Household Transmission of *M. tuberculosis*

Commentary
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Household (HH) contacts who were HIV-infected

- 40% HIV + patients presented with a strain acquired through a contact network outside the household

<table>
<thead>
<tr>
<th>HIV Status</th>
<th>n</th>
<th>RFLP Pattern Compared with Index Case Isolate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Match</td>
</tr>
<tr>
<td>HIV negative</td>
<td>39</td>
<td>33 (84)</td>
</tr>
<tr>
<td>HIV positive</td>
<td>22</td>
<td>13 (59)</td>
</tr>
<tr>
<td>Total</td>
<td>61</td>
<td>46 (75)</td>
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Community Transmission Risk

- Two people living in the same HH do not always have the same strain of MTB suggesting significant transmission outside of HH
- Classen et al (Thorax 1999): found that 55% of HH had an individual with a different strain
- Verver et al (Lancet, 2004): found that only 19% of transmission occurred within the HH
- Schaaf et al (IUTLD, 2003): was only able to link 42% of children to the HH contact
- Non-HH contacts can play significant role in transmission in high incidence areas
Where *does* transmission take place?

- Concept of "*place finding*” instead of “case finding” to allow us to maximize interventions to reduce transmission
- How social interactions affect TB transmission
- Extensive social mixing high density, low income communities in sub-Saharan African
- High numbers of indoor contacts and intergenerational mixing in households and transportation, churches, schools, and bars
What is the role of Clinic in TB transmission in HIV-infected patients?

• HIV infected patients spend significant time in the clinic environment

• Murray et al (IUTLD, 2009) mapped “hot spots” and found that clinics had the 2\textsuperscript{nd} highest TB transmission risk (after bars)

• Need novel strategies to reduce transmission in health care facilities but first need to understand the transmission patterns
TB Contact Networks
Clinic
Kampala Uganda
Clinic

Approach--combining methods from molecular biology, epidemiology and social network analysis
Unanswered Questions & Research Needs

• Is the household a useful/effective entry point for TB control in HIV-infected persons?
• What is the priority for overall TB control in HIV infected persons: community versus more targeted individual TB/HIV management?
• How can we identify the social networks that enhance TB transmission in HIV-infected persons?
• What community interventions could be tested to reduce transmission of MTB?
END