Tuberculosis Surveillance Report
Arizona, 2007

Arizona Department of Health Services
Bureau of Epidemiology and Disease Control
Office of Infectious Disease Services
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Arizona Department of Health Services

Executive Summary

This Tuberculosis Annual Surveillance Report provides data regarding tuberculosis (TB) in Arizona for 2007. While the local health departments provide direct patient care, the Arizona Department of Health Services (ADHS) TB Control Program provides surveillance, data analysis, health education, dissemination of guidelines, and consultation for the local health departments.

Arizona ranked 10th among all 50 states for TB morbidity in 2007. The ADHS Tuberculosis Control Program received 302 reported cases of TB, reflecting a 3% decrease in the number of cases from 2006. The 2007 Arizona case rate of 4.7 per 100,000 population exceeded the national case rate of 4.4 per 100,000 population. Four of Arizona's 15 counties account for 91% (276/302) of all cases, specifically the counties of Maricopa, Pima, Yuma, and Pinal.

Foreign-born status is an important risk factor associated with TB. Since 1993, there has been an increasing trend in the number of TB cases reported as foreign-born, both in Arizona and nationally. In Arizona, TB cases occurring in foreign-born patients accounted for 61% (185/302) of the reported cases in 2007. Nationally, 58% of the reported cases occurred in foreign-born individuals.

Arizona has ranked first in the nation for the percentage of cases diagnosed in a correctional facility for the past several years. In 2007, 19% (54/302) of all cases were reported by federal, state, local, and private correctional facilities. Routine screening and evaluation for TB of all inmates during the intake process allows for diagnosis of both latent and active TB in this population. Completion of treatment is difficult within this population since many of the inmates may be returned to the community or their home country before treatment completion is achieved.

Active TB in young children is indicative of ongoing transmission in the community, and more importantly, of missed opportunities for preventive therapy. In Arizona, children less than 6 years of age comprised 5,6% (16/302) of all cases.

Drug resistance was reported in 16% (35/222) cases. Resistance to Isoniazid was reported in 8% (18/218) of cases. Multi-drug resistance was reported in 1.4% (3/218) of cases, No cases of extensively-drug resistant TB were reported in Arizona in 2007. The percentages of drug-resistance were similar to nationally-reported data for cases in the U.S.

The Arizona TB Control Program strives to achieve the national goal of completion of therapy within 12 months for 90% of active TB cases. In 2005, the most recent year for which data were complete, 83% (204/246) completed treatment within 12 months. This represented a 12% increase in annual completion rates over 2004. Completion of treatment overall for all individuals was 87% (263/246).

I. Purpose of the Report

This Tuberculosis Annual Surveillance Report is designed to be a source of data for tuberculosis (TB) in Arizona for purposes of prevention and control of the disease through interventions, new or changes in policies, rules and statutes, allocation of funds and planning services. The target audience includes government agencies, health care organizations and providers and other interested parties.

II. TB Surveillance, Prevention, and Control in Arizona

The Arizona Department of Health Services (ADHS) TB Control Program is assigned the responsibility of monitoring, controlling and preventing infection, disease, and death associated with TB statewide through surveillance, data analyses, health education, dissemination of guidelines, consultation, and rule making. The ADHS TB Control Program assesses the burden of disease and latent TB infection (LTBI), including the characteristics, distribution and the risk factors associated with disease.

The local health departments in Arizona provide the direct patient care, including medical evaluation, treatment, and contact investigations. They also coordinate with private and other public providers (e.g., correctional health) who provide these services to patients with active TB disease or LTBI.

The Arizona State Public Health Laboratory provides testing services including acid-fast bacillus smear, culture, identification, and drug susceptibility testing for clinical mycobacterial samples statewide and serves as a reference laboratory for all isolates suspected to be positive for TB. The State Laboratory also performs drug susceptibility testing on all first time positive isolates.

Key statewide TB control activities include conducting disease surveillance using state and national databases; conducting case management and directly observed therapy to ensure completion of therapy; monitoring drug resistance patterns; and conducting contact investigations and follow-up of persons exposed to active TB cases to ensure absence of LTBI or medical evaluation and completion of preventive therapy if positive for LTBI.

III. Demographics

A. Incidence of TB

The ADHS TB Control Program received reports of 302 TB cases in 2007, as compared to 314 TB cases in 2006, reflecting a 3.8% decrease in number of cases. Arizona TB case trends have been relatively stable, with a mean of 280 cases and a range between 254 and 314 cases in the past ten years (Table 1 and Figure 1).

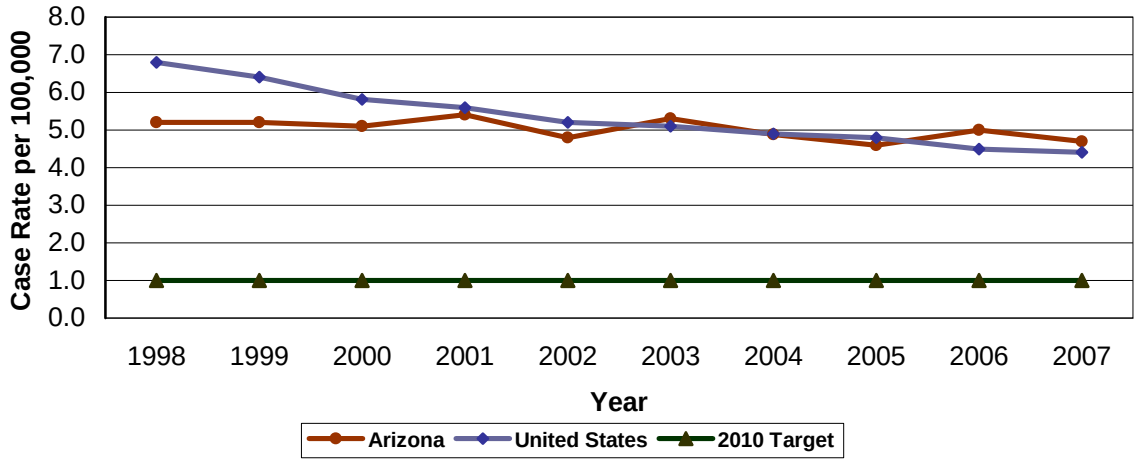
In 2007, the Arizona case rate of 4.7 per 100,000 population exceeded the U.S. case rate of 4.4 per 100,000. In 2007, Arizona ranked 12th among all states for TB morbidity. The national trend of the declining annual case rate has slowed, from an annual average decline of 6.6% for 1993 through 2002 to an annual average decline of 3.3% for 2003 through 2007. In Arizona, the case rate has fluctuated only slightly for the past 10 years between 4.6 and 5.4 cases per 100,000 population. .

Table 1. Tuberculosis Cases and Case Rates per 100,000 Population, Arizona and United States, 1998-2007

	Arizona			United States[a]	
	Cases	Population[b,c]	Rate	Cases	Rate
1998	254	4,883,342	5.2	18,361	6.8
1999	262	5,023,823	5.2	17,531	6.4
2000	261	5,130,632	5.1	16,377	5.8
2001	289	5,306,966	5.4	15,989	5.6
2002	263	5,456,453	4.8	15,078	5.2
2003	295	5,580,811	5.3	14,871	5.1
2004	272	5,580,811	4.9	14,511	4.9
2005	281	6,044,985	4.6	14,093	4.8
2006	314	6,239,482	5.0	13,767	4.6
2007	302	6,432,007	4.7	13,293	4.4

[a]Data from U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, available at: http://www.cdc.gov/tb/surv/
[b]Population denominators for 1998-2003 are estimates from the National Center for Health Statistics (http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm), with the exception of year 2000, which was taken from the 2000 U.S. Census
[c]Population denominators for 2004 - 2007 are estimates provided by the Arizona Department of Economic Security

Figure 1. Tuberculosis Case Rates per 100,000 population, Arizona and United States, 1998 - 2007



B. County of Residence and County Case Rates

Table 2 and Figure 2 present the number of TB cases and case rates by county in 2007.

Four of Arizona's 15 counties accounted for 91% (276/302) of the state's TB cases. These counties were Maricopa, Pima, Pinal, and Yuma, which accounted for 83% of the state's population.

Maricopa County represented 60% of the state's population and accounted for 56% (171/302) of the cases statewide. The case rate for Maricopa County was 4.4 per 100,000 population, which was slightly lower than the statewide case rate of 4.7 per 100,000 population.

Pima County is Arizona's second largest urban area. The county represented 16% of the state's population and accounted for 14% (41/302) of the cases statewide. The case rate for Pima County was 4.1 per 100,000 population which was slightly lower than the statewide case rate of 4.7 per 100,000 population.

Pinal County reported 13% (39/302) of statewide cases. Ninety-two percent (36/39) were diagnosed in correctional facilities located within Pinal County. Arizona's two largest state prison facilities, four private prisons, Immigration and Customs Enforcement Service Processing Center (ICE-SPC), and a county jail are located in Pinal County. The case rate for Pinal County was 13.3 cases per 100,000. While this case rate is higher than the statewide case rate, the rate was inflated by the small population denominator for Pinal County.

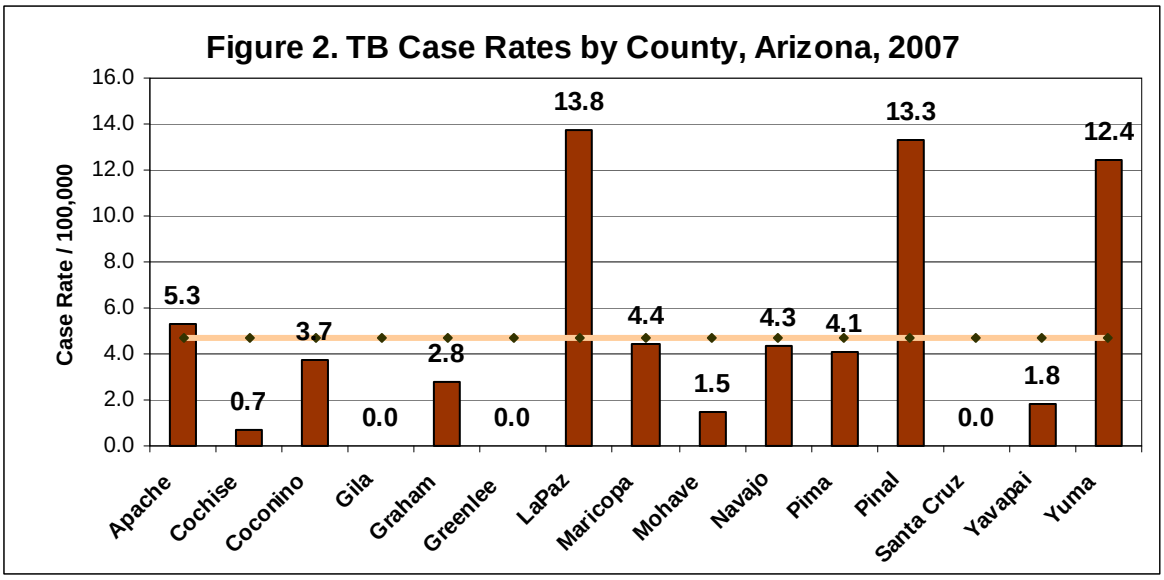
Yuma County accounted for 8% (25/302) of the cases statewide, but represented only 3% of the state population. The case rate for Yuma County was 12.4 per 100,000.

The remaining eight Arizona counties accounted for the remaining 9% (28/302) of the total cases. Gila, Greenlee and Santa Cruz counties did not have any cases in 2007.

Table 2. TB Cases and Incidence Rate by County, Arizona, 2007

County	Number of Cases	Case Rate per 100,000 Population[a]
Apache	4	5.3
Cochise	1	1.5
Coconino	5	3.7
Gila	0	0
Graham	1	2.8
Greenlee	0	0
La Paz	3	13.8
Maricopa	171	4.4
Mohave	3	2.0
Navajo	5	4.3
Pima	41	4.0
Pinal	39	13.3
Santa cruz	0	0
Yavapai	4	1.8
Yuma	25	12.4
Arizona	302	4.7

[a] Population denominators are estimates provided by the Arizona Department of Economic Security



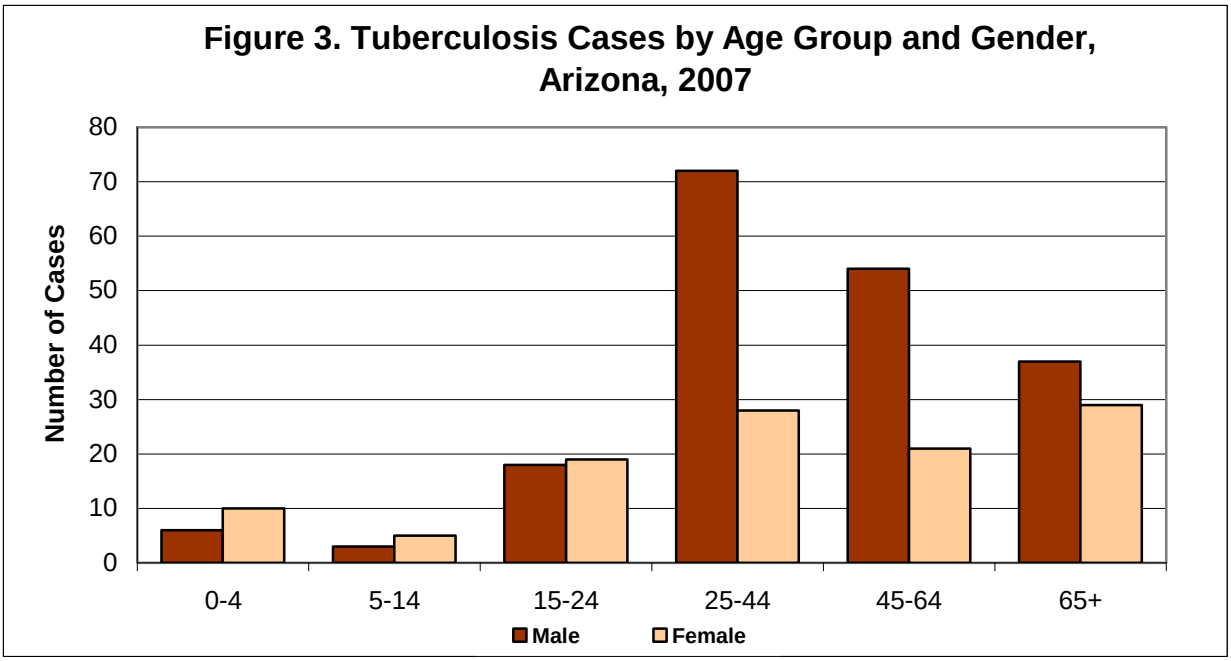
C. Gender/Age/Race/Ethnicity

Figure 3 presents the TB cases by age group and gender. Table 2 presents a breakdown of the cases by gender, age group, race and ethnicity.

Statewide, males accounted for 63% (191/302) of the cases and females accounted for 37% (113/302. The case rate for males was 5.9 per 100,000 population and the case rate for females was 3.5 per 100,000 population.

In terms of age, the highest case rate occurred among those over 65 years of age at 7.9 per 100,000 population, followed by the 25-44 year old age group at 5.6 per 100,000 population. The mean age for all TB cases was 44 years of age and the median age was 43 years. For males, the mean age was 45 years and the median age was 43 years. For females, the mean age was 42 years and the median age was 40 years.

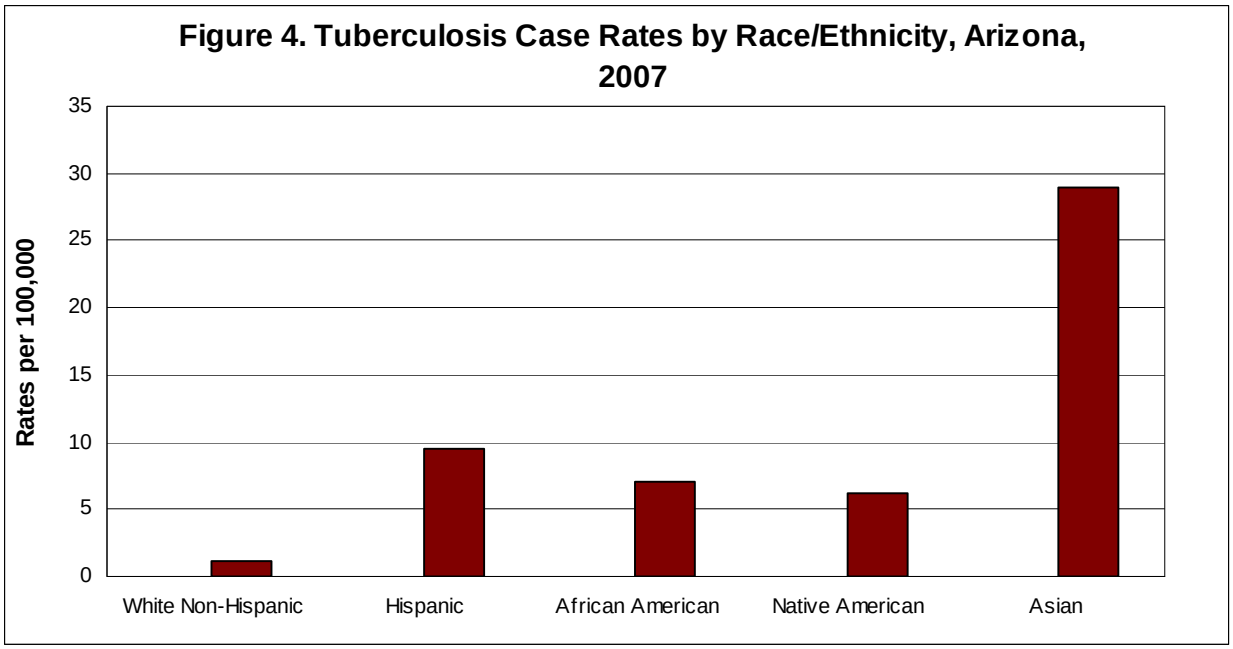
Figure 3. Tuberculosis Cases by Age Group and Gender, Arizona, 2007



Hispanic ethnicity of any race accounted for 57% (172/302) of the reported cases. Asian was reported in 16% (49/302) of the cases, followed by non-Hispanic White in 14% (42/302), Native American 7.2% (22/302), and Black 5.9% (18/302). Only one case was reported as multiple-race and there were no cases reported among Native Hawaiians or Pacific Islanders. The highest TB case rate occurred among Asians with 28.9 cases per 100,000 population. The TB case rates by race and ethnicity are presented in Figure 4.

Table 3. Tuberculosis Cases by Ethnicity, Gender and Age Group, Arizona, 2007									
	Age Group						Total by Ethnicity		
	< 5	5-14	15-24	25-44	45-64	65+	No.	%	Rate[a,b]
American Indian									
Male	0	0	0	5	3	3	11		
Female	1	1	1	1	4	3	11		
Total	1	1	1	6	7	6	22	7.3	6.5
Asian									
Male	0	0	0	11	6	5	22		
Female	0	0	3	14	5	5	27		
Total	0	0	3	25	11	10	49	16.2	28.9
Black, Not Hispanic									
Male	1	0	1	6	3	2	13		
Female	0	1	3	1	0	0	5		
Total	1	1	4	7	3	2	18	6.0	7.1
Hispanic or Latino									
Male	5	3	17	46	30	15	117		
Female	7	2	11	9	9	17	55		
Total	12	5	28	55	39	32	171	56.6	9.6
Native Hawaiian[c]									
Male	0	0	0	0	0	0	0		
Female	0	0	0	0	0	0	0		
Total	0	0	0	0	0	0	0	0.0	0
White, Not Hispanic									
Male	0	0	0	4	12	12	28		
Female	2	1	1	3	2	4	13		
Total	2	1	1	7	14	16	41	13.6	1.1
More than one race									
Male	0	0	0	0	0	0	0		
Female	0	0	0	0	1	0	1		
Total	0	0	0	0	1	0	1	0.3	0.0
Total by Gender									
Male	6	3	18	72	54	37	190	62.9	5.9
Female	10	5	19	28	21	29	112	37.1	3.5
Total by Age Group									
No.	16	8	37	100	75	66	302		
%	5.3	2.6	12.3	33.1	24.8	21.9			
Rate[a,b]	3.2	0.9	4.2	5.5	5.1	7.9			4.7

[a]Rate per 100,000 population
[b]Population denominators for 2007 are estimates provided by the Arizona Department of Economic Security
[c]Includes Pacific Islanders



D. TB in Children Less than 6 Years of Age

Active TB in young children is indicative of ongoing transmission in the community and more importantly, of missed opportunities for preventive therapy. Children less than 6 years of age accounted for 5.6% (16/302) of all cases in 2007.

The case rate for children less than 6 years of age (16/302) was 3.4 per 100,000 population and was lower than the overall statewide case rate of 4.7 per 100,000 population. The 2007 case rate represented a 34% decrease from 2006 case rate among children in this age group.

Of the 16 cases less than 6 years of age, 13 were born in the United States and 3 were foreign-born. Mexico was the country of origin for 2 of the 3 foreign-born cases less than 6 years of age. Over two-thirds of the cases less than 6 years of age were Hispanic. Improving TB control in adults would help control TB in this age group.

E. Site of Infection/Vital Status at Diagnosis

Table 3 presents the TB cases by site of disease and the vital status of the case at diagnosis. Pulmonary TB with no additional site of disease accounted for 76% (230/302) of all cases in 2007. Extrapulmonary disease accounted for 18% (55/302). Both pulmonary and extrapulmonary disease accounted for 5% (16/302). Cases diagnosed after death accounted for 5% (14/302).

Table 4. Tuberculosis Cases by Form of Disease and Vital Status at Diagnosis, Arizona, 2007						
	Alive at Diagnosis		Diagnosis After Death		Total Cases	
	No.	%	No.	%	No.	%
Pulmonary[a]	218	75.7	12	85.8	230	76
Extrapulmonary[b]	55	19.1	1	7.1	55	18
Persons with Both Pulmonary and Extrapulmonary Disease[c]	15	5.2	1	7.1	16	5
Total	288		14		302	

[a]Includes cases with pulmonary listed as major site of disease and no additional site of disease
[b]Includes cases with pleural, lymphatic, bone and/or joint, meningeal, peritoneal, or other site, excluding pulmonary, listed as the major site of disease
[c]Includes miliary cases

III. Risk Factors

Table 5 presents the risk factors associated with the 2007 Arizona cases.

A. Occupation

High-risk occupations for TB transmission include correctional facility workers, health care workers and migrant farm workers. Both health care workers and migrant farm workers each comprised 3.3% (10/302) of the total cases in 2007. There were no correctional facility workers with TB reported in 2007.

B. Reported Behaviors

Substance abuse (including alcohol abuse and/or illicit drug use) was reported in approximately 16% (47/302) of TB cases having a history of substance abuse during the 12 months prior to their TB diagnosis. Excess alcohol use accounted for 11% (34/302) of the cases. Non-injecting drug use accounted for 7% (22/302) and 3% (10/302) of the cases reported injection drug use. The variables for substance abuse were underreported in Arizona. Approximately 13% of the 302 TB cases have missing data for these variables.

Table 5. Tuberculosis Cases by Selected Risk Factors, Arizona, 2003 - 2007

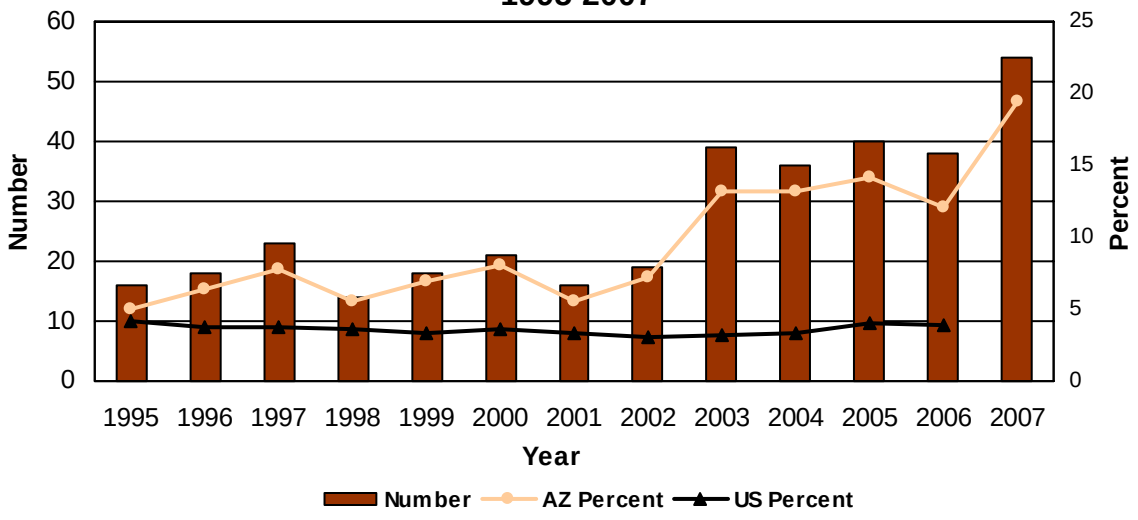
	2003		2004		2005		2006		2007	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Correctional Facility Worker	0	0.0	0	0.0	0	0.0	2	0.6	0.0	0.0
Health Care Worker	3	1.0	6	2.0	1	0.4	9	2.9	10	3.6
Migrant Farm Worker	4	1.3	10	3.3	5	1.8	11	3.5	10	3.6
Reported Behaviors										
Injecting Drug Use[a]	5	1.6	7	2.3	11	3.9	7	2.2	10	3.3
Non-injecting Drug Use[a]	24	7.7	31	10.3	20	7.1	17	5.4	22	7.3
Excess Alcohol Use[a]	27	18.2	48	15.9	29	10.3	39	12.5	35	11.6
Type of Residence										
Long Term Care Facility[b]	5	1.6	10	3.3	7	2.5	11	3.5	9	3.0
Correctional Facility > 15 years[c]	39	12.5	36	11.9	40	16.4	38	14	54	19.4
Homeless[d]	36	11.5	21	7.0	23	8.2	29	9.3	26	8.6
Country of Birth										
Foreign-born	172	55	156	51.7	170	60.5	181	57.8	185	61.3
Underlying Disease										
HIV infection, all ages[e]	17	5.4	23	7.6	20	7.1	15	4.8	17	5.6
HIV Infection, 25-44 years old	13	4.4	19	7.0	12	4.3	9	8.5	11	11.0
Total Cases Per Year	295		272		281		313		302	

[a]Within one year prior to diagnosis of tuberculosis.
[b]Residence at time of diagnosis.
[c]After 2005, the percentage of cases diagnosed in correctional facilities is based on the TB cases >15 years of age.
[d]Includes persons born outside the United States and its territories.
[e]Tuberculosis cases with a reported positive HIV test result. The percent positive represents HIV co-infection among all verified tuberculosis cases, including those not tested for HIV infection.

C. Correctional Facilities

Figure 5 presents the percentage of cases diagnosed in correctional facilities and Table 6 presents a breakdown of correctional cases.

Figure 5. Number and Percent of Tuberculosis Cases Diagnosed in Correctional Facilities, Arizona and United States, 1995-2007



In 2007 and in previous years, Arizona ranked first in the nation for the percentage of TB cases >15 years of age diagnosed in correctional facilities. Preventing TB transmission in congregate settings such as correctional and detention facilities is a significant challenge. Individuals from diverse backgrounds and communities are housed in close proximity for varying lengths of time. Routine evaluation for TB of all inmates during the intake process allows for diagnosis of both latent and active TB in this population.

Correctional facilities accounted for 19% (54/302) of the reported cases. These cases were diagnosed in federal facilities (23/54); private facilities (15/54); local jails (14/54); and state correctional facilities (2/54).

Pinal County reported 67% (36/54 cases) of the correctional cases. There are several correctional facilities located in this county.

Ethnicity was reported as Hispanic in 81% (44/54) of the correctional cases. Foreign-born inmates accounted for 78% (42/54) cases. Mexico was reported as the country of origin in 71% (30/42 cases) of the foreign-born correctional cases. Other countries reported were Guatemala, Honduras and El Salvador.

Table 6. Correctional Facility Cases, >=15 years, Arizona, 2003 - 2007										
	2003		2004		2005		2006		2007	
	No.	%	No.	%	No.	%	No.	%	No.	%
Number of Cases (% is of total cases statewide)	39	12	36	12	40	16	38	14	54	19
Correctional Facility Type										
Federal	14	36	13	36	12	30	16	42	23	43
State	1	3	0	0	5	13	2	5	2	4
Local Jail	12	31	13	36	10	25	10	26	14	26
Private Facility	11	28	10	28	13	33	10	26	15	28
Juvenile	1	3	0	0	0	0	0	0	0	0
Race/Ethnicity										
Hispanic	31	79	29	81	36	90	36	95	44	81
White (non-Hispanic)	4	10	1	3	3	8	1	3	5	9
African-American	0	0	3	8	1	3	0	0	2	4
Asian	3	8	0	0	0	0	1	3	1	2
Native American	1	3	3	8	0	0	0	0	2	4
Age Group										
15-24 years	11	28	6	17	6	15	6	16	9	17
25-44 years	20	51	26	72	27	68	24	63	30	56
45-64 years	8	21	4	11	6	15	8	21	14	26
65+ years	0	0	0	0	1	3	0	0	1	2
Reported Behaviors (Use within past 12 months)										
Injecting Drug Use	2	5	3	8	5	13	4	11	6	11
Non-injecting Drug Use	11	28	11	31	10	25	6	16	10	19
Excess Alcohol Use	12	31	8	22	4	10	7	18	13	24
Underlying Disease										
HIV infection, all ages	1	3	5	14	2	5	1	3	2	4
HIV infection, 25-44 years old	1	5	5	19	1	4	0	0	1	3
Country of Birth										
Foreign-born	31	79	28	78	33	83	34	89	42	78

D. Homelessness

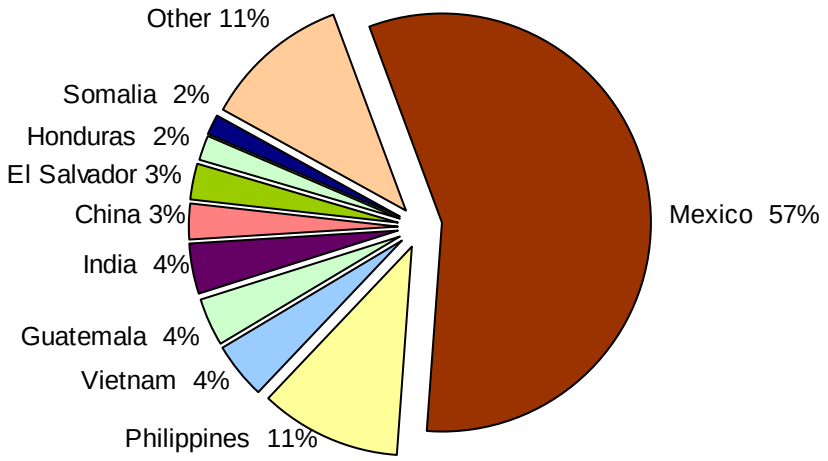
Homelessness was another important risk factor with 9% (26/302)) of cases in 2007 reported as being homeless within the year prior to diagnosis with TB. Maricopa County reported 58% (15/26) of the homeless cases.

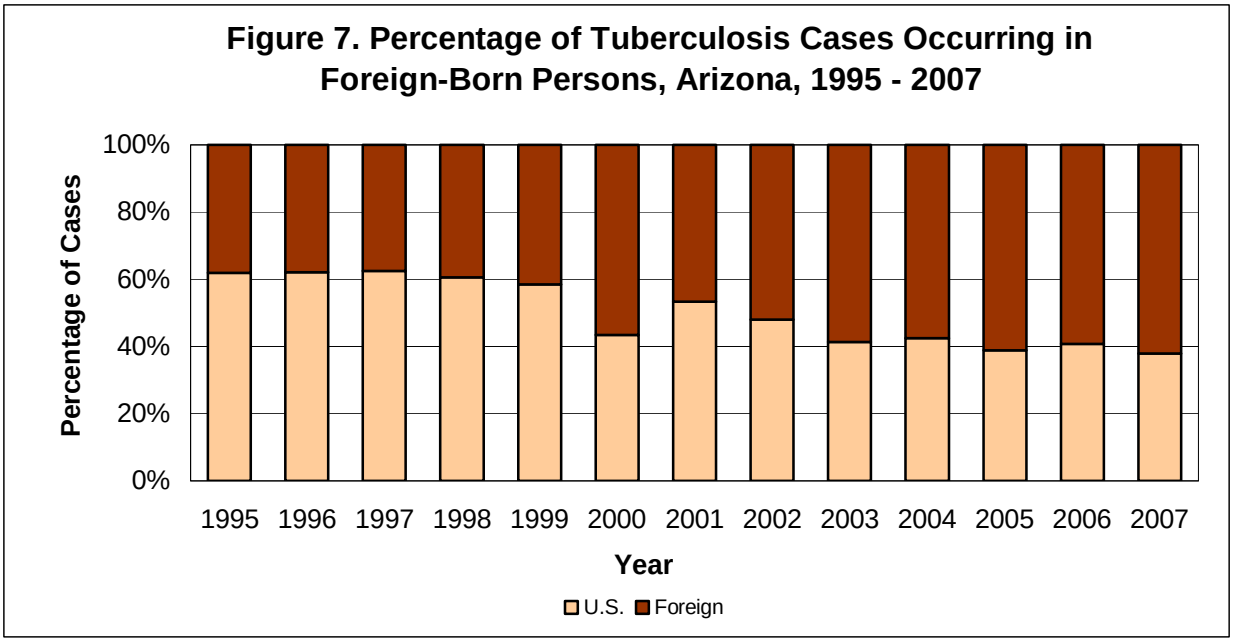
E. Country of Birth

Figure 6 presents the country of birth for foreign-born cases. Figure 7 presents the increasing trend in the percentage of foreign-born cases in relation to the overall number of cases in Arizona.

Arizona cases reported as foreign-born accounted for 61% (185/302) of the statewide cases. Of all risk factors, being foreign-born was most strongly associated with having TB disease. Mexico was identified as the country of birth in 57% (105/185)) of the cases. Of the cases from Mexico, 14% (15/105) reported being in the U.S. less than 1 year and 20% (21/105) reported U.S. residence for both 1 to 4 years and 20 years or more. Southeast Asia was reported as a region of origin for 26% (49/185) of foreign-born cases. Nationally, a similar trend in foreign-born risk factor was seen. In 2007, 58% of all cases in the U.S. were reported as foreign born.

Figure 6. Country of Origin for Foreign-Born Tuberculosis Cases, Arizona, 2007





F. TB and HIV Co-infection

Table 7 presents the proportion of Arizona TB cases with known HIV test results and the HIV co-infection by the age groups of >14 years old and those 25-44 years old. Co-infection with HIV in individuals with TB is a major concern because immunosuppression by HIV can impact the body's ability to fight TB. Individuals with co-infection have higher mortality and are susceptible to increased drug resistance leading to longer and more complex treatment regimens.

HIV testing results were available for 79% (221/278) of the TB cases 14 years of age and older. Positive HIV results were documented in 6% (17/278) of the cases. TB cases between the ages of 25 and 44 accounted for 65% (11/17) of those with positive HIV results.

Table 7. Proportion of Reported Tuberculosis Cases with HIV Results and HIV Co-infection by Age Group, United States and Arizona, 1995-2007

	25-44 Years Old				14 Years and Older			
	HIV Test Results Known[a]		HIV Positive[b]		HIV Test Results Known[a]		HIV Positive[b]	
	U.S.	AZ	U.S.	AZ	U.S.	AZ	U.S.	AZ
1995	52	53	26	19	36	33	13	8
1996	57	65	25	13	41	44	12	6
1997	60	69	21	10	44	45	11	5
1998	61	77	20	16	45	47	10	6
1999	63	84	19	10	48	60	10	6
2000	63	74	17	14	50	63	9	7
2001	63	82	16	9	50	66	9	5
2002	65	85	16	14	53	61	9	7
2003	67	93	16	15	55	71	9	7
2004	67	89	14	18	56	79	8	9
2005	65	85	*	13		83	*	8
2006	*	85	*	9	*	76	*	6
2007	*	86	*	11	*	79	*	6

[a]Includes cases with positive, negative and indeterminate HIV test results. Rhode Island reported HIV test results 1998-2001; California reporting of HIV status is incomplete and only includes persons also reported with AIDS
[b]Based on reported HIV positive status among all reported tuberculosis cases, including those not tested

IV. Directly Observed Therapy

Directly observed therapy (DOT) is the standard of care for administering TB medications. In DOT, health care workers observe the patient take his/her medications to ensure compliance with the treatment regimen.

Table 8 presents the number and percentage of cases receiving DOT. Due to the length of time to complete treatment for TB, 2005 data were the most recently finalized data available.

Table 8. Directly Observed Therapy (DOT), Arizona, 2003 - 2007										
	2003		2004		2005		2006*		2007*	
	No.	%	No.	%	No.	%	No.	%	No.	%
DOT	210	74	196	75	195	72	213	71	120	44
Both DOT & Self-Administered	24	9	31	12	36	13	38	13	29	11
Self-Administered Only	31	11	18	7	28	10	12	4	3	1
Unknown	1	0	4	2	1	0	1	0	4	2
Not Available	18	6	13	5	10	4	36	12	118	43
Total	284		262		270		300		274	

*Provisional data.

V. Completion of Treatment

Figure 9 presents the percentage of cases that completed treatment within 12 months and the overall completion of treatment. Figures 10 and 11 present the completion of treatment for cases diagnosed in a correctional facility and homeless cases.

The TB Control Program strives to achieve the national goal of completion of therapy within 12 months for 90% of active TB cases. In 2005, 83% (204/246) of all cases completed treatment within 12 months, reflecting a 12% increase over 2004 completion of therapy rates. Overall, 87% (218/250) of the cases completed therapy in 2005, regardless of time frame. In 2004, 86% of the cases completed therapy overall. The data for 2006 and 2007 is provisional.

The percentage of completion of treatment for non-correctional facility cases was 88% (184/209). Only 54% (20/37) of correctional facility cases completed treatment within 12 months. Many of the correctional cases were lost to follow-up after being released.

The completion of treatment within 12 months among homeless cases was 82% (14/17) and overall completion was 88% (15/17). Only 2 homeless cases were lost to follow-up in 2005.

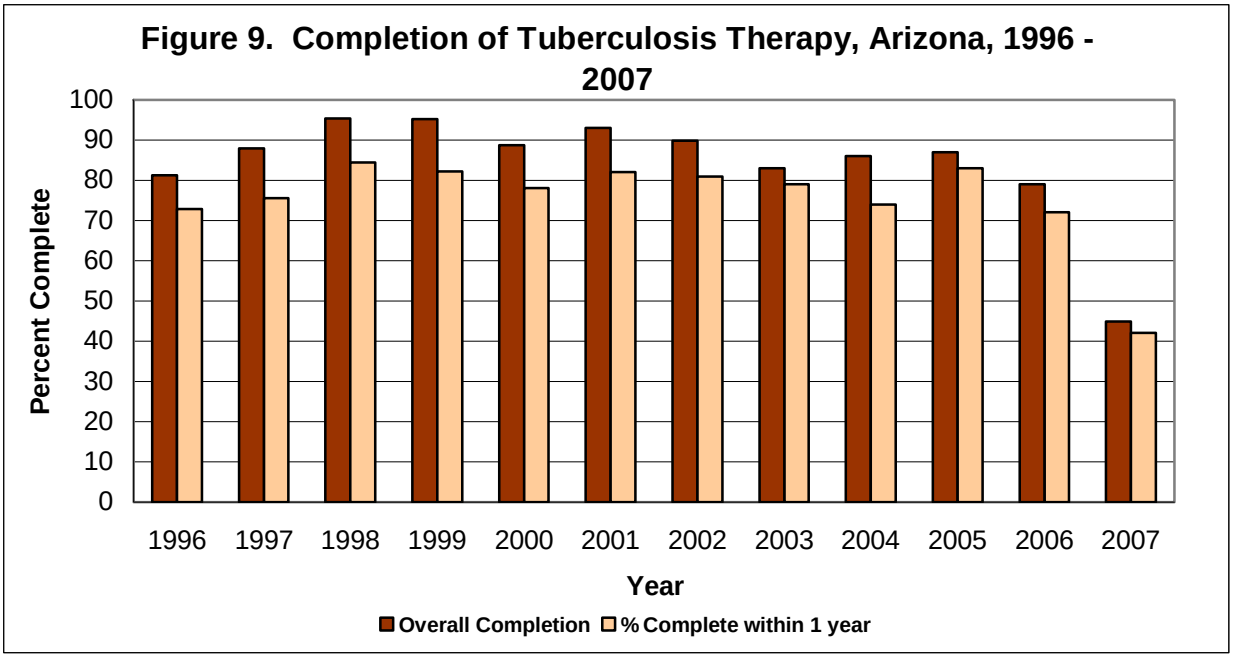


Figure 9. Completion of Tuberculosis Therapy, Arizona, 1996 - 2007
Percent Complete
100
90
80
70
60
50
40
30
20
10
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Year
Overall Completion
% Complete within 1 year

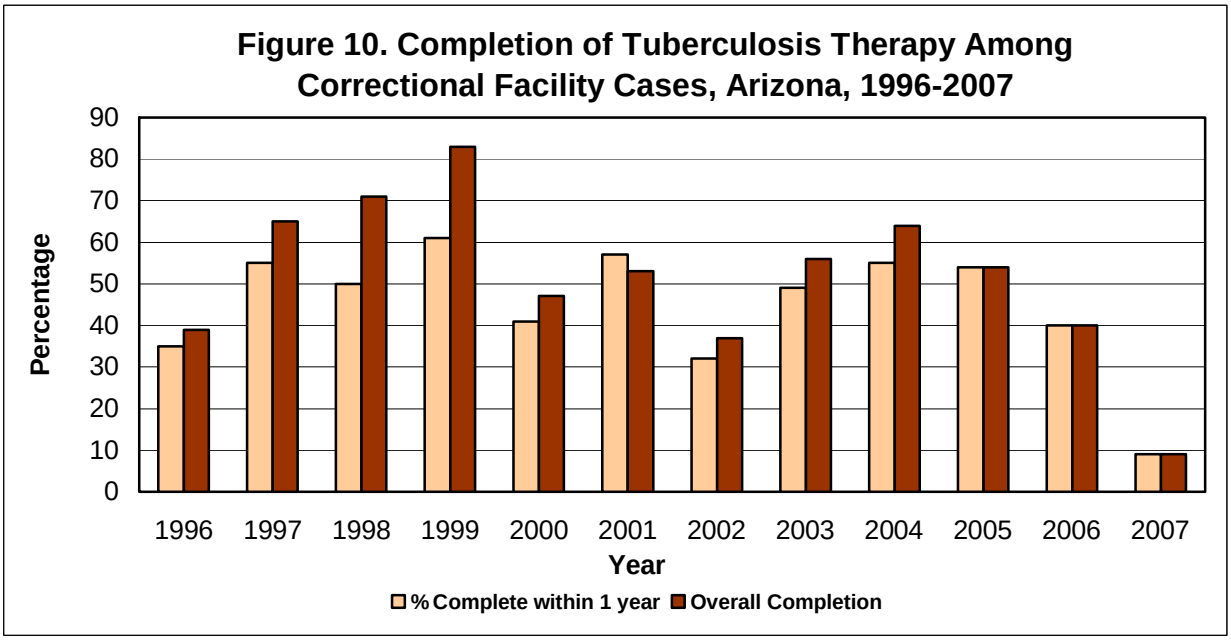
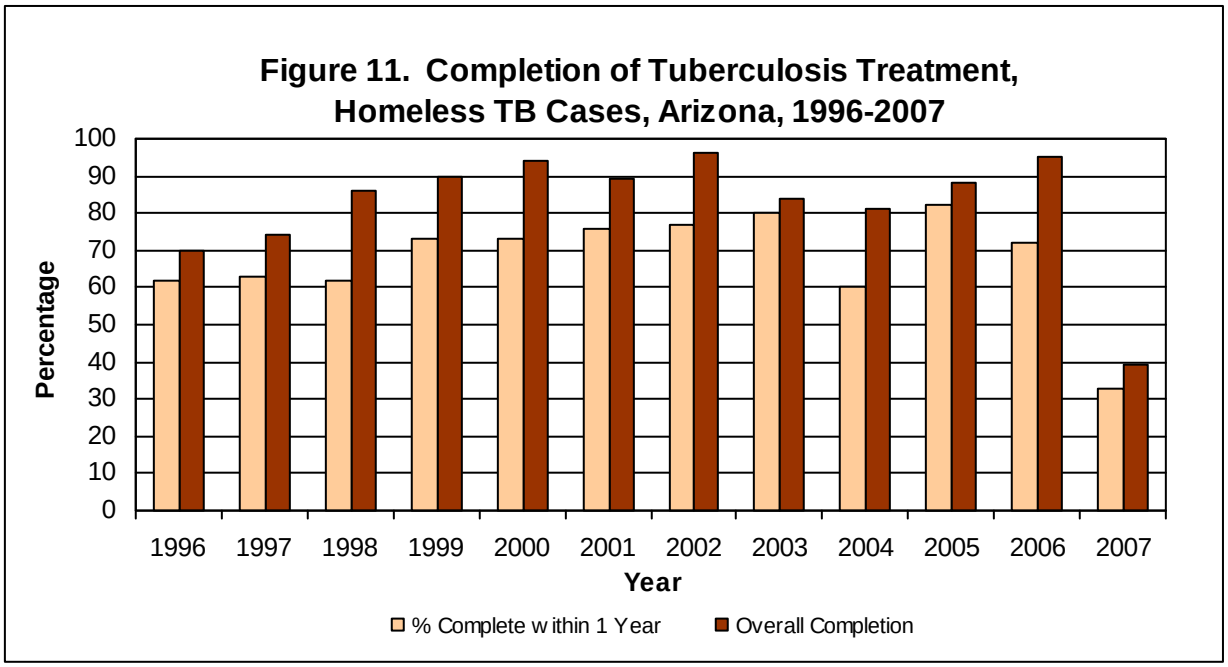


Figure 10. Completion of Tuberculosis Therapy Among Correctional Facility Cases, Arizona, 1996-2007
Percentage
90
80
70
60
50
40
30
20
10
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Year
% Complete within 1 year
Overall Completion



VI. Drug Susceptibility

Table 9 presents the cases whose TB bacteria were identified as resistant to one or more antibiotic drugs. Initial drug susceptibility results were received for 98% (218/222) of the culture-positive TB cases in 2007.

Resistance to Isoniazid occurred among 8% (18/218) of culture confirmed cases. Cases reported as foreign-born accounted for 83% (15/18) of the Isoniazid resistant cases.

Multidrug-resistant TB (MDR-TB) is defined as resistance to Isoniazid and Rifampin. MDR-TB was reported in 1.4% (3/218) of Arizona's TB cases. Nationally, 1.1% of the TB cases were reported as MDR TB in 2007. Foreign-born individuals accounted for two of the three cases.

Resistance to drugs other than Isoniazid and Rifampin was reported in 6.4% (14/218) of the cases. Resistance to any drugs was reported in 16% (35/222).

Extensively drug resistant TB (XDR-TB) is defined as resistance to Isoniazid and Rifampin, plus resistance to any Fluoroquinolone and at least one of three injectable second-line anti-TB drugs such as Amikacin, Kanamycin, or Capreomycin. There were no reported cases of XDR-TB in Arizona for 2007.

Table 9. Drug Resistance, Arizona, 2003 – 2007												
	Cases	Culture Confirmed	Drug Sensitivity Testing		Isoniazid Resistance[a]		Multi-drug Resistance[b]		Other Resistance[c]		Total Resistance[d]	
			No.	%	No.	%	No.	%	No.	%	No.	%
2003	295	228	227	99.6	14	6.2	2	0.9	19	8.4	35	15.4
2004	272	208	205	98.6	20	9.8	2	1.0	24	11.7	46	22.4
2005	281	208	180	86.5	22	12.2	1	0.6	21	11.7	44	24.4
2006	313	288	210	92.1	17	8.1	2	1.0	10	4.8	29	13.8
2007	302	222	218	98.2	18	8.3	3	1.4	14	6.4	35	16.1

[a]Isolates resistant to Isoniazid may be resistant to other drugs including Rifampin; includes initial and final susceptibility results
[b]Resistant to at least insoniazid and Rifampin
[c]Other patterns of drug resistance excluding Isoniazid resistance
[d]Isolates with resistance to any first line drug

VII. Contact Investigations

Contact investigations identify, examine and evaluate all persons who are at risk of infection with *M. tuberculosis* due to recent exposure to a diagnosed or suspected index case. It is a method for new case finding and allows for early treatment of disease, and early detection and treatment of a new infection. In some cases, it may prevent infection. It is an essential component of tuberculosis containment.

The local health departments are responsible for ensuring that contact investigations are conducted at the local level. The local health departments either conduct the contact investigation or coordinate with responsible parties outside public health to ensure that contact investigations are completed. Table 10 presents a summary of contact investigations for sputum smear positive TB cases.

Table 10. Summary of Contact Investigations for Sputum Smear Positive Tuberculosis Cases, Arizona, 2003-2007										
	2003		2004		2005		2006		2007*	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Sputum Smear Positive TB Cases	121		104		101		125		92	
Sputum Smear Positive Cases with Contacts	101	83	86	83	79	78	86	69	65	71
Infected Contacts Started on LTBI Therapy	187		90		80		99		30	
Infected Contacts Completing LTBI Therapy	105	56	43	48	54	68	75	76	6	20

*Provisional data

VIII. Activities

A. International Referral and Case Management

The TB Control Program coordinates with international referral agencies to ensure continuity of care for individuals with TB or suspected of having TB who return to their home country from the U.S. CureTB facilitates the referral process with health officials from Mexico. TBNet facilitates the referral process for all other countries.

The ADHS TB Control Program referred 28 cases to CureTB and TBNet in 2007. Final treatment outcome was difficult to obtain because many of these individuals were lost upon return to their home country, despite the efforts of the referral agencies.

B. Evaluation of Class B1/B2 Referrals

Immigrants and refugees who are traveling to the U.S. are evaluated for TB as part of the admission process, and assigned a classification according to the status of their disease. An individual found to have active TB that is not infectious is classified as a Class B1. Those with a chest x-ray that suggests a history of TB disease that is not currently active are classified as Class B2. The CDC notifies the state health department of all class B1 and B2 individuals who are entering the state. The ADHS TB Control Program forwards these referrals to the local health departments of the counties where the individual will reside. The local health departments provide medical evaluation and treatment for infection.

In 2006, the TB Control Program received 165 notifications for immigrants and refugees designated as B1 or B2, of which 87% (144/165) were evaluated. Final data for 2007 are not yet available

C. Border Health Activities

To ensure continuity of care for individuals being treated for TB who are being deported to Mexico through Nogales, Arizona, the ADHS TB Control Program coordinates “Meet and Greets,” which involve the escorting of these individuals from Arizona law enforcement authorities to Mexican law and public health authorities.

A “Meet and Greet” requires coordination between the TB Control Program, ADHS Office of Border Health, Sonora Health Department, Immigration and Customs Enforcement (ICE), local health departments, and the correctional facility or detention center that is housing the inmate. The ADHS Office of Border Health coordinates the Meet and Greet with epidemiologists from the Hospital General of Nogales, representatives from the Mexican National Institute of Immigration and the Mexican Consulate.

In 2007, 13 Meet and Greets were successfully completed, although long-term TB treatment outcome was not known.

IX. Conclusion

The TB Control Program continues to partner with local health departments, federal agencies, correctional facilities, and the international community to prevent and control TB in Arizona. While the number of TB cases and case rates continue to decline, the number of TB cases reported among foreign-born, correctional facilities, and in children less than six years of age continue to be concerns. Emphasis on completion of treatment for community and correctional cases requires close collaboration with local health departments and outside partners to prevent further spread of the disease and the emergence of drug-resistant TB.