Costs and Benefits of Homeless TB Screening in San Francisco

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Outline

• Overview of TB screening of homeless shelter residents in San Francisco
• TB program-associated costs of homeless screening
• Benefits of the homeless TB screening program in San Francisco
• Questions for the future
Homeless TB Screening in San Francisco

• Mandatory TB screening for residents of City-operated shelters began in 2005
• Coincided with –
  – Widespread adoption of QFT-Gold in SFDPH clinics
  – Implementation of the CHANGES shelter registration system
TB & Homeless Task Force Developed in 2000 to Produce Guidelines

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TB Screening Policy

- All clients receiving San Francisco shelter services for more than 3 days (cumulative within a 30-day period) are required to complete TB screening and evaluation within 10 working days of entering the shelter system.
- Includes city-operated emergency shelters and resource centers but not private or faith-based shelters.
## Initial Screening

<table>
<thead>
<tr>
<th>Screening Results</th>
<th>Follow-up</th>
<th>Data Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>TST or QFT negative and asymptomatic</td>
<td>• None (until following year)</td>
<td>Enter shelter clearance date in the LCR</td>
</tr>
<tr>
<td></td>
<td>• Provide green TB clearance card</td>
<td></td>
</tr>
<tr>
<td>TST or QFT+ and asymptomatic</td>
<td>• Chest x-ray</td>
<td>TB Control enters shelter clearance date or clinical alert in the LCR</td>
</tr>
<tr>
<td></td>
<td>• Medical evaluation at TB Clinic (refer with TB47 form)</td>
<td></td>
</tr>
<tr>
<td>Symptomatic</td>
<td>• New chest x-ray</td>
<td>All TB suspects should be sent to TB Clinic for evaluation. If work-up by</td>
</tr>
<tr>
<td></td>
<td>• Urgent medical evaluation</td>
<td>provider is negative, enter clearance in the LCR</td>
</tr>
<tr>
<td></td>
<td>• TST or QFT</td>
<td></td>
</tr>
</tbody>
</table>

LCR = Lifetime Clinical Record, DPH EHR
# Annual Follow-up Screening

<table>
<thead>
<tr>
<th>Client Type</th>
<th>Treatment History</th>
<th>Evaluation Required</th>
</tr>
</thead>
</table>
| HIV– or HIV+ / TST or QFT– | No prior treatment | • Annual TST/QFT  
• Annual symptom review |
| HIV– or HIV unknown/ TST or QFT+ | Completed LTBI treatment | • Annual symptom review |
| HIV– or HIV unknown/ TST or QFT+ | No prior or incomplete treatment | • Annual symptom review  
• Annual symptom review and medical risk assessment for diabetes, cancer, immune modulating medication intake, end-stage renal disease and HIV  
• If new risk present, repeat chest x-ray annually if patient remains untreated |
| HIV+/ TST or QFT+ | Completed preventive treatment | • Annual symptom review  
• Low threshold to repeat CXR |
| HIV+/ TST or QFT+ | No prior or incomplete treatment | • Minimum annual symptom review and repeat CXR  
• Should be followed by SF TB Control (please refer to TB clinic if necessary) |
Clearance

• Shelter client issued a TB clearance card upon completion of screening
• Expiration date is entered into the DPH Lifetime Clinical Record (LCR)
• Client presents card to shelter/resource center staff at check-in
• Expiration date is entered into the CHANGES registration system
  – Date color-coded based on whether clearance is about to expire (orange) or has expired (red)
TB Screening and Evaluation Process

- Client referred to DPH clinic/affiliated clinic for TST/QFT
- If QFT/TST+ or prior positive or symptomatic, client is referred to TB clinic for chest x-ray and MD evaluation
- Clearance card given to client –
  - At DPH/affiliated clinic if TST/QFT negative (select sites)
  - At TB clinic if TST/QFT+, prior positive, or symptomatic
- Temporary clearance given as needed
TB Program Costs – Assumptions and Estimates (1)

• 2005-2012
  – Annual average of 1,729 homeless needing screening
• QFT-Gold In-tube cost: $32.86 (includes labor and supplies)
• QFT-Gold In-tube positive rate: 7%
• Chest X-ray and MD visit cost: $82.50

2Estimates from unpublished cost effectiveness analysis of QFT in San Francisco.
3San Francisco LTBI rate among homeless persons, 2005-2011.
TB Program Costs – Assumptions and Estimates (2)

- TB Clinic staff time per patient needing chest x-ray and MD evaluation\(^1\)
  - Clerical (registration) – 15 minutes
  - Health Worker (registration) – 7 min
  - Nurse (provide clearance) – 5 min

\(^1\)Based on TB Clinic time survey data collected February-March 2012. Time estimates do not include time to draw QFT or refer patient to TB clinic for chest x-ray and evaluation.
### Annual TB Program Cost

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>QFT-Gold In-tube Test:</strong></td>
<td>$56,827</td>
</tr>
<tr>
<td>1,729 x $32.86 =</td>
<td></td>
</tr>
<tr>
<td><strong># needing chest x-ray and MD evaluation:</strong></td>
<td></td>
</tr>
<tr>
<td>0.07 x 1,729 = 121</td>
<td></td>
</tr>
<tr>
<td><strong>Chest X-ray and MD evaluation:</strong></td>
<td>$9,987</td>
</tr>
<tr>
<td>121 x $82.50 =</td>
<td></td>
</tr>
<tr>
<td><strong>TB Clinic staff time:</strong></td>
<td>$1,922</td>
</tr>
<tr>
<td>Clerical: 30.26 hours x $28.59 = $865</td>
<td></td>
</tr>
<tr>
<td>Health Worker: 14.12 hours x $27.69 = $392</td>
<td></td>
</tr>
<tr>
<td>Nurse: 18.23 min. x 10.09 hours = $665</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL ANNUAL COST</strong></td>
<td>$68,736</td>
</tr>
</tbody>
</table>
## Homeless Cases, 2005-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Shelter</th>
<th>SRO</th>
<th>Street/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>City (n=17)</td>
<td>Private (n=17)</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>3 (18%)</td>
<td>0</td>
<td>7 (41%)</td>
</tr>
<tr>
<td>2006</td>
<td>2 (9%)</td>
<td>1 (5%)</td>
<td>11 (50%)</td>
</tr>
<tr>
<td>2007</td>
<td>3 (12%)</td>
<td>1 (4%)</td>
<td>12 (48%)</td>
</tr>
<tr>
<td>2008</td>
<td>3 (20%)</td>
<td>0</td>
<td>5 (33%)</td>
</tr>
<tr>
<td>2009</td>
<td>0</td>
<td>0</td>
<td>6 (40%)</td>
</tr>
<tr>
<td>2010</td>
<td>1 (14%)</td>
<td>1 (14%)</td>
<td>2 (29%)</td>
</tr>
<tr>
<td>2011</td>
<td>4 (36%)</td>
<td>0</td>
<td>5 (46%)</td>
</tr>
<tr>
<td>2012</td>
<td>0</td>
<td>0</td>
<td>8 (67%)</td>
</tr>
<tr>
<td>2013</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18 (13%)</strong></td>
<td><strong>3 (2%)</strong></td>
<td><strong>60 (42%)</strong></td>
</tr>
</tbody>
</table>
### Characteristics SF City Shelter Cases, 2005-2012 (1)

<table>
<thead>
<tr>
<th></th>
<th>City Shelter</th>
<th>SRO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulm. Smear +</td>
<td>47%</td>
<td>45%</td>
</tr>
<tr>
<td>Pulm. Culture +</td>
<td>80%</td>
<td>73%</td>
</tr>
<tr>
<td>Pulm. Cavitary</td>
<td>0</td>
<td>36%</td>
</tr>
<tr>
<td>HIV +</td>
<td>36%</td>
<td>33%</td>
</tr>
<tr>
<td>Died</td>
<td>6%</td>
<td>14%</td>
</tr>
</tbody>
</table>
Characteristics SF HSA Shelter Cases, 2005-2012 (2)

<table>
<thead>
<tr>
<th></th>
<th>City Shelter</th>
<th>SRO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converters</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Clustered Cases¹</td>
<td>0</td>
<td>9²</td>
</tr>
</tbody>
</table>

¹Clustered to another case in the same shelter or SRO at any time, 2005-2012.
Other Benefits (1)

- Developed close working relationship with homeless providers and shelter staff
  - Facilitates timely response to exposures
  - Opportunities for education and training for shelter staff
- Brings TB awareness to shelter staff
- Use CHANGES to target contact investigations
- Overlapping mechanisms to track screening and clearance
  - TB Control, CHANGES (shelters), LCR (EHR)
- Addresses the disparity in TB rates among the homeless
Other Benefits (2)

- Screening provides opportunity to link patients to other services
  - HIV, cancer, viral hepatitis, diabetes, mental health services, primary care
- Indirectly provides screening for clients being transferred from shelters to SRO housing
- QFT allows for LTBI surveillance in this population
- Green card is powerful motivation for getting TST read
Questions for the future...

• With established relationships and tracking systems...
  – Are there opportunities to reduce costs?
    • Reduce frequency of annual screening?
  – How can we expand treatment for LTBI in this population?
    • Use 3HP?
  – Is it cost effective?
    • ?
  – Does screening program have an impact on health outcomes?
    • TB? Overall health of the population?
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