MONITORING SDG 4.2.1: A BRIEFING FROM THE INTER-AGENCY AND EXPERT GROUP ON ECD MEASUREMENT

Claudia Cappa, UNICEF
1. OVERVIEW OF PROCESS AND PARTNERSHIPS
Target 4.2

Ensure that, by 2030, all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education

Indicator 4.2.1

Proportion of children under age 5 years who are developmentally on track in health, learning and psychosocial well-being
Requirements for SDG reporting

• 47th Statistical Commission Decision 1 (I):

“compilation of global indicators will be based to the greatest extent possible on **comparable and standardized national official statistics**, [...]and that when other sources and methodologies are used, these will be **reviewed and agreed by national statistical authorities**”
In mid-2000s, UNICEF set out to develop a tool to measure key domains of child development

Using the Multiple Indicator Cluster Surveys (MICS) programme as the platform, and for possible use in other household surveys

Limited availability of comparable measures of children’s developmental outcomes at population level, particularly in low- & middle-income countries
MICS Surveys with data on ECDI

93 MICS surveys, 2009-2018 (ECDI also included in a few DHS)
ECDI data used for reporting and monitoring of 4.2 in the SG’s reports.
Work to refine the measure for 4.2.1 needed for...

- Domains in the 4.2.1 SDG indicator not the same as in ECDI or other existing measures
- Much progress has been made in ECD measurement since the development of MICS-ECDI
Inter-agency advisory and coordination group (IAEG-ECD)

- Oversee revision, testing and validation of the ECD measure for use by all countries
- Support development of capacity-building initiatives for countries to collect, analyze and use the ECD measure
- Develop standards and guidelines for ECD monitoring at country-level
- Current members: WHO (Tarun Dua), Save the Children (Lauren Pisani), World Bank (Adelle Pushparatnam, Hiroko Maeda), OECD (Rowena Phair), IADB (Marta Rubio), UNESCO-UIS (Silvia Montoya), Statistics Canada (Dafna Kohen), Palestinian Central Bureau of Statistics (Rami Al Dibs), National Institute of Public Health in Mexico (Argelia Vazquez), chaired by UNICEF (Claudia Cappa)
Technical Advisory Group (TAG): Members

- Santiago Cueto, Grupo de Analisis para el Desarrollo (GRADE), Peru
- Edward Frongillo, University of South Carolina, USA
- Melissa Gladstone, University of Liverpool, UK
- Peter Halpin, University of North Carolina, USA
- Magdalena Janus, McMaster University, Canada
- Gillian Lancaster, Keele University, UK
- Dana Charles McCoy, Harvard University, USA
- Abigail Raikes, University of Nebraska Medical Center, USA
- Nirmala Rao, University of Hong Kong, Hang Kong
- Ghassan Shakhshir, An Najah University, Palestine
- Hollie Hix-Small, Portland State University, USA
Members of the Global Panel for Standard Setting

• 17 experts from 15 countries around the world: US, Europe, Africa, Canada, South Asia, Middle East, East Asia, South America

• Qualifications and background:
  • Expertise in early childhood development/developmental psychology
  • Extensive experience in conducting standardized assessments of young children in primary health care and/or educational settings
  • Experience in clinical assessment of ECD
Development of a new measure of ECD outcomes: Timeline

- Technical consultation: January 2015
- Technical consultation: Sept 2016
- Technical consultation: January 2018
- Technical consultation: November 2018
- Technical consultation: June 2019
- Finalize new ECDI and manual: 2020

Presentation of plans at the 2016, 2017, 2018, 2019 UN Statistical Commission and regular updates to IAEG-SDGs meetings
2. OVERVIEW OF THE METHODOLOGICAL WORK
Overall objectives

To build an improved measure of ECD, aligned with SDG indicator 4.2.1, for use by all countries:

- To be implemented in the context of population based surveys by national statistical authorities.
- To produce comparable, standardized, representative prevalence estimates at the national level.

The new measure should be:

- Conceptually valid
- Psychometrically robust
- Culturally adequate across contexts
- Adequate for population measurement at scale
- Policy relevant

**Not intended to** evaluate interventions or conduct clinical assessments of individual children.
Further analysis and cognitive testing old ECDI:

- Cognitive testing of the current ECDI questionnaire was conducted in Jamaica and in India.
- Psychometric analyses were done on MICS5 data from Bangladesh (2012-2013).

Discussion and revision of:

- Domains covered by the old ECDI;
- Direct child assessment versus parental report;
- Definition of “developmentally on track”;
- The age group covered by the old ECDI;
- Response scales of the ECDI.
Desk review and expert rating:

- Building on an earlier scoping exercise, some 20 instruments and more than 500 items were reviewed against a set of criteria:
  - Conceptual relevance;
  - Existence of empirical evidence, including longitudinal data for predictability;
  - Relevance to diverse populations and cross-cultural applicability;
  - Ability of caregivers to provide an accurate assessment;
  - Policy relevance;
  - Interpretability.

- Both caregiver/teacher reported measures as well as direct assessment tools.
- Additional measures added by UNICEF (e.g., CREDI, MELQO, country-specific ECDI items in MICS).
- Technical consultations with experts to select extended list of items for testing (more than 50 items selected).
# Conceptual framework of the improved ECDI

## Learning

<table>
<thead>
<tr>
<th>Early numeracy</th>
<th>Language, literacy and communication</th>
<th>Fine motor development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counting (verbal and set production)</td>
<td>Letter/alphabet knowledge</td>
<td></td>
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<tr>
<td>Number identification</td>
<td>Phonological awareness</td>
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<tr>
<td>Number/size discrimination</td>
<td>Expressive language</td>
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<td></td>
<td>Receptive language</td>
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</tbody>
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### Executive functioning

- Mental flexibility
- Working memory
- Inhibition

### Approaches to learning/play

## Psychosocial Well-Being

### Social development
- Social competence
- Relationship skills
- Interpersonal conflict resolution
- Prosocial behaviour
- Social cognition
- Theory of mind

### Emotional development
- Empathy
- Emotion knowledge

### Self-regulation

## Health

<table>
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<tr>
<th>Self-care</th>
<th>Gross motor development</th>
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59 ECD items that underwent cognitive and field testing
Cognitive testing of draft set:


- In collaboration with national partners, 59 items were tested using a standardized methodology on a total sample of 149 women.

- Results compiled across countries into consolidated written report with recommendations for further refinement/revision of item wording.
Tested item: Can (name) recognize all numbers from 1 to 5?

This item targets early numeracy skills. The child can clearly identify or recognize all written numbers from 1 to 5 in his/her native language. The child could demonstrate knowledge of written numbers if he/she could say the number when shown the symbol written on paper (e.g., says “one” when shown the number “1”) or if a child can point to a number when asked (e.g., which is the number “1”?).

Final item: Does (name) know all numbers from 1 to 5?
Field testing:

- Field test of ECDI draft set within a household survey – MICS – implemented with NSOs.
- Probabilistic representative samples
- Use of standardized protocols:
  - Standard questionnaires and fieldwork instructions
  - Standard fieldwork logistics and protocols
  - Standard CAPI application with tablets
  - Pre-test of all survey instruments and procedures
  - Dedicated training of enumerators
  - Standard protocol for data quality checks during and after fieldwork
  - Standard data processing tools
- Surveys included household, women’s and child’s questionnaire
- In Mexico, also anthropometry and ECD direct assessment.
Psychometric analyses:

- Flag too difficult/easy items;
- Flag for lack of sensitivity and specificity of items in relation to DA;
- Inspect dimensions within domain;
- Flag items that do not discriminate well;
- Flag redundant items.

Work process behind the improved ECDI:

- Further analysis old ECDI
- Cognitive testing old ECDI
- Desk review and expert rating
- Draft set 1
- Cognitive testing of draft items
- Adjusted draft set 1
- Field testing Mexico, Palestine, Belize
- Psychometric analyses
- Harmonization of available data
- Decision matrix analyses
- Draft set 2
- Standards setting pilot
- Further psychometric analyses
- Final set
- Implementation of new ECDI

Implementation of new ECDI
Harmonization of available data:

- **MICS-ECDI**
  - Mexico
  - Palestine
  - Belize

- **Hong Kong University-ECDI**
  - Bangladesh
  - China
  - India
  - Myanmar

- **CREDI**
  - Bangladesh
  - Brazil
  - Cambodia
  - Chile
  - Colombia
  - Ghana
  - Guatemala
  - India
  - Jordan
  - Laos
  - Lebanon
  - Nepal
  - Pakistan
  - Philippines
  - Tanzania
  - USA
  - Zambia

- **Statistics Canada** (NLSCY and SYC)
- **MELQO** (6 countries)
- **MODEL** (5 countries)

Around 60k children 24 to 59 months
**Decision matrix:**

- Understand the performance of individual items and inform item selection.
- Predefined criteria established at IAEG-ECD meeting in November 2018.
Decision matrix criteria

**Criteria 1**
At least 10% difference from 2 to 3 years old

**Criteria 2**
At least 10% difference from 3 to 4 years old

**Criteria 3**
Item-rest correlation within domain of at least 0.3

**Criteria 4**
Item-rest correlation with full ECDI score of at least 0.25

**Difficulty**
Percentage of children passing item

**Discrimination**
Point-byserial correlations

- **Green:** Meets all criteria
  - 4 items
- **Yellow:** Meets most criteria
  - 46 items
- **Red:** Does not meet any criteria
  - 2 items

Draft set 2 (36 items)
**Draft set 2:**

- Learning domain: 20 items
- Psychosocial wellbeing domain: 11 items
- Health domain: 5 items
Standards setting pilot:

- Pilot the overall approach for ECDI standards setting.

- Generate a series of recommended cut scores in the context of a summative competency-based ECD assessment collected using the new measure.

- Distinguish between ‘on track’ and ‘not on track’ children in terms of their development.

- Need for specificity over sensitivity.
Background on standard setting

- Standard setting is the process of establishing cut scores on a test/measure, by defining a performance standard.

- Two types of standards:
  1) *Content standards*: to address whether the items adequately reflect the content domains that the assessment is intended to measure.
  2) *Performance standards*: classify respondents into categories (e.g., pass/fail).

- #1 has been addressed as part of the continuous activities of methodological work to date, which resulted in the selection of a set of candidate items to measure the three underlying domains.
- #2 is addressed by the standard setting exercise.
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Work process behind the improved ECDI

**Further analyses:**

- Further Item Response Theory Analyses on data from Mexico, Palestine, Belize and the Asia-Pacific dataset for inspection of item difficulty and discrimination.
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Implementation new ECDI

Final set:
Learning domain: 11 questions
Psychosocial wellbeing domain: 5 questions
Health domain: 4 questions

Implementation of new ECDI:

– Standardized questionnaire in 6 languages
– Fieldwork manuals for interviewers and supervisors.
– Scoring instructions and SPSS syntaxes.
THANK YOU

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