The Costs of Stunting

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Presentation for the UNICEF South Asia Regional Conference on
“Stop Stunting”
The Costs of Stunting

South Asia and Sub-Saharan Africa hardest hit

- 161 million children stunted in 2013 worldwide
The Costs of Stunting

Costs of Not Acting: On Human Capital

- Mortality & Morbidity
- Poor school performance and outcomes
- Reduced wages/Income later in life
- Reduced overall productivity for individuals and society
The Costs of Stunting

Costs Imposed on Mortality and Morbidity

- 3.1 million child deaths annually (45% of all child deaths)

- Stunted children: more susceptible to infections in childhood, and more likely to suffer from chronic diseases as adults

- 1000 days may be the tipping point for both economic & cognitive deficits, as well as the risks of future chronic diseases
The Costs of Stunting

Costs on Poor Schooling & Educational Outcomes

- Stunting causes **7 month delay in starting school**
- Stunting linked to **0.7 grades schooling loss**;
- Early childhood nutrition intervention in Guatemala documented: 0.25 SD increase in reading comprehension & cognitive ability tests and **1.2 grades increase in schooling for women and 46% increase in wages for boys**
The Costs of Stunting

Lost Earnings and Productivity

- At least 10% loss in lifetime earnings
- A 1% loss in adult height results in a 2–2.4 percent loss in productivity
- Stunting contributes to loss of up to 11% of GDP in Africa and Asia each year equal to about $149 billion of productivity losses.
- Could cause countries to forego the economic benefits from the demographic dividend
Malnutrition and Poverty

The right investments in early childhood nutrition can drive incomes and growth by locking-in human capital permanently, thereby addressing future poverty and boosting shared prosperity.
In Summary, Nutrition Investments In First 1000 Days Have Life-long Returns

**Malnutrition and Poverty**

Nutrition investments deliver many benefits for poverty reduction & economic growth

<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>1.</strong> Boost GNP by 11% in Africa and Asia</td>
<td><strong>2.</strong> Boost GNP even further by supercharging the demographic dividend</td>
<td><strong>3.</strong> Prevent more than 1/3 of child deaths per year</td>
</tr>
<tr>
<td><strong>4.</strong> Reduce burden of disability for children under 4 by more than half</td>
<td><strong>5.</strong> Increase school attainment by at least one year</td>
<td><strong>6.</strong> Boost wage rates by 5% - 50%</td>
</tr>
<tr>
<td><strong>7.</strong> Make children 33% more likely to escape poverty as adults</td>
<td><strong>8.</strong> Make women 10% more likely to own their own business when they become adults</td>
<td><strong>9.</strong> Break the intergenerational cycle of poverty: stunted mothers are 3 times as likely to have malnourished infants</td>
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</table>
COSTS OF ACTING AT SCALE
Annual Public Investment Required

ESTIMATED BENEFITS

- Nutritional services for 356 M children
- Save 1.1 Million lives
- Save 30 M DALYs
- 30 Million children avoid stunting

US$10.3 B

Source: Horton, Shekar et al, World Bank, 2010
# Estimated Costs and Benefits of scaling-up a package of nutrition services in Four African Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Annual Public Investment (US$ million)</th>
<th>DALYs Saved</th>
<th>Lives Saved</th>
<th>Cases of Stunting Averted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>10.3 billion</td>
<td>30 M</td>
<td>1.1 M</td>
<td>30 M</td>
</tr>
<tr>
<td>DRC (preliminary)</td>
<td>371</td>
<td>5.5 M</td>
<td>93,000</td>
<td>1.7 M</td>
</tr>
<tr>
<td>Mali</td>
<td>64</td>
<td>0.5 M</td>
<td>17,000</td>
<td>0.3 M</td>
</tr>
<tr>
<td>Nigeria</td>
<td>837</td>
<td>8.7 M</td>
<td>183,000</td>
<td>3.0 M</td>
</tr>
<tr>
<td>Zambia (preliminary)</td>
<td>48</td>
<td>0.4 M</td>
<td>10,000</td>
<td>0.4 M</td>
</tr>
</tbody>
</table>
### At Country Level

#### Nigeria

<table>
<thead>
<tr>
<th>Annual Public Investment Required</th>
<th>Estimated Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>$837 M</td>
<td>$2.6 B gains in econ productivity</td>
</tr>
<tr>
<td>[3 Mill. stunt cases averted]</td>
<td>Save 183,000 lives</td>
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<tr>
<td></td>
<td>Save 8.7 M DALYs</td>
</tr>
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</table>

- **Estimated Benefits:**
  - $2.6 B gains in econ productivity
  - Save 183,000 lives
  - Save 8.7 M DALYs
  - 3 Mill. stunt cases averted

- **Source:** Costed Plan for Scaling up Nutrition: Nigeria, Shekar et al, World Bank, 2014

#### DRC (Preliminary)

<table>
<thead>
<tr>
<th>Annual Public Investment Required</th>
<th>Estimated Benefits</th>
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<tr>
<td>$371 M</td>
<td>$782 M gains in econ productivity</td>
</tr>
<tr>
<td>[1.7 M stunt cases averted]</td>
<td>Save 93,000 lives</td>
</tr>
<tr>
<td>[5.5 M DALYs]</td>
<td>Save 1.7 M stunt cases averted</td>
</tr>
</tbody>
</table>

- **Estimated Benefits:**
  - $782 M gains in econ productivity
  - Save 93,000 lives
  - Save 5.5 M DALYs
  - 1.7 M stunt cases averted

- **Source:** Costed Plan for Scaling up Nutrition: Nigeria, Shekar et al, World Bank, 2014
### Mali

**ANNUAL PUBLIC INVESTMENT REQUIRED:**
$64 M

**ESTIMATED BENEFITS:**
- Save 17,000 lives
- Save 482,000 DALYs
- 0.3 million stunting cases averted
- $194 M gains in econ productivity

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### Zambia (preliminary)

**ANNUAL PUBLIC INVESTMENT REQUIRED:**
$48 M

**ESTIMATED BENEFITS:**
- Save 10,000 lives
- Save 431,000 DALYs
- 371,000 stunting cases averted
- $1.1 B gains in econ productivity
## Nigeria: Maximizing Allocative Efficiencies

Is it possible to **maximize impact** while **minimizing cost**? Certain interventions are **more cost-effective** than others…

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Cost/DALY Saved US$</th>
<th>Cost/Life Saved US$</th>
<th>Cost/Stunting Case Averted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nigeria</strong></td>
<td><strong>Global</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CNPs (EBF, CF &amp; hygiene promotion)</td>
<td>12</td>
<td>53-153</td>
<td>783</td>
</tr>
<tr>
<td>Vitamin A supplementation</td>
<td>29</td>
<td>3-16</td>
<td>433</td>
</tr>
<tr>
<td>Therapeutic Zinc suppl./ORS</td>
<td>216</td>
<td>73</td>
<td>932</td>
</tr>
<tr>
<td>Micronutrient powders</td>
<td>44</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Deworming</td>
<td>264</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Iron-folic acid supplementation</td>
<td>43</td>
<td>66-115</td>
<td>974</td>
</tr>
<tr>
<td>Iron fortification of staple foods</td>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt iodization</td>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public provision of complementary food</td>
<td>3,256</td>
<td>500-1000</td>
<td>28,557</td>
</tr>
<tr>
<td>CMAM for SAM</td>
<td>169</td>
<td>41</td>
<td>3,214</td>
</tr>
</tbody>
</table>
What can Nigeria “buy” with limited resources?

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Annual Public Investment (US$ million)</th>
<th>Annual DALYs Saved</th>
<th>Annual Lives Saved</th>
<th>Cost Per DALY Saved</th>
<th>Cost Per Life Saved (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full National Coverage</td>
<td>$837</td>
<td>8.7 million</td>
<td>183,411</td>
<td>$102</td>
<td>$4,865</td>
</tr>
<tr>
<td>Full coverage minus public provision of complementary food</td>
<td>$511</td>
<td>8.6 m</td>
<td>164,390</td>
<td>$56</td>
<td>$2,919</td>
</tr>
<tr>
<td>Scale up CNPs, Micronutrient, deworming and CMAM in states with &gt;25% stunting</td>
<td>$337</td>
<td>4.7 m</td>
<td>96,092</td>
<td>$66</td>
<td>$3,229</td>
</tr>
<tr>
<td>Scale up CNPs, Micronutrient, deworming and CMAM in states with &gt;35% stunting</td>
<td>$271</td>
<td>3.4 m</td>
<td>70,911</td>
<td>$72</td>
<td>$3,496</td>
</tr>
<tr>
<td>Partial scale up micronutrient, deworming in all states and CNP and CMAM in states with &gt;35% stunting</td>
<td>$184</td>
<td>2.3 m</td>
<td>58,519</td>
<td>$82</td>
<td>$3,152</td>
</tr>
</tbody>
</table>
## Estimated Cost Per Benefit Unit in Four African Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>DALY Saved</th>
<th>Life Saved</th>
<th>Case of Stunting Averted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRC</td>
<td>69</td>
<td>4,049</td>
<td>217</td>
</tr>
<tr>
<td>Mali</td>
<td>188</td>
<td>5,323</td>
<td>312</td>
</tr>
<tr>
<td>Nigeria</td>
<td>102</td>
<td>4,865</td>
<td>292</td>
</tr>
<tr>
<td>Zambia</td>
<td>122</td>
<td>5,033</td>
<td>142</td>
</tr>
</tbody>
</table>
Annual Gains in Economic Productivity (GDP) from Scaling-up Ten Nutrition-sensitive Interventions over lifetimes of children who would otherwise have died or become stunted

- **Nigeria**: $837M investment, $2.6B gains in productivity
- **Zambia**: $48 M investment, $1.1B gains in productivity
- **DRC**: $371 M investment, $782M gains in productivity
- **Mali**: $64 M investment, $194M gains in productivity

**In all countries:**
- **Internal Rate of Return > 15%**
- **Highly + net present values**
Costs & Benefits of Nutrition-sensitive Interventions: Example from Nigeria

Four possible nutrition-sensitive interventions have the potential to improve nutrition outcomes in Nigeria

- **School-based Deworming**: $2.4 million annual, $4.55/DALY saved
- **School-based Promotion of Good Hygiene**: $59.5 million annual
- **Biofortification of Cassava**: $25 million total, $0.30-0.50/DALY saved
- **Aflatoxin Reduction through Biocontrol**: $65.4 million annual, 1,537,790 DALYs saved, $43/DALY saved
However, Stunting continues to be invisible and unrecognized...

- By policy makers…
- And by families and communities…
- Hopefully, an appreciation of the economic costs will make it more “visible”
Despite overwhelming evidence of the debilitating costs of stunting in the first 1000 days, minimal resources are allocated in South Asia
Example: Public Funding on Children in India
Bangladesh: Preliminary Estimates

COSTS OF INACTION
$10 BILLION LOSSES TO ECONOMIC PRODUCTIVITY between 2011 and 2021

COSTS OF ACTION:
US$1.3-1.7 for 2011-2021

Source: Profiles, FANTA/USAID, 2012
Next Step:

Similar rigorous estimations on the costs of stunting needed for all South Asian countries to drive political commitment & action?
Acknowledgements

- **Costing Team:**
  - Julia dayton Eberwein
  - Max W. Mattern
  - Ali Winoto Subandoro
  - Christine MacDonald
  - Touyo Okorosobo
  - Wendy Karamba

- **Partnerships:**
  - BMGF
  - R4D
  - UNICEF Country offices