Supporting Early Childhood Development(ECD):

A Life-Course Perspective on Health, Wellness & Success

BY

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LIFE COURSE PERSPECTIVE IS NOT A NEW CONCEPT

"It is easier to build strong children than to repair broken men."

Frederick Douglass (1817-1895)

Comment

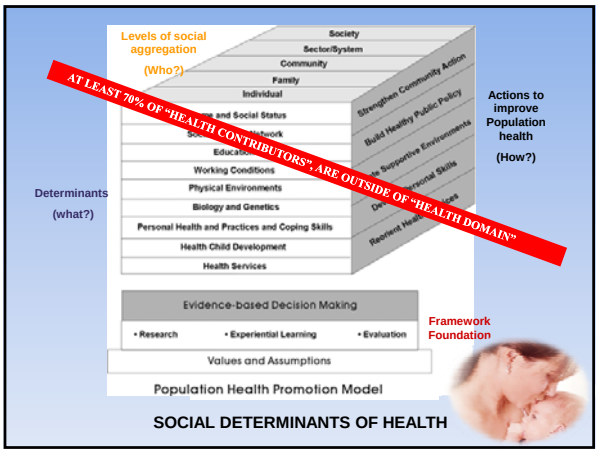
EDC LANCET SERIES, OCT 2016
UN/UNICEF/WHO/WORLD BANK

A good start in life will ensure a sustainable future for all

In 2007, the first *Lancet* Series on early childhood development reported that worldwide more than 200 million children younger than 5 years were failing to reach their developmental potential. In 2011, a second Series identified gaps in implementation and coverage of early childhood development interventions, and presented new evidence on the causes and effects of developmental inequities in early childhood. Crucially, the opportunity to amplify early childhood development interventions is in the first 3 years of life if stimulation through parenting, educational support, and adequate health nutrition

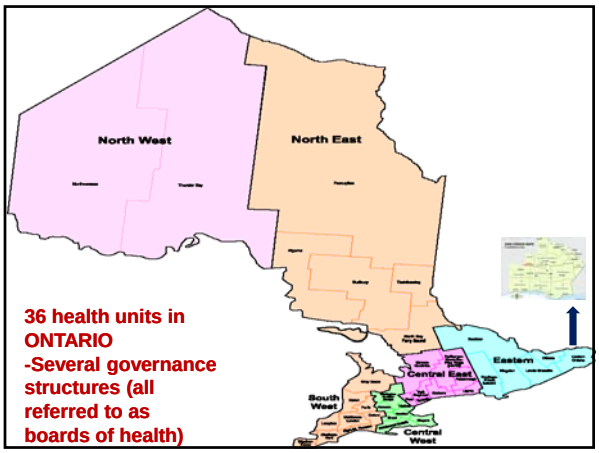
others in the first 1000 days of a child's life. With the multitude of actors and initiatives in early childhood development today, governance is both a challenge and an opportunity, as pointed out by Yusra Shawar and Jeremy Schiffman[4] in a Health Policy paper to accompany the Series.

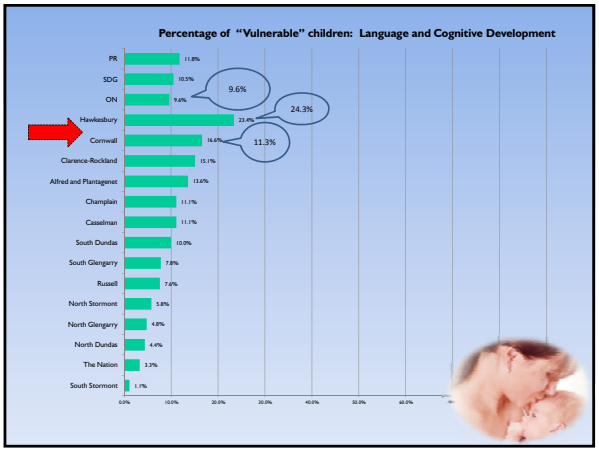
Perhaps the most important message of the Series is the cost of inaction. If children are unable to fulfil their social and developmental potential, this not only harms their futures, but also the societies in which they live. The economic case for countries to invest in early years is clear. In recognition of that reality, to:

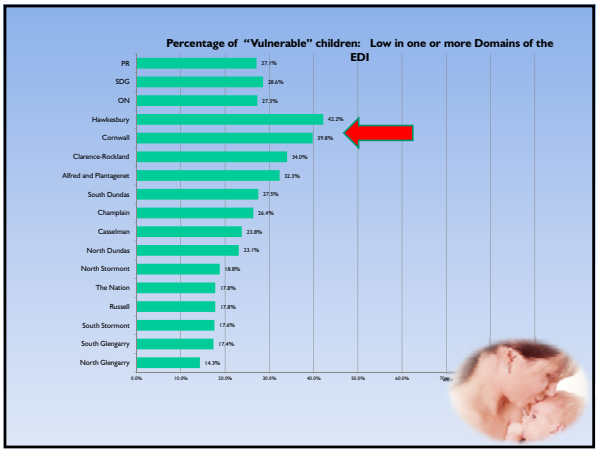

Levels of social aggregation
(Who?)
Society
Sector/System
Community
Family
Individual
Determinants
(what?)
Working Conditions
Physical Environments
Biology and Genetics
Personal Health and Practices and Coping Skills
Health Child Development
Health Services
Actions to improve Population health
(How?)
Strengthen Community Action
Build Healthy Public Policy
Evidence-based Decision Making
• Research
• Experiential Learning
• Evaluation
Framework Foundation
Values and Assumptions
Population Health Promotion Model
AT LEAST 70% OF "HEALTH CONTRIBUTORS", ARE OUTSIDE OF "HEALTH DOMAIN"
SOCIAL DETERMINANTS OF HEALTH

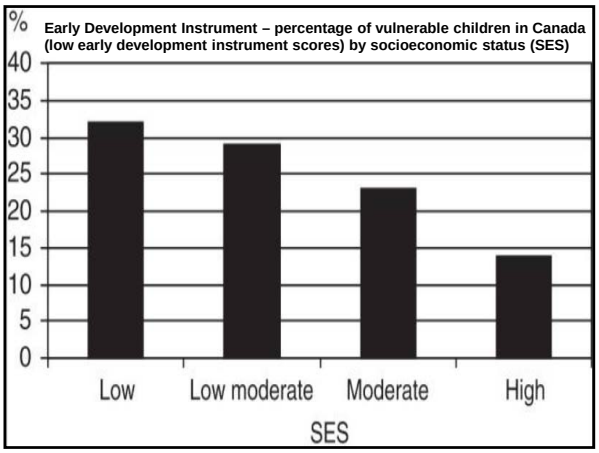

Factors that Influence Early Child Development
Biological/Genetic Endowment
Temperament
Parenting Skills
Physical Environment
Significant Stressors
Social Supports
Abuse or Neglect
Family Relationships
Attachment
Determinants of Health


EDI Scores


North West
North East
Eastern
Central East
South West
Central West
36 health units in ONTARIO
-Several governance structures (all referred to as boards of health)


Percentage of "Vulnerable" children: Language and Cognitive Development
PR
SDG
ON
Hawkesbury
Cornwall
Clarence-Rockland
Alfred and Plantagenet
Champlain
Casselman
South Dundas
South Glengarry
Russell
North Stormont
North Glengarry
North Dundas
The Nation
South Stormont
9.6%
24.3%
11.3%


Percentage of "Vulnerable" children: Low in one or more Domains of the EDI
PR
SDG
ON
Hawkesbury
Cornwall
Clarence-Rockland
Alfred and Plantagenet
South Dundas
Champlain
Casselman
North Dundas
North Stormont
The Nation
Russell
South Stormont
South Glengarry
North Glengarry

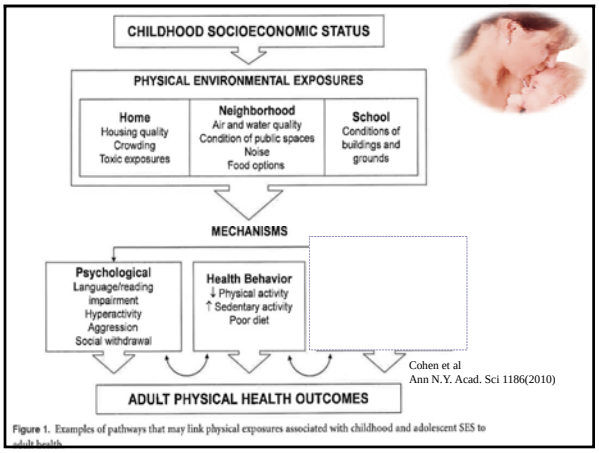


EARLY DEVELOPMENT

LONG TERM IMPACTS

Biological mechanisms which are activated by the circumstances of disadvantage, are the immediate causes of the mis-development of brains and of the modification of the genome's expression in children.

There is a link between these events and illness and poor all-round functioning of the later adulthood.



Cohen et al
Ann N.Y. Acad. Sci 1186(2010)

Figure 1. Examples of pathways that may link physical exposures associated with childhood and adolescent SES to adult health

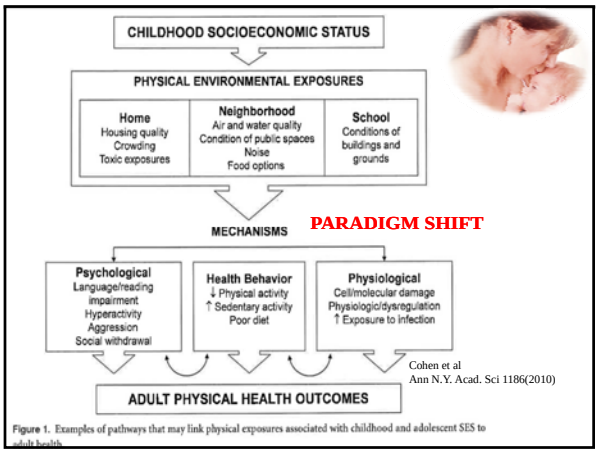


Figure 1. Examples of pathways that may link physical exposures associated with childhood and adolescent SES to adult health

THE FIRST "27 MONTHS" (or 1000 days)

9m + 18m = 27 months

WHY FOCUS ON THE EARLY YEARS? WHAT SCIENCE TELLS US TODAY

- **Early Brain Development-Neuro-Biology**
- **Disruption of vital brain-hormonal control systems (HPA). . . Result in long term, hormonal dis-balances and chronic disease**
- **Gene expression can be modified: *EPIGENETICS***

Advancing Early Childhood Development: from Science to Scale 1 **Lancet ECD series, October 2016**

Early childhood development coming of age: science through the life course

Maureen M Black, Susan P Walker, Lia C H Fernald, Christopher T Andersen, Ann M DiGirolamo, Chunling Lu, Dana C McCoy, Günther Fink, Yusra R Shawar, Jeremy Shiffman, Amanda E Devercelli, Quentin T Wodon, Emily Vargas-Barón, Sally Grantham-McGregor*, for the Lancet Early Childhood Development Series Steering Committee†

Early childhood development programmes vary in coordination and quality, with inadequate and inequitable access, especially for children younger than 3 years. New estimates, based on proxy measures of stunting and poverty, indicate that 250 million children (43%) younger than 5 years in low-income and middle-income countries are at risk of not reaching their developmental potential. There is therefore an urgent need to increase multisectoral coverage of quality programming that incorporates health, nutrition, security and safety, responsive caregiving, and early learning. Equitable early childhood policies and programmes are crucial for meeting Sustainable Development Goals, and for children to develop the intellectual skills, creativity, and wellbeing required to become healthy and productive adults. In this paper, the first in a three part Series on early childhood development, we examine recent scientific progress and global commitments to early childhood development. Research, programmes, and policies have advanced substantially since 2000, with new neuroscientific evidence linking early adversity and nurturing care with brain development and function throughout the life course.

Published Online October 4, 2016 http://dx.doi.org/10.1016/S0140-6736(16)31389-7

This is the first in a Series of three papers about early childhood development

*Senior author

†Members listed at the end of the report

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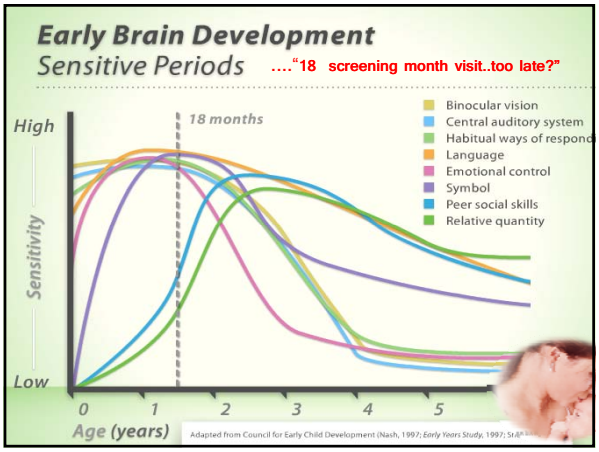
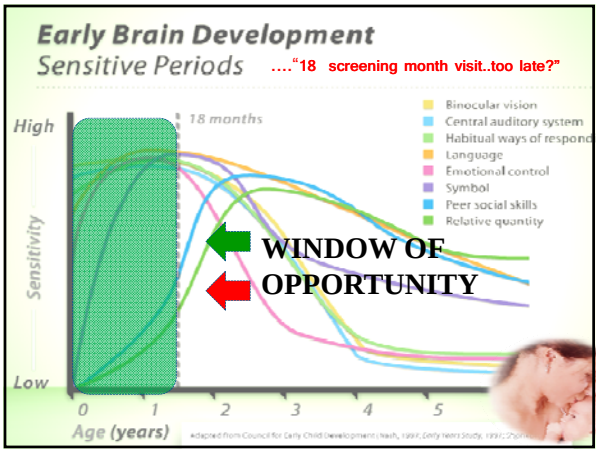
Introduction

Two *Lancet* Series on Child Development in Developing Countries (2007 and 2011) spearheaded the review of evidence linking early childhood development with adult wage earning,[1,2] competence (eg, intelligence quotient, educational attainment, and general knowledge),[1,3,4] health biomarkers,[5] reductions in violence, depressive symptoms and social inhibition,[6] and growth in the





HEMISPHERIC DEVELOPMENT

- **Before 24-30 months, right hemisphere development is more rapid (preverbal, sensorimotor learning dominates).**
- **After 24-30 months, growth spurt in left hemisphere.**
  - **Learning is mediated by language.**
  - **Ability to recall past events, anticipate future events.**

"The…right hemisphere is instrumental to the empathic perception of the emotional states of other human beings…We recognize another individual's emotional state by generating…representations that stimulate how the individual would feel when displaying a certain facial expression."

Alan Schore, 2010

RIGHT HEMISPHERE DEVELOPMENT & EARLY ATTACHMENT

- **Most right hemisphere development occurs during infancy, up to almost 3 years; models of relationships are less flexible after that.**
- **Right hemisphere is dominant for unconscious processes; the left is dominant for conscious processes.**

Alan Schore, 2010

"For the rest of the lifespan the right brain plays a superior role in the regulation of…physiological & endocrinological functions…The attachment relationship directly shapes the maturation of the…right brain stress-coping systems…"

Alan Schore, 2001

INFANTS

- Prefer human face/voice(right brain activity).
- Can scan the face when the person is silent (still face) & tries to evoke response.
- When the person speaks, attention shifts between the mouth & eyes.
- Predisposed to determine safety, seeking social information, regulating emotion.
- Micro-expressions remain an important source of social information throughout life.

NEONATE'S RECOGNITION OF ATTACHMENT FIGURE

- By 2 days, smell, taste, touch, hearing form basis for infant's recognition of mother; tactile contact is essential. Otherwise, infants demonstrate "failure to thrive".
- After 2 months, visual cortex develops rapidly & infant is attuned to micro-expressions of the face, particularly the eyes & pupil size.

THE SCIENCE OF TLC

"The day-to-day stimulations of a nurturing, interesting, stable home life most certainly can sculpt the circuitry of the brain. Reading, singing…and especially talking and cuddling, help shape the child's development in a very real, neurobiological way."

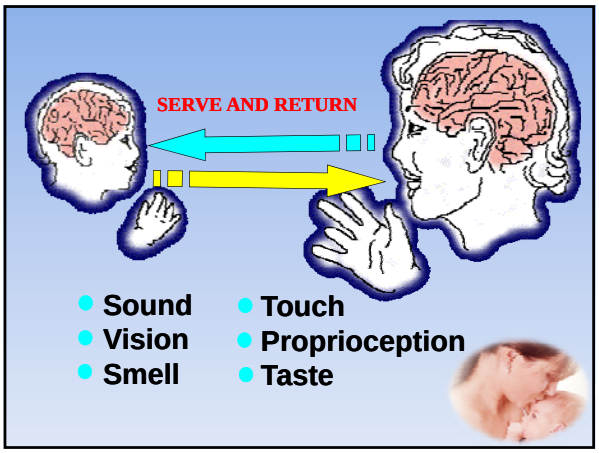
Sullivan & Lasley 2010

THE SCIENCE OF TLC

LOVING ATTACHMENT (TLC)

- Stimulates growth hormones in the infant's brain.
- Increases exploration of the environment, play, and the ability to "take a chance."
- Increases emotional expression & teaches emotional regulation.
- Secure attachment to one person allows formation other healthy attachments.
- Promotes proper brain sculpting

THE SCIENCE OF TLC



VISION & HEARING CRITICAL PERIOD

- Eye cataracts at birth prevent normal development of vision neurons in the occipital cortex.

(Hubel and Wiesel)

- Cochlear defects at birth impair hearing development.

EXAMPLES

- SGA-IUGR children have higher rates of metabolic syndrome (diabetes, hypertension, high blood pressure) as adults.
- People abused as children have higher rates of heart disease as adults.
- Growth failure in neglected babies.

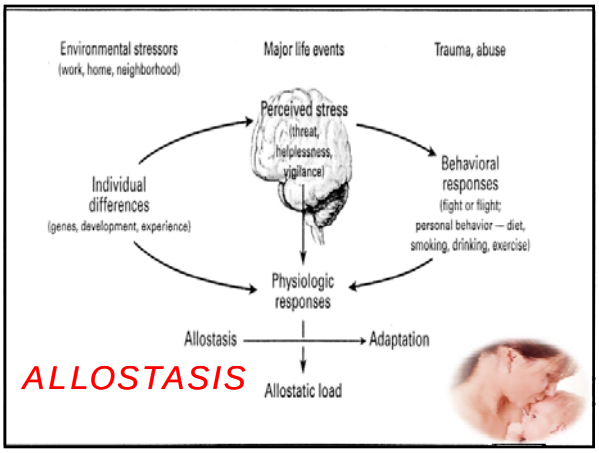
WHAT SCIENCE TELLS US TODAY

NEGLECT/ABUSE/SOCIOECONOMIC DISADVANTAGE-*EFFECTS*

- **Long term, not immediately visible effects. . . presumably "psychological" (classic view)**

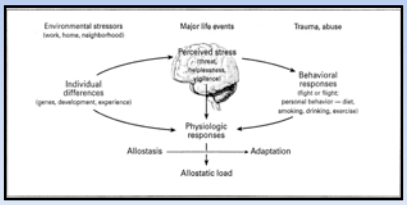
NEW PARADIGM:

- **Disruption of vital brain structure/sculpting and brain-hormonal control systems (HPA). . . Result in long term, hormonal dis-balances and chronic disease**
- **Gene expression can be modified: *EPIGENETICS***



ALLOSTASIS

- ***Allostasis vs. Homeostasis***
- ***Allostatic Load: Chronic, long term health implications-DIRECT LINK TO SES(SDH)***



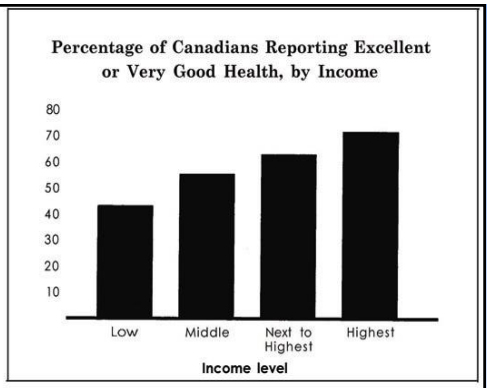


Figure 1. Source: Statistics Canada General Social Survey, 1991.

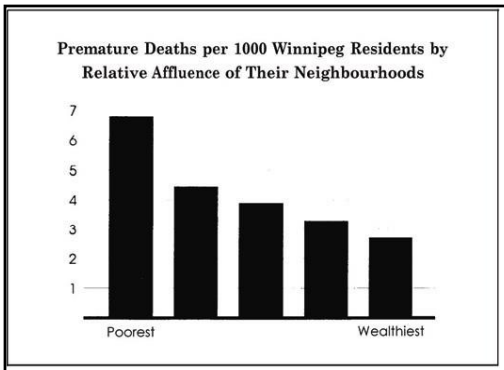
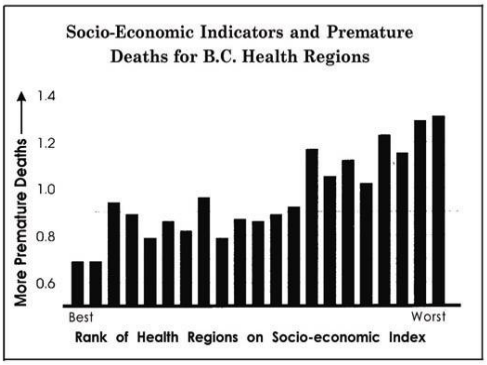


Figure 2. Source: Manitoba Centre for Health Policy and Evaluation, 1994

Figure 5. Source: B.C. Provincial Health Officer's Annual Report (Draft), 1993.



Early secure attachment provides a useful "Internal Working Model" and is a precursor to lifetime optimization of the HPA axis & reduction in "allostatic load."

A new paradigm in chronic disease prevention.

EPIGENETICS

Environmental and Molecular Mutagenesis 49:46–60 (2008)

Review Article

The Social Environment and the Epigenome

Moshe Szyf,[1]* Patrick McGowan,[2,3] and Michael J. Meaney[2,3]
[1]*Department of Pharmacology and Therapeutics, McGill University, Montréal, Québec, Canada*
[2]*Department of Psychiatry, Douglas Hospital Research Center, Montréal, Québec, Canada*
[3]*McGill Program for the Study of Behaviour, Genes and Environment, McGill University, Montréal, Québec, Canada*

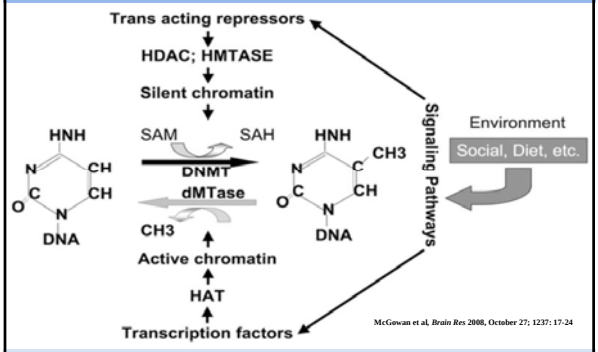
The genome is programmed by the epigenome. Two of the fundamental components of the epigenome are chromatin structure and covalent modification of the DNA molecule itself by methylation. DNA methylation patterns are sculpted during development and it has been a long held belief that early in life and long-term epigenetic programming of behavior and responsiveness to stress and health status later in life. We will also discuss the prospect that the epigenetic equilibrium remains responsive throughout life and that therefore environmental triggers could play a role in generating interindivid-

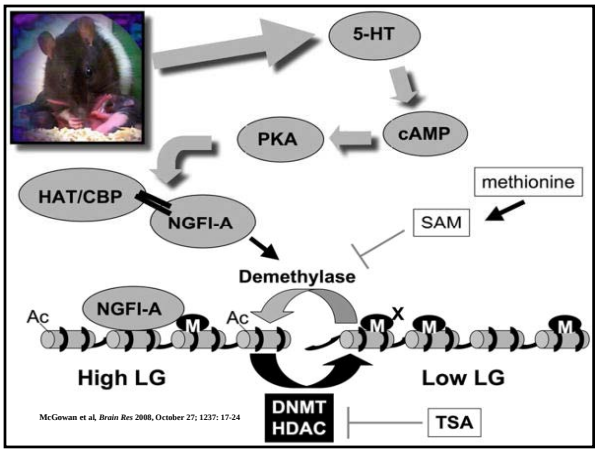
EPIGENETICS (HERITABLE WITHOUT CHANGES IN DNA SEQUENCE)

- **Methylation of DNA (cytosine)**
- **Histone acetylation**

Abnormal translation results in defective protein synthesis...with wide potential negative effects.

Epigenetics- DNA and the "Environment"





CHILDHOOD ADVERSE EVENTS -LONG TERM EFFECTS

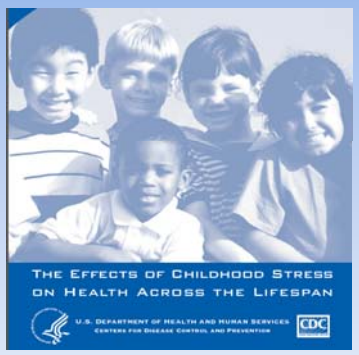
Molecular Psychiatry , (24 April 2012) | doi:10.1038/mp.2

Exposure to violence during childhood is associated with telomere erosion from 5 to 10 years of age: a longitudinal study

I Shalev, T E Moffitt, K Sugden, B Williams, R M Houts, A Danese, J Mill, L Arseneault and A Caspi

There is increasing interest in discovering mechanisms that mediate the effects of childhood stress on late-life disease morbidity and mortality. Previous studies have suggested one potential mechanism linking stress to cellular aging, disease and mortality in humans: telomere erosion. We

ACE STUDY



Witnessing Intimate Partner Violence (IPV) as a Child and its Impact on Health and Behavior- "ACE's occur in clusters"

- **Children who witnessed IPV were 2-6 x more likely to experience another ACE.**
- **As frequency of witnessing IPV increased, the chance of reported alcoholism, illicit drug use, IV drug use, and depression also increased.**
- **Exposure to physical abuse, sexual abuse, and IPV in childhood resulted in men being 3.8 times more likely to report IPV perpetration.**

NOT UNEXPECTED..BUT NOW THERE IS EVIDENCE TO SUPPORT LONG TERM PHYSICAL INSULTS.

STRESS:
DEFINITION & CONSEQUENCES

- Internal/external influences disrupting normal state of well-being.
- Affects health by causing emotional distress and leading to a variety of physiological changes:
  - Increased heart rate,
  - Elevated blood pressure,
  - Dramatic rise in hormone levels. (Allostasis)

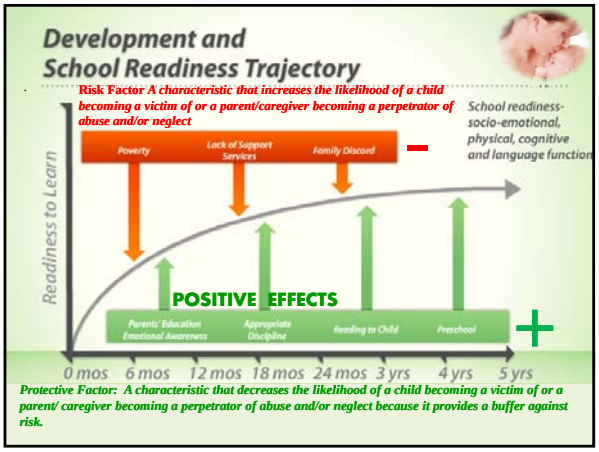
TOXIC CHRONIC STRESS

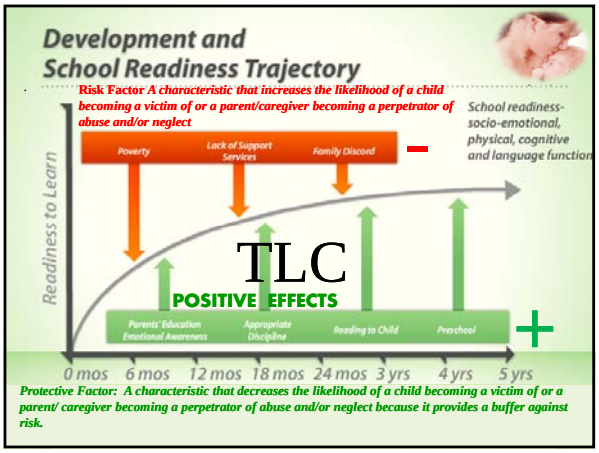
- Toxic stress results from adverse experiences that may be sustained for a long period of time.
- Can disrupt early brain development, compromise the functioning of important biological systems, and lead to long-term health problems.

TOXIC STRESS AND BRAIN DEVELOPMENT IN EARLY CHILDHOOD:
MECHANISMS OF DISRUPTION

- Ability to manage stress is controlled by brain circuits and hormone systems that are developed and activated early in life(HPA).
- Brain circuits development is most vulnerable during early childhood.
- When a child feels threatened, hormones are released and they circulate throughout the body. (abnormal control, dysfunctional regulation leads to allostasis)


PUTTING IT ALL TOGETHER
LIFE-COURSE PERSPECTIVE LENS


Development and School Readiness Trajectory
Risk Factor A characteristic that increases the likelihood of a child becoming a victim of or a parent/caregiver becoming a perpetrator of abuse and/or neglect
School readiness- socio-emotional, physical, cognitive and language function
Poverty
Lack of Support Services
Family Discord
Readiness to Learn
POSITIVE EFFECTS
Parents' Education Emotional Awareness
Appropriate Discipline
Reading to Child
Preschool
0 mos 6 mos 12 mos 18 mos 24 mos 3 yrs 4 yrs 5 yrs
Protective Factor: A characteristic that decreases the likelihood of a child becoming a victim of or a parent/ caregiver becoming a perpetrator of abuse and/or neglect because it provides a buffer against risk.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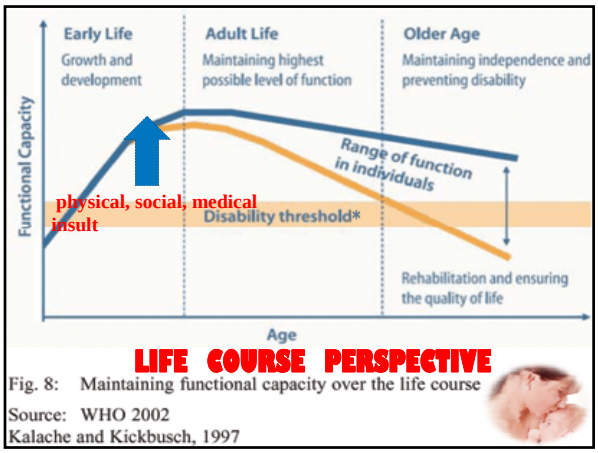
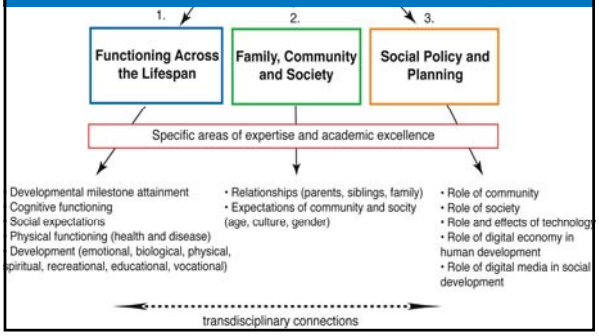


Fig. 8: Maintaining functional capacity over the life course

Source: WHO 2002
Kalache and Kickbusch, 1997

A NEW FRAMEWORK: AN ALL SECTOR APPROACH WITH EMPHASIS ON SUPPORTING OPTIMAL EARLY CHILD DEVELOPMENT THROUGH THE LIFESPAN

* Mental Health Professionals



Advancing Early Childhood Development: from Science to Scale 2

Lancet, Oct 2016

Nurturing care: promoting early childhood development

Pia R Britto, Stephen J Lye, Kerrie Proulx, Aisha K Yousafzai, Stephen G Matthews, Tyler Vaivada, Rafael Perez-Escamilla, Nirmala Rao, Patrick Ip, Lia C H Fernald, Harriet MacMillan, Mark Hanson, Theodore D Wachs, Haogen Yao, Hirokazu Yoshikawa, Adrian Cerezo, James F Leckman, Zulfiqar A Bhutta, and the Early Childhood Development Interventions Review Group, for the Lancet Early Childhood Development Series Steering Committee*

The UN Sustainable Development Goals provide a historic opportunity to implement interventions, at scale, to promote early childhood development. Although the evidence base for the importance of early childhood development has grown, the research is distributed across sectors, populations, and settings, with diversity noted in both scope and focus. We provide a comprehensive updated analysis of early childhood development interventions across the five sectors of health, nutrition, education, child protection, and social protection. Our review concludes that to make interventions successful, smart, and sustainable, they need to be implemented as multi-sectoral intervention packages anchored in nurturing care. The recommendations emphasise that intervention packages should be applied at developmentally appropriate times during the life course, target multiple risks, and build on existing delivery platforms for feasibility of scale-up. While interventions will continue to improve with the growth of developmental science, the evidence now strongly suggests that parents, caregivers, and families need to be supported in providing nurturing care and protection in order for young children to achieve their developmental potential.

DEFINITION OF NURTURING CARE(UNICEF, WHO)

Health, nutrition, security, responsive care-giving and early learning-provided by parent and family interactions and <u>supported by an environment that enables these interactions</u>

American Academy of Pediatrics

POLICY STATEMENT

The Role of Preschool Home-Visiting Programs in Improving Children's Developmental and Health Outcomes

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children

Council on Community Pediatrics

ABSTRACT

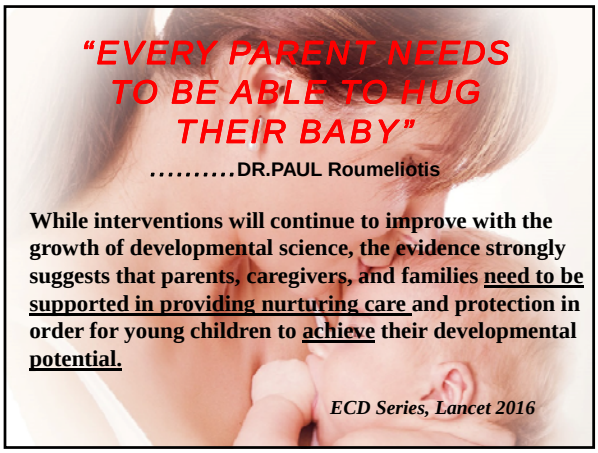
Child health and developmental outcomes depend to a large extent on the capabilities of families to provide a nurturing, safe environment for their infants and young children. Unfortunately, many families have insufficient knowledge about parenting skills and an inadequate support system of friends, extended family, or professionals to help with or advise them regarding child rearing. Home-visiting programs offer a mechanism for ensuring that at-risk families have social support, linkage with public and private community services, and ongoing health, developmental, and safety education. When these services are part of a system of high-quality well-child care linked or integrated with the pediatric medical home, they have the potential to mitigate health and developmental outcome disparities. This statement reviews the history of home visiting in the United States and reaffirms the support of the American Academy of Pediatrics for home-based parenting education and support. *Pediatrics* 2009;123:598–603

www.pediatrics.org/cgi/doi/10.1542/peds.2008-3607

doi:10.1542/peds.2008-3607

Key messages **Lancet ECD Series, October 2016**

- The proportion of children younger than 5 years in low-income and middle-income countries at risk of not attaining their developmental potential because of extreme poverty and stunting remains high (43%).
- The accumulation of adversities, beginning before conception and continuing throughout prenatal and early life, can disrupt brain development, attachment, and early learning. Developmental delays are evident in the first year, worsen during early childhood, and continue throughout life.
- Despite substantial progress in early childhood development research, programmes, and national policies since 2000, services are of varying quality with uncoordinated and inequitable access, especially for children younger than 3 years.
- Children's early development requires nurturing care—defined as health, nutrition, security and safety, responsive caregiving, and early learning—provided by parent and family interactions, and supported by an environment that enables these interactions.
- Coordination, monitoring, and evaluation are needed across sectors to ensure that high quality early childhood development services are available throughout early childhood and primary school, up to the age of 8 years.
- Action at global, national, and local levels is needed to increase political commitment to and investment in early childhood development.



Good early development—the right of every child

Data from the past decade show that millions of women, children, and adolescents have been left behind due to underlying social, economic, and cultural inequities. To address these issues, in September, 2015, the international community adopted the Global Strategy for Women's, Children's and Adolescents' Health, a bold roadmap to end preventable maternal, newborn, and child deaths, including stillbirths, by 2030. The Global Strategy aims to ensure that women, children, and adolescents survive, thrive, and lead lives that are transformative and prosperous.[1] It proposes that at least US$100 billion in demographic dividends can be realised from investments in early childhood and adolescent health and development. Enabling children to develop their full potential, particularly in the first goals, domestic and global human and financial resource allocation for early childhood development remains insufficient. The evidence presented in this Series makes it clear that this situation must change.

This Series adds new insights about the importance of early childhood development at every stage of a child's life from before conception throughout the life course. When early childhood development stalls, there are critical mitigation interventions across health, nutrition, education, child protection, and social protection sectors that should be accessible to all families and young children. And yet we continue to see an overemphasis on policies and programmes for school readiness at the expense of holistic interventions through the life course, particularly in

LET"S ALL ADVOCATE FOR ECD SUPPORT:

ECD THE NEXT GLOBAL ISSUE

Canadian Context:

ROYAL COLLEGE
OF PHYSICIANS AND SURGEONS OF CANADA
COLLÈGE ROYAL
DES MÉDECINS ET CHIRURGIENS DU CANADA

Royal College calls for action to address Canada's inadequate support for early childhood

OTTAWA, NOVEMBER 12, 2014 - Canada's support system for early childhood lags far behind other countries and action is urgently needed, said the Royal College of Physicians and Surgeons of Canada in a new position statement issued today.

To address this crisis, the Royal College and its partners have issued 15 recommendations to improve the health and wellness of Canada's children, including calls for increased government funding and enhanced support for parents.

SPECIAL REPORT

TD Economics

November 27, 2012

EARLY CHILDHOOD EDUCATION HAS WIDESPREAD AND LONG LASTING BENEFITS

The following is a literature review of the benefits and costs associated with high-quality early childhood programs. It is not meant to provide explicit policy recommendations, as it is a very complex sector and requires a more in-depth analysis before detailed recommendations can be made.

Highlights

- There is a great deal of literature showing compelling evidence of the benefits of early learning. Not only do high-quality early childhood education programs benefit children, they also have positive impacts on parents and the economy as a whole.
- Several studies show that the benefits of early childhood education far outweigh the costs. However, quantifying these benefits is not an exact science and results are likely subject to a large margin of error.
- Given the unquestionable number of benefits that early childhood education can provide, it follows

Normal Child Health and Development

Take home points:

- **27 months**
- **All sector approach**
- **Lifespan vision --- mental and physical wellness and prosperity**

Normal Child Health and Development

is the Key to a Lifespan of health!

Lets *work* and advocate together!

"In my beginning is my end."

T.S Eliot

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Child Health & Wellness Information for Parents Worldwide

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