Height/Length Measurement Device

Bo Pedersen
James Powell
Nutrition Supply Forum
6 Nov 2019
Agenda

- Overview of Multiple-Indicator Cluster Surveys
- Update on Height/Length Measurement Device
Overview

- Brief introduction to MICS
- Content
- Nutrition supplies - present
- Future
<table>
<thead>
<tr>
<th>Round</th>
<th>Year/Period</th>
<th>Emphasis</th>
<th># of Surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICS1</td>
<td>1995</td>
<td>World Summit for Children Goals</td>
<td>63</td>
</tr>
<tr>
<td>MICS2</td>
<td>2000</td>
<td>World Summit for Children Goals</td>
<td>65</td>
</tr>
<tr>
<td>MICS3</td>
<td>2005-09</td>
<td>World Fit For Children Goals, MDGs, Other Global Monitoring Frameworks</td>
<td>53</td>
</tr>
<tr>
<td>MICS4</td>
<td>2009-13</td>
<td>MDGs, Other Global Monitoring Frameworks</td>
<td>60</td>
</tr>
<tr>
<td>MICS5</td>
<td>2013-16</td>
<td>Final MDG Assessment, A Promise Renewed, Other Global Monitoring Frameworks, baseline for post 2015 goals/targets</td>
<td>52</td>
</tr>
<tr>
<td>MICS6</td>
<td>2016-20</td>
<td>SDGs, other globally recommended indicators, new topics, emerging issues</td>
<td>68</td>
</tr>
</tbody>
</table>
MICS

23
Years

116
Countries

323
Surveys
In MICS

Household Sample

Water Quality Sub-sample

- Women 15-49
- Men Sub-sample 15-49
- U5 0-4
- 5-17 One random 5-17
<table>
<thead>
<tr>
<th>Household</th>
<th>Women Age 15-49</th>
<th>Men Age 15-49</th>
<th>Children Age 5-17</th>
<th>Children Under 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Household Members</td>
<td>Woman’s Background</td>
<td>Man’s Background</td>
<td>Child’s Background</td>
<td>Under-Five’s Background</td>
</tr>
<tr>
<td>Household Characteristics</td>
<td>Fertility/Birth History</td>
<td>Fertility</td>
<td>Child Discipline</td>
<td>Early Childhood Development</td>
</tr>
<tr>
<td>Social Transfers</td>
<td>Desire for Last Birth</td>
<td>Attitudes toward</td>
<td>[5-14]</td>
<td>Child Discipline [1-4 years]</td>
</tr>
<tr>
<td>Household Energy Use</td>
<td>Maternal and Newborn</td>
<td>Domestic Violence</td>
<td>Child Functioning</td>
<td>[2-4 years]</td>
</tr>
<tr>
<td>Insecticide-Treated Nets</td>
<td>Health</td>
<td>Victimization</td>
<td></td>
<td>Breastfeeding and Dietary Intake [0-2 years]</td>
</tr>
<tr>
<td>Water and Sanitation</td>
<td>Post-natal Health Checks</td>
<td>Marriage/Union</td>
<td></td>
<td>Immunization [0-2 years]</td>
</tr>
<tr>
<td>Handwashing</td>
<td>Contraception</td>
<td>Adult Functioning</td>
<td></td>
<td>incl. Facility Form</td>
</tr>
<tr>
<td>Salt Iodization</td>
<td>Unmet Need</td>
<td>[18-49]</td>
<td></td>
<td>Care of Illness</td>
</tr>
<tr>
<td></td>
<td>Female Genital</td>
<td>Sexual Behaviour</td>
<td></td>
<td>Anthropometry</td>
</tr>
<tr>
<td></td>
<td>Mutilation/Cutting</td>
<td>HIV/AIDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attitudes toward Domestic</td>
<td>Circumcision</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Violence</td>
<td>Tobacco and Alcohol</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Victimization</td>
<td>Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marriage/Union</td>
<td>Life Satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adult Functioning [18-49]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Salt test kits
- Length/Height measuring device
- Weight measuring device
- Mean # households ~ 13,000 (880 – 64,000)
- Mean # surveys ~ 15 (5 – 30)
- Somewhat stable
• Well...
• Permanent and increasing demand to include a multitude of questions, some requiring equipment
• Increased demand for “easier” tests and for precision and accuracy – titration, micronutrients
• Counter-pressure to reduce
Coordinates

Multiple Indicator Cluster Surveys
- Web: mics.unicef.org
- E-mail: mics@unicef.org

Attila Hancioglu
Global MICS Coordinator

Bo Robert Beshanski-Pedersen
Household Survey Consultant
Global MICS Team
Innovation Project Update

Nutrition Supply Forum
6 Nov 2019
Current Device

Recent reviews of household survey data quality have shown that the current techniques and devices used to measure height and length of infants, children and adults may not produce accurate results. UNICEF is therefore seeking solutions that are capable of producing highly accurate recorded readings.
Existing Challenges

Measurement
- Wobble of board
- Movement of child
- Reading measurement
- Rounding
- Positioning

Transfer of data
- Writing it down
- Sending it for transfer
- Manual input
Background

Use cases:
• Household Data Collection (MICS, DHS etc.)
• General Growth Monitoring (Communities and clinics)

Currently available sizes:
• A portable baby/child length and height measuring board, made of wood. Accuracy/Precision of the device: ± 0.2 cm. Range 0-120cm.

• A portable baby/child/adult length and height measuring board, made of wood. Accuracy/Precision of the device: ± 0.2 cm. Range 0-210cm. (2 items: main board + extension).
Background

- 65 Thousand Devices Supplied
- 2014-2018
- 11.9 Million USD
Innovation at UNICEF

Gate 0: Exploration
- Research and work to analyse the product gap and UNICEF's specific value add to the product development.
- Customisable Tampon
- Hypothermia Detection Device
- Infant and Young Child Feeding Gadget

Gate 1: Need
- Further understanding of the need from user and markets perspective. Establishing clear value proposition and plan.
- HIV Testing
- Vaccine containing membrane patches
- Smart Pumps

Gate 2: R&D
- R&D of products takes place. UNICEF must identify whether to engage to drive through financial or other incentive.
- Rapid E.coli testing device
- Height/Length Measurement Device
- Zika Diagnostics

Gate 3: Validation
- Validate the product for UNICEF context.
- Amoxicillin Dispensing Envelope
- ARIDA (Acute Respiratory Infection Diagnostic Aid)
- Accessible Latrine Slab Add-On

Gate 4: Transition to Scale
- Develop and test the model for scaling the product in programmes.
- School Furniture Design & Procurement Guidelines
- Oxygen Therapy
- Non-pneumatic anti-shock garment (NASG)
Explore Phase - Research

- Validated the assumed need
- Investigated reasons for the low quality of data
- Identified measurement devices commercial available and technologies in development
- Identified the key stakeholders

Through:
- Literature review
- Interviews and consultations with subject matter experts and key stakeholders
- Interviews with nutrition specialists from the 5 most procuring country offices of measuring boards
- Market review (current products and future measurement technologies)
- Field observations including interviews with measurers during MISC 5, Nigeria
MICS Anthropometric field data collection - Nigeria
Purpose of Project

The goal of the project is to increase the quality of anthropometric data through development of portable, accurate and child-friendly height/length measurement devices.
## Target Product Profile (TPP)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Minimum Performance</th>
<th>Ideal Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy of device</td>
<td>Measurement of static object ± 3 mm</td>
<td>Measurement of static object ± 1mm</td>
</tr>
<tr>
<td>Accuracy of recorded readings</td>
<td>Field measurement of humans (infants, children and adults) recorded by trained surveyors within ± 3 mm</td>
<td>Field measurement of humans (infants, children and adults) recorded by trained surveyors within ± 1mm</td>
</tr>
<tr>
<td>Physical characteristics</td>
<td>The device must be child-friendly and designed to avoid distress or harm of the individual</td>
<td></td>
</tr>
<tr>
<td>Time for Result</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Method of Use</td>
<td>a) Recumbent length of a baby up to 24 months old. b) Height of a child aged 24 months and up in vertical position. c) Height of adults in vertical position.</td>
<td>Measurement of height/length regardless of position and performed with a single device.</td>
</tr>
<tr>
<td>Output</td>
<td>Digital display in cm with one decimal digit</td>
<td></td>
</tr>
<tr>
<td>Operating Conditions</td>
<td>Stored and used in a wide-ranging climate (heat, cold, humid, dry, dust, wet). Used at health clinics and for mobile field use. Often moved in and out of vehicles; carried over distance on harsh and bumpy terrain.</td>
<td>The device is comfortably and easily relocated from one site to another by the use/support of handles, straps of backpacks. Max. 6 kg.</td>
</tr>
<tr>
<td>Portability</td>
<td>The device is comfortably and easily relocated from one site to another by the use/support of handles, straps of backpacks. Max. 6 kg.</td>
<td>The device is comfortably and easily relocated from one site to another by the use/support of handles, straps of backpacks. Max. 2 kg.</td>
</tr>
<tr>
<td>Power requirements</td>
<td>Rechargeable battery lasting for minimum 24 hours</td>
<td>Rechargeable battery lasting minimum 48 hours including a/c plug, DC 12 volt plug (for recharge through a car battery) solar powered battery, or a combination</td>
</tr>
</tbody>
</table>
Tender Update

RFP Issued – 90 vendors invited. 6 submitted offers.

- 10 mandatory Requirements (training <1 day, weight <6kg, digital output)
- Technical Evaluation
  - Company Profile (financial statements, children’s rights, production capacity)
  - Evidence
  - Sample (16 areas: power supply, packaging, ease of set up, ease of operation, dim light settings, stability of device)

Financial Proposal Score

Total Score

Outcome: 2 of the 6 pass the evaluation for field trial.
0 products had regulatory approval in place. Any product contracted will need it prior to LTA being signed.

Top reasons for failing review
- Unavailable for manufacturing
- Inaccurate
- Lack digital output
- Missing components in sample
Next Step

1. Q1 2020 Field Validation of Successful bids
   • User feedback
   • Accuracy
   • Training requirements

2. LTA finalization (pending certifications)

3. Q2 2020 Catalogue inclusion

4. Review more radical approaches.