

Maricopa County 2010 TB Annual Report

Department of Public Health

Division of Clinical Services



Maricopa County
Department of Public Health

Executive Summary

The Tuberculosis (TB) surveillance report provides data regarding TB rates in Maricopa County. Maricopa County Department of Public Health, Clinical Services Division, provides direct patient care for TB cases within Maricopa County. In addition, the TB Control and Prevention Program is also responsible for conducting contact investigations, surveillance and data analysis, and serves as a community resource for TB.

The Maricopa County TB Control and Prevention Program is a unique program rolled out as an integrated project with a team of epidemiologists partnered with nurse case managers. The epidemiologists establish an initial contact with the patient, the notifying agency and health care providers. Epidemiologists provide an initial TB education to the patient, the patient's family, and health care providers, and promptly initiates a thorough contact investigation. All patients presenting at the clinic are then referred to a nurse case manager for continued clinical care and individualized case management. Nurse case managers work with the physician, the patient and the family to develop an individualized plan of care. Social needs and circumstances are assessed and incorporated into the case management plan.

This report provides a comprehensive overview of Maricopa County TB morbidity. The 2010 TB Surveillance report:

1. Describes the epidemiological trends of TB in Maricopa County; and
2. Summarizes program activities.

The following are the key findings for the 2010 report:

1. The Maricopa County TB case rate is **3.86 cases per 100,000** of the population, which approximately matches the national average of **3.6 per 100,000** of the population. In 2010, Maricopa County reported 153 cases of TB, which is a 10% increase from the number of reported cases in 2009 (139 cases with a case rate of 3.5 per 100,000 of the population). Maricopa County accounted for 54.8% of the TB cases in Arizona.
2. Risk factors for TB cases :
 - Sixty five percent (65.35%) of the total TB cohort were Foreign Born originating from 25 different countries of the world. This is a decrease of 3% from 2009 foreign born cases (67.6% of the total population).

- The Hispanic population continues to have highest rate of TB in Maricopa County. Hispanics accounted for 40% of the total TB cases reported (61 out of 153). Asians accounted for 31% (48 out of 153) of the total TB cases in 2010, compared to 29% (40/139) in 2009 which is a 20% increase in the incidence of TB among the Asian population in Maricopa County for 2010.
 - HIV co-infection was diagnosed in three cases only, a rate of 2.2%.
 - Among the total reported TB cases, 8.5% were homeless at the time of diagnosis. Other high risk behaviors included alcohol abuse in 5.9% cases, injectable drug usage in 3.3% cases and non injectable drug abuse in 3.9% cases.
 - Mono resistance to Isoniazid was reported in only 9 cases for 2010, for a rate of 9.2%. However, there were no reported cases of multi drug resistant TB or extremely drug resistant TB.
 - In 2008, 85.50% of the TB cases completed treatment within twelve months.
 - The contact Index was 15.4 per AFB smear positive pulmonary TB cases for 2010.
 - In 2008, 92.4% of cases received directly observed therapy.
3. Program Achievements:
- 90.91% of the pulmonary cases that were sputum smear positive for AFB had their treatment initiated within 7 days of case reporting.
 - Drug susceptibility testing was completed for 94.44% of the culture positive TB cases in 2010.
 - 92.08 % of all TB cases had known HIV status in 2010, compared 86.6% in 2009.

Maricopa County TB Control and Prevention Program Surveillance Report 2010

TB maintains its notoriety as one of the leading infectious causes of death worldwide and remains a global emergency. The World Health Organization reported a global burden of 9.4 million incident cases and 14 million prevalent cases of TB in 2009. As a member of the global community, Maricopa County residents are vulnerable to the disease.

TB (both cases and suspects) is a reportable disease in Maricopa County. The sooner the cases are reported to the county authority, the sooner epidemiologists can initiate the investigation and treatment to prevent transmission in the community.

To accelerate progress in national TB elimination activities and to guide the local and state programs in measuring their TB control program success, the Centers for Disease Control has selected 15 National TB program objectives, highlighting priority activities and outcomes and setting performance targets for 2015. Maricopa County strives to make progress to meet these objectives.

I. TB Control Program Objectives and Mission

- A. Ensure persons with active TB are identified, isolated if appropriate and provided a full course of directly observed anti-TB therapy (DOT) until the recommended treatment is completed.
- B. Ensure contacts of the reported TB cases are identified, evaluated and provided appropriate preventive therapy.
- C. Monitor TB trends in Maricopa County and prevent the spread of infection by surveillance, data analysis, health education and dissemination of information.
- D. Monitor program performance and track progress towards the national TB program objectives and performance targets for 2015.

II. FY 2011 Work Plan for the Maricopa County TB Control Program

- A. Increase the number and percentage of TB patients who complete therapy within the prescribed time period through the use of DOT.

Goal: For patients with newly diagnosed TB, for whom 12 months or less of treatment is indicated, increase the proportion of patients who complete treatment within 12 months to 93%.

- B. Collaborate with the HIV program to ensure that all newly diagnosed TB cases are counseled and tested for HIV and referred for HIV services if found to be HIV positive.

Goal: Increase the proportion of TB cases with known HIV test results reported to 95%.

- C. Assess the reasons for cases with no contacts identified or a lower number (< 3) contacts identified, assess the delays in interviewing cases or evaluating contacts, assess low completion of preventive therapy rates and devise strategies for improvement.

Contact Elicitation Goal: Increase the proportion of TB patients with positive acid fast bacillus (AFB) sputum smear results who have contacts elicited to 100%.

Contact Evaluation Goal: Increase the proportion of contacts to sputum AFB smear positive TB patients who are evaluated for infection and disease to 93%.

Contact Treatment Initiation Goal: Increase the proportion of contacts to sputum AFB smear positive TB patients with newly diagnosed latent TB infection who start treatment to 88%.

Contact Treatment Completion Goal: For contacts to sputum AFB smear positive TB patients who have started treatment for the newly diagnosed LTBI, increase the proportion who complete the treatment to 79%.

- D. Decrease the delays in initiating treatment for TB patients.

Goal: Increase the number of TB patients with positive AFB sputum smear results who initiate treatment within 7 days from specimen collection to 95%.

- E. Increase the utilization of laboratory reports in determining treatment options.

Goal: Increase the proportion of culture positive TB cases with initial drug susceptibility results reported to 100%.

III. Demographics

- A. Incidence of TB

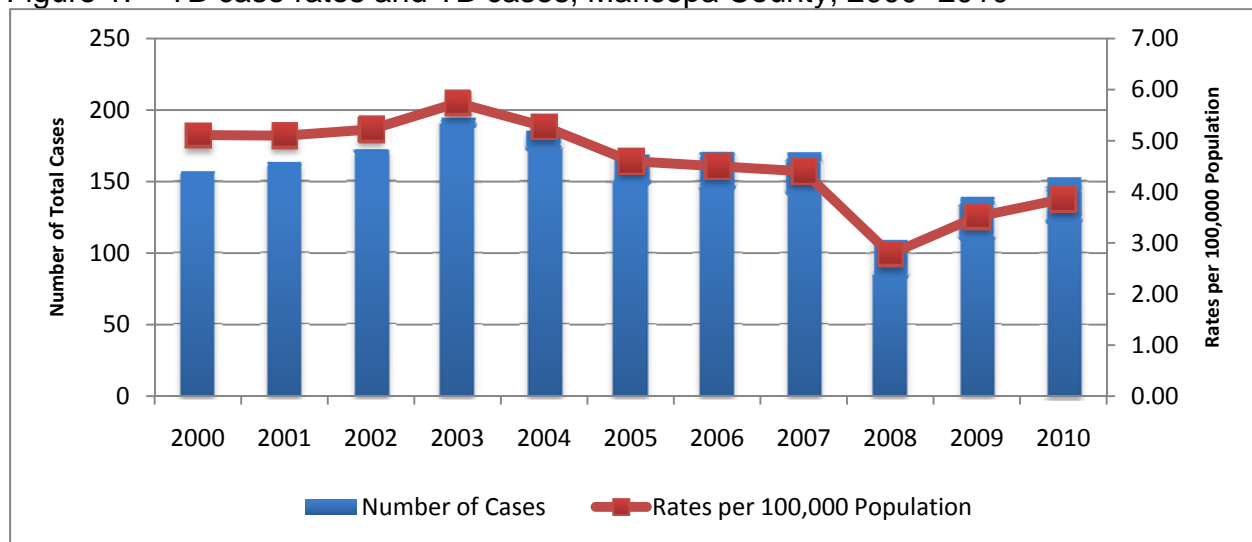
In 2010, 153 cases of TB were reported to the Maricopa County TB Program for an incidence of 3.86 cases per 100,000 population (DES population estimate for Maricopa County in 2010 is 3,964,063). Maricopa County reported 54.8% of the Arizona cases in 2010. There was a 10% increase in the number of cases and a 10% increase in the

incidence of TB when compared to 2009. Maricopa County decreased from 67.6% of the total population in 2009 to 65.35% of the total TB cohort in 2010. Over the last 10 years, the Maricopa County case rate has fluctuated between 2.78 cases per 100,000 to 5.74 cases per 100,000 of the population. In 2008, Maricopa County reported the lowest single year decrease in the case rate of TB: 2.78 cases per 100,000, which is 27.5% lower than the case rate for 2010.

Table I: TB Case rates for USA, Arizona and Maricopa County

| US Case Rate | Arizona Case Rate | Maricopa County Case Rate |
|---------------------------------|---------------------------------|----------------------------------|
| 3.6 / 100,000 Population | 4.4 / 100,000 Population | 3.86 / 100,000 Population |

Figure 1: TB case rates and TB cases, Maricopa County, 2000- 2010



B. Age

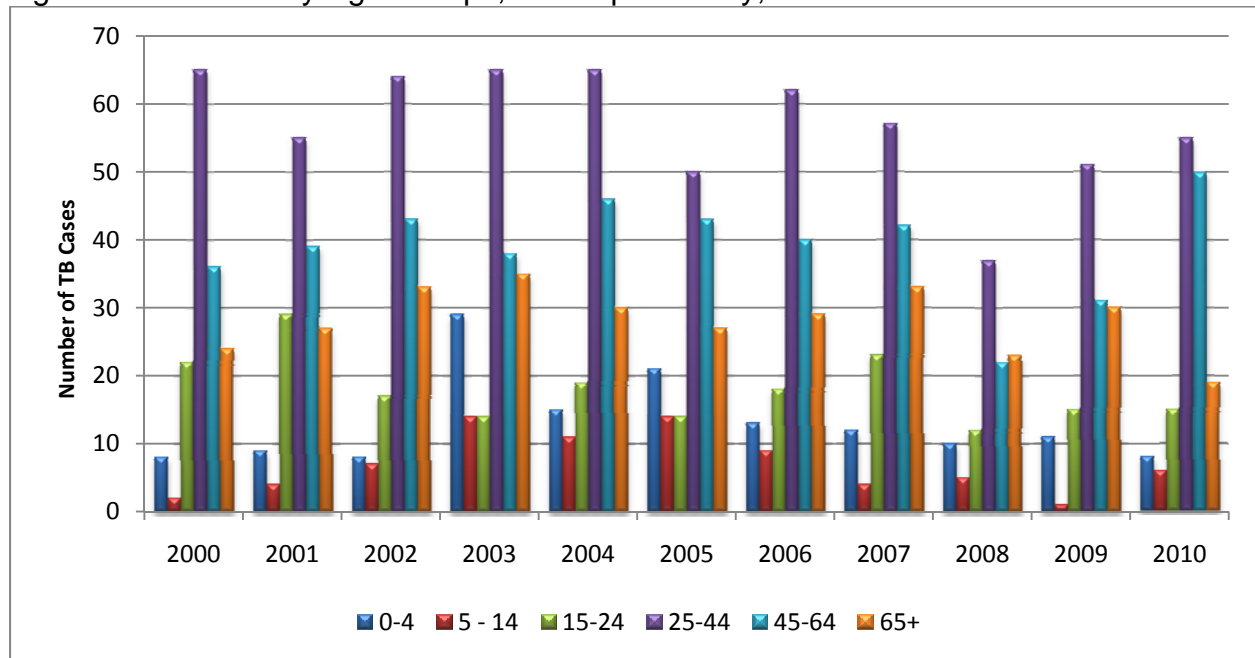
In 2010, 5.2 % of the total TB cases (8 out of 153) were less than four years of age. The 5-14 age group accounted for 3.92 % (6 out of 153) of the cases. The greatest proportion of people who were diagnosed with TB were in the 25 – 44 years age group, accounting for 35.95% (55 out of 153) of the total cases. Age 65 and over accounted for 12.42 % of the total cases (19 out of 153).

The mean age for all active TB cases was 42 years of age and the median age was 43. For males, the mean age was 43 and the median age was 44. For females, the mean age was 40 and the median age was 38.

The occurrence of TB in children under five years of age is of great concern because it is an indicator of ongoing transmission. For newly diagnosed TB in children, source

case investigations are completed to identify the source case and prevent ongoing transmission in the community. In 2010, nine children less than five years of age were diagnosed with active TB disease. Of the nine source case investigations, the source case was identified for only one case and treated for TB.

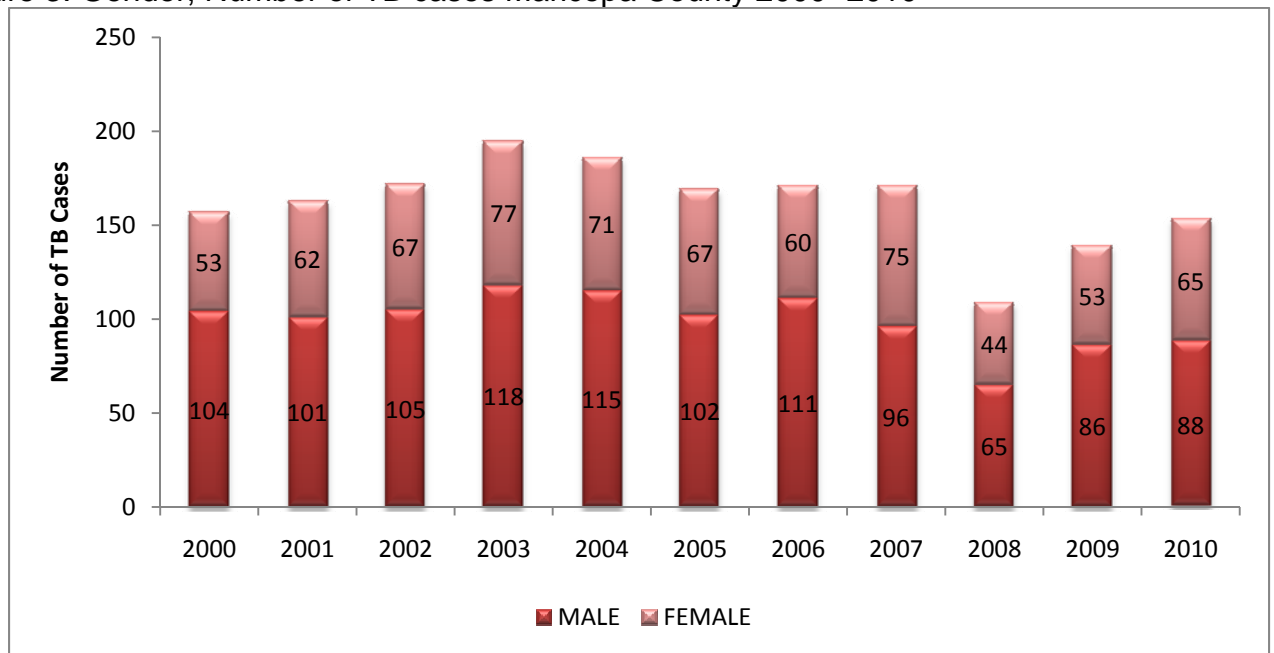
Figure 2: TB cases by Age Groups, Maricopa County, 2010



C. Gender

Males accounted for 57.51 % (88 out of 153) and females accounted for 42.48 % (65 out of 153) of all TB cases in 2010.

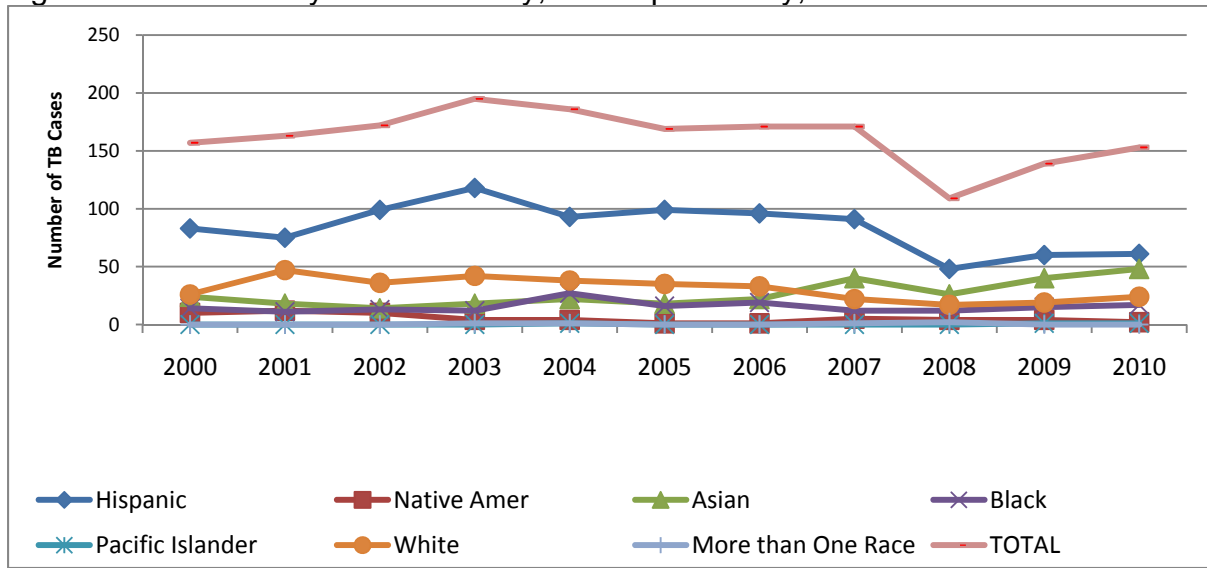
Figure 3: Gender, Number of TB cases Maricopa County 2000- 2010



D. Race/ Ethnicity

The Hispanic population continues to have the highest rate of TB in Maricopa County. Individuals who identify as Hispanic represented 40% (61 out of 153) of the total reported cases. In 2010 Asians accounted for 31% (48 out of 153) of the total TB cases reported in Maricopa County compared to 29% (40/139) in 2009, which is a 20% increase in the incidence of TB among the total Asian population in Maricopa County in 2010. Asian population for 2009 and 2010 (127,259) are from the population statistics unit in the Arizona department of economic security (DES). Non-Hispanic White accounted for 16% of the total cases, followed by African American (11%). Native Americans and Pacific Islanders accounted for 1% in each category.

Figure 4: TB cases by Race/Ethnicity, Maricopa County, 2000- 2010



The table below shows the case rates in the different race groups in 2008, 2009 and 2010. The rates show a 21% increase in the TB incidence in the Asian population. The population estimates used for the different Race/Ethnic groups are the DES population estimates for Maricopa County .

Table II. TB Case rates per 100,000 of the population by Race/Ethnicity, Maricopa County, 2008- 2010

| Race | 2008 | 2009 | 2010 |
|------------------------|---------------------|---------------------|---------------------|
| White | 0.79 case/100,000 | 0.78 case / 100,000 | 0.99 case / 100,000 |
| Hispanic | 4.23 case /100,000 | 5.25case /100,000 | 5.34 case / 100,000 |
| Black | 6.57 case / 100,000 | 8.11 case / 100,000 | 9.11 case / 100,000 |
| Native American | 4.39 case/ 100,000 | 4.34 case / 100,000 | 2.70 case / 100,000 |
| Asian | 21.07 case /100,000 | 32.10 case/100,000 | 38.99 case/100,000 |

IV. Risk Factors

A. Country of Birth

The percentage of TB cases among foreign born individuals was 65.4% (100 out of 153) of the total reported cases in Maricopa County. The foreign born cases originated from 25 different countries, and Mexico accounted for 40 cases (26%) in 2010. The proportion of foreign born cases (65.4% of all cases) in Maricopa County remains higher than that of the U. S. National average of 59%, as reported by CDC in 2009.

Figure 5: Percentage of TB cases among US born and Foreign born in Maricopa County, 2000 – 2010

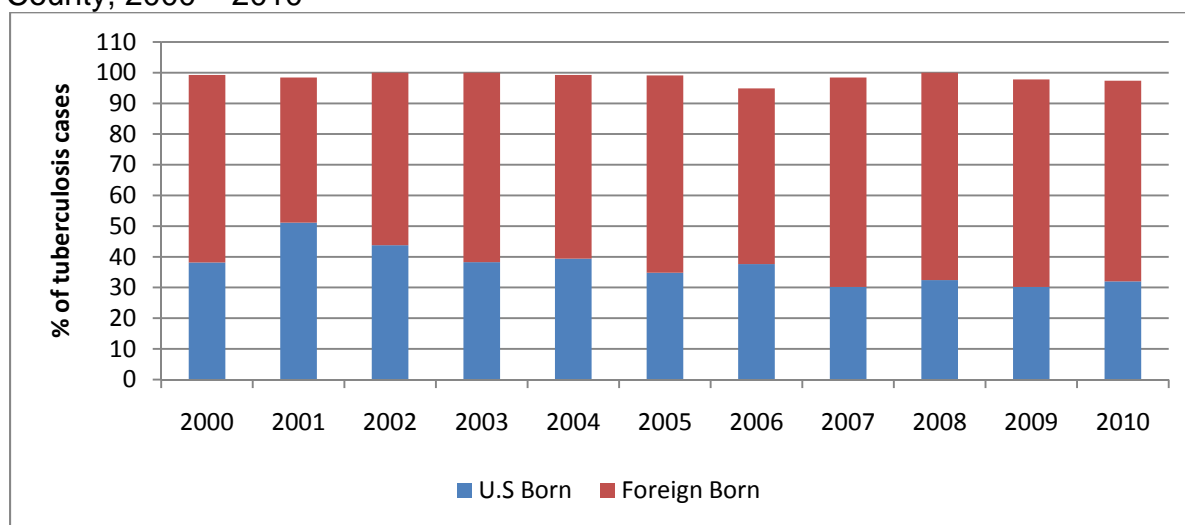
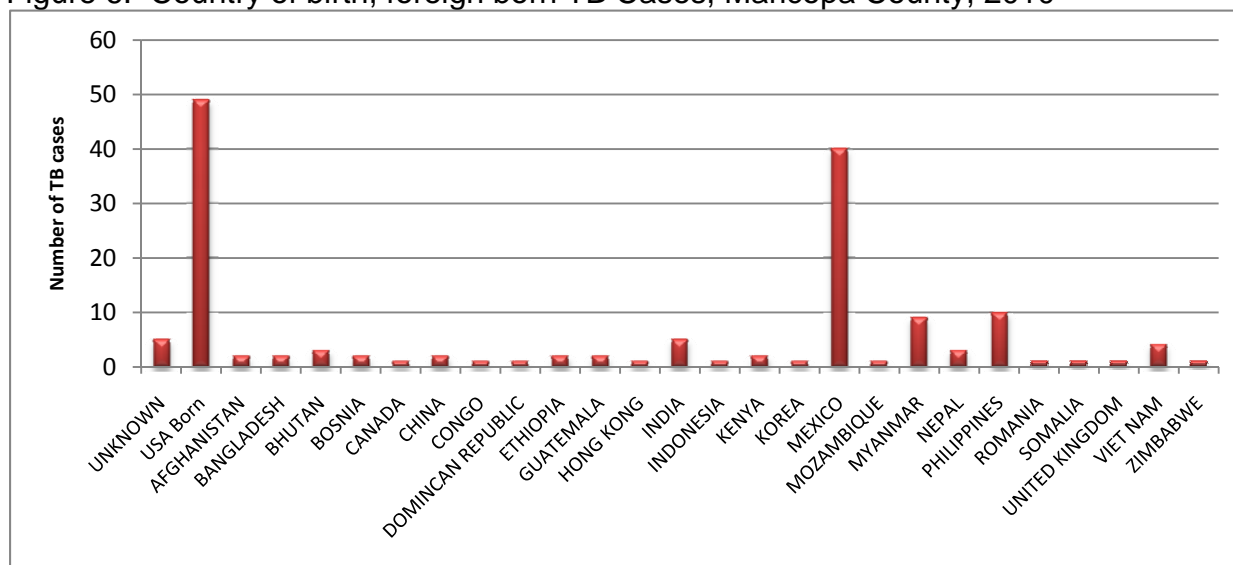


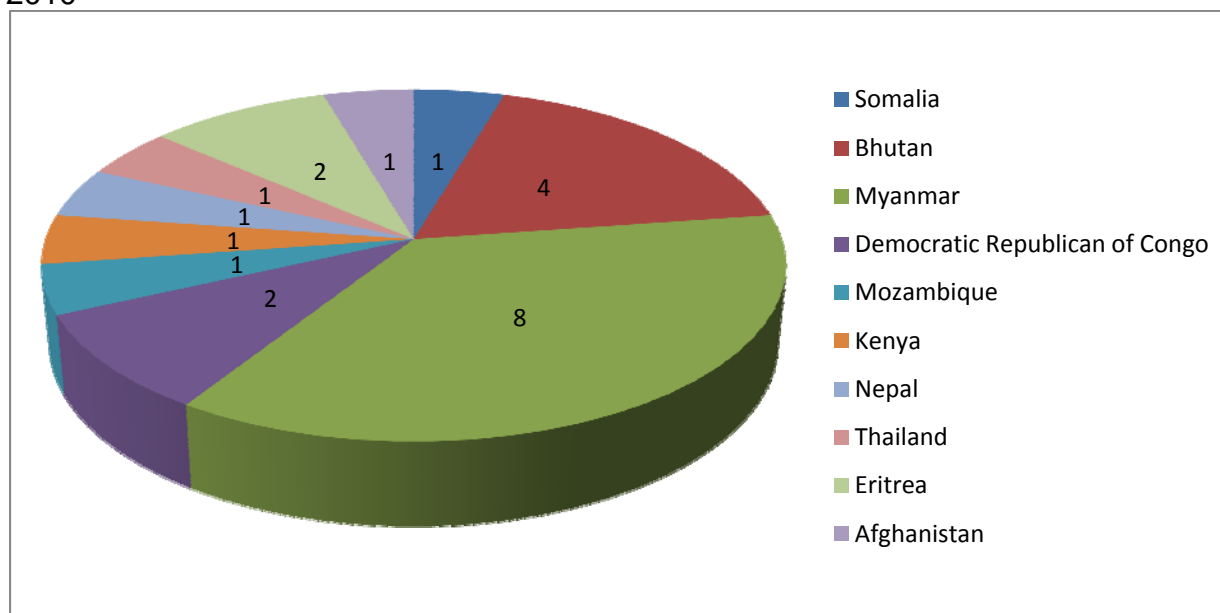
Figure 6: Country of birth, foreign born TB Cases, Maricopa County, 2010



B. Refugees with TB and Countries of Origin

Among the Refugees that were evaluated in Maricopa County in 2010, 22 cases were diagnosed with TB and treatment initiated. Refugees accounted for 14.37% of the total TB cases in Maricopa County, 2010. The refugees were born and originated from 10 different countries.

Figure 7: Number of Refugees with TB and the Countries of Birth, Maricopa County, 2010



C. Reported Behaviors

Substance abuse is defined as having a history of substance abuse during 12 months prior to diagnosis. In 2010, substance abuse was reported in 13.07% of the cases. Nine cases reported excessive use of alcohol, five cases reported using injectable drugs, and six cases reported non-injectable drug use.

D. TB-HIV Co-Infection

Co-infection with HIV and TB impacts the ability of patients to fight infection due to immunosuppression caused by HIV. To prevent morbidities and mortalities associated with TB/HIV co-infection and to provide concurrent care in a timely manner, it is very important to know the HIV status of every patient with active TB. The national TB objectives and performance targets for 2015 recommend that the proportion of patients with HIV test results reported increase to 88.7%. In 2010, the TB Program met this

target, and HIV test results were known for 92.08% of the active TB cases reported to Maricopa County.

Figure 8: Percent of TB Cases with TB-HIV Co-Infection, Maricopa County, 2000- 2010

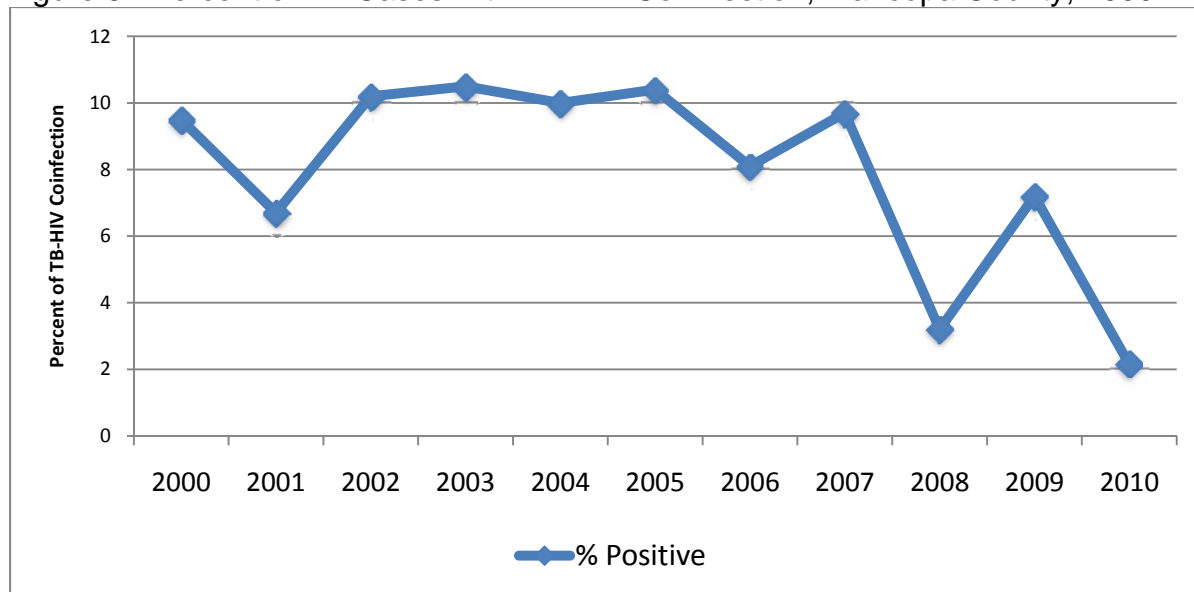


Figure 9: Number of TB Cases (> 14 years age) with HIV results, Maricopa County, 2010

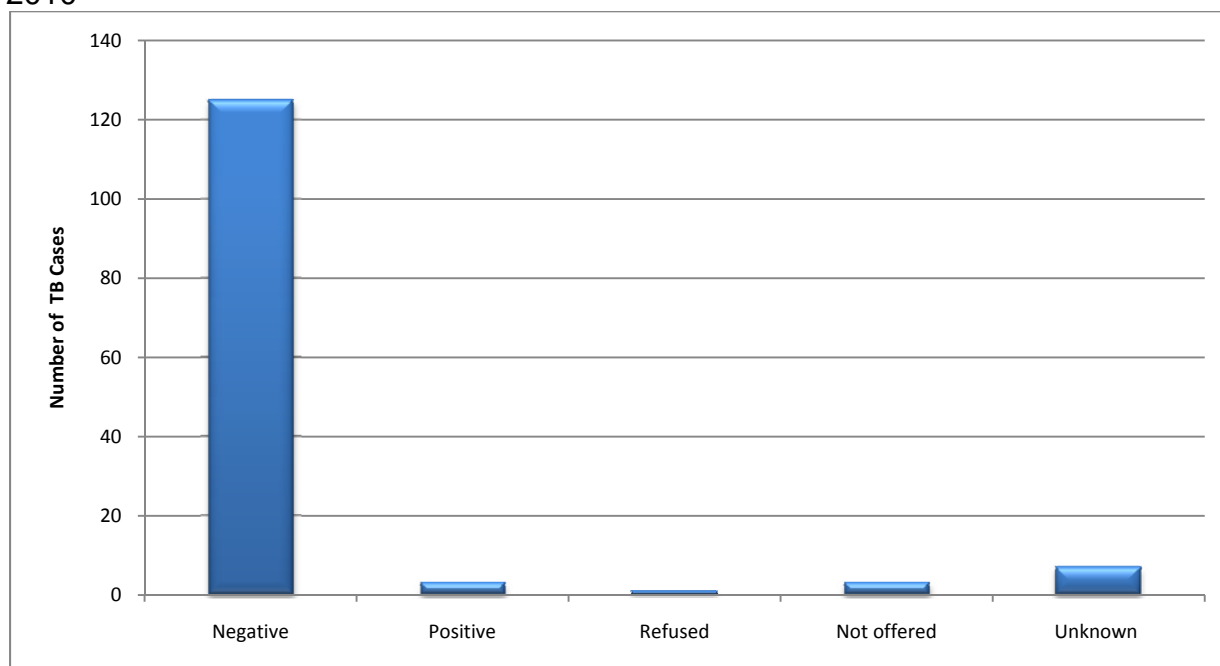
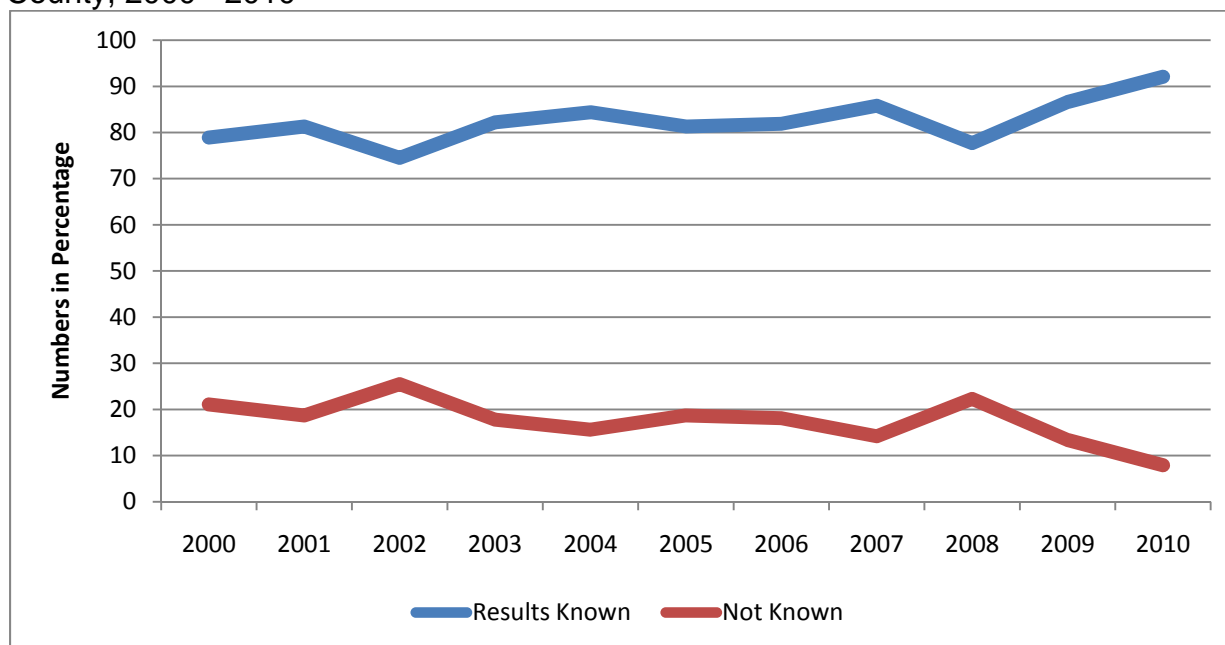


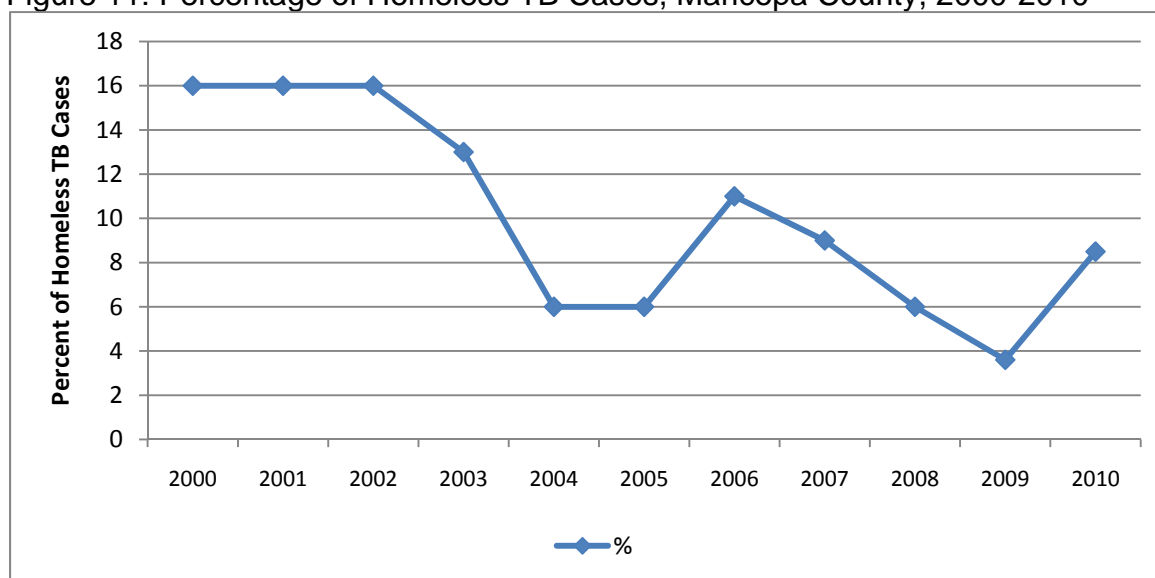
Figure 10: Percentage of TB Cases (> 14 years of age) with HIV results, Maricopa County, 2000 - 2010



E. Homelessness

Homeless is one of the risk factors associated with TB. In 2010 8.5% (13 out of 153) cases with TB reported as being homeless at some time during the 12 months before TB diagnostic evaluation was performed or initiated.

Figure 11: Percentage of Homeless TB Cases, Maricopa County, 2000-2010



F. Verification Criteria and TB Morbidity

In 2010, out of the total 153 cases of TB in Maricopa County, 113 cases were Pulmonary TB (73.8%). Extrapulmonary disease accounted for 23.52% of all total cases (36 out of 153). Out of the total 153 cases: 44 cases were sputum smear positive for acid fast bacilli (AFB); 86 cases had sputum smear negative for AFB; and for 23 cases sputum for AFB was not done. Additionally, 71 cases were sputum culture positive for MTB, 58 cases were sputum culture negative, and sputum cultures were not done in 23 cases. Tissue and other body fluid cultures were reported positive for AFB in 60 cases.

Figure 12: TB Cases by Site of Disease, Maricopa County, 2010

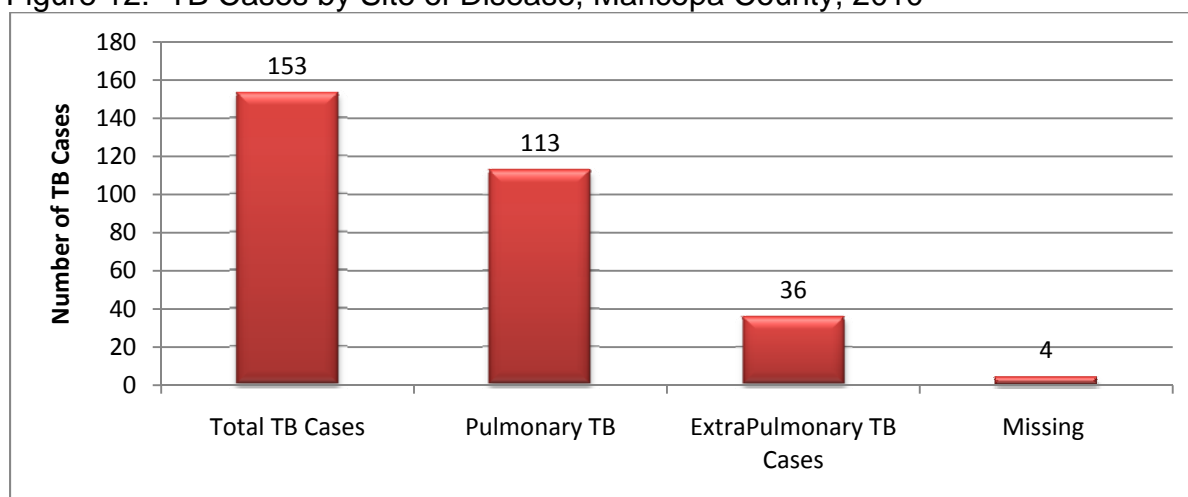
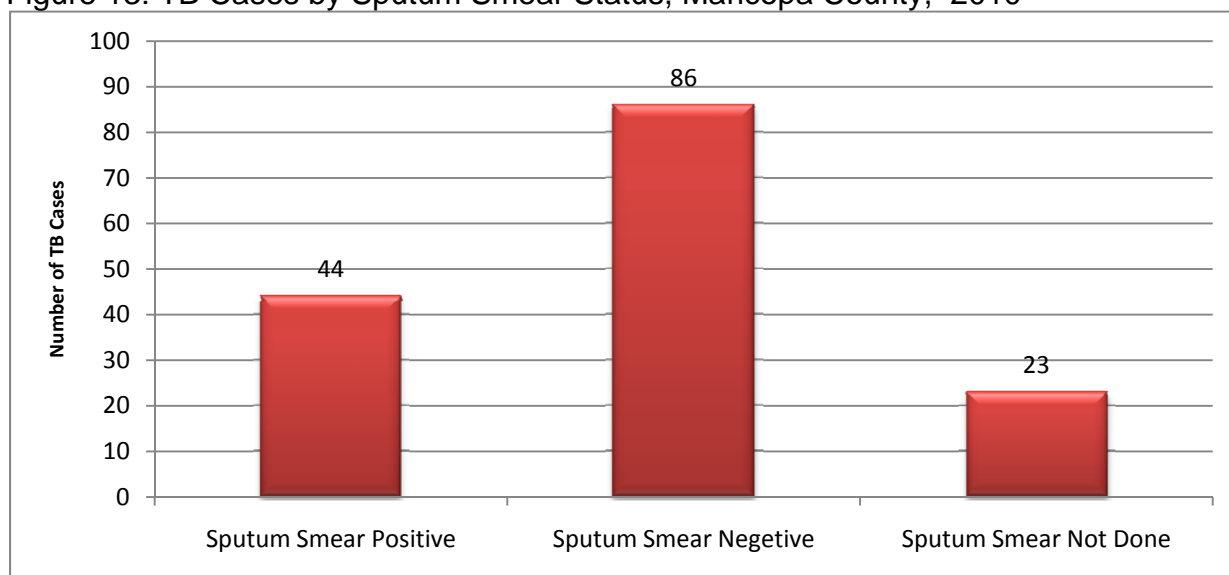


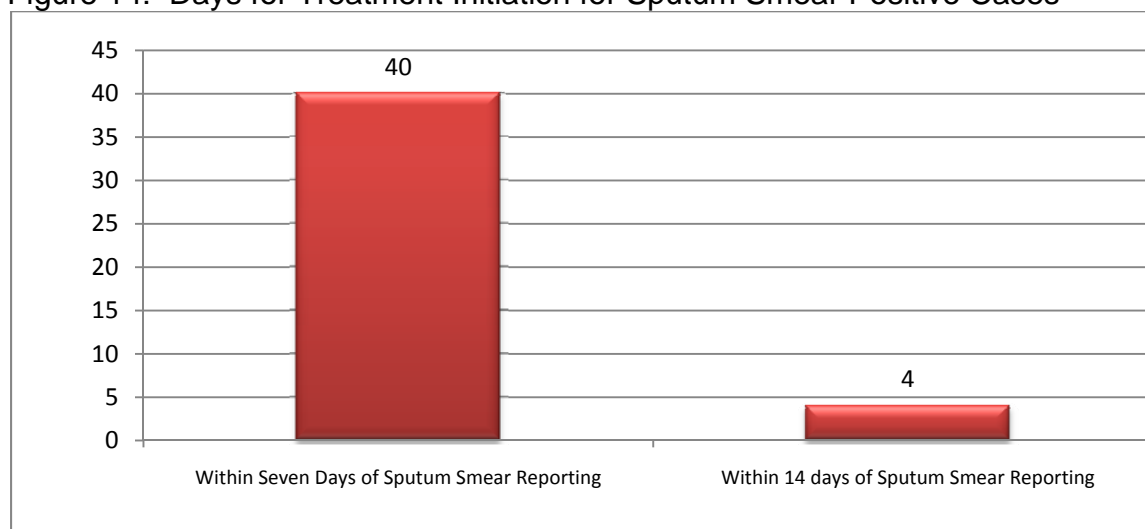
Figure 13: TB Cases by Sputum Smear Status, Maricopa County, 2010



G. Treatment Initiation

Of the sputum smear positive cases, 90.91% (36 out of 44) had treatment initiated within seven days of the sputum smear reporting. Treatment was initiated prior to sputum smear reporting in four of the cases. There were four cases in which treatment was initiated within 14 days of the sputum smear reporting.

Figure 14: Days for Treatment Initiation for Sputum Smear Positive Cases



H. Drug Susceptibility Testing and Drug Resistance

Initial drug susceptibility testing was completed in 94.44% (102 out of 108) of the total culture positive cases. Isoniazid (INH) resistance occurred in 8.8% of the cases in which drug susceptibility was performed (9 out of 102).

There were no reported cases of multidrug resistant TB (defined as resistance to both INH and Rifampin [RIF]) or extensively drug-resistant TB, (defined as resistance to INH, RIF, a fluoroquinolone and at least one of the anti-TB injectable drugs (Amikacin, Kanamycin or Capreomycin)] for the year 2010.

I. Directly Observed Therapy (DOT)

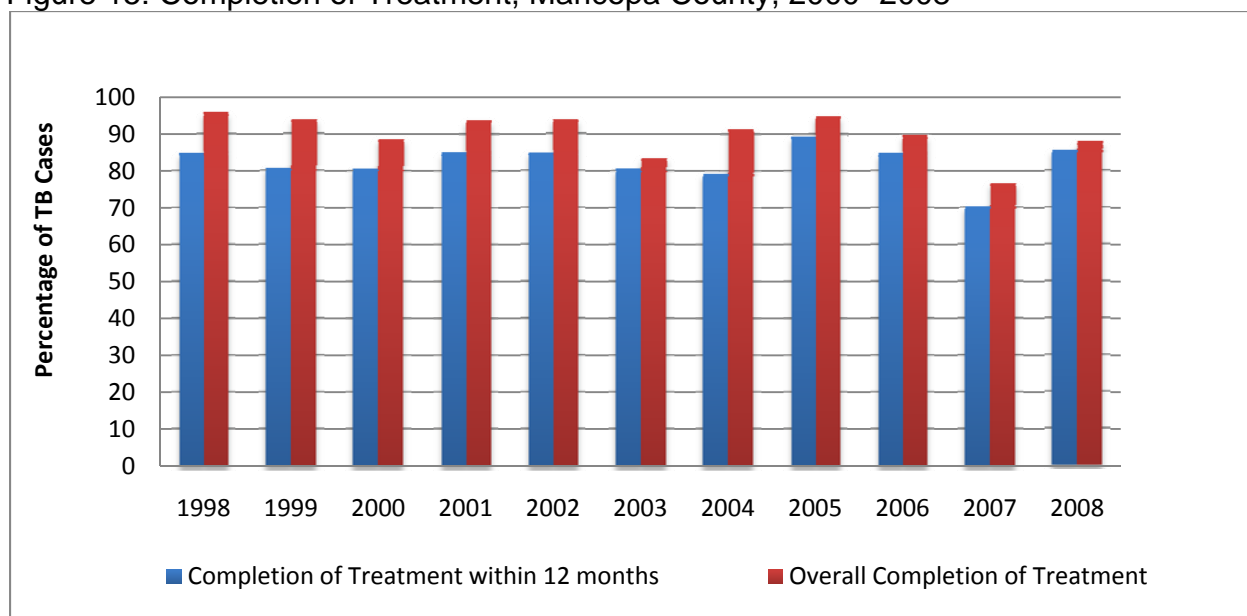
To ensure compliance of treatment, Communicable Disease Investigators from the Clinical Services Division visit the patient's home and observe the patient taking their medications. Due to the length of the time to complete TB treatment, 2008 data for the directly observed therapy were the most recent analyzed data available. In 2008, of those diagnosed TB cases started on TB treatment, 92.4% received DOT or a combination of DOT and self administration. Self administered treatment was reported for 7.5% of the cases started on treatment.

J. Completion of treatment

CDC recommends at least 93% of persons with newly diagnosed TB, for whom therapy of 1 year or less is indicated, will complete therapy within 12 months. In 2008, 87.8% of all cases (86 out of 109) completed treatment within twelve months.

At the time of this report, treatment completion percentages for 2009 and 2010 have not been calculated as some of 2009 and 2010 cases remain open. The completion of treatment percentages for 2009 and 2010 will be presented in the 2011 and 2012 annual reports, respectively. As of December 2010, 56 of the total 153 TB cases reported in 2010 in Maricopa County have completed treatment, with a treatment completion rate of 91.80%.

Figure 15: Completion of Treatment, Maricopa County, 2000- 2008



K. Contact Investigation:

Contact investigations are conducted by Epidemiologists in Maricopa County to identify, screen and evaluate all persons who are at risk for recent exposure and infection with TB. It is an essential component of public health and allows for new case finding, early detection and treatment of cases, all leading to prevention of TB. In 2010, 880 contacts were identified for the 153 counted cases of TB. Out of the total, 693 contacts were identified as pulmonary cases with a positive AFB smear. An average of 15 contacts (contact index) were identified per smear positive pulmonary case.

Contact investigation was initiated on 693 contacts, out of which only 51.9% completed a full evaluation for TB infection and disease. A complete evaluation includes 2-step TB skin test, a chest X-ray for positive reactors, and a diagnostic evaluation by a medical provider.

In 2010, out of the 211 new LTBI contacts identified, treatment was initiated on 138 (65.4%) and treatment is ongoing. At the time of this report, 5.7% of the newly diagnosed LTBI cases have completed treatment. In 2008, 88 new LTBI contacts were identified out of which 45.5% completed treatment. In 2009, 151 new LTBI contacts were identified, out of which 48.3% completed treatment.

Table III. Table shows contact index for pulmonary TB cases with positive acid-fast bacilli sputum smear

| Total TB Cases | Sputum Smear Positive Pulmonary Cases | Contacts Identified for Smear Positive Pulmonary Cases | Contact Index |
|----------------|---------------------------------------|--|---------------|
| 153 | 44 | 693 | 15 |

Conclusion

The Maricopa County TB Control Program continues to partner with health providers, local health agencies, the state health department and the local community to treat and prevent the spread of TB within the county.

The TB Control Program remains committed to meeting the goals of Maricopa County as well as the CDC National TB Objectives in a continued national and international effort to control the disease.

Program Objective 1: For the year 2008, the treatment completion rate was 87.8%. Since some 2009 and 2010 cases remain open, the actual treatment completion rates for these years will be reported in future. The overall treatment completion rate for 2010 as of the time of this report is 91.80%. The Maricopa County goals are to increase the percentage of treatment completion within 12 months to 93 %.

Program Objective 2: Increase the proportion of TB cases with known HIV test results reported to 95%. For the year 2010, 92.08% of the TB cases had a known HIV status. This is an increase of 5.5% from 2009, when 86.6% of the TB cases had a known HIV status.

Program Objective 3: Increase the proportion of TB patients with positive AFB smear results who initiate treatment within seven days of specimen collection to 95%. For the year 2010, 44 pulmonary cases were reported as sputum smear positive for AFB, and 94.44% (40 out of 44) had treatment initiated within seven days of the smear reporting.

Program Objective 4: Increase the proportion of culture positive TB cases with initial drug susceptibility results reported to 100%. Initial drug susceptibility testing was completed in 94.44% of the cases.

Program Objective 5: Contact Investigation

- 5a: Increase the proportion of TB patients with positive AFB sputum smear results who have contacts elicited to 100%. In 2010, contacts were elicited for 88% of the sputum smear positive TB cases. In 2008, contacts were elicited for 84% cases and in 2009 contacts elicited for 87% TB cases.
- 5b: Increase the proportion of contacts of sputum AFB smear positive cases that are evaluated for infection and disease to 93%. In 2008, 44% of the contacts identified completed evaluation, in 2009, 70% completed evaluation and in 2010, 52% contacts identified completed evaluation.
- 5c: Increase the proportion of contacts to sputum AFB smear positive TB patients with newly diagnosed LTBI infection who start treatment to 88%. In 2008, 52% new LTBI contacts started treatment, in 2009, 71% of the contacts with LTBI started treatment and in 2010, 65% of the new LTBI were started on treatment.
- 5d: For contacts to sputum AFB smear positive TB patients who have started treatment for the newly diagnosed LTBI, increase the proportion that complete treatment to 79%. In 2008 45 % new LTBI contacts completed treatment, in 2009 73% completed treatment. The 2010 treatment completion rate will be included in 2011 annual report.

Acknowledgements

We acknowledge the staff of the Division of Clinical Services for their dedication to providing high quality clinical care in an effort to prevent transmission of TB in Maricopa County. We also express our gratitude to the community based health institutions for their diagnosis, reporting, and collaboration in the management of TB cases.