Emerging opportunity to raise nutrition to high global political and fiscal priority

Edward Frongillo
Health Promotion, Education, and Behavior
February 25, 2011
# Nutrition in 20th century

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1912</td>
<td>“Vitamin”, a vital factor in the diet, coined from words &quot;vital&quot; and &quot;amine&quot;</td>
</tr>
<tr>
<td>1941</td>
<td>First Recommended Dietary Allowances (RDAs) established by the National Research Council</td>
</tr>
<tr>
<td>1950-1973</td>
<td>Protein era, which ended with downward revision of estimated protein requirements by WHO</td>
</tr>
<tr>
<td>1969-1977</td>
<td>First generation of data collection for INCAP Longitudinal Study</td>
</tr>
<tr>
<td>1974</td>
<td>Division of Nutritional Sciences formed at Cornell U.</td>
</tr>
<tr>
<td>1960-1979</td>
<td>Energy gap</td>
</tr>
<tr>
<td>1970-1989</td>
<td>Multisectoral nutrition planning, applied nutrition programs, and nutrition surveillance</td>
</tr>
<tr>
<td>1990-2000</td>
<td>Micronutrient deficiencies</td>
</tr>
</tbody>
</table>
Problems and causes, 2000 to present

- Growth faltering
- Low birth weight
- Maternal undernutrition
- Iodine
- Vitamin A
- Iron and zinc deficiencies
- Diarrhea
- HIV and other infectious diseases

- Inadequate infant and child feeding practices
- Female time constraints
- Limited household income and agricultural production
- Food insecurity
- Environmental degradation
- Urbanization

Pelletier, Olson, Frongillo (2011)
Partial solutions, 2000 to present

- Growth monitoring
- Supplementary feeding
- Exclusive breast-feeding
- Complementary feeding
- Nutrition education
- Behavior change communications
- Oral rehydration
- Child spacing
- Fortification
- Vitamin A
- Iron and multiple micronutrient supplementation
- Income generation
- Food aid
- Home gardening
- Agricultural intensification
- Ready-to-use foods

Pelletier, Olson, Frongillo (2011)
Use and interpretation of anthropometry

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991-1995</td>
<td>WHO review of uses and interpretations</td>
</tr>
<tr>
<td>1996</td>
<td>Multicentre Growth Reference Study designed</td>
</tr>
<tr>
<td>1997</td>
<td>Third Report of the World Nutrition Situation from SCN using stunting prevalence</td>
</tr>
<tr>
<td>1997</td>
<td>Multicentre Growth Reference Study starts in Brazil</td>
</tr>
<tr>
<td>2006</td>
<td>WHO Growth Standards released</td>
</tr>
</tbody>
</table>
## Nutrition Milestones

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A reduces mortality</td>
<td>1988</td>
</tr>
<tr>
<td>UNICEF conceptual model</td>
<td>1990</td>
</tr>
<tr>
<td>Malnutrition, infection, and mortality</td>
<td>1993</td>
</tr>
<tr>
<td>Global burden of disease</td>
<td>1996</td>
</tr>
<tr>
<td>Lancet survival series</td>
<td>2003</td>
</tr>
<tr>
<td>Copenhagen consensus of economists</td>
<td>2006, 2008</td>
</tr>
<tr>
<td>World Bank repositioning statement</td>
<td>2006</td>
</tr>
<tr>
<td>Lancet child development series</td>
<td>2007</td>
</tr>
<tr>
<td>Lancet nutrition series</td>
<td>2008</td>
</tr>
</tbody>
</table>
Figure S.1  Impact of Vitamin A Supplementation on Mortality of Infants and Children Six Months to Five Years

Note: Shown are the point estimates and 95% Confidence Intervals for the eight original studies reviewed in detail. Also shown are two summary estimates for the relative effect, taking into account all 8 studies. These have the same point estimates, a 23% reduction in mortality, but differ in the estimated Confidence Intervals. The second estimate (random effects) takes into account the between study variation that we believe exists. The first estimate (fixed effect) assumes that there is a single true RR for all studies. The Prediction interval for a future programme or study is also presented. Again the predicted average effect is 23% but the interval describing possible actual effects is greatly expanded (see text for explanation).
Weight loss
Growth faltering
Lowered immunity
Mucosal damage

Inadequate dietary intake

Appetite loss
Nutrient loss
Malabsorption
Altered metabolism

Disease:
• Incidence
• Severity
• Duration

SCN 1993
Malnutrition-Infection Synergy

- Malnutrition increases case-fatality rate of infection
- Malnutrition **directly** results in more than \( \frac{1}{2} \) of child deaths through potentiating effect of infection
- Majority of these child deaths result from mild-to-moderate malnutrition

Pelletier, Frongillo, and Habicht (1993-1995)
Major causes of death among children under five, world, 2000

- Pneumonia: 20%
- Diarrhoea: 12%
- Malaria: 8%
- Measles: 5%
- HIV/AIDS: 4%
- Perinatal: 22%
- Deaths associated with undernutrition: 60%
- Other: 29%

Sources:
For cause-specific mortality: EIP/WHO.
Child Survival (<5 y age)

- Annual global child deaths 10.8 million
  - 20 per minute
  - 29,000 or 200 airplane crashes per day
- 3/4 of child deaths occur in sub-Saharan Africa and south Asia
- 2/3 of child deaths could be prevented by interventions that are
  - available today
  - are feasible for implementation in low-income countries at high levels of population coverage

Figure 2: Funding for child survival by the US Agency for International Development (USAID)
Data are millions of US$ and proportion of total USAID health budget. Data taken from reference 21. Values for 2003 are planning levels.
Figure 8: Leading global risk factors and contributions to global burden of disease

- Infant & maternal underweight
- Unsafe sex
- High blood pressure
- Tobacco
- Alcohol
- Unsafe water, sanitation and hygiene
- High cholesterol
- Indoor smoke from solid fuels
- Iron deficiency
- High BMI
- Zinc deficiency
- Low fruit and veg intake
- Vitamin A deficiency

% DALYs

- Developing Countries with High Mortality
- Developing Countries with Low Mortality
- Developed Countries

Nutrition: 7/13
Copenhagen Consensus 2008

<table>
<thead>
<tr>
<th>SOLUTION</th>
<th>1</th>
<th>Micronutrient supplements for children (vitamin A and zinc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2  The Doha development agenda</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3  Micronutrient fortification (iron and salt iodization)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4  Expanded immunization coverage for children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5  Biofortification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6  Deworming and other nutrition programs at school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7  Lowering the price of schooling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8  Increase and improve girls’ schooling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9  Community-based nutrition promotion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reducing Malnutrition is essential to poverty reduction

Malnutrition ↔ Poverty

- GDP losses ≥ 2-3%
- Leads to a >10% potential reduction in lifetime earnings for each malnourished individual
- Malnutrition (stunting) in early years linked to a
  - 4.6 cm loss of height in adolescence
  - 0.7 grades loss of schooling
  - 7 month delay in starting school

(Improved nutrition can be a driver of growth)

How Can we Improve Nutrition?

**Short routes:**
Exclusive breast-feeding, appropriate complementary feeding, ante-natal care for mothers, ... (Knowledge, behavior change/demand side interventions); gender interventions, micronutrient supplementation & fortification

**Long routes:**
Income growth, women’s education, agriculture and food production interventions, trade policies, macro-economic policies...
Figure 4: DQ or IQ scores of stunted and non-stunted Jamaican children from age 9–24 months to 17–18 years. Figure shows long-term deficits associated with stunting and the sustained benefits to stunted children who received a home-visiting programme providing early childhood stimulation. WISC-R=Wechsler Intelligence Scale for Children—revised. WAIS=Wechsler Adult Intelligence Scale. Reproduced with permission from Walker SP, Chang SM, Powell CA, Grantham-McGregor SM. Effects of early childhood psychosocial stimulation and nutritional supplementation on cognition and education in growth-stunted Jamaican children: prospective cohort study. Lancet 2005; 366: 1804–07.
**Figure 5**: Effects of food supplementation given to stunted children (Jamaica) or to pregnant women and their offspring through age 3 years (Bogota, Colombia) on developmental levels (DQ). Data points represent mean values reported in the papers.
About the Series

Paper 1: prevalence and short-term consequences (deaths and disease burden)

Paper 2: long-term educational and economic effects and associations with adult chronic diseases

Paper 3: evidence-based interventions to significantly reduce the effects of undernutrition

Papers 4 & 5: scaling up interventions through actions at national and global levels

www.GlobalNutritionSeries.org
### Prevalence of stunting

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All of Africa</td>
<td>40.3</td>
<td>39.8</td>
<td>39.3</td>
<td>38.5</td>
</tr>
<tr>
<td>North</td>
<td>29.4</td>
<td>27.4</td>
<td>25.5</td>
<td>23.0</td>
</tr>
<tr>
<td>East</td>
<td>48.1</td>
<td>47.4</td>
<td>46.7</td>
<td>45.7</td>
</tr>
<tr>
<td>West</td>
<td>38.1</td>
<td>38.1</td>
<td>38.1</td>
<td>38.1</td>
</tr>
<tr>
<td>Middle</td>
<td>45.3</td>
<td>43.8</td>
<td>42.3</td>
<td>40.3</td>
</tr>
<tr>
<td>South</td>
<td>35.4</td>
<td>34.7</td>
<td>34.1</td>
<td>33.3</td>
</tr>
<tr>
<td>All of Asia</td>
<td>48.6</td>
<td>43.1</td>
<td>37.7</td>
<td>30.6</td>
</tr>
<tr>
<td>East</td>
<td>35.9</td>
<td>28.2</td>
<td>21.7</td>
<td>14.4</td>
</tr>
<tr>
<td>South-central</td>
<td>60.7</td>
<td>54.6</td>
<td>48.4</td>
<td>39.9</td>
</tr>
<tr>
<td>South-east</td>
<td>47.0</td>
<td>41.5</td>
<td>36.2</td>
<td>29.4</td>
</tr>
<tr>
<td>West</td>
<td>28.2</td>
<td>25.9</td>
<td>23.7</td>
<td>20.9</td>
</tr>
<tr>
<td>LA and C</td>
<td>23.7</td>
<td>20.9</td>
<td>18.1</td>
<td>14.8</td>
</tr>
<tr>
<td>All</td>
<td>44.4</td>
<td>40.1</td>
<td>36.1</td>
<td>32.5</td>
</tr>
</tbody>
</table>

SCN (2010)
178 Million Children Under 5 Suffer from Stunting
90% of All Stunted Children Live in Just 36 Countries
Vietnam stunting prevalence by province 2005
Stunting

Birth size
- Fetal growth
- Gest. age

Post-natal growth
- Food intake, illness
- Parenting practices (BF, CF, hygiene, interaction)

Maternal size, nutrition, wt. gain
- Adolescent size, nutrition
How can we improve nutrition?

The “Window of Opportunity” for Improving Nutrition is very small...pre-pregnancy until 18-24 months of age.

Data Source: Shrimpton et al (2001)
Figure 2: Core problems reducing the effectiveness of the international nutrition system
Figure 5.1 Principal development partners supporting nutrition

Fragmentation and Rivalry

World Bank 2006
Key Challenges at National Level

1. Getting nutrition on the national agenda
   - Build stable nutrition agenda that survives political and administrative changes
   - Build recognition that nutrition determines human, social, and economic development

Lancet Nutrition Series 2008 Paper 4
Key Challenges at National Level

2. Doing the right things
   – Implement high-impact actions at high coverage
   – Incorporate nutrition into economic and social policies (i.e., poverty, trade, agriculture)

3. Not doing the wrong things
Key Challenges at National Level

4. Acting at scale
   – Scale up delivery and strengthen health systems
   – Think in new ways about the private sector

5. Reaching those in need
Key Challenges at National Level

6. Using data for decision making
   – Monitoring and assessment of process and results
   – Public accountability

7. Building strategic and operational capacity
   – Be location-specific
   – Build institutions (i.e., training is not enough)
Sector Approach

• Nutrition not well placed (or not at all) in most countries
• Power and money flow through various sectors
• Attempts to get sectors to work together for nutrition is not the solution
• Converge nutrition into each relevant sector
• World Bank: start with health sector
Need to build:

• Consensus (through sociopolitical processes)
• Capacity (to make strategic policy decisions and implement them)
• Commitment (through enhancing and supporting motivation)
Global Change in MNCH

Past global nutrition initiatives have been successful:
• Breastfeeding promotion
• Diarrheal disease management

Motivation

What did it take to be successful?

Knowledge and Skills

What motivates people?
What knowledge and skills do people need?

Supportive Institutional and System Structures

What institutional and system structures support change?

Strategies are different at every level:
- policy makers
- program providers
- health workers
- population

Involves changes at every level – from policy through programs to front-line workers and population behavior – comprising a movement
## Responding to Challenges

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainstreaming Nutrition Initiative</td>
<td>2006-2010</td>
</tr>
<tr>
<td>Gates Foundation nutrition strategy</td>
<td>2006</td>
</tr>
<tr>
<td>Standing Committee on Nutrition meeting (Rome)</td>
<td>2007</td>
</tr>
<tr>
<td>Gates Foundation Alive &amp; Thrive Program</td>
<td>2008-2013</td>
</tr>
<tr>
<td>Standing Committee on Nutrition meeting (Hanoi)</td>
<td>2008</td>
</tr>
<tr>
<td>Session on policy processes at ICN (Bangkok)</td>
<td>2009</td>
</tr>
<tr>
<td>Reach Initiative (UNICEF, WFP)</td>
<td>2009-present</td>
</tr>
<tr>
<td>Global Action Plan for Nutrition</td>
<td>2009-2010</td>
</tr>
<tr>
<td>Discussion at G8 meeting in Canada</td>
<td>2010</td>
</tr>
<tr>
<td>Scaling Up Nutrition and 1,000 Days</td>
<td>2010-present</td>
</tr>
</tbody>
</table>
Locus of decisions & action
• National Government
• Ministries
• Regional Teams
• District Teams
• NGO’s
• International Agencies
• Development Partners

Core Domains

Epidemiological

Sociopolitical

Operational

Policy Stages
• Agenda-Setting
• Policy Choice
• Instrument Design
• Implementation
• Monitoring & Evaluation
• Modification

Epidemiological

• *What* nutrition interventions are critical to deliver?
• *When* during the lifecycle?
Operational

• *How* can the delivery of nutrition interventions be integrated with other MCH programs, services, and initiatives?

• *Who* can deliver interventions?

• *How much* will delivering key interventions cost?
Sociopolitical

• *How* is the nutrition problem perceived?
• *What* are the values and interests of people and organizations who will need to take action to move the nutrition agenda?
• *Why* might organizations buy into the nutrition agenda (or not)?
Lapping, Frongillo, Studdert, Menon, Coates, Webb (HPP, 2011)
Key Strategies and Actions

1. Placement of the researcher as a participating observer
2. Orientation meetings with key Vietnamese entities and international agencies to galvanize support for the work and to ensure efforts were vetted and informed by local partners
3. Site visits to remote and ethnic minority areas of Viet Nam to better understand the implementation issues around translating policy into better nutrition outcomes
4. Formation of the Nutrition Partnership Group
5. Targeted meetings
Key Factors

1. Creation of a cohesive policy community
2. Clearly defined internal and external frames articulated through a series of
3. High-profile events that functioned as policy windows
Key Drivers of Process

1. Importance of personal relationships with people in key institutions
2. Ability to identify, create, and make use of opportunities that catalyzed the process
Key results from MNI work in five countries*

1. Strengthening the full spectrum of policy activities is necessary if large-scale and sustained reductions in undernutrition are to be achieved.

2. High priority should be given to strengthening strategic capacities because these are fundamental for...a long-term nutrition agenda at country level.

*Bangladesh, Bolivia, Guatemala, Peru, Vietnam

Pelletier, Frongillo, Gervais, Hoey, Menon, Ngo, Stoltzfus, Ahmed, Ahmed (HPP, 2011)
Key results from MNI work in five countries

3. These conclusions are especially relevant for major global initiatives currently under development that seek to address nutrition through country-led processes and convergence among multiple organizations.

4. The extensive investments in documenting the efficacy of nutrition interventions are unlikely to produce sustainable reductions in undernutrition unless or until these weaknesses in the policy spectrum are better understood and addressed.
Responding to Challenges

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainstreaming Nutrition Initiative</td>
<td>2006-2010</td>
</tr>
<tr>
<td>Gates Foundation nutrition strategy</td>
<td>2006</td>
</tr>
<tr>
<td>Standing Committee on Nutrition meeting (Rome)</td>
<td>2007</td>
</tr>
<tr>
<td>Gates Foundation Alive &amp; Thrive Program</td>
<td>2008-2013</td>
</tr>
<tr>
<td>Standing Committee on Nutrition meeting (Hanoi)</td>
<td>2008</td>
</tr>
<tr>
<td>Session on policy processes at ICN (Bangkok)</td>
<td>2009</td>
</tr>
<tr>
<td>Reach Initiative (UNICEF, WFP)</td>
<td>2009-present</td>
</tr>
<tr>
<td>Global Action Plan for Nutrition</td>
<td>2009-2010</td>
</tr>
<tr>
<td>Discussion at G8 meeting in Canada</td>
<td>2010</td>
</tr>
<tr>
<td>Scaling Up Nutrition and 1,000 Days</td>
<td>2010-present</td>
</tr>
</tbody>
</table>
SUN Framework for Action

• Start from the principle that what ultimately matters is what happens at the country level.
  – Individual country nutrition strategies and program, while drawing on international evidence of good practice, must be country-“owned” and built on the country’s specific needs and capacities.

• Sharply scale up evidence-based cost-effective interventions to prevent and treat undernutrition, with highest priority to the minus 9 to 24 month window of opportunity where we get the highest returns from investments.
  – A conservative global estimate of financing needs for these interventions is $10+ billion per year.
**SUN Framework for Action**

- Take a multi-sectoral approach that includes integrating nutrition in related sectors and using indicators of undernutrition as one of the key measures of overall progress in these sectors.
  - **food security** (including agriculture)
  - **social protection** (including emergency relief)
  - **health** (including maternal and child health care, immunization and family planning)
  - education
  - water-supply and sanitation
  - gender equality
  - governance (including accountability and corruption)
  - state fragility

- Provide substantially scaled up domestic and external assistance for country-owned nutrition program and capacity
**SUN Task Forces**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Strengthen in-country capacity</td>
</tr>
<tr>
<td>B</td>
<td>Communication for scaling up nutrition</td>
</tr>
<tr>
<td>C</td>
<td>Civil society participation</td>
</tr>
<tr>
<td>D</td>
<td>Engagement of development partners</td>
</tr>
<tr>
<td>E</td>
<td>Engagement of business community</td>
</tr>
<tr>
<td>F</td>
<td>Monitoring and evaluation and reporting</td>
</tr>
</tbody>
</table>

“Need for studies on governance options and processes that lead to the emergence and empowerment of nutrition leaders”
What we can contribute through research

• How to achieve strategic capacity: individual and institutional capacity to:
  – Broker agreements
  – Resolve conflicts
  – Build relationships
  – Respond to recurring challenges and opportunities
  – Undertake strategic communications

• Sociopolitical processes, especially understanding how to build at all levels:
  – Awareness
  – Consensus
  – Commitment
  – Planning and design
  – Implementation
  – Evaluation, learning, and modification
What we can contribute through research

- Operational processes, especially understanding:
  - Worker and recipient motivations, demands, and capabilities
  - Contact points and delivery mechanisms
  - Integration into health systems

- Epidemiological, especially understanding how responses to actions depend on conditions:
  - Biological
  - Behavioral
  - Social
  - Physical
What we can contribute through building capacity

• Strategic (individual and institutional) capacity

• Operational
  – Understand opportunities and constraints from insider’s view
  – Motivate workers and recipients and help balance their demands and capabilities
  – Choose or design contact points and delivery mechanisms
  – Integrate new actions into health systems without harming them

• Epidemiological
Relative advantages of USC

- Capabilities for working together in collaborative and interdisciplinary ways
- Interest and experience on both problem and solutions sides, and capable investigators working across both sides
- Expertise in biological, behavioral, social, and physical conditions
Further information

• 1000 days
  http://www.state.gov/secretary/rm/2010/09/147512.htm

• Scaling Up Nutrition