Tuberculosis in Los Angeles County

Surveillance Report
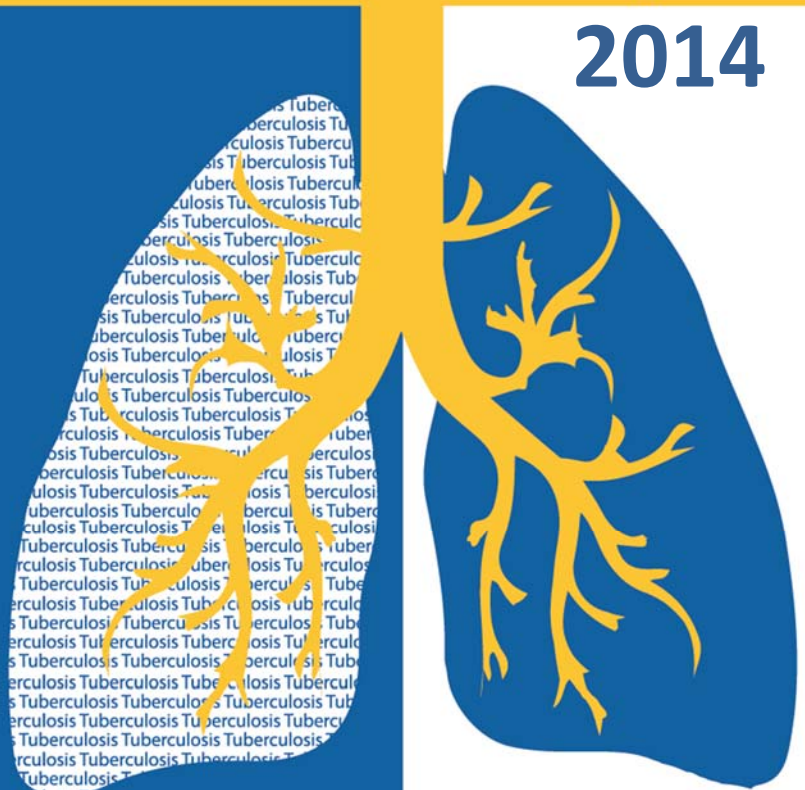
2014

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Dear Colleagues,

I am pleased to provide you with the 2014 "Tuberculosis in Los Angeles County: Surveillance Report." This report examines and presents a snapshot of tuberculosis (TB) in Los Angeles County (LAC). TB cases continue to decline in LAC as a whole from 661 cases in 2013 to 585 cases in 2014, an 11% decline. Similar to past years, our tuberculosis case rate (6.2 per 100,000) was higher than the overall rate for California (5.6 per 100,000) and the United States (2.9 per 100,000).

We see progress from 2010 to 2014, reporting declines in the percentage of all TB cases co-infected with HIV from 6.7% to 4.4% and the percent of all TB cases completing treatment within one year rising from 83.2% in 2010 to 93.2% in 2012. However, many challenges remain. In 2014, a majority of TB cases were seen among racial/ethnic minority individuals, most of whom were non U.S. born. The TB Control Program is working on the early detection of active TB disease and TB infection (TBI) among high-risk individuals by focusing on improving access to nucleic acid amplification tests (NAAT) and interferon gamma release assays (IGRAs).

In addition, assessment and diagnosis of TB among persons experiencing homelessness and those with medical comorbidities increasing progression of TB infection to TB disease continues to be a focus for our program. Improving initiation and completion of treatment of TB infection using the isoniazid and rifapentine (3HP) 12-week regimen are important strategies that will be expanded over the coming year.

Hard work and creative and innovative strategies are essential components in our continued fight against TB. It is our hope that this Surveillance Report will facilitate greater understanding, better planning, and more effective use of resources in the local and national effort to reduce and eventually eliminate TB.

Sincerely,

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Tuberculosis in Los Angeles County:
Surveillance Report 2014

Background

LOS ANGELES COUNTY: DEMOGRAPHIC PROFILE

With its population of 10 million[1], Los Angeles (LA) County is one of the nation's largest counties spanning over 4,000 square miles[2]. LA County is home to a quarter of California residents and to one of the most ethnically diverse populations, composed of 48% Hispanic, 15% Asian/Pacific Islander, 9% Black, 1.5% Native American/American Indian, and 27% Non-Hispanic White populations[1]. LA County is a major port of immigration and a resettlement destination for large numbers of immigrants and refugees, thus driving ethnic diversity in the county's population. According to 2014 U.S. Census estimates, 35% of LA County residents are born outside the U.S. and 57% speak a language other than English at home[1].

Box 1. LA County Service Planning Areas (SPA) Map

Due to its large size, LA County is divided into 8 smaller geographic regions or Service Planning Areas (SPA's) for the purposes of healthcare planning and provision of health services. The 8 SPAs include: SPA 1: Antelope Valley, SPA 2: San Fernando Valley, SPA 3: San Gabriel Valley, SPA 4: Metro, SPA 5: West, SPA 6: South, SPA 7: East, and SPA 8: South Bay (Box 1). Public health clinics located within each SPA offer tuberculosis (TB) screening and treatment services. In 2014, patients received services at the following public health clinics: Antelope Valley Health Center (SPA 1); Glendale Health Center and Pacoima Health Center (SPA 2); Monrovia Health Center and Pomona Health Center (SPA 3); Central Health Center; Hollywood/Wilshire Health Center (SPA 4); Simms-Mann Health and Wellness Center (SPA 5); Martin Luther King Jr. Health Center (SPA 6); Whittier Health Center (SPA 7); Curtis R. Tucker Health Center (SPA 8).
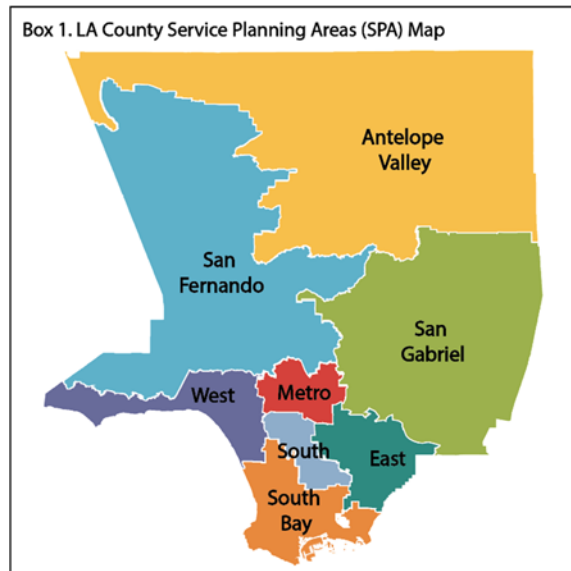
ABOUT LOS ANGELES COUNTY TUBERCULOSIS CONTROL PROGRAM

The LA County Tuberculosis Control Program (TBCP) is an integral part of the Los Angeles County Department of Public Health. One of the primary roles of TBCP is collecting epidemiological data, maintaining a registry of all TB patients, and reporting the data to the California State Tuberculosis Control Branch and the Centers for Disease Control and Prevention (CDC). Our jurisdiction includes all of LA County, with the exception of the cities of Long Beach and Pasadena, who operate independent health departments. TBCP receives reports of TB cases and TB suspects from 116 private hospitals, one VA hospital, and many private medical providers.

TUBERCULOSIS CONTROL PROGRAM ORGANIZATIONAL STRUCTURE

Medical Consultation, Patient Services and Reporting Unit

This Unit is made up of four sections: Medical Consultation, Nursing Surveillance, Incentive and Enabler, and Public Health Investigation/Legal Intervention. The overall goal of these four sections are to provide consultation, guidance, and oversight to ensure all TB patients are identified, reported, and able to complete a prescribed course of treatment while minimizing the risk of TB transmission to others.

Medical Consultation

This section includes Physician Specialists who provide medical consultations to physicians and other health care professionals in inpatient and outpatient settings, both public and private, related to the diagnosis and treatment of active TB disease, TB infection, and TB infection control issues. The medical consultation section works with Nursing Surveillance to review and approve the TB Discharge Care Plan that is submitted by private hospital providers for patients diagnosed with or suspected of having active TB, in accordance to CA State law. Also, as part of the multi-drug resistant TB (MDR-TB) team, physician specialists offer consultations on MDR-TB cases and their contacts. The team recommends and monitors MDR-TB treatment throughout the course of therapy and follow cases for at least 2 years after completion of treatment to ensure any potential relapses are detected in a timely fashion. The unit works with a public health nurse (from the Nursing Surveillance section) who is in charge of identification and case management of MDR-TB cases and their contacts. The MDR-TB public health nurse monitors about 20 MDR-TB cases (both active and inactive) on a yearly basis. The public health nurse also monitors cases with TB strains exhibiting other drug resistance patterns but do not meet the criteria for MDR-TB. In 2014, physician specialists began using eConsult, a web-based program to provide online medical consultations to providers.

Nursing Surveillance

This section is comprised of two teams: the Private Hospital Surveillance team and the Public Health/Corrections team. The Public Hospital/Corrections team consists of Liaison Public Health Nurses assigned to 3 hospital facilities operated by the LA County Department of Health Services (DHS), and to the Men's Central Jail operated by the LA County Sheriff's Department. In each facility, a nurse is assigned to the identification and case management of patients with confirmed or suspected TB disease, and their contacts. In addition, nurses in the team work with the public and community stakeholders to provide nursing consultation on a wide variety of topics and engage laboratories to facilitate specimen submission. The Private Hospital Surveillance team is responsible for strengthening and improving the quality of reporting and care of TB cases in non-DHS facilities. The team consults with community providers and measures the quality of care against program standards and ensures continuity of care as the patient transitions from inpatient to outpatient care. The team also provides consultations to assure that appropriate infection control measures are being taken to prevent the spread of disease. In 2014, the unit processed 507 hospital admissions and 576 hospital discharges.

Incentive and Enabler

This section is dedicated to managing a wide variety of services to assist patients in completing their treatment (i.e., provision of housing, meals, grocery store gift cards, restaurant gift cards, bus passes/tokens). Provision of incentives leads to a significant improvement in adherence to clinic appointments, and clinic-based diagnostic testing, and TB treatment via Directly Observed Therapy (DOT), especially among high priority patients. The unit also provides substance abuse rehabilitation services for patients. In 2014, the unit provided incentives to 710 patients, of which 606 were TB cases and 104 were patients suspected of having TB disease.

Public Health Investigation and Legal Intervention

This section locates non-adherent patients and returns them into care. Staff use education, counseling, and other voluntary measures before exercising their authority to serve Health Officer's Orders. Recommendations are developed for the use of civil orders, and staff work closely with Community Health Services (CHS) and County Counsel in the initiation, enforcement, and follow-up of civil orders, including orders for Exam, DOT, Home Isolation and Civil Detention in a health care facility. As sworn Deputy Health Officers, staff in this section have authority to arrest individuals who violate Health Officer's Orders. In 2014, 188 referrals were processed, including 25 health officer orders for civil detention.

Education and Evaluation Unit

This Unit consists of the following sections: Contact Investigation Monitoring and Assessment; Education, Partnership and Community Outreach; Policy and Program Evaluation; and TB Registry.

Contact Investigation Monitoring and Assessment

This section has oversight responsibilities of contact investigations (CI) conducted by CHS. CIs are monitored to ensure they are conducted according to the TBCP guidelines outlined in the TB Manual Chapter 6: Contact Investigation Tool Kit. The team provides technical assistance with complex, large, or high profile CIs and TB outbreaks. Data analysis support is provided by the Epidemiology and Research Unit and the Genotype Cluster Investigation and Assessment Unit assists with the investigation of TB case clusters to determine if an outbreak event is emerging. Staff collaborate with homeless medical providers and targeted shelter sites to promote TB clearance and TB symptom screening at shelter entry, delivery of targeted testing and treatment of TB infection. In 2014, the team began building an Access database to enhance the tracking of all CIs that are selected and reviewed. The database will capture information relevant to the patient, as well as the CI, including patient demographic and TB disease characteristics, exposure site(s), number of contacts identified per exposure site, and CI progress measures.

Education, Partnership and Community Outreach

This section plans, develops, and delivers TB educational trainings to increase awareness and knowledge of TB infection and active TB disease. Staff assure that training and resources are available to public and private sector medical providers and community agencies who serve high risk populations within LA County. A strong evidence-based evaluation component is also incorporated into educational sessions. Staff partner with the Curry International TB Center, CDC and others on selected training activities. Section staff collaborate with Ryan White-funded early intervention clinics providers to promote delivery of targeted testing and treatment of TB infection. In 2014, this section provided 113 TB related trainings.

Policy and Program Evaluation

In this section, staff participate with the California TB Controllers Association (CTCA) and its workgroups on legislative proposals. This section communicates with DPH and CHS on performance measures and progress towards national targets. Staff also participate on a national level with the TB Program Evaluation Network and submit annual reports describing activities including challenges and barriers, and progress toward CDC performance targets. In 2014 this section hosted the CTCA Spring conference.

TB Registry

This section provides general clerical support and is responsible for entering data into our primary surveillance database: the Tuberculosis Registry Information Management System (TRIMS). TRIMS contains information about suspected and confirmed TB cases, contacts, and persons screened for TB infection. Registry staff also create and maintain physical medical files, including files for TB cases and persons with TB infection who receive 3HP treatment. Additionally, staff enter data from TB screening forms (H-304) originating from a variety of sources (e.g., HIV/TB ambulatory outpatient medical clinics, volunteer, schools and drug programs; outreach via community medical partners); data from contact investigation forms (H-289); lab results (e.g. smears, cultures, NAATS, pyrosequencing drug sensitivities); hospital admission, course, and discharge data (H-803, H-1365, H-1397, H-804 forms); and inter-jurisdictional & bi-national TB notifications.

Epidemiology and Research Unit

This Unit is responsible for providing epidemiologic and data management support for the program. The Epidemiology and Research Unit produces mandated reports and other critical reports to monitor TB surveillance data, ensure high quality reporting of TB epidemiological data, monitors data for high priority TB clusters and outbreaks, evaluate outcomes for outbreak response and other program activities, and support ongoing quality improvement and program evaluation activities. In 2014, the unit conducted data analyses for 7 major reports, over 100 data requests and executive assignments, and staff presented TB data at the National Tuberculosis Controllers Association (NTCA) meeting in June.

Surveillance Epidemiology and Research

This team is responsible for ensuring high quality data for the mandatory reporting of TB cases, including the submittal of the Report of Verified Case of Tuberculosis (RVCT), and prepares mandated epidemiological reports submitted to county, state, and federal agencies. In 2014, this team developed a training manual to serve as a tool for case reporting and quality assurance. Also, the team authored a surveillance report and 2 fact sheets, including new content and enhanced visual presentation to communicate LA County TB data to a broad audience. The Surveillance Epidemiology team currently provides data on TB cases for the quarterly Cohort Review meetings at 5 public health centers, with the aim of supporting improvements in program performance.

Cluster Epidemiology and Response

This team creates and maintains cluster surveillance databases, conducts analysis related to outbreak surveillance and response, prepares epidemiologic reports on high priority clusters, develops protocols and tools for contact investigation and outbreak investigation, provides data support for the implementation of the DPH Guidelines for Shelters, and provides reports for community medical partners serving the homeless populations. In 2014, in conjunction with the Genotype Cluster Identification and Assessment Unit and the Contact Investigation Monitoring and Assessment unit, this team began offering data management consultation services for complex CIs. Additionally, in 2014, in support of the implementation of the DPH Guidelines for Shelters, 'Preventing Tuberculosis (TB) in Homeless Shelters', the unit began working closely with the Los Angeles Homeless Services Authority (LAHSA) to upload TB Clearance and Alert data into the Homeless shelter's Homeless Management Information System (HMIS). The HMIS system notifies shelter intake staff about whether a client has been cleared of TB disease in the past year. This unit also worked with LAHSA staff to implement changes in HMIS that would allow the system to capture data on a

questionnaire administered to homeless clients upon intake to a shelter, which would allow the program to evaluate the implementation of intake screening and referrals for TB evaluation.

Genotype Cluster Identification and Assessment Unit

This unit is responsible for monitoring TB genotype data for the purpose of identifying clusters and outbreaks of TB cases and previously unrecognized links between cases. This team provides technical assistance to CHS TB case managers surrounding the investigation of TB genotype clusters, including the provision of index case interviewing services, data management support, and contact investigation screening services. Index case interviewing services target populations at high risk for TB transmission, including persons experiencing homelessness and those with a history of alcoholism. The unit works closely with the California and CDC cluster and outbreak units for cross-jurisdictional clusters.

Data Management and Information Technology Unit

The TRIMS database is a mission critical system supporting the activities of personnel within the TBCP, CHS, and the Public Health Lab (PHL). Unit personnel are responsible for maintaining and programming the TRIMS database, ensuring the security of the database in accordance with HIPAA regulations, and providing end user IT support for TBCP personnel. Management of data is critical to the support of TB prevention and control activities, and this team has primary responsibility for integrating TRIMS with other data sources to improve the management and performance of these activities.

Administration Unit

This Unit is responsible for all of the administrative aspects of program operations, which include management of human resources, procurement, facilities management, coordination of time collection, and in addition functions as a liaison to DPH Contracts & Grants and DPH Finance.

BRIEF OVERVIEW OF TUBERCULOSIS DISEASE

Tuberculosis Disease

Tuberculosis (TB) is an airborne disease caused by *Mycobacterium tuberculosis* complex *(M. tuberculosis)*[3]. TB is spread through airborne particles (microscopic droplet nuclei) from person to person. This can typically happen when someone with untreated active TB disease coughs, sneezes, speaks, or sings[3]. People nearby may breathe in these droplets and become infected. *Mycobacterium bovis (M.bovis)* is another species that belongs to the *M. tuberculosis* complex that can cause TB. This can happen most commonly by eating or drinking unpasteurized dairy products or coming into contact with infected animals (e.g., cattle, bison, elk) or products from these animals such as meat or milk[4]. Not everyone who is infected with TB becomes sick or experiences symptoms. When a person is infected with TB but has no symptoms, this is known as having TB infection[5].

Tuberculosis Infection

A diagnosis of TB infection indicates a person is infected with TB, but does not experience any of the symptoms that accompany active TB disease and thus cannot spread the infection to other people[3]. Global estimates indicate that 1/3 of the world's population has TB infection[6, 7]. In the U.S. it is estimated that about 11 million people (4%) have TB infection[6]. If these individuals are not treated, approximately 5-10% of them will be at risk of progressing to active TB disease[6]. Thus, identifying and treating persons with TB infection who are at high risk of developing TB disease is critical for the elimination of TB. People who have

lived in countries with high rates of TB are more likely to have TB infection. In addition, several comorbid medical conditions increase a person's risk of TB, including HIV, diabetes mellitus, immunocompromising conditions, and end stage renal disease. In LA County, diabetes mellitus is the 5th leading cause of death, with about 10% of adults having ever been diagnosed[8, 9]. Given the proportion of LA County TB cases with a diabetes mellitus co-diagnosis (~28%), this is an important population to address in our prevention efforts.

ABOUT THIS REPORT

The Tuberculosis Control Program (TBCP) Annual Surveillance Report is composed of summary tables, graphs, and narrative highlighting TB statistics for LA County. The report also presents a profile of TB by Service Planning Area (SPA), highlighting regional TB trends. Data presented in this report are provisional and reflect the most complete information to date. Case count data for previous years may differ from previously published data due to periodic data updates (see Technical Note 10). This report is designed to serve as a resource to:

1. Medical, public health, and other healthcare authorities at county, state, and national levels
2. Provide information on important TB program indicators
3. Provide answers to frequently asked questions
4. Provide highlights of TB surveillance data in Los Angeles County

Data Summary

In 2014, there were a total of 585 cases of TB confirmed in Los Angeles (LA) County. This represents an 11.5% decrease from 661 cases in 2013. The TB incidence rate decreased from 7.0 per 100,000 during 2013 to 6.2 per 100,000 in 2014 (Figure 1). LA County reported the

Box 2. TB Incidence Rates, 2014			
	LA County	**California***	**United States****
Total Cases	585	2,147	9,421
Rate per 100,000	6.2	5.6	2.9

*Report on Tuberculosis in California, 2014, CDPH, 2015.
**Reported Tuberculosis in the United States, 2014. CDC 2015.

10th highest TB incidence rate among 61 California reporting health jurisdictions. The TB incidence rate in LA County in 2014 was higher than the overall state incidence rate (5.6 per 100,000)[10] and more than twice the national incidence rate (2.9 per 100,000)[11] (Box 2).

DEMOGRAPHIC PROFILE

Race/Ethnicity Distribution

In 2014, Asian (44%) and Hispanic (42%) individuals accounted for 85% of TB cases in LA County (Figure 2). The TB incidence rate was highest among Asians (18.8 per 100,000), followed by Blacks (6.0 per 100,000), Hispanics (5.3 per 100,000), and non-Hispanic Whites (1.3 per 100,000) (Figure 3). TB incidence rates among Asians, Blacks, and Hispanics were 14.5, 4.6, and 4.1 times higher than among non-Hispanic Whites, respectively. Asians represented a greater number of TB cases (259 cases in 2014) in LA County compared to other racial/ethnic groups. Between 2013 and 2014, cases decreased by 4.8% among Asians and 16% among Hispanics (Table 1).

Age and Sex Distribution

Thirty-three percent of TB cases (n=196) occurred among persons 65 years of age and older, representing an important demographic group for TB risk (Figure 4). Additionally, persons aged 15-34 years and persons aged 55-64 years contributed 99 (16.9%) and 102 (17.4%) cases, respectively (Table 1). The TB incidence rate was highest for people 65 years and older (17.3 per 100,000), followed by individuals 55-64 years of age (9.6 per 100,000), by those 45-54 years of age (7.6 per 100,000), and by those 35-44 years of age (5.1 per 100,000) (Figure 5). Among older individuals, medical comorbidities can increase their risk of developing active TB and may increase the complexity of medical treatment[10, 12, 13]. Thus, along with the estimated growth of the older population[14] an increased risk of developing co-occurring chronic health conditions is likely[15].

In 2014, there were 15 cases of TB among children aged 0 to 4 years, with an incidence rate of 2.5 per 100,000 (Figure 6). From 2013 to 2014, the number of cases among children 0-4 years of age decreased from 18 cases to 15 cases. Additionally, we observed an increase from 7 to 8 cases among children 5-14 years of age (Table 1). In 2014, Hispanic children 0-4 years old accounted for 66% of pediatric cases. TB among young children indicates recent transmission[16], and the need for focused attention on preventing transmission among this population.

In 2014, TB in LA County occurred more often among males (375 cases, 64%) compared to females (210 cases, 36%), (Table 1; Figure 7). The TB incidence rate was higher among males (8.0 per 100,000) compared

to females (4.4 per 100,000), (Figure 8). TB cases are summarized by race/ethnicity and age in Table 2, by race/ethnicity and sex in Table 3, and by race/ethnicity, sex, and age in Table 4.

Place of Birth
In 2014, TB among cases born outside the U.S. (n=465) was almost 4 times higher than among U.S.-born cases (n=119) (Table 1). For the past five years, non-U.S. born persons have accounted for approximately 80% of TB cases (Figure 9). Non-U.S. born TB cases in 2014 consisted of 303 (65%) males and 162 (35%) females (Figure 10). Among non-U.S. born TB cases with a known place of birth, 54% were Asian, 40% were Hispanic, 4% were non-Hispanic White, and 2% were Black (Figure 11). Over two-thirds (78%) of TB cases born outside the U.S. originated from the following 7 countries: Mexico, Philippines, China, Vietnam, Korea (North and South), Guatemala, and El Salvador (Figure 12). Among U.S.-born TB cases, 49% were Hispanic, 30% were Black, 15% were non-Hispanic White, and 6% were Asian (Figure 11). Table 5 summarizes non-U.S. born TB cases by race/ethnicity and age.

Medical Comorbidities
In 2014, 40% of adult TB cases had one or more medical comorbidities, including diabetes mellitus, end stage renal disease (ESRD), and immunosuppressive conditions (other than HIV). These comorbidities increase a person's risk of progression from TB infection to active TB disease. Among the conditions mentioned above, in 2014 the most common comorbidity reported was diabetes mellitus (n=169; 30%) (Table 6). In fact, from 2010 to 2014, diabetes mellitus has been the most common co-occurring medical condition among TB cases, ranging from 25% to 30% (Figure 13).

HIV Infected Tuberculosis Cases
In 2014, there were 23 (4.4% of cases with known HIV status) TB cases co-infected with HIV (Figure 14; Table 6). Of the total 585 TB cases, information on HIV status was available for 521 (89%) cases. Table 7 presents HIV co-infected TB cases by demographic characteristics. Among HIV-positive TB cases in 2014, 39% were Black and 43.5% were Hispanic. Individuals born outside the U.S. accounted for 39% of cases with HIV co-infection. Also, 26% of HIV co-infected TB cases reported experiencing homelessness in the past year (Table 7).

Substance Use
Recent history of substance use (defined as within the past year) can be common among TB cases. In 2014, excess alcohol use was the most commonly reported type of substance use (8.9%), followed by non-injecting drug use (6.8%), and injecting drug use (1.2%) (Figure 15; Table 6). Substance use provides special challenges in the treatment and control of TB. People with substance use problems are less likely to be screened for TB and less likely to begin and complete treatment for TB infection or TB disease[17].

Homelessness
In 2014, 37 (6.3%) TB cases reported experiencing homelessness in the past year (Figure 16). Among TB cases experiencing homelessness, 38% were Black, 29.7% were Hispanic, 18.9% were Asian, and 13.5% were non-Hispanic white (Table 8). Among homeless TB cases, 92% were male, and 43% were born outside the U.S., while 54% were U.S.-born (Table 8). Substance abuse was commonly reported among cases with a recent history of homelessness, with excess alcohol use (43%) being the most commonly reported form of substance abuse, followed by non-injecting drug use (35%), and injecting drug use (2.7%). TablesTable 9, Table 10, Table 11, and Table 12 present demographic characteristics TB cases experiencing homelessness.

TUBERCULOSIS DISEASE MANAGEMENT AND CHARACTERISTICS

Site of Disease and Verification Criteria

In 2014, 67% of TB cases were diagnosed with Pulmonary TB only, while 22% were diagnosed with extra-pulmonary TB only, and 11% were diagnosed with both pulmonary and extra-pulmonary TB disease sites (Table 13; Figure 17). Among pulmonary TB cases who were sputum culture positive, 72% (n=259) were sputum smear positive while 28% (n=99) were sputum smear negative (Table 14; Figure 18). In terms of verification criteria, 87% of TB cases in 2014 were laboratory confirmed cases and 13% were clinically confirmed cases (Table 15). Similarly, for years 2010 to 2013, approximately 80% of LA County TB cases were laboratory confirmed cases.

Susceptibility Testing

Figure 19 and TablesTable 16,Table 17,Table 18,Table 19 andTable 20, summarize the results of drug susceptibility testing (DST). In 2014, there were 474 culture positive TB cases eligible for DST on first-line drugs used to treat TB. Specifically, DST performed is presented for the following first-line drugs: rifampin (n=469), isoniazid (n=469), pyrazinamide (n=471), ethambutol (n=468) and streptomycin (n=441) (Tables 16-20). Among cases with DST results, 3 (0.5%) had resistance to rifampin, 46 (9.8%) had resistance to isoniazid, 21 (4.5%) had resistance to pyrazinamide, and 28 (6.3%) had resistance to streptomycin. Resistance to these first-line drugs has remained fairly stable over the past 5 years (2010-2014).

Multidrug resistant TB (MDR-TB), defined as having resistance to both isoniazid and rifampin, was identified in 5 (1%) TB cases in year 2014 (Table 21; Figure 19). Among these MDR-TB cases, 1 was a pre-XDR (pre-Extensively Drug Resistant) case (Table 20). Despite the significant growth of MDR-TB cases in some global regions[18, 19], in LA County, MDR-TB has remained a small proportion of TB cases, averaging between 1% and 2% of TB cases during 2010-2014. Treatment for TB cases with MDR-TB is often more complex, and requires lengthier (1 ½ to 2 years) and more costly treatment regimens[18-20].

Initial Drug Regimen and Type of Therapy Administration

Of the 585 TB cases confirmed in 2014, 572 were reported to be alive at diagnosis and having started an initial TB drug regimen (Table 22). The majority of these TB cases (89%) were started on at least 4 first line TB drugs (e.g., isoniazid, rifampin, pyrazinamide, ethambutol, streptomycin). Over the past five years, the number of TB cases started on an initial drug regimen consisting of at least 4 first line TB drugs has increased from 65% to about 90% (Table 22). Information regarding type of therapy administration was available for 562 of the TB cases started on an initial drug regimen (Table 23). Of these cases, 53% were on directly observed therapy (DOT), 36% were on a combination of DOT and self-administered therapy (SAT), and 10% were on SAT only (Table 23; Figure 20). From 2010 to 2014, the proportion of TB cases on DOT only has decreased (69% to 53%), while the proportion of cases on DOT and SAT has increased (16% to 36%), (Table 23).

Treatment Outcomes

Treatment completion reports are not submitted until many months after a TB case is initially reported. Therefore, treatment completion data reported for cases counted in 2012 are the most recent that are reliable and available, and are presented in this report. Outcomes for cases expected to complete therapy in 12 months or less exclude cases with rifampin-resistant disease (including MDR-TB), those with

meningeal disease, and children less than 15 years of age with disseminated TB disease. In 2012, there were 487 TB cases for whom therapy of one year or less was indicated. Among these cases, 93.2% completed therapy within 12 months (Table 24). There were also 26 (5.3%) cases who took longer than 12 months to complete treatment. From 2010 to 2012, the proportion of TB cases completing treatment within one year has been steadily increasing from 83% to 93% (Table 24).

Mortality in Persons with Tuberculosis
From 2010-2014, there were a total of 367 deaths among TB cases (Table 25; Figure 21). Among TB cases who died, 78% died during treatment and 22% died before starting treatment.

GEOGRAPHIC DISTRIBUTION

LA County: Service Planning Areas
Figure 22 and Table 26 and 27 present demographic characteristics for TB cases by Service Planning Area (SPA) for year 2014. Among the 8 SPAs, 4 SPAs reported the highest number of TB cases in 2014 (Figure 22; Table 26, Table 27). Specifically, SPA 3: San Gabriel Valley reported 139 cases (24%), SPA 2: San Fernando Valley reported 117 cases (20%), SPA 4: Metro reported 99 cases (17%), and SPA 6: South reported 88 cases (15%).

SCREENING FOR TUBERCULOSIS INFECTION

Interferon-Gamma Release Assay (IGRA) Test Results
The LA County Public Health Laboratory (PHL) processes QuantiFERON TB Gold in-Tube Test (QFT-GIT), a type of Interferon-Gamma Release Assay (IGRA) test. PHL reports monthly QuantiFERON test (QFT) results for every specimen they process (see technical note 3). In 2014, PHL reported results for QFT tests administered at Community Health Services (CHS) Public Health Clinics, HIV Care Clinics, and other Contract Clinics. Out of 20,488 QFT specimens, a total of 3,301 QFT specimens tested positive. Among positive QFT tests, about 71% were administered at CHS Clinics, 24% at HIV Care Clinics, and 4% at Contract Clinics (Box 3). IGRA tests are an important tool to aid in the diagnosis of TB infection,

Box 3. Positive Test Results from QFT Performed by the LA County Public Health Laboratory, by Clinic Type: LA County, 2014*		
Clinic Type	**Total***	**%**
CHS Clinics**	2,357	71.4
HIV Care Clinics	803	24.3
Contract Clinics	141	4.3
Total tests	3,301	100.0
*Positive test results only; **CHS=Community Health Services.		

particularly among individuals who were previously vaccinated with BCG, or persons who are unlikely to return for a skin test reading. High priority populations that should be targeted for TB infection screening include individuals with at least one of the following risk factors: HIV infection, immunocompromising medical conditions (other than HIV), foreign-birth from a country with high TB prevalence, contact with individuals diagnosed with TB disease, or homelessness. TB infection screening is important because it allows detection of infection among individuals who could be at risk of developing or progressing to TB disease, and thus may be eligible for preventive therapy.

TB Notifications
LAC TBCP is also working on the early detection and treatment of TB infection among high-risk non-U.S. born individuals. To achieve this, focus is placed on newly arrived immigrants, refugees, and asylees with a

TB notification. TB notifications inform jurisdictions of recent arrivals with a Class A (active TB with waiver), Class B1 (TB suspects), Class B2 (TB infection) or Class B3 (contact to known TB case) TB notification, that should be promptly evaluated, as outlined in guidelines from CDC[21]. The goal of evaluating immigrants with TB notifications is to (1) identify and treat TB cases promptly and (2) identify and treat persons with TB infection to prevent progression to active disease. Thus, the program provides surveillance to monitor and follow-up these high-risk newly arrived immigrants and refugees in LA County.

FIGURES

Figure 1: Tuberculosis Cases and Incidence Rates: Los Angeles County, 1992-2014
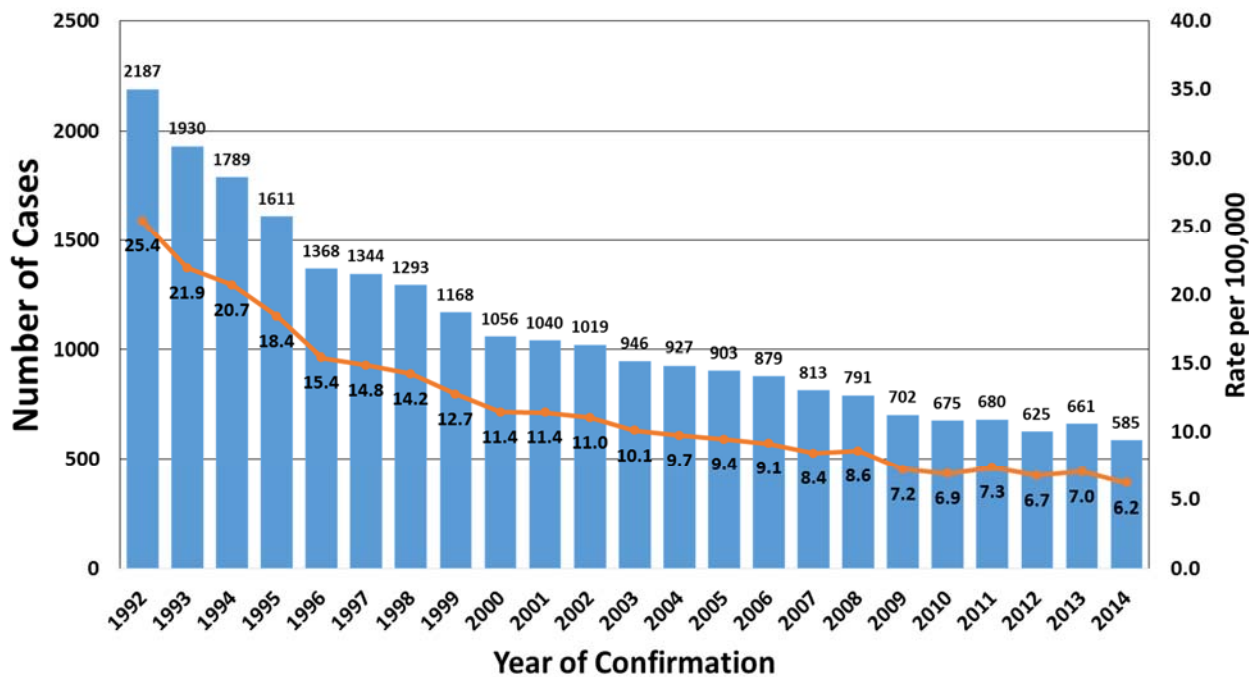
Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change. Population estimates prepared for Los Angeles County, Internal Services Department.[24]

*Case count data for previous years may differ from previously published data and statistics due to updates in TB case information entered into the TB surveillance database, and thus the counts for previous years presented in this report may not match TB counts previously released (the differences are generally very small).

Figure 2: Tuberculosis Cases by Race/Ethnicity*: Los Angeles County, 2010-2014
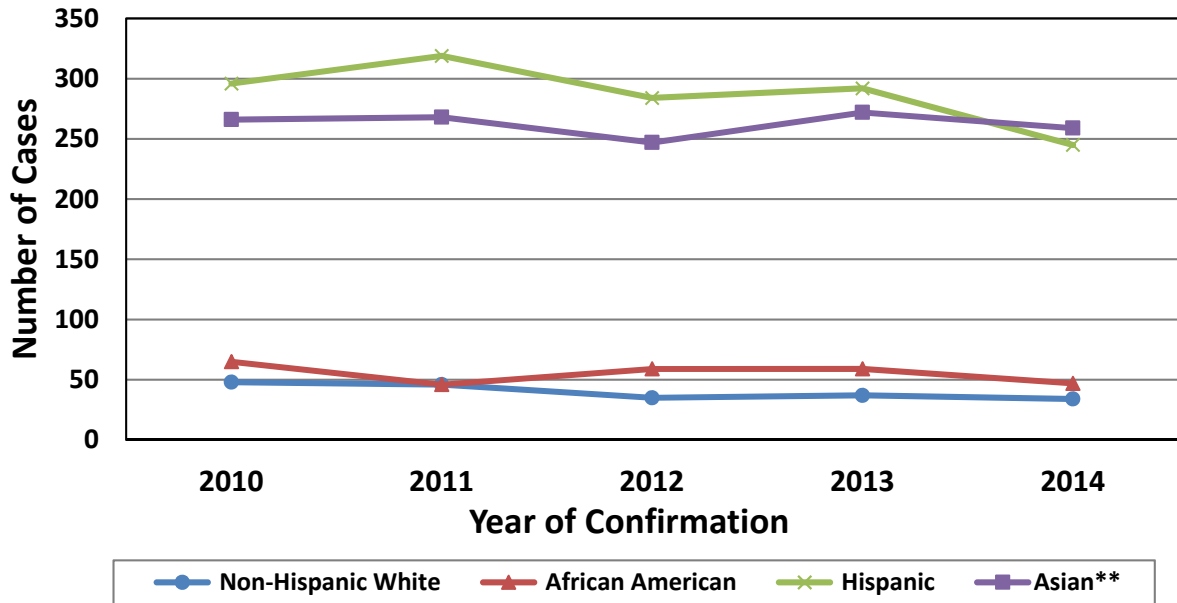
*Excludes 'Other' race/ethnicity category due to small cell counts. ** Asian includes Asian and Pacific Islanders. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Figure 3: Tuberculosis Incidence Rates by Race/Ethnicity*: Los Angeles County, 2010-2014
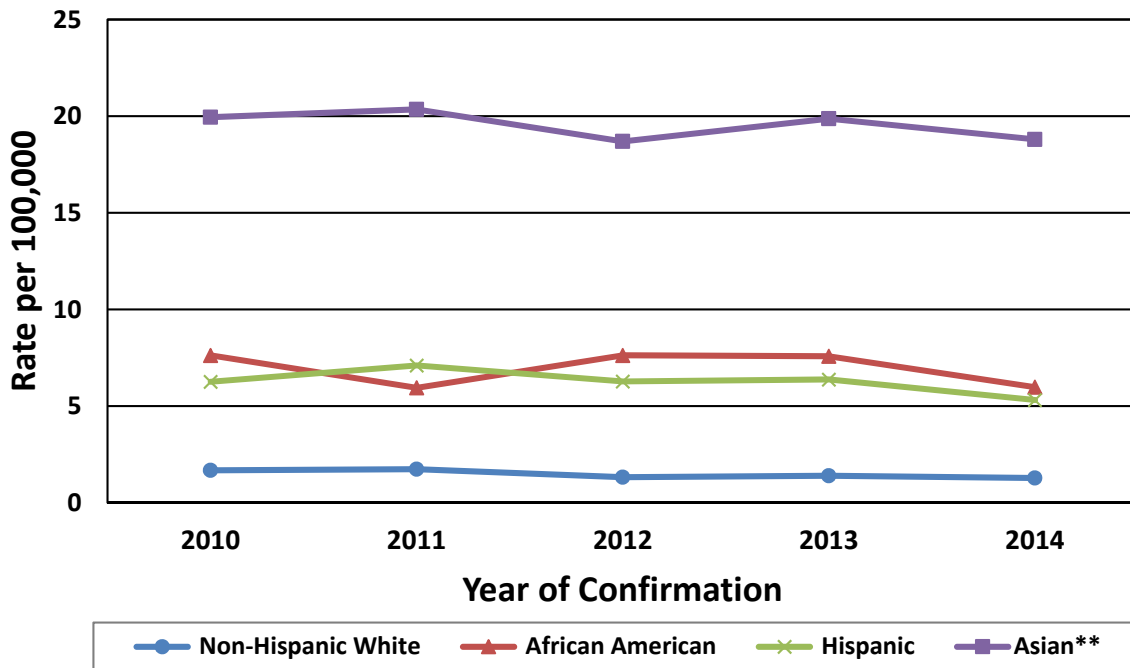
*Excludes 'Other' race/ethnicity category due to small cell counts. ** Asian includes Asian and Pacific Islanders. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change. Population estimates prepared for Los Angeles County, Internal Services Department.[24]

Figure 4: Tuberculosis Cases by Age Group: Los Angeles County, 2010-2014
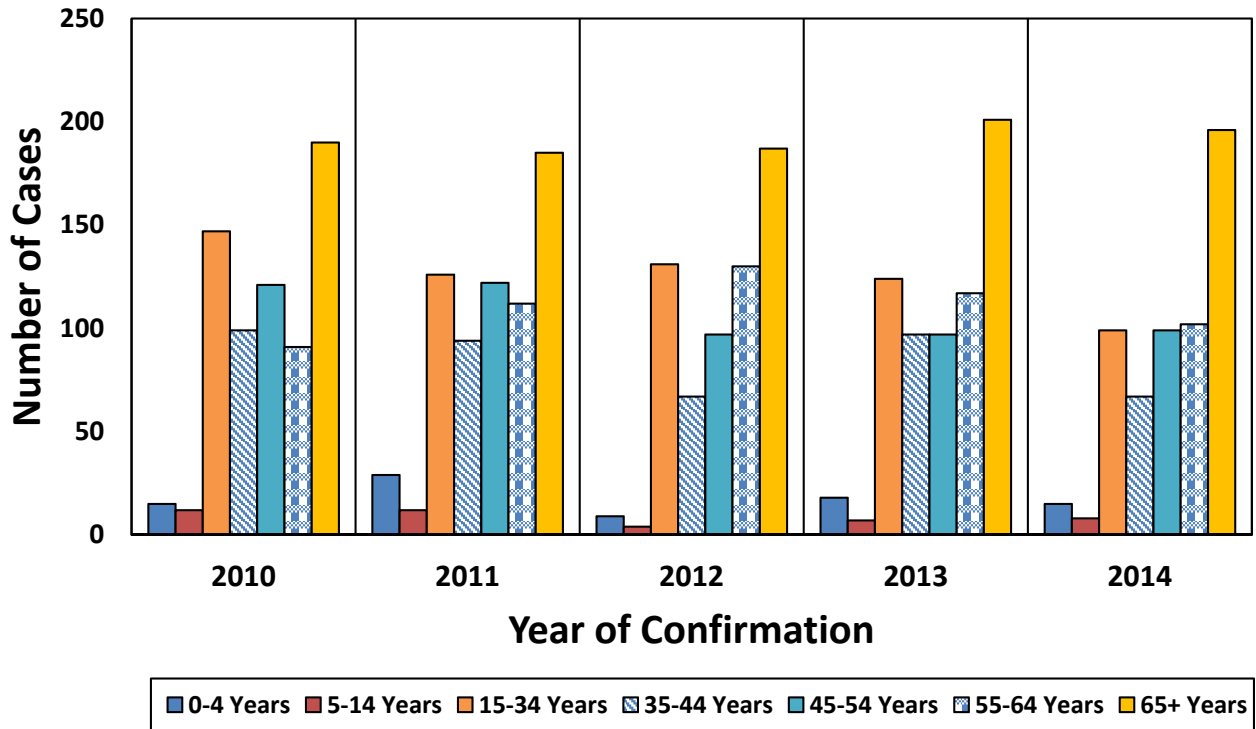
Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Figure 5: Tuberculosis Incidence Rates by Age Group: Los Angeles County, 2010-2014
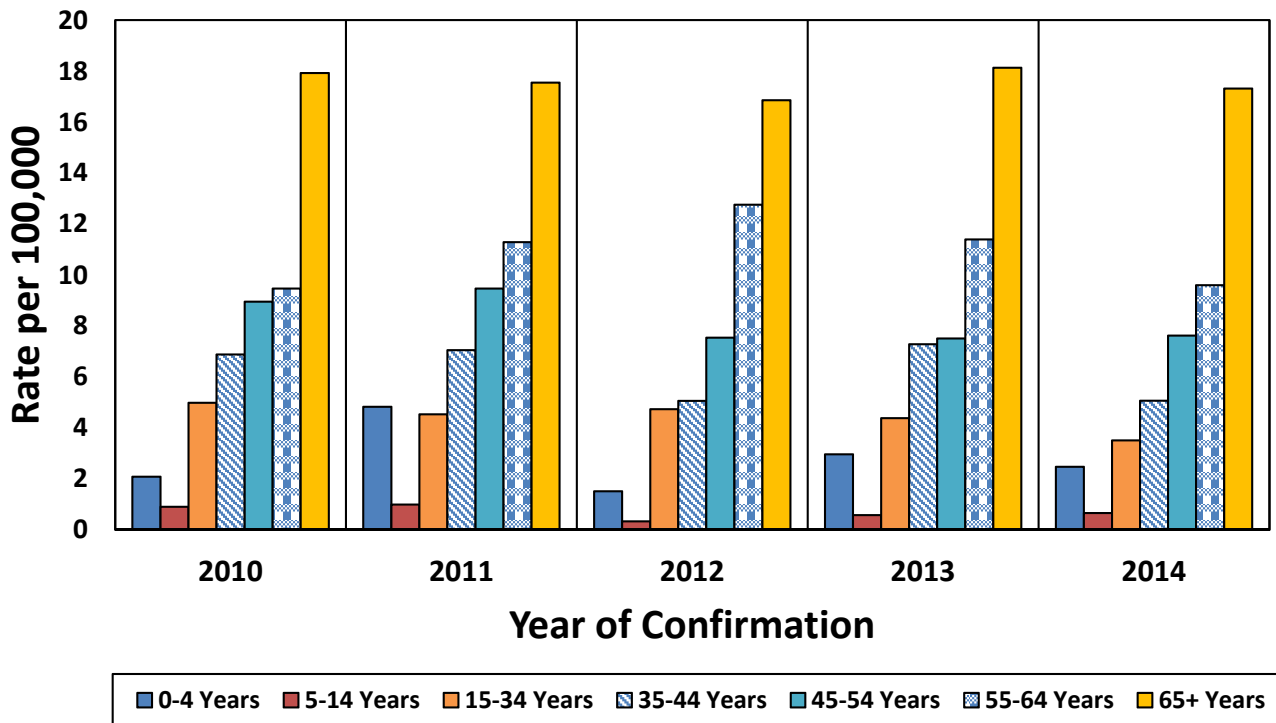
Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change. Population estimates prepared for Los Angeles County, Internal Services Department.[24]

Figure 6: Tuberculosis in Children under 5 Years Old: Los Angeles County, 2010-2014
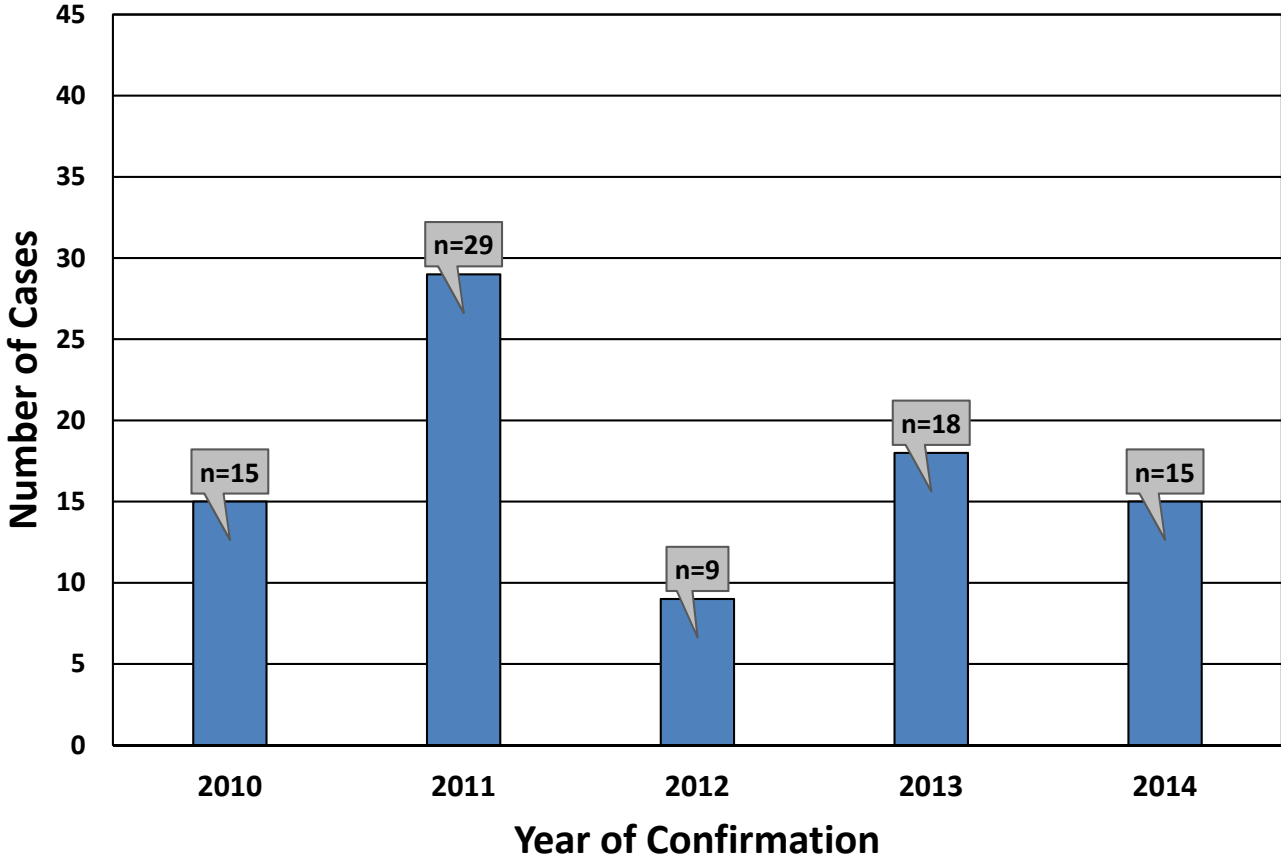
Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

TB among children 0 to 4 years old represented 2.6% (n=15) of all TB cases reported in 2014. Also, Hispanic children 0 to 4 years old accounted for 66% (n=10) of pediatric TB cases.

Figure 7: Tuberculosis Cases by Sex: Los Angeles County, 2010-2014
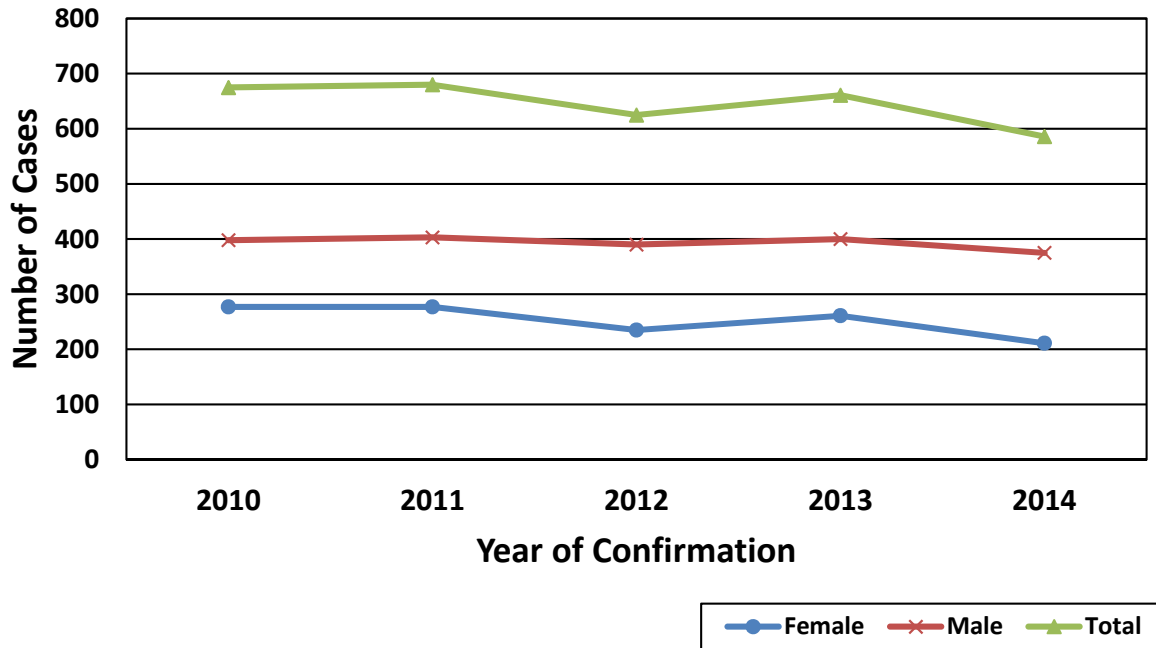
Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Figure 8: Tuberculosis Incidence Rates by Sex: Los Angeles County, 2010-2014
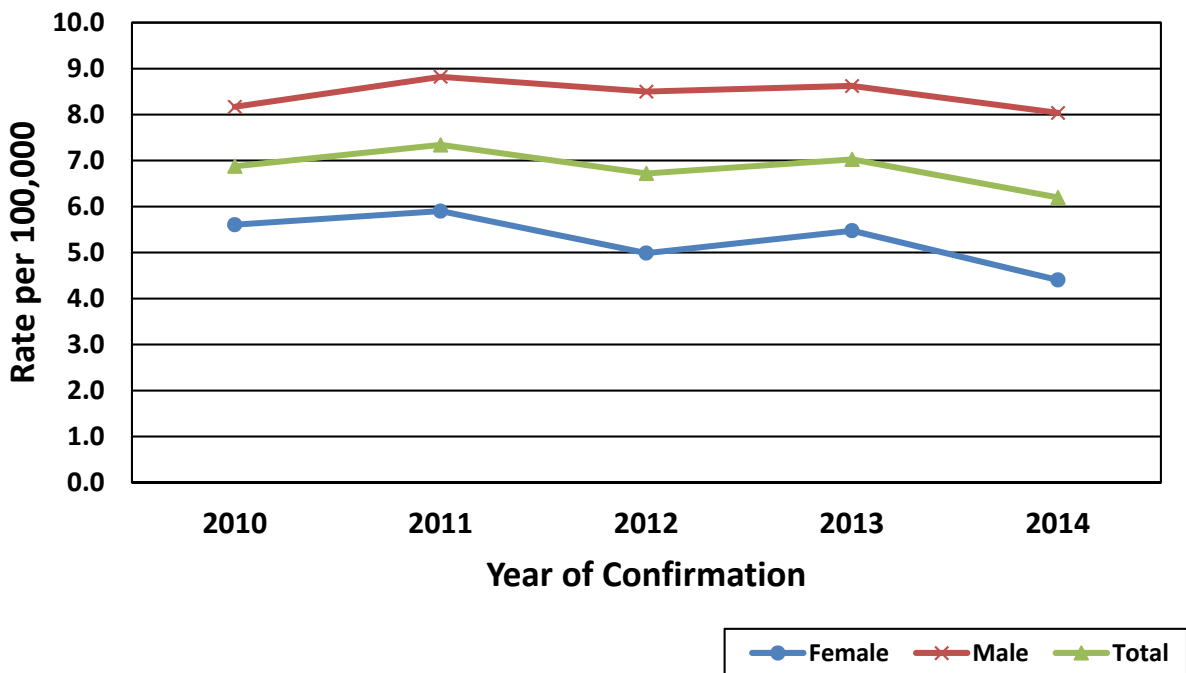
Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change. Population estimates prepared for Los Angeles County, Internal Services Department.[24]

Figure 9: Tuberculosis Cases by Birthplace*: Los Angeles County, 2010-2014
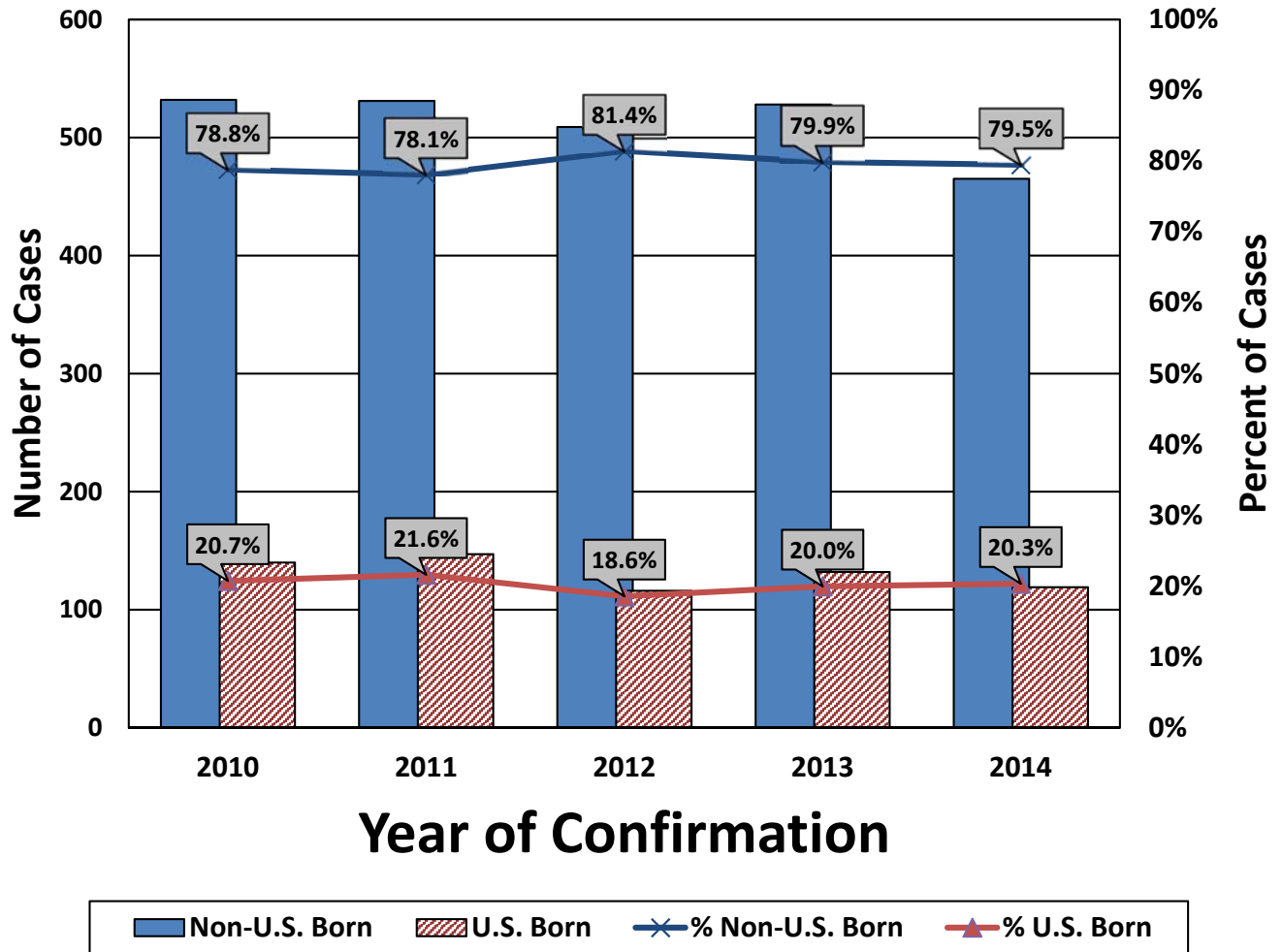
*Includes only TB cases with known place of birth. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

In 2014, there were 4 times the number of TB cases born outside the U.S. (n=465) than cases born in the U.S. (n=119).

Figure 10: Tuberculosis Cases by Birthplace* and Sex: Los Angeles County, 2014
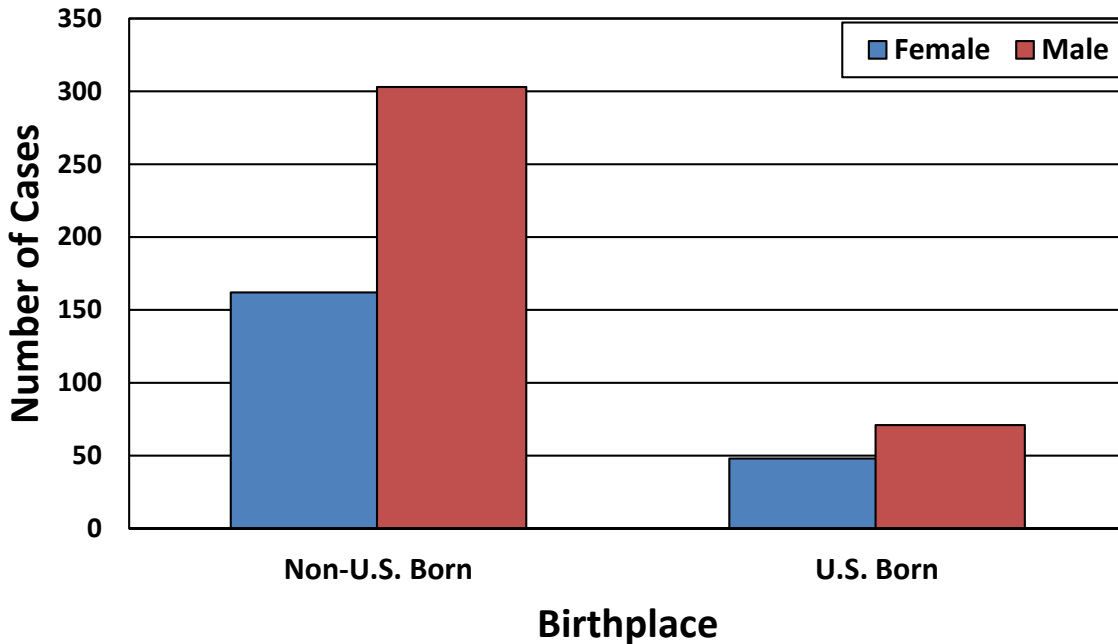
*Includes only TB cases with known place of birth. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Figure 11: Tuberculosis Cases by Birthplace and Race/Ethnicity*: Los Angeles County, 2014
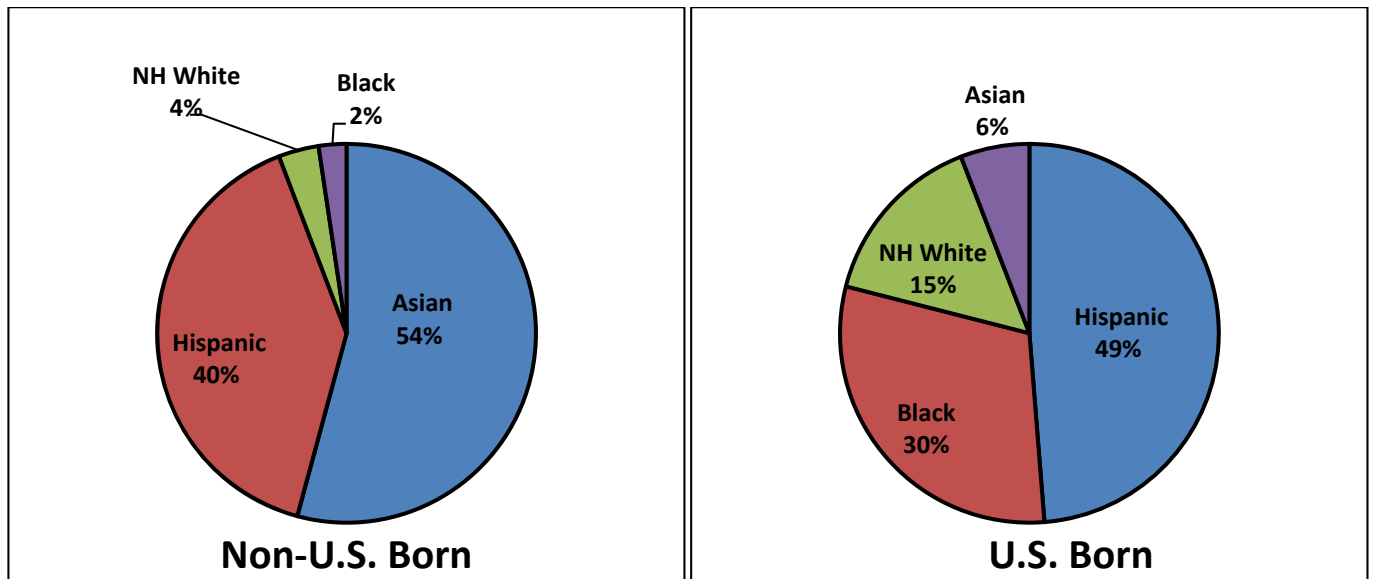
*Includes only TB cases with known place of birth. NH White = non-Hispanic White. Asian includes Asian and Pacific Islanders. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Figure 12: Tuberculosis Cases by Country of Birth*: Los Angeles County, 2014
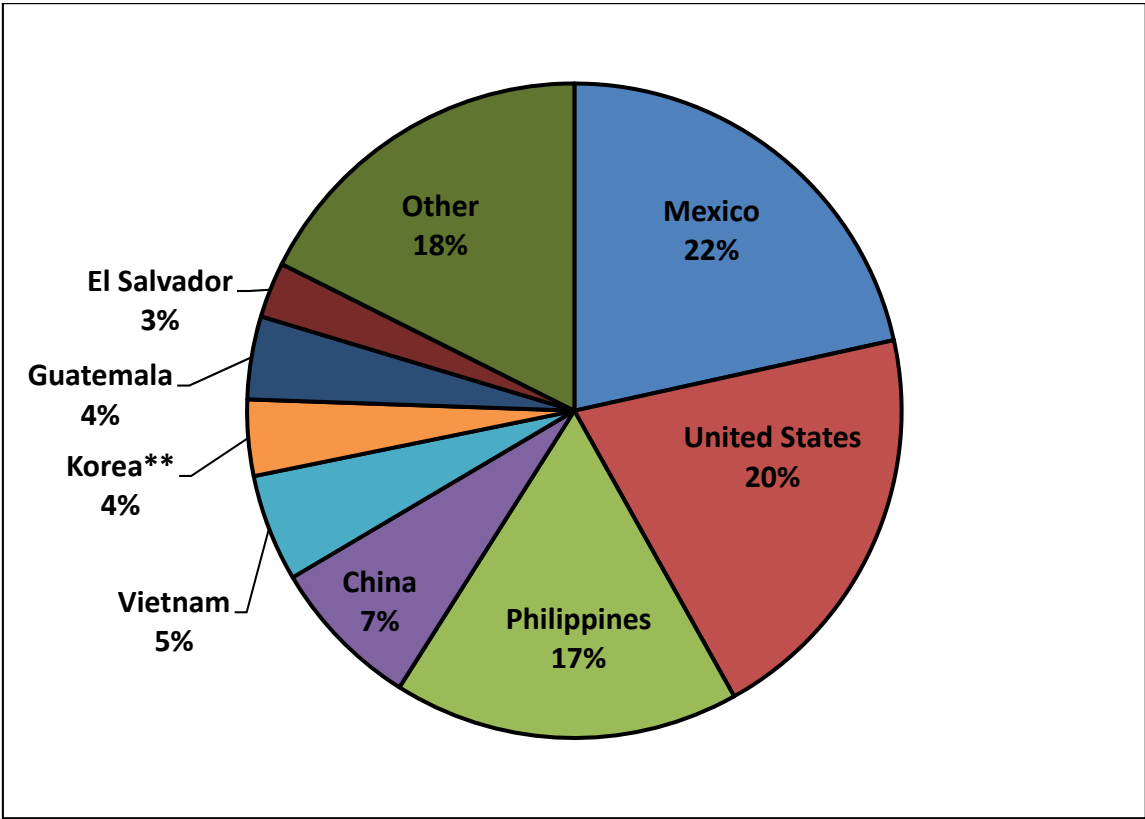
*Includes only TB cases with known place of birth. **Includes North and South Korea. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Two-thirds of TB cases born outside the U.S. (63%) originated from 7 countries: Mexico, Philippines, China, Vietnam, Guatemala, Korea, and El Salvador. These countries all have an elevated burden of TB.

Figure 13: Comorbidities among Adult Tuberculosis Cases: Los Angeles County, 2010-2014
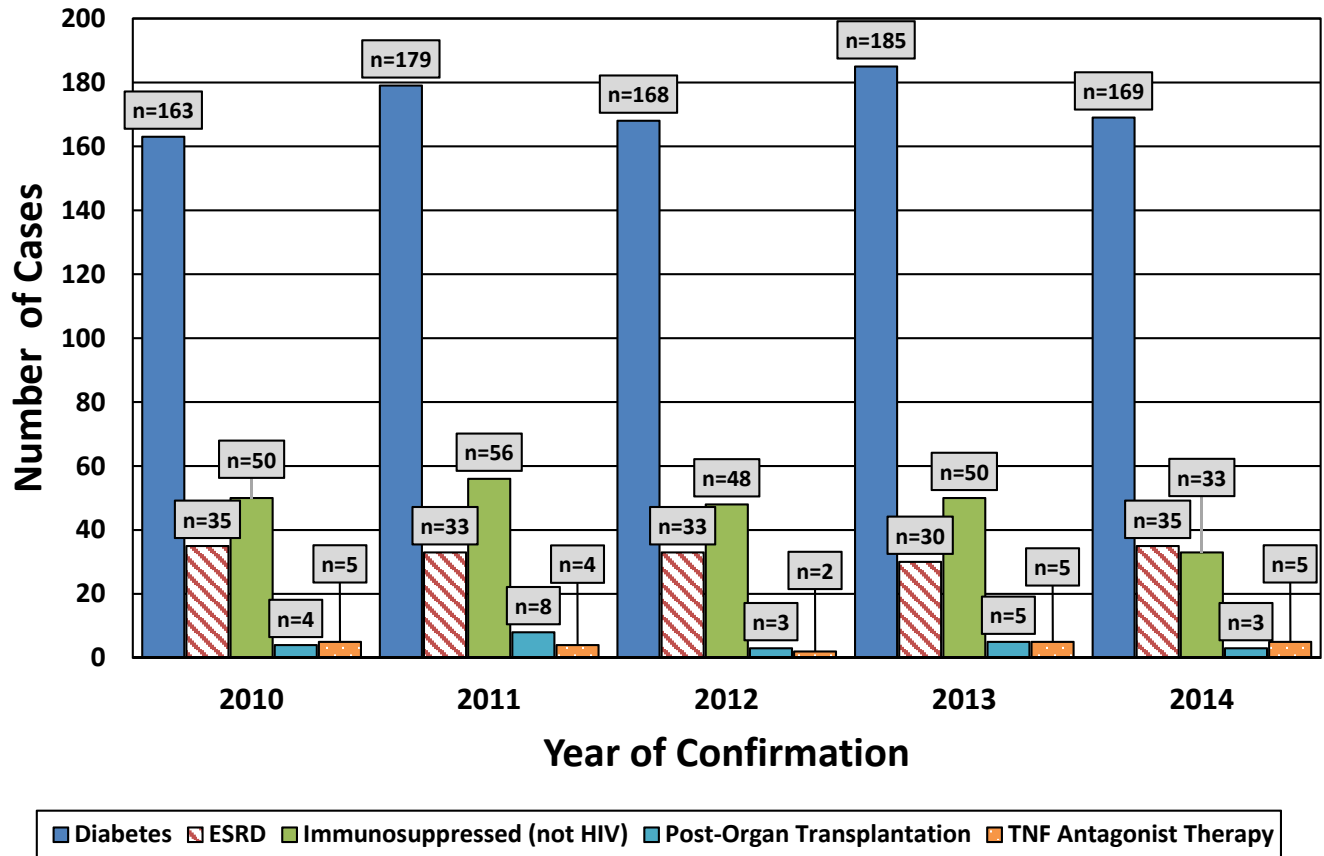
TB cases can have more than one comorbidity. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

In 2014, 40% of adult TB cases had one or more medical comorbidities, including diabetes mellitus, ESRD, post-organ transplantation, or another immunosuppressive condition. The most common comorbidity was diabetes mellitus (30% of cases). Comorbidities increase the risk of TB infection progressing to active TB disease.

Figure 14: HIV Infected Tuberculosis Cases: Los Angeles County, 2010-2014
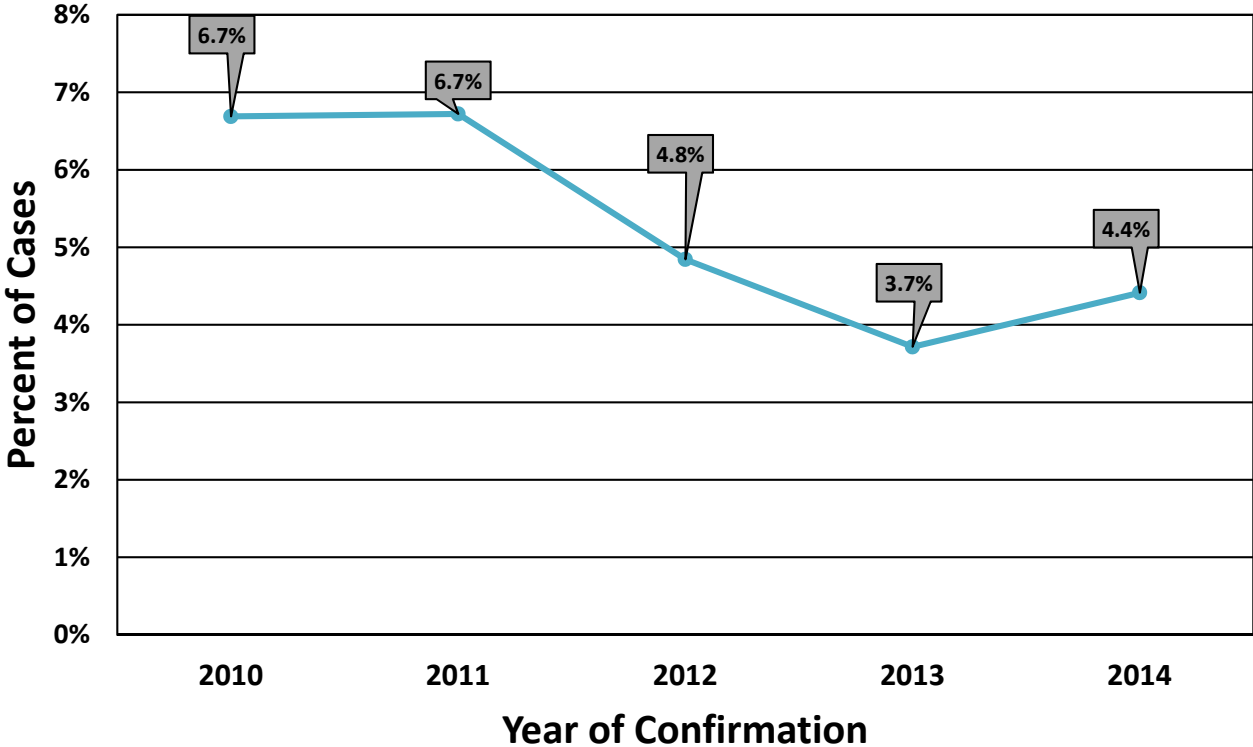
Data include only cases with known HIV status. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

In 2014, there were 23 (4.4%) HIV co-infected TB cases reported in LA County. People living with HIV are at high risk for rapid progression to TB disease.

Figure 15: Reported Substance Use* among Tuberculosis Cases: Los Angeles County, 2010-2014
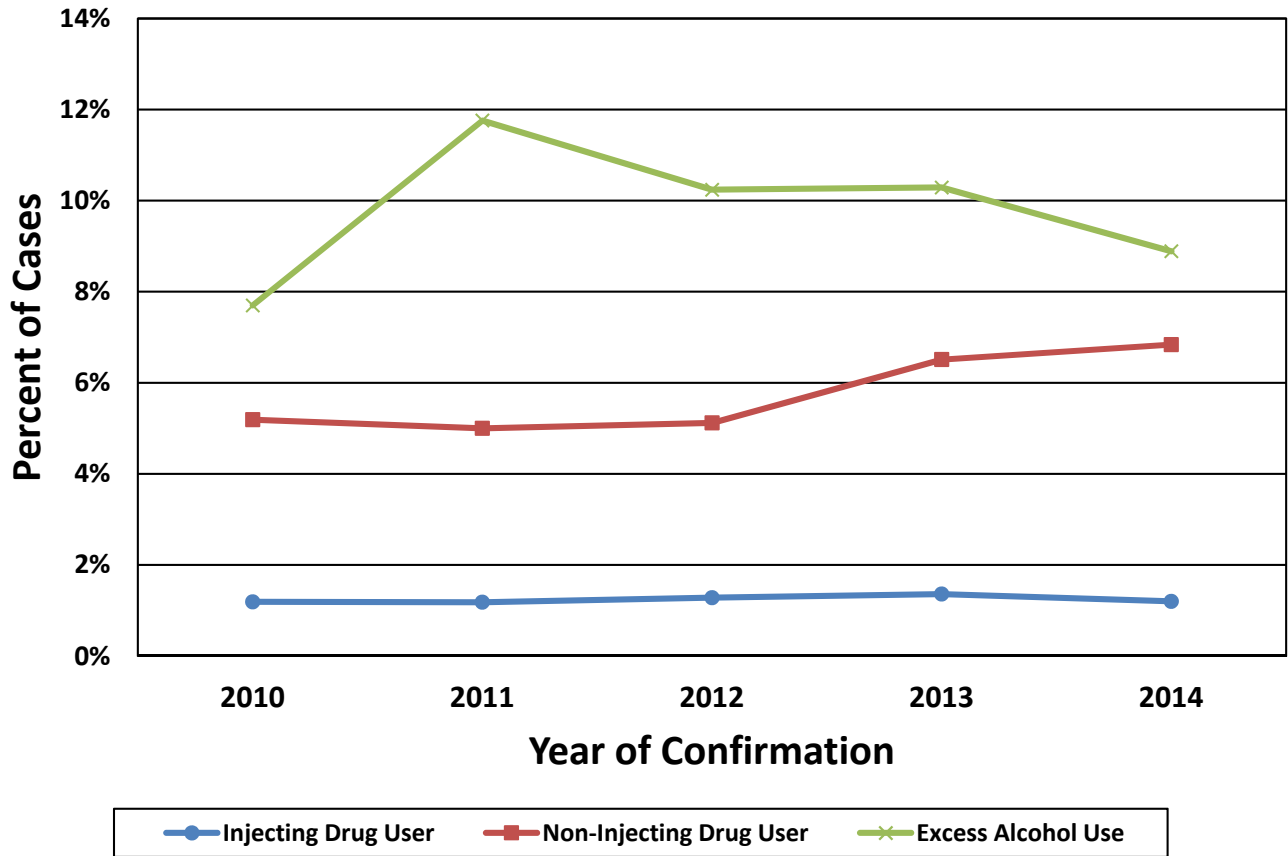
*Drug or excess alcohol use within the past year. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

In 2014, excess alcohol use (8%) was the most commonly reported type of substance use. In fact, excess alcohol use has been most commonly reported in the past 5 years. Substance use is a challenge to the control of TB because individuals with substance use problems are less likely to begin and complete TB treatment.

Figure 16: Tuberculosis Cases Experiencing Homelessness*: Los Angeles County, 2010-2014
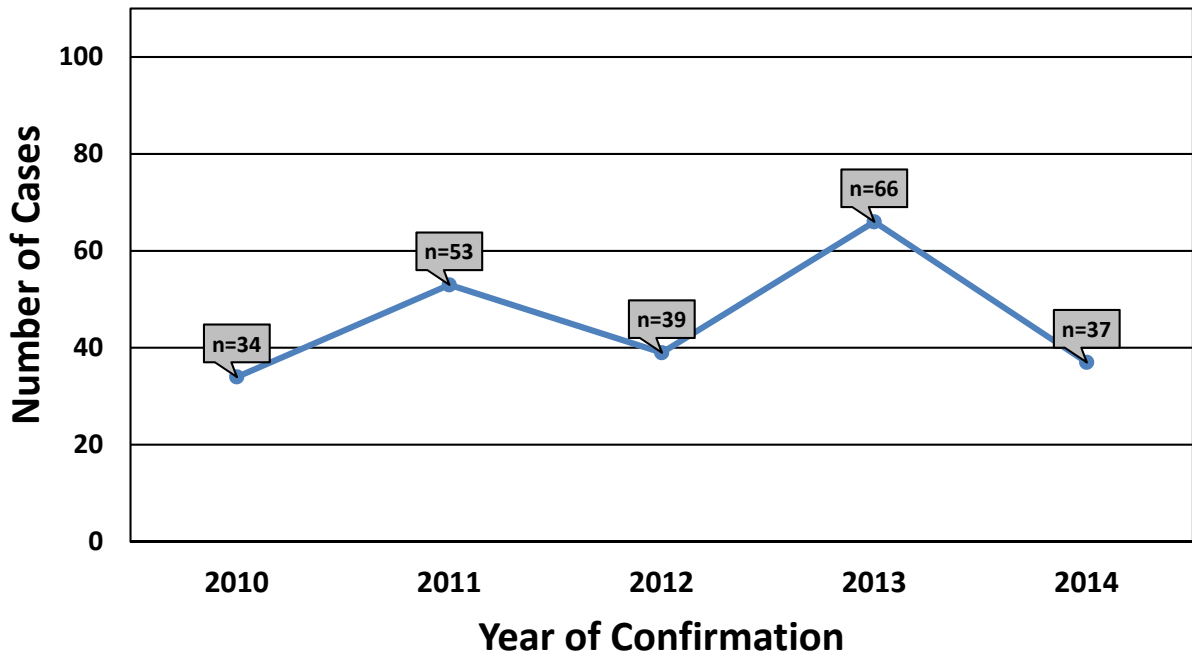
*Homelessness at any time during the 12 months prior to TB diagnosis. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

In 2014, 37 (6%) TB cases confirmed in LA County reported experiencing homelessness within the past year. Persons experiencing homelessness are particularly vulnerable to TB. Factors such as crowded living situations can increase the risk of transmission in this population.

Figure 17: Tuberculosis Cases by Site of Disease: Los Angeles County, 2014

Both Pulmonary and
Extra-pulmonary
11%

*Extra-
pulmonary 22%

Pulmonary
67%

*Cases with pleural,
lymphatic, bone and/or
joint, meningeal,
peritoneal, or other site of
disease. Data exclude Long
Beach and Pasadena TB
cases. Data are provisional
and subject to change.
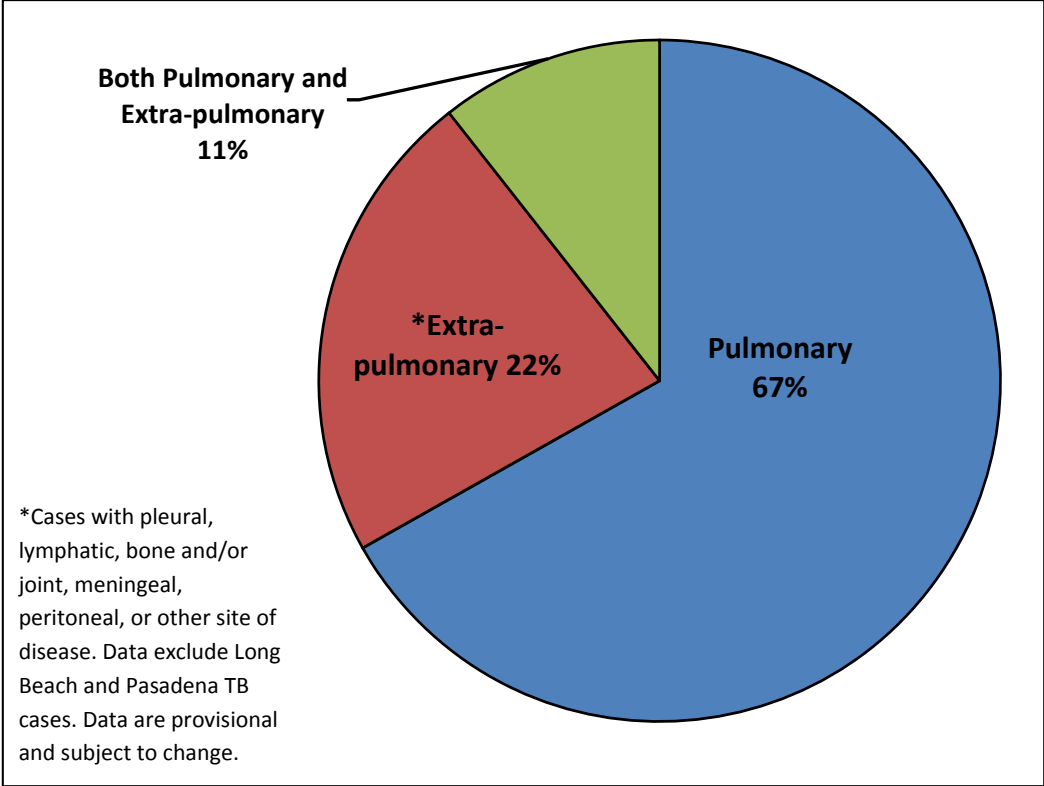
Figure 18: Pulmonary Culture Confirmed Tuberculosis Cases by Sputum Smear Result*: Los Angeles County, 2014

Smear Negative
27.7% (n=99)

Smear Positive
72.3% (n=259)

*Culture and smear positivity
defined as within 14 days of
treatment start date. Data
exclude Long Beach and
Pasadena TB cases. Data are
provisional and subject to
change.
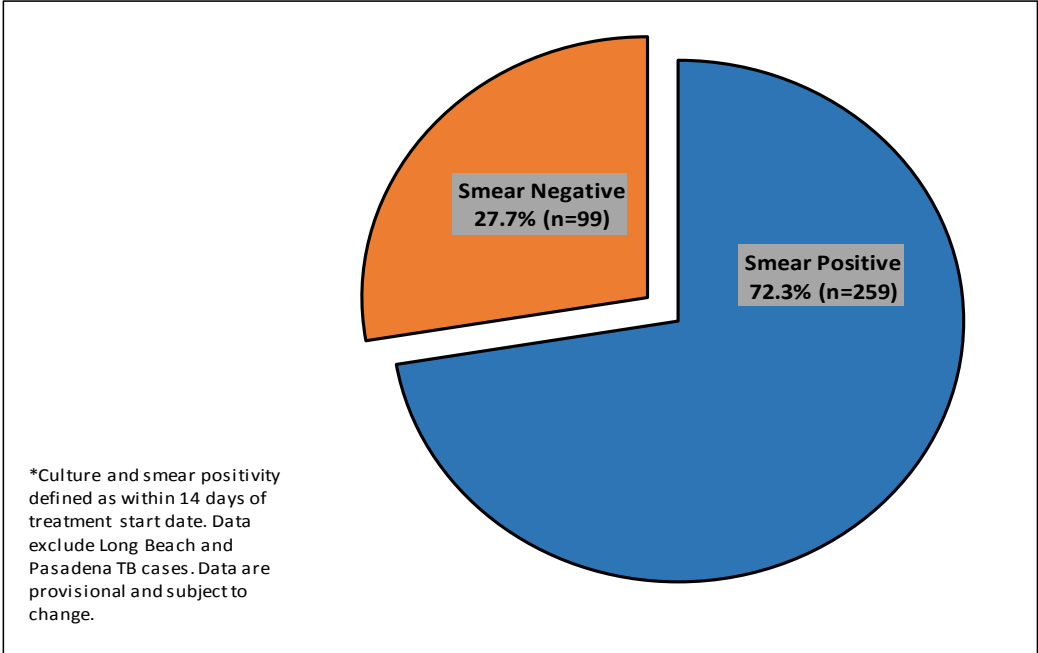
Figure 19: Drug Resistance* among Tuberculosis Cases: Los Angeles County, 2014
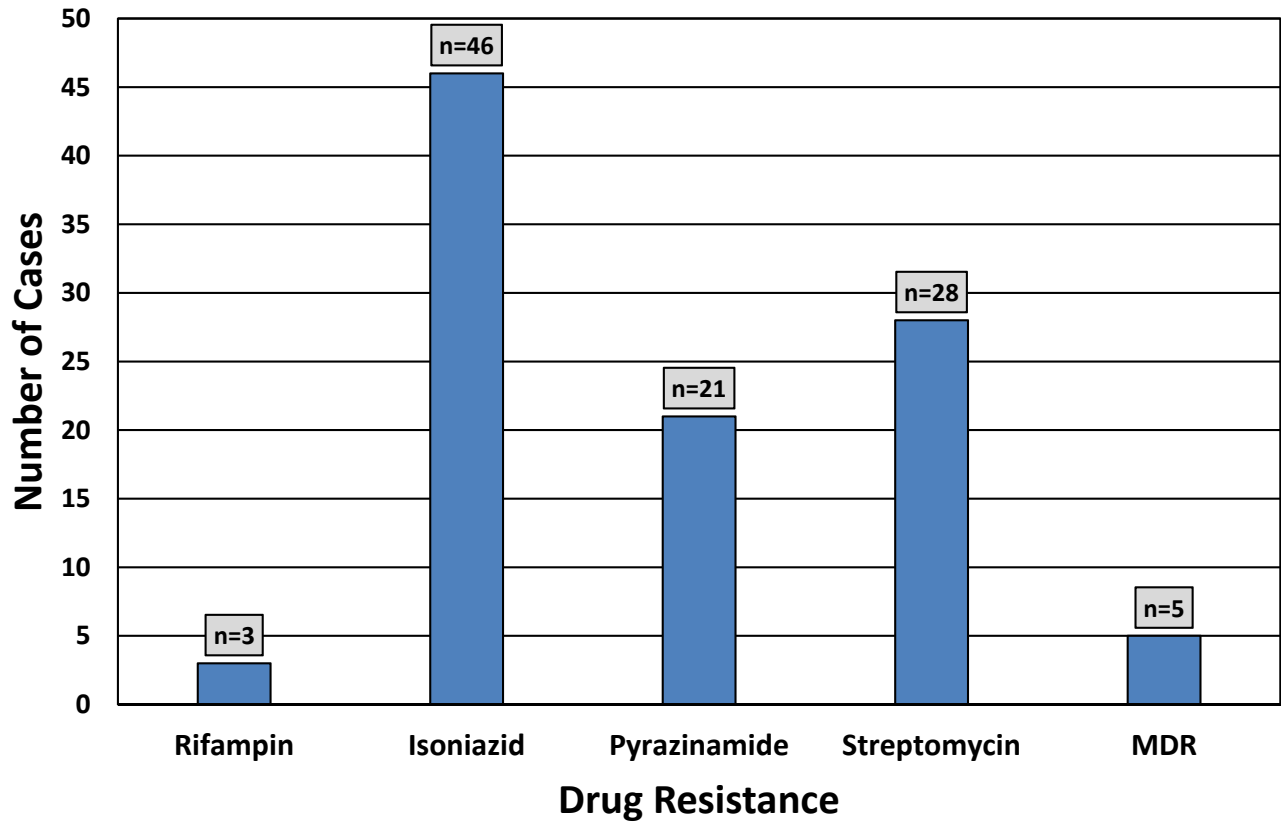
*RIF=Rifampin; INH=Isoniazid; PZA=Pyrazinamide; SM=Streptomycin; MDR=Multi-drug resistance (resistance to isoniazid and rifampin). Based on culture positive cases with susceptibility testing. Data for individual drug resistance cases exclude MDR-TB cases. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

> **Resistance to first-line TB drugs has remained fairly stable in the past 5 years. In 2014, multidrug resistance (MDR) was identified in 5 TB cases.**

Figure 20: Tuberculosis Cases by Therapy Administration*: Los Angeles County, 2014
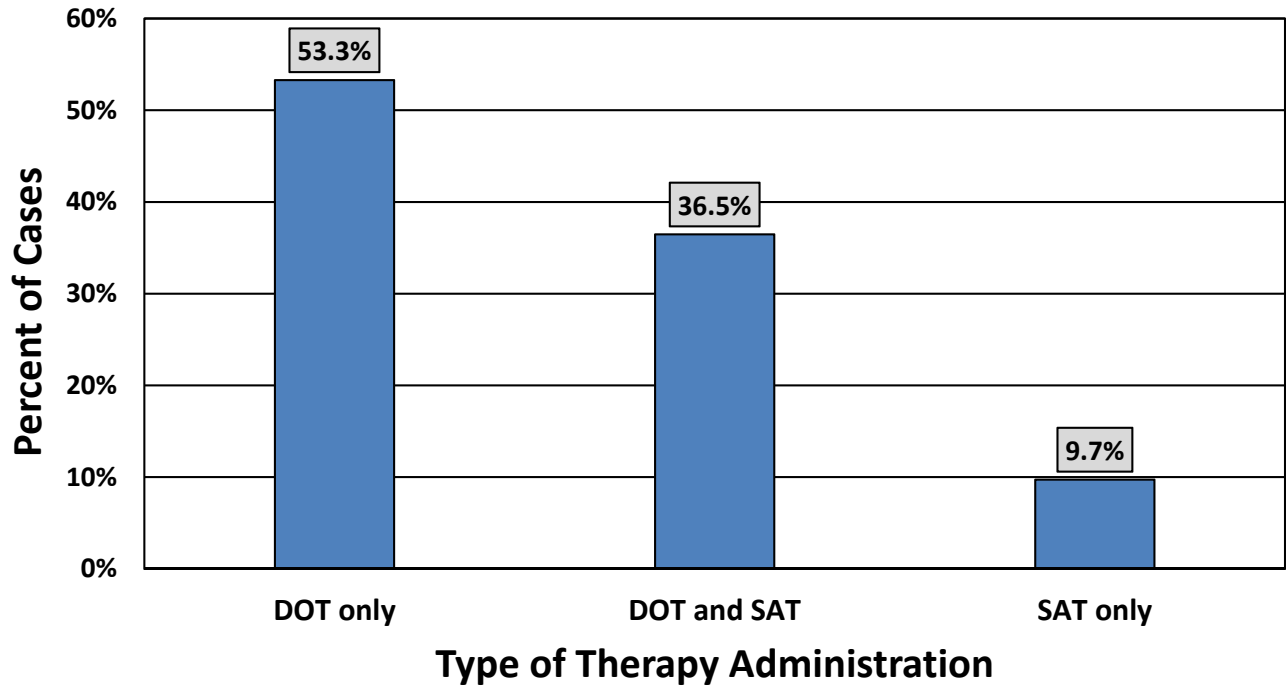
*DOT=Directly Observed Therapy; SAT=Self-Administered Therapy. Based on total number of cases started on therapy and with information on type of therapy administration. 'DOT only' may include TB cases on SAT on weekends. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

In 2014, 53.3% of TB cases were on DOT only, while 36.5% were on a combination of DOT and SAT. In 2014 there was a slight increase, from 2013, in the percentage of TB cases on DOT only (53.3% vs. 49.5%, respectively).

Figure 21: Deaths among Tuberculosis Cases: Los Angeles County, 2010-2014

Alive
n=2,859, 89%

Died
n=367, 11%

Died before Tx
22%

Died during Tx
78%

*Tx=Treatment. Cause of death not available at this time. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.
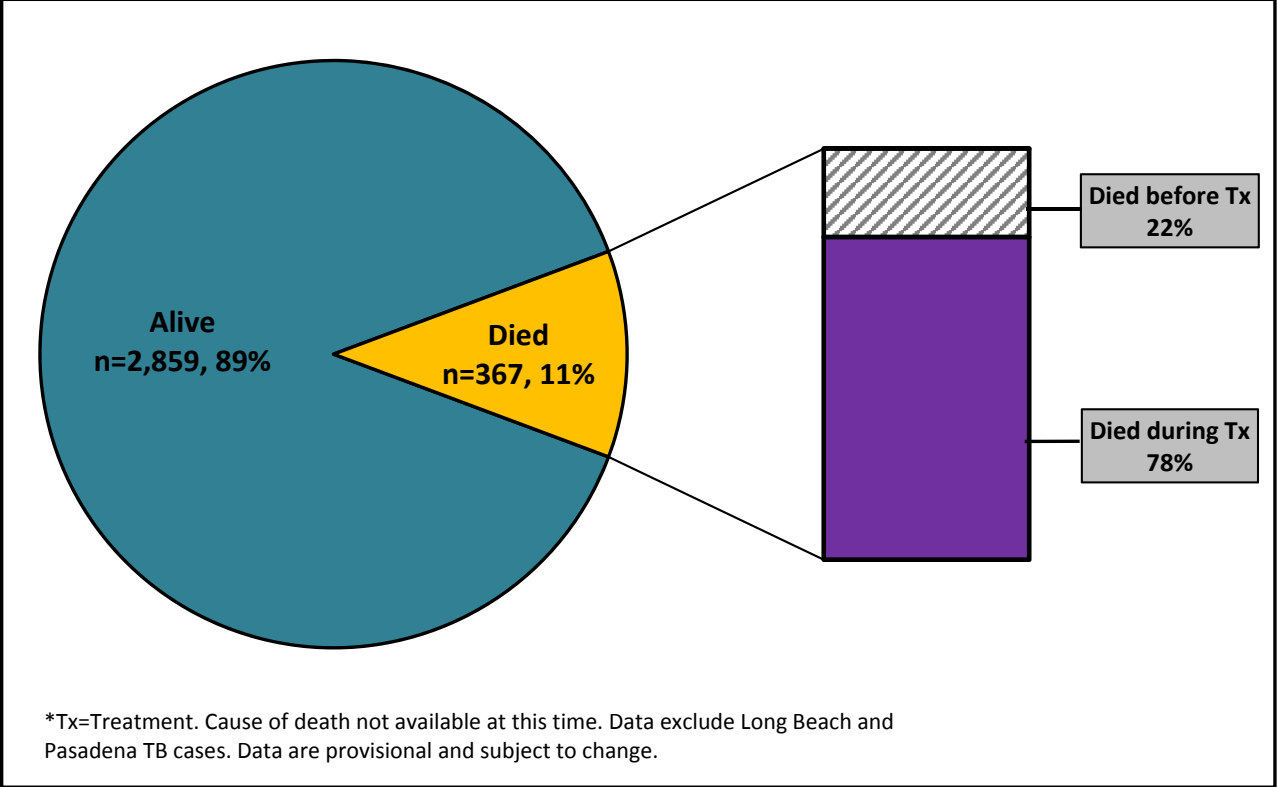
Tables

Table 1: Demographic Characteristics of Tuberculosis Cases: Los Angeles County, 2010-2014

| | Year of Confirmation | | | | | | | | | | Percent Change* |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	2013-2014
Race/Ethnicity											
NH White	48	7.1	46	6.8	35	5.6	37	5.6	34	5.8	-8.1
Black	65	9.6	46	6.8	59	9.4	59	8.9	47	8.0	-20.3
Hispanic	296	43.9	319	46.9	284	45.4	292	44.2	245	41.9	-16.1
Asian	266	39.4	268	39.4	247	39.5	272	41.1	259	44.3	-4.8
Other	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	-
Age Group											
0-4	15	2.2	29	4.3	9	1.4	18	2.7	15	2.6	-16.7
5-14	12	1.8	12	1.8	4	0.6	7	1.1	8	1.4	14.3
15-34	147	21.8	126	18.5	131	21.0	124	18.8	99	16.9	-20.2
35-44	99	14.7	94	13.8	67	10.7	97	14.7	67	11.5	-30.9
45-54	121	17.9	122	17.9	97	15.5	97	14.7	98	16.8	1.0
55-64	91	13.5	112	16.5	130	20.8	117	17.7	102	17.4	-12.8
65+	190	28.1	185	27.2	187	29.9	201	30.4	196	33.5	-2.5
Sex											
Female	277	41.0	277	40.7	235	37.6	261	39.5	210	35.9	-19.5
Male	398	59.0	403	59.3	390	62.4	400	60.5	375	64.1	-6.3
Birthplace											
Non-U.S. Born	532	78.8	531	78.1	509	81.4	528	79.9	465	79.5	-11.9
U.S. Born	140	20.7	147	21.6	116	18.6	132	20.0	119	20.3	-9.8
Unknown	3	0.4	2	0.3	0	0.0	1	0.2	1	0.2	-
Country of Birth											
Mexico	170	25.2	166	24.4	169	27.0	153	23.1	126	21.5	-17.6
United States	140	20.7	146	21.5	115	18.4	132	20.0	119	20.3	-9.8
Philippines	95	14.1	102	15.0	92	14.7	116	17.5	101	17.3	-12.9
China	47	7.0	31	4.6	35	5.6	46	7.0	44	7.5	-4.3
Vietnam	34	5.0	34	5.0	39	6.2	38	5.7	31	5.3	-18.4
Korea***	27	4.0	37	5.4	32	5.1	26	3.9	22	3.8	-15.4
Guatemala	25	3.7	28	4.1	25	4.0	32	4.8	24	4.1	-25.0
El Salvador	18	2.7	35	5.1	28	4.5	25	3.8	16	2.7	-36.0
Other	119	17.6	101	14.9	90	14.5	93	14.2	102	17.5	9.7
Total Cases	675	100.0	680	100.0	625	100.0	661	100.0	585	100.0	-11.5

*Percent change not calculated due to small cell counts. **NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. Other race/ethnicity category includes 1 Native American case for year 2011. ***Includes both North and South Korea. Data excludes Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 2. Tuberculosis Cases by Race/Ethnicity* and Age Group: Los Angeles County, 2010-2014

| | Year of Confirmation | | | | | | | | | |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
	Cases	%*	Cases	%*	Cases	%*	Cases	%*	Cases	%*
NH White										
0-4	1	2.1	1	2.2	0	0.0	0	0.0	1	2.9
5-14	1	2.1	0	0.0	0	0.0	0	0.0	1	2.9
15-34	10	20.8	1	2.2	3	8.6	2	5.4	3	8.8
35-44	5	10.4	7	15.2	2	5.7	5	13.5	2	5.9
45-54	8	16.7	12	26.1	10	28.6	11	29.7	5	14.7
55-64	7	14.6	5	10.9	5	14.3	8	21.6	7	20.6
65+	16	33.3	20	43.5	15	42.9	11	29.7	15	44.1
Subtotal	48	100.0	46	100.0	35	100.0	37	100.0	34	100.0
Black										
0-4	3	4.6	1	2.2	0	0.0	0	0.0	0	0.0
5-14	1	1.5	1	2.2	0	0.0	0	0.0	1	2.1
15-34	10	15.4	9	19.6	13	22.0	11	18.6	6	12.8
35-44	11	16.9	6	13.0	6	10.2	7	11.9	7	14.9
45-54	22	33.8	11	23.9	10	16.9	15	25.4	9	19.1
55-64	9	13.8	10	21.7	20	33.9	12	20.3	14	29.8
65+	9	13.8	8	17.4	10	16.9	14	23.7	10	21.3
Subtotal	65	100.0	46	100.0	59	100.0	59	100.0	47	100.0
Hispanic										
0-4	11	3.7	23	7.2	7	2.5	17	5.8	10	4.1
5-14	8	2.7	9	2.8	2	0.7	6	2.1	5	2.0
15-34	84	28.4	72	22.6	77	27.1	72	24.7	59	24.1
35-44	51	17.2	45	14.1	41	14.4	52	17.8	40	16.3
45-54	56	18.9	67	21.0	41	14.4	43	14.7	38	15.5
55-64	25	8.4	47	14.7	51	18.0	37	12.7	32	13.1
65+	61	20.6	56	17.6	65	22.9	65	22.3	61	24.9
Subtotal	296	100.0	319	100.0	284	100.0	292	100.0	245	100.0
Asian										
0-4	0	0.0	4	1.5	2	0.8	1	0.4	4	1.5
5-14	2	0.8	2	0.7	2	0.8	1	0.4	1	0.4
15-34	43	16.2	44	16.4	38	15.4	39	14.3	31	12.0
35-44	32	12.0	36	13.4	18	7.3	33	12.1	18	6.9
45-54	35	13.2	32	11.9	36	14.6	27	9.9	46	17.8
55-64	50	18.8	49	18.3	54	21.9	60	22.1	49	18.9
65+	104	39.1	101	37.7	97	39.3	111	40.8	110	42.5
Subtotal	266	100.0	268	100.0	247	100.0	272	100.0	259	100.0
Total Cases	675	100.0	680	100.0	625	100.0	661	100.0	585	100.0

*Percent equals cell count divided by column subtotal or total. **NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. 'Other' race/ethnicity category excluded due to small cell counts. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 3. Tuberculosis Cases by Race/Ethnicity* and Sex: Los Angeles County, 2010-2014

	Year of Confirmation									
	2010		**2011**		**2012**		**2013**		**2014**	
	Cases	**%**	**Cases**	**%**	**Cases**	**%**	**Cases**	**%**	**Cases**	**%**
NH White										
Female	20	41.7	14	30.4	14	40.0	12	32.4	16	47.1
Male	28	58.3	32	69.6	21	60.0	25	67.6	18	52.9
Subtotal	48	100.0	46	100.0	35	100.0	37	100.0	34	100.0
Black										
Female	23	35.4	17	37.0	22	37.3	20	33.9	13	27.7
Male	42	64.6	29	63.0	37	62.7	39	66.1	34	72.3
Subtotal	65	100.0	46	100.0	59	100.0	59	100.0	47	100.0
Hispanic										
Female	121	40.9	121	37.9	105	37.0	113	38.7	95	38.8
Male	175	59.1	198	62.1	179	63.0	179	61.3	150	61.2
Subtotal	296	100.0	319	100.0	284	100.0	292	100.0	245	100.0
Asian										
Female	113	42.5	125	46.6	94	38.1	116	42.6	86	33.2
Male	153	57.5	143	53.4	153	61.9	156	57.4	173	66.8
Subtotal	266	100.0	268	100.0	247	100.0	272	100.0	259	100.0
Total Cases	675	100.0	680	100.0	625	100.0	661	100.0	585	100.0

*NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. 'Other' race/ethnicity category excluded due to small cell counts. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 4. Tuberculosis Cases by Race/Ethnicity*, Sex, and Age Group: Los Angeles County, 2014

| | Age Group | | | | | | | | | | | | |
| | 0-4 | | 5-14 | | 15-34 | | 35-44 | | 45-54 | | 55-64 | | 65+ | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
NH White														
Female	1	100.0	0	0.0	2	66.7	1	50.0	1	20.0	3	42.9	8	53.3
Male	0	0.00	1	100.0	1	33.3	1	50.0	4	80.0	4	57.1	7	46.7
Subtotal	1	100.0	1	100.0	3	100.0	2	100.0	5	100.0	7	100.0	15	100.0
Black														
Female	0	0.0	1	100.0	3	50.0	1	14.3	2	22.2	3	21.4	3	30.0
Male	0	0.0	0	0.0	3	50.0	6	85.7	7	77.8	11	78.6	7	70.0
Subtotal	0	0.0	1	100.0	6	100.0	7	100.0	9	100.0	14	100.0	10	100.0
Hispanic														
Female	5	50.0	5	100.0	25	42.4	13	32.5	8	21.1	12	37.5	27	44.3
Male	5	50.0	0	0.0	34	57.6	27	67.5	30	78.9	20	62.5	34	55.7
Subtotal	10	100.0	5	100.0	59	100.0	40	100.0	38	100.0	32	100.0	61	100.0
Asian														
Female	3	75.0	1	100.0	17	54.8	7	38.9	12	26.1	12	24.5	34	30.9
Male	1	25.0	0	0.0	14	45.2	11	61.1	34	73.9	37	75.5	76	69.1
Subtotal	4	100.0	1	100.0	31	100.0	18	100.0	46	100.0	49	100.0	110	100.0
Total Cases	15	100.0	8	100.0	99	100.0	67	100.0	98	100.0	102	100.0	196	100.0

*NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. 'Other' race/ethnicity category excluded due to small cell counts. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 5. Tuberculosis Cases Born Outside the U.S. by Race/Ethnicity* and Age Group: Los Angeles County, 2010-2014

| | Year of Confirmation | | | | | | | | | |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
NH White										
0-4	0	0.0	1	4.8	0	0.0	0	0.0	0	0.0
5-14	1	4.2	0	0.0	0	0.0	0	0.0	0	0.0
15-34	6	25.0	0	0.0	1	5.9	1	5.9	1	6.3
35-44	2	8.3	2	9.5	2	11.8	2	11.8	1	6.3
45-54	5	20.8	5	23.8	3	17.6	5	29.4	1	6.3
55-64	3	12.5	1	4.8	2	11.8	1	5.9	3	18.8
65+	7	29.2	12	57.1	9	52.9	8	47.1	10	62.5
Subtotal	24	100.0	21	100.0	17	100.0	17	100.0	16	100.0
Black										
0-4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5-14	0	0.0	0	0.0	0	0.0	0	0.0	1	9.1
15-34	8	47.1	4	44.4	6	35.3	5	38.5	4	36.4
35-44	4	23.5	1	11.1	4	23.5	4	30.8	1	9.1
45-54	3	17.6	2	22.2	1	5.9	2	15.4	1	9.1
55-64	1	5.9	2	22.2	3	17.6	1	7.7	1	9.1
65+	1	5.9	0	0.0	3	17.6	1	7.7	3	27.3
Subtotal	17	100.0	9	100.0	17	100.0	13	100.0	11	100.0
Hispanic										
0-4	0	0.0	2	0.8	0	0.0	2	0.9	0	0.0
5-14	2	0.9	0	0.0	0	0.0	2	0.9	0	0.0
15-34	60	25.9	54	22.1	58	24.6	49	21.3	32	17.2
35-44	44	19.0	39	16.0	34	14.4	45	19.6	34	18.3
45-54	53	22.8	58	23.8	39	16.5	34	14.8	34	18.3
55-64	21	9.1	42	17.2	48	20.3	36	15.7	30	16.1
65+	52	22.4	49	20.1	57	24.2	62	27.0	56	30.1
Subtotal	232	100.0	244	100.0	236	100.0	230	100.0	186	100.0
Asian										
0-4	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4
5-14	1	0.4	1	0.4	2	0.8	0	0.0	1	0.4
15-34	38	14.7	41	16.0	32	13.4	38	14.2	30	11.9
35-44	32	12.4	36	14.0	18	7.5	33	12.4	17	6.7
45-54	34	13.1	32	12.5	36	15.1	27	10.1	46	18.3
55-64	50	19.3	49	19.1	54	22.6	60	22.5	48	19.0
65+	104	40.2	98	38.1	97	40.6	109	40.8	109	43.3
Subtotal	259	100.0	257	100.0	239	100.0	267	100.0	252	100.0
Total Cases	532	100.0	531	100.0	509	100.0	528	100.0	465	100.0

*NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. Other race/ethnicity category excluded due to small cell counts. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 6. Adult Tuberculosis Cases by Comorbidities* and Reported Substance Use: Los Angeles County, 2010-2014**

| | Year of Confirmation | | | | | | | | | |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Diabetes	163	25.5	179	28.0	168	28.0	185	29.5	169	30.1
ESRD	35	5.5	33	5.2	33	5.5	30	4.8	35	6.2
Immunosuppressed (not HIV)	50	7.8	56	8.9	48	8.0	50	8.0	33	5.9
HIV Positive	39	5.8	41	6.0	28	4.5	22	3.3	23	3.9
Post-Organ Transplantation	4	0.6	8	1.3	3	0.5	5	0.8	3	0.5
TNF Antagonist Therapy	5	0.8	4	0.6	2	0.3	5	0.8	5	0.9
Injecting Drug Use	8	1.2	8	1.2	8	1.3	9	1.4	7	1.2
Non-Injecting Drug Use	35	5.2	34	5.0	32	5.1	43	6.5	40	6.8
Excess Alcohol Use	52	7.7	80	12.0	64	10.0	68	10.0	52	8.9

*TB cases can have more than one comorbidity. HIV includes all ages. **Drug or alcohol use within 1 year of TB diagnosis. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 7. Demographic Characteristics of HIV Infected Tuberculosis Cases: Los Angeles County, 2010-2014

| | Year of Confirmation | | | | | | | | | |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Race/Ethnicity*										
NH White	2	5.1	3	7.3	0	0.0	4	18.2	1	4.3
Black	10	25.6	10	24.4	6	21.4	6	27.3	9	39.1
Hispanic	25	64.1	27	65.9	19	67.9	11	50.0	10	43.5
Asian	2	5.1	1	2.4	3	10.7	1	4.5	3	13.0
Age Group**										
15-34	10	25.6	10	24.4	3	10.7	5	22.7	3	13.0
35-44	13	33.3	9	22.0	10	35.7	6	27.3	9	39.1
45-54	11	28.2	17	41.5	6	21.4	6	27.3	7	30.4
55-64	3	7.7	5	12.2	7	25.0	3	13.6	3	13.0
65+	2	5.1	0	0.0	2	7.1	2	9.1	1	4.3
Sex										
Female	7	17.9	6	14.6	3	10.7	5	22.7	3	13.0
Male	32	82.1	35	85.4	25	89.3	17	77.3	20	87.0
Place of Birth										
Non-U.S. Born	28	71.8	30	73.2	20	71.4	13	59.1	9	39.1
U.S. Born	10	25.6	11	26.8	8	28.6	9	40.9	14	60.9
Unknown	1	2.6	0	0.0	0	0.0	0	0.0	0	0.0
Injecting Drug Use**										
Yes	0	0.0	1	2.4	0	0.0	2	9.1	2	8.7
No	38	97.4	37	90.2	25	89.3	19	86.4	21	91.3
Unknown	1	2.6	3	7.3	3	10.7	1	4.5	0	0.0
Non-Injecting Drug Use**										
Yes	3	7.7	8	19.5	6	21.4	3	13.6	9	39.1
No	35	89.7	30	73.2	21	75.0	18	81.8	14	60.9
Unknown	1	2.6	3	7.3	1	3.6	1	4.5	0	0.0
Excess Alcohol Use**										
Yes	1	2.6	14	34.1	6	21.4	3	13.6	3	13.0
No	35	89.7	24	58.5	21	75.0	18	81.8	20	87.0
Unknown	3	7.7	3	7.3	1	3.6	1	4.5	0	0.0
Homelessness**										
Yes	6	15.4	12	29.3	6	21.4	8	36.4	6	26.1
No	32	82.1	28	68.3	22	78.6	14	63.6	17	73.9
Unknown	1	2.6	1	2.4	0	0.0	0	0.0	0	0.0
Total	39	100.0	41	100.0	28	100.0	22	100.0	23	100.0

*NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. **There were no HIV co-infected TB cases under the age of 15. ***Within 1 year of TB diagnosis. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

**Table 8. Demographic Characteristics of Tuberculosis Cases Experiencing Homelessness*:
Los Angeles County, 2010-2014**

| | Year of Confirmation | | | | | | | | | |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Race/Ethnicity**										
NH White	3	8.8	3	5.7	2	5.1	6	9.1	5	13.5
Black	11	32.4	16	30.2	13	33.3	23	34.8	14	37.8
Hispanic	14	41.2	30	56.6	21	53.8	34	51.5	11	29.7
Asian	6	17.6	4	7.5	3	7.7	3	4.5	7	18.9
Age Group***										
15-34	8	23.5	8	15.1	8	20.5	8	12.1	5	13.5
35-44	5	14.7	15	28.3	9	23.1	17	25.8	4	10.8
45-54	13	38.2	12	22.6	8	20.5	24	36.4	12	32.4
55-64	3	8.8	15	28.3	13	33.3	10	15.2	9	24.3
65+	5	14.7	3	5.7	1	2.6	7	10.6	7	18.9
Sex										
Female	2	5.9	7	13.2	4	10.3	8	12.1	3	8.1
Male	32	94.1	46	86.8	35	89.7	58	87.9	34	91.9
Birthplace										
Non-U.S. Born	18	52.9	26	49.1	18	46.2	30	45.5	16	43.2
U.S. Born	15	44.1	27	50.9	21	53.8	35	53.0	20	54.1
Unknown	1	2.9	0	0.0	0	0.0	1	1.5	1	2.7
Injecting Drug Use*										
Yes	2	5.9	4	7.5	3	7.7	4	6.1	1	2.7
No	26	76.5	44	83.0	33	84.6	57	86.4	31	83.8
Unknown	6	17.6	5	9.4	3	7.7	5	7.6	5	13.5
Non-Injecting Drug Use*										
Yes	6	17.6	16	30.2	12	30.8	19	28.8	13	35.1
No	23	67.6	32	60.4	23	59.0	42	63.6	20	54.1
Unknown	5	14.7	5	9.4	4	10.3	5	7.6	4	10.8
Excess Alcohol Use*										
Yes	11	32.4	25	47.2	19	48.7	36	54.5	16	43.2
No	19	55.9	24	45.3	17	43.6	28	42.4	17	45.9
Unknown	4	11.8	4	7.5	3	7.7	2	3.0	4	10.8
Total	34	100.0	53	100.0	39	100.0	66	100.0	37	100.0

*Within 1 year of TB Diagnosis. **NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. ***There were no TB cases experiencing homelessness under the age of 15. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 9. Tuberculosis Cases Experiencing Homelessness* by Race/Ethnicity** and Sex: Los Angeles County, 2010-2014

	Year of Confirmation									
	2010		**2011**		**2012**		**2013**		**2014**	
	Cases	**%**	**Cases**	**%**	**Cases**	**%**	**Cases**	**%**	**Cases**	**%**
NH White										
Female	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Male	3	100.0	3	100.0	2	100.0	6	100.0	5	100.0
Subtotal	3	100.0	3	100.0	2	100.0	6	100.0	5	100.0
Black										
Female	2	18.2	3	18.8	1	7.7	2	8.7	2	14.3
Male	9	81.8	13	81.3	12	92.3	21	91.3	12	85.7
Subtotal	11	100.0	16	100.0	13	100.0	23	100.0	14	100.0
Hispanic										
Female	0	0.0	3	10.0	3	14.3	5	14.7	0	0.0
Male	14	100.0	27	90.0	18	85.7	29	85.3	11	100.0
Subtotal	14	100.0	30	100.0	21	100.0	34	100.0	11	100.0
Asian										
Female	0	0.0	1	25.0	0	0.0	1	33.3	1	14.3
Male	6	100.0	3	75.0	3	100.0	2	66.7	6	85.7
Subtotal	6	100.0	4	100.0	3	100.0	3	100.0	7	100.0
Total Cases	34	100.0	53	100.0	39	100.0	66	100.0	37	100.0

*Homelessness within 1 year of TB Diagnosis. **NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 10. Tuberculosis Cases Experiencing Homelessness* by Race/Ethnicity** and Age Group: Los Angeles County, 2010-2014

| | Year of Confirmation | | | | | | | | | |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
NH White										
15-34	1	33.3	0	0.0	0	0.0	0	0.0	0	0.0
35-44	0	0.0	1	33.3	0	0.0	1	16.7	0	0.0
45-54	2	66.7	1	33.3	1	50.0	3	50.0	4	80.0
55-64	0	0.0	1	33.3	1	50.0	2	33.3	1	20.0
Subtotal	3	100.0	3	100.0	2	100.0	6	100.0	5	100.0
Black										
15-34	1	9.1	1	6.3	4	30.8	3	13.0	0	0.0
35-44	1	9.1	4	25.0	2	15.4	3	13.0	3	21.4
45-54	6	54.5	5	31.3	1	7.7	9	39.1	4	28.6
55-64	0	0.0	5	31.3	5	38.5	4	17.4	4	28.6
65+	3	27.3	1	6.3	1	7.7	4	17.4	3	21.4
Subtotal	11	100.0	16	100.0	13	100.0	23	100.0	14	100.0
Hispanic										
15-34	4	28.6	6	20.0	4	19.0	4	11.8	4	36.4
35-44	3	21.4	8	26.7	7	33.3	12	35.3	1	9.1
45-54	3	21.4	6	20.0	5	23.8	11	32.4	2	18.2
55-64	3	21.4	8	26.7	5	23.8	4	11.8	1	9.1
65+	1	7.1	2	6.7	0	0.0	3	8.8	3	27.3
Subtotal	14	100.0	30	100.0	21	100.0	34	100.0	11	100.0
Asian										
15-34	2	33.3	1	25.0	0	0.0	1	33.3	1	14.3
35-44	1	16.7	2	50.0	0	0.0	1	33.3	0	0.0
45-54	2	33.3	0	0.0	1	33.3	1	33.3	2	28.6
55-64	0	0.0	1	25.0	2	66.7	0	0.0	3	42.9
65+	1	16.7	0	0.0	0	0.0	0	0.0	1	14.3
Subtotal	6	100.0	4	100.0	3	100.0	3	100.0	7	100.0
Total Cases	34	100.0	53	100.0	39	100.0	66	100.0	37	100.0

*Homelessness within 1 year of TB Diagnosis. There were no TB cases experiencing homelessness under the age of 15. **NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 11. Tuberculosis Cases Experiencing Homelessness* by Race/Ethnicity** and Reported Substance Use***: Los Angeles County, 2010-2014

	Year of Confirmation									
	2010		2011		2012		2013		2014	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
NH White										
Injecting Drugs										
Yes	1	33.3	0	0.0	0	0.0	0	0.0	1	20.0
No	1	33.3	3	100.0	2	100.0	5	83.3	3	60.0
Unknown	1	33.3	0	0.0	0	0.0	1	16.7	1	20.0
Non-Injecting Drugs										
Yes	1	33.3	0	0.0	0	0.0	1	16.7	2	40.0
No	1	33.3	3	100.0	2	100.0	4	66.7	3	60.0
Unknown	1	33.3	0	0.0	0	0.0	1	16.7	0	0.0
Excess Alcohol Use										
Yes	2	66.7	2	66.7	1	50.0	3	50.0	3	60.0
No	0	0.0	1	33.3	1	50.0	2	33.3	2	40.0
Unknown	1	33.3	0	0.0	0	0.0	1	16.7	0	0.0
Subtotal	3	100.0	3	100.0	2	100.0	6	100.0	5	100.0
Black										
Injecting Drugs										
Yes	0	0.0	0	0.0	0	0.0	2	8.7	0	0.0
No	10	90.9	15	93.8	10	76.9	20	87.0	13	92.9
Unknown	1	9.1	1	6.3	3	23.1	1	4.3	1	7.1
Non-Injecting Drugs										
Yes	3	27.3	9	56.3	6	46.2	7	30.4	7	50.0
No	7	63.6	6	37.5	4	30.8	15	65.2	6	42.9
Unknown	1	9.1	1	6.3	3	23.1	1	4.3	1	7.1
Excess Alcohol Use										
Yes	4	36.4	9	56.3	5	38.5	12	52.2	7	50.0
No	6	54.5	6	37.5	6	46.2	10	43.5	6	42.9
Unknown	1	9.1	1	6.3	2	15.4	1	4.3	1	7.1
Subtotal	11	100.0	16	100.0	13	100.0	23	100.0	14	100.0
Hispanic										
Injecting Drugs										
Yes	1	7.1	4	13.3	3	14.3	2	5.9	0	0.0
No	10	71.4	22	73.3	18	85.7	29	85.3	10	90.9
Unknown	3	21.4	4	13.3	0	0.0	3	8.8	1	9.1
Non-Injecting Drugs										
Yes	1	7.1	7	23.3	6	28.6	11	32.4	4	36.4
No	10	71.4	19	63.3	15	71.4	20	58.8	6	54.5
Unknown	3	21.4	4	13.3	0	0.0	3	8.8	1	9.1
Excess Alcohol Use										
Yes	4	28.6	13	43.3	13	61.9	21	61.8	6	54.5
No	9	64.3	14	46.7	8	38.1	13	38.2	4	36.4

	2010		2011		2012		2013		2014	
Year of Confirmation										
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Unknown	1	7.1	3	10.0	0	0.0	0	0.0	1	9.1
Subtotal	14	100.0	30	100.0	21	100.0	34	100.0	11	100.0
Asian										
Injecting Drugs										
Yes	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
No	5	83.3	4	100.0	3	100.0	3	100.0	5	71.4
Unknown	1	16.7	0	0.0	0	0.0	0	0.0	2	28.6
Non-Injecting Drugs										
Yes	1	16.7	0	0.0	0	0.0	0	0.0	0	0.0
No	5	83.3	4	100.0	2	66.7	3	100.0	5	71.4
Unknown	0	0.0	0	0.0	1	33.3	0	0.0	2	28.6
Excess Alcohol Use										
Yes	1	16.7	1	25.0	0	0.0	0	0.0	0	0.0
No	4	66.7	3	75.0	2	66.7	3	100.0	5	71.4
Unknown	1	16.7	0	0.0	1	33.3	0	0.0	2	28.6
Subtotal	6	100.0	4	100.0	3	100.0	3	100.0	7	100.0
Total	34	100.0	53	100.0	39	100.0	66	100.0	37	100.0

*Homelessness within 1 year of TB Diagnosis. **NH White = non-Hispanic White; Black = non-Hispanic Black;
Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. ***Drug use or excess alcohol use in the past
year. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 12. Tuberculosis Cases Experiencing Homelessness* by Race/Ethnicity** and Place of Birth: Los Angeles County, 2010-2014

| | Year of Confirmation | | | | | | | | | |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
NH White										
Non-U.S. Born	1	33.3	0	0.0	0	0.0	0	0.0	1	20.0
U.S. Born	2	66.7	3	100.0	2	100.0	6	100.0	4	80.0
Subtotal	3	100.0	3	100.0	2	100.0	6	100.0	5	100.0
Black										
Non-U.S. Born	2	18.2	0	0.0	0	0.0	1	4.3	0	0.0
U.S. Born	9	81.8	16	100.0	13	100.0	21	91.3	14	100.0
Unknown	0	0.0	0	0.0	0	0.0	1	4.3	0	0.0
Subtotal	11	100.0	16	100.0	13	100.0	23	100.0	14	100.0
Hispanic										
Non-U.S. Born	10	71.4	22	73.3	15	71.4	26	76.5	8	72.7
U.S. Born	3	21.4	8	26.7	6	28.6	8	23.5	2	18.2
Unknown	1	7.1	0	0.0	0	0.0	0	0.0	1	9.1
Subtotal	14	100.0	30	100.0	21	100.0	34	100.0	11	100.0
Asian										
Non-U.S. Born	5	83.3	4	100.0	3	100.0	3	100.0	7	100.0
U.S. Born	1	16.7	0	0.0	0	0.0	0	0.0	0	0.0
Subtotal	6	100.0	4	100.0	3	100.0	3	100.0	7	100.0
Total Cases	34	100.0	53	100.0	39	100.0	66	100.0	37	100.0

*Homelessness within 1 year of TB diagnosis. **NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 13. Tuberculosis Cases by Site of Disease: Los Angeles County, 2010-2014

| | Year of Confirmation | | | | | | | | | |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Pulmonary	475	70.4	470	69.1	405	64.8	455	68.8	391	66.8
Extra-pulmonary*	137	20.3	135	19.9	147	23.5	128	19.4	132	22.6
Both Pulmonary and Extra-pulmonary	63	9.3	75	11.0	73	11.7	78	11.8	62	10.6
Total Cases	675	100.0	680	100.0	625	100.0	661	100.0	585	100.0

*Cases with pleural, lymphatic, bone and/or joint, meningeal, peritoneal, or other site of TB disease; no cases with pulmonary TB disease included. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 14. Tuberculosis Cases with Known Sputum Culture and Sputum Smear Positivity*: Los Angeles County, 2010-2014

| | | Year of Confirmation | | | | | | | | |
| | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Sputum Culture Positive	**Sputum Smear Positive**										
	No	61	84.7	67	89.3	55	94.8	55	90.2	53	77.9
No	Yes	11	15.3	8	10.7	3	5.2	6	9.8	15	22.1
	Subtotal	72	100.0	75	100.0	58	100.0	61	100.0	68	100.0
	Sputum Smear Positive										
Yes	No	117	32.9	97	27.0	92	28.5	102	28.5	99	27.7
	Yes	239	67.1	262	73.0	231	71.5	256	71.5	259	72.3
	Subtotal	356	100.0	359	100.0	323	100.0	358	100.0	358	100.0
Total Cases		428	100.0	434	100.0	381	100.0	419	100.0	426	100.0

*Culture and Smear positivity defined as within 14 days of treatment start date. Data include cases with pulmonary site of TB disease. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 15. Tuberculosis Cases by Verification Criteria: Los Angeles County, 2010-2014

| | Year of Confirmation | | | | | | | | | |
| | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | |
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Laboratory Confirmation*	579	85.8	565	83.1	532	85.1	556	84.1	509	87.0
Clinical Confirmation										
Clinical Case	95	14.1	89	13.1	81	13.0	88	13.3	66	11.3
Provider Diagnosis	1	0.1	26	3.8	12	1.9	17	2.6	10	1.7
Total Cases	675	100.0	680	100.0	625	100.0	661	100.0	585	100.0

*Laboratory Confirmation includes TB cases classified as culture positive, NAAT positive, and smear positive. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 16. Tuberculosis Cases with Resistance to Rifampin: Los Angeles County, 2010-2014

Year of Confirmation	Culture Positive Cases	No. with RIF Susceptibility Testing	Cases with Resistance to RIF*	
			Cases	%
2010	529	523	1	0.2
2011	544	537	0	0.0
2012	508	502	2	0.4
2013	533	528	1	0.2
2014	474	569	3	0.5

*RIF=Rifampin; excludes MDR-TB cases. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 17 Tuberculosis Cases with Resistance to Isoniazid: Los Angeles County, 2010-2014

Year of Confirmation	Culture Positive Cases	No. with INH Susceptibility Testing	Cases with Resistance to INH*	
			Cases	%
2010	529	523	50	9.5
2011	544	536	48	8.8
2012	508	501	35	6.9
2013	533	528	55	10.3
2014	474	469	46	9.8

*INH=Isoniazid; excludes MDR-TB cases. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 18 Tuberculosis Cases with Resistance to Pyrazinamide: Los Angeles County, 2010-2014

Year of Confirmation	Culture Positive Cases	No. with PZA Susceptibility Testing	Cases with Resistance to PZA*	
			Cases	%
2010	529	521	29	5.6
2011	544	536	37	6.9
2012	508	499	25	5.0
2013	533	526	34	6.5
2014	474	471	21	4.5

*PZA=Pyrazinamide; excludes MDR-TB cases. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 19 Tuberculosis Cases with Resistance to Ethambutol: Los Angeles County, 2010-2014

Year of Confirmation	Culture Positive Cases	No. with EMB Susceptibility Testing	Cases with Resistance to EMB*	
			Cases	%
2010	529	523	4	0.8
2011	544	537	5	0.9
2012	508	502	3	0.6
2013	533	528	3	0.6
2014	474	468	0	0.0

*EMB=Ethambutol; excludes MDR-TB cases. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 20 Tuberculosis Cases with Resistance to Streptomycin: Los Angeles County, 2010-2014

Year of Confirmation	Culture Positive Cases	No. with SM Susceptibility Testing	Cases with Resistance to SM*	
			Cases	%
2010	529	502	35	7.0
2011	544	511	44	8.6
2012	508	484	40	8.3
2013	533	505	44	8.7
2014	474	441	28	6.3

*SM=Streptomycin; excludes MDR-TB cases. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 21 Tuberculosis Cases with Multidrug Resistance: Los Angeles County, 2010-2014

Year of Confirmation	Culture Positive Cases	No. with MDR Susceptibility Testing*	Cases with Multidrug Resistance**					
			MDR Only	%	pre-XDR	%	XDR	%
2010	529	523	9	1.7	1	0.2	0	0.0
2011	544	537	11	2.0	1	0.2	0	0.0
2012	508	501	4	0.8	1	0.2	0	0.0
2013	533	528	5	1.0	0	0.0	1	0.2
2014	474	469	4	0.8	1	0.2	0	0.0

*Cases with drug susceptibility results for both isoniazid and rifampin. **MDR=Multidrug Resistant (Resistance to at least isoniazid and rifampin); Pre-XDR = pre-Extensively Drug Resistant (Resistance to isoniazid and rifampin and either a fluoroquinolone or a second line injectable, but not both); XDR = Extensively Drug Resistant (resistance to isoniazid and rifampin and a fluoroquinolone and a second line injectable). Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 22 Tuberculosis Cases by Initial Drug Regimen: Los Angeles County, 2010-2014

Year of Confirmation	Total Cases	Alive at Diagnosis Cases	Started on Initial Drug Regimen Cases	Initial Drug Regimen* (%)				
				IRZ, E/S	IRZ	IRE	IR	Other
2010	675	656	645	65.4	0.9	2.0	0.2	31.5
2011	680	669	664	77.6	1.2	1.7	0.3	19.3
2012	625	608	599	86.6	2.0	1.7	0.3	9.3
2013	661	641	640	90.0	0.9	2.2	0.5	6.4
2014	585	575	572	88.8	1.2	2.8	0.7	6.5

*I=Isoniazid; R=Rifampin; Z=Pyrazinamide; E=Ethambutol; E/S=Ethambutol and/or Streptomycin; Other=all other drugs.
Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 23 Tuberculosis Cases by Type of Therapy Administration: Los Angeles County, 2010-2014

Year of Confirmation	Total Cases	Cases Started on Initial Drug Regimen	Cases w/ Information on Type of Therapy Administration	Type of Therapy Administration* (%)					
				DOT Only		DOT and SAT		SAT Only	
				Cases	%	Cases	%	Cases	%
2010	675	645	644	447	69.3	107	16.6	90	14.0
2011	680	664	664	414	62.3	176	26.5	74	11.1
2012	625	599	599	341	56.9	191	31.9	67	11.2
2013	661	640	639	316	49.5	252	39.4	70	11.0
2014	585	572	562	301	53.3	206	36.5	55	9.7

*DOT = Directly Observed Therapy; SAT = Self-Administered Therapy. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 24 Treatment Outcomes among Tuberculosis Cases for whom One Year or Less of Therapy was indicated: Los Angeles County, 2010-2012

Treatment Status*	Year of Confirmation					
	2010		**2011**		**2012**	
	Cases	**%**	**Cases**	**%**	**Cases**	**%**
Completed Treatment ≤ 1 year	486	83.2	489	90.5	454	93.2
Completed Treatment > 1 year	50	8.6	37	6.8	26	5.3

*Completion of Treatment as reported to CDC. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 25 Deaths in Persons with Tuberculosis: Los Angeles County, 2010-2014

Year of Confirmation	Total Cases	Total Deaths		Died Before Starting TB Therapy		Died During TB Therapy	
		Cases	%	Cases	%	Cases	%
2010	675	68	10.1	20	29.4	48	70.6
2011	680	77	11.3	11	14.3	66	85.7
2012	625	79	12.6	17	21.5	62	78.5
2013	661	83	12.6	20	24.1	63	75.9
2014	585	60	10.3	11	18.3	49	81.7

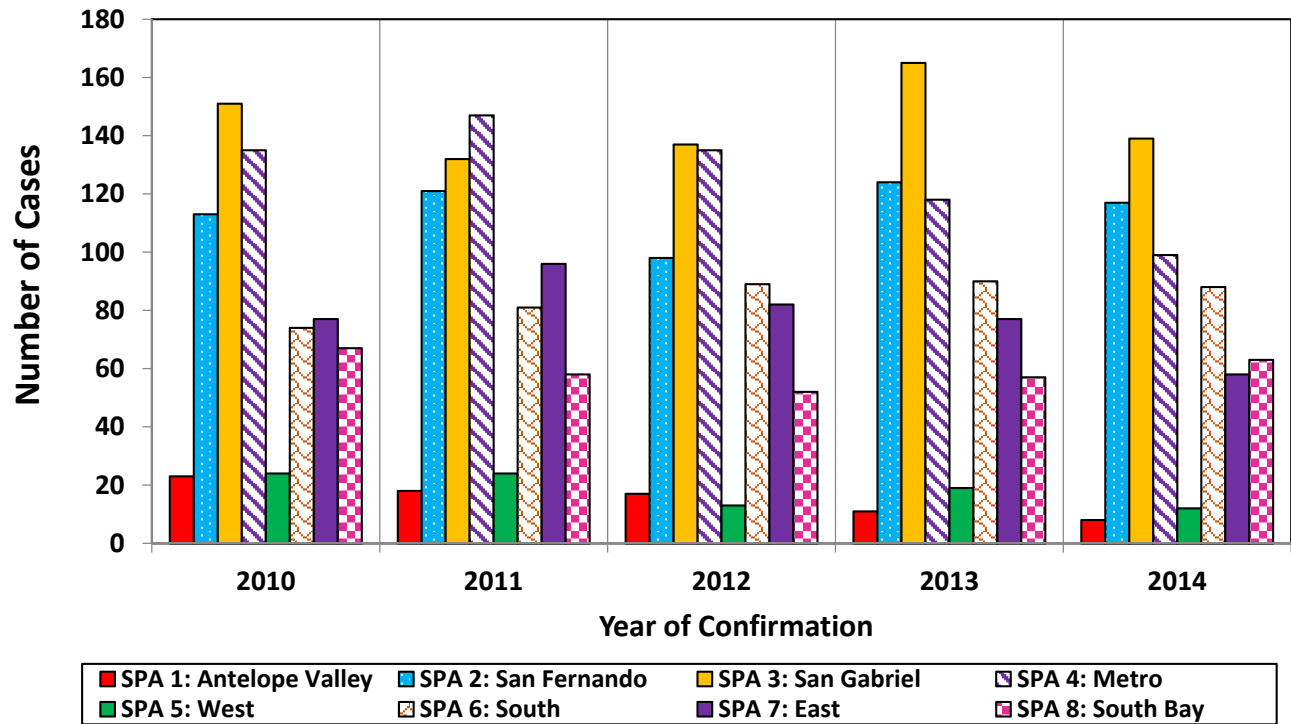Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Tuberculosis Cases by Service Planning Area

Figure 22 Tuberculosis Cases by Service Planning Area (SPA)*: Los Angeles County, 2010-2014

*TB cases assigned to TB Control Headquarters not included in SPA counts. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 26 Tuberculosis Cases by Service Planning Area (SPA): Los Angeles County, 2014

	California*	LA County	Antelope Valley SPA 1	San Fernando SPA 2	San Gabriel SPA 3	Metro SPA 4	West SPA 5	South SPA 6	East SPA 7	South Bay SPA 8
Race/Ethnicity**										
NH White	165	34	<5	13	<5	8	<5	<5	<5	<5
Black	118	47	<5	6	<5	12	<5	18	<5	7
Hispanic	776	244	<5	35	38	40	<5	61	45	20
Asian	1,081	259	<5	63	99	39	<5	7	12	32
Age Group										
0-4	56	15	<5	5	<5	<5	<5	<5	<5	<5
5-14	35	8	<5	<5	<5	<5	<5	<5	<5	<5
15-24	187	32	<5	6	<5	<5	<5	10	<5	<5
25-44	530	133	<5	24	23	29	<5	25	12	17
45-64	661	200	<5	40	42	32	5	33	21	26
65+	678	196	<5	41	65	34	5	16	17	16
Sex										
Female	848	210	<5	39	54	30	<5	31	24	25
Male	1,299	374	5	78	85	69	8	57	34	38
Birthplace										
Non-U.S. Born	1,670	464	6	99	128	76	7	55	39	54
U.S. Born	463	119	<5	18	10	23	5	33	19	9
Unknown	14	1	<5	<5	<5	<5	<5	<5	<5	<5
Total Cases	2,147	584	8	117	139	99	12	88	58	63

*Report on Tuberculosis in California, 2014. CDPH, 2015. **NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. < Suppression due to small cell count. 1 case assigned to TB Control Headquarter not included in SPA count. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

Table 27 Proportion of Tuberculosis Cases by Service Planning Area (SPA): Los Angeles County, 2014

	California*	LA County	Antelope Valley SPA 1	San Fernando Valley SPA 2	San Gabriel Valley SPA 3	Metro SPA 4	West SPA 5	South SPA 6	East SPA 7	South Bay SPA 8
Race/Ethnicity**										
NH White	165	34	12.5	11.1	0.7	8.1	33.3	2.3	1.7	6.3
Black	118	47	0.0	5.1	0.7	12.1	25.0	20.5	0.0	11.1
Hispanic	776	244	50.0	29.9	27.3	40.4	8.3	69.3	77.6	31.7
Asian	1,081	259	37.5	53.8	71.2	39.4	33.3	8.0	20.7	50.8
Age Group										
0-4	56	15	0.0	4.3	2.2	1.0	8.3	2.3	3.4	1.6
5-14	35	8	0.0	0.9	1.4	1.0	0.0	2.3	1.7	1.6
15-24	187	32	25.0	5.1	2.9	2.0	8.3	11.4	8.6	3.2
25-44	530	133	37.5	20.5	16.5	29.3	0.0	28.4	20.7	27.0
45-64	661	200	12.5	34.2	30.2	32.3	41.7	37.5	36.2	41.3
65+	678	196	25.0	35.0	46.8	34.3	41.7	18.2	29.3	25.4
Sex										
Female	848	210	37.5	33.3	38.8	30.3	33.3	35.2	41.4	39.7
Male	1,299	374	62.5	66.7	61.2	69.7	66.7	64.8	58.6	60.3
Birthplace										
Non-U.S. Born	1,670	464	75.0	84.6	92.1	76.8	58.3	62.5	67.2	85.7
U.S. Born	463	119	25.0	15.4	7.2	23.2	41.7	37.5	32.8	14.3
Unknown	0.6	0.2	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Percent of Total‡	-	-	1.3	20.0	23.8	17.0	2.1	15.1	9.9	10.8

*Report on Tuberculosis in California, 2014. CDPH, 2015. **NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. 1 case assigned to TB Control Headquarter not included in SPA proportions. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

TECHNICAL NOTES

1. Tuberculosis Case Definition: An episode of TB disease in a person meeting the laboratory or clinical criteria for TB as defined in the "Report of Verified Case of Tuberculosis (RVCT)" manual[22].

2. Reporting TB Cases: Health care providers (including administrators of healthcare facilities and clinics) in LA County are required by law (California Code of Regulations Title 17, Section 2500) to report all local confirmed and suspected cases of active TB, within one (1) working day of the time of identification to the Health Officer. The director of any clinical laboratory or designee must report laboratory evidence suggestive of TB to the health department on the same day that the physician who submitted the specimen is notified (California Code: Title 17, Chap. 4, Sec 2505).

3. Data Source: Tuberculosis cases reported in LA County are entered into the TB Registry Information Management System (TRIMS). This database contains records for TB cases and suspects and contacts of TB cases, and provides the basis for the data presented in this report. To assess for the presence of TB infection, the LA County Public Health Laboratory (PHL) processes QuantiFERON TB Gold in-Tube Test (QFT-GIT), a type of Interferon-Gamma Release Assay (IGRA) test. Among recently developed screening tests, the IGRA test is recommended as an aid for detecting TB infection[3, 23]. The LA County PHL provides the TBCP with data on all QFT-GIT tests processed in their lab. For this surveillance report, positive QFT-GIT test data were summarized by the type of clinic where the test was administered. Clinics were grouped into 3 categories: (1) Community Health Services Public Health Clinics; (2) HIV Care Clinics (HIV care clinics that also offer TB screening services); (3) Contract Clinics (Community-based clinics, contracted by TBCP, that offer low-cost TB screening services).

4. Population Denominators: LA County population estimates used for calculating rates included in this report were obtained from the Population Estimates and Projections Systems (PEPS), which are made available to the LA County Department of Public Health by Urban Research[24]. The cities of Long Beach and Pasadena are separate reporting jurisdictions, as recognized by the California Department of Public Health. Thus, TB cases occurring in Long Beach and Pasadena are excluded from LA County TB data, and their population totals are not included in the LA County population denominators used to calculate rates in this report.

5. Race/Ethnicity: There is one variable for race and one for ethnicity "Hispanic." If a case is classified as "Hispanic" then the case is reported as "Hispanic" in this report regardless of race.

6. Age: Age was calculated by following Wang's[25] formula for age calculation which uses a person's birthday and takes into account leap year and non-leap year birthdays. For analysis presented in this report, age was categorized into 7 distinct age groups. For analyses by SPA, age was categorized into 6 distinct age groups that reflect the same age categorization used by the California Department of Public Health Tuberculosis Control Branch, in order to show comparisons by age groups.

7. U.S.-born refers to cases born in one of the 50 states, District of Columbia, or other U.S. territories and outlying areas. A person born abroad to a parent who is a U.S. citizen is considered U.S. born. All others with a known country of birth are considered non-U.S. born[22].

8. Drug Susceptibility Testing (DST): DST is performed to help determine whether a person's *M. tuberculosis* strain is sensitive or resistant to any TB drug(s). DST helps guide the selection of the most appropriate TB treatment regimen and duration.

9. Completion of Treatment: Since the case completion reports are not submitted until many months after a TB case is initially reported, treatment completion data reported for cases counted in 2012 are the most recent available and are presented in this report. Completion of treatment is presented for years 2010-2012 in Table 24. Outcomes for cases expected to complete therapy in 12 months or less exclude cases with rifampin-resistant disease (including MDR-TB), those with meningeal disease, and children less than 15 years of age with disseminated TB disease.

10. To calculate Service Planning Areas (SPA), the locally assigned identification number, from the RVCT form, was used. This number identifies the SPA in which a case was confirmed.

11. Data for 2014 are provisional and reflect the most complete information available as of July 2015. Case count data for previous years may differ from previously published data and statistics due to updates in TB case information entered into the TB surveillance database, and thus the counts for previous years presented in this report may not match TB counts previously released (these differences are generally very small).

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