TB Outbreak in Illinois Community/Hospital Partnerships

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Advocate Medical Group and Advocate Dreyer
Objectives

1. Evaluate TB risk factors in your community or service area.

2. Identify screening questions to use in the ER and hospital admission process to identify persons at risk for TB infection.

3. Describe the experience and impact of a TB outbreak on the local hospitals.
Where Is TB Found in Your Community?

- Foreign Born and untreated LTBI
- Healthcare Facilities- hospitals, outpt settings, rehab facilities
- Congregate settings: correctional institutions, homeless shelters, Long Term Care facilities, group homes
- IV Drug Users/Addiction Treatment Centers
- Universities and Schools
History and Background

- Infection Preventionist at a 159 bed acute care hospital located in Kane County
- Had always been at low risk for TB in the county and in the hospital
- Did not have a very robust TB screening tool
Illinois TB Case Rate 2009

Illinois Tuberculosis Case Rates per 100,000 Population 2009

Kane 10 1.97

DuPage 29 3.12

Suburban Cook 100 4.10

Chicago 202 7.08
And then........
Illinois TB Case Rate 2011

Illinois Tuberculosis Case Rates per 100,000 Population 2011

United States
Total Cases: 10,821
Rate: 3.39
From MMWR Vol. 61 No. 11
Illinois (including Chicago)
Total Cases: 350
Population: 12,830,032
Rate: 2.68
Illinois (outside Chicago)
Total Cases: 153
Population: 10,125,034
Rate: 1.90
City of Chicago
Total Cases: 188
Population: 2,696,688
Rate: 8.10
Suburban Cook County
Total Cases: 75
Population: 2,490,077
Rate: 3.00
Illinois (outside Cook County)
Total Cases: 116
Population: 7,035,007
Rate: 1.55
Illinois Population Figures from 2010 Census Summary File 1
National Rate calculated with population data from the 1 July, 2011 population estimates, U.S. Census Bureau.
Rates are suppressed for areas with a population < 100,000.

Case counts as of 19 March, 2012.
Our local homeless shelter
Evolution of a TB Outbreak

- Beginning with a single index case in 2007, the outbreak has encompassed residents at the local homeless shelter, volunteers/staff at that shelter (small #), and household/social contacts of the (+) shelter cases.
- 1400 people considered exposed in this outbreak.
- Area hospitals have been impacted during the progression of inpatient & outpatient evaluation, illness treatment, and delayed placement due to isolation requirements.
From April 2007–August 2014, a total of 50 outbreak cases, including 41 culture-confirmed cases in the PCR00629 TB genotype cluster, were identified among persons affected by homelessness TB outbreak.

43 out of 50 outbreak cases were counted for Kane County.
KANE COUNTY HEALTH DEPARTMENT as of 9/23/2014

Note: Cases in brown are counted as Kane county cases, EXPIRED.
Cases in green are counted as Kane county cases, but transferred to another county for tx.
Cases in purple are counted as Kane cases, tx completed. NOTE: VERY HIGH rate of treatment completion!
Cases in blue are not counted as Kane cases, are counted as cases of other counties, linked to homeless shelter outbreak
This could happen to you…

- Mobility: Homeless shelter (+) TB or (+) LTBI cases may be traveling/visiting friends and present to your ER for complaints unrelated to TB (e.g. ETOH intoxication, falls/fractures, LOC)
- The “unknown”: There remain hundreds of persons on our local TB “Hotlist” who need testing or treatment and many do not even know they are on that list
- Financial: in 2011 alone, the “charity care” related to the outbreak was 1.8 million dollars at one hospital.
Illinois and Kane County TB Rate 2014

Illinois Tuberculosis Case Rates per 100,000 Population 2014

- 2014 Rates
  - Rate Suppressed: 0
  - ≥ 2.49 (Illinois Rate 2014)
  - 2.50 - 3.50 (Year 2010 Target)
  - > 3.50

- United States
  - Total Cases: 0.012
  - Rate: 0.0
  - From: MMWR Vol. 64 No. 18

- Illinois (including Chicago)
  - Total Cases: 320
  - Population: 12,046,554
  - Rate: 2.49

- Illinois (outside Chicago)
  - Total Cases: 179
  - Population: 10,142,453
  - Rate: 1.78

- City of Chicago
  - Total Cases: 141
  - Population: 2,708,101
  - Rate: 5.21

- Suburban Cook County
  - Total Cases: 64
  - Population: 2,559,271
  - Rate: 2.51

- Illinois (outside Cook County)
  - Total Cases: 115
  - Population: 7,035,182
  - Rate: 1.76

- Illinois Population figures from 2013 American Community Survey (5-year), U.S. Census Bureau.


- Rates are suppressed for areas with a population < 100,000.

- Illinois case counts as of 19 March 2014; are subject to change/updates.
  - National figures are provisional until the complete report is published later in 2014.
## Kane County 2006-2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Number Active in Kane</th>
<th>Pulmonary</th>
<th>Extra-Pulmonary</th>
<th>Kane Rate</th>
<th>Illinois Rate</th>
<th>US Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>14</td>
<td>10</td>
<td>4</td>
<td>2.8</td>
<td>4.4</td>
<td>4.6</td>
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<tr>
<td>2007</td>
<td>13</td>
<td>5</td>
<td>8</td>
<td>2.6</td>
<td>4.1</td>
<td>4.4</td>
</tr>
<tr>
<td>2008</td>
<td>14</td>
<td>7</td>
<td>7</td>
<td>3.0</td>
<td>3.6</td>
<td>4.2</td>
</tr>
<tr>
<td>2009</td>
<td>10</td>
<td>9</td>
<td>1</td>
<td>2.0</td>
<td>3.2</td>
<td>3.8</td>
</tr>
<tr>
<td>2010</td>
<td>31</td>
<td>28</td>
<td>3</td>
<td>6.0</td>
<td>2.8</td>
<td>3.6</td>
</tr>
<tr>
<td>2011</td>
<td>30</td>
<td>24</td>
<td>6</td>
<td>5.8</td>
<td>2.8</td>
<td>3.4</td>
</tr>
<tr>
<td>2012</td>
<td>19</td>
<td>16</td>
<td>3</td>
<td>3.7</td>
<td>2.7</td>
<td>3.2</td>
</tr>
<tr>
<td>2013</td>
<td>17</td>
<td>13</td>
<td>4</td>
<td>3.3</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>2014</td>
<td>12</td>
<td>10</td>
<td>2</td>
<td>2.3</td>
<td>2.5</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Source: Illinois Dept of Public Health
TB Screening

PROTECT

them from
TUBERCULOSIS

Keep them away from sick people
Insist on plenty of rest
Train them in health habits
Consult the doctor regularly

"Healthy looks" can hide TUBERCULOSIS

the X-RAY will show it before you know it

Don't kiss me!

YOUR KISS OF AFFECTION
THE GERM OF INFECTION

Christmas Seals Fight Tuberculosis
Can you Imagine??

SYMPTOMS OF TUBERCULOSIS
BE EXAMINED IF YOU HAVE ONE OR MORE OF THESE

A continued temperature of 98° or less in the morning and an afternoon temperature of 99° or more are strong indications of tuberculosis.

A low blood pressure may mean tuberculosis.

If you have any one or more of these symptoms be examined by a careful physician at once.

Loss of weight or Tiring easily suggests tuberculosis.

A cough lasting longer than three weeks is very suspicious.
New TB Screening Tool in Meditech

TB SCREENING

Risk Factors: (Risk Factor History Pertains to Patient Life Span)

Have you ever had/been...

Positive skin test or blood test for TB N
Told you have TB N
Chest Xray Performed for TB N
Contact with TB Positive Individual N

Health care employee N
Known immunosuppression>> Y
Traveled outside of US for >3 weeks at a time Y
Homeless or resided in a shelter N

In a correctional facility for > 72 hrs Y
New TB Screening tool cont.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a correctional facility for &gt; 72 hrs</td>
<td>Y</td>
</tr>
<tr>
<td>Employee of a correctional facility</td>
<td>N</td>
</tr>
<tr>
<td>Born outside of the United States</td>
<td>N</td>
</tr>
<tr>
<td>Country of birthplace</td>
<td></td>
</tr>
<tr>
<td>Year moved to US</td>
<td></td>
</tr>
</tbody>
</table>

Subtotal: 2

Respiratory Symptoms: (Current Symptoms)
- Bloody Sputum: Y
- Persistent Cough > 3 Weeks: N
  Subtotal: 4

Other Symptoms: (Current Symptoms)
- Fever: Y
- Night Sweats: Y
- Unexplained Weight Loss: Y
  Subtotal: 1

Risk Total: 7
- Immediately Place in Airborne Precautions.
### TB Risk Factors (Pertains to Patient's Life Span)

<table>
<thead>
<tr>
<th>Factor</th>
<th>6/24/15</th>
<th>6/25/15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive skin test or blood test for TB</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Told you have TB</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Chest X-Ray Performed</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Contact with TB Positive Individual</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Health Care Employee</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Known Immunosuppression</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Traveled outside US for &gt;3 wks/time</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Travel When?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel Where?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeless or Lived in a Shelter</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>In a Correctional Facility for &gt;72 hrs</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Employee of a Correctional Facility</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Born Outside of the United States</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

#### Positive skin test or blood test for TB

- Select Single Option (F5)
  - 1 = Yes
  - 0 = No

#### Group Information

- If ANY 2 answers in this section are Yes, section is assigned 2 points. If all answers are Yes, only 2 points are assigned. Max for this section is 2 points.

#### Row Information

- Risk factor pertains to the patient's entire life span. Document yes if they have ever in their life had a positive skin test or blood test for TB.
TB Screening Tool in EPIC

### TB Respiratory Symptoms: (Current Symptoms)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloody Sputum (Current)</td>
<td>0</td>
</tr>
<tr>
<td>Persistent Cough &gt;3wks</td>
<td>0</td>
</tr>
<tr>
<td>Respiratory Symptom Subtotal</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Group Information
If ANY answer in this section is Yes, section is assigned 4 points. If all answers are yes, only 4 points are assigned. Max for this section is 4 points.

#### Row Information
Risk factor pertains to the patient’s current symptoms. Document yes if they currently have bloody sputum.

### TB Other Symptoms: (Current Symptoms)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever (Currently)</td>
<td>0</td>
</tr>
<tr>
<td>Night Sweats (Currently)</td>
<td>0</td>
</tr>
<tr>
<td>Unexplained Weight Loss (Current)</td>
<td>1</td>
</tr>
<tr>
<td>Other Symptom Subtotal</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Group Information
If ANY answer in this section is Yes, section is assigned 1 point. If all answers are yes, only 1 point is assigned. Max for this section is 1 point.

#### Row Information
Risk factor pertains to the patient’s current symptoms. Document yes if they currently are having fevers.
Pediatric TB Screening Tool

EPIC

TB Risk Factors: (Pertains to Patient's Life Span)
- Born Outside of the United States
- Country of Birthplace
- Traveled outside US for >1wk/time
- Travel Where?
- Length of Stay
- Contact with TB Positive Individual
- Contact When?
- Positive Contact is a Family Member
- Exposure to person shelter/correction facility
- Risk Factor Subtotal

TB Respiratory Symptoms: (Current Symptoms)
- Bloody Sputum (Current)
- Persistent Cough >3wks
- Respiratory Symptom Subtotal

TB Other Symptoms: (Current Symptoms)
- Fever (Currently)
- Night Sweats (Currently)
- Unexplained Weight Loss (Current)
- Other Symptom Subtotal

TB Screen Total Score
- TB Screen Risk Total Score

Infectious Disease Screening
- Antibiotic Resistant Infections, History of Infection source/site
TB Screening Tool was developed as a hard stop in the Electronic Health Record (EHR)

Questions were asked on entry onto a unit for both admitted patients and those on observation

If a patient had a score greater than 6, an automatic alert would pop up on screen to alert the Healthcare Worker (HCW) to consider active TB in differential, place patient in airborne infection isolation room (AIIR) and notify Infection Prevention
Initially, Nursing did not want to perform this extensive TB screening on patients as they thought it would take too much time. After using this tool, Nursing actually came to its defense when a merge with another hospital threatened to remove the tool = **Success**!

Initially, infection Prevention had to work diligently with nursing on clarification and critical thinking related to certain questions:

- **Weight Loss:**
  - Has the patient been deliberately trying to lose weight? On a diet?
  - Has the weight loss occurred over a long length of time?

- **Night Sweats:**
  - Is this something new or normal for this patient?
  - Peri-menopausal/menopausal female?
Hospital Incidence of TB via Annual TB Risk Assessment 2009-2013

<table>
<thead>
<tr>
<th>Year</th>
<th># suspected</th>
<th># confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2008</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2009</td>
<td>1</td>
<td>0</td>
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<tr>
<td>2010</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2011</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>2012</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>2013</td>
<td>14</td>
<td>2</td>
</tr>
</tbody>
</table>

Implemented the new TB Screening Tool
Other settings for this TB Screening Tool

- **Homeless Shelters**
  - Partnered with another local Homeless Shelter to assist in expanding their TB Screening questions

- **Outpatient Addiction Treatment Centers**
  - TJC, on survey, identified inadequate TB screening questions for new clients. Able to utilize this same tool for this outpatient population

- **Correctional Facilities**
  - Identified an increase population in this local setting. Partnered with this setting on improving their TB screening assessment.
In Conclusion

- It was important to partner with IDPH to develop an effective TB screening tool in the midst of a TB outbreak.
- Identified an increase in suspected and confirmed TB cases post implementation of the new TB screening tool.
  - Important to note: None of the identified active TB cases were related to the TB outbreak.
- Partnered with other settings in the community which can facilitate active TB identification across the continuum of care.
  - Keeps TB identification at the forefront.
It Takes a Village

- Kane County Health Department - Disease Prevention and Emergency and Preparedness Staff – Arlene Ryndak, Sarah Boline and Mari Pena, et al
- Illinois Department of Public Health Laboratory, John Nawrocki, Ahmad Abuarqoub
- Homeless Shelter – Ryan Dowd, Neil McMenamin, John Moriarty et al
- CDC-Krista Powell, MD, et al
- Presence Mercy Medical Center – Laura Marconnet et al
- Rush Copley Medical Center – Maria Montero et al
- Delnor Hospital – Kelly Heisner et al
- Presence St. Joseph Hospital, Elgin – Kathy Hogan et al
- Open Door Clinic
- Dr. James McAuley, Rush Medical Center
- University of Illinois Laboratory
- Cellestis, Inc
- City of Aurora
- NIOSH-Stephen Martin, et al
- Cook County Department of Public Health- TB Control
- City of Chicago Department of Public Health- TB Control
- Lake County Health Department
- DuPage County Health Department
- McHenry County Health Department
- Heartland Alliance
- Heartland National TB Center, Tyler, Texas
- Aunt Martha’s FQHC
- Will County Public Health Department
- Kendall County Public Health Department
“TB or not TB, that is the question.”
Contact Information

- Lynn Skelton BSN, RN, CIC
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- Elaine Darnall, RN, BSN, CIC
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With special thanks to Laura Marconette of Presence Mercy Hospital
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