Correlates of completing routine vaccination among children in Mysore, India

Soumyadeep Mukherjee¹; Karl Krupp¹,²; Vijaya Srinivas²; Poornima Jaykrishna²; Reshma Shaheen²; Anjali Arun²; Bhavana Niranjakumar²; Purnima Madhivanan¹,²

¹Robert Stempel College of Public Health, Florida International University, Miami, USA; ²Public Health Research Institute of India, Mysore, India
Background

• Expanded Program on Immunization (EPI) established by the WHO in 1974.
• Initially targeted vaccine preventable diseases (VPD) like Tuberculosis, Poliomyelitis, Diphtheria, Tetanus, Pertussis, Measles.
• Nearly 20 million children incompletely vaccinated in 2010.
• India, Nigeria and Indonesia: 53% of under-vaccinated children
Immunization in India

• 1978: India adopted the Expanded Program on Immunization.
• 1985: Universal Immunization Program (UIP) introduced.
• Objective of UIP: immunization coverage of all infants and pregnant women by the 1990s.
• 2012 estimates: 70-87% coverage for different routine vaccines.
• National Family Health Survey-3 (NFHS-3), 2005-06: Less than 45% immunization coverage.
Some factors associated with under-vaccination in India

• Role of parental attitudes in vaccination completion
  – studies are rare.
• Lack of faith in vaccination at the family level.
• Lack of knowledge about vaccine efficacy.
• Fear of side effects.
• Lack of family support.
• Lack of motivation and information.
Study objective

To examine the correlates of complete routine vaccination among children in the South Indian city of Mysore in Karnataka.
Study setting: India

- According to area: 7th largest country
- Population: More than 1200 million (2nd highest!)
  - National language: Hindi

10/31/2013
Study setting: Karnataka

- 8th largest Indian state by area.
- 9th largest by population.
- Official language: Kannada.
AREA vs POPULATION
MYSORE DISTRICT

Prepared by: District NRIMS Centre,
ZP, Mysore
Source: District Statistical Office, Mysore
Methods

• Participants: 800 parents of at least one adolescent daughter attending a school in Mysore.
• 2-stage probability proportional to size sampling.
• Self-administered questionnaires in English or Kannada.
• Study approved by IRB of the Public Health Research Institute of India.
• Questions:
  – Perceived barriers towards getting children vaccinated
  – Perceived benefits of vaccination
  – Knowledge, attitudes and practice related to utilizing health care for the child.
Methods (contd.)

• Outcome variable:
  - Complete immunization of all children: Parents who replied that all of their children received all the UIP vaccines.
  - Unimmunized or incompletely immunized: All other parents

• Data analysis: Using software SAS, Version 9.3
  - Descriptive statistics
  - Bivariate and multivariable logistic regression adjusted for clustering.
Figure 1: Distribution of parents (%) according to complete vaccination of their children (N=778)
Figure 2: Parents’ “belief in vaccines’ effectiveness” and complete vaccination of children.
Figure 3: Parent’s fear of vaccinating children and children’s complete vaccination (N=778)
Figure 4: Parent’s belief that disease is better than vaccination and children’s complete vaccination (N=778)

- Better to get disease: 288
- Not better to get disease: 257

Legend:
- Did not complete routine vaccination
- Completed routine vaccination
Figure 5: Parent’s knowledge about where to get vaccination and children’s complete vaccination (N=778)
Figure 6: Parent’s difficulty in taking time off work and children’s complete vaccination (N=778)
Figure 7: Parent’s tendency to ask doctors/nurses about vaccination and children’s complete vaccination (N=778)

- **Ask**
  - Did not complete routine vaccination: 450
  - Completed routine vaccination: 215

- **Does not ask**
  - Did not complete routine vaccination: 95
  - Completed routine vaccination: 18
Figure 8: Parent’s tendency to get vaccine recommended by doctor/nurse and children’s complete vaccination (N=778)
Figure 9: Parent getting children vaccinated with optional vaccines and children’s complete vaccination (N=778)
Figure 10: Parent taking sick child to MD/MBBS doctor and children’s complete vaccination (N=778)
Figure 11: Parent’s religion and children’s complete vaccination (N=778)

- Hindu: 408
  - Did not complete routine vaccination: 199
  - Completed routine vaccination: 209
- Muslim/Christian/Other: 137
  - Did not complete routine vaccination: 34
  - Completed routine vaccination: 103
Table 1: Results of multivariable logistic regression

<table>
<thead>
<tr>
<th>Items</th>
<th>Adjusted Odds Ratio&lt;sup&gt;a&lt;/sup&gt; (OR)</th>
<th>95% Confidence Interval (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received any other optional vaccine <em>(Ref: Did not receive any optional vaccine)</em></td>
<td>4.56</td>
<td>3.09-6.74</td>
</tr>
<tr>
<td>Ask about vaccination when visited a doctor/nurse <em>(Ref: Do not ask)</em></td>
<td>2.07</td>
<td>1.10-3.90</td>
</tr>
<tr>
<td>Believe that vaccinations are effective in preventing disease <em>(Ref: Do not believe)</em></td>
<td>2.50</td>
<td>1.19-5.28</td>
</tr>
<tr>
<td>Believe that getting the disease and natural protection is better than getting vaccinated <em>(Ref: Believe that vaccination is better)</em></td>
<td>0.71</td>
<td>0.52-0.96</td>
</tr>
</tbody>
</table>

<sup>a</sup> Only the variables statistically significant are shown here. In addition to these, other variables introduced in the multivariable model are: respondent’s age, education level, occupation, religion, whether seeks care from an MD/MBBS doctor when child is sick, fear about getting children vaccinated, knowledge about the place of vaccination and getting time off work.
Discussion

• Complete vaccination rate: less than the national averages.
• Higher educational attainment of parents: higher proportion of fully vaccinated children.
• Religion: Hindus more likely to vaccinate children than other religions.
• Belief in vaccines’ effectiveness: more likely to have completely vaccinated children.
• Getting children vaccinated with optional vaccines: Higher likelihood of complete vaccination with routine vaccines
• Difficulty in taking time off work: barrier
Limitations

• Parents in this sample are older compared to parents usually surveyed for routine immunization studies: potential recall bias.
• Not controlled for birth order.
• School-based sample: limited representativeness
• Could not look at gender disparities.
• Parents had to reply “no” even if one child was not fully vaccinated: addressed by analyzing the subsample of parents with single children.
Strengths

- A large number of attitudinal factors considered.
- Socio-demographic variables: taken into account.
- Focuses on a setting which accounts for a majority of unimmunized children worldwide.
- Addresses parents with girl children: the more disadvantaged group.
- One of the first studies to examine parental attitudes regarding vaccination in India.
Conclusions

• Belief in vaccines effectiveness and administering optional vaccines are important facilitators.
• Belief that getting the disease is better is an important barrier.
Thank you!

Questions?