Strengthening the Economic Evaluation of Multisectoral Strategies for Nutrition (SEEMS-Nutrition)

December 13, 2019

Presented by Carol Levin, PhD
Objectives for today

- Understand **data needs, challenges, and use-cases** of evidence on costs, cost-effectiveness, and cost vs. benefit for agriculture-nutrition investments
- What information do we have on the costs and benefits of nutrition sensitive investments to date?
- Introduce new approach for economic evaluation of nutrition sensitive and multisectoral strategies to improve nutrition
Economic evaluation is used to support decision-making in health, with some health areas more advanced than others.

<table>
<thead>
<tr>
<th>Health Area</th>
<th>Low-income countries</th>
<th>Lower-middle-income countries</th>
<th>Upper-middle-income countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>104</td>
<td>31</td>
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<tr>
<td>Cancers</td>
<td>88</td>
<td>54</td>
<td>6</td>
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<tr>
<td>Infectious disease</td>
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<td>38</td>
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<td>CVD</td>
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<tr>
<td>Respiratory</td>
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<td>39</td>
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</tr>
<tr>
<td>Neonatal &amp; maternal</td>
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<td>8</td>
</tr>
<tr>
<td>TB</td>
<td>31</td>
<td>45</td>
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<tr>
<td>Malaria</td>
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<tr>
<td>Mental health</td>
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<td>Digestive disorders</td>
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<td>Diabetes</td>
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<td>Injuries</td>
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<td>Musculoskeletal</td>
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<td>Diarrhoeal</td>
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<td>Sense organ disorders</td>
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<td>Enocrine, blood, &amp; immune</td>
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<tr>
<td>STD</td>
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<td>Skin &amp; oral</td>
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<td>Meningitis</td>
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<td>Congenital anomalies</td>
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<td>Anemia</td>
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Number of economic evaluations by health area and income group.
## Types of economic evaluations

<table>
<thead>
<tr>
<th>Method</th>
<th>Cost measurement</th>
<th>Description</th>
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<tr>
<td>Cost-effectiveness analysis</td>
<td>$</td>
<td>Compares the net costs and benefits of alternative interventions, where benefits are measured as natural units (e.g., deaths or disease cases averted).</td>
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<tr>
<td>Cost-utility analysis</td>
<td>$</td>
<td>Compares net costs and benefits of alternative interventions, where benefits are measured by a health metric that combines death and disability into a single health metric called quality adjusted life year (QALY) or disability adjusted life year (DALY).</td>
</tr>
<tr>
<td>Cost-benefit analysis*</td>
<td>$</td>
<td>Compares net costs and benefits, where the benefits are assigned a monetary value to the measure of an outcome by alternative interventions.</td>
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<tr>
<td>Cost analysis or cost minimization</td>
<td>$</td>
<td>Collects and analyzes the cost of an intervention.</td>
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<tr>
<td>Cost efficiency analysis</td>
<td>$</td>
<td>Cost per outcome or output achieved by an intervention.</td>
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</tbody>
</table>

*analysis of return on investment (ROI)
Examples where economic evaluation evidence has been used to strengthen decision-making and priority setting

- **Health technology assessment and innovations**
  - Eg, in the introduction of new vaccines or investment in underutilized vaccines that are cost-effective (HPV, HepB, etc)

- **Intervention prioritization**
  - Eg, CEA is critical in identifying a package of interventions for UHC, otherwise the intervention won’t be included
  - Eg, in the development of ART treatment guidelines and other policies

- **New program development or scale-up**
  - Eg, Benefit-cost analysis of wheat flour fortification by the Copenhagen Consensus led to the creation of Haiti’s first food fortification program

- **Funding decisions**
  - Eg, GAVI and Global Fund investment cases
Measuring costs and benefits of nutrition sensitive agriculture investments is tricky to do

Why?

- Limited information on costs and impacts for nutrition sensitive interventions.
  - Much of it is modeled, limited empirical evidence and challenging b/c of cross sectoral nature.
  - Limited published information on costs of agriculture interventions, policies, programs.

- Complex pathways from agriculture to nutrition and health outcomes

- Health and agriculture intervention impacts and costs measured differently—how to combine them?
  - Health: by intervention, facility or individual- derive a unit cost per beneficiary.
  - Agriculture: typically by crop (acre, yield, etc), by household (net income), by enterprise.
  - Spillover effects are harder to measure for agriculture
Current level of economic evidence available for nutrition interventions across sectors

Building on previous work looking at evidence of impact, we reviewed literature for economic evidence for interventions in the Compendium of Action for Nutrition:

- Intervention has cost data
- Intervention has evidence of cost effectiveness or return on investment
- Intervention has evidence of economic outcomes
Nutrition interventions in health that work across the life course

Pregnant women
- Balanced energy protein supplementation
- MMN supplementation
- Calcium supplementation
- Folic acid supplementation
- Iron and iron-folate supplementation
- IPTp and ITN for malaria
- Deworming
- Vitamin D supplementation
- Zinc supplementation
- Omega-3 fatty acid supplementation
- Antenatal psychosocial assessment & MH support
- Control of household air pollution

Neonates
- Delayed cord clamping
  - Neonatal vitamin K administration
  - Vitamin A supplementation
  - Massage for promoting growth in preterm infants
  - Zinc supplementation to treat infections
  - Vitamin E supplementation in preterm infants
- Iron supplementation
  - Folic acid supplementation
  - Family planning, delayed age at first pregnancy, & birth spacing

Infants and children
- Optimal breastfeeding promotion
  - Complementary feeding promotion
  - Management of SAM
  - Management of MAM
  - Vitamin A supplementation
  - Iron supplementation
  - MMN supplementation including iron
  - Lipid-based nutrient supplementation
  - Deworming
  - Malaria prophylaxis and treatment
  - Feeding practices in diarrhea
  - Zinc therapy for diarrhea
  - Vitamin D supplementation
  - Zinc supplementation to treat pneumonia
  - Control of household air pollution

Adolescents and women of reproductive age

Notes
1 Adapted from Synthesis of Evidence of Multisectoral Approaches for Improved Nutrition, November 2017, Banking on Nutrition Partnership
2 Universal salt iodization, included in the agriculture section of the review, is also included in the priority package of interventions listed in Bhutta et al. 2013

Studies show clear evidence of impact on nutrition outcomes
- Intervention has cost data

Studies show clear evidence of impact on intermediate outcomes
- Intervention has evidence of cost effectiveness or return on investment
- Intervention has evidence of economic outcomes
- Intervention is included in the priority package of interventions in The Lancet’s Maternal and Child Nutrition Series (Bhutta et al. 2013)
Interventions in **agriculture** that impact nutrition across the farm-to-fork value chain

### Mass fortification
- **Food safety and aflatoxin prevention**
  - Food storage support
  - Fortification – community
  - Promotion of processing for income generation
  - Enhancing digestibility & nutritional value of foods
  - Malting, drying, pickling, and curing

### Price policies (taxes and subsidies)
- Consumer BCC and education
- Household food storage

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#### Production
- **Biofortification**
- **Home gardening**
- **Food safety and aflatoxin prevention**
- **Cash cropping**
  1. Animal rearing (homestead and extensive)
- **Aquaculture and capture fisheries**
- **Irrigation**
  - Biodiversity (wild foods and local varieties)
  - Improved access to inputs and financing
- **Household and extension worker nutrition**
  - **ed./BCC**
  - Rotation and intercropping
  - Insect farming
  - Production of lipid-based nutrient supplements

#### Processing and storage
- **Marketing regulations**
- **Labeling regulations**

#### Retail and labeling

#### Purchase and consumption

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**Studies show clear evidence of impact on nutrition outcomes**

**Studies show clear evidence of impact on intermediate outcomes**

**Studies show mixed or minimal evidence on outcomes included in the review**

- Intervention has cost data
- Intervention has evidence of cost effectiveness or return on investment
- Intervention has evidence of economic outcomes
- Intervention is included in the priority package of interventions in *The Lancet’s Maternal and Child Nutrition Series* (Bhutta et al. 2013)

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**Notes**

Adapted from *Synthesis of Evidence of Multisectoral Approaches for Improved Nutrition*, November 2017, Banking on Nutrition Partnership

1. Cash cropping also has potential to do harm by decreasing diet diversity, and therefore should only be promoted in contexts in which it could support both income and consumption pathways
Overview of the common approach
Building on ANH Academy Technical Brief

ANH Academy Technical Brief

Economic Evaluation of Multisectoral Actions for Health and Nutrition

www.anh-academy.org

ANH Academy
Agriculture, Nutrition & Health Academy
SEEMS-Nutrition is developing a common approach to guide how economic evaluations for nutrition are conducted.

1. Develop a typology of interventions

2. Map impact pathways and identify program activities, inputs, and costs

3. Develop standardized cost data collection tools and collect cost data alongside impact evaluation

4. Compare program costs and benefits to reflect the relevant question/decision and sector

- Standardized data across programs and countries
- Relevant information to decision makers
- Stronger evidence for nutrition
Step 1: Build on generic typology for interventions

**Figure source:** de la Peña et al. IFAD 2018
Step 2: Map impact pathways and broadly identify program activities, costs and benefits

Source: de Pena et al. 2015
Define activities, inputs and costs based on PIPs

**ACTIVITIES**
- Extension
- Production
- Storage and processing
- Distribution and transport
- Catering, retail, labelling
- Behaviour change

**INPUTS**
- Personnel
- Organisational infrastructure
- Physical inputs – e.g. seed, fertiliser, livestock, equipment
  - Labour, land, water
- Equipment, e.g. thresher
- Vehicles, fuel
- Supplies, equipment, overheads
- Materials, e.g. manuals, seeds, leaflets, platform, e.g. space for meetings, radio airtime, billboards, home visits
  - Personnel, e.g. facilitators / counsellors, management

**COSTS**
- Direct costs to provider for personnel
  - For salaries, incentives, volunteered time, and other staff costs e.g. travel and subsistence
- Institutional fixed and variable costs to provider
  - For personnel management, training, and monitoring systems, office space and utilities, donations
- Opportunity cost to participant
  - For time taken to engage with extension service
- Direct cost to other service provider
  - Of any increased demand for government services
- Direct costs to provider for physical inputs
  - For additional inputs needed, such as fuel to use equipment
- Direct costs to beneficiaries
  - For equipment maintenance and utilities (e.g. fuel), and space for storage and processing
- Opportunity cost for beneficiary
  - For labour, land use, and water use
- Direct cost to provider for equipment (e.g. thresher)
- Direct cost to beneficiary
  - For maintenance costs
- Opportunity cost to beneficiary
  - For labour
- Direct cost to provider for vehicles / fuel provided
- Direct cost to beneficiary
  - For additional inputs needed
- Opportunity cost to beneficiary
  - For labour
- Direct costs to provider of supplies, equipment, overheads
- Direct cost to beneficiary
  - For changing behaviour
- Opportunity cost to participant
  - For uptake of new behaviour
- Direct cost to other service provider
  - Of any increased demand for government services
Identify the full range of outputs and outcomes along the program impact pathway

**Health and Nutrition**
- ↑ use of maternal health services
- Exclusive breastfeeding
- Micronutrient deficiencies
- Anemia & hemoglobin
- Death averted
- Under/over-weight
- Stunting
- Wasting
- Low birthweight
- Illness averted

**Water, Sanitation & Hygiene**
- Water quality
- Water storage
- ↓ Distance of water source to home
- ↓ Girls’ school dropout post-puberty
- ↓ Danger/Shame with open defecation

**Agriculture**
- Production of nutrient-rich foods
- Consumption of nutrient-rich foods
- Intake of macro- & micro-nutrients
- Dietary Diversity

**Livelihoods**
- ↑ Women’s empowerment
- ↓ vulnerability
- ↑ household income
- ↑ access to assets
- Protection from shocks

**Food expenditure**
- Food security
### Step 3: Toward a standard set of outputs and outcomes

#### Activities
- Production
- Storage and processing
- Distribution and transport
- Catering, retail and labeling
- Behavior change communication

#### Inputs
- **Production**
  - Extension, training, seeds, fertilizer, labor, land
- **Storage and processing**
  - Training, infrastructure, personnel, equipment, utilities
- **Distribution and transport**
  - Vehicles, fuel, maintenance, personnel
- **Catering, retail and labeling**
  - Training, personnel, supplies, equipment, overhead
- **Behavior change communication**
  - Training, materials development, personnel, supplies

#### Costs
- **Production**
  - e.g. Direct cost to provider for salaries, incentives and volunteer time...
- **Storage and processing**
  - e.g. Direct cost to provider for equipment...
- **Distribution and transport**
  - e.g. Direct cost to beneficiary for maintenance costs
- **Catering, retail and labeling**
  - e.g. Direct cost to beneficiary for equipment costs
- **Behavior change communication**
  - e.g. Opportunity cost to beneficiary for labour

#### Outcomes
- **e.g. Increased production diversity**
- **e.g. Decreased food contamination**
- **e.g. Increased profits**
- **e.g. Increased profits**
- **e.g. Improved dietary adequacy**
# Toward a standard unit cost typology

<table>
<thead>
<tr>
<th>Intervention Typology</th>
<th>Intervention</th>
<th>Intervention details</th>
<th>Activities/technology</th>
<th>Standard unit of direct (activity/output) cost</th>
<th>Shared multisectoral intervention costs</th>
<th>Standard unit cost integration/multisectoral actions</th>
<th>Standard unit cost intervention (I+G+H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase demand of nutritious foods</td>
<td>Behavior change and communication</td>
<td>Providing information to caregivers to produce nutritious meals for consumption</td>
<td>• Development of training materials</td>
<td>• Cost per nutrition training</td>
<td>• Cost per planning meeting</td>
<td>• Cost per awareness raising*</td>
<td>• Cost per preschool child</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Training of trainers nutrition package for Agriculture extension workers</td>
<td>• Cost per agricultural extension agent changed</td>
<td>• Cost per household reached with inputs</td>
<td>• Cost per household producing nutrient rich foods</td>
<td>• Cost per person</td>
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<td></td>
<td></td>
<td></td>
<td>• Use of training materials</td>
<td>• Cost per meal per preschool child</td>
<td>• Cost per agriculture training</td>
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</tr>
<tr>
<td>Increase supply of nutritious foods</td>
<td>Diversification/promotion of nutritious crops</td>
<td>Training on improved farming practices , along with provision of inputs for nutritious foods</td>
<td>• Development of training materials</td>
<td>• Cost per agricultural extension agent changed</td>
<td>• Cost per agriculture extension visit</td>
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<tr>
<td></td>
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<td></td>
<td>• Training of trainers agriculture package (production, post-harvest, processing) for Agriculture extension workers.</td>
<td>• Cost per household reached with inputs</td>
<td>• Cost per household reached with inputs</td>
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<td></td>
<td></td>
<td></td>
<td>• Use of training materials</td>
<td>• Cost per agriculture extension visit</td>
<td>• Cost per agriculture extension visit</td>
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<td></td>
<td></td>
<td></td>
<td>• Seed distribution and agriculture extension support</td>
<td>• Cost per household producing nutrient rich foods</td>
<td>• Cost per household producing nutrient rich foods</td>
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<tr>
<td>Enabling Environment</td>
<td>Strengthening childcare and parenting practices</td>
<td>Providing information to caregivers for improved care practices</td>
<td>• Development of training materials</td>
<td>• Cost per caring practices training</td>
<td>• Cost per education planning meeting</td>
<td>• Cost per awareness raising*</td>
<td>• Cost per preschool child</td>
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<td></td>
<td></td>
<td>• Training of trainers caring practices package</td>
<td>• Cost per local agent changed</td>
<td>• Cost per education planning meeting</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Use of training materials</td>
<td>• Cost per mother/caregiver reached</td>
<td>• Cost per awareness raising*</td>
<td></td>
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</tr>
</tbody>
</table>

- **Development of training materials**
- **Cost per nutrition training**
- **Cost per agricultural extension agent changed**
- **Cost per meal per preschool child**
- **Cost per planning meeting**
- **Cost per awareness raising**
- **Cost per education planning meeting**
- **Cost per preschool child**
- **Cost per household reached with inputs**
- **Cost per agriculture extension visit**
- **Cost per household producing nutrient rich foods**
- **Cost per awareness raising**
- **Cost per local agent changed**
- **Cost per mother/caregiver reached**
Example of standardized activity cost categories
Step 4: Estimate net costs and benefits

- Health, agriculture, social & economic benefits
The SEEMS-Nutrition common approach is being applied to 6 nutrition projects to generate data on costs and benefits

<table>
<thead>
<tr>
<th>Country</th>
<th>Project/Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nepal</td>
<td><strong>Suahara II</strong>&lt;br&gt;A nationwide multisectoral nutrition strategy aiming to improve nutrition outcomes in women and children in 42 of Nepal's 75 districts.</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td><strong>Soutenir l’Exploitation Famaliales pour Lancer l’Elevage des Volailles et Valoriser l’Economie Rurale (SELEVER)</strong>&lt;br&gt;An integrated poultry value chain and nutrition intervention to improve nutrition status and diets.</td>
</tr>
<tr>
<td>Kenya</td>
<td><strong>MoreMilk</strong>&lt;br&gt;A market-based intervention in the informal dairy sector to generate nutrition and health benefits for children</td>
</tr>
<tr>
<td>Bangladesh</td>
<td><strong>Targeting and realigning agriculture to improve nutrition (TRAIN)</strong>&lt;br&gt;A maternal and child health and nutrition behavior change communication strategy integrated within an agricultural credit program aiming to improve production diversity and income generation.</td>
</tr>
<tr>
<td>Malawi</td>
<td><strong>Nutrition Embedded Evaluation Programme Impact Evaluation (NEEP-IE)</strong>&lt;br&gt;A community-based pre-school meals and household food production intervention to improve children’s diets, currently planning for nationwide scale up.</td>
</tr>
<tr>
<td>Kenya</td>
<td><strong>Marketplace for Nutritious Foods</strong>&lt;br&gt;A skills-building and financial investment project to create local markets full of diverse, nutritious, and affordable foods.</td>
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</tbody>
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* Indicates retrospective analysis
Malawi case study
Watch the IFPRI policy seminar to see an application of SEEMS-Nutrition

Thank you

Acknowledgements  SEEMS Nutrition partners

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<tr>
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