The cost of responding to a waterborne cholera outbreak in a village in Uganda compared to a simple hypothetical intervention

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Cholera Outbreak- Hoima District, Sept 2015

- Cholera outbreak - Kaiso fishing village, Hoima
- Rapid Response Team assembled by MoH, supported by WHO, CDC, and UNICEF to:
  - establish Kaiso Cholera Treatment Centre (KCTC)
  - investigate the outbreak; and
  - implement control measures
- 120 cholera cases (4 deaths) identified
- Drinking contaminated water from lakeshore caused outbreak

Cost of cholera response & control vs a simple hypothetical intervention
Location of Cholera Outbreak in Hoima District

Cost of cholera response & control vs a simple hypothetical intervention
Limited information on cholera cost analyses

- Repeated cholera outbreaks - Africa, Asia & Latin America
- Cholera imposes substantial economic burden on countries of the African region
- Limited information on cost analyses for cholera outbreak response and control activities vis-a-vis preventive measures
Objectives

- To determine the cost of responding to and controlling the cholera outbreak
- To compare the cost to a would-be simple preventive measure – constructing deep wells to provide cleaner water
Collection of cost data

Cost data was collected on:

- Medical Equipment and supplies used
- Utilities
- Personnel Costs
- Person Hours

Cost data obtained from KCTC, health facilities, Hoima District Health Office, UPHFP, UNICEF, CDC, and WHO

The cost of constructing deep wells was quoted by a U.S.-based NGO
Definitions & Analysis

- Direct Cost - Expenditure on medications, medical equipment and supplies, utilities, allowances and transport for responders
- Indirect Cost - Salary and other compensations for responders
- Not included - Vehicle depreciation, building maintenance, loss of productivity to case-persons due to illness and deaths
# Cost of Response & Control = $71,769

<table>
<thead>
<tr>
<th>Cost category</th>
<th>Cost in UgShs</th>
<th>Cost in USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Equipment &amp; Supplies</td>
<td>5,942,675</td>
<td>1,774</td>
</tr>
<tr>
<td>Utilities</td>
<td>200,000</td>
<td>60</td>
</tr>
<tr>
<td>Personnel Costs</td>
<td>64,403,935</td>
<td>19,225</td>
</tr>
<tr>
<td><strong>Direct Costs</strong></td>
<td></td>
<td><strong>21,059</strong></td>
</tr>
<tr>
<td>Person Hours</td>
<td>169,578,340</td>
<td>50,620</td>
</tr>
<tr>
<td><strong>Indirect Costs</strong></td>
<td></td>
<td><strong>50,620</strong></td>
</tr>
<tr>
<td><strong>Overall Total</strong></td>
<td>240,124,950</td>
<td><strong>71,679</strong></td>
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</tbody>
</table>
Cost of response was 28 times cost of constructing a deep well

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Cost in USD</th>
<th>Control Costs: Deep well Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response &amp; Control</td>
<td>$71,769</td>
<td>71,769:2500 =~28</td>
</tr>
<tr>
<td>Direct Costs</td>
<td>$21,059</td>
<td>21,059:2500 =~8</td>
</tr>
<tr>
<td>Indirect Costs</td>
<td>$50,620</td>
<td>50,620:2500 =~20</td>
</tr>
<tr>
<td>Construction of a deep well</td>
<td>$2500</td>
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</table>
Summary of results

- Constructing a deep well to provide cleaner water would cost approximately $2500.
- The total cost incurred in this outbreak would have been enough to construct 28 deep wells ($71769/2500). Even the direct cost only would have been enough to construct 8 deep wells ($21059/2500).
- One such deep well would have prevented this outbreak and averted future waterborne outbreaks.
Conclusion

- A simple prevention measure such as constructing deep wells for village residents can be substantially cost-effective for preventing waterborne diseases such as cholera.
Recommendation

- Governments should proactively implement prevention measures for waterborne outbreaks whenever possible, instead of passively responding to these outbreaks.
Acknowledgments

- Ministry of Health
- WHO
- CDC
- UNICEF
- PHFP
- Hoima District Health Office