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Changing nutrition behaviors in multi-sectoral agriculture and nutrition programs

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why the “first 1,000 days”?

Figure: World Bank, 2006; References: Shrimpton et al, Pediatr, 2001, Rivera & Habicht, Am J Public Hlth, 1996; Martorell, J Nutr, 1995
essential nutrition actions

1. Promotion of **optimal nutrition for women**

2. Promotion of adequate intake of iron and folic acid and prevention and **control of anemia** for women and children

3. Promotion of **adequate intake of iodine** by all members of the household

4. Promotion of **optimal breastfeeding** during the first six months

5. Promotion of **optimal complementary feeding** starting at 6 months with continued breastfeeding to 2 years of age and beyond

6. Promotion of optimal nutritional care of sick and severely **malnourished children**

7. Prevention of **vitamin A deficiency** in women and children

What theories or methodological perspectives on SBCC should we draw upon?
Focus on knowledge acquisition

Learner is helped to order, classify or arrange information to see similarities and differences

Requires fewer resources than other health education approaches

Stetson & Davis, Health Education in Primary Healthcare Projects, 1999
Can we assume that knowledge acquisition will lead to changes in behaviors?
behavior change communication

- Emphasizes engagement with target populations; not just knowledge, but skills, encouragement and support

- Involves research to identify barriers to behavior change and examines feasibility of adopting new behaviors

- Message development through reinforcing communication channels

- Underlying models are from social psychology

Photo: Alive & Thrive Partner Update, 2013

Stetson & Davis, Health Education in Primary Healthcare Projects, 1999
health belief model

INDIVIDUAL PERCEPTIONS

- Perceived susceptibility to disease "X"
- Perceived seriousness (severity) of disease "X"

MODIFYING FACTORS

- Demographic variables
- Sociopsychological variables

LIKELIHOOD OF ACTION

- Perceived benefits of preventive action minus perceived barriers to preventive action
- Likelihood of taking recommended preventive health action

Cues to Action

- Mass media campaigns
- Advice from others
- Reminder postcard
- Illness of family member/friend
- Newspaper of magazine article

Transtheoretical model/stages of change

1. Precontemplation
   No recognition of need for or interest in change

2. Contemplation
   Thinking about changing

3. Preparation
   Planning for change

4. Action
   Adopting new habits

5. Maintenance
   Ongoing practice of new, healthier behavior

Image: http://www.esourceresearch.org/
social-ecological theory

• **Social Cognitive Theory** *(Bandura, 1986)*
  – People learn not only through their own experience, but also by observing the actions of others
  – Also called “Social Learning Theory”

• **Theory of Reasoned Action** *(Alzen & Fishbein, 1975)*
  – Behavioral intention depends on an individual’s attitude about the behavior and subjective norms
  – “Theory of planned behavior” *(Ajzen, 1985)* builds from this theory

• **Behaviorist theory**
  – Planning (pursuit of long-term objectives)
  – Motivation (short-term cognitive or emotional process)
  – Habit (automated behaviors produced by routine cues)
intervention approaches

• One-on-one counseling
  – Counseling, messaging, interpersonal communication

• Facilitated group discussions
  – Information, education and communication (IEC) materials (e.g. posters, illustrated counseling cards, videos) are useful tools
  – Recipe trials and cooking demonstrations

• Peer-to-peer
  – Positive deviance approaches
  – Diffusion of innovations (Ewert, 1989)
  – Theater and art

• Mass media & social media
  – Social marketing
  – Advocacy
what works? – breastfeeding

• Lay and professional breastfeeding support extended duration of exclusive breastfeeding (RR: 0.81; 95% CI: 0.74-0.89) and any breastfeeding (RR before 4-6 wks: 0.65; 95% CI: 0.51-0.82)

• Lay support especially effective in prolonging exclusive breastfeeding

• Professional support more effective in prolonging any breastfeeding

what works? – complementary feeding (1)

• Programs use a combination of communication approaches including mass-media techniques, one-on-one interactions between community health workers and mothers, and printed materials

• Message action-oriented and based on formative research

• Promotion of EBF, continued BF, optimal complementary feeding (i.e. introduction, texture, frequency, energy-density, diversity, responsiveness)

• Increases in energy density, energy intake (up to 164 kcal/day) and height-for-age Z-scores (HAZ) of children by 0.3 to 0.87 SD

Caulfield et al, Food and Nutrition Bulletin, 1999
Process for the Promotion of Child Feeding (ProPAN)

1. Identify nutrition situation
   • Document review

2. Preparation for fieldwork

3. Data collection
   • Training of field staff
   • Dietary assessment
   • Market survey
   • Semi-structured interviews

4. Analyzing data and prioritizing recommendations

PAHO/UNICEF, 2013
what works? – complementary feeding (2)

• Complementary feeding support without food supplements or conditional cash transfers
  • Reduced stunting in food-secure populations (difference in HAZ between intervention and controls: 0.25 SD; 95% CI: 0.01-0.49)

• Complementary feeding support with food supplements or conditional cash transfers
  • Reduced stunting in food-insecure populations (difference in HAZ between intervention and control: 0.41 SD; 95% CI: 0.05-0.76)

what works? – complementary feeding (3)

• Evaluation of two models of targeting food assistance and BCC at mothers’ clubs in Haiti: preventive vs. recuperative approach

• Recuperative model targeted underweight children 6-59 mo providing them food assistance for 9 mo

• Preventive model targeted all children 6-23 mo and provided up to 18 mo of food assistance; BCC messages were scheduled to ensure delivery of message were age-specific to reach caregivers when they needed the information most

• Mean anthropometric indicators were +0.14 Z-scores higher (HAZ, \( P=0.07 \)) and +0.24 Z-scores higher (weight-for-age (WAZ)/weight-for-height (WHZ), \( P<0.001 \)) in preventive model communities

• In a meta-analysis, SBCC and nutrition education about iron status improvement combined with IFA decreased prevalence of anemia among pregnant and non-pregnant women (RR: 0.58; 95% CI: 0.44-0.76)

• SBCC and nutrition education about iron status improvement alone did not decrease prevalence of anemia among these same target groups (RR: 0.83; 95% CI: 0.69-1.00)
How have nutrition behavior change efforts been employed in multi-sectoral programs?
agriculture-nutrition pathways

• Own production → food consumption
• Income → food purchase
• Income → healthcare purchase
• Food prices → food purchase
• Women’s time use → care capacity
• Women’s workload → maternal energy use
• Women’s control of income → resource allocation

Gillespie et al, The Agriculture Disconnect in India: What Do We Know?, 2012
agriculture-nutrition pathways

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Gillespie et al, The Agriculture Disconnect in India: What Do We Know?, 2012
Income effects of shifts in cash cropping are dependent on prices.

Programs in which subsistence production is maintained are more likely to show positive nutrition outcomes with an increase in income generated from cash cropping.

Increased income does not translate directly into increased food consumption at either the household or child level.

Shifts in control of income from women to men are important.
Village model farms (VMF) serve as distribution points for seeds, animals and training (serve approx. 40 households)

- NGOs provide training and technical assistance to a community-selected leader to manage VMF and facilitate nutrition education among women’s groups

- Women are primary program beneficiaries (e.g. production inputs, training, nutrition education)

- Initial program in Bangladesh but expansion to other countries

consumption patterns among households with homestead gardens

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**Dark-green leafy vegetables in at least 3 of the last 7 days**

- Year 1999: Mothers 37%, Children (6-59 months) 28%
- Year 2000: Mothers 86%, Children (6-59 months) 76%

**Vitamin A intake from fruits and vegetables**

- Year 1999: Mothers 30 μmol/L retinol equivalent per day, Children (6-59 months) 10 μmol/L
- Year 2000: Mothers 230 μmol/L retinol equivalent per day, Children (6-59 months) 40 μmol/L

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challenges & changes

• Only recently have essential nutrition actions and behavior change negotiation for improved nutrition practices among mothers been introduced (HKI, *Nutrition Bulletin*, 2010)

• Introduction of animals into model farms adds enormous complexity

• Programs have not been rigorously evaluated (e.g. Cambodia study; Olney et al, *Food and Nutrition Bulletin*, 2009)
<table>
<thead>
<tr>
<th>Target Crops</th>
<th>Nutrients</th>
<th>Countries</th>
<th>Release Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bean</td>
<td>Iron</td>
<td>DR Congo, Rwanda</td>
<td>2012</td>
</tr>
<tr>
<td>Cassava</td>
<td>Vitamin A</td>
<td>DR Congo, Nigeria</td>
<td>2011</td>
</tr>
<tr>
<td>Maize</td>
<td>Vitamin A</td>
<td>Nigeria, Zambia</td>
<td>2012</td>
</tr>
<tr>
<td>Pearl Millet</td>
<td>Iron</td>
<td>India</td>
<td>2012</td>
</tr>
<tr>
<td>Rice</td>
<td>Zinc</td>
<td>Bangladesh, India</td>
<td>2013</td>
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<tr>
<td>Sweet Potato</td>
<td>Vitamin A</td>
<td>Mozambique, Uganda</td>
<td>2007</td>
</tr>
<tr>
<td>Wheat</td>
<td>Zinc</td>
<td>India, Pakistan</td>
<td>2013</td>
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HarvestPlus, http://www.harvestplus.org/content/crops
Effect of an intervention to introduce OSP in rural Uganda on the prevalence of inadequate vitamin A intakes

biofortification

• Consumers willing to purchase biofortified varieties though little research has been done on farmers’ willingness to adopt biofortified crops

• SBCC needed throughout chain from development to consumption

• Impact evaluations under different climatic and socioeconomic conditions needed to assess effectiveness and farmer acceptance

• Results are positive for the few nutritional impact studies

animal-source food production

• Consistent increases in animal production and positive associations between household income/expenditure and production

• Improvements in dietary intake and nutritional status found when women either played a critical role in the intervention or the intervention included a SBCC component

• Limited evidence of impact on women’s income or workload

• Study design limitations

take-home messages on what works (1)

1. Include nutrition explicitly in program/policy objectives and measure it

1. Both resources and SBCC efforts are needed for behavior change and nutrition improvements – focus on preventive support

2. SBCC works well when multiple, reinforcing communication channels are employed

3. Do your homework – SBCC done right requires formative research

1. Deliver audience-specific, locally-adapted SBCC messages when the audience needs it most

2. Develop an evidence-based program theory to guide programs and assess intermediate outcomes to understand pathways of change
intermediate outcome measures

• Women’s empowerment
  – Women’s time and workload
  – Women’s control over household decisions and income
  – Women’s access to productive assets

• Diet diversity

• Infant and young child feeding practices

• Food security

• Micronutrient status

• Anthropometry

Photo: Tomohiro Hamakawa
7. Consider potential negative consequences of programs and design programs appropriately to minimize unintended negative outcomes

8. Invest in women

9. Improve evaluation designs; RCTs not likely appropriate, but we can draw on their strengths
Impact of agriculture programs on women’s time, workload, control of decisions and resources as well as caregiving practices

Impact on intermediate outcomes

Dearth of data
- participation and characteristics of participants in agricultural interventions
- quality of implementation
- costs and cost-effectiveness
- contextual variation

Trade-offs in emphasis on animal-source foods for nutrition?
How to integrate agriculture and nutrition?

Better reporting of context and intervention details in publications

Stronger evaluation designs

Opportunities for systematic learning across sites?
Thank you