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TCG4: Recommendations on Indicator 4.2.3 (Positive and Stimulating Home Environments) - December 2017

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This note covers three key questions: 1) methodologies for measuring positive and stimulating learning environments that have been shown to be workable within low- and middle-income countries; 2) recommendations for modifications to the indicators; and 3) recommendations for a work plan to further address Indicator 4.2.3, as part of the SDGs thematic indicator set.

I. What does it mean to have a positive and stimulating home learning environment?

Ample research demonstrates the importance of home environments for children's development over the course of early childhood and beyond, in both low-income (Galasso, Weber & Fernald, 2017) and high-income countries (Bradley, Corwyn, Burchinal, McAdoo, & Garcia Coll, 2001). Parents are children's first teachers, and the quality of the home environment may be a leading cause of the notable disparities in children's development that emerge early in infancy and persist over time (Fernald, Kariger, Hidrobo & Gertler, 2012). Due to the positive influence of stimulation on neural development, children in homes with responsive parents, access to stimulating toys and activities, and freedom to explore have been shown to have more advanced development (Bradley et al., 2001; Frongillo, Kulkarni, Basnet & de Castro, 2017).

Positive and stimulating activities can be interpreted to refer to a range of caregiving practices of young children. **Positive home environments** are characterized by parental responsiveness and warmth, with no exposure of young children to violence, either through physical punishment, intimate partner violence, or other home-based violence. Maternal depression or presence of other mental health conditions such as parental substance abuse are also important elements of home environments, although less frequently mentioned as a key element of positive home environments. **Stimulating home environments** include engagement of children in activities with toys or through storytelling, reading, singing and dancing, etc; providing children with toys and other materials to facilitate their play; and being responsive to children through language and other means. Parents' support for children's learning can also be indexed through enrolment of children in early childhood education. While distinct constructs, associations between warm, responsive parenting and child cognitive development have also been reported in many studies. In sum, the definitions of "positive" and "stimulating" are related to one another, but may also be best considered conceptually distinct and requiring of unique types of indicators.

Early childhood development is holistic in nature. As such, a broad definition of positive and stimulating home learning environments includes health and nutrition status, specifically measurement of children's access to health care, including immunizations and well-child care, and critically, adequate nutrition. Undernutrition and lack of micronutrients has been linked to delayed cognitive development; frequent infectious diseases such as diarrhoea and acute respiratory infections have also been linked to children's difficulty learning. Because of the strong, reliable links to child development, inclusion of these elements in definitions of stimulating home environments may be justified.

Recognition of the importance of measuring home environments in global studies has arisen relatively recently, and in the past five years, several research publications have addressed the theoretical and conceptual elements of supportive caregiving hypothesized to be globally relevant. There is a substantial body of research outlining the significance of home environments for child development, and it is not possible to review all relevant literature here. Instead, a short summary of notable contributions to the dialogue and implications for global measurement are outlined here.



Qualitative and quantitative investigation of the elements most strongly associated with caregiving was conducted as input into the MICS3 module on early childhood development (Kariger, Frongillo, Engle & Britto, 2012). Results from their study identified two family caregiving practices, limit-setting and support for learning, and caregiving resources (adequacy of child care when mother was working), in addition to six play activities, which were subsequently included in the MICS surveys. These items asked parents to report on frequency of reading books, telling stories, taking the child out of the home, playing with and teaching the child. Of note, in describing the development of the items used to measure home environments, Kariger and colleagues tested a much larger set of items than were eventually included in the MICS6 survey, and also reported nascent but promising evidence of validity between supportive caregiving indicators and child development.

II. Review of methodologies to measure positive and stimulating home environments

Several studies have examined the quality of home environments across and within low- and middle-income countries, and some have also included high-income countries. In general, the two modes of methodology are to interview parents regarding practices and typical daily activities with young children, or to conduct observations based on a standardized protocol of children's home environments. Because many elements of parenting practices are not possible to observe during a short visit, most measures of home environments have relied on survey questions to document most of the information. Longer home visits are required to observe elements of home learning environments if the goal is to produce data without relying on parent or caregiver report.

The process of establishing validity for scales used to measure positive and stimulating learning environments should ideally follow a similar process as measurement of child development, beginning with identification of theoretically-justified items, testing of various combinations of these items in a range of countries, establishment of an underlying factor structure, and comparison of the strength and applicability of that factor structure across countries.

Below is a short description of four surveys or studies that have used these methodologies, along with a brief description of the strengths and limitations of each approach. It is important to note that only research studies to date have included both high- and low/middle income countries, and for any ongoing work on indicators of home environments, it will be critical to examine functioning across a range of country income levels. This is especially the case given the association between country income and parenting practices, as described below.

1) MICS UNICEF household survey, UNICEF.

What's included? UNICEF runs the MICS household survey, which includes several modules, of which early childhood development is one. It has been implemented in more than 50 low- and middle-income countries to date. Several family care indicators are included in the MICS household survey, including frequency and type of parent/child interactions; presence of books and other play materials; whether the child experienced inadequate care (left alone or in the care of another child under age 10); use of violent punishment such as beating a child, hitting or slapping the child, or calling a child names; and child's attendance in early childhood education programs. The MICS6 module for children under age 5 also includes questions on children's health and nutrition status, and access to health care.



Validity evidence. Using data collected with MICS4 items on home environments, recent evidence has demonstrated the impact of family learning environments as measured by the MICS modules on children's development, especially cognitive development (Frongillo, Kulkarni, Basnet & de Castro, 2017) and related to fathers' involvement in children's learning as well as mothers' (Jeong, McCoy, et al., 2016). Provision of books, attendance at early childhood education programs, and parents' reports of stimulating activities were significantly associated with children's early literacy and numeracy skills. Analyses of MICS data has also demonstrated significant variability between and within countries on caregiving practices (Bornstein & Putnick, 2012), with strong associations between country wealth, maternal education, and positive and stimulating parenting practices (Sun, Liu, Chen, Rao, and Liu, 2016).

Strengths and limitations. The analyses on child development and positive and stimulating home environments using MICS data suggest that the items used are functioning well: Items indexing positive and stimulating home environments are related to predictors of parenting and child outcomes in theoretically-expected ways, at least in the studies published to date. Another strength of the MICS is that the survey can capture multiple dimensions of children's early environments, including home environments and health and nutrition status. Two limitations include the lack of psychometric evidence suggesting that the items index an underlying construct of positive and stimulating parenting and that the items function similarly across countries, and the relatively constrained set of items that are possible to include in the MICS survey. Of note, maternal depression and other parental mental health conditions, including intimate partner violence, have not been included in the MICS survey to date, despite the evidence suggesting that these factors have a profound impact on child development.

2) DHS household survey.

What's included? The DHS household survey is funded by USAID and has been implemented in many countries in Africa, Asia, and Latin America. DHS does not include items specifically focused on quality of home learning environments. DHS covers intimate partner violence, and has several items focused on describing elements of children's health and nutrition status.

Validity evidence. The DHS survey does not include items specifically focused on positive and stimulating home learning environments. Evidence on the association between intimate partner violence (IPV) and infant health using DHS data suggest that IPV shows a weak but persistent relationship with infant health (Urke & Mittelmark, 2015).

Strengths and limitations. A strength of the DHS survey is inclusion of IPV. Limitations include the lack of emphasis on positive and stimulating home environments, and on child development beyond child health outcomes.

3) HOME Scale observations of home learning environments.

What's included? The HOME Scale was designed to capture key elements of children's home environments, including parental responsiveness, discipline practices, and exposure to stimulating materials and experiences (Bradley & Corwyn, 2005). Trained observers administer the scale after observing practices within the home for at least an hour. Variations of the HOME Scale have been used in many countries to date. The authors of the scale explicitly note that there are important and meaningful cultural differences in parenting practices, with some practices nearly universal (such as



holding and kissing infants) and others much less so (such as engaging in direct conversation with young children).

Validity evidence. The HOME Scale has been shown to predict child outcomes in many countries. Common parenting practices have been found to vary based on cultural context and socio-economic status of parents, yet the associations between stimulating and responsive parenting and child development using the HOME Scale tend to be consistent across countries. The HOME Scale has been shown to demonstrate partial measurement invariance when used across several low- and middle-income countries using a prospective study design and community sampling (Jones et al., 2017), yielding common factors of emotional and verbal responsivity; safe and clean environment; and child cleanliness. Countries in this study included India, Nepal, Bangladesh, Pakistan, Brazil, Peru, South Africa and Tanzania.

Strengths and limitations. The quality and breadth of evidence provided by the HOME Scale is a strength. Recent evidence demonstrating that the scale functions at least somewhat similarly across low- and middle-income countries is an important contribution. Limitations include the reliance on trained observers to administer the scale, which poses challenges when administering the HOME Scale through household surveys, and the lack of data on parental mental health and children's health and nutrition status, which may be important components of positive and stimulating home environments in many parts of the world.

4) PRIDI Regional Survey of Child Development, Home Characteristics Module.

What's included? The PRIDI Regional Survey of Child Development was developed through the Inter-American Development Bank to generate regional indicators of child development in Latin America. Four countries participated in the PRIDI: Peru, Costa Rica, Nicaragua and Paraguay. Representative samples of households were drawn, and observers made visits to interview parents and assess child development. The purpose of the study was to document multiple aspects of children's learning environments and child development, and items reflected a broad range of constructs including health, nutrition, cognitive stimulation, discipline practices and family socio-economic status. There are no plans to repeat the PRIDI study in other countries at present.

Items on the PRIDI related to positive and stimulating home environments include the following: number of books for children under age 5 years; toys and learning materials in the home; how frequently someone played with, read to or sang to the child; and approaches to child discipline.

Validity evidence. In the technical report produced by IDB, results from the PRIDI demonstrate a weak but consistent association between child development and children's home environments (Verdisco, Cueto & Thompson, 2016).

Strengths and limitations. PRIDI's experience demonstrates that data on children's home environments can be collected as part of a larger observation-based battery of child development, administered by trained data collectors. The use of these scales in representative samples in four countries adds to the evidence that home environments show reliable associations with child development when used across populations. Limitations include the use of the PRIDI only in Latin America, which impedes the ability to assume that the items would function well in other parts of the world.



III. Recommendations for possible modifications

Looking across the methodologies outlined here, there is evidence that the constructs measured are important for child development and reflect some (but not all) of the critical components of stimulating and positive home environments. However, a limitation is that the scales have not yet been fully validated by establishing factor structures either within or across countries, and it is not clear whether the items measured to date in household survey such as the MICS would meet technical standards for cross-country comparability. These analyses would be possible to do, given the wealth of available data from the MICS survey. Results from empirical reports indicate that the studies identified focused on the ability of the items to predict child outcomes in various countries, but did not include descriptions of the underlying factor structures and/or examination of measurement invariance of scales in more than one country.

Existing evidence demonstrates that measurement of positive and stimulating home environments is an important component of understanding children's development. While existing scales show associations between home environments and children's development in the expected directions, within data from household surveys, there have been few studies that have looked carefully at item-level functioning and comparability across countries. The limited number of items tested in household surveys may provide a shallow indication of the overall quality of home environments, and efforts should be made to include measures of parental mental health.

Methodologies outlined above point to two main approaches to collecting information on home environments: first, through household surveys in which caregivers are interviewed; and second, through observations of children's home environments using trained observers, which will produce more detailed and comprehensive information but also requires substantially more investment in training data collectors.

Next steps. To improve the availability of information on positive and stimulating home environments, the following steps are recommended.

1) **Expand definitions of positive and stimulating home environments**

Existing items can serve as a starting point, but a broader range of constructs may be necessary to capture positive and stimulating home environments. The list of measured constructs should be expanded to include at a minimum (items in bold may require observations):

- Main construct of positive interactions:
 - o **Subconstruct: Parental responsiveness (example items below)**
 - **Responds to child's verbalizations**
 - **Initiates conversations with child**
 - **Speaks positively of child**
 - o Subconstruct: Use of non-violent discipline
 - o Subconstruct: Parental well-being
 - Absence of parental depression
 - Absence of substance abuse issues



- Absence of intimate partner violence
- Stimulating home environments:
 - Subconstruct: Cognitive stimulation
 - Presence of children's books
 - Child having been read to during last week
 - Engagement of child in learning and play activities (with fathers as well as mothers)
 - Suitable child care arrangements (i.e., not left in care of another child under age 10)
 - Exposure of child to early childhood education

More comprehensive measurement of parental responsiveness to children's verbalizations and engagement of children in discussion can be indexed by observation-based scales like the HOME Scale, which require trained observers. While the inclusion of trained observers may be prohibitive for household surveys, effort should be made to explore the inclusion of a few items that index parent-child interaction more fully than is possible by relying only on parent report.

2) Make any methodological changes that may emerge from more comprehensive analyses of data.

Perform additional analyses of existing data. To strengthen the existing scales, more work should be done to analyse the cross-country comparability of existing data sets including indicators of home environments, such as the MICS6. Results should be used to confirm the existence of factor structures and identify well-performing and less well-functioning items across countries. Results from household surveys should be compared with results from studies using the observer-based HOME Scale.

Modify scales as needed with addition of items from HOME Scale and other indices. Beyond inclusion of new items on parental mental health and intimate partner violence, it may be necessary to add additional items to improve functioning of some of the subconstructs outlined above.

Conduct validation studies. Once new items are identified, validation studies are needed to examine the relation between child development and home environments. These studies should also include a focus on the associations between observers' ratings of children's home environments and household surveys, to help inform revisions to household surveys and test their functioning against more objective assessments of home environments. Ideally, validation studies are longitudinal in nature, and examine the association between home environments at one time-point and learning and development at a later time point. Validation studies could also help inform identification of items that are feasible to collect through household surveys on an ongoing basis, and those that may require more in-depth national studies to fully capture.

Examine results for measurement invariance. Results should be tested for measurement invariance before assuming that cross-country comparisons are valid. Because few measurement invariance analyses have been conducted on household-survey based, cross-country measures of home environments to date, it is difficult to predict what results may yield. However, because results from observational scales suggest only partial measurement invariance, it is possible that measures of



home learning environments will not yield directly-comparable results. Because Indicator 4.2.3 is part of the thematic indicator set, this degree of invariance may be acceptable – but should be clearly articulated, along with justification of which elements of home learning environments do not seem to function similarly across countries.

Identify a small set of additional items that could be added to existing household survey batteries to bolster measurement of Indicator 4.2.3. The methodological steps outlined above are intended to generate new items that could be added to existing indicator sets in household surveys. These items will need to be tested systematically and across countries before making a final determination as to their feasibility, technical strength, and relevance across countries.

IV. Conclusions

Home environments matter for children's learning and development, both concurrently and many years into the future. The inclusion of Indicator 4.2.3 in the education goal of the SDGs is an important and positive step forward, in that education systems will function more effectively if efforts are made to ensure that children have positive and stimulating home environments prior to starting school. Home environments also explain the persistent and powerful inequities in learning that arise prior to school, and become increasingly difficult to address as the school years progress.

While present scales indicate basic properties of validity, three key steps may help improve the functioning of the scale: 1) add measures of parental mental health; 2) complete cross-country validity analyses using existing data; and 3) consider adding observational items that could be conducted as part of household survey visits.

Main sources of data for thematic monitoring of Indicator 4.2.3 are likely to come from either regional or global surveys of child development, which are typically conducted through household surveys. As of now, there are few if any administrative data sources that provide the type of information that could help improve monitoring of positive and stimulating home environments.



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