

Maricopa County 2011 TB Annual Report

Department of Public Health

Division of Clinical Services

5/4/2012



**Maricopa County
Department of Public Health**

Total Cases Maricopa County, 2011 = 118

Crude Case Rate per 100,000 Population = 3.09 (U.S. 2011 =3.40)

Case Rate U.S-Born per 100,000 Population = 1.19 (U.S. 2011= 1.50)

Case Rate Foreign- Born per 100,000 Population = 13.86 (U.S. 2011 = 17.30)

Race and Ethnicity - Specific Case Rates per 100,000 Population

Asian = 24.95

White Hispanic = 8.04

American Indian = 6.75

Black/African American = 6.29

White non-Hispanic = 1.11

Gender - Specific Case Rates per 100,000 Population

Male = 3.65

Female = 2.54

Key Findings:

In 2011, Maricopa County reported 118 confirmed cases of Tuberculosis (TB), for a case rate of 3.09 per 100,000 population (the 2010 U.S. Census Bureau population estimate for Maricopa County is 3,817,117). This is a 22.87% decrease from the number of reported cases in 2010, (153 reported cases with a case rate of 3.86/100,000 population).

Approximately, sixty seven percent (66.94%) of the total TB cohort (79/118) were foreign born, originating from 25 different countries around the world. This is an increase of 26.58% from 2010 foreign born cases (65.35% of the total population, 100/153).

In 2011, Hispanic population accounted for 37.28% of the total TB cases reported (44/118). In 2010, people who identified as Hispanic represented 40% of the total reported cases in Maricopa County. Despite this 6.80% decrease in the incidence of TB among Hispanics as compared to 2010, Hispanic population continues to compromise the largest proportion of TB cases in Maricopa County. Asians accounted for 32.28% (38/118) of the total TB cases in 2011, compared to 31.00% in 2010; which is an increase of 3.87% in the incidence of TB among Asian population in Maricopa County for 2011.

Among the total TB case reported, 9.30% (11/118) were known to be homeless at the time of diagnosis. HIV co-infection was diagnosed in seven cases, a rate of 5.90%.

Eighty six percent (86.46%) of the total cases received directly observed therapy (DOT) at their residences, administered by a Maricopa County Department of Public Health (MCDPH) Communicable Disease Investigator. Nearly three percent (2.54%, 3/118) were residents of group homes or long term care facilities and received DOT at the facility. Four percent (4.23%, 5/118) received DOT in a hospital setting, or were deceased during treatment in a hospital. Four percent (4.23%, 5/118) were on self administered therapy managed by private medical providers. Nearly three percent (2.54%, 3/118) received no treatment because diagnosis was established from culture reports after patients were deceased.

There were two reported cases of INH resistance, one reported case of Streptomycin resistance and no reported multi-drug resistance (MDR or XDR) cases in Maricopa County during 2011.

The contact index for sputum acid fast bacilli (AFB) smear positive Pulmonary TB cases was 17.46 per case. The contact index for the all Pulmonary TB cases (sputum AFB smear positive and sputum AFB smear negative), was 10.25 per case.

For the year 2010, the total completion of treatment was 94.52%. The National TB Program Objectives, CDC, recommends completion of treatment within 12 months of treatment initiation. Eighty seven percent (87.67%) of the total 2010 cohort met the CDC recommended criteria of treatment completion within the twelve-month treatment plan. Based on the burden and site of the disease, MCDPH medical providers prescribed longer-treatment plans for eleven patients in the total cohort, which prolonged the treatment duration beyond the twelve-month plan.

National TB Program Objectives and Performance Targets for 2015:

1) Completion of Therapy:

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% by 2015.

Completed treatment within 12 months (%):

Cohort Period	2009	2010
Maricopa County Average (%)	87.00%	87.67%
National Average (%)	84.20%	70.60%

The treatment for the 2011 cohorts is ongoing. The completion of treatment for 2011 will be reported in the annual report for 2012.

2) TB Case Rates:

Decrease TB case rate in U.S.-born persons to less than 0.7 cases per 100,000 by 2015

Decrease in TB case rate for foreign-born persons to less than 14.0 cases per 100,000 by 2015

Decrease the TB case rate in U.S. - born non – Hispanic blacks to less than 1.3 cases per 100,000 by 2015

Decrease the TB case rate for children younger than 5 years of age to less than 0.4 cases per 100,000 by 2015

Cohort Year 2011	U.S.-born	Foreign Born	U.S.-born non-Hispanic blacks	Children under 5 years
Total Number	39	79	3	2
Case Rate	1.19/100,000	13.86/100,000	1.60/100,000	0.009/100,000

- ❖ All population estimates from the U.S. Census Bureau population estimate for Maricopa County, 2010. <http://2010.census.gov/2010census/popmap/> and http://magcensus.com/pdf/CEN-2010_2011-03-11_2010-Census-Population-Detail-Race-by-Hispanic-Latino-Ethnicity.pdf
- ❖ The rate for U.S.-born non –Hispanic black calculated using the population estimate from U.S. Census for non-Hispanic black, 2010
- ❖ Foreign born TB cases continue to outnumber U.S.-born cases in Maricopa County

3) Contact Investigation:

Contact Elicitation: Increase the proportion of TB patients with positive AFB sputum smear results who have contacts elicited to 100.0% by 2015.

Evaluation: Increase the proportion of contacts to sputum AFB smear- positive TB patients who are evaluated for infection and disease to 93.0% by 2015.

Increase the proportion of contacts to sputum AFB smear - positive TB patients with newly diagnosed Latent TB Infection (LTBI) who start treatment to 88.0% by 2015.

For contacts to sputum smear positive TB patients who have started treatment for newly diagnosed LTBI, increase the proportion who completes treatment to 79% by 2015.

Cohort year 2011	Contact Elicitation	Contact Evaluation	Treatment Initiation	Treatment Ongoing
Total number of contacts	908	566	95	17
Proportion of Contacts	94.23%	62.33%	71.96%	17.89%

4) Laboratory Reporting – Drug Susceptibility Results for Culture Positive TB Cases:

Increase the proportion of culture positive TB cases with initial drug- susceptibility results reported to 100.0% by 2015.

	Maricopa County	National Average
Initial Drug Susceptibility Results reported (%)	98.80	95.60

5) Sputum Culture Conversion:

Increase the proportion of TB patients with positive sputum culture results who have documented conversion to sputum culture negative within 60 days of treatment initiation to 61.5% by 2015.

	Maricopa County	National Average
Documented Conversion of sputum within 60 Days of Treatment Initiation (%)	43.50	33.40

6) Recommended Initial Therapy:

Increase the proportion of patients who are started on the recommended initial 4 drug regimen when suspected of having TB disease to 93.4% by 2015.

	Maricopa County	National Average
Patients Started on Recommended 4 drugs (%)	96.50	89.70

7) Known HIV Status:

Increase the proportion of TB cases with positive or negative HIV test result reported to 88.7% by 2015.

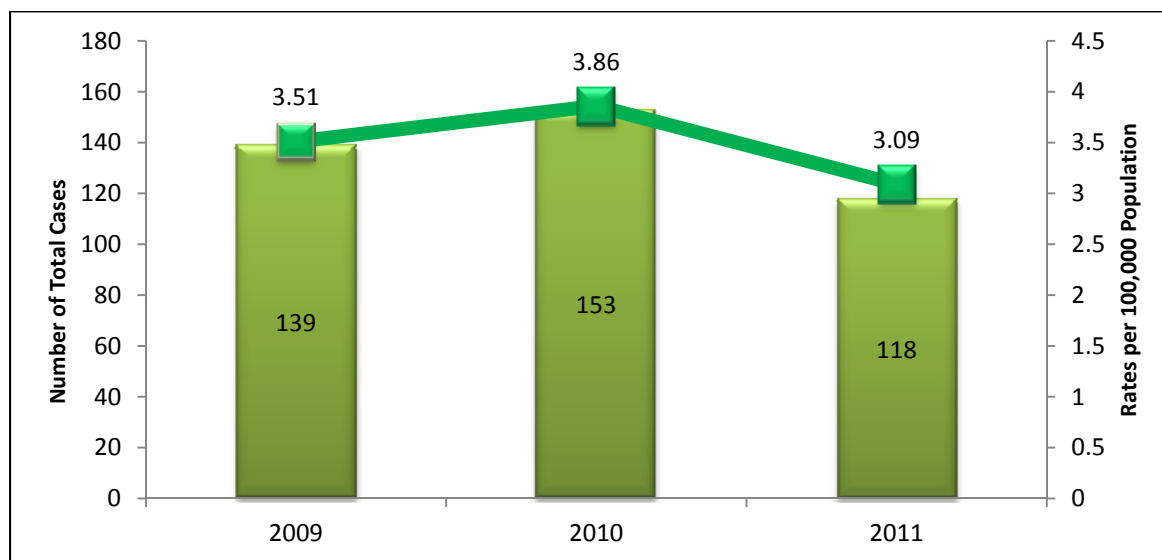
	Maricopa County	National Average
HIV test result Reported (%)	92.40	82.10

Tuberculosis Epidemiological Profile Maricopa County, 2011

Incidence of Tuberculosis in Maricopa County:

In 2011, 118 cases of TB were reported, for an incidence of 3.09/100,000 population.

Figure 1: Total TB Cases and TB Case Rates, Maricopa County, 2009- 2011

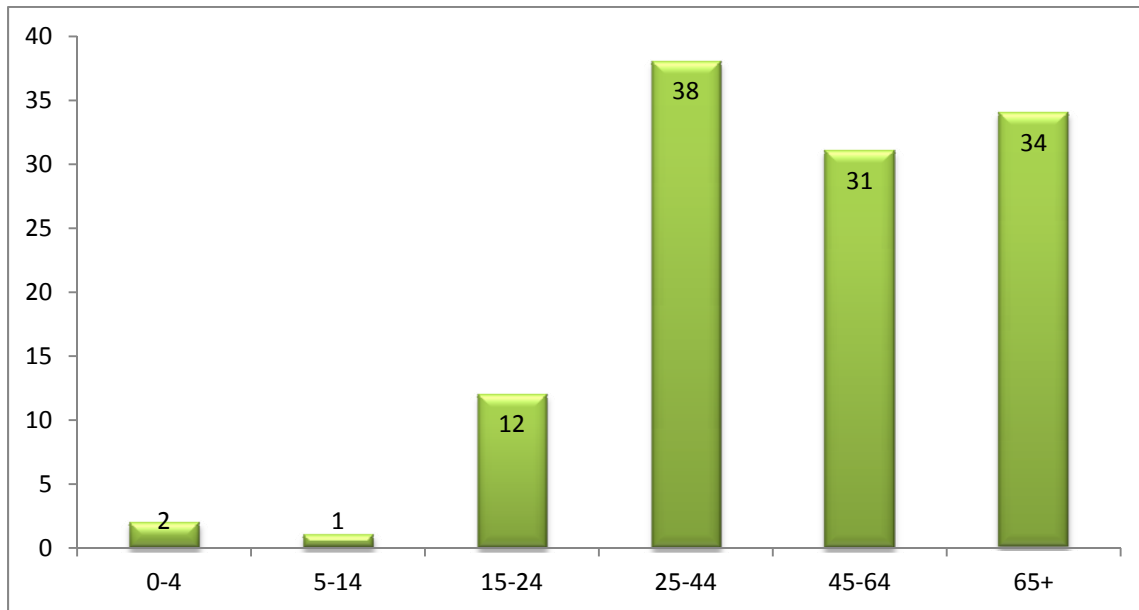


Demographics of Tuberculosis in Maricopa County, 2011:

1) Age:

In 2011, 1.69% (2/118) of the total TB cases were less than 4 years of age and the 5-14 age group accounted for 0.84% (1/118) of the cases. The greatest proportion of TB incidence observed was in the 25-44 year age group, accounting for 32.20% (38/118) of the total cases.

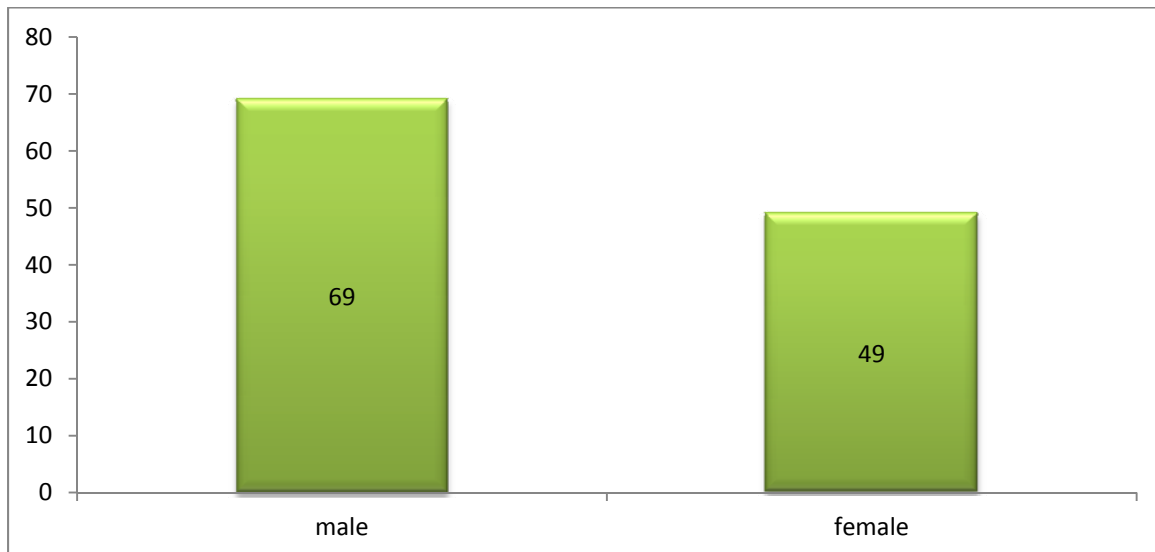
Figure 2: TB Cases by Age Group, Maricopa County, 2011



2) Gender:

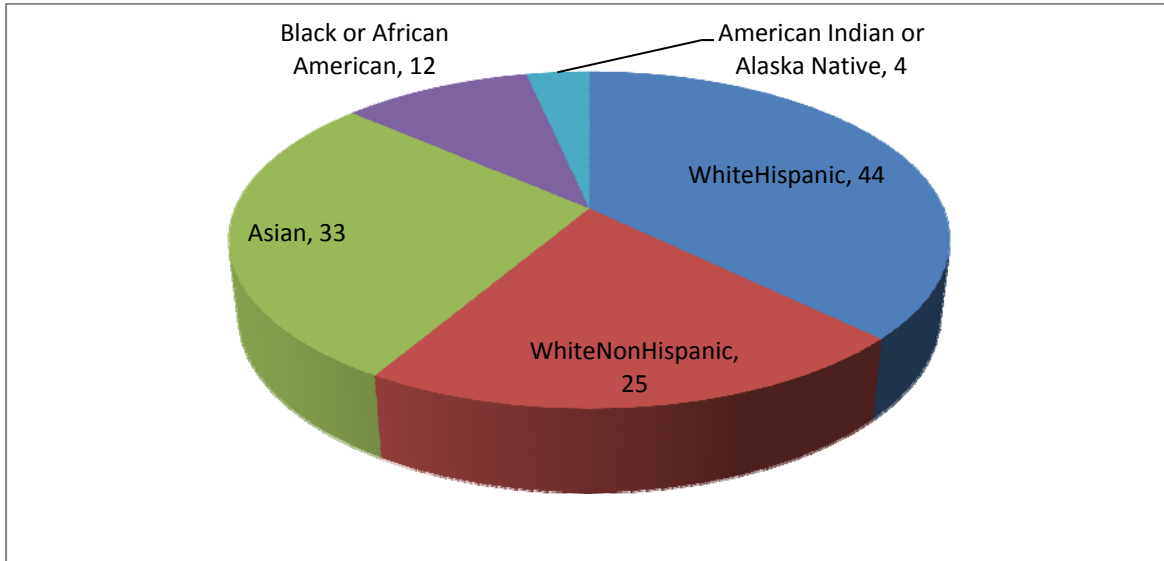
Males comprised 58.47% (69/118) and females accounted for 41.52% (49/118) of all reported TB case in 2011.

Figure 3: TB Cases by Gender, Maricopa County, 2011



3) Race/Ethnicity:

Figure 4: TB Cases by Race and Ethnicity, Maricopa County, 2011



4) Countries of Birth:

Figure 5: TB Cases among U.S.-Born and Foreign-Born, Maricopa County, 2011

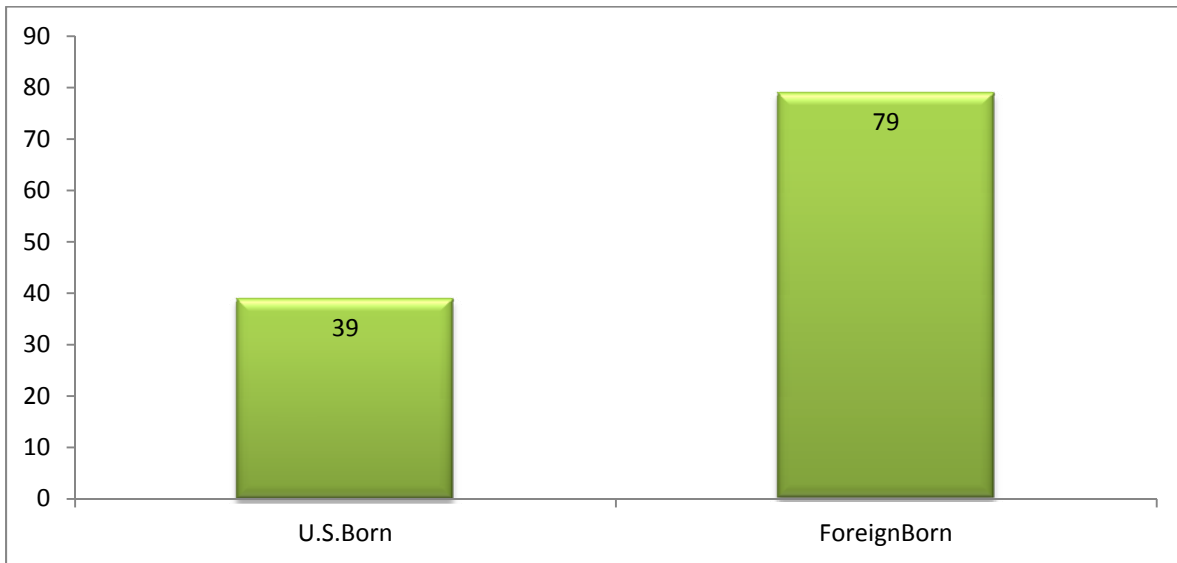
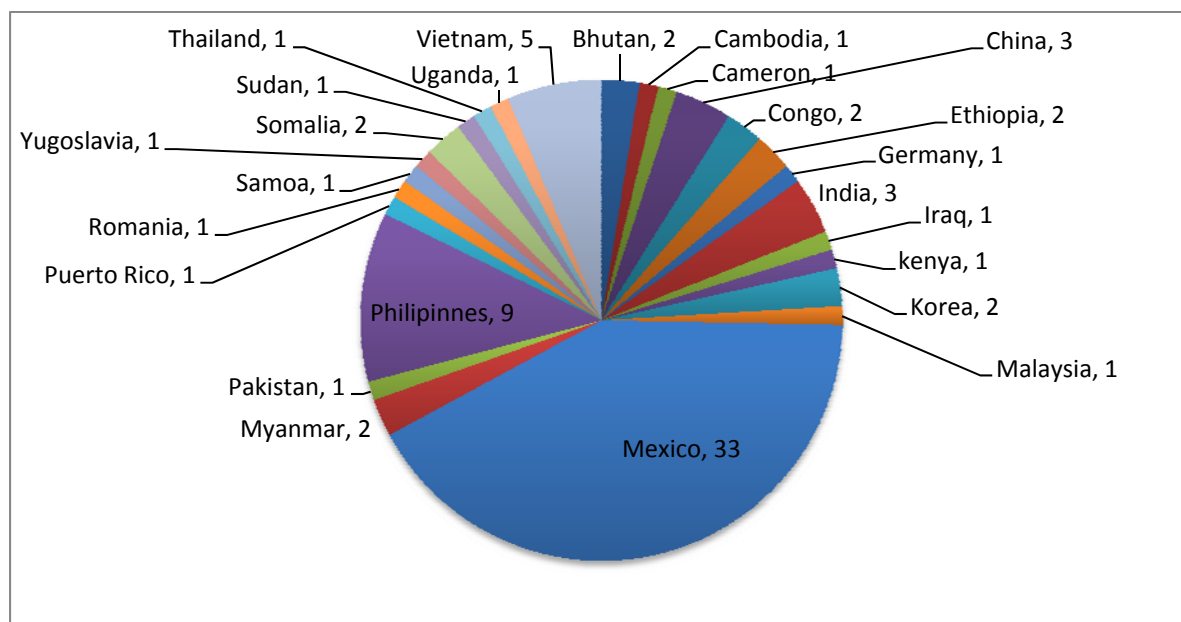


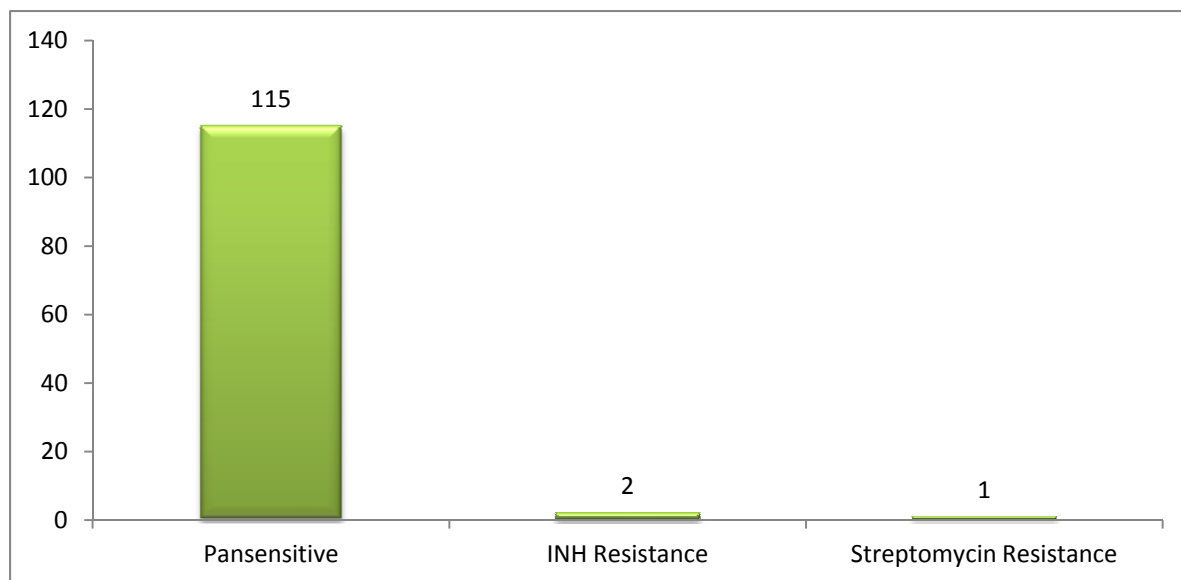
Figure 6: TB Cases by Countries of Birth among Foreign- Born Cases, Maricopa County, 2011



5) Drug Susceptibility :

The two INH resistant cases were reported as originating from Yugoslavia and Vietnam. The one Streptomycin resistant case was reported as U.S.-born. There were no observed MDR OR XDR cases reported.

Figure 7: Drug Susceptibility Pattern, Maricopa County, 2011



6) Verification Criteria:

In 2011, out of the total 118 counted cases of TB, 87.28% (102/118) were diagnosed as Pulmonary TB. Of the total 102 Pulmonary TB cases, 50.98% (52/102) cases were sputum smear positive for AFB; 48.03 % (49/102) cases were sputum smear negative for AFB; and in two pulmonary cases sputum for AFB was not done.

Extra pulmonary TB accounted for 12.71% (15/118) of all the cases in Maricopa County.

Fig 8: TB Cases by Site of Disease, Maricopa County, 2011

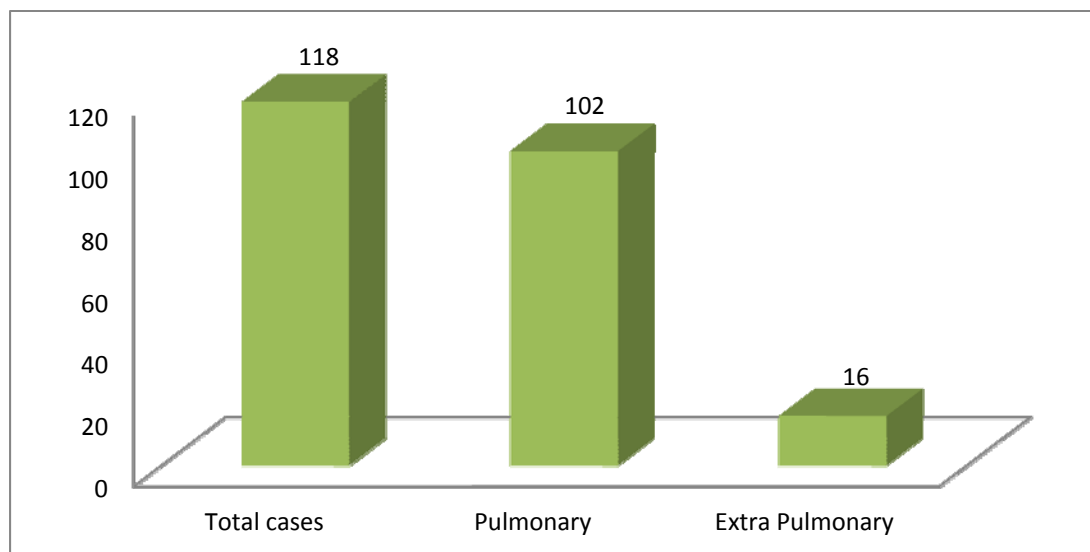
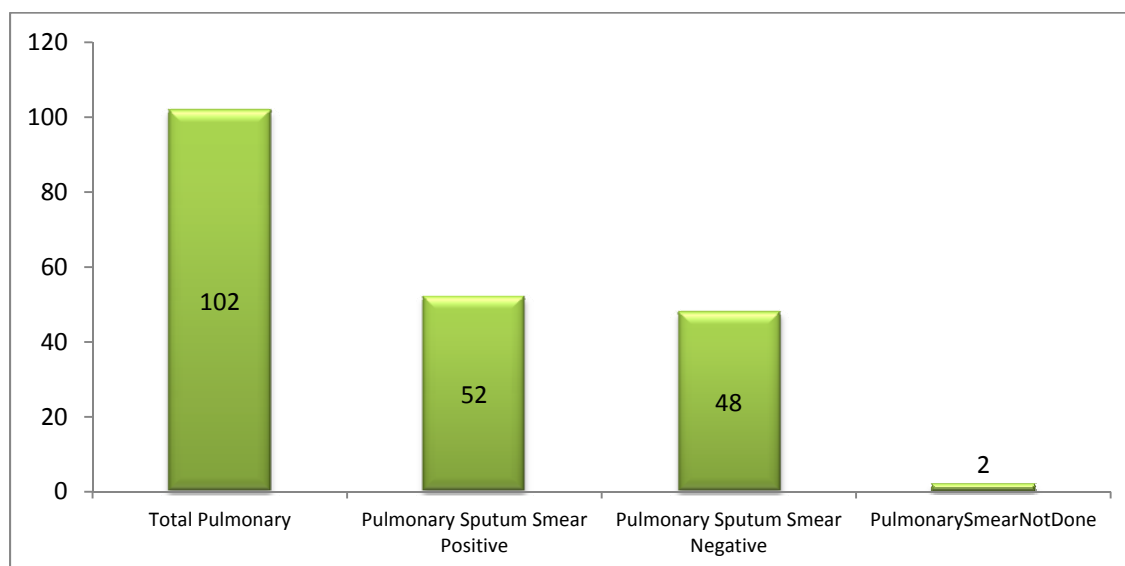
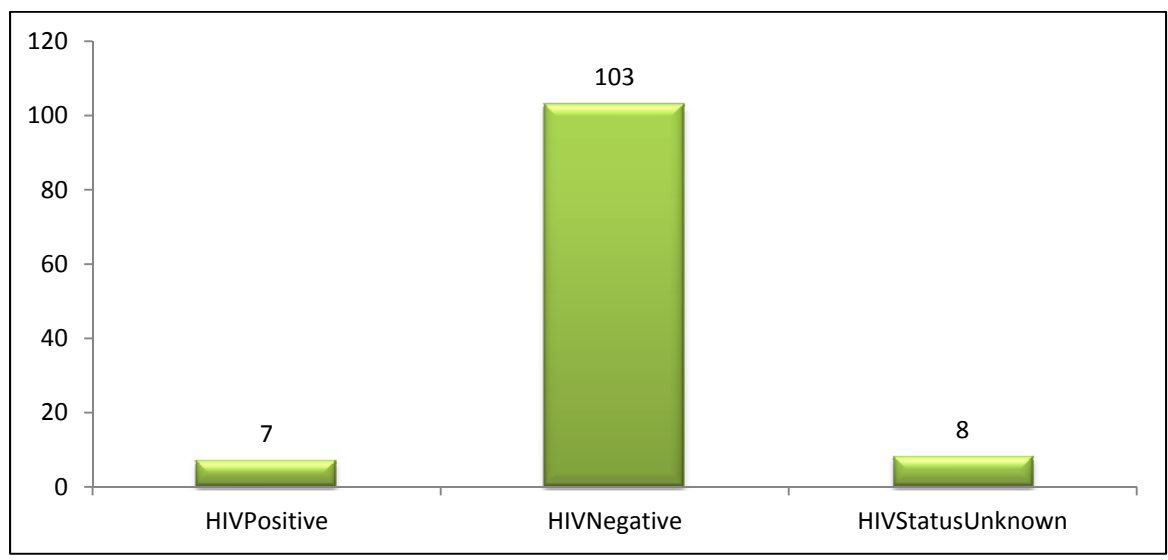


Fig 9: TB Cases by Sputum Smear Status, Maricopa County, 2011



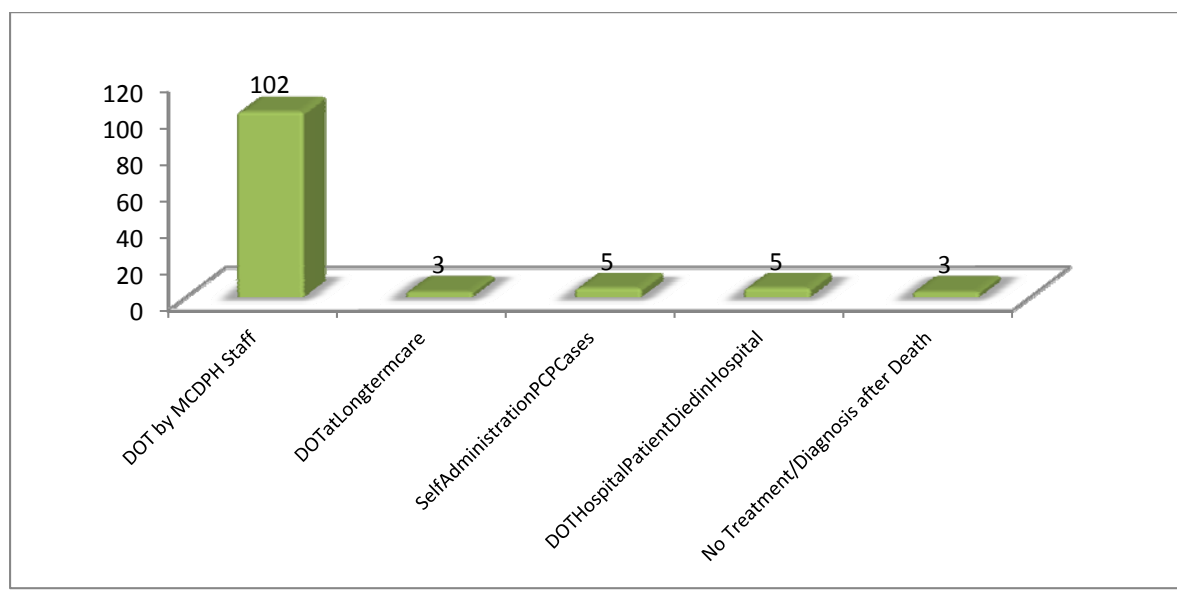
7) TB HIV Co-Infection:

Figure 10: Number of TB cases with HIV Status, Maricopa County, 2011



8) Directly Observed Therapy (DOT) :

Fig 11: Use of Directly Observed Therapy, Maricopa County, 2011



Program Evaluation:

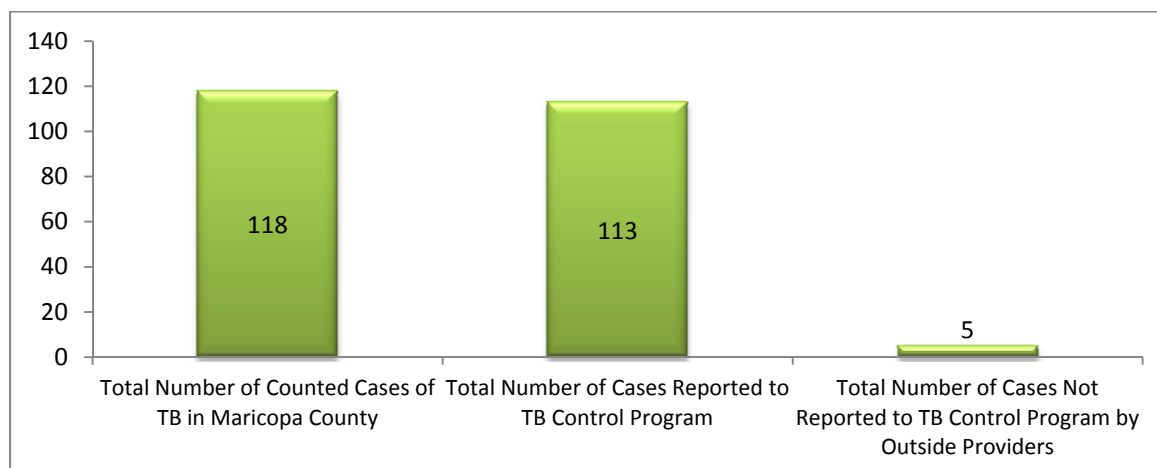
The goal of the Maricopa County TB Control Program is to better control TB by improving the general program operations to achieve the national TB Program Objectives 2015. The core components of the TB Control Program activities are:

- 1) Identify cases with clinically active tuberculosis;
- 2) Provide laboratory and diagnostic services to establish the diagnosis;
- 3) Initiate therapy within seven days of reporting to the MCDPH TB control program;
- 4) Manage persons infected with TB to ensure completion of treatment for the recommended duration;
- 5) Identify household, social, school, workplace and other congregate setting contacts for evaluation of infection. Initiation of window therapy for children under 5 and INH preventative therapy for infected individuals;
- 6) Collect and analyze data; and
- 7) Provide training and education to patients, medical providers, and the community.

Out of the 118 counted cases of TB in Maricopa County in 2011, 113 cases were reported to the TB Control Program. Five of the total 118 cases were diagnosed and treated by outside providers and were not reported to the TB Control Program.

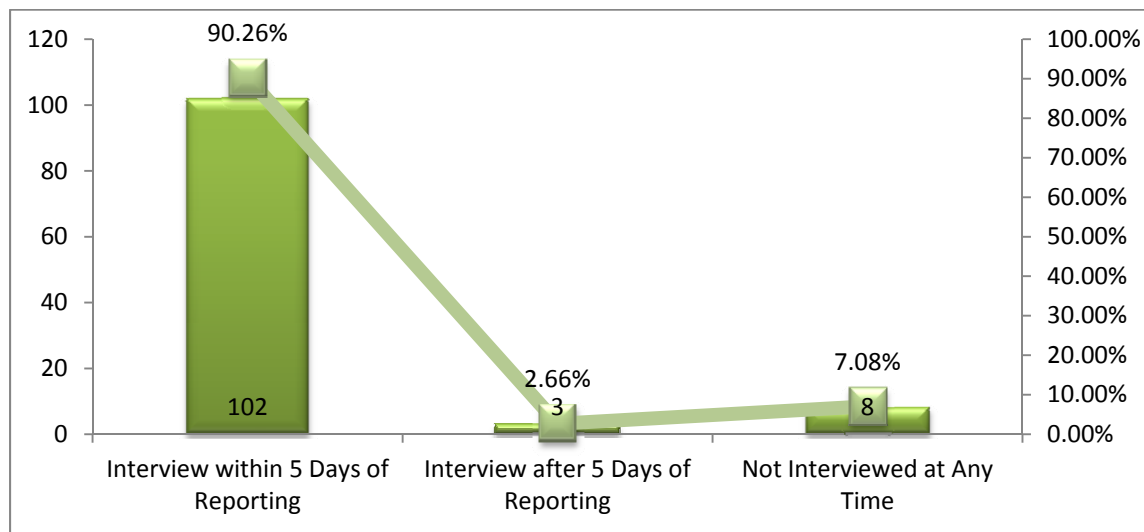
Within five days of receiving a report of a case or suspect through TB Intake, a detailed interview of the case or suspect is completed by a TB Epidemiologist. The purpose of the interview is to provide TB education to the index case/suspect and the family; to identify contacts that have been exposed to the case during the infectious period and initiate a prompt contact investigation; to evaluate the contacts and provide window treatment for children under 5 years of age; and to provide preventative LTBI treatment as recommended by CDC.

Figure 12: Total Number of Counted Cases and Total Number of Reported Cases, Maricopa County, 2011



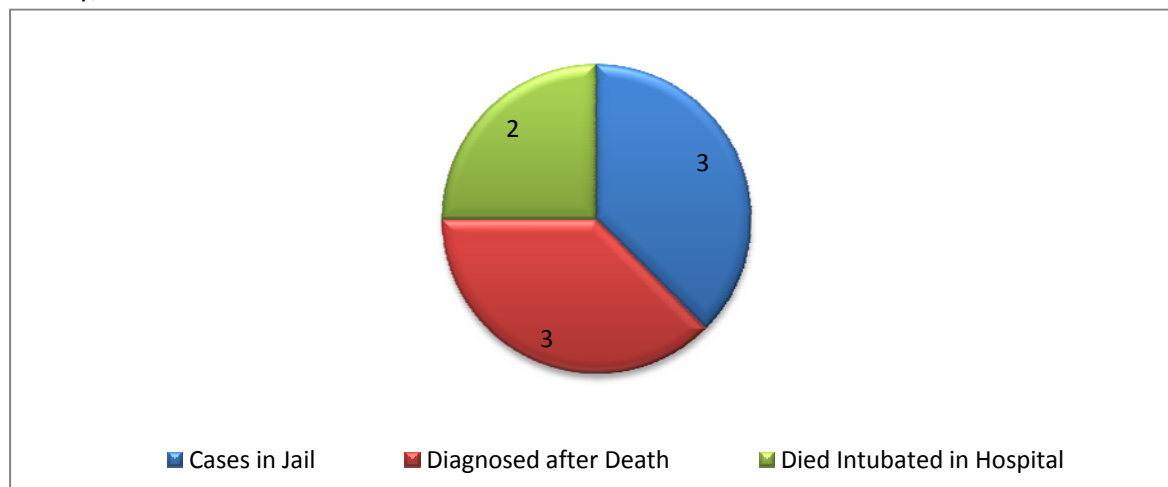
Among all cases reported to the TB Control Program, 90.26% (102/113) were interviewed within five business days of receiving the report (this includes 2 children for whom the parents were interviewed and a source case investigation was completed); 2.66% (3/113) interviewed after 5 business days of reporting and 8 out of the reported 113 cases (7.08%) were not interviewed at any time due to reasons described in Figure 14. As noted above five cases were not reported to MCDPH TB Control Program.

Figure 13: Index Case Interview Timeline from the Date of Reporting to the TB Intake, Maricopa County, 2012



Out of the 113 TB cases reported to the TB Control Program, the initial interview was not completed by a TB Epidemiologist in 8 index cases. The interview was not completed in these cases because three of the eight cases were in jail, three cases had a TB diagnosis established from culture reports obtained from laboratories after the death of the index case, two cases were on mechanical ventilation at the time of the reporting and died while still intubated, there was no opportunity to interview the cases.

Figure 14: Reasons for Not Interviewing Within Five Business Days of Reporting to MCDPH, Maricopa County, 2011



Treatment initiation within 7 days of reporting to the TB intake:

Figure 15: Treatment Initiation, Maricopa County, 2011

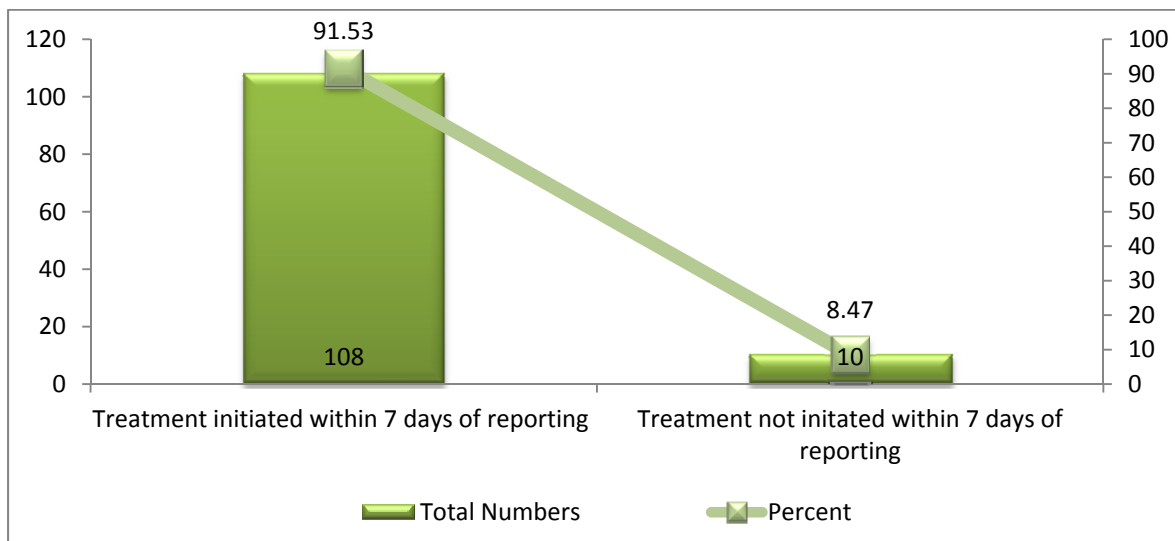
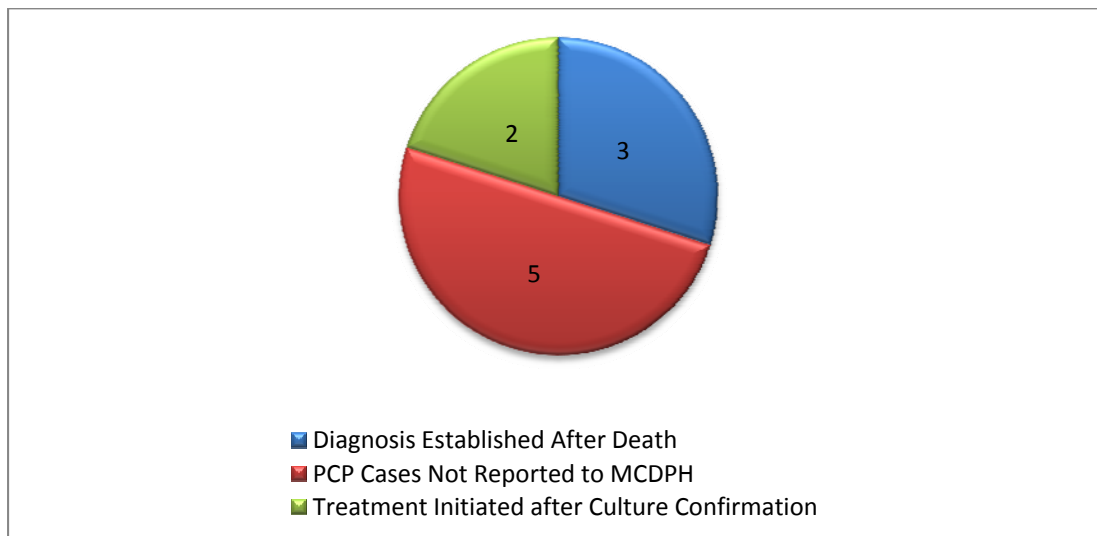


Figure 16: Reasons for Not Initiating Treatment within Seven Days, Maricopa County, 2011



Completion of Treatment for 2010:

The treatment for the 2011 TB cases is ongoing and will be reported in the 2012 Annual Report. For the year 2010, the completion of treatment, within the CDC recommended 12 month period, as described in the national objectives 2015, was 87.67% (128/146). A total of 94.52% (138/146) of the TB cases reported to Maricopa County 2010 have completed treatment at the time of this report. This includes the cases that were on a longer recommended treatment protocol.

Figure 17: Completion of Treatment, Maricopa County, 2010

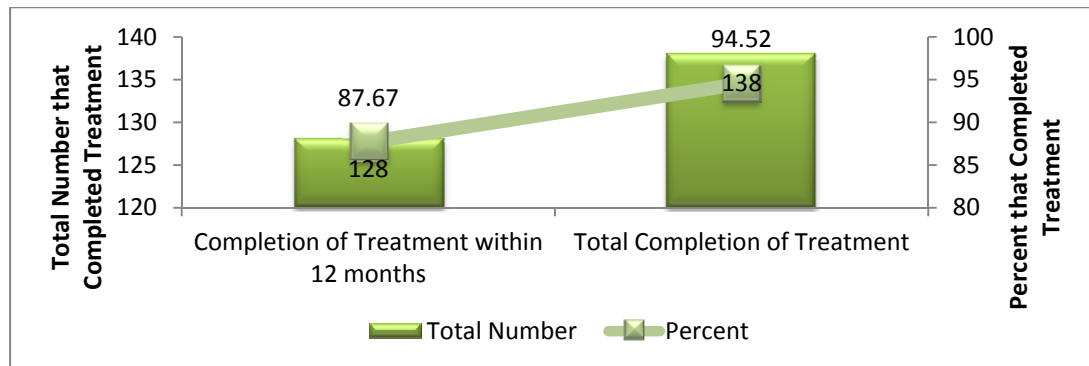
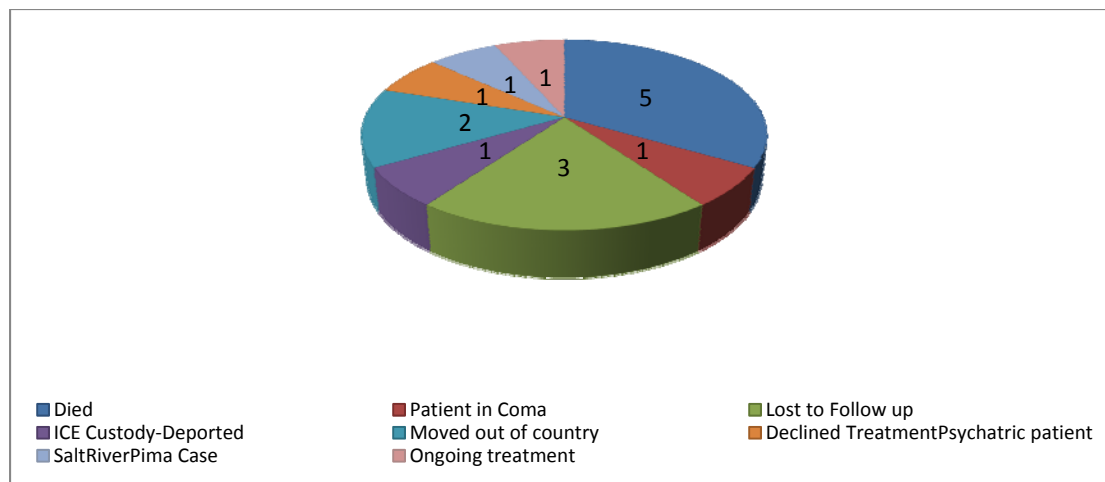


Figure 18: Reasons for Not Completing Treatment, Maricopa County, 2010



Contact Investigation Initiation:

Ninety eight percent (98.07%, 51/52) of the pulmonary sputum smear AFB positive cases had a contact investigation initiated within five days of reporting to MCDPH. A contact investigation was not initiated within five days of reporting on one case because three or more sputum specimen smears collected over a period of several days were consecutively negative for AFB.

Figure 19: Contact Investigation Initiation Timeline for Sputum Smear Positive Index Cases, Maricopa County, 2011

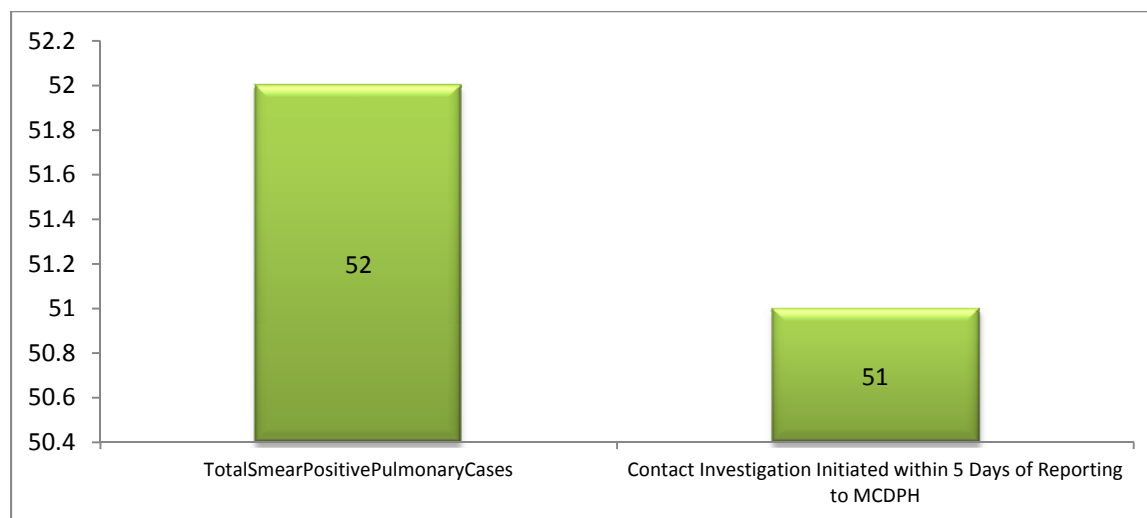


Table 1: Contact Index for Pulmonary TB Cases, Maricopa County, 2012

	Number of Contacts Elicited	Contact Index
For All Pulmonary TB Cases (N= 102)	1046	10.25
For Sputum AFB Smear Positive Pulmonary TB Cases(N = 52)	908	17.46
For All Sputum AFB Smear Negative TB Cases (N= 48)	138	2.87

Note: The above table reflects the total contacts identified for all pulmonary TB cases (sputum smear positive and sputum smear negative cases). The National Objectives include contacts for sputum AFB smear positive pulmonary cases only. However, the CDC also recommends initiation of contact

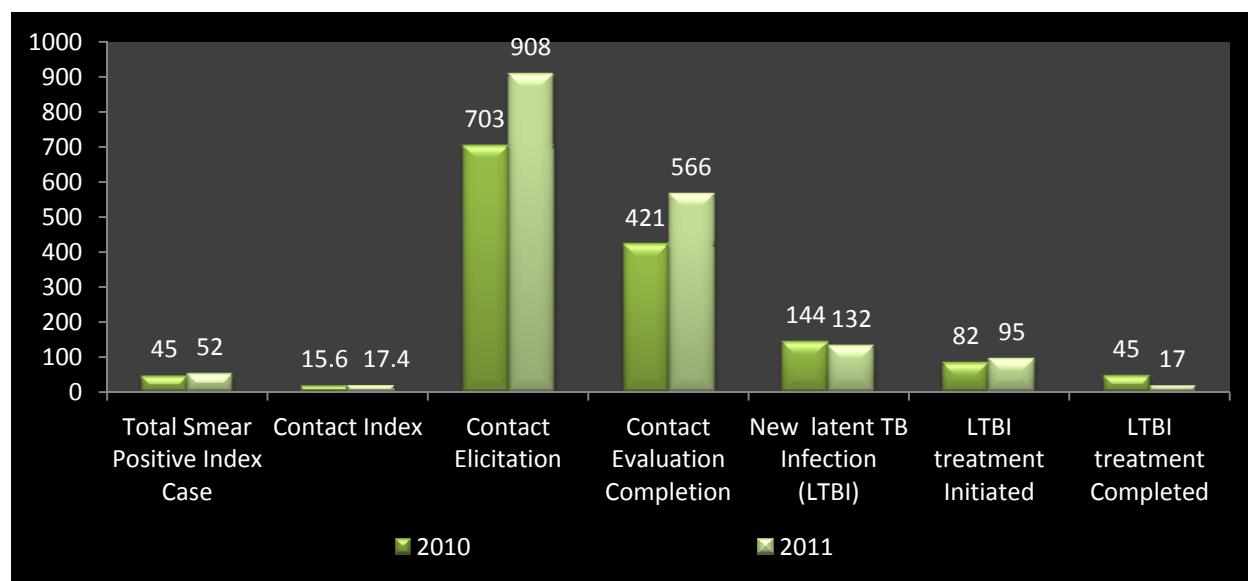
investigations on high risk populations (immune compromised individuals, children under 5 years of age and persons over the age of 65) exposed to a sputum AFB smear negative index case.

Contact Elicitation:

In 2011, a total of 1046 contacts were elicited, of which 908 were contacts to sputum smear positive pulmonary cases. Contact elicitation for sputum smear positive pulmonary cases was 94.23% (908/52) with a contact index of 17.46 per case. Sixty two percent (566/908) of the contacts elicited in sputum smear positive pulmonary cases completed a full evaluation, which included a two-step tuberculin skin test, a chest x-ray for positive reactors, and an evaluation by a medical provider. There were 132 new LTBI cases identified during contact investigations. LTBI treatment was initiated in 71% (95/132) of the new LTBI cases, of which 17.89% have completed treatment, 40% are currently undergoing treatment, and 42.10% have been lost to follow up.

For the year 2010, the contact index was 15.6 per case. Sixty percent (421/703) of the contacts elicited completed a full evaluation. Almost twenty one percent (20.5%, 144/703) were diagnosed as new LTBI cases. Treatment initiated in 57% (82/144) of the new LTBI cases, of which 54.9% (45/82) completed treatment.

Figure 20: Contact Investigation for Sputum Smear Positive Pulmonary TB Cases, Maricopa County, 2010 and 2011



Note: The treatment for new LTBI cases for 2011 is ongoing. The actual completion of treatment for 2011 will be included in the 2012 annual report.

Intake:

All active TB cases, TB suspects, LTBI cases, interjurisdictional cases and jail exposures are reported to the TB Intake Coordinator. The Intake Coordinator reviews reports for all pertinent medical information. A TB Case Manager is assigned to any active TB case and any TB suspect that has been started on the recommended four drug regimen. Reported TB suspects who have not been started on TB medication will have a TB workup in the clinic and will receive follow up by the clinic staff until a confirmed diagnosis is established by an Infectious Disease Specialist.

For 2011, a total of 971 encounters were entered in the intake database. The encounters include all reported active TB cases and TB suspects, positive TB skin tests or IGRA's, inter jurisdictional cases, inter jurisdictional contacts, airline exposures, and all reportable laboratory reports for follow up. Active TB cases, TB suspects, inter jurisdictional contacts and reported LTBI cases on treatment total 310 encounters. Positive TB skin test and IGRA test results, reportable lab results accounted for 661 encounters, all of which are followed up by the Intake Coordinator.

The table below summarizes the number of active TB cases and TB suspects assigned to a TB case manager, the number of TB suspects followed up by the clinic staff, the LTBI cases reported to intake who initiated treatment with MCDPH (does not include all reported LTBI cases), and the reported inter-jurisdictional contacts. There were a total of 146 cases assigned to Case Managers, with TB being ruled out in 28 of the cases, leaving a total of 118 counted TB cases in Maricopa County for 2011.

Table 2: Intake Summary, Maricopa County, January 2011- December 2011

Month	TB Cases and TB Suspects Assigned to a Case Manager	TB Suspects Followed Up by the Clinic Staff	Latent TB Infection Reported to the Intake for Treatment	Inter Jurisdictional Contacts
January	11	0	6	1
February	7	0	2	2
March	10	4	2	7
April	11	2	4	7
May	16	1	6	2
June	11	3	4	4
July	7	1	2	0
August	14	4	4	2
September	16	6	8	2
October	10	6	12	7
November	14	7	6	26
December	19	4	8	2
Total	146	38	64	62

Acknowledgements:

We acknowledge the staff of the Maricopa County Department of Public Health Clinical Services Division, for their dedication to providing high quality clinical services 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.