The Lancet Series on Maternal and Child Nutrition

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Series Background

✓ 2008 Series identified need to focus on critical period during pregnancy and first two years of life, the 1,000 days in which good nutrition and healthy growth have lifelong benefits.

✓ 2008 Series also called for greater priority for national nutrition programs, stronger integration with health programs, enhanced inter-sectoral approaches and more focus and coordination in the global nutrition system.

✓ Five years on, we re-evaluate problems of maternal and child undernutrition, consider growing problem of overweight and obesity for women and children and assess the current and needed national and global response.
Series Overview

✓ **Paper 1:** prevalence and consequences of nutritional conditions during life course from adolescence (for girls) through pregnancy to childhood and implications for adult health

✓ **Paper 2:** evidence supporting nutrition-specific interventions, health impact and cost of scaling up

✓ **Paper 3:** nutrition-sensitive interventions and approaches and their potential to improve nutrition

✓ **Paper 4:** the features of an enabling environment for nutrition and how they can be favourably influenced

✓ **Comment:** examines what is currently being done, and what should be done nationally and internationally
Framework for Actions to Achieve Optimum Fetal and Child Nutrition and Development

Benefits during the life course
- Cognitive, motor socioemotional development
- School performance and learning capacity
- Adult stature
- Work capacity and productivity
- Obesity and NCDs

Nutrition specific interventions and programmes
- Adolescent health and preconception nutrition
- Maternal dietary supplementation
- Micronutrient supplementation or fortification
- Breastfeeding and complementary feeding
- Dietary supplementation
- Dietary diversification
- Feeding behaviours and stimulation
- Treatment of severe acute malnutrition
- Disease prevention and management
- Nutrition interventions in emergencies

Nutrition sensitive programmes and approaches
- Agriculture and food security
- Social safety nets
- Early child development
- Maternal mental health
- Women's empowerment
- Child protection
- Classroom education
- Water and sanitation
- Health and family planning services

Optimum fetal and child nutrition and development
- Breastfeeding, nutrient rich foods, and eating routine
- Feeding and caregiving practices, parenting stimulation
- Low burden of Infectious diseases
- Food security, including availability, economic access, and use of food
- Feeding and caregiving resources (maternal, household, and community levels)
- Access to and use of health services, a safe and hygienic environment

Knowledge and evidence
- Politics and governance
- Leadership, capacity, and financial resources
- Social, economic, political, and environmental context (national and global)

Building an enabling environment
- Rigorous evaluations
- Advocacy strategies
- Horizontal and vertical coordination
- Accountability/incentives regulation, legislation
- Leadership programmes
- Capacity investments
- Domestic resource mobilisation
32.4 million babies were born SGA in 2011; 27% of all births in LMICs
Risks of SGA for Mortality and Preterm Birth for Neonatal Mortality

Reductions in child mortality could be achieved by targeting interventions to reach babies born too small or too soon.
Risk of SGA for Stunting

20% of stunting by 24 months can be attributed to being SGA
Stunting Rate is Slowly Decreasing

165 million children under five are stunted (25.7%)

2.1% annual rate of reduction is not fast enough to reach WHA target
Prevalence of Wasting and Severe Wasting in Children <5 Years Old by UN Regions, 2011

52 million children under 5 are wasted, 19 million severely wasted
Breastfeeding Practices by UN Region During 2000-2010

- **Exclusive breastfeeding for 6 months only 30% or less in UN regions**

![Bar chart showing breastfeeding practices by region.](chart)

- Early initiation of breastfeeding
- Exclusive breastfeeding (1-5 months)
- Predominant breastfeeding (1-5 months)
- Partial breastfeeding (1-5 months)
- No breastfeeding (1-5 months)
- Any breastfeeding (6-23 months)
Child Deaths Attributed to Nutritional Conditions

Undernutrition (fetal growth restriction, sub-optimal breastfeeding, stunting, wasting and deficiencies of vitamin A and zinc) is responsible for 45% of all under five child deaths, representing more than three million deaths each year (3.1 million of the 6.9 million child deaths in 2011).

Fetal growth restriction and sub-optimal breastfeeding together are responsible for more than 1.3 million deaths, or 19.4% of all under five child deaths, representing 43.5% of all nutrition-related deaths.

Deficiencies of vitamin A and zinc are responsible for nearly 300,000 child deaths.
Short stature, low BMI and vitamin and mineral deficiencies in pregnancy contribute to maternal morbidity and mortality, fetal growth restriction, infant mortality and stunted growth and development.

Stunting of growth in the first 2 years of life affects 165 million children who have elevated risk of mortality, cognitive deficits and increased risk of adult obesity and non-communicable diseases.

Vitamin A and zinc deficiencies in young children increase the risk of death from infection and other micronutrients have important developmental consequences.

This new evidence strengthens the case for a continued focus on the critical 1,000 day window during pregnancy and the first two years of life, highlighting the importance of intervening early in pregnancy and even prior to conception.
Packages of Nutrition Interventions

- **Optimal maternal nutrition during pregnancy**
- **Infant and young child feeding**
- **Micronutrient supplementation in children at risk**
- **Management of acute malnutrition**

1. Maternal multiple micronutrient supplements to all
2. Calcium supplementation to mothers at risk of low intake
3. Maternal balanced energy protein supplements as needed
4. Universal salt iodization
5. Promotion of early, exclusive breastfeeding for 6 months; continued breastfeeding until 24 months
6. Appropriate complementary feeding education in food secure populations and additional complementary food supplements in food insecure populations
7. Vitamin A supplementation between 6-59 months age
8. Preventive zinc supplements between 12-59 months of age
9. Supplementary feeding for moderate acute malnutrition
10. Management of severe acute malnutrition
11. Management of acute malnutrition
LiST Modeling Effects on Mortality for 34 High Burden Countries

Figure 2: Linkages between risk factors, interventions, and mortality in LiST
LiST=Lives Saved Tool. MMN=multiple micronutrients. BEP=balanced energy protein. SGA=small-for-gestational-age. SAM=severe acute malnutrition. MAM=moderate AM.
Countries With High Burden of Malnutrition

These 34 countries account for 90% of the global burden of malnutrition
Impacts on Mortality and Stunting

Mortality in children younger than 5 years could be reduced by 15% (range 9-19%)

- 35% (19-43) reduction in diarrhoea-specific mortality
- 29% (16-37) reduction in pneumonia-specific mortality
- 39% (23-47) reduction in measles-specific mortality
- Reduced deaths due to asphyxia and congenital anomalies
- Little effect on maternal mortality

Stunting overall reduced by at least 20.3% (range 11.1-28.9%)

Severe wasting reduced overall by 61.4% (range 35.7-72%)
Effect of Scale-up Interventions on Deaths in Children Younger than 5 Years

- Management of SAM
- Preventive zinc supplementation
- Promotion of breastfeeding
- Appropriate complementary feeding
- Management of MAM
- Periconceptual folic acid supplementation or fortification
- Maternal balanced energy protein supplementation
- Maternal multiple micronutrient supplementation
- Vitamin A supplementation
- Maternal calcium supplementation

Number of deaths of children <5 years averted
### Effect of Packages of Nutrition Interventions at 90% Coverage

<table>
<thead>
<tr>
<th>Nutrition interventions</th>
<th>Number of lives saved</th>
<th>Cost per life-year saved</th>
</tr>
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<tbody>
<tr>
<td>Optimum maternal nutrition during pregnancy</td>
<td>102,000 (49,000-146,000)</td>
<td>$571 (398-1,191)</td>
</tr>
<tr>
<td>Infant and young child feeding</td>
<td>221,000 (135,000-293,000)</td>
<td>$175 (132-286)</td>
</tr>
<tr>
<td>Micronutrient supplementation in children at risk</td>
<td>145,000 (30,000-216,000)</td>
<td>$159 (106-766)</td>
</tr>
<tr>
<td>Management of acute malnutrition</td>
<td>435,000 (285,000-482,000)</td>
<td>$125 (119-152)</td>
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Potential Impact of Scaling Up 10 Proven Interventions

Continued investment in nutrition-specific interventions and delivery strategies to reach poor segments of the population at greatest risk can make a significant difference.

If these 10 proven nutrition-specific interventions were scaled-up from current population coverage to 90%, we could:

- Save an estimated 900,000 lives in 34 high burden countries (where 90% of the world’s stunted children live)
- Reduce the number of children with stunted growth and development by 33 million

On top of existing trends, the WHA targets for 2025 are reachable.
## Total Addition Annual Cost of Achieving 90% Coverage with Nutrition Interventions

<table>
<thead>
<tr>
<th>Nutrition interventions</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Salt iodisation</td>
<td>$68</td>
</tr>
<tr>
<td>Multiple micronutrient supplementation in pregnancy (includes iron-folate)</td>
<td>$472</td>
</tr>
<tr>
<td>Calcium supplementation in pregnancy</td>
<td>$1914</td>
</tr>
<tr>
<td>Energy-protein supplementation in pregnancy</td>
<td>$972</td>
</tr>
<tr>
<td>Vitamin A supplementation in childhood</td>
<td>$106</td>
</tr>
<tr>
<td>Zinc supplementation in childhood</td>
<td>$1182</td>
</tr>
<tr>
<td>Breastfeeding promotion</td>
<td>$653</td>
</tr>
<tr>
<td>Complementary feeding education</td>
<td>$269</td>
</tr>
<tr>
<td>Complementary feeding supplementation</td>
<td>$1359</td>
</tr>
<tr>
<td>SAM management</td>
<td>$2563</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$9559</strong></td>
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Data are 2010 international dollars, millions.
Promising interventions exist to improve maternal nutrition and reduce fetal growth restriction and small-for-gestational age (SGA) births in appropriate settings in developing countries, if scaled up

A set of 10 evidence based interventions if implemented at scale can save at least 15% of under 5 child deaths (i.e. 900 000 lives saved) and avert a fifth of all stunting

Delivery strategies exist to especially target undernutrition and impact child mortality among the poorest, particularly community health workers

The costs for scaling up these nutrition specific interventions globally is $9.6 billion, affordable given the gains

A clear need exists to introduce promising evidence-based interventions in the preconception period and adolescents and also address the impact on long-term neurodevelopmental outcomes
Nutrition-sensitive Programmes Can Impact Nutrition: Through Increases in Income

A 10% increase in GDP/PC leads to a 6% reduction in stunting
**Definition:**

**Nutrition-Sensitive Interventions and Programs**

Interventions or programs that address the **underlying determinants** of fetal and child nutrition and development—food security; adequate caregiving resources at the maternal, household and community levels; and access to health services and a safe and hygienic environment—and incorporate specific nutrition goals and actions.

Nutrition-sensitive programs can serve as delivery platforms for nutrition-specific interventions, potentially increasing their scale, coverage, and effectiveness.

**Examples**

<table>
<thead>
<tr>
<th>Agriculture and food security</th>
<th>Social safety nets</th>
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<tbody>
<tr>
<td>Early child development</td>
<td>Maternal mental health</td>
</tr>
<tr>
<td>Women’s empowerment</td>
<td>Child protection</td>
</tr>
<tr>
<td>Schooling</td>
<td>Water, sanitation, and hygiene</td>
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<tr>
<td>Health and family planning services</td>
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</tbody>
</table>
Nutrition-sensitive Programmes Can Impact Nutrition: Through Empowerment of Women

There is evidence that men and women allocate food and other resources differently

Evidence shows:

Positive associations between dimensions of women’s empowerment and improved maternal and child nutrition

Negative associations between disempowerment (e.g. domestic violence) and child nutrition outcomes

Positive impacts of cash transfers and agricultural programmes on measures of women’s empowerment
## Evidence Review of Programmes from 4 Sectors

<table>
<thead>
<tr>
<th>✓ Agriculture</th>
<th>✓ Early child development</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Social safety nets</td>
<td>✓ Schooling</td>
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**Selected based on:**

- Relevance for nutrition
- Availability of evaluations of nutritional impact
- High coverage of the poor
- Targeting: programmes that are or could be targeted to reach nutritionally vulnerable groups
## Nutritional Impacts of Targeted Agricultural Programmes

<table>
<thead>
<tr>
<th>Evidence of nutritional impact is inconclusive</th>
<th>Although there is some evidence of impact from home gardens and homestead food production systems on vitamin A intake and status of children</th>
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<tbody>
<tr>
<td>Strong evidence from roll out of biofortified vitamin A rich orange sweet potato on vitamin A intake of mothers and children and vitamin A status of children</td>
<td></td>
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<table>
<thead>
<tr>
<th>Limited evidence likely due to</th>
<th>Weaknesses in program goals, design, targeting, implementation</th>
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<tbody>
<tr>
<td>Lack of rigor in impact evaluation, including lack of theory-based program impact pathway analysis</td>
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**Social Safety Nets**

**Are important poverty reduction tools:**

- Provide transfers to a billion poor people and reduce poverty; are often implemented at scale and achieve high coverage of the poor; increase demand for health and education services

- Help mitigate negative effects of global changes, conflicts, shocks; protect income, food security, diet quality, assets and human capital investments among the poor

- Enhance women’s empowerment when targeted to women and when they include specific gender-focused interventions

**Key findings:**

- Strong evidence of impacts on health care utilisation, but limited impacts on child nutrition; some studies show impacts in younger, poorer children, with longer exposure

- Lack of clarity in nutrition goals, weaknesses in design and poor quality health services likely responsible for the limited nutritional impacts
Enhancing the Nutrition-sensitivity of Programmes

The potential to improve nutrition outcomes is clear, but it has yet to be unleashed:

Important note: several of the programmes documented were not originally designed with clear nutrition goals and actions from the outset and were retrofitted to be “nutrition-sensitive”

Enhancing nutrition-sensitivity:

- Improve targeting, timing and duration of exposure to interventions
- Use conditions to stimulate demand for programme services
- Strengthen nutrition goals, design, implementation – use programmes as delivery platforms for health and nutrition services
- Optimise women’s nutrition, time, physical and mental health and empowerment
Paper 3 Key Messages

Nutrition-sensitive programs in agriculture, social safety nets, early child development and education have enormous potential, yet to be unleashed, to enhance scale, coverage and effectiveness of nutrition-specific actions.

Targeted agricultural programs and social safety nets play a key role in mitigating negative effects of shocks and global changes, supporting livelihoods, food security, diet quality and women’s empowerment, and reaching nutritionally at-risk populations.

Incorporating nutrition in early child development programs and in school curricula can benefit both nutrition and child development and have long-lasting impacts into adulthood and future generations.

Investments in nutrition-sensitive programs can play a pivotal role in preventing excess undernutrition and impaired child development that scale-up of nutrition-specific interventions cannot resolve on its own.
The Challenges

- To maintain global commitment
- To accelerate country level commitment
- To convert commitment into action
- To accelerate improvements in nutrition status

Improvements in nutrition status are lagging behind economic growth
A More Collective Approach is Needed

A “whole of society” approach to combine resources and know-how

• beyond government, e.g. business and civil society
• beyond the usual sectors, e.g. education and ICT

Need to create an “enabling environment” for nutrition

• enable these actors to come together
• enable the emergence of new champions
• incentivize them to do the right things for nutrition
Characterising Enabling Environments

What does an enabling environment for undernutrition reduction look like?

Three vital factors for creating momentum and converting it to impact:

- Framing, knowledge and evidence
- Politics and governance
- Capacity and financial resources

Impact
Key Features of an Enabling Environment

- New Framing and Evidence
- Politics and Governance
- Commitment and Accountability
- Human and Financial Resources
Nutrition Narratives

- Nutrition for Growth
- Supercharging the Demographic Dividend
- Nourishing Minds
- Child Survival
- Hidden Hunger
- The First Step in Preventing NCDs in later life

Narratives need to be backed up with credible evidence
Paper 4 Key Messages

Enabling environments are needed to bring stakeholders together in harmony for nutrition

Key features of enabling environments for nutrition:

- Collective approach, political approach, accountability strengthened, more creativity around resource mobilization with stronger checks and balances

Leadership at all levels is fundamentally important – for creating and sustaining momentum and converting it to impact

Operational research on how to scale up and a shift to the “why?” and “how?” as well as the “what” of effectiveness

Undernutrition reduction can be accelerated through deliberate action

Let’s not wait for political will, let’s will our politicians to act
Nutrition: A Massive Unfinished Agenda

Since 2008: tremendous increase in political commitment to improve nutrition; yet this has translated into only modest impact.

This represents a massive unfinished agenda to address the cause of 45% (3.1 million) of all under 5 child deaths and the 165 million children who are stunted.

These 165 million children with stunted growth have compromised cognitive development and physical capabilities, making yet another generation less productive than they would otherwise be.
Nutrition Foundational to Development

This series furthers the evidence base that good nutrition is a fundamental driver of a wide range of development goals.

Countries will not be able to break out of poverty and sustain economic advances if so much of their population fails to get the nutrition needed for a healthy and productive life.

Undernutrition reduces a nation’s economic advancement by at least 8% (direct productivity losses, losses via poorer cognition, and losses via reduced schooling).

The current and post-2015 development agenda must prioritise addressing all forms of malnutrition at the top of its goals.
We Must Ramp Up Spending; and the Cost is Affordable

New estimates show that an additional $9.6 billion annually in high burden countries could save nearly a million children per year.

An increase in donor spending is vital if nutrition targets are to be met or surpassed.

Government spending in LMIC needs to match or exceed this rate of increase.

Nutrition budget lines need to be established in all high-burden countries.

The Scaling up Nutrition (SUN) Movement is a critical driver in this effort and support for it must remain strong.
NOW is Our Critical Window of Opportunity to Scale Up Nutrition

National and international momentum to address human nutrition and related food security and health needs has never been higher.

We must work together to seize this opportunity.