Changing how we think about cost-effectiveness of addressing childhood anemia

Findings from the Uganda Micronutrient Powders Pilot

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Webinar outline

• Introduction to the MNP study in Uganda
• Why do a costing study?
• What are the different cost components?
• What were the costs of MNP distribution?
• How cost-effective were the programs?
• Study implications and next steps
Anemia Prevalence in Uganda

52.8% among children 6–59 months (DHS 2016)
Anemia Causal Pathway

- INFECTION
- INFLAMMATION
- MICRONUTRIENT DEFICIENCY
- GENETIC BLOOD DISORDERS
- Nutrient availability, absorption, and utilization
- Loss, destruction, or impaired production of red blood cells
- ANEMIA
Addressing Nutritional Anemia through Micronutrient Powders

• Reduce anemia and iron deficiency
• Easy to use
• WHO recommended where prevalence of anemia >20%
Although efficacy of MNP has been established...

...there is little evidence on how to cost-effectively deliver the product.
MNP Pilot Project

• Led by the Ministry of Health’s Micronutrient Technical Working Group
SPRING Costing Research Addresses:

Choice of MNP delivery through...

- **Health facilities**
  - “facility arm”
- OR
- **Village Health Teams**
  - “community arm”
...to eligible children 6-23 months

- Which distribution method results in the best **coverage** and **adherence**?
- Which distribution method is the most **cost-effective**?
- How do different program management structures and **scaling up** affect program costs and cost-effectiveness?
Sub-counties in Namutumba were randomly assigned to one of two MNP delivery platform:

Community-based or Facility-based
MNP Research Timeline 2016-2017

- Mobilization and Orientation
- Distribution (February)
- Qualitative (May)
- MNP Distribution and Data Collection
- Routine data collection (stock levels, VHT/HW reporting, spot checks)
- Costing data collection
- Endline Quantitative / Qualitative (Nov-Dec)
What Can We Learn from a Costing Study?

• Often, we do not know the true cost of health and nutrition interventions.

• This makes it difficult for policy-makers to weigh trade-offs and ensure the efficient allocation of resources.

For our MNP costing study...

1. Identify scope of costing study
2. Costs for Facility and Community delivery channels
3. Identify who bears which costs
4. Costs associated with measures of success ("effects")
5. Scale up over space and/or time
6. Sensitivity analyses
## Elements of Costing Analysis

<table>
<thead>
<tr>
<th>Initial Investments</th>
<th>Start-Up &amp; Ongoing Activities</th>
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<tbody>
<tr>
<td>Costs</td>
<td>Costs</td>
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<tr>
<td>• Capital investments</td>
<td>• Logistics</td>
</tr>
<tr>
<td>• Monthly overhead</td>
<td>• Social behavior change communications</td>
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<tr>
<td>• MNP procurement</td>
<td>• Capacity building</td>
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<td>• Monitoring and evaluation</td>
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### Opportunity Costs

<table>
<thead>
<tr>
<th>Attending Activities</th>
<th>Last Mile</th>
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<tbody>
<tr>
<td>Costs</td>
<td>Costs</td>
</tr>
<tr>
<td>• Cost of time away from normal duties (paid employees and volunteers)</td>
<td>• Time spent distributing VMP</td>
</tr>
<tr>
<td>• Time spent attending activities (trainings and meetings)</td>
<td>• Transportation costs</td>
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</tbody>
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MNP Supply Chain

“Last Mile” - Last steps in the supply chain to deliver MNP to beneficiaries

- Health Workers at Outreach
- Health Workers at Facility
- Final Delivery Point
- VHTs in villages
- Target Households
- Beneficiary, HW or VHT

Costs:
- Procurement Cost
- International Transport + Handling Cost
- Storage Cost / Cost of Requisitions
- Transport + Handling Cost

MNP Pilot Supply Chain

SPRING Office / DHO

Facility Stores at all HC II, III, and IVs
Opportunity Cost of People’s Time

*Opportunity cost of time* = *hours worked* × *estimated hourly wage*

- Time allocation
  - Interviews with HWs and VHTs involved in MNP distribution
- Salaries or Prevailing market wage

**Total Cost** = Budgetary costs + *opportunity cost*

*Total cost reflects the full cost burden to society, and who bears what proportion of each cost.*
Results: Total Cost
Using Pilot Study Cost Data to Construct Programmatic Scenarios

• Pilot Study Cost Scenario
  • Duration – 9 months
  • Targeted children split between two study arms
  • Arm-specific training and other start-up costs
  • Whole-study start-up costs, e.g., SBC costs

• Needed to ‘Translate’ Pilot Study Costs into Programmatic Contexts
  • Multi-year intervention programs – 3-years
  • District-wide focus
  • Smooth some start-up and training costs over 3 years
  • Different ways of managing programs
Comparing Delivery Platforms: Scaled-up to the Entire District for Three Years

Product costs are a large % of total costs
Training costs are high
Last Mile costs loom large

Facility Arm
- $9,182
- $299,538
- $58,234
- $148,910
- $48,814
- $132,973
- $362,638
- $94,507

Community Arm
- $1,797,517
- $9,182
- $532,512
- $58,234
- $144,835
- $501,225
- $105,571

- Monthly Fixed Costs
- MNP Procurement
- Capital Investments
- M&E
- Capacity Building
- SBC
- Logistics
- Opp Cost "Last Mile"
- Opp Cost "Attending Activities"
Scale-Up Scenarios: Alternative Program Management Options
(over 3 years for a whole district similar to Namutumba)

1. Implementing partner scale-up
2. Implementing partner scale-up *with paid VHTs*
3. Ministry of Health takeover
4. Ministry of Health takeover *with paid VHTs*
5. Implementing partner *integrated scale-up*

“Integration” is combining some program elements with existing Infant and Young Child Feeding efforts (trainings, travel, etc.)
## Scale-Up Total Cost Comparisons

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Facility Arm</th>
<th>Community Arm</th>
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<tbody>
<tr>
<td></td>
<td>Total Cost</td>
<td>Total Cost</td>
</tr>
<tr>
<td>Implementing Partner Scale-Up</td>
<td>$1,225,133</td>
<td>$1,797,517</td>
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<tr>
<td>Implementing Partner Scale-Up with Paid VHTs</td>
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<tr>
<td>Ministry of Health Takeover</td>
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<tr>
<td>Ministry of Health Takeover with Paid VHTs</td>
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<tr>
<td>Implementing Partner Integrated Scale Up</td>
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Savings are possible, but program effectiveness and sustainability must be considered.
Summary of Costing Data

- Community arm scenarios are more expensive than facility arm, primarily due to additional VHT costs.
- MNP product cost and Last Mile opportunity costs were the largest portion of total costs (approx. 25% each), followed by capacity building.
- Personnel costs are very large, primarily because of training and product delivery.
- Integration can help reduce costs – up to a point.
  - Integration resulted in a 32% reduction in the MNP budget.
- Though a month’s supply of MNP for one child is inexpensive, total MNP program costs are high because of the large number of children served and the personnel required to provide that service.
Cost-effectiveness
Defining Measures of Program Success (Effects)

**Packets distributed:** inventory flows of packets (2-month supply) distributed in each delivery platform

**Currently consume:** MNP consumed $\geq 1$ time in the last 7 days

**Adhere to protocol:** one sachet of MNP consumed at least 3 times in past 7 days, with food
Cost-effectiveness of Implementing Partner Scale-Up

- **Facility Distribution**:
  - Total Program Cost: $1,225,133
  - MNP packets distributed: 87,538
  - Cost-effectiveness: $0.47 per sachet (2-month supply)

- **Community (VHT) Distribution**:
  - Total Program Cost: $1,797,517
  - MNP packets distributed: 277,396
  - Cost-effectiveness: $6.48 per packet (2-month supply)
  - Cost-effectiveness: $0.22 per sachet
Program success by delivery platform

Currently consume*  
Community Arm: 64%  
Facility Arm: 35%

Adhere to protocol*  
Community Arm: 58%  
Facility Arm: 31%

Children 6-23 months (reported by caregiver)

*Difference between arms is statistically significant

n=543 community arm  
n=521 facility arm
### Cost-Effectiveness Comparison of Three-Year Scale-Up Scenarios
MNP Distribution in Namutumba, Uganda

<table>
<thead>
<tr>
<th>Scale Up Scenario</th>
<th>Cost/Packet Distributed (2-mo supply)</th>
<th>Cost/Child Reached (taken MNP in past week)</th>
<th>Cost/Child Adhered to Protocol</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Community Arm</td>
<td>Facility Arm</td>
<td>Community Arm</td>
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<tr>
<td>Implementing Partner (IP)</td>
<td>$6.48</td>
<td>$14.00</td>
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<td>IP w/ paid VHTs</td>
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<td>MOH Takeover</td>
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<td>MOH Takeover w/ paid VHTs</td>
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#### Key Messages:
1) Community arm is more cost-effective than Facility arm, for all indicators of success;
2) Both platforms are expensive in terms of adherence to protocol
Summary of Cost-effectiveness Results

• Facility arm total costs were lower than community arm costs, regardless of how distribution was managed or by whom

• Community arm was much more effective and hence more cost-effective than facility arm

• Both delivery platforms fell short of expectations regarding consumption of MNP and especially adherence to protocol
  • Therefore, the cost per case of anemia averted may be high
SPRING Cost-effectiveness Research Can Address

• Choice of distribution method
  o Consider cost-effectiveness

• Assessment of who bears which program costs
  o Budgetary costs are much larger than opportunity costs
  o Opportunity costs may be more important in influencing productivity and sustainability

• Preparation for scaling up MNP distribution
  o Which group can/should manage MNP distribution?
  o Can/should VHTs be paid?
    • If so, how much and by whom?
Study implications and next steps for MNP in Uganda

• Results of WFP and UNICEF programs coming in.
• Ministry of Health Micronutrient Technical Working Group reviewing results.
  • Informing MoH budgetary and programmatic decisions
Thank you!
Questions?

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