SPRING Extended Cost Effectiveness Model
Maternal Interventions to Improve Birth Outcomes

SPRING Model Team

(Amanda Pomeroy (JSI); Warren Stevens (consultant); Marc Cunningham (JSI); Alexis D’Agostino (JSI); Jolene Wun (JSI))
Pathway & Time of Impact

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

Maternal Nutrition

“Short Term”

Low Birth Weight
Preterm Birth

Growth & Metabolism in Childhood

Infant Mortality

Child/Teen Hypertension

“Long Term”

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**

<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>
<td></td>
<td></td>
</tr>
<tr>
<td>MMS</td>
<td>161.99</td>
<td>442.73</td>
</tr>
<tr>
<td>BPE</td>
<td>536.47</td>
<td>900.73</td>
</tr>
<tr>
<td>FP/IPI</td>
<td>1976.12</td>
<td>2756.01</td>
</tr>
</tbody>
</table>

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

*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*