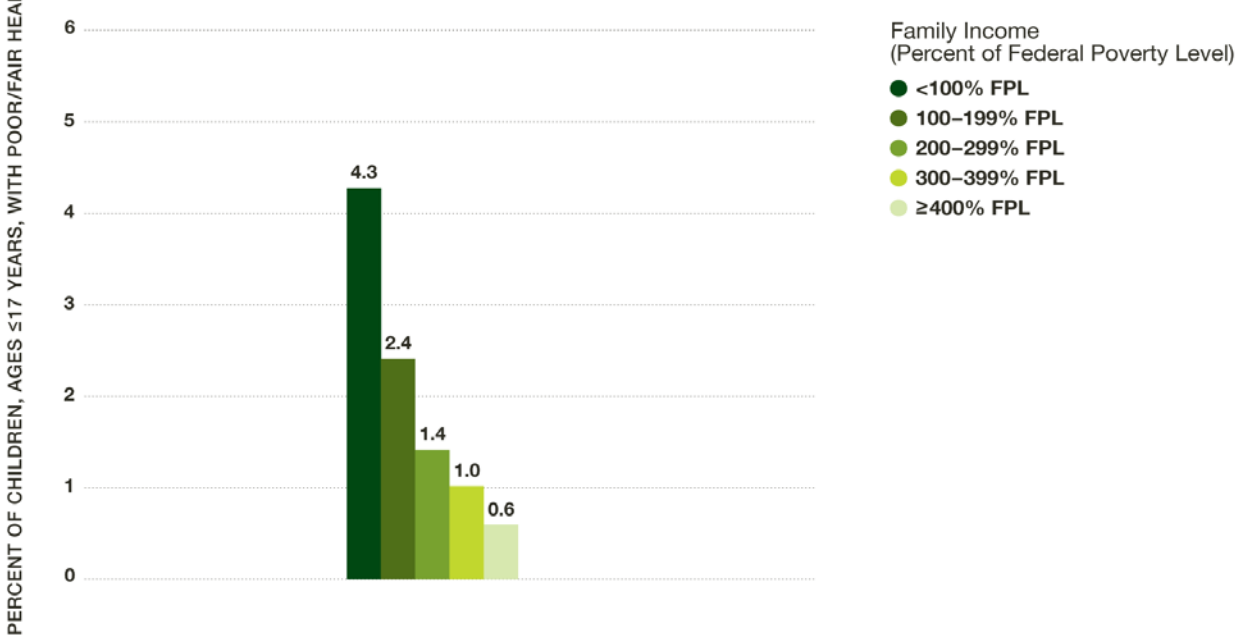
FIGURE 1. Infant mortality rate,* by year — United States, 1915–1997



*Per 1000 live births.

Parents' Income, A Child's Chances for Health

Children in poor families are about seven times as likely to be in poor or fair health as children in the highest-income families.



Prepared for the Robert Wood Johnson Foundation by the Center on Social Disparities in Health at the University of California, San Francisco.
Source: National Health Interview Survey, 2001–2005.
*Age-adjusted

www.commissiononhealth.org

The New 21st Century Scientific Basis for the MCH Life Course

- Provides an understanding of how the social environment gets built into or embodied into our physical bodies
- Bridges our intuitive understanding of the social causes of ill health (poverty, malnutrition, stress) with our understanding of its clinical manifestations and treatment
- Incorporates our growing scientific understanding of the biology of human development into our health trajectories
- Focuses on root causes of illness and disparities

– Cheri Pies

Section 2

Life Course Model as an Organizational Framework

Key Definitions and Concepts

- Life Course (vs. Life Cycle and Life Span)
- Risk and Protective Factors
- Pathways and Trajectories
- Early Programming
- Cumulative Impact
- Critical or Sensitive Periods

Clarifying Terms

- **Life Span**: length of time a species is capable of living or the length of an individual's life
- **Life Cycle**: regular, predictable series of life stages or reproductive cycle
- **Life Course**: age-graded developmental trajectories shaped by contexts

– Johns Hopkins School of Public Health

What is Life Course?

- Life Course is a theory or perspective that seeks to understand, explain, and improve health and disease patterns across population groups.

– Amy Fine

- Life Course suggests that a complex interplay of biological, behavioral, psychological, and social protective and risk factors contribute to health outcomes across the span of a person's life.

– Cheri Pies

Life Course Concepts 'T*2E2*'

- **Timeline** – health is cumulative and longitudinal, i.e., developed over a lifetime.
- **Timing** – health and health trajectories are particularly affected during critical/sensitive periods.
- **Environment** – the broader environment (biologic, social, physical, economic) affects health and development.
- **Equity** – health inequality reflects more than genetics and personal choice.

– Fine and Kotelchuck

A life course approach recognizes the role of time in shaping health outcomes and incorporates time into models explaining health outcomes.

How Time Matters

- Individuals' health changes over time.
- Determinants of health vary over time.
- Relations between determinants and health can change over time.
- Relation between determinants and health may depend on time.

– M.E. Hughes, JHSPH

Time Scales

- Individual time (chronological age, physical maturation, social norms)
- Historical time (calendar year, year born, technological development, social change)
- Others may be important for specific outcomes

Possible Time Patterns

- Trajectories
  - Upward, downward or mixed
- Relation between determinants and health
  - Latent
  - Accumulation
  - Pathways
  - Critical and sensitive periods
  - Triggers

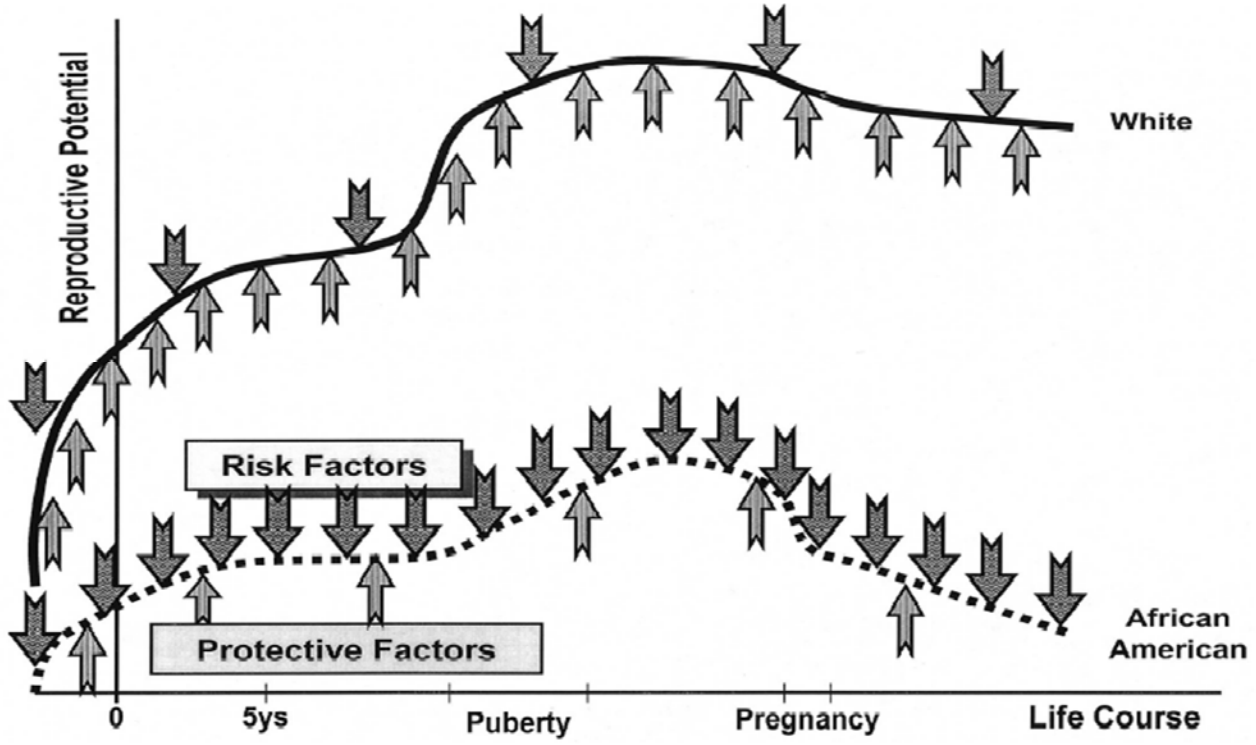
– M.E. Hughes, JHSPH

Risk and Protective Factors

Protective factors improve health and contribute to healthy development. Risk factors diminish health and make it more difficult to reach one's full potential.

Factors are not limited to individual behavior or access to health, but can include family, neighborhood, community, and social policy.

Life Course Perspective



– Michael Lu and Neal Halfon
Racial and ethnic disparities in birth outcomes: a life-course perspective. Maternal Child Health J. 2003; 7:13-30.

Pathways and Trajectories

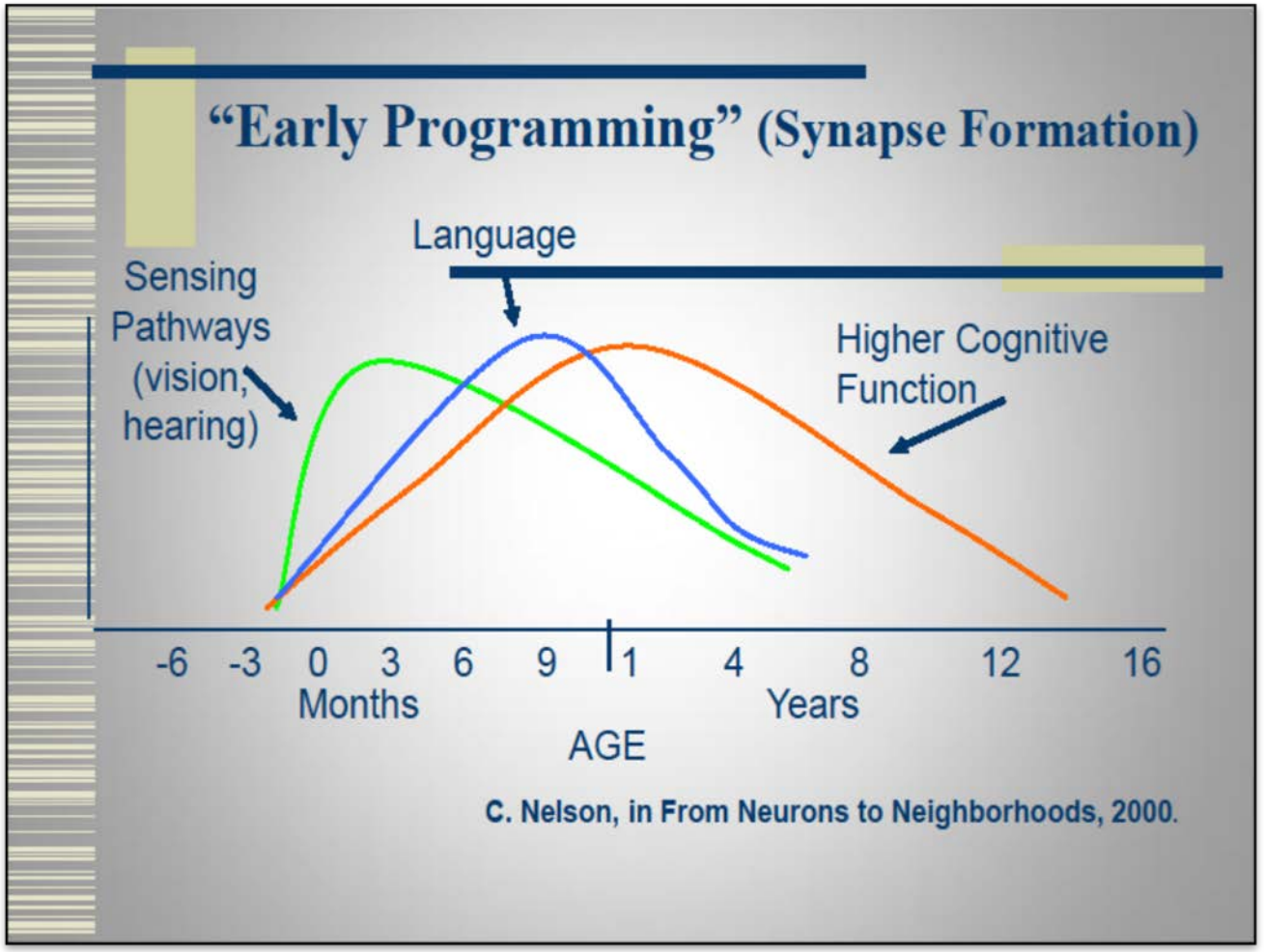
Health pathways, or trajectories, are built or diminished over the life span. While individual trajectories vary, patterns can be predicted for populations and communities based on social, economic, and environmental exposures and experiences.

– Fine and Kotelchuck, Rethinking MCH: The Life Course Model as an Organizing Framework, Concept Paper, DHHS, HRSA, October 2010.

Early Programming

Early experiences can program an individual's future health and development. This includes prenatal programming as well as intergenerational programming (i.e. the health of the mother prior to conception) that impact disease or condition, or make and individual more vulnerable or susceptible to developing a disease or condition in the future.

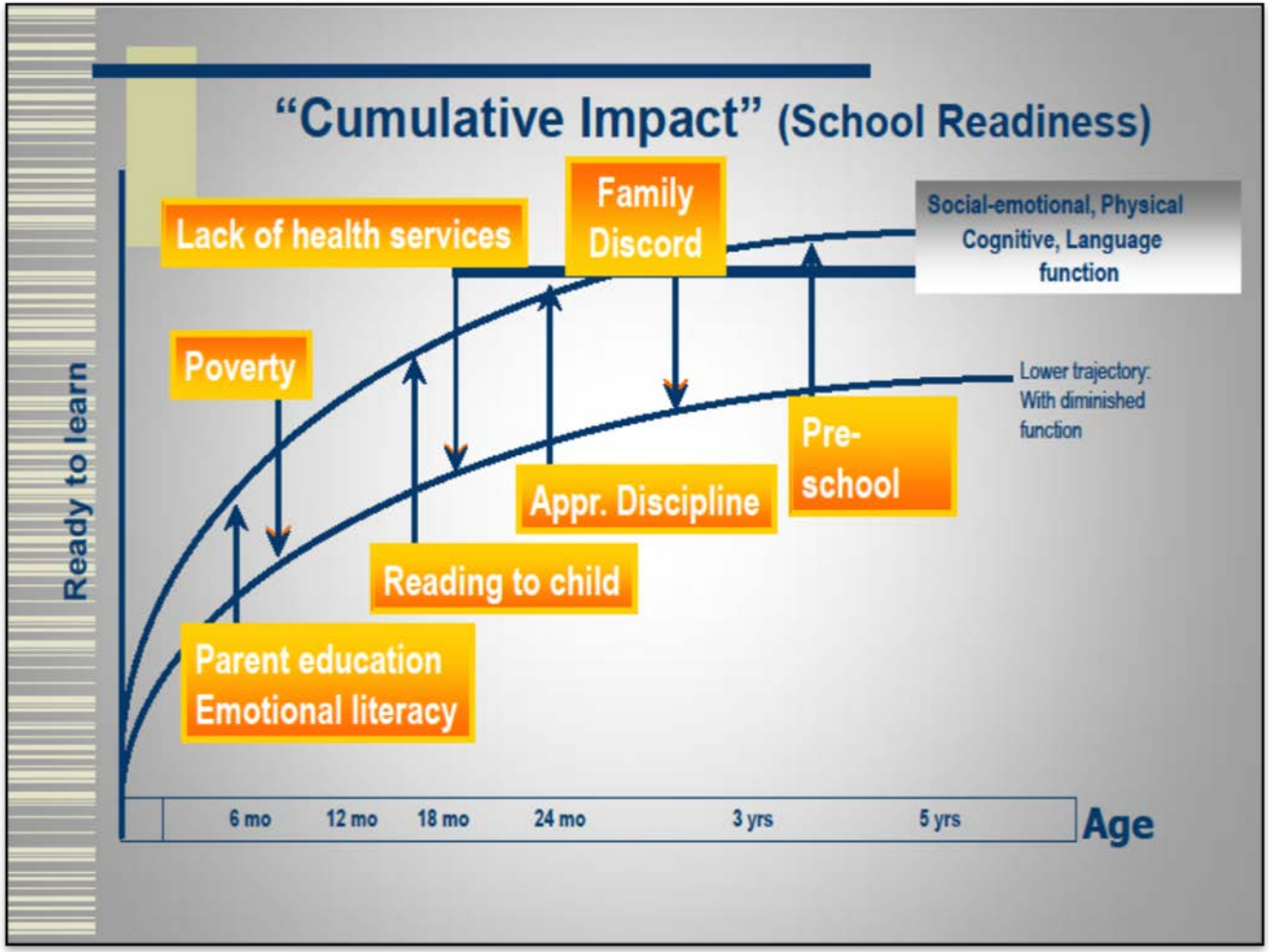
– Fine and Kotelchuck, Rethinking MCH: The Life Course Model as an Organizing Framework, Concept Paper, DHHS, HRSA, October 2010.


"Early Programming" (Synapse Formation)
Language
Sensing Pathways (vision, hearing)
Higher Cognitive Function
-6 -3 0 3 6 9 1 4 8 12 16
Months
Years
AGE
C. Nelson, in From Neurons to Neighborhoods, 2000.

Cumulative Impact

While individual episodes of stress may have minimal impact in an otherwise positive trajectory, the cumulative impact of multiple stresses over time may have a profound direct impact on health and development, as well as an indirect impact via associated behavioral or health services seeking changes.

– Fine and Kotelchuck, Rethinking MCH: The Life Course Model as an Organizing Framework, Concept Paper, DHHS, HRSA, October 2010.


"Cumulative Impact" (School Readiness)
Ready to learn
Lack of health services
Family Discord
Social-emotional, Physical
Cognitive, Language
function
Poverty
Lower trajectory:
With diminished
function
Pre-
school
Appr. Discipline
Reading to child
Parent education
Emotional literacy
6 mo
12 mo
18 mo
24 mo
3 yrs
5 yrs
Age

Critical or Sensitive Period

While adverse events and exposures can have an impact at any point in a person's life course, the impact is greatest at specific critical or sensitive periods of development (e.g. during fetal development, in early childhood, during adolescence, etc.).

– Fine and Kotelchuck, Rethinking MCH: The Life Course Model as an Organizing Framework, Concept Paper, DHHS, HRSA, October 2010.

Is Life Course Old or New?

LCT marries long-term MCH concepts with new science

- Barker Hypothesis – links LBW to increased risk of heart disease, diabetes.
- Felitti's ACE Study – links early childhood adverse events to increased risk of obesity, heart disease, diabetes, depression.
- Neurons to Neighborhoods, NAS – early environments, nurturing relationships, parents are the "active ingredients" in healthy brain development – from the earliest ages forward.

Is Life Course Old or New? (cont.)

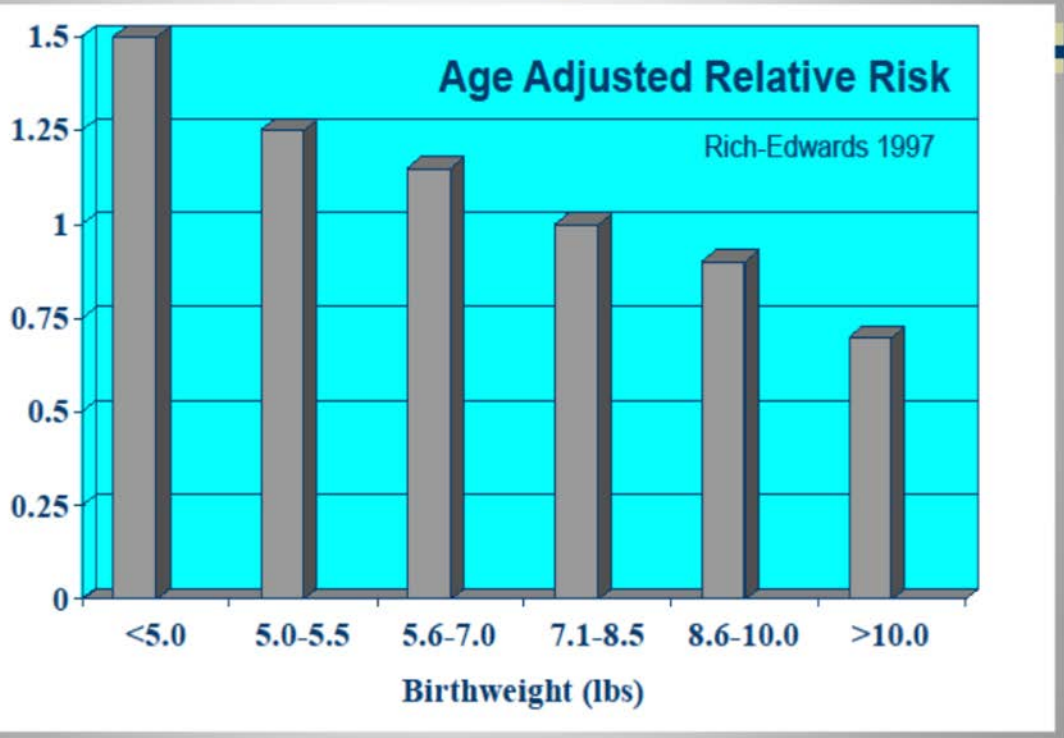
- Lu/Halfon – link disparities in birth outcomes to differential developmental trajectories of the mother, based on early life experiences (programming) and cumulative stress.
- Epi-genetics – links environmental triggers to gene expression.

The same science is also informing other fields.

– Milton Kotelchuck

Barker Hypothesis

Birth Weight and Coronary Heart Disease



MCH Life Course Literature Focuses on Two Key Questions

- Why do health disparities exist and persist across population groups?
- What are the factors that influence the capacity of individuals or populations to reach their full potential for health and well-being?

Additional Concepts to Life Course Perspective

- **Interactive processes** – The development of health over a lifetime is an interactive process, combining genes, environments and behaviors.
- **Lifelong development/lifelong intervention** – Throughout life and at all stages, even for those whose trajectories seem limited, risk factors can be reduced and protective factors enhanced, to improve current and subsequent health and well-being.

– Fine and Kotelchuck

Critiques and Questions

- Early programming — too deterministic?
- Too front-loaded? What does LCT tell us about later life stages?
- What does LCT tell us about CSHCN?
- How does LCT interface with genetic services?
- If it is all connected over a lifetime, how do we make the case for a focus on Maternal and Child Health?

– Amy Fine

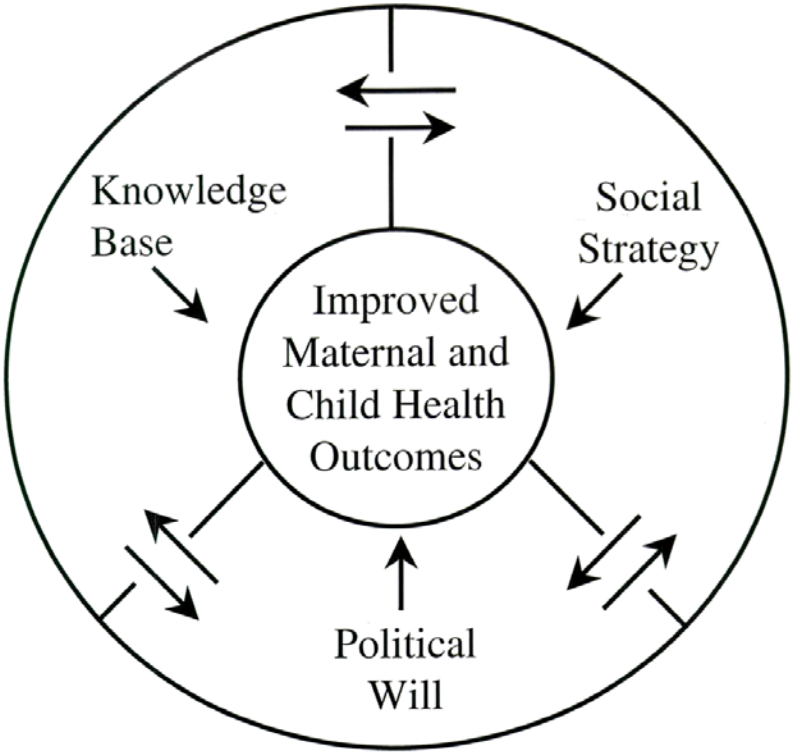
Aligning Practice with LCT

But, LCT also…

- Greatly expands the opportunities for intervention: a much broader set of venues and partners over a much longer timeline
- Suggests the need for better linkage (vertical, horizontal, temporal)
- Encourages us to rethink and realign some of the current strategies and add new ones

– Amy Fine

A System's Approach



– Richmond and Kotelcheck

Section 3

Examples of Life Course Development

PKU: A Life Course Development Perspective

PKU & Life Course Development: Birth to Two Years

- **Issues:**
  - Brain is particularly sensitive to elevated phenylalanine levels
  - Family needs to incorporate care for a metabolic disorder into their lives
    - Includes the specific aspects of care and accepting the presence of a genetic disorder
    - Sharing the information with other family members

- **Potential Barriers:**
  - Information overload
  - Feelings of fear or guilt
  - Learning the practical aspects of care
    - Special formula, counting phes, blood tests
  - Adjusting to varying appetite of child
  - Financial constraints
    - Securing insurance coverage
    - Cost of formulas and special foods

PKU & Life Course Development: Ages 4-6 years

- **Issues & Potential Barriers:**
  - Entering the school system
    - Managing a special diet at school
    - High phenylalanine levels will affect ability to learn
  - More interaction with the wider world
    - Play dates
    - Baby sitters
  - Child is developing own will
    - May show resistance to aspects of managing PKU

PKU & Life Course Development: Middle & High School Years

- **Issues & Potential Barriers:**
  - Child has increasing independence and time away from family
  - Elevated phenylalanine levels can impact school performance and ability to build relationships
    - They are building a foundation for their future decisions, such as college and career
  - Peer influence becomes more important
  - They may not 'feel different' if blood levels are elevated

PKU & Life Course Development: Young Adulthood

- **Issue and Potential Barriers:**
  - Much greater independence, legal as well as practical
  - Risk for maternal PKU
    - Risk to unborn child
    - Need for genetic counseling
  - If in college or working, performance will be negatively impacted by elevated phenylalanine levels
  - Need ability to communicate with own medical providers
  - Insurance coverage

Examples of Life Course Development

Obesity and Child Health

Obesity and Child Health

- Emerging major public health problem
  - Obesity tripled in 20 years
- Patterns of obesity begin in childhood
  - 17-18% of children and youth overweight (2006)
- Implications for lifetime of health problems
  - Links to type 2 diabetes, cardiovascular diseases, pregnancy complications

– Holly Grason

Lifespan: Obesity Impact and Prevention

Level of Intervention	Lifespan Stage Intervention and Impact			Impact of early intervention
	Preconception/ Pregnancy	Infant/ childhood	Adolescence	Adulthood
Individual	Observational studies [1,2]			
		Preschool education [4]		
Family		Parent education [5]		
		Parent education [5]		
Local/ School/ community		Teacher curriculum [6]		
National				

– Guyer B, Ma S, Grason H, Frick KD, Perry D, Sharkey A, McIntosh J. 2009. Early childhood health promotion and its lifecourse health consequences, Academic Pediatrics, 9(3): 142-149.

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