Improving risk assessment among contacts exposed to a person with infectious tuberculosis in Maryland

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Maryland Department of Health and Mental Hygiene
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MISSION

• To improve the health of Marylanders by reducing the transmission of infectious diseases, helping impacted persons live longer, healthier lives, and protecting individuals and communities from environmental health hazards

• We work in partnership with local health departments, providers, community based organizations, and public and private sector agencies to provide public health leadership in the prevention, control, monitoring, and treatment of infectious diseases and environmental health hazards.
Outline

• **Project Overview**
  – Background information
  – Objectives

• **Methods/Findings**

• **Lessons learned**
  – Limitations and Challenges
  – Policy and Practice Implications

• **Questions & Answers**
Background Information¹-³

CDC Guidelines for TB programs:

- Identify, treat, and report of all persons with infectious TB
- Conduct **contact investigations** to find persons who were exposed to a TB infectious patient
  - Extent investigations to second- and third tier contacts outside the household
- Determine contacts TB status and risk of progression to TB disease
- Provide care and TB treatment to contacts if needed

- **Of contacts with latent TB infection, ~55-65% complete treatment**
  - *Screening for infection is not often based on health status of individual contacts*

- **Genotyping data has helped to identify weaknesses in contact investigations**
  - Locations outside the household are not commonly identified by investigators
Objectives

• To continue to improve contact investigations by creating/implementing forms that standardize collection of information that has been missed historically

• To use our increasingly limited resources in the very best way possible by ensuring that disease is prevented in those at greatest risk

• To aid in the prioritization process of contacts
Methods

• Assemble a comprehensive list of factors that may accelerate progression to active TB in latently infected contacts

• Establish a working group to:
  • Review the status quo of risk assessment in Maryland
  • Brainstorm possible ways to improve the TB Contact Record and the Location-based Contact Investigation forms

• Revise Forms
  • field-tested Location-based Contact investigation form
  • TB Contact Record form

• Encourage implementation of both forms into contact investigations
Findings: Medical Risks$^{4-15}$

- **Well-known**: HIV, diabetes, lung-disease, kidney disease, immunosuppressants (e.g. corticosteroids), age<5, malnourishment

- **Recently identified**: Smoking, excess alcohol, TNF-alpha inhibitors, malignancies (e.g. head/neck cancer)
Risk Factors Associated with the Development of Tuberculosis

- HIV CD4 low *
- HIV CD4 high*
- Diabetes
- Alcohol#
- Alcohol
- Silicosis
- Kidney failure
- anti-TNFs
- Infliximab
- Nutrition
- Smoking
- Cancer^
- Malignancies*
- 0-10 years age*
- Coricosteroids*

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Moran-Mendoza O. 2010

a Relative Risks unless indicated, * Hazard Ratios, # Odds Ratio, ^ Incidence Risk Ratio
Findings: Forms Content and Format

**TB Contact Form**
- Medical risks
- Multiple contacts per page
- Index Case infectious period and case ID
- Added Interferon gamma release assay (IGRA)
- Contact priority level based on CDC guidelines

**Location-based Contact Investigation Form**
- Types of exposure settings in which the contact could have taken place
<table>
<thead>
<tr>
<th>Last Name</th>
<th>First</th>
<th>Middle</th>
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<table>
<thead>
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<th>Address</th>
<th>City</th>
<th>State</th>
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<table>
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<tr>
<th>Phone</th>
<th>Country-of-origin</th>
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<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Hispanic</th>
<th>Race</th>
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<th>Encounter Setting</th>
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</thead>
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<td>Household</td>
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<td>Work</td>
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<td>Leisure</td>
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<td>Congregate</td>
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<tr>
<th>Relation to Case</th>
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<table>
<thead>
<tr>
<th>Date Contact Ended: <strong>/</strong>/__</th>
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<tbody>
<tr>
<td>Date Contact Ended: <strong>/</strong>/__</td>
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<thead>
<tr>
<th>Comments:</th>
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</thead>
</table>

**Tuberculosis Contact Record**

**Index Case:**

**Case Infectious Period:** Start: __/__/__ End: __/__/__

**Type of Case/Suspect:** Pulmonary Smear Pos.

<table>
<thead>
<tr>
<th>Initial TST</th>
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<tbody>
<tr>
<td>Placed: <strong>/</strong>/__</td>
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<tr>
<td>Read: <strong>/</strong>/__</td>
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<tr>
<td>mm</td>
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</tbody>
</table>

**Prior History**

<table>
<thead>
<tr>
<th>Prior TB:</th>
<th>Y N</th>
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<tr>
<td>Year: <strong>/</strong>/__</td>
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</table>

<table>
<thead>
<tr>
<th>Prior BCG:</th>
<th>Y N</th>
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<tbody>
<tr>
<td>Year: <strong>/</strong>/__</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Prior TST:</th>
<th>Y N</th>
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<tbody>
<tr>
<td>Year: <strong>/</strong>/__</td>
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**Prior IGRA:**

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<tr>
<th>Prior IGRA:</th>
<th>Y N</th>
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<tbody>
<tr>
<td>Year: <strong>/</strong>/__</td>
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<table>
<thead>
<tr>
<th>Prior TLTBI:</th>
<th>Y N</th>
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</thead>
<tbody>
<tr>
<td>Year: <strong>/</strong>/__</td>
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</tbody>
</table>

**Risk Factors:**

- HIV
- Diabetes
- Lung disease
- Smoking
- Alcohol abuse
- Kidney failure
- Steroids
- TNFα inhibitors
- Other immunosuppressants
- Head/neck cancer
- Age < 5 years
- Underweight (<10% normal)
- Tuberculosis disease
- LTBI
- PMD evaluation
- LHD evaluation

**Outcome:**

- TB disease
- LTBI
- Not Recommended
- Recommended
- Accepted
- Refused
- PMD evaluation
- LHD evaluation
- Tuberculosis disease
- LTBI
- Not Recommended
- Recommended
- Accepted
- Refused

**Return Appointment:**

- Begun: __/__/__
- Date: __/__/__

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Please complete every box carefully.
**TUBERCULOSIS CONTACT RECORD INSTRUCTIONS**

**INDEX CASE:**

**CASE INFECTIOUS PERIOD:**

**TYPE OF CASE/SUSPECT:**

**COUNTY:**

**STATE/LOCAL CASE#:**

**FORM COMPLETED BY:**

**DATE:**

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**Box 1**

*Index Case*- Local identification of index case.

*Case Infectious Period*- Indicate the beginning and ending dates of the infectious period for the index case.

*County*- Case's county of residence

*Case #*- Indicate state or local case number

**Form Completed By and Date**- Indicate clearly who is completing the form and the date that the form was completed.

**Box 2**

*Name*- Indicate the complete name of the contact

*Address*- Indicate the complete address of the contact

*Phone*- Indicate the contact's phone number

*Country-of-origin*- Indicate the contact's nationality

*Age*- Indicate the contact's age

*Sex and Race*- Indicate the contact's sex and race

*Relation to case*- Describe the relationship of the contact to the index case. i.e. spouse, co-worker, housemate, friend, in same homeless shelter, etc. and provide the date that the relationship ended.

*Comments*- Document the place of exposure or any other applicable information such as signs/symptoms, etc. Be specific.

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**Box 3**

*Priority*- Indicate the priority level of the contact based on state and CDC guidelines.

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**Box 4**

*Exposure Setting*- Check if the contact lived in the same household, worked at the same place, attended the same school, spent leisure time, or attended the same congregate settings (i.e. church, prison, homeless shelter, etc.). Indicate the number of hours per week that the contact took place.

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**Box 5**

*Prior History*- Check if there is knowledge of prior TB disease or BCG vaccination. Indicate the specific dates when known. Check and date if there are prior tuberculosis skin test (TST) results or prior interferon gamma release assay (IGRA) results. Check if there was prior treatment of latent TB infection (LTBI) and provide the year if known.

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**Box 6**

*Other Info*- Check if the contact has common TB symptoms (cough, night sweats, fever, hemoptysis, etc.). Specify the date and the results of the chest X-ray.

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**Box 7a**

*TB Sxs now:* ☐ Y ☐ N

*X-Ray:* ☐ Normal ☐ Abnormal ☐ Active TB

*Placed:* ___/___/___  Read: ___ mm

8-10 week f/u:___/___/___

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**Box 7b**

*IGRA*

*Type of IGRA test was used*

*Read:___/___/___*  ☐ Pos ☐ Neg

*Result:* ☐ Pos ☐ Neg

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**Box 8**

*RISK FACTORS*

*OUTCOME*

*Y N HIV* ☐ Y ☐ N

*Diabetes* ☐ Y ☐ N

*Lung disease* ☐ Y ☐ N

*Smoking* ☐ Y ☐ N

*Alcohol abuse* ☐ Y ☐ N

*Kidney failure* ☐ Y ☐ N

*Steroids* ☐ Y ☐ N

*TNFα inhibitors* ☐ Y ☐ N

*Other immunosuppressants* ☐ Y ☐ N

*Head/neck cancer* ☐ Y ☐ N

*Age<5 years* ☐ Y ☐ N

*Underweight (<10% normal)* ☐ Y ☐ N

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**Box 9**

*PMD evaluation*

*LHD evaluation*

*Not Recommended*

*Recommended*

*Accepted*

*Refused*

*Returned Appt:___/___/___*  ☐ Y ☐ N

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**Box 10**

*RETURN APPT:___/___/___*  ☐ Y ☐ N

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Please complete every box carefully

DHMH 659  Rev. 02/2012
Contact Investigation Form for Locations

**STATE/LOCAL CASE# : __________________**

1. **Most days, how do you spend your day during the daytime?** (ask generally about : 6 am – 5 pm, but specific time not essential)

<table>
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<tr>
<th>Place name</th>
<th>Location (address/ zipcode)</th>
<th>Activity</th>
<th>Transportation to and from</th>
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2. **Most days, how do you spend your time during the early evening hours?** (ask generally about 5 pm – 10 pm, but specific time not essential)

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<th>Location (address/ zipcode)</th>
<th>Activity</th>
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3. **Most days, how do you spend your time during the overnight hours?** (ask generally about 10 pm - 6 am), but specific time not essential)

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<th>Transportation to and from</th>
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4. **Tell me about other regular weekly or monthly activities where you usually spend time with other people? What do you like to do on the weekends?**

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5. **Can you think of any other place or special indoor event where you spent time with people?** (specify a specific date range according to patient's infectious period)

(i.e. music concerts, weddings, birthdays, reunions, night clubs, weekend trips, etc.)

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<th>Activity</th>
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Lessons-learned

• **Need to develop additional interventions to improve contact investigations**
  - Database for electronic documenting of contact’s risk factors
  - Fostering of collaboration across TB program staff is essential to develop the best policies regarding contact investigations

• **Continual review and revision as needed of available tools is needed for improving contact investigations and for coordinating efforts through training**
Policy & Practice Implications

*Improved TB Contact and Location-based Contact Investigation Form:*

- Provide new training tools for TB staff
- Provide a new system for identifying additional contacts and for documenting contacts’ risks
- Aid in screening prioritization following a contact investigation, so most high risks are fully screened and treated for latent TB infection
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• Nancy Baruch
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• Judy Thomas
Questions & Answers
References