SPRING Extended Cost Effectiveness Model
Maternal Interventions to Improve Birth Outcomes

SPRING Model Team
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Pathway & Time of Impact

“Costs” = MCH Interventions:
- MMS, BPE, IPI change via FP

**Maternal Nutrition**

**“Short Term”**
- Low Birth Weight
- Preterm Birth
- Infant Mortality

**“Long Term”**
- Growth & Metabolism in Childhood
- Child/Teen Hypertension
- Adult Hypertension
- CVD Mortality

- Adult Hypertension
- CVD Mortality
Data and Methods

Data

• 2011 Bangladesh base population
  – DHS, UNICEF LBW Survey, IDB, GBD, BD Life tables
  – RRs: Evidence Review

Methods

• Provider perspective
• Decision Tree/Markov model
• Epidemiological Transition
• Variable Cost Function
• One Way Sensitivity Analyses
KEY FINDINGS

• Survivorship in the short term period has a significant confounding effect on long term results

• The inclusion of long term effects produced an increase in CER, showing a non-trivial additional value on later life health outcomes

• All interventions were **cost effective** when considering just short term effects

• MMS and BPE interventions were **highly cost effective** when both short and long term effects counted; FP was possibly not.
# Cost Effectiveness Ratios *

*WHO threshold for cost effectiveness: three times GDP per capita per DALY. Bangladesh CER Threshold: $2229 (Highly cost effective would be less than GDP, $743). Source: World Bank 2011 GDP per capita for Bangladesh*

<table>
<thead>
<tr>
<th>3% Discount</th>
<th>Low Delivery Cost</th>
<th>High Delivery Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Long- and Short-Term Benefits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMS</td>
<td>$160.03 ($110 – $253)</td>
<td>$437.37 ($299 – $530)</td>
</tr>
<tr>
<td>BPE</td>
<td>$529.76</td>
<td>$889.45</td>
</tr>
<tr>
<td>FP/IPI</td>
<td>1952.41</td>
<td>2722.94</td>
</tr>
<tr>
<td><strong>Short-Term Benefits Only</strong></td>
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<td></td>
</tr>
<tr>
<td>MMS</td>
<td>161.99</td>
<td>442.73</td>
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<tr>
<td>BPE</td>
<td>536.47</td>
<td>900.73</td>
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<tr>
<td>FP/IPI</td>
<td>1976.12</td>
<td>2756.01</td>
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</tbody>
</table>

CERs improve by $2 to $33/DALY with the inclusion of long term effects