Implementation of the ASQ: Inventory for 0-12 month children in Madagascar

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In Madagascar, >50% of children are stunted by age 12 months.
Madagascar 5-arm RCT

- Motivated by prevalence of stunting & long-term impact evaluation of the national nutrition program, PNNC
- **Status quo** program as counterfactual
- Arms add **increasing levels of intensity** (cost):
  - Intensive counseling (IC)
  - Add supplementation of child (6-18 mo)
  - Add supplementation of pregnant/lactating mom
  - IC + Early stimulation (home visits)
- Test cost-effectiveness of each layer
- Test the **value added** of each layer to:
  - Reduce growth faltering
  - Promote child development
Madagascar study sample & survey periods

- **125 PNNC communities**, stratified by region (5 regions)
- 10 households per group per community (3750 households):
  - Pregnant women
  - Children 0-6 months
  - Children 6-12 months

- **Baseline**: June-August 2014 *(children 0-12 mo)*
  - Assessed children with the **ASQ: Inventory**

- Intervention started in Sept 2014

- **Follow-up** @18 months after baseline *(children 12-30 mo)*
  - Repeat assessment with the **ASQ: Inventory**
  - Assess a sub-sample with the **Bayley Scales**
# ASQ Assessment Comparison

Two parent report measures

<table>
<thead>
<tr>
<th>ASQ-3</th>
<th>ASQ: Inventory</th>
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</thead>
<tbody>
<tr>
<td>Purpose: Screening</td>
<td>Purpose: Progress monitoring</td>
</tr>
<tr>
<td>Age: 1-66 months (21 age intervals)</td>
<td>Age: 1-54 months (1 questionnaire for all ages)</td>
</tr>
<tr>
<td>5 developmental domains</td>
<td>Same 5 developmental domains</td>
</tr>
<tr>
<td>(communication, gross motor, fine</td>
<td></td>
</tr>
<tr>
<td>motor, problem solving and personal</td>
<td></td>
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<tr>
<td>social)</td>
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<tr>
<td>6 questions within each domain</td>
<td>The number of question varies based on start &amp; stopping rules (earlier items credited, no ceiling effect)</td>
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</table>
ASQ-3 Screening: 6 questions per age group w/ overlapping items

10 months

1. If you hold both hands just to balance her, does your baby support her own weight while standing?

2. When sitting on the floor, does your baby sit up straight for several minutes without using his hands for support?

3. When you stand her next to furniture or the crib rail, does your baby hold on without leaning her chest against the furniture for support?

4. While holding onto furniture, does your baby bend down and pick up a toy from the floor and then return to a standing position?

5. While holding onto furniture, does your baby lower himself with control (without falling or flopping down)?

6. Does your baby walk along furniture while holding on with only one hand?

12 months

1. While holding onto furniture, does your baby bend down and pick up a toy from the floor and then return to a standing position?

2. While holding onto furniture, does your baby lower herself with control (without falling or flopping down)?

3. Does your baby walk along furniture while holding on with only one hand?

4. If you hold both hands just to balance him, does your baby take several steps without tripping or falling? (If your baby already walks alone, check “yes” for this item.)

5. When you hold one hand just to balance her, does your baby take several steps forward? (If your baby already walks alone, check “yes” for this item.)

6. Does your baby stand up in the middle of the floor by himself and take several steps forward?
ASQ: **Inventory**

Continuous measure with age-appropriate starting points & a 3 no’s in-a-row stopping rule

**Scoring:**
0 = Not yet
1 = Sometimes
2 = Yes

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### 6 up to 9 month babies start here:

12. When your baby is on her tummy, does she straighten both arms and push her whole chest off the bed or floor?  
   2-6

13. Does your baby roll from his back to his tummy, getting both arms out from under him?  
   3-6

14. When sitting on the floor, does your baby sit up straight for several minutes without using her hands for support?  
   5-8

15. Does your baby get into a crawling position by getting up on her hands and knees?  
   6-6

### 9 up to 12 month babies start here:

16. When you stand your baby next to furniture or the crib rail, does he hold on without leaning his chest against the furniture for support?  
   6-8

17. If you hold both hands just balance your baby, does he take several steps without tripping or falling? (If your baby already walks alone, mark “yes” for this item)  
   4-12

18. While holding onto furniture, does your baby lower himself with control (without falling or flopping down)?  
   5-10

19. While holding onto furniture, does your baby bend down and pick up a toy from the floor and then return to a standing position?  
   4-10
Different discriminating ability of tests

**ASQ-3 Screening**
- Uses **cutoff scores** to assess need for further assessment
- Does **not show progress** over time

**ASQ: Inventory**
- Allows for **percentile growth charts**
- Allows programs to **monitor development and progress**

5
4
3
2
1
Adapting the ASQ:Inventory for Madagascar

• U of Oregon provided:
  – Table of ordered items and age starting points
  – Initial French translations (ASQ-3)
  – Feedback on issues that arose in adaptation

• Local expert provided:
  – Malagasy translation
  – Adaptation to local context
  – Training of testers
  – 3 rounds of field pilot testing and updates
ASQ Extended: Evidence of validity in multiple countries

- Strong **age trends** – as expected
- Picks up on **differences** by anthropometrics, education and wealth

Additionally, in Mexico, the Extended ASQ showed:

- Parent Engagement Activities with children 4-24 mo are positively & significantly linked to Communication

![Effect Size on EASQ z-score (SD units)]

Source: Kariger, PK, et.al., The use of brief, parent report measures for assessing child development and household stimulation in a large sample of young Mexican children; Unpublished.
Will caregivers be accurate reporters?

Demonstration items

For behaviors that may not have been observed by parent

In Madagascar, ~11% reported child doesn’t tap or try to grab images in a picture book, but the child demonstrated he does.

~8% reported child doesn’t reach out to touch a mirror, but the child demonstrated she does.
Demonstration items
As a validity check of parent report:

11 fine motor & 5 problem solving items
Reported vs. observed scores

Perfect agreement: 36-82% - varies by item
Within +/- 1 point: 87-99%
Under-reporting by 1 point : 7-51% (mostly report=0 vs. observed=1)

Concordance of reported vs. observed total scores is ~0.9 (19 items)
ASQ: Inventory Plans

University of Oregon
• Combining data sets from different projects to develop percentiles
• Collecting data for a concurrent validity study using the Battelle Developmental Inventory
• Checking test-retest reliability

Madagascar project
• Continuing to explore the ASQ:Inventory baseline data
• Expand the ASQ:Inventory adaptation for older children
• Perform a concurrent validity study using the Bayley Scales on a subset of our sample
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