Tuberculosis in Fresno County

Preliminary figures indicate that 35 cases of tuberculosis disease were recognized in Fresno County during 2012.* (This number does not reflect two cases of active TB disease resulting from the use of BCG [Bacillus Calmette-Guerin] in the treatment of bladder cancer.) This is the fourth consecutive annual decrease in TB disease incidence in Fresno County and a 69.5% decrease in the number of cases since 2003 (See Figure 1). The number represents 3.5 cases per 100,000 people (3.5/100,000). In 2011 tuberculosis (TB) affected 3.4/100,000 people in the US, 5.8/100,000 in California, and 4.6/100,000 in Fresno County. In California in 2011 Fresno dropped from 13th to 19th among the counties in TB incidence.

Of the 35 cases of TB disease in 2012, 16 were male (45.7%) and 19 were female (54.3%). Seven of the 35 had disease outside of the lung. These extrapulmonary sites of disease included the larynx, pleura, lymph nodes, colon, bone, and meninges (see Figure 2).

Eighteen TB disease patients (51.4%) were Hispanic, four (11.4%) were East Indian, and six (17.1%) were Hmong (See Figure 3). Twenty five patients (71.4%) were foreign born (countries of birth included Mexico, Laos, Korea, and India). Of these 25 foreign born patients the average time in the United States prior to diagnosis was 19.8 years, with a range from one year to 58 years.

Three of the TB disease patients were homeless at the time of diagnosis in 2012. Four (11.4%) patients with TB disease reported significant illicit drug use. 32 of the 35 TB patients were tested for HIV infection and three (9.7% of those TB disease patients tested) were HIV positive. Four of the 35 cases, or 11.4%, had unknown HIV status (a testing rate much improved over the prior year). Three (8.6%) patients with TB died in 2012 (decreased from five in 2011). Twenty three (65.7%) patients had medical conditions or behaviors that put them at increased risk for developing TB disease (including alcohol abuse, smoking, diabetes, HIV, significant illicit drug use, and cancer). One patient had a history of treatment for TB disease in the past.

The average age of TB patients diagnosed in Fresno County in 2012 was 55.7 years with a range from 18 years to 91 years. (See Figure 4). Significantly, there were no cases of active TB disease in children in 2012.

* 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 timelines, as well as the use of different population estimates. Of the 35 cases of diagnosed TB disease in 2012, five (14.2%) had negative culture. Of the 30 culture positive TB cases, none had extensively drug resistant tuberculosis (XDR-TB), none had multi-drug resistant TB (MDR-TB), three (10%) had isoniazid (INH) resistant only TB, and one (3.3%) had PZA (pyrazinamide) resistant only TB (see Figure 5). Twenty six (86.7%) of the culture positive patients had pansensitive organisms.

Referrals for TB disease in Fresno County came from hospitals (24), private medical providers (7), Department of Public Health contact investigations (2), interjurisdictional notification (1), and notification from a private laboratory (1) (see Figure 6). All but one (97.1%) of the county’s 35 TB disease patients received their treatment from the Fresno County Public Health Department.

The extent of pulmonary involvement at the time of diagnosis in those patients with TB in 2012 is noted in Figure 7. Twenty nine percent of patients presented with radiological evidence of very advanced disease (cavitary lesion or miliary pattern).

Figure 8 indicates TB disease by zip code in Fresno County in 2012.

Patients with TB disease in 2012 came from all walks of life. Figure 9 demonstrates the different occupations held by these patients.

Missed opportunities for TB control among the 2012 TB disease patients included two instances of declining or failing to complete recommended treatment for latent TB infection (LTBI) and one instance of significantly delayed or missed diagnosis of active TB.

**Tuberculosis in California, the United States, and other Nations**

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 and the leading cause of death in those with HIV/AIDS.

It has been estimated that 4.2% of Americans were infected with TB in 1999/2000. Of these it is expected that 10% will develop TB disease during their lifetime.

**Development of Drug Resistant TB**

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 between 2000 and 2006, 2% of
patients with MDR or multi-drug resistant TB (TB resistant to at least INH and rifampin) were found to have this XDR (extensively drug resistant) TB. Infection with these drug resistant organisms 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 have been two cases of XDR-TB recognized in Fresno County to date. Both were successfully treated.

Public Health Strategies to Control, Prevent, and Eliminate TB

Currently, the Fresno County Chest Clinic Program employs four strategies to control and ultimately eliminate TB. The first strategy is to find, and promptly and adequately treat, individuals that have active disease. The second strategy to control TB is to identify individuals who have been exposed to someone with TB disease, evaluate them for TB infection or TB disease, and treat them if they have either of these. The third strategy to control TB is to conduct “targeted testing” and involves screening individuals for TB infection that are known to be at higher risk for infection with TB or at higher risk for developing TB disease if infected. The final strategy to control TB is to apply control measures in high risk settings. The dedicated, knowledgeable, and professional staff of the Chest Clinic Program identify and treat TB disease, identify and evaluate exposures to TB and offer treatment if needed, screen certain high risk populations, and assist the public with the application of control measures in high risk environments.

Title 17 of the California Code of Regulations requires that notification be given to the county health department of all diagnosed or suspicious cases of tuberculosis by telephone or fax within one working day of identification. California Health and Safety Code 121362 also requires that providers treating persons with active TB report to the local health officer any pertinent information the health officer requests.

Additional Information Available

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 559-600-3413.
Active TB: Trend for the 2003-2012

![Graph showing Active TB trend from 2003 to 2012. The x-axis represents the time (Year) from 2003 to 2012, and the y-axis represents the cases with a peak in 2003 and a decline towards 2012.]

**FIGURE 2**

2012 Fresno County TB Disease Sites

- Pulmonary, 28, 80%
- Lymph node / Pulmonary, 3, 8%
- Pleural, 1, 3%
- Colon / Pulmonary, 1, 3%
- Bone / Meninges / Pulmonary, 1, 3%
- Laryngeal / Pulmonary, 1, 3%

![Pie chart showing the distribution of disease sites with Pulmonary being the most common.]
Fresno County 2012 TB Cases by Race/Ethnicity Distribution

- Caucasian, 4, 11.4%
- East Indian, 4, 11.4%
- Hispanic, 18, 51.4%
- Hmong, 6, 17.1%
- Korean, 1, 2.9%
- Mien, 1, 2.9%
- Vietnamese, 1, 2.9%
- East Indian, 4, 11.4%
**FIGURE 4**

**Fresno County 2012 Cases by Age**

![Bar chart showing the distribution of TB cases by age group in 2012 in Fresno County.](chart)

Cases by Age Group:
- 10-19yrs: 1 case
- 20-29yrs: 5 cases
- 30-39yrs: 6 cases
- 40-49yrs: 3 cases
- 50-59yrs: 5 cases
- 60-69yrs: 2 cases
- 70-79yrs: 9 cases
- 80+ yrs: 5 cases

**FIGURE 5**

**Fresno County, TB 2012 Drug Resistance Patterns**

![Bar chart showing the drug resistance patterns in 2012.](chart)

Drug Resistance Patterns:
- No Culture: 5 cases
- INH: 3 cases
- PZA: 1 case
- No Resistance: 26 cases
FIGURE 6

2012 Fresno County TB Case Referral Sources

Number of Patients

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<thead>
<tr>
<th>Referral Source</th>
<th>Patients</th>
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<td>Interjurisdictional transfer</td>
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<td>Contact Investigation</td>
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</tr>
<tr>
<td>Private Provider</td>
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</tr>
<tr>
<td>Laboratory</td>
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</tbody>
</table>

FIGURE 7

Fresno County 2012 TB Cases by Pulmonary Disease Extent

Cases

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<th>Chest X-Ray Presentation</th>
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</tr>
<tr>
<td>Effusion/Infiltrate</td>
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</tr>
<tr>
<td>Effusion/Nodule</td>
<td>1</td>
</tr>
<tr>
<td>Effusion/Cavitory</td>
<td>2</td>
</tr>
<tr>
<td>Infiltrate</td>
<td>17</td>
</tr>
<tr>
<td>Nodule</td>
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</tr>
<tr>
<td>WNL</td>
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<tr>
<td>Adenopathy</td>
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</tr>
<tr>
<td>Cavitary Lesion</td>
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</tbody>
</table>
FIGURE 8
2012 Active Tuberculosis Cases in Fresno County
by Zip Code
Fresno County 2012 TB cases by Patient Occupation

- Unemployed, 13, 37.1%
- Field Worker, 4, 11.4%
- Retired, 8, 22.9%
- Education, 1, 2.9%
- Disabled, 1, 2.9%
- Cashier, 1, 2.9%
- Data entry, 1, 2.9%
- Food service, 1, 2.9%
- Handyman, 1, 2.9%
- Janitor, 1, 2.9%
- Homemaker, 1, 2.9%
- Healthcare, 1, 2.9%
- Student, 1, 2.9%