ECONOMIC IMPACT OF SUB OPTIMAL NUTRITION AND CHILD DEVELOPMENT

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Foundations for the Future: Approaches to Advancing Global Nutrition and Early Childhood Development

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Background

- A growing literature has highlighted the important consequences of early life developmental deficits.
- Particularly strong empirical associations have been observed between early life growth and educational attainment.
- Some data on economic implications available, but mostly local and study-specific.

The main objective of this project was to create country-specific as well as global estimates of the economic impact of early life growth faltering.
Improvement in early life physical growth (current prevalence of delay)

Improvements in future educational attainment

Increase in wage due to increased education

Net present value of additional lifetime earnings

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Nutrition Impact Model Study (NIMS)

Longitudinal studies measuring effect of preschool developmental deficiencies on educational outcomes

Published country-specific studies on returns to education

Country-specific wage projections, UN population data
STEP I: How Would Children’s Height Change if Everybody would Reach Their Physical Growth Potential?
Height Distribution: WHO Reference & Tanzania
Current vs. Healthy Height Distribution: Colombia
Quantifying Benefits

• **Years of educational attainment**: universally beneficial, but maybe harder to understand at a global level (what do a million school years mean?)

• **Dollars of future income lost**: likely the most common measure, but dependent on local wage and price levels, and thus not “neutral” across countries
# Years of Educational Attainment Lost

<table>
<thead>
<tr>
<th>Region</th>
<th>Countries</th>
<th>Cohort Size (Million)</th>
<th>Total years of educational attainment lost (millions)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia/Pacific</td>
<td>25</td>
<td>29.5</td>
<td>10.9</td>
<td>[6.6,15.6]</td>
</tr>
<tr>
<td>Latin America &amp; Caribbean</td>
<td>32</td>
<td>11.0</td>
<td>3.4</td>
<td>[2.0,5.0]</td>
</tr>
<tr>
<td>North Africa &amp; Middle East</td>
<td>28</td>
<td>12.3</td>
<td>4.4</td>
<td>[2.3,6.7]</td>
</tr>
<tr>
<td>South Asia</td>
<td>6</td>
<td>36.7</td>
<td>27.6</td>
<td>[20.0,35.8]</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>46</td>
<td>33.5</td>
<td>23.1</td>
<td>[17.2,29.5]</td>
</tr>
</tbody>
</table>
Years of Educational Attainment Lost

Legend

- Years of schooling lost
  - 0.00 - 0.19
  - 0.20 - 0.39
  - 0.40 - 0.59
  - 0.60 - 0.79
  - 0.80 - 0.99
Main Modeling Assumptions

- 40 years of labor force participation (20-59)
- 3% annual discounting
- 2% annual real wage growth
- Average local wage earned over lifetime
- Benefits in international dollars (or PPP)
## Economic Impact

<table>
<thead>
<tr>
<th>Region</th>
<th>Nominal US$ billion</th>
<th>PPP-adjusted US$ billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia and Pacific</td>
<td>32.9</td>
<td>114.8</td>
</tr>
<tr>
<td></td>
<td>[17.1, 50.7]</td>
<td>[59.4, 176.6]</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>44.8</td>
<td>106.9</td>
</tr>
<tr>
<td></td>
<td>[19.2, 74.6]</td>
<td>[45.9, 178.2]</td>
</tr>
<tr>
<td>North Africa, Middle East and Central Asia</td>
<td>18.3</td>
<td>65.8</td>
</tr>
<tr>
<td></td>
<td>[6.8, 31]</td>
<td>[24.7, 111.7]</td>
</tr>
<tr>
<td>South Asia</td>
<td>46.6</td>
<td>222.2</td>
</tr>
<tr>
<td></td>
<td>[33.4, 61.1]</td>
<td>[159.1, 291.2]</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>34.2</td>
<td>106.8</td>
</tr>
<tr>
<td></td>
<td>[24.4, 45.3]</td>
<td>[76.2, 141.2]</td>
</tr>
<tr>
<td>Global benefits per cohort in US$ billion</td>
<td>176.8</td>
<td>616.53</td>
</tr>
<tr>
<td></td>
<td>[100.9, 262.6]</td>
<td>[365.3, 898.9]</td>
</tr>
</tbody>
</table>
Limitations

- Only captures early childhood improvements in physical growth (which are smaller than improvements in ECD overall)
- Only captures labor market benefits through schooling (not accounting for height or cognitive improvements)
- Does not take into account other health and wellbeing benefits for individuals

➡ Likely to be a very conservative estimate of the true benefits
Global Estimates Summary

Globally, under a very conservative set of assumptions, growth faltering causes

- a loss of 69 million years of educational attainment per birth cohort

- a total wage loss of US$ 177 billion at current exchange rates, and a wage loss of USI$ 617 at purchasing power parity adjusted rates per birth cohort

Given current cost estimates for prevention, the **benefit cost ratio** for investing this area likely exceed a factor of 3:1
Thank you!