

CONCEPT NOTE
EARLY HUMAN DEVELOPMENT INDEX



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Abstract:

Internationally accepted development indexes attempt to evaluate complex phenomenon, usually through the mathematical transformation of multiple factors into simpler information. These indexes permit global comparisons and facilitate rankings of countries' performances in a certain area. The early child development realm has been largely bereft of an internationally recognized index that captures the state of child development within a country. Given the increasing recognition of the importance of early child development (ECD) in the long term progress of countries, the ECD paradigm might benefit from an index that includes the multitude of factors that have been demonstrated to influence how young children grow and develop. Such an index should be multi-tiered, and provide contextual information on how a given country performs in relevant areas. Here we propose the Early Human Development Index (EHDI), which hopes to capture the ECD status of countries through emphasizing the many factors (scales) that define the network of the developing child. We outline why such an index is necessary, describe the conceptual design behind its creation, and suggest ways that the EHDI might be implemented for use in the international arena.

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I. Introduction

"Nothing else in the world... not all the armies... is so powerful as an idea whose time has come."

-Victor Hugo

Globally there is a shift in thinking of development from purely economic progress to human well-being, the foundation of which is laid during early human development (Alderman & King, 2006). The critical role of human capital in facilitating knowledge and technology driven growth is now widely accepted. For both developed and developing countries, investment in human capital formation has become a pivotal part of national development strategies (Mankiw, Romer and Weil 1992). Concurrently, three fields of knowledge -- neuroscience, economics and program evaluation science have independently established that investing in the early years pays the greatest dividend to human capital formation. These three fields converge on one conclusion – early human development is indispensable to development in general (Heckman & Kruger, 2003; McCartney & Phillips, 2006; Shonkoff & Phillips, 2000).

The science of early child development¹ provides incontrovertible evidence for the importance of contextual factors for human development. Research shows that the interaction between person and context sets the trajectory for human development (Graue, 1992; Richter, 2010). This principle, not only emanates from research but also human rights instruments. The Convention on the Rights of the Child (CRC), the most universally endorsed human rights treaty in the world (UNICEF, 2005), focuses on Rights from an ecological development perspective, where the most proximal contexts to the most distal level contexts are discussed with respect to their impact on child development (Hodgkin & Newell, 2007). The CRC maintains that child survival, development, protection, and participation are the result of the combination of child and context, with context defined very broadly (i.e., including country; Britto, 2002). While the CRC recognizes that parents have the primary responsibility of bringing up children, it is also recognized that creating optimal environments rests with larger systems of

¹ In this concept note we use “early human development” and “early childhood development” interchangeably because while both these terms refer to the same phase of human life, discipline specific nomenclature refers to this phase of life differently. For example, the fields of education and psychology tend to refer to this phase as early childhood and economics and international development as early human development. Given that we seek to bring together these two perspectives, we use these terms interchangeably.

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local community, service providers, national policy makers, and the international community.

In addition to human rights tools, international frameworks, global indices and international databases are cogent instruments for moving forward the development agenda. At a minimal level, the importance of early childhood development is reflected in two influential international development frameworks that were drafted at the turn of the millennium—the Millennium Development Goals (MDG; UN 2000) and Education for All (EFA; UNESCO, 1990). These frameworks approached the largest risk factors facing human, societal and economic development through a series of goals, targets and indicators, with a limited degree of attention to early human development. For example, several of the goals of the MDGs relate to early human development such as reduction in mortality, improved child and maternal health, and primary education, but there is a lack of direct mention of ECD. Similarly, the EFA goal 1, addresses ECD through monitoring early education enrolment and access, primarily. The lack of specificity and comprehensiveness of these goals has made advocacy for ECD more difficult.

With respect to the key leading development indices, e.g., Human Development Index, Gender Parity Index, Global Competitiveness Index, the Environmental Performance Index, the Health Systems Attainment scores, and the World Poverty Index (WPI), and the major databases (World Development Indicators (WDI), *childinfo* and *devinfo*, UNESCO Global Database, Macro International (UNDP, 2010, WEF, 2010, WHO, 2000; Alkire and Santos 2010) there is little mention of early childhood development, although some relevant variables such as preschool enrollment are tracked. This limited acknowledgement of the role of early human development needs to be addressed and redressed if we are to truly create sustained development built on human capital.

II. Significance of the EHDI

The purported limitless capacity of human potential can be harnessed during the phase of early human development through interactions with optimal contexts, environments and situations. Despite the evidence in favor of early human development, we lack a globally accepted measure of early child development, as most countries do not include ECD measures in their national reports. Currently, as an international community we are unable to report on the progress made in early human well-being for several reasons. While several existing disparate initiatives do measure aspects of human development and the socio-economic context, they are not linked in a meaningful way so as to hold cogent lessons for policy and action for early childhood. Therefore, national reporting indices do not typically include early human development scales or indicators. In the face of these nascent, yet uncoordinated efforts, and limited attention to ECD, it is difficult to ensure that the foundation for human capital and well-being has its rightful place on the global agenda. Not having an index of early childhood development is of particular concern given that evidence is increasingly revealing the importance of the earliest years of life for long-term productivity, and the attention to the earliest years is much less in developing than in OECD countries. This disparity has consequences for the global population, particularly because over 90% of young children are in the majority world (1,962,419,000; UNICEF, 2008) and one third of them are under 5 years of age (600 million).

This concept note provides the conceptual paradigm for an Early Human Development Index (EHDI) from a socio-ecological and economic perspective. The aim of developing the EHDI is to focus international attention and facilitate policy dialogue on early human development both intrinsically as a human right and instrumentally, as important for social, economic and national development. The significance of this index is that builds upon currently existing and accepted socio-economic and human development indices and databases by delineating the optimal links between them and achievement of early human development while developing new indicators to fill the gaps in measurement. The EHDI represents the much needed effort of coordinating and linking existing monitoring systems, albeit within the framework of early human development. Furthermore, EHDI is singularly unique in that it will focus attention on the critical outcomes in the child's earliest years and stress the relationship to the factors that influence this development. The EHDI represents innovation in monitoring of early childhood, because it expands the scope of understanding human development, beyond measuring child outcomes, in isolation, to embedding them within the layered context in

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which a child resides; a model that resonates with the Convention on the Rights of the Child and links to other globally accepted indices. The other unique aspect of the HDCI is that while provides a total score for international comparisons and measurement of progress, it also provides specific information on how to bolster contextual dimensions to improve child outcomes. In other words, at a national level, it will provide data for policy planning and intervention. Described below in greater detail are the conceptual underpinnings for the EHDI and a brief overview of methodological design for the development of the index.

III. Conceptual Design of the EHDI

“Every child should have...a nurturing, caring, and safe environment – to survive, be physically healthy, mentally alert, emotionally secure, socially competent, and able to learn.”

United Nations, A World Fit for Children Goal, 2002

In this section, we present an overview of ECD and the state of knowledge on how we can attain optimal early human development. Second, we present a typology of scales that should be considered for the EHDI, based on the conceptual justification. Finally, presented in this section, is the template of the EHDI as an exemplar of the Index and its reporting characteristics.

III. A. Rationale for the EHDI

The overview of ECD is presented from multidisciplinary perspectives, as a justification of the conceptualization of the EHDI.

Early Childhood Development (ECD) is a multifaceted concept that covers the early childhood period from prenatal to 8 to 9 years of age, or until the transition to school is complete (UNICEF, 2002a; UNESCO, 2005) and consists of a set of development and inter-twined process of providing services for young children and families. Within this age children make rapid strides in all aspects of development with interaction with their environment (Richter, 2010). The multidimensional aspects of ECD are comprised of several domains of growth, learning and development, including but not limited to physical health and motor development, the development of cognitive skills, social and emotional development and competencies in language and literacy skills, ethical and spiritual development and sense of national identity, to name a few (Britto & Kagan, 2010). Recent seminal work, in the Developed World “From Neurons to Neighborhoods” (Shonkoff & Phillips, 2000), commissioned by the United States Institute of Medicine, and more globally by the World Health Organization, “Early Child Development: A Powerful Equalizer” (Irwin, Siddiqui, & Hertzman, 2007), cogently culled and coalesced research from the neurobiological, social, economic and behavioral sciences to demonstrate that early childhood is also considered the key period for ensuring for child

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survival and development. The achievement of holistic development is due to mutual influences of early experience and gene expression.

The scientific research and evidence on ECD specifies three main age periods during which development occurs with differing risks and opportunities (McCartney & Phillips, 2006). Conception to age 3 is the period of most rapid growth of mental and socio-emotional capacities, as well as the key period for ensuring survival and adequate growth (Shonkoff & Phillips, 2000). Brain architecture is built in a “bottom up” sequence, thereby necessitating the appropriate development of early capacities. The development of the brain incorporates experience, positive or negative, that shapes the brain’s capacities through a complex connection of neural circuits in different parts of the functioning brain (Davidson, 2002). For example, the impact of poverty on early development can be noted prenatally where the odds of a poor infant being born low birth weight are nearly twice that of a non-poor infant (Brooks-Gunn, Britto, & Brady, 1999). Through the early years there is also noted is an increase in malnutrition, stunting, and often delayed gross and fine motor development (Chueng, Yip, & Karlberg, 2001; Kariger, Stoltzfus, Olney, et. al., 2005; Kuklina, Ramakrishnan, Stein, Barnhart, & Martorell, 2004). Poor nutrition and infection cause stunting, which has been linked with delayed cognitive and verbal development (McGregor, et. al., 2007). Interventions during this period tend to be made through health and nutrition services and systems of support to families and communities (WHO, 1999). It should be noted that most infant and young child deaths are preventable with adequate nutrition and protection against disease, for example exclusive breastfeeding, clean drinking water, hygienic sanitation, and oral rehydration during illness (e.g., diarrhea; Bartlett, 2005; Black, Morris, & Bryce, 2003; Lopez, 2000). In addition to the risks of poor health and nutrition, children need to be protected from the risks of exposure to violence and stress as well (Garbarino, Dubrow, Kostelny, & Pardo, 1992; Osofsky, 1997). Young children benefit from positive and responsive interactions with at least one consistent caregiver, including exposure to language and opportunities for exploration and learning (Britto, Fuligni, & Brooks-Gunn, 2006; Richter, 2004). For example, verbal engagement between parents and young children is one of the strongest influences on subsequent language development (Hart & Risely, 1995). These occur primarily in homes and communities (Britto, Engle & Alderman, 2007).

In the period from 3-5 years, in addition to continuing support for strong physical health, disease prevention, cognitive and learning stimulation and emotional and social responsiveness, children need protection from violence, abuse and neglect within their homes. The issue of protection is particularly relevant as very young children who suffer violence in their homes lack the capacity to report and many children are afraid to

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report incidents of violence against them for fear of the consequences (Pinheiro, 2007). Protection of children is also required to ensure their safety and security, in particular nascent policy developments aimed at reducing the risk of disaster note an increase in childhood deaths due to accidents and lack of safety. Beyond protection and safety, children also need exposure to educational opportunities in formal and non-formal group settings, pre-primary and preschool, family and community-based programs (Bowman, Donovan, & Burns, 2001; Zigler, Gilliam, & Jones, 2006) as increased participation of the family and wider community facilitates early childhood development. Participation in such quality early learning and development programs has been linked with improved child development outcomes (Murphy & Burns, 2002).

The period from 6 to 8 or 9 years is normally the transition to school, a time when group learning and socialization opportunities are likely to be highly effective (Montie, Xiang, & Schweinhart, 2006; Vogler, Crivello, & Woodhead, 2008). Research has indicated that development during this phase, sometimes termed as school readiness, is linked to learning, school completion, later skill development, and acquisition of academic competencies and non-academic success (Arnold 2004; Jaramillo and Tietjen 2001; Coordinators' Notebook 2008; Kagitcibasi, Sunar and Bekman 2001; Pianta and McCoy 1997; Reynolds 2000; Rouse, Brooks-Gunn and McLanahan 2005). Children who enter school 'ready to learn' are more likely to succeed at school, stay in school, achieve life long learning and productivity in later adulthood; human capital created through a strong foundational start. In addition to families and communities, schools play a major role (Connell & Prinz, 2002), as the three pillars of school readiness are: ready children, ready families and communities and ready schools (Britto, 2010). The crucial role of schools as the fundamental context for learning and development is widely recognized, at this age, However, this development is vulnerable to adversity and risk, especially during critical windows of time. Also, linked are adverse outcomes of exposure to disease and toxins in the environment and accidents and injuries (Morgan, Garavan, Smith, Driscoll, Levitsky, & Strupp, 2001; Rodier, 2004). Environments can potentially pervert development, and often inalterably. Based on this scientific evidence of ECD, any index attempting to improve young child wellbeing should provision for opportunities in environments in which all children, in the target population, are able to develop to their fullest potential.

Early child development does not take place in a vacuum; the context is an important determinant of children's development and achievement of developmental potential. Several conceptual models posit factors and influences on early human development. While each has merit in its own right, we present an amalgamation of these models, given the purpose of developing a comprehensive index. From the

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rights-based socio-ecological perspective, children require supportive, nurturing, stimulating environments, contexts and conditions, in order to promote and foster development (McCartney & Phillips, 2006). Children's development as a result of good health, nutrition, early stimulation, positive social and emotional interactions with significant adult/caregiver, play as well as learning opportunities, and protection from violence, gets its best start during this important period (Britto, Ulkuer & Meyers, 2009). The support and promotion ECD occurs in the context of viable systems, with respect to provision of education, health, protection and social services (Britto, Cerezo, & Ogbunugafor, 2008).

From a Rights perspective within the framework of the Convention on the Rights of a Child (CRC), a focus on ECD should take into consideration the fulfillment of children's rights to survival, development, participation and protection (Britto, 2002). For the index, this translates into ensuring that national policies accommodate for the right of all children to survive and be healthy, to develop to their fullest potential in a holistic way across all domains of development, to be able to participate in their environment as agents-of-change and be protected from abuse, neglect, and forms of disadvantage and vulnerabilities. In addition, this literature establishes links to other policy alternatives to create an "enabling environment" for the duty bearers to accomplish their tasks towards young children (World Bank, 2006). However it should be noted that policy frameworks for implementing holistic development are weak, often falling short of comprehensive service provision and tend to lie at the periphery sector and national development agendas (UNESCO, 2010). The conditions of optimal development are created by the adult population. The most proximal adults are the key caregivers and families, who create environments conducive for optimal development (Bornstein, 2006; Vygotsky, 1998). At more distal levels are the members of the community who provide support through programs and services to create these environments conducive for development. Situated at the most distal level are adults who create the policy and legislative structure that indirectly impact environments for children (Hodgkin & Newell, 2007). The framework of the CRC, in effect provides a conceptual frame for the development of the EHDI.

Other socio-ecological models have also unpacked the levels of the environment linked with early development. The classic model of environment and individual interaction, in the development literature, has been proffered by Urie Bronfenbrenner (Bronfenbrenner, 1979). As per this model, the child is embedded within layers of the ecological context from the micro, meso to macro. Micro contexts (e.g., family) are most proximal to the young children and macro the most distal. As per this model, the micro level of the family is influenced by the more distal contexts of community,

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interventions, culture, and policy (Bronfenbrenner, 1979; Robinson, Eickelkamp, Goodnow, & Katz, 2008; Vygotsky, 1929). While this classic model provides a more nested or layered perspective to understanding the environment, in reality the complexities of the relationships between levels they are neither completely linear nor totally mutually exclusive.

Other interdisciplinary models have also yielded frameworks for studying early human development and its interaction with the context (Chawla, 2003; Kahn, 2002; Kellert, 1983; 2002; Kuo, 2004; Saunders, 2003). This work emanating from multiple disciplines, such as environmental sciences, quantum physics, architecture, and context psychology, makes a compelling case for the importance of nature in human development by demonstrating fundamental importance of ecological conditions and environmental context in the process of physical, cognitive, language, social and emotional development (Bookchin, 1993; Mergen 2003Vadala, 2007; UNEP, UNICEF & WHO, 2002). The ecological environment provides a context for ECD in several ways. Fundamentally, the environment is the basic resource base (e.g.: water, food, shelter, air quality) for human development. The impact of toxins and pollution of ecosystems and the built environment promotes insults to the developing child that can lead to long term developmental deficiencies (Vitale, 2009; WHO, 2002; UNEP, UNICEF & WHO, 2002). Most recently, research is noting the influence of the character of the built environment, as expressed in urban planning, infrastructure and architecture are determinant in family practices, limiting and, or expanding opportunities for developmentally significant areas such as stimulation, nutrition, and shelter (Iltus & Hart, 1995).

Research in ECD is expanding to non-traditional disciplines, such as quantum physics, to consider the fundamental role of the natural context of human development. Developmental psychologist, Alan Fogel brings his training as a physicist to bear on these questions (Fogel 1993). He proposes that early childhood development is a complex dynamic system in which four sub-systems interact (Fogel 1993), namely: the intrapersonal, the interpersonal, the socio-cultural and, the ecologic. Each of these sub-systems encompasses their own set of complex and dynamic elements and interactions which cumulatively create an emergent dynamic context in which ECD occurs. Bookchin (1993) proposes that no matter how detached we claim to be from natural phenomena, humans are inextricably linked with the ecological environment. Bronfenbrenner (1997) proposes that this connection is fundamental element (in his perception, the overarching element) of the human ecosystem. Fogel (1993) goes further to propose that the ecological system has a direct, dynamic effect in humans, and more to the point of this model, a determinant element in ECD.

III.B. Conceptual Framework for the EHDI

The EHDI, premised on a multidisciplinary literature is conceptualized as comprising of health, nutrition, early stimulation, early learning and education, legal protection, social and economic protection. Based on the multidisciplinary conceptual models of early development, the Human Rights conventions and global indices, databases and indicators of social and economic development, we propose that the EHDI should consist of several interrelated dimensions, each of which would comprise a scale within the index. Based on the multidisciplinary literature we propose seven provisional scales for consideration:

- Scale 1: Young Child Outcomes;
- Scale 2: Families & Proximal Contexts;
- Scale 3: Socio-political;
- Scale 4: Economic;
- Scale 5: Environment;
- Scale 6: Health; and
- Scale 7: Education

Scales 2 to 7 each address a unique, yet related dimension that influences and is linked to early child development. By doing so, not only do the scale individually represent a key dimension, but also cumulatively capture the multiple levels of the environment as espoused in the multidisciplinary literature. It should be noted, that while the influence of some of the scales on early development is stronger than others, all 6 are being proposed for conceptual comprehensiveness.

Scale 1: Young Child Development

The focus of this scale is on the dimensions of survival, development, participation and well-being. This scale will gauge child health and what children know and are able to do. Initial domains of development and learning that will be considered are health, motor development and well-being, social and emotional development, cognition and general knowledge, language, literacy and communication, approaches to learning, moral, ethic and civic development. It should be noted that this scale will be developed for 3 groups: 0-3, 4-5 and 6-8/9 years of age, based on the conceptual literature. This scale could draw on several existing initiatives and databases. With respect to global initiatives, a set of 15 indicators is being developed to monitor the implementation of General Comment 7 (GC7) of the

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Convention on the Rights of the Child (CRC), specially aimed at early childhood, however lacking any indicators of child outcomes per se. Another global initiative, Early Learning and Development Standards (ELDS), developed indigenously over 40 countries articulate what children should know and be able to do at specific age time points based on national values and evidence of early childhood. However, the ELDS have not been transformed into an index or even set of scales. Moreover, they do not measure the environment. With respect to databases, the Multiple Indicator Cluster Survey (MICS-3 & 4) database administered by UNICEF that looks at household level contexts and child outcomes. The items of the MICS hold promise for the EHDI. With respect to measures, several instruments are being tested globally, for example the “Early Development Instrument” and the World Bank developed compendium on measuring outcomes in early childhood. However this scale is very much oriented to primary school, therefore not completely holistic in its conceptualization. These initiatives and databases are provided as examples to demonstrate the multiple efforts underway to measure ECD at different levels. While this is not an exhaustive list, it serves to provide information on sources that can be built upon for the purposes of developing the Young Child Outcomes Scale.

Scale 2: Families and other proximal contexts

As is clearly demonstrated in the literature, families, the household, and other early care environments are the most proximal and natural contexts for early child development. These contexts are recognized for the important aspects of support, stimulation and responsivity provided to the children in safe, clean, protective consistently structured settings. Again there are multiple efforts underway to measure and assess the proximal contexts and environments for young children. Most commonly items and indicators measuring the home environment are used in program evaluation studies where either homes and families are the target of the services or considered a mediating factor in the improvement of child outcomes (Bradley, 2004, 2005; Kagitcibasi, Unar, Bekman, 2001) Most recently the MICS-3 survey and database collected from 28 countries on the quality of proximal environments and the interactions between young children and key caregivers. This database could serve as a very useful source of information for constructing Scale 2. The *Innocenti Report Card 7* (IRC, 2007), measured and reported on family environments. While the Report Card focused on older children and only OECD nations, the items of the Dimension or Scale 4 “Family and Peer Relations” are important to consider for the EHDI. In particular, some of the items measured

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under this scale are not easily amenable to policy change, e.g., *how often do your parents eat the main meal with you around a table?*” Therefore, the selection of indicators for scales that possess a strong subjective element and cultural valence, such as family environment and interactions, will require careful consideration of several factors, including the ability to influence those aspects through programs and services. With respect to non-family proximal settings, aspects currently being measured in the literature are the structural dimensions (e.g., light, space, hygiene, adult to child ratio; Harms, Clifford & Cryer, 2005), interactions between the key-caregivers and the children with respect to support and stimulation (Snow, Burns & Griffin, 1998; Villegas & Lucas, 2002) and investigations of program curricula, practices and overall “child friendly” dimensions of the environment (Sophian, 2004; UNICEF, 2009).

Scale 3: Socio-political

Early Child development is understood to be embedded within more dynamic social, cultural and historic influences (Gardiner and Kosmitzki 2002; Rogoff 2003). The value placed on the domains of early development are culturally constructed and need to be sensitive to context and diversity (Pence and Nsamenang 2008). National social policies guide government decisions and actions around particular sets of social issues or problems pertaining to early human welfare, public access and social programmes (Alcon, Erskine and May 2002). Typically, health and education systems, as guided by sector policies, have the most direct link to early child development and education (UNESCO 2007). These policies guide provisions for access and quality of programmes, standards, certification and training of staff, and resource allocation to education systems. There is also a range of social policies that have an impact on the lives of young children indirectly. Employment, parental leave, labour, immigration and welfare policies, for example, have all been linked with child outcomes (Kamerman et al. 2003; McCartney 1990; Minujin, Delamonica and Komarecki 2006).

This scale could draw from and synthesise international efforts to collect data and characterize the most ECD relevant data of the wide spectrum of socio-political issues, such as: Transparency International’s Global Corruption Report, which monitors governance, access to services, corruption and fair representation in government; UNESCO’s Atlas of the World’s Languages in Danger and the The Index Of Biocultural Diversity developed by the international organization Terralingua as well as other initiatives to assess prejudice, ethnic segregation,

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ethnic conflict, loss of cultural diversity and language extinction; UNIFEM's annual report which considers gender discrimination, violence against women and the state of opportunities for women; finally, instruments such as the Global Survey of the State of Civil Society, developed by the international organization Civicus which uses a participatory international survey process to assess the state and strength of civil society organizations.

Scale 4: Economic

As the connections between ECD and the economy are both intuitive and supported by the scientific literature (Heckman, 2006), therefore a scale is entirely dedicated to economic dimensions of a country. Per capita income, for example, is highly correlated with several human development indicators (World Bank, 2010), and is consequently an indispensable component of any index which aims to capture the many influences on developing children. Given the plethora of data linking wealth and poverty to development, the economic scale as it applies to the EHDI would appear to be simple to construct. This, however, is far from truth, as ostensibly economic correlations to developmental status can mask more mechanistic, often elusive, influences. Several past examinations of child and adolescent well-being, for example, have uncovered that tax levels, rather than wealth, are more strongly correlated with positive outcomes (UNICEF, 2007). From this one example, one can understand how economic influences, in their many different forms, are integral to the construction of this EHDI, as routine summaries of GDP and GNI can be misleading.

Other indicators, including government expenditure on programs and services that focus on young children and families, might be highly relevant for the development of the EHDI (van Ravens, 2008; van Ravens, & Aggio, 2008). Even further, the World Economic Forum's Global Competitiveness Report (GCR) and its associated index and rankings provide a different perspective, with its own set of indicators that could relate to ECD outcomes (WEF, 2009). The GCR is not written with any interest for how a country is developing in general, but only in how a country's market economies are preparing to compete on the global market. Reports like this are especially important to consider, because while their indicators are intuitively removed from ECD status, their actual statistical correlation ECD status has never been rigorously tested. Such is a dominant theme for the economic scale – one should think outside of the proverbial box

when constructing an economic scale, and consider indicators of various types, from different sources.

Scale 5: Environment

Existing Indices and reports regarding environmental quality and biodiversity are designed to consider the human ecology aspect of development. The Environmental Performance Index (Esty, 2002; Sutton, 2003) is designed with a human ecology bias, presuming that humans are indelibly connected to nature and what happens to the natural world happens to humans. The joint effort by several UN agencies in collaboration with the World Bank and several international NGOs to develop a Millennium Ecosystem Assessment was also driven by the presumption that the changes we affect on nature, we affect on ourselves. Therefore when accounting for the “services” that ecosystems provide to humans, not only where the more concrete elements (such as water, food, shelter, etc.) considered, but there is a method to account for cultural and aesthetic services provided by ecosystems.

The general EHDI, and more specifically, the Environment scale in it, could serve as a complementary image of this relation between humans and ecosystems. This scale could provide the opportunity to consider the relation between the state of ECD in a country and the state of biodiversity, environmental quality, and the planning and quality of the built environment. As with other scales, items and indicators selected should be ones most connected with ECD or which show the most promise of providing future insight into ECD issues.

Scale 6: Health

Like the economic (Scale 4) indicators, the connection between health indicators and ECD status might appear to be intuitive and simple. The scientific and medical literature is rich in findings linking health status to poor overall development (Grantham-McGregor, 2007; Walker 2007; Engle, 2007). The scale containing contextual health indicators will aim to summarize the health status of a given country. This includes the prevalence of diseases (communicable and non-communicable), as well as more structural indicators that contain systematic information about healthcare structure. While there is a large body of literature emphasizing the burden of diseases like HIV and malaria on development (Sachs and Gallup 2001; Bonds et al. 2010), the connections between non-communicable

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diseases and ECD development is newer, but no less significant (Stuckler, Basu and McKee, 2010).

The general challenge in constructing this scale lies in highlighting the range of relevant health indicators that define the context of the developing child. There are direct health indicators that do this effectively, many captured in the Millennium Development Goals (MDG). Progress towards MDG's 1, 4, 5, and 6, are monitored by direct health indicators that measure the health status of individuals or impute population prevalence for a condition or disease. Health statistics for a given country are plentiful in several global databases, and highlighting which are related to EHDI should be an evidence-based, but uncomplicated task. Direct health indicators, however, hardly capture the entirety of a country's health context that is relevant to the developing child. Health system indicators that measure characteristics of a country's healthcare system, carry information about indirect effectors on young children, the health structure into which they are born into and function. These indicators would include healthcare expenditure, healthcare coverage, and access (WHO, 2000).

Scale 7: Education

Ability to function and participate in a structured school system is a key aspect of child experiences and influences on development and learning. UNESCO's Education For All (EFA) is the world's leading guide for defining comprehensive education goals for early children. EFA goals are a particularly useful guide because of the range of education issues covered. Progress in these goals is monitored through educational indicators that capture educational demographics of early learning settings, gender and ethnic disparities in education, and pre-primary, and primary educational quality. The EHDI education scale will inextricably link with the EFA targets to define the education scale. It will focus on quality of education, including, systemic characteristics of the educational system and the education at a population level. The MDG's similarly have a strong educational component (MDG's 2 and 3), calling for, amongst other mandates, universal primary education and amelioration of the gender gap in education. Therefore, the MDGs will also be linked in the education scale. However, the limited ECCE focus in the EFA and the limited attention to children with disabilities (Betts & Lata, 2009) in any existing report or index will get particular attention in the development of the EHDI education scale.

III. C. The Visual Profile of the EHDI

An Index is a quantitative score constructed by applying a set of rules to a set of scales in order to reflect a construct, we are developing the EHDI to reflect the conceptualization of the “goodness of fit” between the person by context interaction yields optimal development. The EHDI index score is a composite measure of the child (scale 1) and the environment (scale 2 to 7). The characteristic feature of an index is that it puts together conceptual scales that can be measured in different ways based on a set of statistical rules (Trochim, 2009). In addition, an index is created because currently existing measures, while measuring individual components, are unable to cut across a set of constructs that when combined yield a composite score.

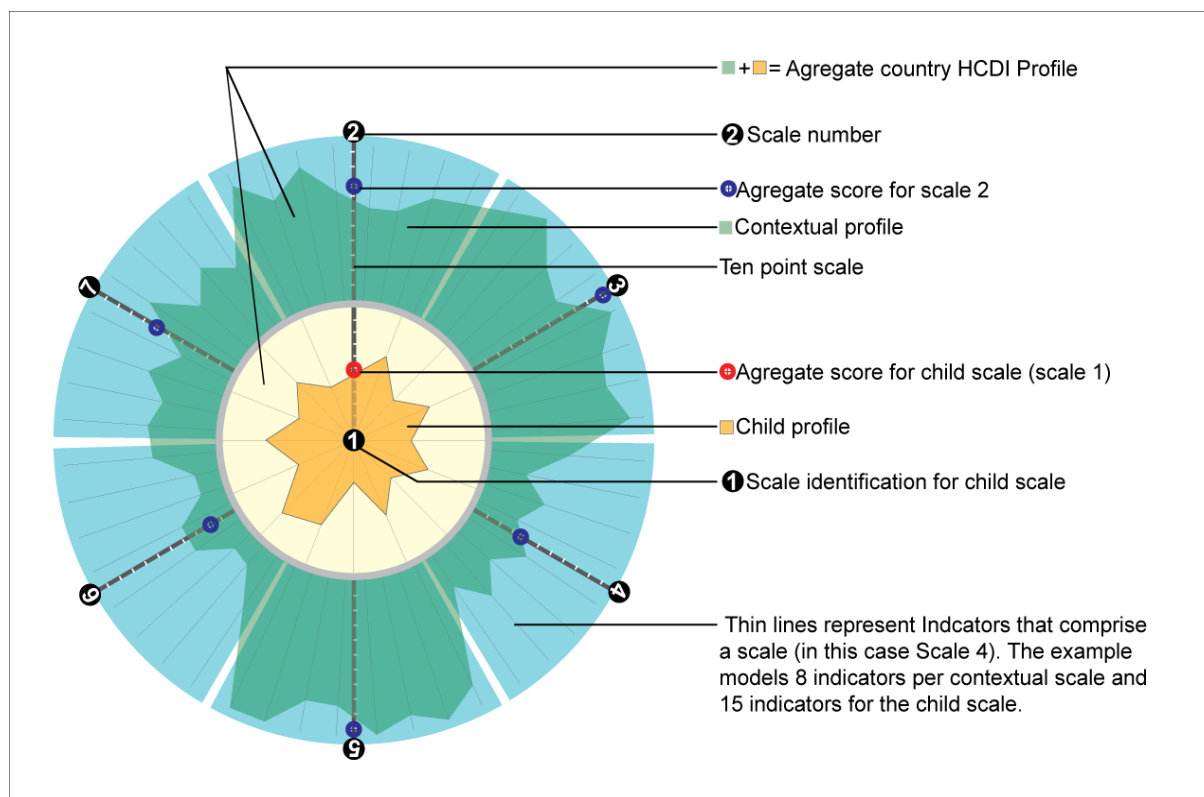


Figure 1: EHDI visual profile model

Conceptually EHDI index score could be considered an aggregate score of six contextual scales and one child focused scale. Each scale is unidimensional, in that the cluster of indicators taps into a unitary dimension. The score for each scale reflects the aggregate score of the indicators it contains. The indicators reflect the key items that determine content of each of the scales.

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The visual profile model for the EHDl (see figure 1) contains two areas: an exterior circle (colored blue) representing the contextual aspects, and an interior circle (colored yellow) representing child-focused aspects. The model deliberately segregates the child-focused scale (number 1) from the contextual scales (2 to 7). The purpose of this design is to allow the reader to have an integrated understanding of the state of early childhood in a country, while providing a clearly visible way to identify the child related scale and to contrast the child profile and the contextual profile.

The blue dots running the length of a segmented gray line represent the aggregate score for each contextual scale. The red dot represents the aggregate score for the child scale. The visual scale runs from the center of the circle to the perimeter. The closer to the center, the lower the score, the closer to the perimeter, the higher the score.

The thin gray lines in both the inner and the outer circles represent the number of indicators considered in each scale. In the case of the child scale, this model accounts for 15 hypothetical indicators, while the contextual scales have 8 hypothetical indicators each. A line is drawn in both circles representing the score for each indicator. The resulting polygon (dark blue in the outer circle and dark yellow in the inner circle) represents the state of ECD in the country. As with the scale score, the farther from the center, the more area covered by the polygons, the larger the polygon, and the higher the quality of ECD. This quick visual reference allows to perceive not just the general score, but also to have a more nuanced understanding of which indicators, in which scales, contribute more to the country's EHDl score.

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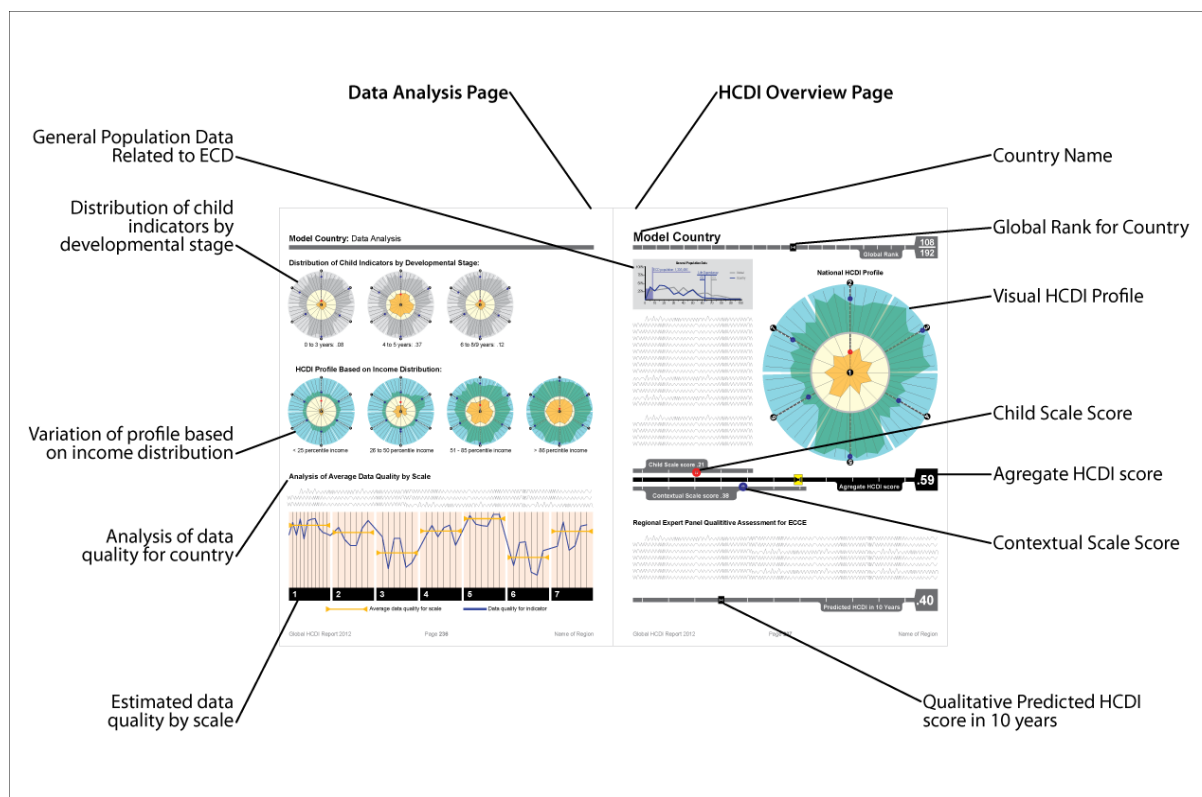


Figure 2: Model country profile report pages

To further increase the capacity of the EHDl index to reflect the complexity of ECD, the country score and visual profile described above, would be presented as part of a report that would include several other elements of information and analysis.

As conceptualized, the overview page of the report (see figure 2) would provide basic information about the country's population that would help provide a clearer setting for the EHDl data. It would also provide information about the rank of the country, as compared with other countries assessed in the index. The Aggregate EHDl score would be displayed as a total and also broken down into the child scale score and the contextual scales score. Finally, this page would contain a second score reflecting the estimated EHDl score for this country based on the result of the qualitative expert consultation described in section III, describing the rationale of the EHDl. The qualitative prospective score will provide another tool to assess differences between countries and to determine trends in the state of ECD.

The analysis page (see figure 2) will allow the readers to consider how the profile changes based on multiple population parameters. The figure shows the profile broken down based on child developmental stage and, based on income distribution in the

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country. At the bottom of this page there is a graph displaying the analysis of data quality for each indicator (and averaged by scale) for the country. This information will allow readers to determine information gaps that might affect the overall country score. Information about data gaps helps provide a more rounded understanding, not just of the EHDl score, but also of the state of ECD in a country.

A major and significant contribution of this index and representation of results, is that this level of resolution and the possibility of navigating between general information and relevant details will allow international policy makers to quickly compare countries in terms of ranking, while also providing tools to compare key features that differentiate one country from another. This capacity is particularly important in the case of countries that might have a similar overall score but could have very distinct child and contextual profiles. A nuanced understanding of the profile behind the EHDl score will promote an effective identification of areas of concern as well as determining priorities for the allocation of resources.

IV. Brief Overview of the Methodological Design for the EHDI

*Much of the beauty that arises in art comes from the struggle
an artist wages with his limited medium.*

-Henri Matisse

Due to its comprehensive nature, developing a globally comparable index for ECD can be challenging. Developing, selecting, and linking indicators to form an index is inherently a complex task involving a multitude of issues, from the accuracy of measurement to the implications of the outcomes for children, families, communities, programs and systems in disparate parts of the world (Brooks-Gunn et al., 1995; Hauser, Brown, Prosser, 1997; Moore, 1997). Therefore, in addition to a robust technical methodology the approach should be one that is agreed upon by consensus and applicable globally.

Children are, inherently, politically vulnerable, as they are not directly responsible for their development and well-being, which is, in many ways, a direct proxy for the general state of a nation. The holistic evaluation, therefore, of early development could be politically contentious. Other indexes have sparked debate regarding their ideological influences, mathematical validity, and overall necessity (Navarro, 2000; Murray and Frenk, 2001; Navarro 2001). Other critiques have involved less critique of the motivations behind the creation of indexes and instead, focused on methodological problems. Common criticisms include the over-emphasis on aggregating data, and the arbitrary nature of how certain factors are weighted relative to others in the creation of indexes (Ravllion 1997, Lauer et al., 2004).

While agendas, preferences, and leanings amongst experts in the ECD arena are inevitable, nonetheless, the geopolitical climate in which this process will be conducted need to be taken into consideration. Even further, the mathematical formulations shouldn't be arbitrary in construction, nor should they only be present to add evidence of rigor to the process. Instead, the index formulation methodology should follow from sound, lucid logic on exactly what is being measured, and why. The development of the EHDI reflects a heightened awareness of these issues. To this effect, the approach will be evidence-based, step-wise, contain checks and balances, and be tested empirically.

Given the complex and multifaceted nature of index development, a multiple-phased sequential mixed method design is required (see Table 1). A mixed design incorporates the qualitative aspects of gaining input and endorsement from a large

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group of international stakeholders and a quantitative process that tests the data for validity and reliability of index properties. This design is considered appropriate for instrument development, based on understanding the meaning of ECD across diverse populations of interest (Creswell, 2003; Newman, et. al., 2003; Tashakkori & Teddlie, 2003).

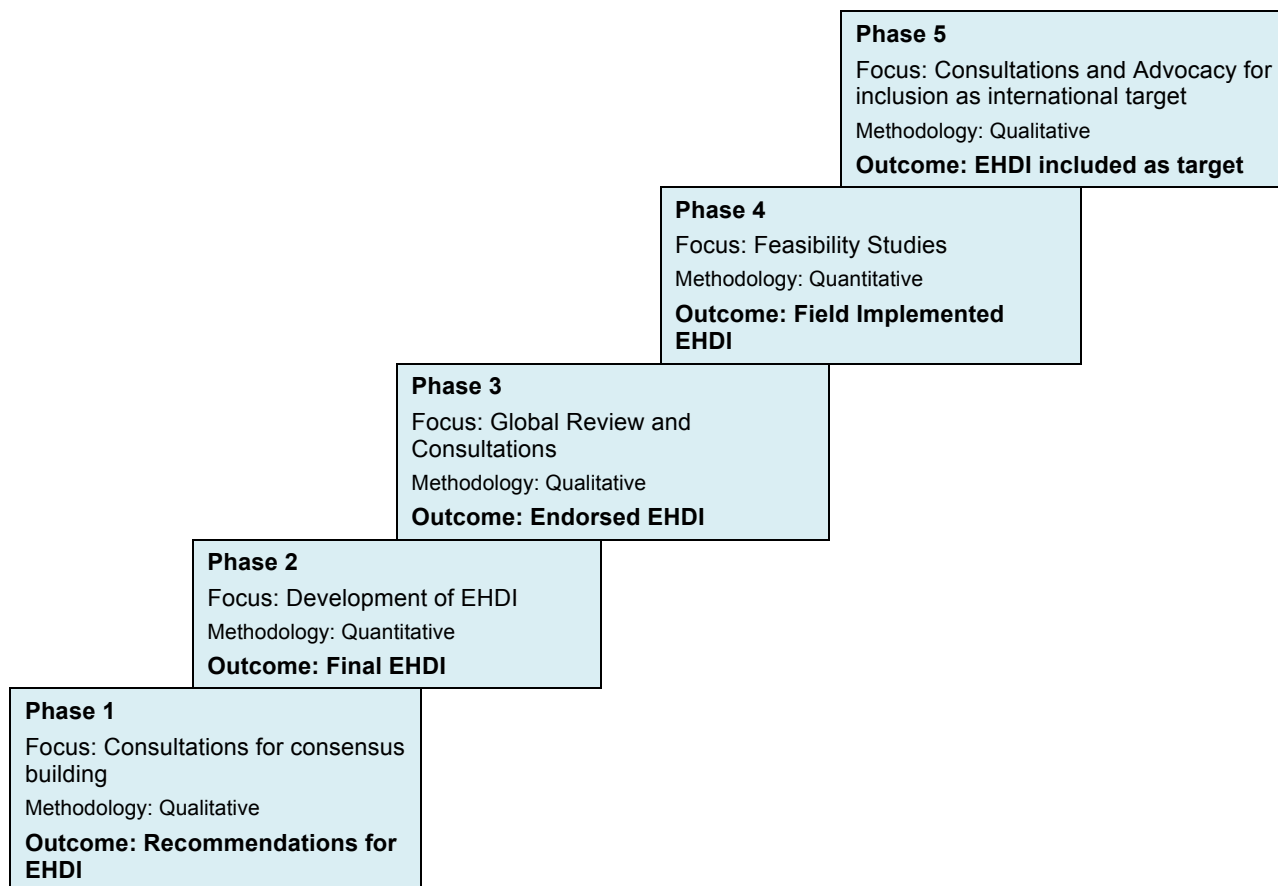


Table 1: Proposed Development Design

Phase 1: Global Consultations for Consensus Building

In order for the EHDI to have global applicability and relevance, all stakeholders need to be involved in the development. Their contribution and buy-in is central. Second, there are several initiatives underway with respect to the development of ECD indicators. It is important that these efforts be included and that the EHDI build on this robust body of work. Therefore global consultations and partnerships are required at the initial stage of development to ensure that a collaborative and inclusive process forms the foundation for the EHDI. While the subsequent phase, is designed as per the

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design principles of scientific methodology, this initial phase is very much rooted in ensuring the global relevance of the index via participation and contributions of partners.

Phase 2: Development of EHDI

Phase 2 is the quantitative phase of development of the EHDI. It is quite complex and consists of multiple steps. The steps outlined below are based on index construction methodology (Trochim, 2009; see figure 3). Each of the colored squares, below, represents scale of potential relevance to the EHDI, with each color representing a specific dimension (e.g., children, families and proximal contexts, socio-cultural and political, economic, health, education). The grey squares represent gap areas for which new indicators will be developed and the black square represent irrelevant indicators for the purpose of the initiative. The white outlined squares represent the reporting mechanisms to which the EHDI should be applicable (e.g., the WDI, HDR, WDR, WCR).

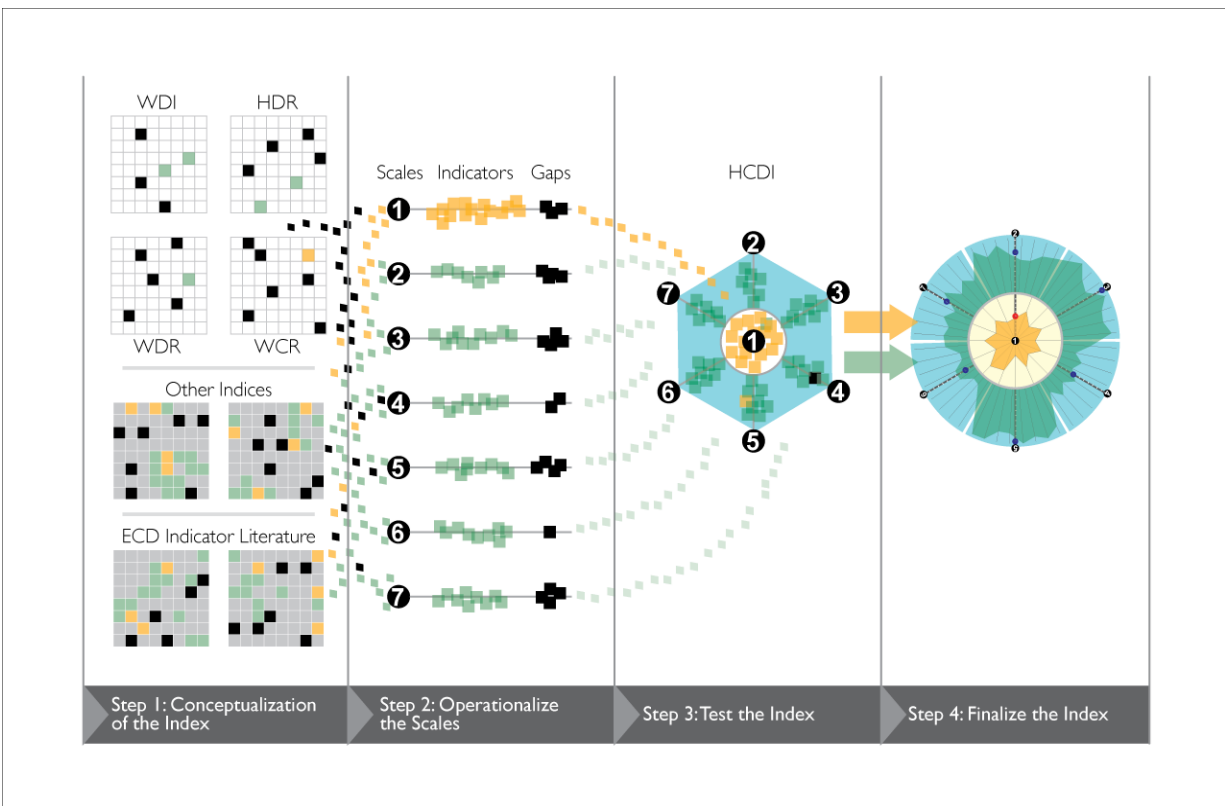


Figure 3: Overview of Phase 2 of the Design

Step 1, *Conceptualization of the Index* using conceptual and empirical techniques, the potential and relevance of existing indices and indicators, for the purpose of the EHDI will be identified and inter linkage investigated.

Step 2, *Operationalize the Scales* based on the analysis of step 1, yield results on the areas of coverage and gaps in creating a holistic indicator. Where gaps are noted, new indicators will be designed to ensure comprehensive focus of the EHDI. It is anticipated that with respect to child outcomes, the least number of universally accepted indicators exist. Therefore, these would need to be developed.

Step 3 *Test the Index* will be focused on pilot testing this composite index in a specified sample of countries to ascertain the properties of the index and validate the scales. The weighting of the scales for the final EHDI score will be estimated.

Step 4 *Finalize the Index* this finalization of the index based on the results of a series of statistical and conceptual analysis.

Phase 3: Global Review

Once the final index is designed, it should be presented to the international panel of relevant stakeholders, who participated in Phase 1, for their comment, input, review and endorsement. The global review of the EHDI is very important to ensure its acceptance and implementation. The global review will determine the final EHDI, its implementation and use for measuring early child development.

Phase 4: Feasibility Studies of EHDI

After the EHDI has been finalized, countries could volunteer to test the feasibility of EHDI for monitoring and reporting on the Index. The purpose of feasibility studies is to test the applicability of the EHDI for national reporting and links to other routinely reported indices of a country. The goal of Phase 4 is to examine how feasible the EHDI is in terms of data-availability, and what adaptations perhaps need to be made to increase the number of countries able to produce the EHDI. The feasibility study would also provide evidence for the advocacy of this index into international framework targets. This phase is different from Step 3 of Phase 2, the purpose of which was the development of the EHDI. The purpose of the feasibility studies is to investigate the implementation of the EHDI in a variety of countries as a reporting tool on early childhood. The goal of the feasibility studies is to learn how to make the EHDI an

effective instrument for country social and economic policies and inform policy planning, and to determine how the EHDI links with other national existing reporting mechanisms. Testing the feasibility of the EHDI is for the sustainability and value of the tool as it is during this phase we will learn how to “fit” instrument in the policy and measurement situation of a country.

Qualitative Assessments

A key aspect of the feasibility study is a qualitative assessment of the EHDI in country and region contexts. Past criticism of other indexes has highlighted situations where there were large discrepancies between local sentiment, and objective measure (Navarro, 2001). While each has their own individual merit, any index that purports to capture the general status of any global phenomenon should contain both qualitative and quantitative arms. To this end, regional meetings would be important to organize, comprised of experts in various fields related to the scales of the EHDI. The experts will be from various nations around the world (representation is key), and be organized by geographical region (using UN geoscheme, or some other internationally accepted division scheme). These experts would provide qualitative assessments of the status of indicators and scales in the EHDI measured countries, based on their own observations. This is critical to the testing of the EHDI, as subjective viewpoints and perspectives are highly germane to the overall process of evaluating the state of ECD around the world. If, for example, the measured EHDI in a given country is incongruent to the qualitative assessments of the status of ECD in a given country, then the EHDI should be re-examined. While the goal for the EHDI is not necessarily exact concordance between expert opinion and calculated EHDI, significant discrepancies would be informative, and might indicate a flaw in the mathematical or conceptual design of the EHDI.

Phase 5: Advocacy for EHDI

Any novel global index requires active advocacy to ensure international usage and eventually, mainstream adoption. The most basic advocacy tool is the strength of the index, that is, how well it performs at its proposed task and is viewed by experts in the field who examine indices theoretically, and test them empirically. In the case of the EHDI, input from experts is already built into the process of creation of the index (see Phases 3 and 4).

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For the EHDI, further advocacy could take place at international meetings in the years following its completion. This can create crosstalk between the authors of different indices, which might be useful for sharing methods, data, and perspectives. Globally, a second generation of international development frameworks will come of age in 2015. This will be a time to revisit the utility of the 1st generation, evaluate their impact and revise them so that they are current with modern socio-economic conditions and most recent findings from the scientific literature. It will be the time when new indices and targets will be considered for inclusion in the development frameworks. Therefore, the data from the field testing will be informative for this purpose.

V. Conclusion

The time to develop the EHDI could not be more opportune on several fronts. First, the science of early childhood has come of age. We now know more about the importance of early human development than ever before and also know more about how to apply that knowledge to improve young child wellbeing. Second, globally the development paradigm is shifting towards building social and economic progress on human capital, the inception of which is laid during the early years. Third, from a policy perspective the world community is beginning to think about the next generation of development framework goals and targets. The EHDI could very be an influential index for the post-2015 international targets.

The significance of the concept and design proposed for the EHDI can also be noted on several fronts. First, by being built on several bodies of multidisciplinary literature, the EHDI amalgamates “development” – early human development, social and economic development, the science of developing scales and indexes, the work of international development agencies. Second, with respect to design, the outlined process highlights technical strengths and a collaborative approach. Both components of the process are required to develop a robust international index with global endorsement and application. Significance of EHDI is noted in the design to link with existing indices and databases, while creating a young child specific index. Most significantly, this concept note takes a humble, yet courageous step in redefining the nature of global indexes, in terms of communicating a plethora of context-specific information about a country. Instead of a single score, this concept note puts forward 4 different measures: a child-specific score, a context-specific score, a composite score, and a qualitative assessment. All four contain information useful to for fully determining the status of ECD around the world, and for the multidimensional problem-solving necessary to address ECD-related problems.

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