TB Contact investigation - the role of pulmonologists – case Finland

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I have the following, real or perceived direct or indirect conflicts of interest in this presentation:

<table>
<thead>
<tr>
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<th>Nature of conflict / commercial company name</th>
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</thead>
<tbody>
<tr>
<td>Tobacco-industry and tobacco corporate affiliate related conflict of interest</td>
<td>-</td>
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<tr>
<td>Grants/research support (to myself, my institution or department):</td>
<td>Research grants to my institution: Finnish TB Foundation, Tampere Tuberculosis Foundation for my PhD students and our webpage tuberculosis.fi</td>
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Tuberculosis in Finland 1960-2015

![Tuberculosis Incidence in Finland 1960-2015](image)
TB in Finland in 2018

- 226 new cases were detected
- Incidence 4.1/100,000
- 151 pulmonary TB cases, 49 AFB smear positive
- 4 MDR-TB cases, 1 XDR-TB
- Average age of patients 57 y
  - Finns 72 y
  - Foreign-born 36 y
- Origin of patients:
  - Finnish-born 127 (56 %)
  - Foreign-born 94 (42 %)
  - No data 5 (2 %)
- 2 pediatric patients (under 15-yo)
- 5 HIV-TB co-infections
Origin and age groups of TB patients

[Bar chart showing the origin and age groups of TB patients in Finland in 2018. The chart indicates the number of cases in different age groups and whether the patients are Finnish-born or not.]
Contact tracing

• Mandatory to investigate infectious TB cases
• Revised national guidelines 2017
• Aim to reduce workload and concentrate on finding and investigating contacts with highest risk of infection
• Expansion of the use of IGRA and LTBI treatment to young adults (under 35-yo)
• New guidelines for congregational exposures
• New electronic forms
Responsibilities of different stake holders

- **Infectious TB case**
  - Specialized health care (respiratory diseases): start contact investigation within a week

- **TB in children (or young adults); searching for the source case**

- **Primary health care performs contact investigation; doctor responsible of infectious diseases in charge of CI**
Responsibilities of chest physician

When treating a TB patient:
• Is this patient contagious?
• Where has he/she get TB?

What should be in the patient records:
• Decision to start CI
• High/low level of infectiousness?, trying to find source case
• Period of infectiousness

Take care to pass the information to others:
• A special form for index case
• Pass the responsibility to a TB nurse (specialized health care)
• For children < 7 yo; pass the information to pediatricians
• List the contacts to primary health care (doctor responsible of infectious diaseases) to start the investigations
Categorization of index cases

High risk, pulmonary
- AFB smear-positive
- AFB smear-negative but cavitary

Low risk, pulmonary
- AFB smear-negative

Non-respiratory TB
- AFB smear-positive, aerolized secretion
Who to investigate

High risk, pulmonary
- Those living in same household
- If under 7-yo and total exposure time > 8h
- Other individuals total exposure time > 40 h

Low risk, pulmonary
- Those living in same household
- Under 7-yo total exposure > 40h
Contact tracing in Finland

**TUBERCULOSIS PATIENT**

**Pulmonary TB**

- **High risk**¹:
  - AFB smear-positive
  - AFB smear-negative but cavitary²

- **Low risk**³:
  - AFB smear-negative

**Look for source case if**

- Patient is < 16-yo
- Consider if patient is < 35-yo and Finnish-born

**Under 7-yo total exposure > 8h**⁴

- Other individuals exposure > 40h⁴

**Family members**

- Participation in risk procedure⁵

**Under 7-yo total exposure > 40h**⁴

**Other close contacts if needed**

**Investigate exposed individuals**

**Treat TB cases**

**Evaluate the need for LTBI treatment**⁶

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¹ The period of infectiousness depends on duration of symptoms, if not known previous 3 months.
² Treating physician will estimate the period of infectiousness.
³ The period of infectiousness depends on duration of symptoms, if not known previous 1 month.
⁴ Exposure in a room size 60m² or smaller
⁵ E.g. resuscitation, intubation, bronchoscopy, respiratory physiotherapy, induction of sputum and autopsy without proper protection
⁶ Immunocompromised and under 35-yo
• Children < 7yo: in specialized healthcare
• Others in primary healthcare
• IGRA for < 35 yo
• Positive IGRA: consider treatment of LTBI
• Children < 4 yo therapy for LTBI until found to be IGRA negative, then vaccinated. If IGRA+, continued treatment of LTBI.
• Chest x-ray for all; urgently if symptoms
• Our cut-off for IGRA 1.0 for the treatment of LTBI

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Tests (n)</th>
<th>TB events*</th>
<th>Years†</th>
<th>c HR</th>
<th>a HR</th>
<th>P values</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFN-γ level (IU/mL)c‡</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative (&lt;0.35)</td>
<td>37 253</td>
<td>29</td>
<td>1 33 647</td>
<td>1 (ref)</td>
<td>1 (ref)</td>
<td>&lt;0.001§</td>
<td></td>
</tr>
<tr>
<td>Low positive (0.35 to&lt;1.0)</td>
<td>2488</td>
<td>16</td>
<td>6995</td>
<td>10.7</td>
<td>8.8</td>
<td>&lt;0.001</td>
<td>4.66 to 16.50</td>
</tr>
<tr>
<td>Medium positive (1.0 to&lt;4.0)</td>
<td>2971</td>
<td>50</td>
<td>9087</td>
<td>25.1</td>
<td>19.2</td>
<td>&lt;0.001</td>
<td>11.62 to 31.60</td>
</tr>
<tr>
<td>High positive (≥4.0)</td>
<td>5373</td>
<td>157</td>
<td>16 233</td>
<td>43.0</td>
<td>31.3</td>
<td>&lt;0.001</td>
<td>19.82 to 49.53</td>
</tr>
</tbody>
</table>

Stratification by interferon-γ release assay level predicts risk of incident TB

A Restricted cubic spline with knots at 0.35, 3, and 6 IU/ml.

Hazard ratio on log scale

tuberkuloosi.fi - website for general population and a tool for patient counselling

- 10 languages
- TB information
- possibility to send questions to experts
- TB brochures
- videos
- stories
- info for media
Transmission

*Tuberculosis is spread from a person to person through the air. Luckily tuberculosis is not transmitted easily. Correct treatment reduces the spread of the disease.*

Tuberculosis (TB) bacteria get into the air when a person with TB speaks, coughs or sings. Other persons staying in the same indoor environment e.g. in the same room may breathe in this air and get infected.

However, not all people with TB disease spread it to others. TB bacteria are spread by those who have the disease in airways, usually in the lungs, and who generate many bacteria in their sputum.

Tuberculosis is not easily transmitted. Family members living together are at highest risk. Risk of transmission is very small in casual contacts. Only one third of exposed persons become infected.

TB is not transmitted through dishes, drinks, food, clothes or surfaces.

The risk of transmission can be reduced: The sick person should get rapidly evaluated for TB. He/she should follow the treatment instructions carefully. When the sick person learns a safe way to cough, it prevents the spread of bacteria into air. Regular ventilation reduces effectively the amount of bacteria in the room air. Outside, there is practically no risk of transmission.
Contact tracing - what does it mean?

Why is contact tracing done?

Contact tracing is a process used to stop the spread of TB disease in the community. Contact tracing activities are regulated by the Finnish Communicable Diseases Act.

The aim of contact tracing is to find other people with TB disease and those infected with TB.

How is contact tracing conducted?

Most commonly, contact tracing is started with a patient who has been diagnosed with TB disease of the lungs.

It is possible that some other people who have spent a lot of time with the patient have been infected with TB or have got TB disease. Health personnel in the hospital will interview the patient to find out who those people may be.

For example

- members of the family and other people living in the same household with the person with TB disease
- other persons and groups such as friends, relatives and persons at work or study place and in potential recreational circles

By giving the names of possibly infected persons, the person with TB disease helps others around to stay healthy. The information he/she gives is confidential.

Where are the exposed examined and what kind of tests are done?

The exposed people are contacted and asked to book a time for a checkup.
TB outbreak investigation, Turku 2012-2013

- Local CI at Turku region; more than 600 contacts for a case, all < 35 yo, in three different schools
- IGRA for 219 <35 yo close contacts
  - 46 (21%) + (QFT > 1.0)
  - 31/190 (16%) Finnish-born +
  - 15/29 (52%) Foreign-born +
  - An index case, B relative of A (refused for CI)/”super infectious”
- Orange: TB case
- Dark blue: IGRA +
- Light blue: IGRA -