The Economic and Social Impact of Road Traffic Injuries in South Asia

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Rationale for estimating costs of RTI
Cost of RTI globally and in South Asia
Association between RTIs and economic development
Social Cost Dimensions of RTIs
Cost-effectiveness of road safety interventions
Burden of RTIs in South Asia: Magnitude

- One of the highest rate of road traffic deaths in the world
  - Example: India = 29.2/100,000
- RTI account for 50-75% of all injury related deaths
- 15-30% of ER visits and 30-50% of trauma related hospital visits due to RTI
 Needed for decisions

• Decision making & prioritization of resources:
  – Need to understand magnitude of problem in economic terms in order to determine level of financial investment that is needed

• Selection of cost-effective interventions
  – Identification of interventions with the greatest return on investment (ROI) or benefit-to-cost ratio
Cost of Injuries
### Global Costs of RTIs

<table>
<thead>
<tr>
<th>Region</th>
<th>Regional GNP 1997</th>
<th>As %</th>
<th>Estimated annual crash costs GNP $ Billions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>370</td>
<td>1%</td>
<td>$3.7</td>
</tr>
<tr>
<td>Asia</td>
<td>2454</td>
<td>1%</td>
<td>$24.5</td>
</tr>
<tr>
<td>Latin America/Caribbean</td>
<td>1890</td>
<td>1%</td>
<td>$18.9</td>
</tr>
<tr>
<td>Middle East</td>
<td>495</td>
<td>1.5%</td>
<td>$7.4</td>
</tr>
<tr>
<td>Central/Eastern Europe</td>
<td>659</td>
<td>1.5%</td>
<td>$9.9</td>
</tr>
<tr>
<td><strong>Sub total</strong></td>
<td><strong>5615</strong></td>
<td></td>
<td><strong>$64.5</strong></td>
</tr>
<tr>
<td><strong>Highly motorized countries</strong></td>
<td><strong>22,665</strong></td>
<td>2%</td>
<td><strong>$453.3</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>$517.8 Billion</strong></td>
</tr>
</tbody>
</table>

(Jacobs et al., 2000)
# US Incidence and Costs of Injury

(Finkelstein, et al 2006)

<table>
<thead>
<tr>
<th></th>
<th>Medical Costs</th>
<th>Productivity Losses</th>
<th>Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fatal</strong></td>
<td>$1 Billion</td>
<td>$142 Billion</td>
<td>$143 Billion</td>
</tr>
<tr>
<td><strong>Hospitalized</strong></td>
<td>$34 Billion</td>
<td>$49 Billion</td>
<td>$92 Billion</td>
</tr>
<tr>
<td><strong>Non-hospitalized</strong></td>
<td>$45 Billion</td>
<td>$125 Billion</td>
<td>$171 Billion</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$80 Billion</td>
<td>$326 Billion</td>
<td>$406 Billion</td>
</tr>
</tbody>
</table>

*Cost Estimates Based on 2000 data*
Costs of Road Traffic Injuries

**Direct Costs**
- Medical
- Mental health
- Emergency response services
- Law enforcement services
- Judicial services

**Indirect Costs**
- Premature deaths
- Lost productivity
- Absenteeism
- Economic development
- Quality of life
- Other intangible losses
Methods for economic appraisal of RTIs

**Human Capital Approach**
- Remedial costs (healthcare costs), Loss output (net of future earnings), Reconstruction costs (material damage), Pain and suffering

**Willingness-to-pay**
- Use of surveys to estimate what individuals are willing to pay to have a lower risk of injury (or what they are willing to accept for a higher risk of injury)
- Value of Statistical Life can be generated
Cost of RTIs in South Asia

India:
– USD $13.5–50 Billion (3% of GDP)

Bangladesh:
– USD $745 Million (1.6% of GDP)

Pakistan:
– USD $1.65 Billion (1.3% of GDP)

[based on VOSL estimations; Cropper et al]
RTI and Economic Development: Globally
(Bishai et al 2006)

7.9%
(Bishai et al 2006)

4.7%
(Bishai et al 2006)

3.1%
Road Traffic Deaths and Economic Development in India
Road Traffic **Injuries** and Economic Development in India 
*(Garg & Hyder 2006)*

11/100,000 population
Road Traffic Deaths and Economic Development in India

(Garg & Hyder 2006)

Adjusted mean annual death rate per 100,000 people

Per capita NDP year 2001 (100 US$)

2/100,000 population
Injury Statistics

“A statistic is not just a number, it is a number with a teardrop on it.”

- Wade Hampton Frost
Immeasurable losses

38,000 children become orphans each year in Bangladesh
### Social Impact of Road Traffic Fatalities in South Asia (Thomas et al 2004)

<table>
<thead>
<tr>
<th>RURAL AREA</th>
<th>Poor</th>
<th>Non-Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>India:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road deaths</td>
<td>48.1</td>
<td>26.1</td>
</tr>
<tr>
<td>Bangladesh:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serious Injury</td>
<td>91.3</td>
<td>123.9</td>
</tr>
</tbody>
</table>

Rates per 100,000 population; p<0.05
### Social Impact of Road Traffic Fatalities: Bangalore, India

*(Thomas et al. 2004)*

<table>
<thead>
<tr>
<th>URBAN (n=189)</th>
<th>Poor</th>
<th>Non-Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Took a loan</td>
<td>73%</td>
<td>53%</td>
</tr>
<tr>
<td>Had to sell asset</td>
<td>17%</td>
<td>6%</td>
</tr>
<tr>
<td>Took on extra work</td>
<td>25%</td>
<td>10%</td>
</tr>
</tbody>
</table>

All diff’s sig. p<0.05
Cost-effective Investments?
### Spending on Safety: Road Traffic (Bishai & Hyder 2003)

<table>
<thead>
<tr>
<th>Country</th>
<th>Per capita Expenditure (US$)</th>
<th>Total Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uganda</td>
<td>$0.09</td>
<td>$11,531,934</td>
</tr>
<tr>
<td>Pakistan</td>
<td>$0.07 ($11,531,934)</td>
<td></td>
</tr>
</tbody>
</table>

This is equivalent to:

- About 1% as much as annual government health spending
- About 0.2% as much as annual military spending
Countries should spend more on preventing RTIs---especially since cost-effective interventions exist.
### Effective Interventions Exist (Bishai & Hyder 2006)

<table>
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<tr>
<th>Intervention</th>
<th>Cost per Disability Adjusted Life Year (DALY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved enforcement (LMIC average)</td>
<td>$5.25</td>
</tr>
<tr>
<td>Speed bumps at top 25%ile dangerous junctions (LMIC average)</td>
<td>$8.89</td>
</tr>
<tr>
<td>Bicycle helmets (China)</td>
<td>$107</td>
</tr>
<tr>
<td>Motorcycle helmets (Thailand)</td>
<td>$467</td>
</tr>
</tbody>
</table>

By comparison: treating AIDS patients in Africa with simplest regimen of highly active therapy costs $635 per DALY averted.
Spending on road safety: A Proposal for South Asia

- If 10% of the total costs of RTIs were established as a justifiable level of funding, then spending on road safety should be:

  - India: USD $1.35 – 5 Billion
  - Pakistan: USD $165 Million
  - Bangladesh: USD 74.5 Million
Conclusion

• Under-investment in road safety and strong economic rational for increased spending by governments in South Asia on the prevention of road traffic injuries and fatalities

• Interventions for road traffic injuries are among the most cost-effect health and public health interventions that have shown to be successful

• The cost of injuries is too high in economic and social terms (a “moral imperative”)

• Need to address social dimensions and inequities caused by road traffic injuries
Thank You

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