The Public Health Impact of TB in the Correctional System

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The Public Health Impact of TB in the Correctional System

Objectives

• Discuss role of TB prevention & control in correctional facilities for advancing TB elimination goals

• Identify public health challenges and opportunities related to TB prevention and control in correctional facilities.
.....observations of a former TB Controller who found herself behind bars.....
INCARCERATION IN THE U.S
2013
- After 2 year decline state prison pop’n increased
- First time in 34 years federal pop’n decreased

FIGURE 1
Total state and federal prison populations, 1978–2013

State prison population
Federal prison population
Incarceration Rates by Country per 100,000 persons

<table>
<thead>
<tr>
<th>Country</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>707</td>
</tr>
<tr>
<td>Virgin Is. (USA)</td>
<td>535</td>
</tr>
<tr>
<td>Rwanda</td>
<td>492</td>
</tr>
<tr>
<td>Russia</td>
<td>470</td>
</tr>
<tr>
<td>Virgin Isl. (UK)</td>
<td>425</td>
</tr>
<tr>
<td>England/Wales</td>
<td>148</td>
</tr>
<tr>
<td>Canada</td>
<td>118</td>
</tr>
<tr>
<td>Germany</td>
<td>78</td>
</tr>
</tbody>
</table>

International Centre for Prison Studies, October 2012
Correctional Facilities

- Jails/Detention Centers
  - Usually managed by local law enforcement
  - Incarcerates
    - pretrial inmates
    - inmates with < 1 year sentence
- State prisons: Sentenced inmates
- Federal prisons
  - Pretrial & sentenced inmates related to federal crimes
- Private Prisons: federal, state & local governments contract with for-profit companies to run prisons
  - In 2010, 12.7% of federal inmates and 7.5% state inmates were housed in privately run facilities
State & Local Prison Incarceration Rates by State, 2012 (does not include local jails)

Number of Prisoners per 100,000 residents
Epidemic of Incarceration

• Untreated mental illness
  – Deinstitutionalization / dissolution of mental health care facilities

• Untreated substance abuse (40-50%)

• Criminalization of drug use
  – Mandatory minimum sentencing, etc.

• Incarceration of undocumented immigrants
INCARCERATION RATES BY RACE & ETHNICITY, 2010

(Number of people incarcerated per 100,000 people in that group)

The New Jim Crow: Mass Incarceration in the Age of Colorblindness
Overcrowding
TB & INCARCERATION IN THE U.S
TB Cases Diagnosed in Correctional Facilities, Percentage of All Reported TB Cases, 1993-2011
Percent of TB Cases in Correctional Facilities by Type of Facility, 1993-2011

- Local Jail: 51%
- State Prison: 31%
- Other: 10%
- Juvenile Facility: 1%
- Federal Prison: 7%
- Unknown: 0.4%
Number of TB Cases in Correctional Facilities in U.S.-Born and Foreign-born Persons, 1993-2011
TB Cases in Correctional Facilities by Race/Ethnicity, 1993-2011

* “Other” includes groups comprising <2% of total incarcerated cases (American Indian, Native Hawaiian/Pacific Islander, or Multiple Races). Incarcerated TB cases of unknown race/ethnicity are 0.3% of total cases and are not shown.
Percent of TB Cases by HIV Status and Correctional Facility Status, 1993–2011

HIV Status

- Positive
- Negative
- Indeterminate
- Refused
- Not offered
- Unknown

TB Cases not in Correctional Facilities

TB Cases in Correctional Facilities
Percent of TB Cases by Treatment Completion Status and Correctional Facility Status, 1993-2009

NOTE: Data for “Adverse Treatment Event” and “Unknown” each accounted for <0.1% of outcomes.
# TB Corrections by State- 2012

<table>
<thead>
<tr>
<th>State</th>
<th>Cases Diagnosed</th>
<th>Proportion of TB Cases Diagnosed in CFs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>116/1222</td>
<td>9%</td>
</tr>
<tr>
<td>California</td>
<td>72/2171</td>
<td>3%</td>
</tr>
<tr>
<td>Arizona</td>
<td>45/184</td>
<td>24%</td>
</tr>
<tr>
<td>Florida</td>
<td>28/652</td>
<td>4%</td>
</tr>
<tr>
<td>U.S.</td>
<td>359/9582</td>
<td>4%</td>
</tr>
</tbody>
</table>

- Four states account for 72% of TB cases diagnosed in U.S. correctional facilities. Remaining 46 states had 0-9 cases in 2012.
- Texas has 32% of the incarcerated TB patients in the country and 13% of the TB cases overall.
Federal Bureau of Prisons

- 26-46 TB Cases per year (last 5 years)
- Rate per Average Daily Population:
  - 15-26/100,000
- 70-80% Foreign Born
  - > 90% Mexico
- HIV infected: 10-20% each year
- INH resistant: >10% each year
- 1-2 cases per year → highly infectious → large Cis → substantial transmission
Prevention and Control of Tuberculosis in Correctional and Detention Facilities: Recommendations from CDC

- Screening: Intake/Annual
- Isolation
- Active TB Tx
- Contact Investigation
- LTBI Tx
- Collaboration with public health
- Management of airborne infection isolation rooms
- Education staff & inmates
TB & INCARCERATION IN THE U.S

RESEARCH GAPS

• No published data on TB case rates or trends
• No studies of demographic or clinical characteristics in US in past 10 years
• Minimal data on the extent to which incarceration history is associated with TB disease
• Role of IGRAs in TB screening correctional facilities
What about rates?


![Graph showing TB incidence over years (2006-2010)]
Incarceration history


- Retrospective analysis of 2011 Georgia TB cases
- 106 US-born adults with prevalent TB
  - 46% documented history of incarceration
  - 16% incarcerated during the year before diagnosis.
Observation #1

Widespread TB transmission in U.S. correctional facilities still occurs.
U.S. Correctional Outbreak TB Literature

Transmission of Tuberculosis in a Jail
Timothy F. Jones, MD; Allen S. Craig, MD; Sarah E. Valway, DMD, MPH; Charles L. Woodley, PhD; and William Schaffner, MD

Tuberculosis outbreaks in prison housing units for HIV-infected inmates—California, 1995-1996
Centers for Disease Control and Prevention (CDC)

Evaluation of an extensive tuberculosis contact investigation in an urban community and jail

Outbreak of tuberculosis in a correctional facility: consequences of missed opportunities
L. E. Sosa, M. N. Lobato, T. Condren, M. N. Williams, J. L. Hadler

Unrecognised transmission of tuberculosis in prisons
C.R. MacIntyre, N. Kendig, L. Kummer, S. Birago, N.M.H. Graham, & A.J. Plant

Probable Transmission of Multidrug-Resistant Tuberculosis in Correctional Facility—California
Centers for Disease Control and Prevention

• 57 year old Tijuana taxi driver picked up crossing Mexico border into U.S. – Type 2 DM
• Intake: Portable chest x-ray (CXR) read as “negative”. No TB symptoms. Prior TST Pos. Prior LTBI tx x 9 mos
• Three months after intake TB diagnosed
  – Cavitary CXR, AFB smear positive
  – Cough x 6 weeks with hemoptysis
  – Two months later: Susceptibility Results → RIF/INH/PZA/SM
  – Re-read of initial CXR: “subtle evidence of upper lobe disease”

- Index case housed on 120 bed unit during infectious period:
  - total of 131 days
    - including 41 days after returning from initial hospitalization on standard 4-drug therapy. No symptom improvement.

- Very high turnover

- Never left unit – meals/recreation occur on unit – except for insulin line
388 inmate contacts identified
  - Prior Positive TST: 155/384 = 40%
  - Inmate TST conversions: 29 /158 (18%)
    • 9/66 (14%) U.S. Born
    • 20/92 (22%) Foreign Born
    • 17/69 (25%) Housed in same Quarter
  - Staff TST conversions: 4/87 (4.6%)
  - One clinical case of lymphatic TB – HIV infected inmate- clinical diagnosis
MDR-TB Contact Investigation: Dispersal of 388 Inmate Contacts 12 Weeks into the Investigation, 2010

Dispersal of Inmate Contacts (n=388) as of 12/11/10

- Deported n=102 → foreign communities (90 → Mexico)
- Other FBOP Facilities n=101 (43 facilities)
- Remained incarcerated at FPF n=84
- Released - California community n=38
- USMS “In-Transit” n=63 (5 contract facilities)

Location of Inmate Contacts:
- Other FBOP facility
- USMS contract facility
- California community
- Foreign community
Contact Investigation: Prison A

March 15, 2013: 25 yo female intake – TST negative, denies TB symptoms, HIV neg

May 10, 2013: Clinic visit: “back pain”

- cough x 16 weeks (had never been to Health Services regarding cough)
- 10 # wt loss in 16 weeks
- CXR: Severe lung disease LUL and superior RLL with multiple large cavitary lesions
- AFB smear pos numerous x 3
- PCR positive – MTB complex
<table>
<thead>
<tr>
<th>Contact Type</th>
<th>TST Pos</th>
<th>Tested</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing A</td>
<td>33</td>
<td>149</td>
<td>22%</td>
</tr>
<tr>
<td>Housing B</td>
<td>7</td>
<td>55</td>
<td>13%</td>
</tr>
<tr>
<td>Work</td>
<td>14</td>
<td>105</td>
<td>13%</td>
</tr>
<tr>
<td>Other Prisons</td>
<td>5</td>
<td>27</td>
<td>19%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>59</td>
<td>336</td>
<td>18%</td>
</tr>
</tbody>
</table>

Cell in Housing Unit A
Begin infectious period

July 1

Cough Started

Oct 1

Infectious Period

Mar 6

Mar 15

Mar 10

Tijuana

AZ Private Prison

Nevada Detention Center

Housing Unit A-1

UNICOR

Hospitalized

Intake Prison A

End infectious period

May 10
Contact investigations in correctional facilities very challenging.

- Require expertise.
- Require access to correctional data.
- Close collaboration with public health
- Data collection challenge
- It is virtually impossible to find inmates who have been released
Observation #2

Widespread TB transmission is ALWAYS associated with diagnostic delay.
Reasons for Delay

• Provider error:
  – failure to recognize or suspect TB

• Health care system error
  – e.g., abnormal radiology result not received or CXR not available

• Correctional error:
  – symptomatic person does not report symptoms and correctional staff who observe symptoms fail to report them to staff
Observation #3

Declining TB clinical expertise is a major challenge for correctional facilities.
Declining TB Expertise

• Correctional facilities are high incidence settings often located in low incidence communities -- that lack TB expertise

• Local infectious disease and pulmonology “experts” – often are not experts

• Correctional facility clinicians often lack TB experience and expertise
Case Example

- 29 y.o. Honduran male inmate - HIV negative
- Housed in rural Pennsylvania prison
- 10/2013: PPD 0 mm / Asymptomatic
- CXR – obtained due to hypertension

  10-23-13: Positive. bilateral upper lobe consolidation with upper lobe volume loss. Cannot exclude active TB

- Clinician decided that TB was not in differential because inmate was asymptomatic and negative TST
One year later….

• 10/4/2014 (1 year later): reported to sick call with cough and hemoptysis
• Sent to local hospital
• Bronch performed: BAL: AFB smear negative
• Started on levoquin for community acquired pneumonia
• 10/13/14 (Friday evening) returned – local pulmonoloist states: “TB ruled out – diagnosis pneumonia – clinically improved”
• Inmate admitted to general population
Situation discovered…..

- 10/15/14 – situation “discovered” → sent to facility with All room to isolate and start RIPE
- 11/15/14: AFB culture positive → MTB

Variations on this scenario happen every few weeks……
How to educate correctional clinicians AND maintain competence on an important, complex disease that they may never see?
Observation #4

Public health / corrections collaboration is key to TB prevention & control in correctional facilities.
Examples of Deliverables

Public Health

• Consultation
  – TB diagnosis & treatment of cases
  – Release Planning
  – Contact Investigation
  – Policies/Procedures

• TB education

Correctional Facilities

• Case Detection
• Case Reporting
• Active TB Treatment
• Release Planning
• Contact Investigation
• Treatment of Latent TB Infection
Culture of Corrections

Security ALWAYS comes first
Observation #5

Ongoing TB education of correctional healthcare workers, custody staff and inmates, poses major challenges.
Release planning for inmates with active TB is a critical aspect of TB control in correctional facilities.
Observation #7

Correctional facilities provide opportunities for TB prevention & control:

• Case Detection
• Treatment of LTBI
Preliminary Results: Pilot Evaluation of 3HP in 7 pilot facilities

233/243 (90%) completed regimen

• 10 discontinued, 8 with AE
  – 2 (0.8%) abdominal pain
  – 3 (1.2%) elevated liver transaminase levels
  – 3 (1.2%) nausea or vomiting

• DOT provided via weekly call-out clinics rather than lengthy pill-line
  – relationship with one provider and support of inmate cohort
3HP – now standard LTBI treatment in the BOP

Isoniazid-Rifapentine Treatment for Latent TB Infection

Addendum to “Management of Tuberculosis”

Federal Bureau of Prisons Clinical Practice Guidelines

December 2014

…..observations of a former TB Controller who found herself behind bars…..
What is the public health response to this epidemic?