TUBERCULOSIS IN FRESNO COUNTY (2008)

Preliminary figures indicate that 70 cases of tuberculosis disease were recognized in Fresno County during 2008.* This represents 7.5 cases per 100,000 people, and abruptly reverses the downward trend of the previous five years (See Figure 1). In 2007 TB affected 4.4/100,000 people in the US, 7.2/100,000 in California, and 4.5/100,000 in Fresno County. The current public health goal for reducing TB disease (Healthy People 2010) is 1/100,000.

Of the 70 cases of TB disease in 2008, 38 were male (54%) and 32 were female (46%). Twelve of the 70 (17.1%) had extrapulmonary disease including meningitis (1), scrofula (2), pleural TB (2), peritoneal TB (3), TB of the brain (1), TB of the joint (1), and two patients with disseminated TB (see Figure 2). Two patients had a history of treatment for TB in the past.

Thirty one TB disease patients (44.3%) were Hispanic and 19 (27.1%) were Hmong (See Figure 3 for further details on ethnicity distribution). Forty six patients (65.7%) were foreign born (Mexico, Philippines, Laos, Cambodia, Honduras, Thailand, Iran, Russia, and India). Of these 46 foreign born patients the average time in the United States prior to diagnosis was 16 years, with a range from one year to 51 years.

Homeless persons accounted for one (1.4%) case of TB. Four (5.7%) patients with TB reported drug use, and 2 (6.7% of those TB disease patients tested) were HIV positive. (Forty of the 70 cases had unknown HIV status). Six (8.6%) patients with TB died in 2008.

The average age of TB patients diagnosed in Fresno County in 2008 was 41.5 years with a range from under one year to 89 years. (See Figure 4 for age related details). Nine (12.9%) patients were age five or younger.

Of the 70 cases of diagnosed TB in 2008, 18 (25.7%) were culture negative. Of the 52 culture positive TB cases, 1 (1.9%) was XDR (and one culture negative patient with TB was epidemiologically linked to this patient), 2 (3.8%) were MDR, 2 (3.8%) were INH resistant only, 1 (1.9%) was streptomycin resistant only, 1 (1.9%) was PZA resistant only, 1 (1.9%) was resistant to both rifampin and streptomycin, 2 (3.8%) were resistant to both INH and streptomycin, and 3 (5.8%) were resistant to INH, streptomycin, and ethambutol (see Figure 5). Thirty nine (75%) were pansensitive.

Referral for TB disease in Fresno County came from hospitals (36), private medical providers (16 ), Department of Public Health contact investigations (15), employment screening (1), interjurisdictional transfer (1), and self referral (1) (see Figure 6).

* These figures may vary slightly from subsequently published data from state and federal agencies due to minor differences in interpretation of RVCT (Report of Verified Case of Tuberculosis) criteria and time lines.
The extent of pulmonary involvement at the time of diagnosis in those patients with TB in 2008 is noted in Figure 7. Twenty-six percent of patients presented with radiological evidence of very advanced disease (cavitary lesion or lung opacification).

Figure 8 indicates TB disease by zip code in Fresno County in 2008.

Patients with TB disease in 2008 were from a wide variety of walks of life. Figure 9 demonstrates the different occupations held by these patients.

Recognized missed opportunities for TB control among the 2008 TB disease patients included four instances of overlooked contacts on contact investigation, five instances of failing to take treatment for LTBI (latent TB infection), three instances of delay in diagnosis of active TB, one instance of incorrect treatment of previous TB disease, and one instance of a missed immigrant screening.

Fully 1/3 of the world’s population is infected with TB. Worldwide there are nine million new cases of TB disease annually with two million deaths annually. TB is the second leading cause of infectious disease – related deaths worldwide, the leading cause of death in those with HIV/AIDS, and the leading killer of women of childbearing age.

It is estimated that 10% of Californian’s are infected with TB and of these 10% will develop TB disease during their lifetime.

Recent recognition of TB disease that is resistant to both INH and rifampin as well as any fluoroquinolone and any second line injectable medication poses a grave threat to public health. In the United States 4% of MDR or multi-drug resistant TB (those resistant to at least INH and rifampin) were found to be this XDR (extensively drug resistant) TB between 2000 and 2004. These drug resistances make the disease almost untreatable with currently available antibiotics and the mortality rate in those with this disease and co-infection with AIDS is extremely high. There has been one case of XDR-TB recognized in Fresno County to date.

California statute (Title 17) requires notification of the county health department of all diagnosed or suspicious cases of tuberculosis by telephone or fax within one working day of identification. Health and Safety Code statute (121362) also requires that providers treating persons with active TB report to the local health officer any information as required at such times as the health officer requires.

Three recognized processes are involved in the control of, and attempt to eliminate, TB. The first of these is finding and promptly and adequately treating individuals that have active disease. The second process in TB control is identifying individuals who have been exposed to someone with TB disease and evaluating them for TB infection or TB disease then treating them if they have either of these. The third process in the control of TB is “targeted testing” and involves screening individuals known to be at higher risk for contracting TB to determine if they may have the infection or the disease. Two programs within the Department of Public Health’s Community Health Division are busy daily
with these three aspects of TB control. The dedicated, knowledgeable, and professional staff of the Chest Clinic and the Communicable Disease Investigations program identify and treat TB disease and infection, identify and evaluate exposures to TB, and screen high risk populations.

If you have any questions regarding TB infection or disease or the control of TB in Fresno County please contact our Community Liaison Nurse at 559-445-3413.

FIGURE 1
Figure 2

TB Disease Sites

- Pulmonary (58, 82.9%)
- Joint (1, 1.4%)
- Meningitis (1, 1.4%)
- Brain (1, 1.4%)
- Lymph Node (2, 2.9%)
- Pleural (2, 2.9%)
- Disseminated (2, 2.9%)
- Peritoneal (3, 4.3%)

Figure 3

Race / Ethnicity Distribution

- Hispanic (31, 44.3%)
- Hmong (19, 27.1%)
- Chinese (1, 1.4%)
- Cambodian (1, 1.4%)
- Laotian (3, 4.3%)
- Filipino (3, 4.3%)
- East Indian (6, 8.6%)
- Caucasian (6, 8.6%)
### Age Distribution (Figure 4)

![Age Distribution Chart](chart)

### Figure 5

#### TB Drug Resistance Patterns

- **No Resistance** (39, 55.7%)
- XDR (1, 1.4%)
- Strep (1, 1.4%)
- R/S (1, 1.4%)
- PZA (1, 1.4%)
- MDR (2, 2.9%)
- INH (2, 2.9%)
- I/S (2, 2.9%)
- I/S/E (3, 4.3%)
- **No Culture** (18, 25.7%)
Figure 6

TB Referral Source

- Hospital (36, 51.4%)
- Private Health Provider (16, 22.9%)
- Contact Investigation (15, 21.4%)
- Employment Screening (1, 1.4%)
- Interjurisdictional Transfer (1, 1.4%)
- Self referral (1, 1.4%)

Figure 7

Pulmonary Disease Extent

- Infiltrate (32, 45.7%)
- Cavitary (17, 24.3%)
- No Pulmonary Pathology (5, 7.1%)
- Miliary (4, 5.7%)
- Effusion (4, 5.7%)
- Nodule (3, 4.3%)
- Adenopathy (2, 2.9%)
- Infiltrate/effusion (2, 2.9%)
- Opacification (1, 1.4%)
Figure 8
TB Disease by Zip Code

<table>
<thead>
<tr>
<th>Zip Code</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>93210</td>
<td>1</td>
</tr>
<tr>
<td>93612</td>
<td>2</td>
</tr>
<tr>
<td>93622</td>
<td>3</td>
</tr>
<tr>
<td>93631</td>
<td>3</td>
</tr>
<tr>
<td>93654</td>
<td>2</td>
</tr>
<tr>
<td>93657</td>
<td>1</td>
</tr>
<tr>
<td>93702</td>
<td>13</td>
</tr>
<tr>
<td>93705</td>
<td>1</td>
</tr>
<tr>
<td>93711</td>
<td>1</td>
</tr>
<tr>
<td>93721</td>
<td>2</td>
</tr>
<tr>
<td>93725</td>
<td>5</td>
</tr>
<tr>
<td>93727</td>
<td>6</td>
</tr>
<tr>
<td>Homeless</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zip Code</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>93609</td>
<td>2</td>
</tr>
<tr>
<td>93619</td>
<td>1</td>
</tr>
<tr>
<td>93630</td>
<td>1</td>
</tr>
<tr>
<td>93640</td>
<td>1</td>
</tr>
<tr>
<td>93656</td>
<td>1</td>
</tr>
<tr>
<td>93662</td>
<td>4</td>
</tr>
<tr>
<td>93703</td>
<td>1</td>
</tr>
<tr>
<td>93706</td>
<td>1</td>
</tr>
<tr>
<td>93720</td>
<td>2</td>
</tr>
<tr>
<td>93722</td>
<td>3</td>
</tr>
<tr>
<td>93726</td>
<td>11</td>
</tr>
<tr>
<td>93728</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 9
Occupations

- Unemployed (24, 34.3%)
- Child (11, 15.7%)
- Field worker (9, 12.9%)
- Home maker (9, 12.9%)
- Student (3, 4.3%)
- Packer (4, 5.7%)
- Technician (1, 1.4%)
- Teacher (1, 1.4%)
- Printer (1, 1.4%)
- Janitor (1, 1.4%)
- Farmer (1, 1.4%)
- Engineer (1, 1.4%)
- Casino worker (1, 1.4%)
- Administrator (1, 1.4%)
- Gardener (2, 2.9%)