Community, workplace and individual-level risks for STI in Central American sex workers: a multilevel approach

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BACKGROUND

There is growing interest in the role of “place” or “venue” in the risk for sexually transmitted infections (STI). The term “place” collectively refers to structural characteristics of a workplace or other setting (e.g. neighborhood, school, etc.) that can affect disease risk. Plausible mechanisms for the role of “place” on STI risk include its effects on individual risk behaviors and on patterns and roles of sexual mixing as well as structural attributes of place that influence underlying access to condoms or STI care or willingness to adopt preventive or care-seeking behaviors (causal model below).

This study is a component of the Multicenter Study (EMC) that implemented 2nd generation surveillance of HIV/STI and behaviors in vulnerable populations in 5 Central American countries. Dissemination of preliminary descriptive data has already served to refine intervention designs and mobilize funding to serve the populations under study. Multilevel analysis has the potential to add to our understanding of whether, how, and why sex workplaces and communities are associated with STI risk.

SPECIFIC AIMS

We will examine individual-level risk factors among female sex workers (FSW) in 5 Central American countries and consider the independent role of a woman’s workplace and community in determining her risk for prevalent STI, including HIV infection. These aims are to:

1. Examine the independent associations of individual-level socio-behavioral characteristics with current C. trachomatis, N. gonorrhoeae, and T. vaginalis infection as well as to explore evidence of current or past T. pallidum infection, herpes simplex virus type 2 (HSV-2) and recent or non-recent HIV infection.
2. Determine the independent and nested associations of individual, workplace and community-level factors with STIs.

METHODS

• Sampling – Two-stage cluster sampling in capital cities; exhaustive (take-all) sampling for all ports (non-capital)
• Ethical aspects – Protocol reviewed and approved by each country-level IRB as well as the University of Washington’s IRB. Written or verbal consent. Free treatment for all confirmable STI detected.
• Laboratory methods
  C. trachomatis and N. gonorrhoeae – PCR (Cobas automated system, reagents from Roche Pharmacuticals)
  T. pallidum – on-site RPR with TPHA confirmation performed at central laboratory
  HSV-2 – ELISA (Focus Technologies)
  T. vaginalis – In Pouch culture system (BioMed)
  HIV – in-country by EIA serology (OIAI, Abbott Laboratories); WB confirmation and diluted ELISA results (OIAI-LDS)
• Socio-behavioral face-to-face interview – instrument adapted from questionnaires used and validated internationally; wording adapted for each country; trained interviewers.
• Statistical methods – logistic model for individual analysis; multilevel logistic model for individual, workplace and community-level analysis.

STRENGTHS & LIMITATIONS

• Prevalence of STI varies by study site
• Taking the case of one of the STI under study, C. trachomatis prevalence varies by reported workplace type and this variation seems more pronounced when disaggregated by study site. Cumulative experience working as an FSW is also strongly associated with this infection and will need to be treated as an important confounder.
• Average C. trachomatis prevalence varies by workplace cluster where women were recruited to participate in the study (data not shown). Higher average prevalence is found in establishment-based venues in El Salvador, Guatemala and Nicaragua but in street-based venues for Panama.
• This exploratory analysis of the relationship between C. trachomatis and workplaces within communities suggest that there are patterns of interest. Patterns for other STI preva

PRELIMINARY RESULTS

STI prevalence by study site

<table>
<thead>
<tr>
<th>Country/Study Site</th>
<th>C. trachomatis (%)</th>
<th>N. gonorrhoeae (%)</th>
<th>T. vaginalis (%)</th>
<th>HIV (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Salvador* L</td>
<td>13%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>San Miguel P</td>
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<td>Puerto Barrios C</td>
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<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Guatemala* L</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>San Pedro Sula L</td>
<td>12%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>San Pedro Sula P</td>
<td>12%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Sample distribution by workplace type

Select STI prevalence by number of years experience as FSW

DISCUSSION

• Comprehensive profile of STI prevalence and risk factors in a region where there is little prior knowledge
• 2nd generation surveillance – scope and scientific rigor
• Design conducive to studying social and structural phenomenon
• Generalizability – enhanced by probabilistic sample in capitals and more limited in purposively selected ports
• Possible selection bias – mobility of women between workplaces undefined
• Cross-sectional design – definition of causal relationships is limited; relates to how persistent community or workplace characteristics are
• Measurement – issues with capture of behavioral exposure during relevant timeframe; incomplete exposure information especially on sexual networks; use of secondary data; misclassification of exposure likely unrelated to STI