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>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Match</td>
</tr>
<tr>
<td></td>
<td></td>
<td>--- n (%)</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>
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<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
Kampala Uganda

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