TB Outbreak Experience in British Columbia

Shelley Dean
TB Control
BC Centre for Disease Control
CVI TB Outbreak

- Introduction
- Early Cases
- Challenges
- Contact Tracing
TB Incidence in BC by Origin and Year

Tuberculosis incidence rates per 100,000, by birthplace and year, B.C. 1996-2006

<table>
<thead>
<tr>
<th>Year</th>
<th>Foreign born</th>
<th>Canadian born</th>
<th>Aboriginal, registered on reserve</th>
<th>Aboriginal, registered, off reserve</th>
<th>Provincial rate (B.C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>23</td>
<td>21.1</td>
<td>21.1</td>
<td>36.0</td>
<td>8.3</td>
</tr>
<tr>
<td>1997</td>
<td>27.1</td>
<td>23</td>
<td>31.1</td>
<td>31.6</td>
<td>10.4</td>
</tr>
<tr>
<td>1998</td>
<td>22.3</td>
<td>21.5</td>
<td>49.4</td>
<td>46.5</td>
<td>13.6</td>
</tr>
<tr>
<td>1999</td>
<td>31.6</td>
<td>14.1</td>
<td>36.5</td>
<td>32.5</td>
<td>7.3</td>
</tr>
<tr>
<td>2000</td>
<td>13.1</td>
<td>19.4</td>
<td>18.6</td>
<td>38.7</td>
<td>9.6</td>
</tr>
<tr>
<td>2001</td>
<td>25.8</td>
<td>19.2</td>
<td>32.5</td>
<td>25</td>
<td>7.8</td>
</tr>
<tr>
<td>2002</td>
<td>17.3</td>
<td>15.4</td>
<td>38.7</td>
<td>28.6</td>
<td>7.8</td>
</tr>
<tr>
<td>2003</td>
<td>21.6</td>
<td>15.4</td>
<td>28.6</td>
<td>10.6</td>
<td>7.8</td>
</tr>
<tr>
<td>2004</td>
<td>20</td>
<td>15.4</td>
<td>10.6</td>
<td>5.5</td>
<td>1.3</td>
</tr>
<tr>
<td>2005</td>
<td>17.4</td>
<td>20.4</td>
<td>36.3</td>
<td>36.4</td>
<td>1.3</td>
</tr>
<tr>
<td>2006</td>
<td>20.1</td>
<td>17.4</td>
<td>36.4</td>
<td>36.3</td>
<td>1.3</td>
</tr>
</tbody>
</table>
First Nations Communities in BC

- 120,044 Status Aboriginal persons in BC
- 58,781 Aboriginal persons living on-reserve (49%)
- ~ 200 First Nations Communities in British Columbia
- ~ 100 Health Centres
- Many communities are isolated and remote.
TB Outbreak in Central Vancouver Island

Port Alberni
Population: 17,743
### TB Incidence*, Central Vancouver Island

<table>
<thead>
<tr>
<th>Year</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>0.8 (2)</td>
</tr>
<tr>
<td>2004</td>
<td>3.2 (8)</td>
</tr>
<tr>
<td>2005</td>
<td>1.6 (4)</td>
</tr>
<tr>
<td>2006</td>
<td>5.9 (15)</td>
</tr>
<tr>
<td>2006*</td>
<td>91 (15)</td>
</tr>
<tr>
<td>2007*</td>
<td>121 (~ 20)</td>
</tr>
</tbody>
</table>

*Registered Aboriginal Population based upon 2001 stats (~16,540)
* Case 1 – April 2006

- 29 year old FN woman off reserve in Port Alberni
- History of heavy alcohol use
- April developed increasing dyspnea and chest pain
- May hospitalized with left pleural effusion, bronchoscopy, thoracostomy, decortication of LLL
- Fluid subsequently grew M. tuberculosis
- Limited contact tracing, pleural TB, client not very forthcoming

* Index vs. Source Case
Case 2 – July 2006

- 15 month old FN girl on reserve in Port Alberni
- July 14 developed L-sided weakness
- July 16 admitted to BCCH with L hemiparesis due to cerebral infarctions
- CSF 50% lymphocytes, 50% neutrophils, CXR showed a miliary pattern
- Started on treatment for presumed TB meningitis
- Reverse contact tracing initiated
Case 3 – August 2006

- 20 year old FN man, Port Alberni and Ucluelet
- Contact of Case 2
- Daily crack cocaine use
- Symptomatic since April/06, cough, night sweats
- **Skin test negative**, CXR showed bilateral airspace disease, L pleural effusion, cavitation both upper lobes
- Treatment challenging due to non-compliance
Case 4 – August 2006

- 40 year old FN woman off reserve in Port Alberni
- History of heavy alcohol use
- Symptoms since April, cough, chest pain, night sweats, weight loss
- June 3 presented to hospital, R pleural effusion, skin test negative, treated for atypical pneumonia
- August 2 returned with increased symptoms, miliary pattern on CXR, respiratory failure, septic shock
- BAL specimen positive for M tuberculosis
- Survived initial presentation, died December/06 (details of death not known by TBC)
37 year old FN man, mobile in Port Alberni area

Daily alcohol and crack cocaine use

Symptoms of cough and weight loss

Sister become concerned, brought him to MD

CXR showed bilateral infiltrates, L pleural effusion, L upper lobe cavitation

Initially treated as an out-patient, significant challenges, MHO involved, transferred to TB2
Cases 6 - 11, October 2006

- 6 cases diagnosed in October, all FN
- 4 presented with symptoms, 2 picked up through reverse contact tracing of case 2
- Delay in diagnosis in 3 cases
- 3 pleural cases, 3 pulmonary cases
- 3 heavy drinkers, 1 using crack cocaine
- 3 lived on-reserve, 3 lived off-reserve
Situation in October 2006

- 11 cases active TB
- 6 pleural effusion
- 2 smear positive
- 1 child with TB Meningitis
Challenges

- Communication - many agencies & individuals involved.
- No existing health care services to access street people.
- Limited social services for street people.
- Number of cases → overwhelming volume of work
- Tuberculosis is not a disease of absolutes. (e.g. incubation periods, level of infectiousness)
- Limited experience working with street people.
Lines of Communication

BCCDC
TB Control
TBSAC
Pharmacy
Lab

Local
Health
Services

FNIH
Vancouver

VGH Lab

VIHA - Port Alberni

First Nation’s
Health Centre

Chief, Council & Community members
Access to Health Care

- Many clients didn’t have physicians
- 4 month period – no physician accepting new patients
- Feb/07 Nurse Clinic 3d/wk at Drop-In
- Oct/08 Physician 1d/wk at Drop-In
- Future Street Clinic is being Planned
Social Challenges

Existing socio-economic conditions such as:

- poverty
- inadequate housing or homelessness
- substance use
- mental illness
- inadequate access to health care

These challenges require support and services over and above those connected with TB programming.
Port Alberni Social Services

- One shelter
- One free meal agency/drop-in
- Salvation Army Food Bank 2d/wk
Social Challenges

Nurses spend many hours and require support from allied staff in:

- Attempting to locate adequate housing for clients with TB
- Arranging for appointments with mental health and addictions programs

To facilitate provision of holistic health care
Volume of Work

One Public Health Nurse – TB part-time

- Nurse Team Leader
- Seven Public Health Nurses
- Three DOT workers
Cultural Challenges

- First Nations population
- Street population
Working with Street People

- Build trusting relationship
- Flexibility
Building Trust

- Respect – person and their priorities
- Understanding – lifestyle and social issues
- Knowledge of Support Agencies
- Interact with staff at Support Agencies (and be seen interacting)
- Mingle with street people and get to know them
- Humour
Building Trust: Approaches

- Harm Reduction

- Social Resources
Contact Tracing

Painting by Jane Ash Poitras
Most important node is the baby????
TB Control invited a field epidemiologist and a community medicine resident to conduct an in-depth investigation October/06
Active Case Diagnoses By Month

Total 33 cases: Includes * 3 clinical diagnosis, 1 primary disease
BCCDC Epi Investigation

- Initially reviewed information in iPHIS, contact lists, discussions with VIHA and FN Community nurses

- Developed a questionnaire, in-depth interview of each case
Contact Tracing

**Assumptions** (often false) with high-risk clients:

- Cases know their contacts
- Cases will reveal their contacts
- “Casual” contacts are less important
- Interconnections among contacts of cases are unimportant
Social Network Approach

- Risk of disease acquisition is mediated through relationships with others
- How disease spreads through a population
- Identifies the key individuals and locations central to disease propagation
Networks and TB investigations

For the current outbreak:

• Establish epidemiologic links between cases

• Identify additional case and contacts in need of treatment and monitoring

• Make recommendations to control the outbreak
Networks and TB Investigations

Questionnaire included:

- Demographic
- Risk behaviors (Alcohol or illicit drug use)
- Places of social aggregation
- Friends/family/acquaintances
Connections According to Social Network Questionnaire
• I.e. Where do you hang out?

- Contact
- TB disease: not infectious
- TB disease: infectious
Locations

Hotel 1 = bar, residence
Hotel 2 = lounge, residence
CC = crack house
GG = crack house
Street = street and alleys
Suspected Chain of Transmission

5
Index Case

Alcohol Network

hotel pub #1
hotel lounge #2

1
4
6
7
8
12

9
room-mate of 6

10
barmaid at hotel pub #1

Crack Network

crack houses
streets and alleys

3
6
11
12

2
child cared for by 3

13
relative of 3
Contact Tracing

- Named or Social Contacts: 829
- Clients placed on prophylaxis: 115
- Completed prophylaxis: 80
- Defaulted on prophylaxis: 25
- Currently on prophylaxis: 35
- Currently on x-ray follow-up: 115
Contact Tracing

- 110 contacts diagnosed with Latent TB refused INH prophylaxis.

- These contacts are being followed by chest x-ray and symptom checks.

- 10 of these contacts have developed Active TB.
<table>
<thead>
<tr>
<th>TYPE</th>
<th>NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLEURAL EFFUSION</td>
<td>10</td>
</tr>
<tr>
<td>PULMONARY-SMEAR +</td>
<td>10</td>
</tr>
<tr>
<td>PULMONARY- CULTURE POSITIVE</td>
<td>14</td>
</tr>
<tr>
<td>CLINICAL</td>
<td>3</td>
</tr>
<tr>
<td>MENINGITUS /MILLIARY</td>
<td>1</td>
</tr>
<tr>
<td>TB LYMPHADENITUS</td>
<td>1</td>
</tr>
<tr>
<td>PRIMARY</td>
<td>1</td>
</tr>
<tr>
<td>Extra-Pulmonary (Breast)</td>
<td>1</td>
</tr>
<tr>
<td>Age Group</td>
<td>Count</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
</tr>
<tr>
<td>0-5</td>
<td>2</td>
</tr>
<tr>
<td>5-18</td>
<td>0</td>
</tr>
<tr>
<td>19-30</td>
<td>15</td>
</tr>
<tr>
<td>31-45</td>
<td>16</td>
</tr>
<tr>
<td>46-55</td>
<td>5</td>
</tr>
<tr>
<td>55-65</td>
<td>2</td>
</tr>
<tr>
<td>70 PLUS</td>
<td>1</td>
</tr>
</tbody>
</table>
CVI Outbreak

- CVI Outbreak is ongoing (41 cases to date)
- ~ 7 live “on-reserve”,
  ~ 33 live “off-reserve”
  **however boundary is artificial**
- Treatment for LTBI: ~ 80 completed
- Contact Investigation: > 1000 Client’s Screened
Access to Health Care

- Partnerships were developed between nurses and agencies supporting street people.

- Partnerships were developed between Public Health Nurses and Community Health Nurses.

- Nurses working hard with their Health Authority to open a Health Care Clinic/Centre for street people.
Acknowledgements

- Dr Victoria Cook, BCCDC
- Dr Elizabeth Brodkin
- Lena Shah, Field Epi Program
- Shirley Rempel, Nurse Consultant, TBSAC
- Janice Jespersen, Nurse Leader, VIHA
- Tribal Council
- CVI Public Health
- VIHA MHOs and Infection Prevention & Control
- FNIH-BC Region and Health Canada
- Division of Epidemiology, BCCDC
Protecting our Future Generation