Using simple management science and operations research tools and thinking to make changes in public health

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Bloomberg Philanthropies

Environment | Education | Public Health | Government Innovation | Art and Culture

Data for Health Initiative
PARTNERSHIP IN DATA FOR HEALTH (D4H)

- Bloomberg Philanthropies
- CDC Foundation
- Vital Strategies
- University of Melbourne
- Johns Hopkins University
- World Health Organization
- US Centers for Disease Control and Prevention

Four years (Apr 2016 - Mar 2019), $100 M and renewed for two more years
D2P countries are not blue
D2P Training — Influence Policy

**Health-related laws**
- Enforced by government agencies other than public health (e.g., cigarette taxes, mandatory seat belt use)
- That apply to the health system (e.g., universal health coverage)

**Government regulations set by public health or other agencies**
- Health regulations (e.g., changes in training of health workers, treatment guidelines)
- Regulations set by other ministries that impact health (e.g., environmental regulations, eligibility for school nutrition programs)

**Strategic decision making for health programs**
- Resource allocation (e.g., increasing the funding allocation for disease prevention activities, for a specific high-burden disease, or a high-burden geographic area)
- Requests to external funders, government finance departments, etc.
- Program planning (e.g., developing new interventions, adapting existing ones)
Example of a project

*Keep Our Future Generation Alive*

Routine HIV Testing & Treatment for Children

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Introduction

• National estimates using Spectrum Zambia\(^1\) indicated that \textbf{36,000 HIV positive children} were not tested at the end of 2015
• Despite the National recommendation to test ALL children (opt-out testing), only 3% of those visiting a clinic are tested for HIV
• After the age of 1 year old, children are not routinely tested
• If HIV positive children are left untreated
  • 75% will die by the age of 5 years
  • up to 80% will die by the age of 10 years
• The model did not provide ages!

\(^1\) Spectrum Zambia 2013/2014, \url{http://www.avenirhealth.org/software-spectrum.php}
OR/MS Process

1. Identify the **problem**
2. Determine the **root cause(s)** (i.e., fishbone diagrams)
3. List potential policy options to address the root cause(s)
4. Develop a **model** to evaluate the potential public health impact
5. Estimate the budget and conduct an **economic analysis**
6. Estimate the feasibility (budgetary, political, economical, operational)
7. Write a policy brief and create a presentation
8. Conduct the policy forum
One Solution
Compartmental Model (for every age up to 10)

S = Susceptible
E = Exposed
I = Infected
T = on Treatment
R = “Recovered”
Another Solution
Simple Model

• No every brief created a compartmental model
  — Decision trees
  — Simple multiplication
• Staff skills – no mathematical modelers
• Available country data – spotty
• Modeling software – Excel
• Capacity building – easy to understand/update
<table>
<thead>
<tr>
<th>COSTS BY OPTION</th>
<th>Option 1 Routine Testing</th>
<th>Option 2 Pre &amp; Primary School Drives</th>
<th>Option 3 Pre School Entry Screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated number of POSITIVE CHILDREN FOUND in 1 year</td>
<td>6,929</td>
<td>4,311</td>
<td>528</td>
</tr>
<tr>
<td>Estimated number of LIVES SAVED in 1 year</td>
<td>1,288</td>
<td>336</td>
<td>64</td>
</tr>
<tr>
<td>Estimated ANNUAL TESTING COST (testing, HR, training, community sensitisation)</td>
<td>$1,289,722</td>
<td>$2,375,951</td>
<td>$493,476</td>
</tr>
<tr>
<td>TESTING COST per POSITIVE CHILD</td>
<td>$186</td>
<td>$551</td>
<td>$934</td>
</tr>
<tr>
<td>Estimated ANNUAL TREATMENT COST (testing, HR, training, community sensitisation)</td>
<td>$1,216,060</td>
<td>$1,133,911</td>
<td>$138,967</td>
</tr>
<tr>
<td>TREATMENT COST per POSITIVE CHILD</td>
<td>$176</td>
<td>$263</td>
<td>$263</td>
</tr>
<tr>
<td>POLITICAL FEASIBILITY</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>OPERATIONAL FEASIBILITY</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>
News and Impact!

• Good
  – More resource
  – More attention
  – More screening
  – More kids found

• Bad
  – More problems found (logistics)
  – No active evaluation
  – Still not finding all the kids
1. Reduce salt intake: Save a heart! – Reduced morbidity and mortality due to hypertension
2. The Sweet Solution: Mandatory Folic Acid Fortification of Sugar to Prevent Neural Tube Defects in Zambia
3. No Action Today, No cure tomorrow: Addressing Antimicrobial Resistance in Zambia
4. Rabies – Zero Human Rabies Deaths; a one health approach to rabies elimination in Zambia
POLICY FORUM (STAKEHOLDERS)

- CDC/Zambia, WHO
- Four Zambian sugar companies (Mansa, Kawambwa, Zambia Sugar, Kasama Sugar), Zambian Veterinary Association, Fortified Food Association
- Meharry Medical College, University of North Carolina, University of Zambia, other local universities and hospitals, and other NGOs
D2P STATISTICS TO DATE (2016-2019)

- 218 participants in twelve countries
- 88 policy briefs
  - 78/88 (89%) were presented to a decision-maker
  - 43/88 (55%) had an impact on public health decision-making

- Four countries set to take over D2P
  - Currently, only Zambia has led their own D2P training
  - Two of the Zambian facilitators mentored in Tanzanian

- Linking all D4H activities (CRVS, Bulletin, Scientific Writing)
OTHER SPECIFIC IMPACTS

- **Shanghai**
  - Provided second dose VZV
  - Expanded helmet law requiring helmets for e-bikes
  - Expanded closure of bird markets to prevent H5N1
  - Revised patient notification systems to improve colonoscopy screening

- **Colombia**
  - Set out a plan to enforce motorcycle helmet laws, improve data collection, and initiate educational campaign

- **Zambia**
  - Started routine testing and treating healthcare workers for TB
  - With Ministry of Home Affairs, improved management of TB in prisons

- **Myanmar**
  - Secured financial support from UNICEF and GAVI for vaccination projects
  - Changed malaria testing and treatment guidelines
CHALLENGES

- Difficult to find decision scientists
- Sometimes difficult to achieve high-grade products
  - Facilitators are not SMEs in everything
  - Lack of in-country SMEs (process, history, economics, options)
  - Hard to fit a high-quality product into short time period. Projects have died after learning more about them
- Insufficient engagement with countries
- Difficult to identify the ‘ideal student, ideal team, or topic’
- Differences in what partners see as “success”
SUMMARY

- Changing policies
- Building capacity
  - At the minimum, they know about the process
  - Taken ownership of D2P and changed the training to meet their needs (i.e., taking their time to conduct the training)
  - Demand for this training (current and new countries)
- Some MOH see a need for decision scientists
Thank you