

**IMPROVING THE
DEVELOPMENTAL OUTCOME
OF BABIES**

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**Child Youth Family & Social Development
Human Sciences Research Council**

**South African Paediatrics Association
The Sky's the Limit Congress 2008
Sun City 29 May - 1 June**

HSRC RESEARCH OUTPUTS

5353

SOURCES (1)

**WHO Commission on the Social
Determinants of Health (2007)**

Early Child

Development

(discussant)



SOURCES (2)

The Lancet Series on Child Development in Developing Countries – Papers 1-3 (2007)

† Child development in developing countries 1
Developmental potential in the first 5 years for children in developing countries

*Sally Gunther-McCoy, Yan Ben-David, Santiago Pena, Anu Chowdhury, Barbara Strauss and Peter van der Linden
Child Development Steering Group†

(co-author)

Child development in developing countries 2
Child development: risk factors for adverse outcomes in developing countries

*Sara Pridemore, Theodore D. Wachs, Julie Meeks, Jennifer B. Joshi, and Gail A. Wassenaar, Erezseon Miller, J. J. A. Carey, and the International Child Development Steering Group†

Child development in developing countries 3

Strategies to avoid the loss of developmental potential in more than 200 million children in the developing world

Peter H. Engle, Meenuka Bhat, Janet B. Behrman, Meera Ghosh, David K. Malin, Paul J. Serfaty, Lydia C. Egert, Ragnhild M. Mørud, Alory Engle, and the International Child Development Steering Group†

SOURCES (3)

The Lancet Series on Maternal and Child Undernutrition – Paper 2 (2008)

Maternal and Child Undernutrition 2

Maternal and child undernutrition: consequences for adult health and human capital

*Cesar G Victora, Linda Adair, Caroline Fall, Pedro Challa, Reynaldo Martorell, Linda Richter, Harshpal Singh Sachdev, for the Maternal and Child Undernutrition Study Group**

(co-author)

IMPORTANCE OF EARLY YEARS

- Sensitive (critical?) periods**
- Life course effects, increasing costs of remediation**
- High returns on improvements in early health and development**
- Long-term impacts**
- Aggregated human capital effects**

? KEY IDEAS

- Importance of the early years**
- Major risk factors**
- Strategies to improve child development**
- Beyond survival**
- Early child development programmes**
- The role of the health services – IMCI and Care for Child Development**

IMPORTANCE OF EARLY YEARS

- Sensitive (critical?) periods
- Life course effects, increases in risk
- Decrease in mortality
- Increase in cognitive and social skills
- Increase in educational attainment
- Increase in employment and income
- Increase in health and well-being

SENSITIVE PERIODS

- Brain development**
- Physical growth**
- Language and cognitive development**
- Internal working models of relationships, social behaviour, adjustment**

BRAIN DEVELOPMENT (1)

- Experience-dependent syntactical aspects of eg visual cortex, language development

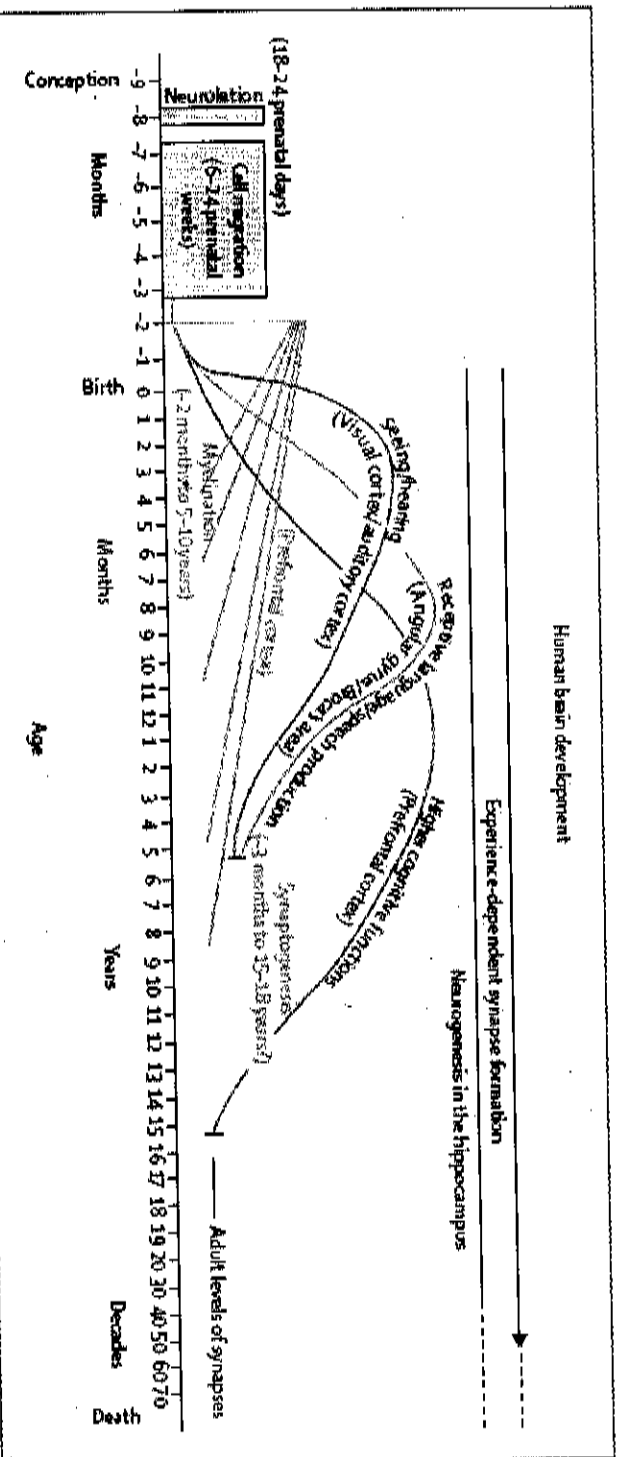


Figure 1: Human brain development
 Reproduced with permission of authors and American Psychological Association® (Thompson RA, Nelson CA. Developmental science and the media: early brain development. *Am Psychol* 2001; 56: 5-15).

BRAIN DEVELOPMENT (2)

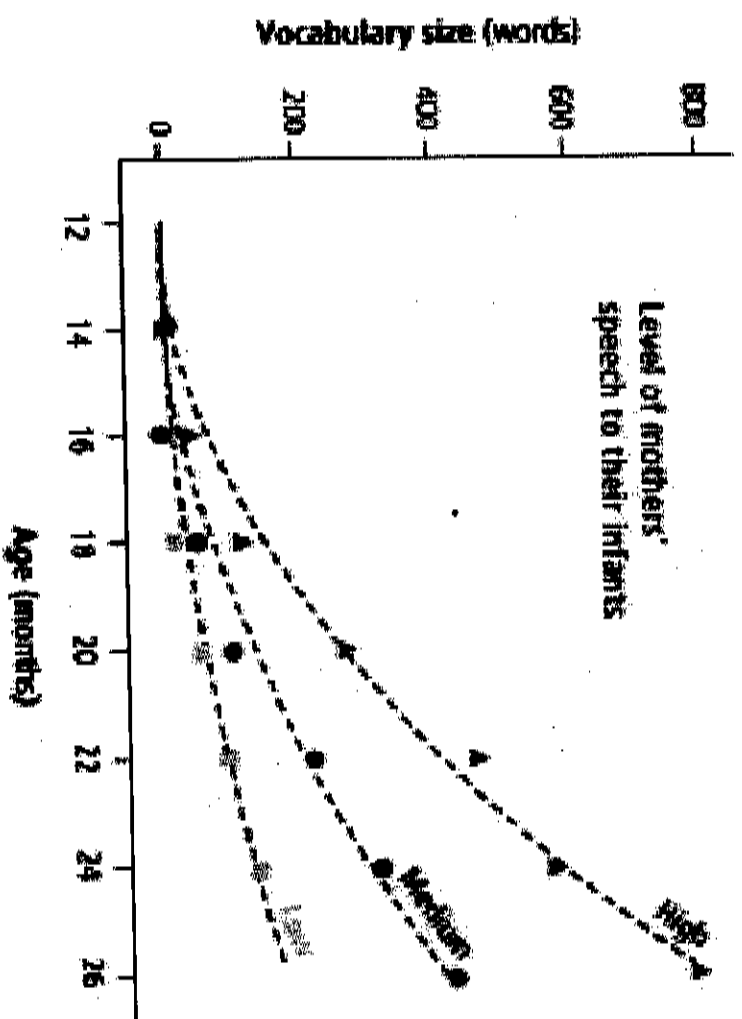
- Experience-expectant**
eg emotional & language learning based on responsive, contingent human interaction
- Neural Darwinism**
Eg use it (increase & strengthen connections) or lose it (synaptic pruning)
- Stress**
Eg reaction priming

PHYSICAL GROWTH

- **Birthweight & length > adult height**
 - in low income countries, 1cm increase in birth length > ± 0.85 cm increase adult height
- **Compensatory growth**
 - catch up limited to first 2-5 years
- **Environmental improvements can trigger catch-up, but more effective in early childhood**

LANGUAGE & COGNITION

Figure 1. Effects of Mothers' Level of Speech on Their Child's Vocabulary Size



Source: Hammersley and others 1991.

RELATIONSHIP TEMPLATES

- Attachment relationships built on sensitive, responsive, contingent interactions
- Secure, Anxious Insecure, Anxious Avoidant (eg crying)
- Template of expectations regarding behaviour of others – internal working models

IMPORTANCE OF EARLY YEARS

- Shorter (and) longer periods**
- Life course effects, increasing costs of remediation**

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LIFE COURSE EFFECTS (1)

- **Early “determination”**
 - **Bottom-up determination, difficult to reverse**
 - **Canalization (valley enclosed by high ridges, safely guiding the phenotype)**
 - **Funnel of causality**
- **Early environmental invariance**
 - **Especially adverse environments related to poverty**

LIFE COURSE EFFECTS (2)

- Life course pathways**
 - **Growth and health**
 - **Education and earnings**
 - **Social behaviour**
 - **Inequality**

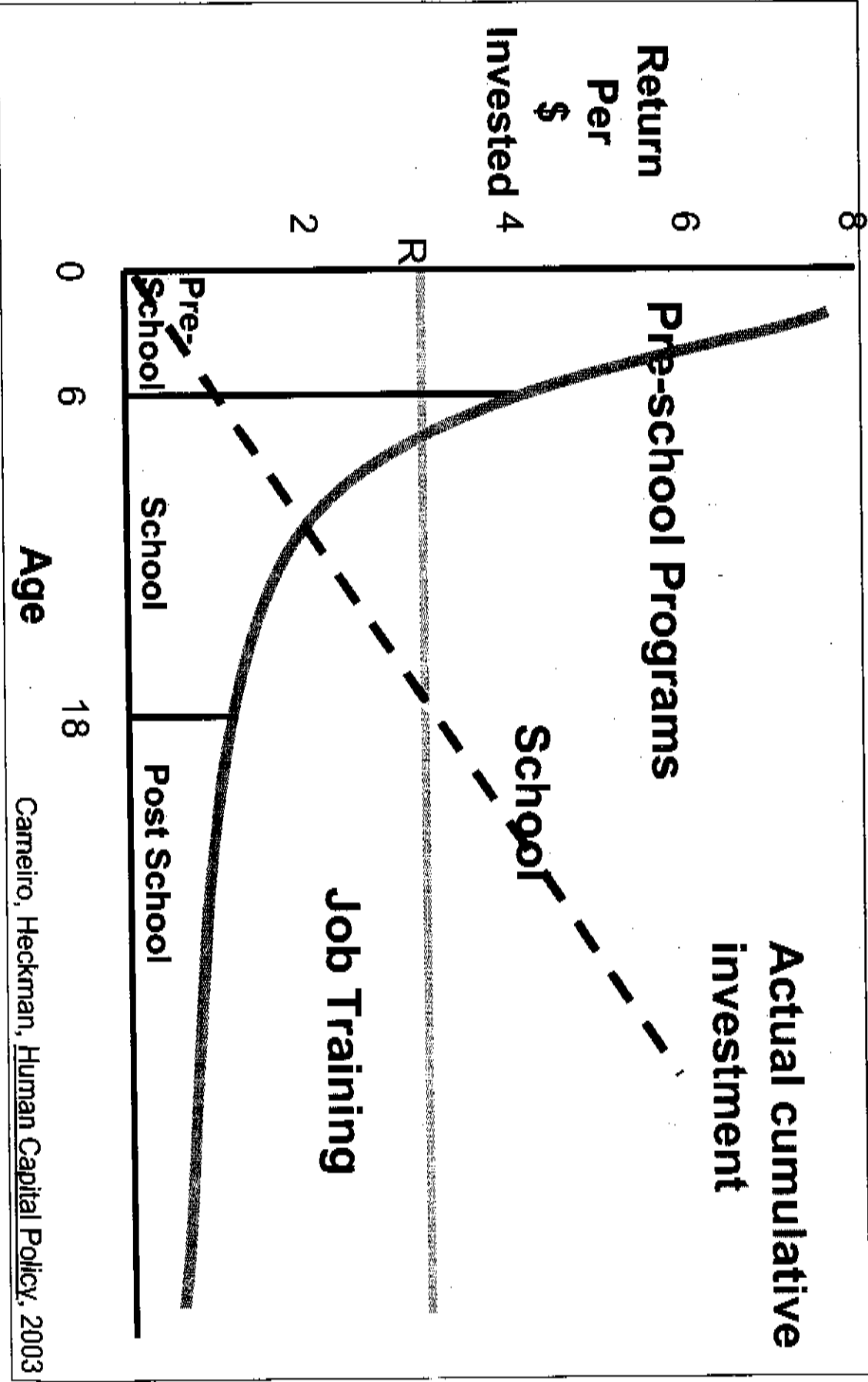
- High cost of remediation**
 - **Eg special education, social welfare, justice system, etc**
 - **2nd chances more expensive than 1st!**

IMPORTANCE OF EARLY YEARS

- Childhood (0-5) period**
- High returns on improvements in early health and development**

- Childhood (5-18) period**
- Childhood (18-25) period**

INVESTMENT RETURNS (1)



INVESTMENT RETURNS (2)

□ WHO Review *A Critical Link* (1999)

- **Combination (nutrition + stimulation) most effective**

□ *Eg Guatemala INCAP study*

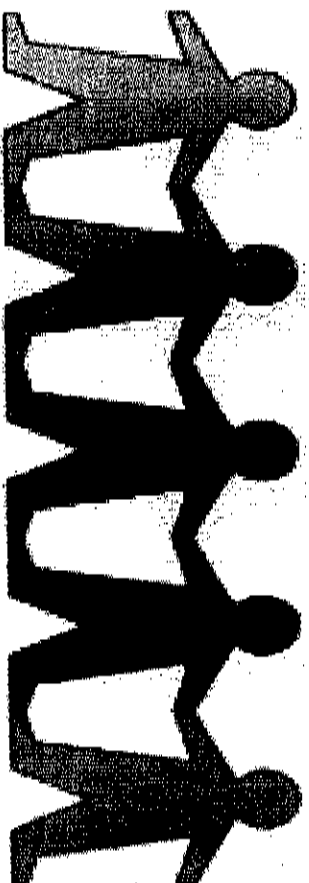
- **Hoddintot et al (2008 Lancet)**
- **Atole supplementation**
- **25 year follow up**
- **0-3 years > higher cognitive performance**
 - > **more years of schooling**
 - > **higher earnings (46% higher)**
- **3-6 years – no benefits**

IMPORTANCE OF EARLY YEARS

- Sensitive (critical) periods
- Life course events: interventions
- Outcomes
- Early years: interventions
- Long-term impacts
- Policy implications

LONG-TERM IMPACTS

- Human capital – education and earnings
- Long-term cohort studies in developing countries
- Including Birth to Twenty (Soweto-Jhb)



COHORTS

Consortium of Health Orientated
Research in Transitioning Societies



STUNTING & POVERTY

□ STUNTING

- Loss of 1SD height 12-36 months
- > Decreased cognitive scores in all longitudinal studies examined
- > Effect size 0-4 to 1.05 SD (\pm 5-10 IQ points)

□ POVERTY

- Difference between top & bottom quintiles
- > Effect sizes between 0.7 and 1.24 SD (\pm 7 to 12 IQ points)

EDUCATION

- **HAZ -2SD > loss of 0.91 grades**
- **Poverty (quintile 3-5) > loss of 0.71 grades**
- **Stunted children lower grades (0.72SD below non-stunted maths & reading**
- **Stunting and poverty > loss of 2.15 grades**
- **Fewer years in education, fewer grades attained, less learned/year**

EARNINGS

- Each year of schooling increases wages by 9.7%
- Loss by stunting and poverty
 - Stunting only 22.2%
 - Poverty only 5.9%
 - Stunting & poverty 30.1%
 - Average earnings deficit 19.8%
- Inter-generational effects of poverty and stunting

HUMAN CAPITAL

- Loss through high mortality & morbidity
- Loss of human potential in education and earnings
- Intergenerational poverty by reduced income
- Paper 2 *Lancet Maternal & Child Undernutrition – (18-40yr follow-up) >>*
 - high glucose concentrations, high blood pressure
 - increased risk for mental illness
 - reduced offspring birthweight
- Early childhood development a driver of economic growth
- Reduce disparities

MAJOR RISK FACTORS

Nutrition

- Intrauterine growth restriction, childhood undernutrition (31%), iodine (35%), iron (23-33%), breastfeeding

Infectious diseases & parasites (33% world's people at least 1 intest helminth)

Environmental exposures eg lead

Psychosocial

- Stimulation and learning (60-90% no learning materials), emotional security, maternal depression (17% prevalence)

STRATEGIES

There is good evidence for impact of

ECD programmes in low resource countries

- Improving food intake, reducing iron & iodine deficiency**
- Combined nutrition & stimulation programmes**

ECD QUALITY, INTENSITY?

- Centre-based PLUS home visiting
- Well-trained teachers
- Low teacher-child ratios
- Child-directed learning
- Frequent & good parent education and involvement
- Second-generation activities to capacitate families

Intervene early, often, effectively, over time

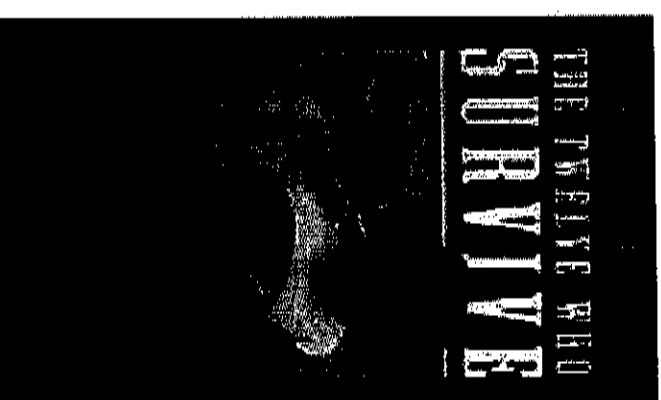
BEYOND SURVIVAL ...

□ 1979 WHO/UNICEF Declaration of Alma-Ata on Primary Health Care

□ 1982 UNICEF Child Survival and Development Revolution (GOBI-FFF)

□ 1995 Robert Myers
The Twelve who Survive

12 out of every 13 children will celebrate a first birthday. What will happen to these children who survive? The same living conditions that previously put their survival at risk continue to put them at risk of impaired development in their earliest years. We must invest much more in programs devoted to growth, development and care in early childhood to help children realize their individual and social potential.



AND AGAIN ...

CHILD SURVIVAL I

Child survival I

Where and why are 10 million children dying every year?

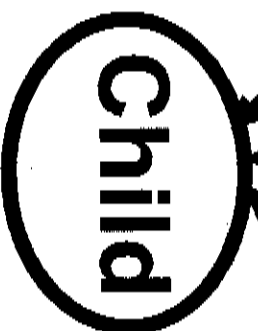
Robert E Black, Saul S Morris, Jennifer Bryce

- Reduce social and economic disparities**
- Improve reach, access to and quality of health services**
- Improve home and community practices**

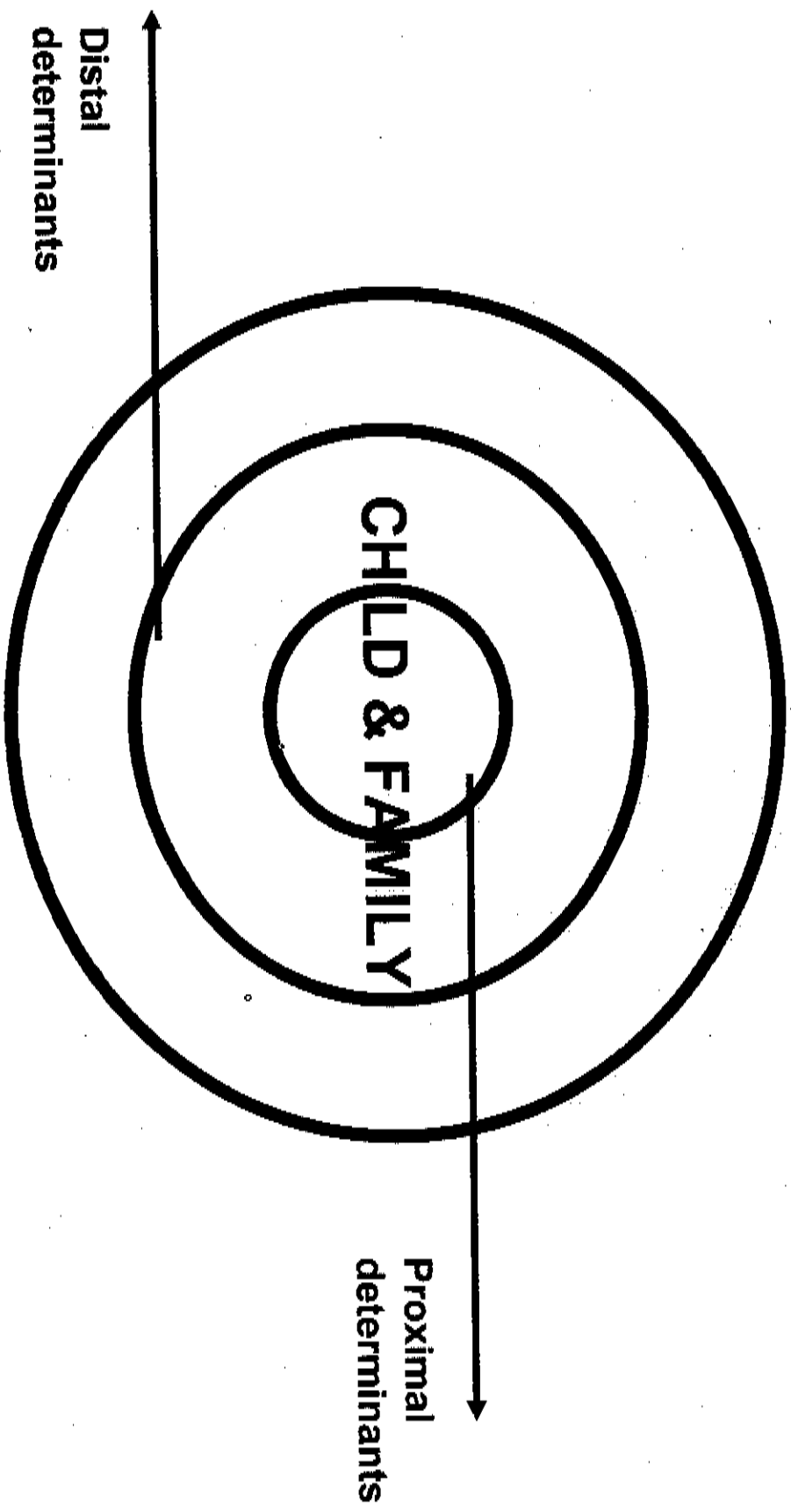
The Lancet Series on Child Development (2007)

HEALTHY START IN LIFE

SURVIVAL GROWTH DEVELOPMENT



ECOLOGICAL FRAMEWORK



CENTRALITY OF FAMILIES

- Relationships drive ECD, attachment.
- Nurturant environments for ECD
- Strong proximate influence
- Mediate distal influences
- Support for families (including income, opportunity costs)
- Family-friendly policies
- Affirm & support caregiver skills and capacities

FATHERS, WORKING MOTHERS

- Influence of men on children's development – nutrition, health services, schooling**
- Absentee fathers as a result of labour migration – need to improve commitment & support**
- Working mothers – good quality, affordable child care**

ADDITIONAL LINKS TO ECD

- Reproductive choice**
- Pregnancy support**
- Maternal (parental) mental health**
- Early child nutrition & growth**
- Child care for working families**
- Address vulnerability (eg HIV/AIDS)**
- Reduction of physical punishment**
- Deter widespread institutionalization**
- Sustainable development, social protection, income transfers**

Universal curve shift to support children's health/wellbeing & reduce vulnerability

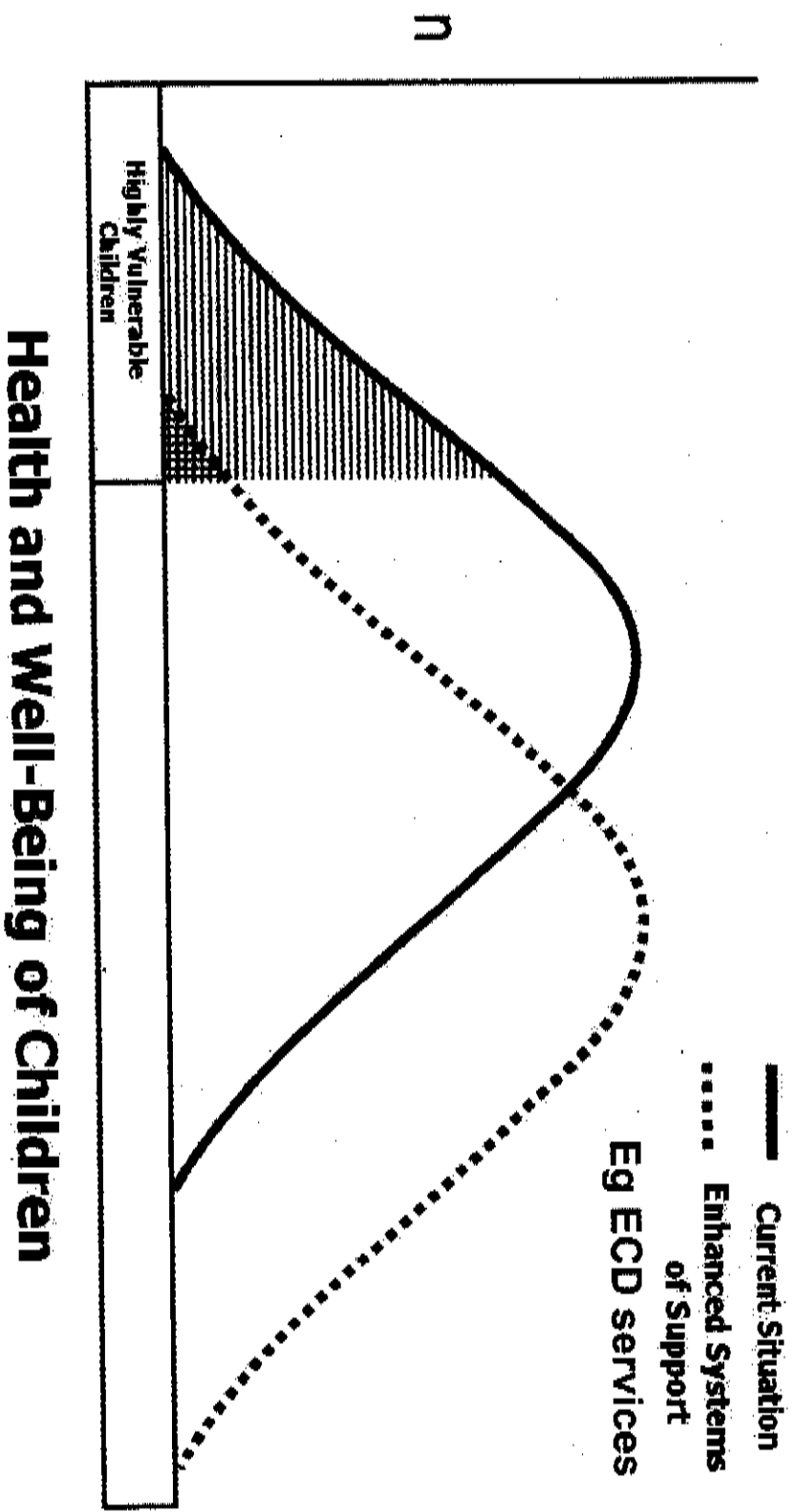
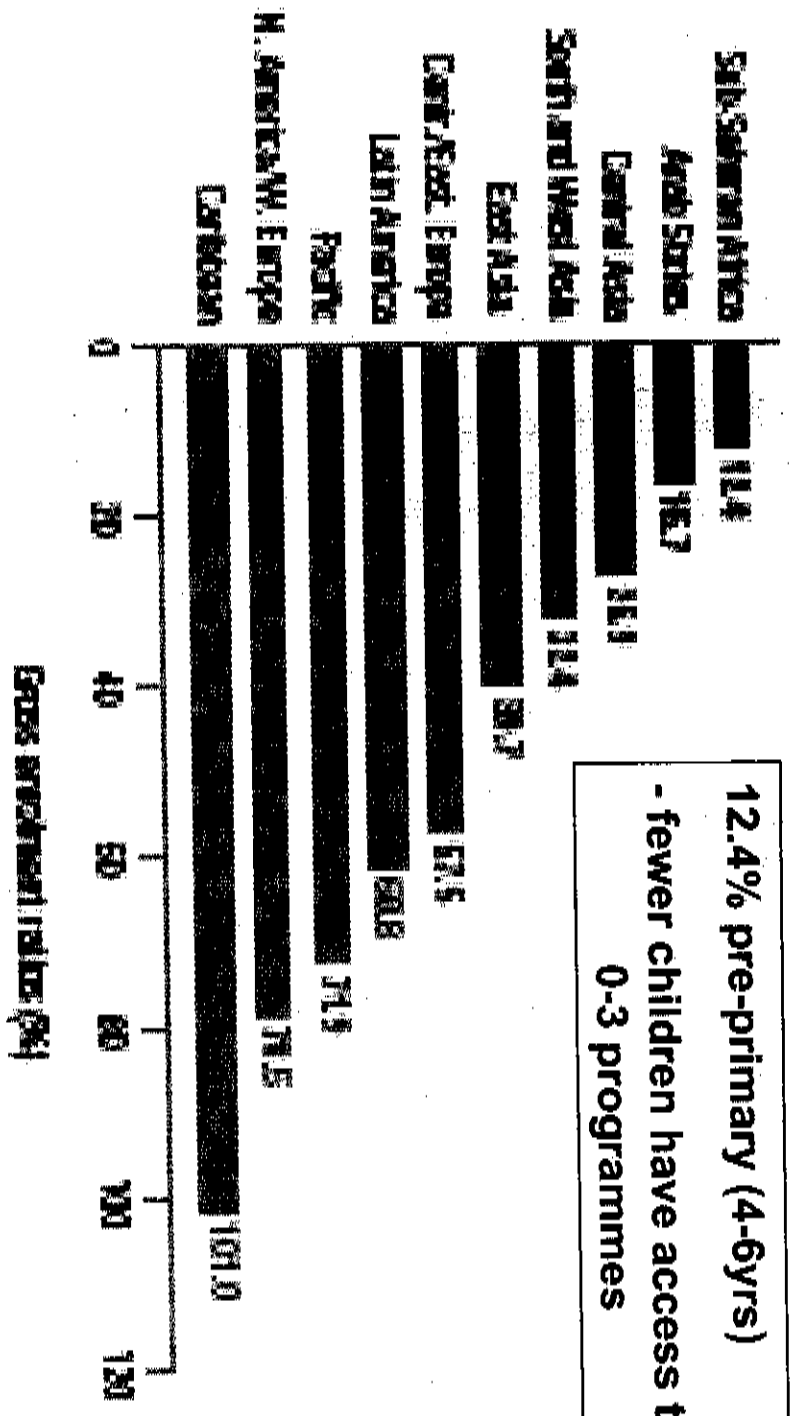


Figure B: Gross enrollment ratio in pre-primary education, 2004

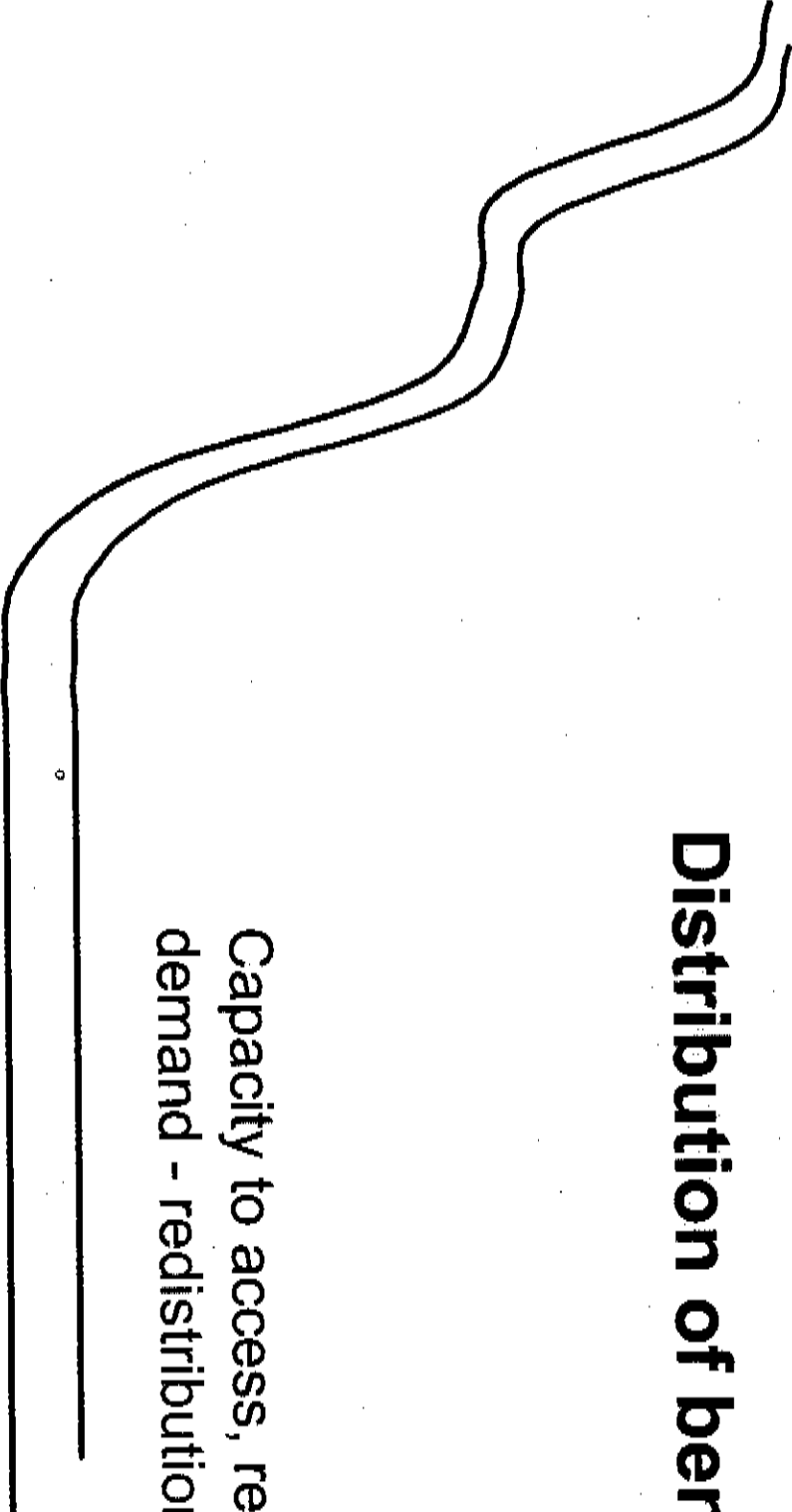


REINFORCING INEQUALITY?

Provision

Distribution of benefits

Capacity to access, receive,
demand - redistribution



ROLE OF HEALTH SECTOR

- **ECD determinant of NB later health outcomes**
- **WHO (and UNICEF) technical support for ECD policies, resourcing, costing – prioritize, resource**
- **ECD interventions, eg IMCI Care for *Child Development***

ROLE OF HEALTH SECTOR

- Relative organization, reach**
- Point of contact – young children and caregivers**
- Integrated Management of Childhood Illness (IMCI)**
- Care for Child Development**
- Family and Community Practices**

CARE FOR CHILD DEVELOPMENT

- Integrated, comprehensive**
- Directed at caregivers and families**
- Focus on communication and play**
- Based on success – feeding practices and responsive care**
- Easy to use, well received**
- Experience gained – 8 countries, centre & community HW contacts**
- Can be implemented on large scale**
- Widely endorsed**

IMCI-CCD PACKAGE

- Simple counselling messages**
- Training programmes & materials for advocates, HWs and community providers**
- Support for families to solve common problems**
- Guidance for adaptation**
- A monitoring and evaluation framework**



**IMPROVING THE CARE OF
YOUNG CHILDREN**

**Care for Child
Development**

More than 10 million children in
developing countries do not receive their fifth birthday.
Nearly 20 times that number — over 200 million

children — live in
full-time day care centers.

Improving the care of young children

is a key to child development.

Recommendations for Feeding and for Care for Development

<p>Up to 3 Months or 3 Months or</p>  <p>Prevention: Do not give after meals or fluids (just breast milk or formula) especially for high risk infants.</p>	<p>4 Months up to 6 Months</p>  <p>Prevention: Do not give after meals or fluids (just breast milk or formula) especially for high risk infants.</p>	<p>6 Months up to 12 Months</p>  <p>Prevention: Do not give after meals or fluids (just breast milk or formula) especially for high risk infants.</p>	<p>12 Months up to 2 Years</p>  <p>Prevention: Do not give after meals or fluids (just breast milk or formula) especially for high risk infants.</p>	<p>2 Years and Older</p>  <p>Prevention: Do not give after meals or fluids (just breast milk or formula) especially for high risk infants.</p>
<p>Play: Provide toys for your child to hold in their hand, such as blocks, rings, or toys that can be held in their hand.</p>  <p>Commutative: Look into your child's eyes and smile and talk with them or her, when you are breastfeeding in a good way.</p>	<p>Play: Have large colored things for your child to reach for, and see things to see.</p>  <p>Commutative: Talk to your child and get a response on going with words or gestures.</p>	<p>Play: Give your child items, such as blocks, rings, or toys that can be held in their hand, and see things to see.</p>  <p>Commutative: Respond to your child's words and intonation. Talk your child has some of things and people.</p>	<p>Play: Give your child things to hold in, and to put into containers and take out.</p>  <p>Commutative: Ask your child things that are simple to answer, and respond to your child's responses to you. When you talk, always use full sentences, and</p>	<p>Play: Help your child walk, crawl, and explore objects, such as blocks, rings, or toys that can be held in their hand.</p>  <p>Commutative: Draw your child to talk and answer your child's questions. Teach your child words, songs and games, and talk with your child about things or books.</p>

Doing these activities helps your child learn more and do better in school later on. Children learn by playing with you and with the toys you make for them. Let children move and explore safely. Remember that a child learns from both.

Praise and celebrate what your child does to do. Children become confident by being loved and praised. Children become aggressive and behave worse if they are treated harshly.

Make and find simple toys for your child. 6-11 months: Make toys as a shape, size, color, or sound. 12 months: Make toys that are simple to use, such as blocks, rings, or toys that can be held in their hand.

► Counsel the Mother About Feeding Problems

If the child is not being fed as described in the above recommendations, counsel the mother accordingly. In addition:

- 1 If the mother reports difficulty with breastfeeding, assess breastfeeding (See **YOU'VE REPORTED DIFFICULTY**) as needed, show the mother correct positioning and attachment for breastfeeding.
- 2 If the child has been breastfed, counsel the mother as follows:
 - Check mother's condition that she can produce all the breastmilk that the child needs.
 - Suggest giving more frequent, longer breastfeeding days or night, and gradually reducing other milk or feeds.
 - If other milk needs to be continued, counsel the mother as:
 - Breastfeed as much as possible, including at night.
 - Make sure that other milk is a highly appropriate breastmilk substitute.
 - Make sure other milk is correctly and hygienically prepared and given in adequate amounts.
 - Reduce prepared milk within six hours.
- 3 If the mother is using a bottle to feed the child:
 - Recommend establishing a cup for bottles.
 - Show the mother how to hold the child with a cup.
- 4 If the child is not taking feed readily, counsel the mother as:
 - Sit with the child and encourage eating.
 - Check the child on alternate feeding in a separate place or time.
- 5 If the child is not handling a wet diaper freely, assess the mother as:
 - Suggest that more frequently and for longer if possible.
 - Use wet, warm, softening, fragrance-free to encourage the child to eat as much as possible, and offer frequent oral stimulation.
 - Change a standard nappy if it interferes with feeding.
 - Expect that ingesta will improve as other goals better.
- 6 Follow-up any feeding problems in 5 steps.



► Counsel the Mother About Care for Development Problems

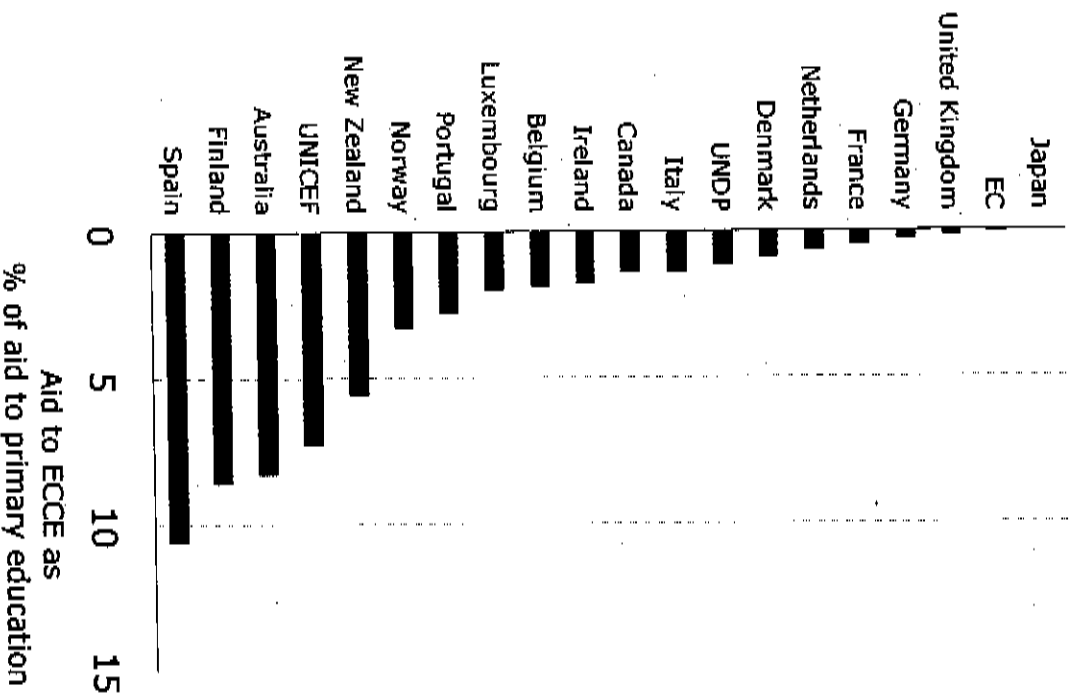
If the child is not being cared for as described in the above recommendations, counsel the mother accordingly. In addition:

- 1 If the mother does not breastfeed, counsel the mother as:
 - Hold your child close when nursing, hold at the side, and talk or sing to child.
 - If the mother does not know what her child does to play or communicate:
 - 1 Listen for your children play and communicate from birth.
 - 2 Demonstrate for her how her child responds to activities.
- 2 If the mother feels her child is not responding to requests, counsel her as follows:
 - 1 Listen for her behavior.
 - 2 Help her identify a long person who can demonstrate language and help her play and communicate.
 - 3 Hold up her responses by demonstrating her ability to carry out a simple activity. Other persons and make her produce talk.
 - 4 Refer to a local service if needed.
- 3 If the mother feels she does not have enough time to provide care for her children, assess her as:
 - 1 Explain why it is important for someone to provide care for development.
 - 2 Consider ways for development with other care for the child (family, health, education).
 - 3 Ask other family members to help provide care for development or help her with her other tasks.
- 4 If the child is not responding, or seems "stagnant":
 - 1 Encourage the mother or other family members to do care for development activities.
 - 2 Check to see whether the child has activities in any area of development including motor and hearing.
 - 3 Help the child with activities playing, hearing or development to provide activities.
- 5 If the mother has to leave the child with someone else for a period of time, and the child does not behave with this new person, gradually:
 - 1 Try to have the same person watching the child.
 - 2 Encourage mother to spend time with child when possible.
 - 3 Refer to local services if needed.
- 6 Encourage more frequent ways of playing with the children such as:
 - 1 Repeat back for encouragement to make your child for good behavior.
 - 2 Repeat children's behavior, try to understand why they are sad or angry.
 - 3 Give your child freedom about what to do instead of saying "no".



Ask mothers are trying to do for their child they can for their children.
 Help mothers feel confident and good about getting care.
 Ask, listen, praise, advise, check understanding and help solve problems.

ECCE: LOW PRIORITY DONORS



Almost all donors allocate to pre-primary less than 10% of what they give to primary education

Bilateral donors give priority to centre-based programmes for children from age 3

SECTORAL FRAGMENTATION

Eg South Africa

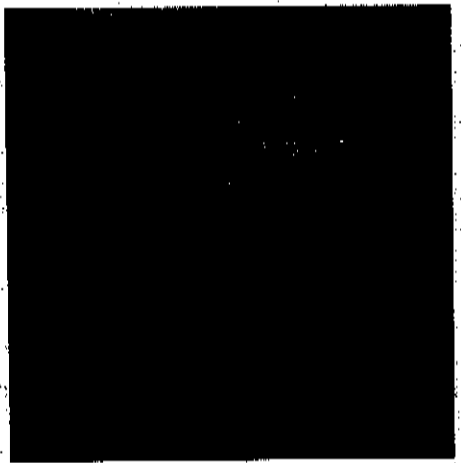
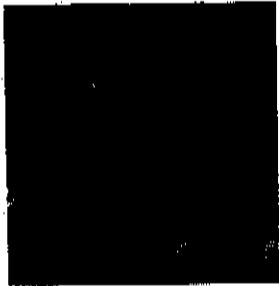
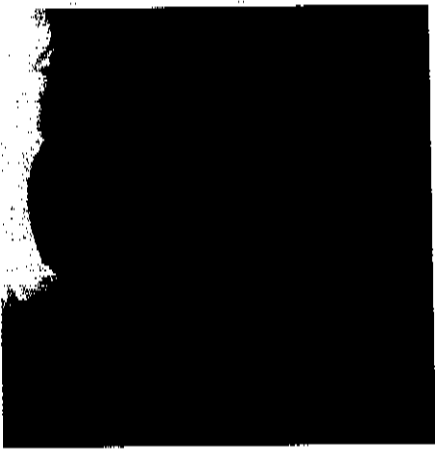
- 0-4 yrs Department of Social Development
(ECD 23% coverage in 2007)

- 5+ yrs Department of Education
(Grade R 58% coverage in 2007)

Question?

- Does staying in school longer make you smarter? (Grade R) OR

- Do smarter children stay in school longer (ECD provision)?



THANK YOU!

