

Conference: Children and HIV: Start Early, Start Now (Melbourne July 18th, 2014)
Panel: Emerging Evidence and responses to HIV-exposed children

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Part 1: What is the Emerging Evidence for ECD?

There are so many disciplines and sciences that are adding evidence in support of why ECD is important but also how to implement interventions at scale. In this presentation I focus on Neuroscience

- **The nature- nurture debate is over.** Once we said nature *or* nurture; then nature *and* nurture. Now we know it is nature *with* nurture, the degree of interdependence is even greater than we ever imagined. They are two parts of a whole, interacting constantly and together playing a singular role in a child's brain development – and a child's future. Genes provide the blueprint for brain development, but the environment shapes it.
- **The brain develops at its most rapid pace in the first few years of life.** In young children, neurons form new connections at the astounding rate of 700 to 1000 per second. These early synaptic connections form the basis of neuroplasticity, which underlies a child's physical and mental health, lifelong capacity to learn, adapt to change, and develop psychological resilience.
- **Early intervention is the answer ... because it becomes progressively harder to fix problems.** By the age of around 7 years, neuroplasticity of the brain has plummeted to about 50% of its earlier levels. When a child's brain does not get what it needs to develop during that period, the amount of effort required to set it back on track is enormous – and optimal outcomes are far less likely. Who we eventually become as adults depends in large part on the experiences and opportunities that the brain uses to shape itself in early childhood.
- With respect to programming for young children affected and exposed to HIV/AIDS: Toxic stress & Epigenetics.
- First the harmful impact of **toxic stress** on early brain development and function.
 - What is toxic stress? Stress is experienced at many levels - positive, tolerable and toxic. Toxic stress occurs when an infant or young child

¹ These remarks translate several large bodies of research. Since these are remarks and not a paper, While research is drawn upon it is not cited directly, the authors and their scholarship is acknowledged. References are available upon request.

experiences poverty, high burden disease contexts, violence, abuse, neglect, enduring hunger – deep, chronic, and often multiple adversities. These are conditions often experienced by young children in High burden HIV communities.

- How does toxic stress harm early development? Through several pathways: (i) It produces high levels of cortisol, a stress hormone that disrupts the process of brain development by limiting proliferation of brain cells, damaging health, learning, and behavior. So during the early years, when the proliferation is so rapid, and a child experiences toxic stress, this limits brain development; (ii) it keeps the body in a state of hyper vigilance. The autonomic nervous system is continually activated. As a result it starts to wear down and systems start to deteriorate, also known as the “weathering hypothesis.” There is greater susceptibility to disease, we see a rise in hypertension, blood pressure and cardiac problems; and (iii) stress interferes with the child’s ability to benefit from interventions. I will use the example of nutrition to explain this point further. Toxic stress and nutrients interact with each other, affecting how the brain and body absorb nutrients and influence a child’s developmental status. The human body prioritizes how and where nutrients are distributed and absorbed in a complex ‘supply’ (nutrient availability) and ‘demand’ (nutrient absorption capacity) system. High levels of stress also affect the absorption capacity of other vital organs, potentially diminishing the effectiveness of nutritional supplements.
- So this evidence is clear -- smarter interventions should therefore understand how to reduce stress and buffer the child from stress, to improve outcomes.
- **Second, the new frontier of epigenetics is demonstrating how children are parented or cared for in the first years of their lives can affect brain function for the rest of their lives – and may even affect future generations.** We are learning more about how early caregiving influences behavior, even affecting genetic predispositions by altering the expression of genes – literally turning the gene – and its related function – on or off. **Adequate nutrition and consistent, supportive adult caregiving are the best ways to offset the effects of multiple adversity and to support healthy brain development.** The human brain is wired to search for experiences, expecting certain stimuli during time windows – some very short. When the expectation for sensitive and stimulating caretaking is not met, the brain does not know what to do or how to assemble itself, because it relies on the cues from caregiving to create neural connections.

Part 2: What are Effective Programmatic Responses?

- We are all familiar with the several classic longitudinal studies, originally from the U.S., though now increasing in the developing world. For example, Jamaica early nutrition and stimulation study, the mother and child education programme from Turkey.
- In effect across these studies, there has been a universal set of results, even noted 20 years later. These robust studies have demonstrated impact for children – who are now young adults, families and communities – outcomes are improved, lives are improved, relationships are improved.
- So now I want to turn to understand what the key ingredients of these programmes that are making the difference. Today I want to focus on ingredient – which is **quality**. This really is the active ingredient of change.
- Quality, or the effectiveness factor for ECD programmes has typically been studied at two levels: structural quality and interactional quality
 - **Structural quality** – relates to the actual physical surroundings; the programme regulations and standards – training of care providers; ratio of children to adults; curriculum; programme dose - this is an impressive list and each one of these can be further drilled down into its characteristic components.
 - For example physical surroundings: safety “creating an oasis of safety”; using biophilic features in architectural design.
 - Dose: intensity- how many hours per day; frequency- how many days per week; duration – how many months or years – depending on outcome this varies greatly
 - **Interactional quality** relates to the relationship between the adult and the children. This is really the essence or the active ingredient of quality that makes a difference. Recognized are interactions that are responsive, interactions that build trust and sense of safety; interactions that promote curiosity, learning, exploration, interactions with age appropriate expectations, etc. vary by age of child and number of children

Part 3: How do we create effective policy and institute systems change?

- I am going to focus on **governance** as the key factor for effective policies and systems change. These results are based on a study of governance and finance across 6 countries used mixed methods research and multi-disciplinary analytical models.
- ECD governance is the **process of allocating responsibility** for services amongst specific stakeholders within and across levels of government and between public and private sectors for multiple functions.
- Why Governance? Because Ensuring successful implementation and delivery of ECD services requires collaborative efforts amongst local government officials, practitioners, community residents, and families as important stakeholders
- Governance is implemented directly through political processes, policies, and service support, and indirectly through standard-setting, regulation, accountabilities and feedback mechanisms.
- Governance has two dimensions:
 - **Vertical coordination** (across national, subnational, and local levels of government): Decentralization is a common process affecting vertical governance through which decision-making and/or budgeting responsibilities are devolved or expanded from central to local levels of government, and has impacted ECD in a range of countries
 - **Horizontal coordination** (or intersectorality) is central to integrated efforts and intersectoral approaches. it has been noted in many models, for example When a single sector is the primary lead in ECD services, the associated content area may dominate. In other models – an umbrella group is created – to oversee the integration of services.
- What we found in our research is that the governance of ECD services is situated within larger political, public policy, cultural and economic contexts which include two key features:
 - Environmental conditions -- typically refer to distribution of political power, prevailing market structures, cultural and community norms, demographic transitions, and the availability of physical infrastructure (e.g., transportation).
 - Capabilities -- implementation capability refers to the system's ability to design, implement, coordinate and monitor the overall plan of action and

can be further broken down into capacity of knowledge and capacity of practice, with the former being more relevant at the systems and the latter to service-levels.

- What we learned was:
 - The **relative influence of actors in ECD varies substantially across countries**. As nations increase their capacity to invest, it appears that NGO centrality may decline. Furthermore, successful national examples of policy agenda-setting and national action planning, occur through coordination among government, NGO and civil society sectors. However, not all actors are equal in influence. The involvement of ministries of finance appears particularly critical to ECD prominence in national policy. This finding implies that as national economies grow, the potential for scale up of ECD may rest in government institutions leading partnerships with NGOs and civil society.
 - Across all of the countries studied, the **mid-level of governance (e.g., district or provincial level) appears to suffer particularly in its overemphasis on vertical aspects of compliance**, rather than horizontal aspects of coordination. This finding has clear implications for scale up of programs, in that the middle-level may be the bottle-neck that needs further exploration. Our study findings suggest that building capacity at this level might be important for successful scale up.
 - **Innovations in local governance control in budgeting and decision-making affected ECD services in countries with recent initiatives in decentralization might offer a potential for scale up of programs**. Such innovations have the potential to create local buy-in regarding the importance of ECD when incentives to invest in service provision are in place, thereby growing the demand for services.