Epidemiology of TB: UK, London and Tower Hamlets

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June 2013
• Sources of slides 3 to 11:
  – Enhanced Tuberculosis Surveillance (ETS)
  – Enhanced Surveillance of Mycobacterial Infections (ESMI)
  – Office for National Statistics (ONS) mid-year population estimates
  – Prepared by: TB Section - Health Protection Services, Colindale

• Sources of slides 12 - 34:
  – London TB Register
  – London Regional Epidemiology Unit
  – North East and North Central London Health Protection Team
Tuberculosis case reports and rates. UK 2000-2011
Tuberculosis case reports and rates by region, England, 2011
Figure 1.4. Three-year average tuberculosis case rates by local areas*, UK, 2009-2011


Tuberculosis case reports and rates by place of birth, UK, 2000-2011
Tuberculosis case reports by place of birth and region/country, UK, 2011

Country/Region (% where place of birth known)

- England (96%) 1,972 Non-UK-Born 5,975 UK-born
- Northern Ireland (94%) 32 Non-UK-Born 31 UK-born
- Scotland (79%) 202 Non-UK-Born 176 UK-born
- Wales (95%) 79 Non-UK-Born 46 UK-born
- London (98%) 2,926 Non-UK-Born 511 UK-born
- South East (90%) 204 Non-UK-Born 593 UK-born
- East Midlands (96%) 335 Non-UK-Born 140 UK-born
- East of England (94%) 351 Non-UK-Born 149 UK-born
- West Midlands (95%) 656 Non-UK-Born 325 UK-born
- Yorkshire & the Humber (87%) 387 Non-UK-Born 217 UK-born
- North West (93%) 514 Non-UK-Born 263 UK-born
- North East (83%) 67 Non-UK-Born 33 UK-born
- South West (86%) 146 Non-UK-Born 130 UK-born
Most frequent countries of birth for non-UK-born tuberculosis cases, UK, 2011

<table>
<thead>
<tr>
<th>Country of birth</th>
<th>Number of cases</th>
<th>Percentage of cases*</th>
<th>Median time since entry UK (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>1846</td>
<td>30</td>
<td>4 (1 - 11)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1113</td>
<td>18</td>
<td>7 (2 - 25)</td>
</tr>
<tr>
<td>Somalia</td>
<td>424</td>
<td>7</td>
<td>7 (3 - 11)</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>290</td>
<td>5</td>
<td>6 (2 - 20)</td>
</tr>
<tr>
<td>Nepal</td>
<td>222</td>
<td>4</td>
<td>2 (2 - 4)</td>
</tr>
<tr>
<td>Nigeria</td>
<td>201</td>
<td>3</td>
<td>5 (1 - 8)</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>158</td>
<td>3</td>
<td>9 (6 - 10)</td>
</tr>
<tr>
<td>Philippines</td>
<td>124</td>
<td>2</td>
<td>6.5 (2.5 - 10.5)</td>
</tr>
<tr>
<td>Kenya</td>
<td>121</td>
<td>2</td>
<td>12 (6 - 36)</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>110</td>
<td>2</td>
<td>6 (2 - 12)</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>104</td>
<td>2</td>
<td>4 (1 - 9.5)</td>
</tr>
<tr>
<td>Eritrea</td>
<td>104</td>
<td>2</td>
<td>3 (1 - 5)</td>
</tr>
<tr>
<td>Poland</td>
<td>64</td>
<td>1</td>
<td>4 (2 - 6)</td>
</tr>
<tr>
<td>China</td>
<td>63</td>
<td>1</td>
<td>4 (0 - 9.5)</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>60</td>
<td>1</td>
<td>7 (4 - 14)</td>
</tr>
<tr>
<td>Others (each &lt;1%)</td>
<td>1181</td>
<td>19</td>
<td>7 (2 - 17)</td>
</tr>
<tr>
<td><strong>Total</strong>*</td>
<td><strong>6185</strong></td>
<td><strong>100</strong></td>
<td><strong>6 (2 -13)</strong></td>
</tr>
</tbody>
</table>
Non-UK-born tuberculosis case reports by time since entry to the UK to tuberculosis diagnosis, UK, 2011

Epidemiology of TB: UK, London and Tower Hamlets
Tuberculosis case reports and rates by age group and sex, UK, 2011
Proportion of tuberculosis cases with first-line drug resistance, UK, 2000-2011
TB Rates in London
Tuberculosis case rates (per 100,000 population) by region, England, 2000-2010
High burden of TB in London

Capital’s ethnic diversity and immigration patterns

Relative poverty in susceptible communities
  – Overcrowded living conditions
  – Poor housing
  – Poor nutrition

Social exclusion

Risky lifestyles
  – crack cocaine use
  – street homelessness
  – Alcohol dependency
London TB rate per 100,000 population by sector of residence - reported to the London TB Register

![Graph showing London TB rate per 100,000 population by sector of residence, with data from 2006 to 2012, including the London Total, North Central, North East, North West, South East, South West, and London Total.]
TB notifications London - year ending 31 March 2013

- North Central
- North East
- North West
- South East
- South West

- Total notifications in London residents
- Rate per 100,000
TB Rates per 100,000 population by Local Authority of residence - 2012

Epidemiology of TB: UK, London and Tower Hamlets
TB notifications – Tower Hamlets 2009-12

Year ending 31/03/2013

- 2009: 141
- 2010: 154
- 2011: 140
- 2012: 120
- Rates/100,000: 120
Non UK-born TB cases - Tower Hamlets residents 2012 - by year of entry into the UK

- Not recorded: 12%
- 0-2 years: 15%
- 3-5 years: 21%
- 6-10 years: 15%
- >10 years: 37%

Graph showing the distribution of years of entry into the UK with a bar chart and a pie chart.
TB cases in Tower Hamlets residents 2012- by ethnicity and country of birth

- Bangladeshi
- Black-African
- Black-Caribbean
- Black-Other
- Chinese
- Indian
- Other
- Pakistani
- White

- Not recorded
- UK-born
- Non-UK born
Country of birth for TB cases - Tower Hamlets residents - 2005 – 11
## Tower Hamlets TB cases – 2012 – by site of infection

<table>
<thead>
<tr>
<th>Site of Disease</th>
<th>No.</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>Extrathoracic lymph node</td>
<td>19</td>
<td>cervical, intracranial, abdominal, retropharyngel, submandibular, supraclavicular</td>
</tr>
<tr>
<td>Intrathoracic lymph node</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Other sites</td>
<td>12</td>
<td>breast, central neck, forehead, idiopathic granulomatous, liver, ophthalmic, pericardial, skin</td>
</tr>
<tr>
<td>Bone other</td>
<td>8</td>
<td>Ankle, hip. Knee, Tibia, Clavicle, Toe, Elbow, shoulder</td>
</tr>
<tr>
<td>Bone/Spine</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>GI tract</td>
<td>6</td>
<td>abdominal lymph node, peritoneal, terminal ileum</td>
</tr>
<tr>
<td>Pleural</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CNS/other</td>
<td>3</td>
<td>brain, presumed CNS involvement</td>
</tr>
<tr>
<td>CNS/Meningitis</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Miliary TB</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Genitourinary</td>
<td>1</td>
<td>Testicular</td>
</tr>
</tbody>
</table>
How can we control TB in London?

Early diagnosis and treatment of symptomatic cases

Treatment completion

Appropriate isolation and exclusion

Active case finding

- Screening at risk contacts (contact tracing)
- Screening high risk populations

Prophylactic treatment for latent infection

Immunisation with BCG?
**Treatment non-completion**

Risk factors for non-completion are usually life-style and social factor.

In 2012 10/126 TH residents with TB had at least one risk factor

<table>
<thead>
<tr>
<th>Risk factors for TH residents - 2012</th>
<th>History of drug use</th>
<th>History of homelessness</th>
<th>Prison history</th>
<th>Alcohol problem</th>
<th>Mental health concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Not known</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>No</td>
<td>105</td>
<td>110</td>
<td>108</td>
<td>96</td>
<td>104</td>
</tr>
<tr>
<td>Not recorded</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>
Contact screening

Aim
• To find associated symptomatic cases
• To detect cases of latent infection

Yield:
• Up to 10% of new cases diagnosed through contact tracing
• Disease occurs in 1% of close (household) contacts of sputum smear positive disease
• Yield from casual contacts 0.375%
• Transmission from smear negative pulmonary tuberculosis: relative risk estimated at 0.18-0.35 that of smear positive cases
Considerations for screening casual contacts

Case of infectious TB (sputum smear positive pulmonary TB)

AND

Index case in the following settings:
• Passenger in a long-haul flight (>8 hrs)
• Inpatient in an open ward >8 hrs or contact with the immuno-suppressed
• Healthcare workers
• Cases in a educational settings (school, college, university)
• Cases in childcare settings
• Cases in prisons, hostels, residential or nursing homes or other similar settings
• Workplaces where there is considerable contact with colleagues
• Significant exposure in social settings, e.g. place of worship, clubs, pubs
Concentric Circle Approach

Household/Residence Environment

- Close contacts (high risk)
- Other-than-close contacts (medium risk)
- Other-than-close contacts (low risk)

Leisure/Recreation Environment

Work/School Environment

Index Patient

High Priority Close Contacts

Low Priority Close Contacts

Other-than-close

Lower Priority
The index case

32 yr old male, works in an open plan office in the City, 10 hr/day

History of productive cough, weight loss, loss of appetite, night sweats and tiredness for 3-4 weeks

3 courses of antibiotics over a period of 2 months by GP, no improvement

GP referral to respiratory physician, waiting for another month

3 months after onset of symptoms sputum taken: AFB seen

Patient advised not to go to work and started anti TB treatment
Workplace assessment

Working with 33 colleagues

Sitting arrangements and workspaces

Assessment of indoor ambient parameters: temperature, relative humidity, air pressure, air flow rate, air velocity, carbon dioxide levels, size and concentration of particles

Measurement of the physical distance between cases
Screening of contacts

Household contacts: Two identified
one already on TB prophylaxis due to immuno-suppression
the other had since moved and uncontactable

Workplace: All 33 workplace contacts were screened using Quantiferon Gold,
14 (42%) tested positive (13 latent TB, 1 lymph node TB)
Think about TB!