Making Early Childhood Interventions Effective

An overview of *The Lancet*’s new “Child Development” series
Presented by Harold Alderman on behalf of the Global Child Development Steering Group
2007 *Lancet* Series on Child Development:

- Found that more than 200 million children under age 5 years in low- and middle-income countries not reaching their developmental potential
- Identified major risks for poor child development
- Described available evidence on effective early interventions

2011 *Lancet* Series on Child Development:

- Updated this evidence from the standpoint of equity of opportunities and scaling up of programs
One Slide Summary of ECD: Development of Disparities

Protective Factors* > Risk Factors*

FIRST 1000 DAYS

Reduction in risk factors, increase in protective factors, or intervention during a sensitive period.

Risk Factors* > Protective Factors*

*Biological and psychosocial risk and protective factors

AGE

BRAIN FUNCTION

BEHAVIORAL COMPETENCE TRAJECTIONS

Optimal

Below potential

Prenatal  Birth  Early Childhood  Adolescence  Adulthood

Optimal
Recovery
Below Potential
The developing brain

New evidence from neuroscience on how the brain develops through interactions of genetic, biological, and psychosocial influences

Exposure to biological and psychosocial risks leads to deficits in brain structure and function, and impaired cognitive and social emotional development

Disparities increase with early, multiple, and cumulative risks

Early exposure to risks sets children on a lower path of development leading to long-term effects on schooling and income.
Neural Circuits are Wired in a Bottom-Up Sequence

Sensory Pathways (Vision, Hearing)

Language

Higher Cognitive Function

Brain Plasticity Decreases Over Time

Source: Levitt (2009)

Normal Brain Plasticity Influenced by Experience
Physiological “Effort” Required to Enhance Neural Connections

Age (Years)

Source: Levitt (2009)
Stylized investment priorities in human capital

EARLY CHILDHOOD PROGRAMS APPEAR PROFITABLE, EVEN IF PAYOFF IS ONLY 20+ YEARS FROM TODAY

Take advantage of malleability
- Build foundations for further learning
- Prevent early damage / avoid irreversible loss of potential
Figure 6.4  Cognitive Development by Wealth Decile in Ecuador, 2003–04

Source: Paxson and Schady 2007.

Note: TVIP = Test de Vocabulario en Imágenes Peabody. Each line corresponds to one decile from the national distribution of wealth, from the first (poorest) decile, to the fourth. The test is coded so that a score of 100 corresponds to the average performance in a reference population, and the standard deviation is 15.
Progress in school enrollments does not always translate to improvements in outcomes

Proportion of 15-19 year olds who can read a simple sentence, by highest grade completed
Biological risks

Evidence on key biological risks is overwhelming: chronic undernutrition, iron and iodine deficiency, and intra-uterine growth restriction are all risks in the 1st 1000 days and preventable.

Additional risks of cognitive impairment from severe and/or repeated malaria attacks and HIV infection
Psychosocial risks

Lack of learning opportunities and poor quality caregiver-child interaction are well known risks for poor development.

The 2011 Lancet series reports on three additional psychosocial risks:

- maternal depression
- exposure to societal violence
- institutional rearing
Maternal Depression

WHO: Meta-analysis: of maternal depression

17 studies, 11 countries, 13,923 mother-child pairs

Higher odds of child underweight and stunting associated with maternal depression/depressive symptoms

Other studies find associations between maternal depression and low scores on child development

Thus, addressing maternal depression is both a nutrition intervention and a means to improve stimulation

Surkan, 2011, Bull WHO
Protective influences

New evidence identifies protective influences which promote child development

- breast feeding
- responsive caregiver-child interaction
- opportunities for young children to play and learn
- maternal education
Nutrition and health interventions

• Breastfeeding
• Micronutrient supplementation for mothers and young children particularly iodine and iron
• Food supplementation in young children in populations with insufficient food; promotion of good feeding practices
• Reduce infections:
  – prevention and effective treatment for malaria, HIV
  – support for children and families affected by HIV

To be frank, so far this doesn’t break new ground
Nutrition and health are important, but...

Substantial gains in children’s development require:

• Improvements in parenting, stimulation and early education

• Reductions in stressful experiences including maternal depression and exposure to violence

• Increases in protective influences such as maternal education that reduce impact of risks
Reducing stressful experiences

• Prevent institutionalization

• Protection from exposure to societal violence and psychosocial support for children and families affected by societal violence

• Promote maternal mental health. There have been successful efficacy trials affecting even neonatal mortality as well as cognition but as with many aspects of ECD the challenge is to go to scale.
The good news

• We can reduce inequality by addressing multiple risks children face

• Interventions can effectively reduce developmental delays

• Particularly if interventions are early, of high quality, and integrated
Interventions for parents and families

- Interventions that improve parents’ ability to provide stimulation and quality interactions including “bathing children in language” even before they are able to converse

- Parents’ ability for care giving can be enhanced through home visits, guidance and support from health providers, and group parent training

- This enrichment can also be delivered by para-professionals
Parenting interventions

• Impacts are larger when:
  – both parents and children participate
  – interventions involve modeling and practice of behavior.
  – most disadvantaged children targeted
  – Sessions over 3 months
Major frontier/challenge

• Can programs achieve synergy of nutrition interventions and stimulation?

• Promising [unpublished] trial in Pakistan finds that Lady Health visitors can improve both nutrition in cognitive under 24 months but effect not additive

• Similar results from Colombia for children >16 months, show only cognitive improvement

• This replicates an early study from Jamaica
Early childhood education interventions

• For children 3 years and older center-based programs (preschools) are appropriate and effective in improving children's cognitive and social-emotional development and school readiness

• Impact is greater with higher quality programs but informal and community-based programs have proven benefits
Preschool enrolment by region and income – less than 20% for poorer income quintiles

Proportion of young children attending preschool in 58 low-income and middle-income countries by income quintile within country summed across sample countries by region. Data are from UNICEF’s 2005 Multiple Indicator Cluster Survey 3 for children aged 3 and 4 years.
Promising directions for ECE interventions

- Use of media including educational radio and TV for children over 2 years
- Cash-transfer programs with early childhood components such as attendance at parenting sessions. Why focus on primary school enrollment when more than 95% already attend? Wealth gap in preschool is much larger.
- Where governments have expanded ECE coverage (Argentina and Uruguay) learning improved at secondary level
Integrated interventions

• Reducing inequalities requires integrated interventions early in life that target the many risks to which children are exposed.

• Need to identify opportunities for integration of stimulation and education programs with nutrition and health services

• Evaluate strategies to take parenting and early education programs to scale while maintaining effectiveness
There is a particular challenge in go to scale in ECD in low income countries

Until recently few low income countries have expressed interest in ECD investments, in part because of limited evidence on the impact of such programs at scale. This in turn has led to few opportunities to acquire such evidence. Additionally, education ministries have been pressed to meet universal primary enrollment and to find teachers for these classes.

This is changing, partially due to new impact evaluations with evidence to lending setting up a virtuous cycle.
Returns on investment in early childhood are substantial

Early childhood is the most effective and cost-efficient time to ensure that children can benefit from school and later opportunities.

Investment in early child development programs to reduce risks and support development can break the cycle of inequity faced by millions of children and families.
Estimating economic benefits of investing in early child development

Lancet study used data from 73 countries to estimate long-term effects of one type of ECD intervention – preschool.

Countries with higher preschool enrolment have smaller gap in attained schooling between highest income quintile and other quintiles.
Preschool's lasting positive effects

Association of preschool enrolment and the schooling gap for 73 low-income and middle-income countries. Schooling gap defined as the gap between schooling attainment of the wealthiest quintile of youth compared with youth in other wealth quintiles. Average education gap is for those aged 15-19 years. Pre-primary gross enrolment rate is from 8-12 years earlier. Bandwidth=0.8.
Increasing preschool enrolment:
Benefit-to-cost ratio of 6.4 - 17:1

Increasing preschool enrolment benefits attained schooling

Estimated increase in future earnings US $11 - 34 billion

Benefit-to-cost ratio from 6.4 to 17:1, depending on % preschool children enrolled (25% - 50%)

Conservative estimate – only one early child development intervention
Studies of specific ECD programs show similar returns

Not *all* the evidence is from upper income countries.

• A long term panel from Turkey shows center-based parental training has at least a benefit : cost ratio 4.25. The ratio for home-based parental training exceeded 5.91.

• The lowest estimate of benefits for pre-school in Uruguay was 3.2

• PIDI in Bolivia has a benefit of 2.91 dollars for every dollar invested
There is even more evidence on the economic returns to nutrition

This was illustrated with studies of low birth weights as well as comparisons of benefit:cost ratios for the Copenhagen consensus workshops in 2004 and 2008. These returns are high even if reduced mortality and lower health costs are left aside.

Moreover, a 40 year tracking of a nutrition intervention in Guatemala shows higher schooling and cognitive scores leading to 40% higher wages in the treatment group.
Conclusion

Few reasonable people will doubt that ECD can enhance a child’s lifetime potential and increase intergenerational equity.

Until recently the question has been, can this potential be enhanced within the severe budget constraints of low income countries.

Evidence is accumulating, however, that risks can be reduced and ability supported in a cost effective manner.
Authors


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