Effect of integrated WASH and Nutrition Programming on Maternal and Child Nutrition in Oromia, Ethiopia

September, 2015
Outline

• Background and Objectives
• Survey Methodology
• Survey Results
• Interviews and FGD Methodology
• Interviews and FGD Results
• Research strengths and limitations
• Recommendations and next steps
• Conclusion
Research Background and Objectives

• Continuous exposure to environments with poor WASH conditions reduces utilization of essential nutrients and hinder nutrient absorption in the gut, leading to both acute and chronic undernutrition.
• Co-programming may break the cycle
Objectives

• Compare nutritional outcomes in women and children within the Oromia Region of Ethiopia that have been exposed to an intervention of one of two types:
  1) health and nutrition only, or
  2) integrated WASH, health and nutrition

• Identify ways in which WASH and nutrition activities are effectively integrated.
• Identify barriers to effective integration of WASH and nutrition activities.
• Identify opportunities for better integration of WASH and nutrition activities.
Survey Methodology

• Cross-Sectional
• 12 DFAP/PSNP kebeles
• Arsi Zone of Oromia Region
  – Sire and Dodota Woredas/districts
• 2-stage random selection:
  – 1) kebeles
  – 2) Sub-Kebeles
• Households (n=1,007) selected by EPI method
• Interviewed mothers of children under 5
• 11 enumerators, 4 supervisors
  – 3 day training, including pilot
• Obtained information from one randomly selected child <5 per HH
Anthropometric Measurements

- **Height/Length**
  - Simple meter (± 1 cm)
  - Height-for-age Z-score (stunting)
- **Weight**
  - Hanging Salter scale (± 0.1 kg)
  - Weight-for-age Z-score (underweight)
  - Weight-for-height Z-score (wasting)
- **MUAC**
  - Data from Health Centers
  - Monthly CHD screenings
  - Children <5 and PLW
Main Indicators

• Demographics
  – Age, gender, education status, family size

• Access to DFAP/PSNP
  – Food/cash transfer received, messages from HEW’s received, seeds, backyard and KHG

• Diet
  – 24-hr food group for mother
  – 24-hr frequency of food group for child
  – Breastfeeding history

• Food security and coping strategies
  – Seasons of adequate food provision
  – Frequency of “coping strategies” during food shortage period

• 2-week disease recall for mother and child
  - Fever, diarrhea, ARI
  - Treatment given for diarrhea

• Medical Record-
  - Measles and BCG vacc, vitamin A and deworming, ANC and iron, access to health post

• Primary and secondary water source
  - Location and availability

• Latrine type and use indicators

• Knowledge of critical handwashing times and materials

• Other behaviors
  - Food storage, water storage, household water treatment, presence of feces near home, separation of animals
Variables of Interest

- **Outcome Variables:**
  - stunting, wasting, underweight, disease status

- **Predictor Variables:**
  - Dietary diversity, food security, handwashing knowledge and practice, primary sanitation facility, primary water source, disease status (for undernutrition variables)

- **Variables to control for:**
  - Education level (SES), gender of HHH, number of children in HH, Immunization status
Intervention Type and Undernutrition in Children under 5

PREVALENCE OF UNDERNUTRITION IN CHILDREN <5 PER INTERVENTION TYPE

- **Health and Nutrition**
- **WASH + Health and Nutrition**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Health and Nutrition</th>
<th>WASH + Health and Nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasting (WHZ&lt;-2)</td>
<td>9.7</td>
<td>6.9</td>
</tr>
<tr>
<td>Wasting (MUAC&lt;12)</td>
<td>2.4</td>
<td>2.6</td>
</tr>
<tr>
<td>Stunting (WAZ&lt;-2)</td>
<td>52.4</td>
<td>35.1*</td>
</tr>
<tr>
<td>Underweight (WAZ&lt;-2)</td>
<td>23.6</td>
<td>13.4*</td>
</tr>
</tbody>
</table>
Intervention Type and Disease Status

PREVALENCE OF DISEASE IN PAST TWO WEEKS PER INTERVENTION TYPE

- **Health and Nutrition**
- **WASH + Health and Nutrition**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Health and Nutrition</th>
<th>WASH + Health and Nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Diarrhea</td>
<td>24.8</td>
<td>21.3</td>
</tr>
<tr>
<td>Child Fever</td>
<td>32.7</td>
<td>19.3*</td>
</tr>
<tr>
<td>Child ARI</td>
<td>14.6</td>
<td>15.7</td>
</tr>
<tr>
<td>Mother Diarrhea</td>
<td>9.2</td>
<td>7.3</td>
</tr>
<tr>
<td>Mother Fever</td>
<td>17.3</td>
<td>12.7*</td>
</tr>
</tbody>
</table>

* indicates a significant difference.
## Toilets Make You Taller…

- Compared to Open Defecation….Odds Ratios for Stunting are:

<table>
<thead>
<tr>
<th>Latrine Type</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pit latrine w/o slab</td>
<td>0.65 (0.42, 0.99)</td>
</tr>
<tr>
<td>Pit latrine w/ cleanable slab</td>
<td>0.38 (0.24, 0.66)</td>
</tr>
<tr>
<td>Latrine w/ slab &amp; hole cover</td>
<td>0.23 (0.07, 0.75)</td>
</tr>
</tbody>
</table>
…They also Reduce Diarrhea and Fevers..

Families belonging to households using an improved sanitation facility experienced:

• **Significantly lower odds of all three childhood illnesses:**
  – Diarrhea, OR: 0.60 (95% CI: 0.44, 0.83)
  – Fever, OR: 0.65 (95% CI: 0.48, 0.88)
  – ARI, OR: 0.67 (95% CI: 0.46, 0.96)

• **Significantly lower odds of fevers in moms**
  – OR: 0.63 (95% CI: 0.44, 0.92)

• **Lower odds of diarrhea in moms**
…and Reduced Diarrhea is Associated with Improved Nutrition.

• Two week **history of diarrhea** was associated with a **46% increase in the odds of stunting** and a **62% increase in the odds of underweight**
  – OR: 1.46 (95% CI: 1.09, 1.97)
  – OR: 1.62 (95% CI: 1.13, 2.32)

• Children with a **history of diarrhea** also had significantly **lower dietary diversity scores** than those without
  – Direction of association unclear, and may be bi-directional
Clean Water Can Help Too…

- As number of days in past week with access to an **improved water source** increases, odds of diarrhea and fever in mothers in the past two weeks decreases.

- Children belonging to households using an **improved water source** had lower odds of diarrhea and wasting and **significantly lower odds of fever, stunting and underweight**
Other Associations

• **Dietary diversity** a better predictor of nutritional outcomes in children than frequency, and strongly correlated with stunting, wasting and underweight

• **Food Security** also strongly correlated with stunting

• **Knowledge of critical handwashing times** as well as **availability of cleaning agent** is weakly correlated with improved nutrition and reduced disease
  – Correlation statistically significant for stunting, underweight, and fevers in mothers
Ranking of Predictors for Undernutrition in Multivariate Analysis

• **Stunting**
  1. Sanitation Facility
  2. Coping Strategy Index (food security)
  3. Dietary Diversity
  4. Water Source

• **Underweight**
  1. Sanitation Facility
  2. Dietary Diversity

• **Wasting**
  1. Dietary Diversity
**Strength**

- Large survey sample size
- Representative sample
- Good coverage of important WASH, nutrition and health indicators
- Triangulation of HH data with observations, water point functionality survey, health center data collection, interviews, ODF days, etc.

**Limitations**

- Measuring devise, especially height
- Market days produced possible selection bias
- Education status proxy for SES only
- Cross-sectional study design
Summary and Recommendations

• Integration of WASH activities into nutrition interventions can significantly reduce acute and chronic undernutrition

• Initiatives such as Community-Led Total Sanitation and Hygiene (CLTSH) aimed at eliminating open defecation, promoting latrine use, and reducing disease may have a particularly strong effect

• Clean water promotes nutritional outcomes through reduction of disease and provision of water for multiple uses, such as agriculture

• Opportunities and structures for integration exist and can save time and money

• Coordination is needed to initiate taking advantage of these opportunities
Thanks!