STOP STUNTING
Improving Child Feeding, Women’s Nutrition, and Household Sanitation in South Asia
UNICEF Regional Office for South Asia, 10-12 November, 2014, New Delhi

Stunting bodies, stunting brains

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The WHO Multicentre Growth Reference Study: a new approach for developing growth references

- Descriptive approach (existing growth charts):
  defines growth on the basis of representative samples of healthy groups, i.e., without identifiable disease

- Prescriptive approach (new approach by WHO):
  defines growth on the basis of health and feeding practices known to promote optimal growth and selects the sample accordingly
Mean length from birth to 24 months for the six MGRS sites

Six universal motor development milestones assessed between 4 and \(\approx 18\) months of age
WHO Child Growth Standards

Patrones de crecimiento infantil de la OMS

Стандартные показатели ВОЗ в области развития ребенка

Normes OMS de croissance de l’enfant

معايير منظمة الصحة العالمية لنمو الطفل

世界卫生组织儿童生长标准
Implementation of the WHO Child Growth Standards

> 130 countries in Sep 2014

Adoption Status
- Green: Adopted
- Yellow: Under consideration
- Red: Not adopted
- White: No response

Defining childhood stunting

2 years 9 months
Weight: 10.7 kg
Height: 78.3 cm

2 years 6 months
11.6 kg
86.4 cm

Foto: courtesy of UNICEF, Perú (niñas de Andahuaylas)
Stunting may be missed if adequate measurements are not made

Measurements of two Maldivian children

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Height</th>
<th>Weight</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girl X</td>
<td>2 yr 2 mo</td>
<td>86 cm</td>
<td>12 kg</td>
<td>16.2</td>
</tr>
<tr>
<td>Girl ●</td>
<td>4 yr 4 mo</td>
<td>86 cm</td>
<td>12 kg</td>
<td>16.2</td>
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</table>
Correct measurement techniques and equipment are essential.
Stunting has decreased but not enough
In 2013, about half of all stunted children lived in Asia – 64 m in S Asia
Stunting occurs in the first 1,000 days

Timing of growth faltering, 54 national DHS surveys

Foetal growth in adequate environments is also consistent across populations

Only 3% variance due to inter site difference

Childhood Stunting: Context, Causes and Consequences

Consequences

Stunted Growth and Development

Causes

Household and family factors
- Maternal factors
- Home environment

Inadequate Infant and Young Child Feeding
- Breastfeeding (Inadequate breastfeeding practices)
- Complementary Feeding (CF) (Inadequate CF practices)

Infection
- Clinical and subclinical infection

Context

Community and societal factors
- Political economy
- Health & Healthcare
- Education
- Society and Culture
- Agriculture and Food Systems
- Water, Sanitation and Environment
# Stunted Growth and Development: Causes

## Inadequate Infant and Young Child Feeding

<table>
<thead>
<tr>
<th>Breastfeeding</th>
<th>Complementary Feeding (CF)</th>
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<tbody>
<tr>
<td><strong>Inadequate BF practices</strong></td>
<td></td>
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<tr>
<td>- Delayed initiation</td>
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<td>- Non-exclusive BF</td>
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<tr>
<td>- Early cessation of BF</td>
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<tr>
<td><strong>Inadequate CF practices</strong></td>
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<tr>
<td>- Infreq. feeding</td>
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<td>- Inadeq. feeding during illness</td>
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<td>- Thin consistency</td>
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<td>- Non-responsive feeding</td>
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<tr>
<td><strong>Poor quality foods</strong></td>
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<tr>
<td>- Poor MN quality</td>
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<tr>
<td>- Low diet diversity / intake of ASFs</td>
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<tr>
<td>- Anti-nutrient cont.</td>
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<tr>
<td>- Low energy cont. of comp. foods</td>
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<tr>
<td><strong>Food &amp; water safety</strong></td>
<td></td>
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<tr>
<td>- Contaminated food and water</td>
<td></td>
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<tr>
<td>- Poor hygiene practices</td>
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<td>- Unsafe storage/prep of foods</td>
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## Infection (clinical and sub-clinical)

- Enteric infections: Diarrheal disease, environmental enteropathy, helminths
- Respiratory infections
- Malaria
- Reduced appetite due to infection
- Inflammation
Stunted Growth and Development: **Consequences**

**Concurrent problems & short-term consequences**

**Health**
- Premature Death
- Infectious diseases such as diarrhoea, pneumonia, and measles

**Developmental**
- Motor skills: delay in sitting, standing, or walking
  - Cognitive development: delayed learning

**Economic**
- Health costs
Stunted Growth and Development: Consequences

**Health**
- increased risk of becoming overweight later in life, with associated higher risk of coronary heart disease, stroke, hypertension and type II diabetes
- Higher risk of labor complications and of retarded fetal growth

**Developmental**
- associations between early height-for-age and cognitive or language ability at 5 years
- height before 6 years related to age at school enrolment and grades attained by late adolescence
- lower scores in developmental tests (IQ) and in school performance

**Economic**
- lower aerobic capacity affects physical work
- reduced likelihood of formal employment; stunted children earn 20% less as adults compared to non-stunted individuals
- a 1% loss in adult height due to childhood stunting is associated with a 1.4% loss in economic productivity
The first 2 y of life: a sensitive period for neurodevelopment

- The brain undergoes a period of rapid growth characterized by neurogenesis, axonal and dendritic growth, synaptogenesis, cell death, synaptic pruning, myelination, and gliogenesis.

- Damages attributed to undernutrition:
  - Prefrontal cortex: attention, fluency and working memory.
  - Hippocampus dendrite density: spatial navigation, memory formation, memory consolidation.
  - Reduced myelination of axon fibers: speed at which signals are transmitted.
  - Occipital lobe and motor cortex: delays in the evolution of locomotor skills.

Prenatal nutritional deficits might have long-term effects on adult mental development

- associations between birth size adjusted for gestational age and development at 6 and 24 months (Guatemala)
- One SD increase in birthweight, ~0.5 kg, was associated with 0.21 y more schooling and 8% decreased risk of grade failure (Brazil, Guatemala, India, the Philippines, and South Africa)
- Lower maternal haemoglobin and neonatal ferritin predicted lower intra-individual variability in temperament-like behaviours in Peruvian infants that suggested diminished responsiveness.
- maternal iron deficiency anaemia at 6–10 weeks post partum was associated with lower maternal sensitivity and child responsiveness (South Africa)
- children whose mothers received iron and folate during pregnancy had better intelligence quotient (IQ), executive, and motor functioning than the placebo group at ages 7–9 years (Nepal)
- trials of fish oil, DHA, or DHA and eicosapentaenoic acid showed that infants born to supplemented mothers had improvements in visual acuity, attention, and aspects of cognitive performance (high income countries)

Magnitude of nutrition challenges with an impact on childhood development

1. 161 million stunted children in 2013
2. 496 million non pregnant women, 32 million pregnant women + 273 million children under 5 with anemia in 2011
3. 32 million SGA babies in 2010
4. 42 million in 2013
5. 62% children not exclusively breastfed in 2012
6. 51 million wasted children under 5 in 2013
http://www.who.int/nutrition/en/index.html

Rome Declaration: commitments to eradicate hunger and prevent all forms of malnutrition, worldwide

Framework for Action: policy and programme options on

- Sustainable food systems promoting healthy diets
- International trade and investment
- Nutrition education and information
- Social protection
- Health systems delivery of direct nutrition interventions and health services to improve nutrition
- Water, sanitation and hygiene
- Food safety

www.fao.org/ICN2