

**Arizona
Annual
Tuberculosis
Surveillance
Report**

2014



HEALTH SERVICES

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I. Executive Summary

The Arizona Department of Health Services (ADHS) Tuberculosis Control Program (the Department) conducts surveillance, data analysis, program evaluation, and consultation for health care providers, health care facilities, and Arizona's tribal and local health departments (LHDs). Close collaboration with the Arizona State Public Health Laboratory (ASPHL), ensures appropriate laboratory testing for specimens and monitoring drug-resistance patterns in the state.

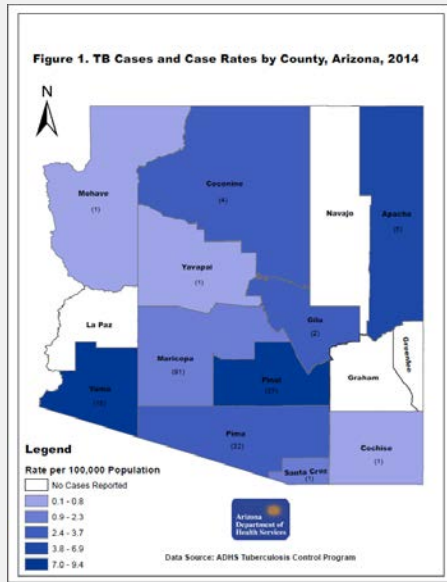
Arizona is comprised of fifteen counties and twenty-one federally recognized tribes. The LHDs provide direct patient care for tuberculosis (TB) control activities. The LHDs coordinate with various medical providers and correctional health staff members within their jurisdiction to provide TB control and prevention services.

The ASPHL provides comprehensive testing services including acid-fast bacillus (AFB) smear, culture, nucleic acid amplification, identification, and drug susceptibility testing for clinical mycobacterial samples statewide. The ASPHL serves as a reference laboratory for all isolates suspected to be positive for TB and performs drug susceptibility testing for all first-time positive isolates. The laboratory also sends isolates to the Centers for Disease Control and Prevention (CDC) contract lab in Michigan for genotyping of all positive culture isolates.

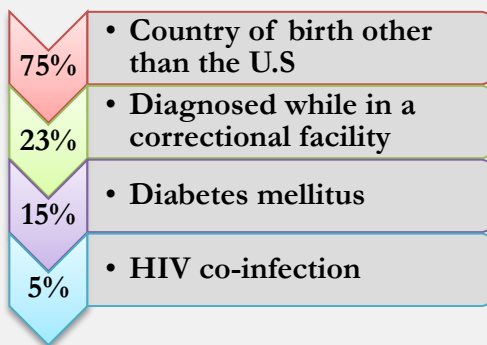
This report provides information about Arizona's reported TB cases in 2014 and completion of treatment data for 2012. The latest year for completion of treatment information available is 2012 due to length of time needed to successfully complete TB treatment.

II. Report Highlights

- ❖ **Active TB cases** reported in Arizona in 2014 totaled 193. The 2014 TB case rate in Arizona was 2.9 per 100,000 population compared to 3.0 per 100,000 nationally.



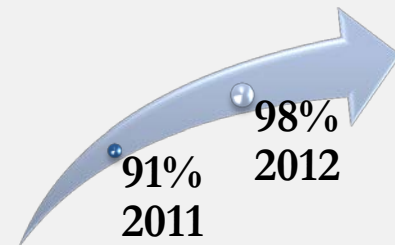
- ❖ **Risk Factors** identified for all Arizona TB cases include:



- ❖ **Drug susceptibility** testing was reported for 100% (152/152) of the culture positive TB cases.
 - 13.8% (21/152) reported isoniazid (INH) resistance.
 - 2 cases of multi-drug resistance were reported.

- ❖ **Completion of treatment** has been a targeted focus of the Department. The latest year for which completion of treatment data is available is 2012. The Department saw improvement for completion of treatment of both correctional and non-correctional TB cases.

- Completion of treatment within twelve months for non-correctional TB cases was:



- Completion of treatment within twelve months for correctional TB cases was 94.1% (16/17) compared to 72.3% (16/22) in 2011. In 2012, there were a total of 56 correctional facility TB cases of which 69.6% (39/56) were repatriated to another country during treatment.

- ❖ **Continuity of care** for active TB cases who return to their home country is achieved with international referrals via CureTB and TBNet. These agencies provide assistance to TB cases for medical case management and treatment continuation. The Department coordinates Meet and Greets through the Ports of Entry of Nogales and San Luis for cases returning to Mexico. These Meet and Greets are coordinated with the Office of Border Health, ADHS TB Control and the health department in Mexico. In 2014, eleven Meet and Greets were arranged.

III. Cases Rates

TB Cases and Case Rates in Arizona and Nationally, 2005-2014

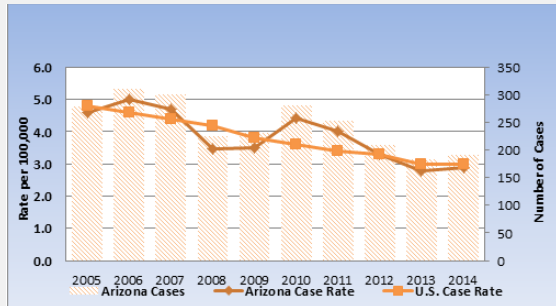


Figure 1

In 2014, Arizona’s LHDs reported 193 cases of active TB with a case rate of 2.9 per 100,000. This represents a 4.7% increase in number of cases and 3.5% increase in case rate compared to 2013. In the United States (U.S.), a total of 9,412 TB cases were reported in 2014 with a case rate of 3.0 per 100,000. This was the lowest rate recorded in the U.S. since 1953 and the lowest decline in incidence in over a decade.

TB Case Rates by Selected Population Groups, Arizona, 2014

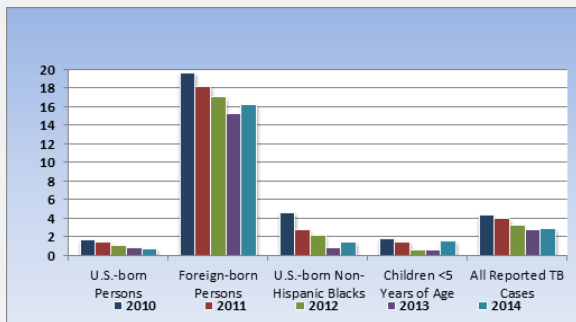


Figure 2

In 2014, the TB case rate among foreign-born individuals was 16.3 per 100,000. The case rate among U.S.–born persons was 0.8 per 100,000. Among U.S.–born Non-Hispanic Blacks, the rate was 1.5 per 100,000. TB case rates among children less than five years of age was 1.6 per 100,000. All case rates increased except U.S.-born TB cases.

TB Cases by County of Residence, Arizona 2014

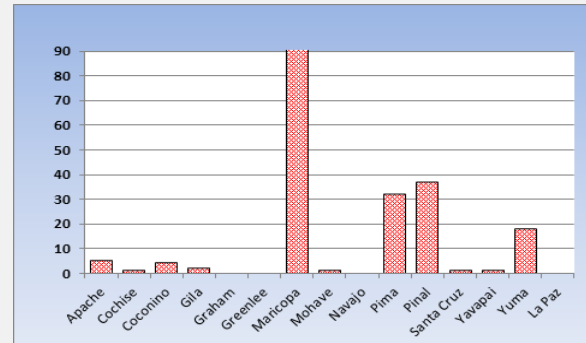


Figure 3

Four of Arizona’s fifteen counties (Maricopa, Pinal, Pima and Yuma) comprised 92.2% (178/193) of active TB cases reported. Maricopa County, the most highly populated county in Arizona, reported 47.2% (91/193) of the states’ cases.

The TB cases reported from Pinal County accounted for 19.2% (37/193) of cases statewide with 86.5 % (32/37) diagnosed in a correctional facility. There are twenty-one correctional facilities located within Pinal County, including U.S. Immigrations and Customs Enforcement Service Processing Centers (ICE-SPC), federal, state, local and privately managed facilities. Yuma County reported 9.3% (18/193) of total cases and Pima County reported 16.6% (32/193). In 2014, there were no cases reported in Graham, Greenlee, La Paz or Navajo counties.

TB Case Rates by County, Arizona 2014

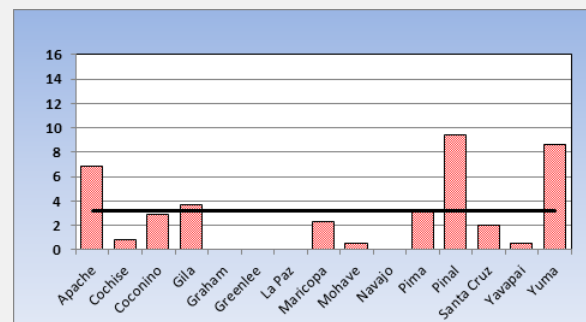


Figure 4

The statewide TB case rate, represented by the solid black line in Figure 4, was exceeded in Apache, Gila, Pinal, Pima and Yuma counties. Maricopa County, which reports around 50% of the states' TB cases annually, reports the same case rate from 2013, 2.3 per 100,000. This is lower than the state and national rate.

Pinal County increased from 8.1 to 9.4 per 100,000. Yuma County decreased from 10.5 per 100,000 in 2013 to 8.6 per 100,000 in 2014. Apache and Gila counties have elevated case rates due to low population numbers.

IV. Cases and Case Rates by Race and Ethnicity

Number of TB cases by Race and Ethnicity

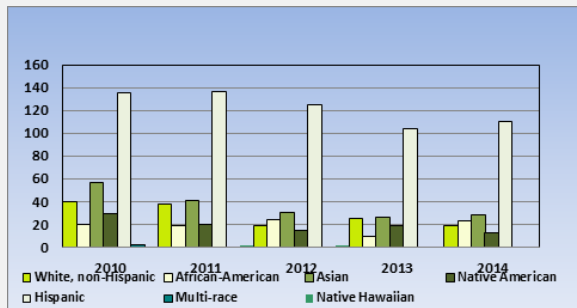


Figure 5

Hispanic ethnicity of any race accounts for 57.0% (110/193) of all reported TB cases annually. TB cases of Asian descent accounted for 14.5% (28/193) followed by Native American at 6.7% (13/193), Non-Hispanic Whites accounted for 9.9% (19/193) and Black/African-American accounted for 11.9% (23/193) of reported TB cases.

Case Rates by Race and Ethnicity

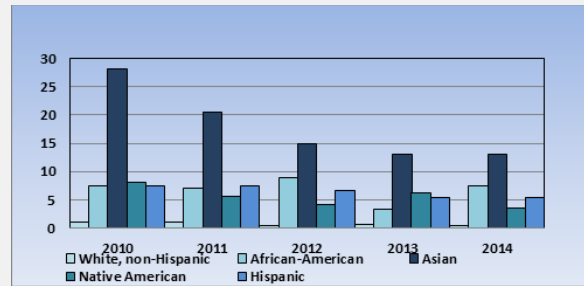


Figure 6

The highest TB case rate among racial/ethnic groups was reported for TB cases of Asian descent with 13.0 per 100,000. The rate stayed the same from 2013. The rates among Native Americans decreased from 6.2 per 100,000 in 2013 to 3.6 per 100,000 in 2014. TB case rates among Hispanics increased slightly from 2013 from 5.3 per 100,000 to 5.4 per 100,000 in 2014. The TB case rate among African-Americans increased from 3.3 per 100,000 in 2013 to 7.4 per 100,000 in 2014.

V. Cases by Gender

TB Cases by Gender, Arizona, 2014

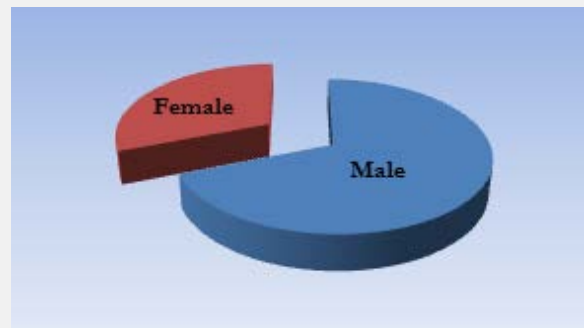


Figure 7

In 2014, males accounted for 69.4% (134/193) of active TB cases. Females accounted for 30.6% (59/193) of cases. This is consistent with national and previous years' surveillance data.

VI. Cases and Case Rates by Age Groups

Number of TB Cases by Age Groups and TB Case Rates by Age Groups

In 2014, 32.1% (62/193) of TB cases were reported in the 25 – 44 year age group. Those in the 45 – 64 year age group accounted for 21.2% (41/193) of TB cases followed by the 65+ age group with 22.8% (44/193) and the 15 – 24 age groups with 17.1% (33/193). Pediatric cases aged 5 – 14 years contributed 3.1% (6/193) and those 4 and under accounted for 3.6% (7/193) of all cases.

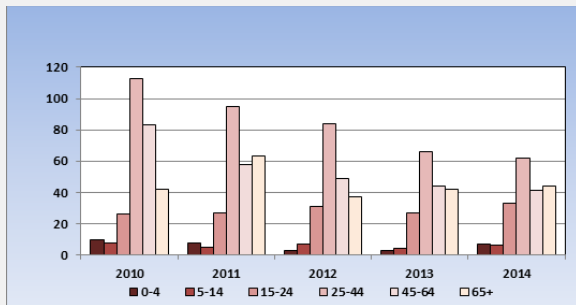


Figure 8

In Arizona, the highest case rates occurred in the 65 years or older age group (4.5 per 100,000). The second highest occurred in those 25 to 44 years of age (3.6 per 100,000). The TB case rate for children under 5 increased from 0.7 to 1.5 per 100,000.

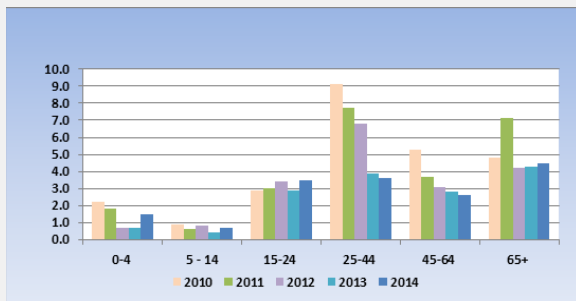


Figure 9

VII. Case Rates by Nativity and Country of Origin

TB Cases by Nativity

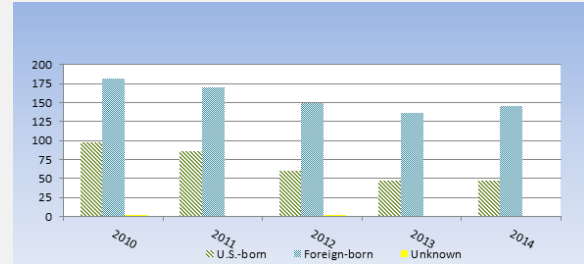


Figure 10

In 2014, 75.1% (145/193) of the TB cases were identified as foreign-born cases. U.S.-born TB cases accounted for 24.4% (47/193) of total reported cases. For TB surveillance purposes, a U.S.-born person is defined as someone born in the United States or its associated jurisdictions or someone born in a foreign country but with at least one parent who is a U.S.-citizen.

TB Cases by Country of Birth

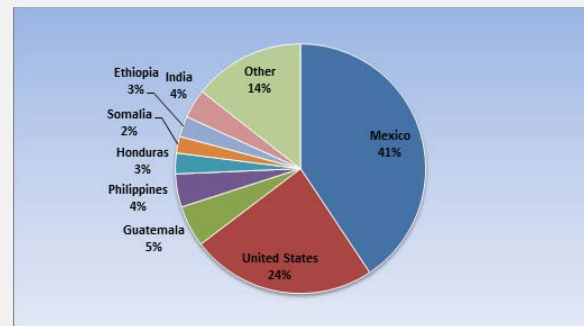


Figure 11

For country of birth besides the U.S., Mexico accounted for the highest percentage with 39.4% (76/193). Guatemala had the second highest with 5.2% (10/193) of all cases. The third highest is the Philippines which accounted for 4.2% (8/193) of cases. The other category contains all other countries with 3 or fewer cases reported in 2014.

VIII. HIV Co-infection and HIV Testing Status

Percentage of TB Cases with HIV Co-infection and % HIV Results Known, Arizona 2010-2014

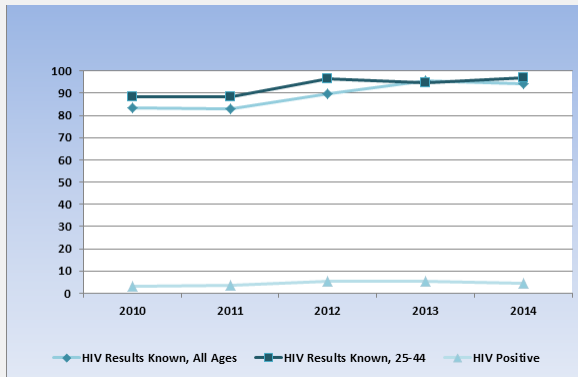


Figure 12

HIV is the strongest known risk factor for TB disease. The Department recommends all medical providers to provide HIV counseling and testing for all TB patients. Co-infection with HIV and TB in individuals is a major concern. Immunosuppression by HIV can negatively impact the body's ability to fight infection. Individuals with co-infection have high mortality rates and are more susceptible to increased drug resistance. This leads to longer and more complex treatment regimens.

In 2014, 94.2% (180/191) of all reported cases had HIV screening results reported and with positive results reported for 4.7% (9/193) of the cases.

IX. TB Cases Diagnosed in Correctional Facilities

TB Cases Diagnosed in a Correctional Facility

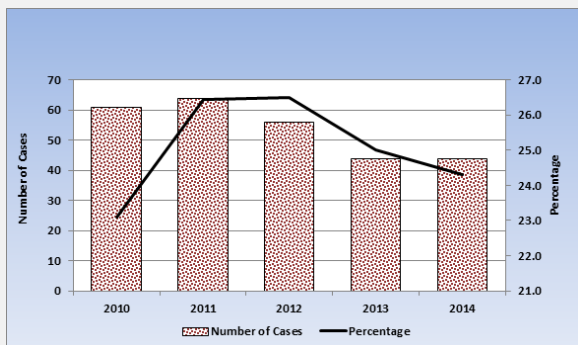


Figure 13

Arizona has consistently ranked as one of the highest states in the nation for percentage of TB cases diagnosed while incarcerated. In 2014, among reported cases over the age of fourteen, residence in a correctional facility at time of diagnosis represented 24.3% (44/181) of cases. Routine evaluation of all inmates for TB during the intake process allows for diagnosis of both latent and active TB in this population. The Department works closely with all correctional facilities in the state and provides correctional health staff with TB training and education to ensure facilities abide by inmate screening requirements.

X. TB Risk Factors

TB Cases by Selected Risk Factors

	2011		2012		2013	
	Cases	%	Cases	%	Cases	%
Total Cases	211		184		193	
Occupation						
Health Care Worker ≥ 15 years	8	4.0	5	2.8	7	3.9
Migrant Farm Worker ≥ 15 years	17	8.4	7	4.0	4	2.2
Reported Behaviors						
Injecting Drug Use* ≥ 15 years	8	4.0	14	7.8	6	3.3
Non-injecting Drug Use* ≥ 15 years	26	12.9	29	15.8	13	7.2
Excess Alcohol Use* ≥ 15 years	24	11.9	21	11.9	21	11.6
Type of Residence						
Long Term Care Facility [†]	2	1.0	4	2.2	4	2.1
Homeless*	12	5.7	17	9.2	9	4.7
Comorbidities/Exposures						
Diabetes Mellitus [‡]	36	17.1	36	19.6	30	15.5
Immunosuppression (Not HIV/AIDS) [‡]	4	1.9	9	4.9	5	2.6
Incomplete LTBI Therapy [‡]	5	2.4	4	2.2	1	0.5
Contact of infectious TB case (2 years or less) [‡]	8	3.8	7	3.8	15	7.8

*Within one year prior to diagnosis of tuberculosis.
[†]Residence at time of diagnosis.

Table 1

Risk factors associated with cases reported to the Department in 2014 include diabetes mellitus in 15.5% (30/193) of cases, homelessness in 4.7% (9/193) and contact of an infectious TB case within the previous two years in 7.8% (15/193) of cases.

Among reported cases over the age of fourteen, risk factors included non-injecting drug use in 7.2% (13/181) of cases and excess alcohol use in 11.6% (21/181) of cases. High-risk occupations for TB transmission include health care workers and migrant farm

workers. Migrant farm workers comprised 2.2% (4/181) and health care workers represented 3.9% (7/181) of 2014 cases. The other significant risk factors include TB/HIV co-infection, residence in a correctional facility and country of birth. These risk factors were discussed in more detail individually.

XI. TB Drug Resistance Patterns

TB Cases Reported with Drug Sensitivity and Drug Resistance

In 2014, 78.8% (152/193) of the TB cases reported had positive culture results. Of these cases, 100% reported drug sensitivity results. Isoniazid (INH) resistance increased from 2013 from 11.1% to 13.7% of culture-positive cases. In 2014, two cases of multi-drug resistance were reported.

XII. Directly Observed Therapy

Directly Observed Therapy, Arizona, 2002-2012

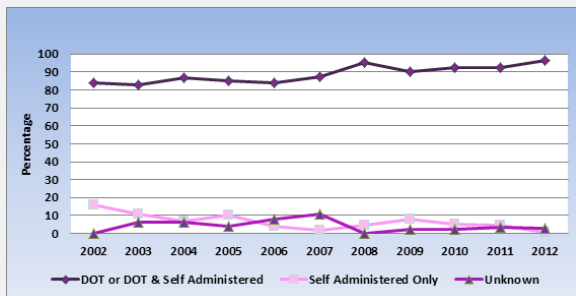


Figure 14

Directly observed therapy (DOT) is the standard of care for administering TB medications to active cases. In DOT, health care workers observe the individual take his/her medications to ensure compliance with the treatment regimen. All LHDs are encouraged to provide DOT for community cases. DOT can be difficult for some of

Arizona's LHDs as most of the rural counties are large and require traveling long distances to provide this service. Video DOT (vDOT) is being utilized in some LHDs in Arizona. Several LHDs also provide DOT for correctional facilities within their jurisdictions. Other facilities have their own nursing staff provide DOT to inmates.

In 2012, 96.6% (198/205) of the TB cases who started treatment received DOT or a combination of DOT and self-administered therapy. Self-administered therapy only was reported for 0.5% (1/205) of cases.

XIII. Completion of Treatment

Completion of Treatment, Arizona, 2008-2012

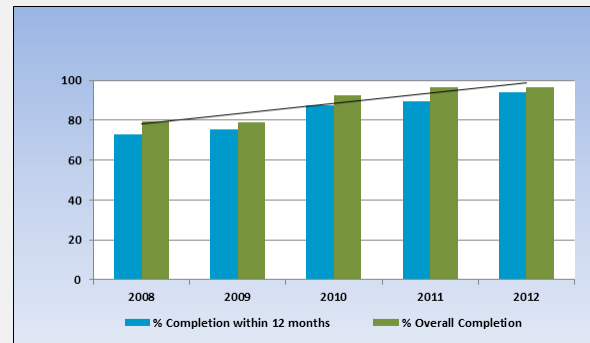


Figure 15

Completion of treatment for TB cases is a continuing focus for the Department. The overall goals for treatment of TB are to cure the individual patient and limit the transmission of TB to other people. Thus, successful treatment of each individual TB patient benefits the individual and the community. The Department conducted cohort reviews and collaborated with LHDs which improved completion of treatment in Arizona. Also, the Department utilizes international referrals to provide completion of treatment information for TB cases that have left the U.S. and returned to their country of origin. In 2012, 94.2% (131/139)

of the eligible cases completed treatment within twelve months.

Completion of Treatment for Non-Correctional Facility TB Cases

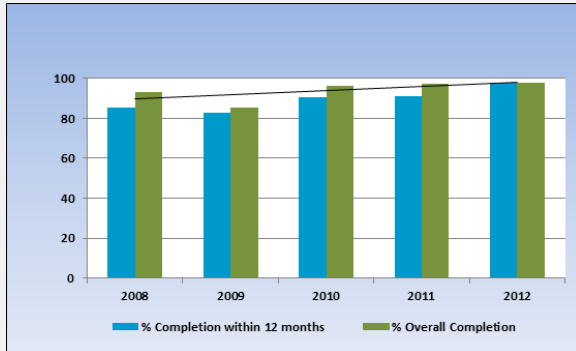


Figure 16

Residence in a correctional facility impacts completion of treatment rates negatively. For cases of TB not diagnosed in a correctional facility, 97.7% (127/130) of cases completed treatment within one year.

Completion of Treatment for Correctional TB Cases

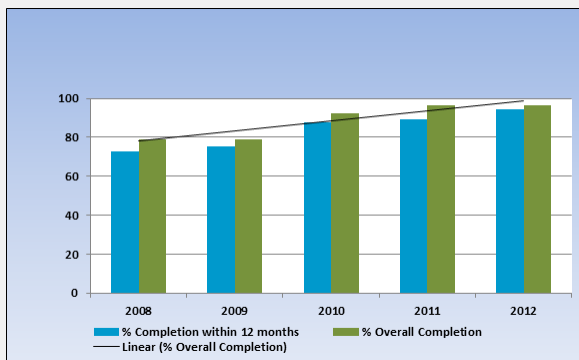


Figure 17

In 2012, 94.1% (16/17) of TB cases diagnosed in a correctional facility completed treatment within one year. The denominator does not include cases which moved out of the U.S. during treatment. The Department has been focusing on improving treatment completion through close collaboration with correctional facilities.

XIV. Contact Investigation Data in Arizona

Contact Investigations

Contact investigations are an essential component of TB control. Contact investigations identify, examine, and evaluate all persons who are at risk of TB infection due to recent exposure to a diagnosed infectious case. This process facilitates new case finding which in turn allows for early detection and treatment of new infections. In some cases, it may even prevent disease. The LHDs are responsible for conducting contact investigations or coordinating with responsible parties outside local public health to ensure contact investigations are completed. The last year for which contact information data is available is 2012 due to the length of time to complete treatment.

In 2012, contacts were identified for 83.3% (70/84) of sputum-smear positive TB cases. Of contacts to sputum-smear positive TB cases, 67.0% (746/1,107) were evaluated. Of the contacts evaluated 106 contacts were newly diagnosed latent TB infections (LTBI). 62.0% (66/106) of these cases initiated LTBI treatment and 53.0% (35/66) completed treatment.

XV. International Referrals and Class Bs

Evaluation of Class B1/B2 Referrals

Immigrants and refugees traveling to the U.S. are evaluated for TB as part of the admission process, and are assigned a classification according to the status of their disease. Class A individuals have TB disease and have been granted a waiver. Class B1 includes individuals with non-infectious pulmonary TB disease with negative acid-fast bacilli sputum smears and cultures. Class B1 also includes extra

pulmonary TB cases. Class B2 individuals have positive skin tests but have negative evaluations for active TB disease. Class B3 individuals are recent contacts of a known TB case.

The CDC Division of Global Migration and Quarantine notifies the Department of all Class B individuals entering the state. The Department forwards these referrals to the LHDs where the individual will reside. The LHDs provide medical evaluation and treatment. The transitory nature of the immigrant and refugee population makes it difficult to initiate or complete evaluations and treatment for these individuals. The Department is developing strategies to overcome these barriers.

In 2014, the Department received 289 notifications for immigrants and refugees designated as class B1, of which 51.9% (150/289) initiated medical evaluation within 30 days and 59.5% (172/289) completed medical evaluation overall. The Department received 129 Class B2 notifications. Of these 67.4% (87/129) completed the evaluation.

International Referrals and Case Management

The Department 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. CureTB facilitates the referral process with public health officials in Mexico and is expanding to other countries. Migrant Clinicians Network (TBNet) facilitates the referral process for all countries, including Mexico. In 2014, 49 cases and suspect cases were referred to CureTB and 89 cases and suspect cases were referred to TBNet.

Border Health Activities

To ensure continuity of care for individuals being treated for TB who are repatriated to

Mexico through Nogales and San Luis, Arizona, the ADHS TB Control Program coordinates “Meet and Greets.” The Meet and Greet involves transferring these individuals from Arizona and federal law enforcement authorities to Mexican law enforcement and public health authorities.

The Meet and Greet protocol developed in 2007 has resulted in better coordination of inmates returning to Mexico. The protocol includes working closely with the ADHS Office of Border Health, correctional facilities, LHDs, Sonoran partners, CureTB, and ICE authorities. In 2014, the Department arranged eleven Meet and Greets through the port of Nogales and one through the port of San Luis.

The Department is collaborating with Sonoran public health officials to improve communication and completion of treatment for binational TB cases. MEDSIS (Medical Electronic Disease Surveillance Intelligence System) the Arizona disease surveillance system for reporting TB cases is now available for use in Sonora, Mexico.

XVI. Conclusion

Conclusion

The Department continues to partner with local health departments, federal agencies, correctional facilities, and the international community to prevent and control TB in Arizona. These partnerships have improved treatment completion, data quality and communication between different jurisdictions. Continued close collaborations with local health departments and outside partners will prevent further spread and curb the emergence of drug-resistant TB.