Comparison of cost of illness of extensively drug-resistant (XDR) vs. non-XDR typhoid fever in Pakistan: policy implications for typhoid vaccine

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Outline

• Background
• Objectives
• Methodology
• Results
• Way forward
Background

- Pakistan is a low socio-economic country with a high burden of infectious diseases.
- Also lack the facilities for treatment of infectious diseases are scarce in Pakistan.
- A novel S. typhi has emerged in Hyderabad which is resistant to 5 classes of drugs and known as extensively drug resistant S. typhi.
- This has further decreased the options available to treat the typhoid and cost of treatment has risen.
Background

• SEAP (Surveillance for Enteric Fever in Asia Project) is the project

• running in Karachi and reporting the rate of XDR typhoid increasing in the city

• This was the first time a large number of XDR cases were reported from the region
Objective of the study

• Compare the cost of illness of blood culture-confirmed XDR vs. non-XDR typhoid fever cases from SEAP in Pakistan
Methodology

• Study Design
  • Cross sectional study
• Study period
  • September 2016-July 2018

• Study setting
  • Not for profit Tertiary care hospital
  • Not for profit secondary hospital
  • Inpatient (all age patients)
Methodology

• **Sample Size**
  • 260 patients with culture proven S. typhi

• **Variables**
  • Direct medical expenses: out of pocket treatment (including medicine, diagnostics and hospital stay)
  • Direct non-medical expenses: out of pocket spending on transportation (to and from hospital), food and lodging for the patient and his/her caregivers
  • Indirect cost
    • Cost spent in-terms of productivity loss (school days, work days and sick leave days lost by the patient)
Methodology

• Inclusion criteria
  • Culture proven of S. typhi irrespective of sensitivity
  • Those who have no co morbidities
  • Given written informed consent

• Data sources and data collection
  • telephonic interviews with patients immediately after enrollment
    • 6 weeks follow up
Methodology

• Data analysis plan
  • Data cleaning and analysis were done on STATA
Results

Patients visiting the health facilities

- Tertiary care hospital
- Secondary care hospital
## Results

Median dollars spent on direct medical expenses (medicine, diagnostics, laboratory, hospital stay) (2016 USD)

<table>
<thead>
<tr>
<th>Hospital (in Patient)</th>
<th>XDR typhoid patients</th>
<th>Non XDR typhoid patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary care hospital</td>
<td>573</td>
<td>157</td>
</tr>
<tr>
<td>Secondary care hospital</td>
<td>94</td>
<td>42</td>
</tr>
</tbody>
</table>
Results

Median dollars spent on direct non medical expenses (transportation, food, and lodging) (2016 USD)

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<thead>
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<th>Hospital</th>
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<th>Non XDR typhoid patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary care hospital</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Secondary care hospital</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>
# Results

Median productivity loss (school days, working days, and sick leave days lost) incurred by the patient

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<td>14</td>
</tr>
<tr>
<td>Secondary care hospital</td>
<td>15</td>
<td>12</td>
</tr>
</tbody>
</table>
Way forward

- Preparedness for emergency medical responses
  - Budget impact and fiscal space
    - Vaccination, targeted/universal, source of financing
  - Economic epidemiology
    - Behavioral aspects of medication adherence, irrational use of medicine and quackery
  - Cost of vaccine
    - Vaccine plus cold chain, management and training

- Household resources
  - Catastrophic health shocks and affordability
  - Access related issues
## Acknowledgements

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<thead>
<tr>
<th>AKU</th>
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<tr>
<td>Dr Farah Qamar</td>
<td>Team of SEAP</td>
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<td></td>
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Thank you